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United States
Department of
Agriculture

Office of the General Counsel
1400 Independence Ave. SW
Washington, DC 20250-1400

February 12, 2021

Delivered via Electronic Mail

**Re: Freedom of Information Act (FOIA) Request No. 2020-REE-06411-F
Final Response**

This is the final response to the September 21, 2020, Freedom of Information Act (FOIA) request submitted to the U.S. Department of Agriculture (USDA), Research, Education and Economics (REE) mission area. The Office of Information Affairs (OIA), Freedom of Information Act (FOIA) Division is under the purview of the General Counsel (GC) and serves as the focal point for USDA's FOIA program. It provides coordination and ensures agency-wide compliance with the FOIA. Additionally, the OIA-FOIA processes requests and appeals on behalf of the Office of the Secretary (OSEC); the Under Secretaries; USDA's staff offices; and the Research, Education and Economics and Trade and Foreign Agricultural Affairs mission areas.

Your request sought, "the meeting minutes (not meeting agendas) from the meetings of the National Agricultural Research, Extension, Education, and Economics Advisory Board, NAREEE, from 2016 to the present."

A search for responsive records was conducted by the REE mission area. The REE Mission Area is dedicated to the creation of a safe, sustainable, competitive U.S. food and fiber system and strong, healthy communities, families and youth through integrated research, analysis, and education. Responsive records totaling one hundred sixteen (116) pages were identified. Following a review of the responsive records, the DFO has determined that certain information contained therein should be withheld pursuant to 5 U.S.C. § 552(b)(6) (FOIA Exemption 6). Below is an explanation of the information that has been withheld.

FOIA Exemption 6

Exemption 6 generally is referred to as the "personal privacy" exemption. It provides that the disclosure requirements of FOIA do not apply to "personnel and medical files and similar files the disclosure of which would constitute a clearly unwarranted invasion of personal privacy." Application of the exemption involves balancing the public's interest in disclosure against individuals' privacy interests.

The information withheld under Exemption 6 consists of conference call access codes, the name of a nominee who was not selected for the position nominated for, and other personal information related to individuals. This information qualifies as "similar files" because it is

information in which individuals have a privacy interest. The personal information withheld is purely personal in nature and does not advance one's understanding of the government's operations. As for the teleconference access codes, participants have a privacy interest in ensuring no uninvited individual is listening in on the call. Since there is a viable privacy interest that would be threatened by disclosure, Exemption 6 authorizes this office to withhold the information. Accordingly, we have determined that the public interest in the information's release does not outweigh the overriding privacy interests in keeping it confidential.

You may appeal this response by email at USDAFOIA@usda.gov. Your appeal must be in writing, and it must be received electronically no later than 90 calendar days from the date of this letter. The OGC will not consider appeals received after the 90 calendar-day limit. Appeals received after 5:00 p.m. EST will be considered received the next business day. The appeal letter should include the FOIA tracking number listed above, a copy of the original request, the OIA's response to your original request, and a statement explaining the basis of your appeal. For quickest possible handling, the subject line of your email should be marked "Freedom of Information Act Appeal." You should also reference FOIA No. 2020-REE-06411-F

You may seek dispute resolution services from the OIA's FOIA Public Liaison, Ms. Camille Aponte. Ms. Aponte may be contacted by telephone at 202-505-0271, or electronically at Camille.Aponte@usda.gov or USDAFOIA@usda.gov.

You also have the option to seek assistance from the Office of Government Information Services (OGIS). Please visit <https://ogis.archives.gov/mediation-program/request-assistance.htm> for information about how to request OGIS assistance in relation to a FOIA request.

Provisions of the FOIA allow us to recover part of the cost of processing your request. In this instance, no fees are being charged.

If you have any questions regarding this letter, please contact Mr. Nicholas Mantzaris at 202-694-5260 or electronically at Nicholas.Mantzaris@usda.gov or USDAFOIA@usda.gov.

For additional information regarding USDA FOIA regulations and processes, please refer to the information available online at www.dm.usda.gov/foia.

The OIA appreciates the opportunity to assist you with this matter.

Sincerely,



Alexis R. Graves
Departmental FOIA Officer
Office of Information Affairs

Enclosures: Responsive Records (116 pages)

**National Agricultural Research, Extension, Education, and Economics (NAREEE)
Advisory Board**

MINUTES OF THE NAREEE BOARD MEETING

July 17-19, 2019
The Darcy Hotel
1515 Rhode Island Avenue, NW
Washington, DC, 20005

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EXECUTIVE SUMMARY

National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board Meeting

July 17-19, 2019
The Darcy Hotel
1515 Rhode Island Avenue, NW
Washington, DC, 20005

The National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board met in public session from July 17-19, 2019, in Washington, DC, to orient incoming new members and to complete various business items related to the Board's duties as an advisory body to the four agencies within the Research, Education, and Economics (REE) mission area and to the Secretary of Agriculture.

July 17, 2019

The meeting began with an Orientation Session for new members conducted by Michele Esch, the NAREEE Executive Director and Designated Federal Officer (DFO). Ms. Esch gave an overview of the Citrus Disease Subcommittee (CDS); the Specialty Crop Committee (SCC), and the National Genetic Resources Advisory Council (NGRAC), as well as the Science Advisory Council (SAC). The Board will have to decide whether to continue the Data Management Working Group (DMWG). Ms. Esch also reviewed the Board's Relevance & Adequacy (R&A) review process. As part of the Orientation, Andrew Tobin, Deputy Director of the USDA Office of Ethics, gave a presentation on Ethics for the NAREEE Advisory Board.

After the Orientation Session Ms. Esch opened the formal meeting, summarizing her background and asking Board members to introduce themselves and to name any salient issues for their stakeholder category.

Dr. Scott Hutchins, Deputy Under Secretary for REE, introduced himself and provided remarks, describing his professional and personal perspectives on the OneUSDA teamwork management principles, such ideas as the need to prioritize, to invest in compelling value propositions rather than simply spending money, to work efficiently, and to think big about what is possible and needs to occur to achieve progress. He gave an overview of the REE agencies: the Agricultural Research Service (ARS); the Economic Research Service (ERS); the National Agricultural Statistics Service (NASS); the National Institute of Food and Agriculture (NIFA); and the Office of the Chief Scientist (OCS). He reviewed current REE topics, including the ERS/NIFA relocation to Kansas City; the National Bio and Agriculture-defense Facility (NBAF); the NASS 2017 Census of Agriculture; and Farm Bill implementation. USDA is holding stakeholder meetings to receive inputs and many groups have come in for listening sessions at which USDA solicits their views on how the department can do better. During a Q&A session with Board members, the ERS/NIFA relocation was a primary discussion topic.

REE agency representatives provided updates and took questions from Board members.

For ARS, Dr. Mojdeh Bahar, Assistant Administrator, Office of Technology Transfer, gave a presentation for ARS Administrator Chavonda Jacobs-Young on *Nurturing a Culture of Innovation*. Dr. Bahar described two impactful initiatives: 1) the Innovation Fund, which has program elements to avoid the “valley of death” in moving research to development, and 2) Small Business Innovation Research (SBIR) Technology Transfer, an interagency collaboration under OneUSDA to make sure all agencies are pulling in the same direction.

For NIFA, Dr. Scott Angle, Director, indicated that he wanted to discuss where NIFA has been, where it is now, and where it will go in the future instead of focusing his time on the relocation. Dr. Angle discussed the Agriculture and Food Research Initiative (AFRI), the flagship program for competitive extramural funding of agricultural research. The program is approximately \$500 million, and in the past exclusively supported Land Grant Universities. But AFRI is changing and accelerating support for other academic and industry experts. During discussion, a member commented that extension work is needed for producers and broadband access is essential. Dr. Angle noted that helping farmers get broadband access has been a USDA priority for many administrations.

For NASS, Mr. Hubert Hamer, Administrator, described his organization as the official statistics agency of USDA. NASS is using precision agriculture to reduce the burden of collecting data, with several strategic initiatives: 1) the Data Collection Dashboard; 2) the NASS Operating Model Reimagined; and 3) Improving the Agricultural Data User Experience. During discussion, he said NASS is researching whether a future without surveys is possible. Digital data collectors on combines and other equipment must be calibrated and NASS is checking for bias, using satellite data, and taking other steps, but it is early in the planting season and thus hard to figure things out.

For OCS, Dr. Dionne Toombs, Director, noted changes in the REE Action Plan. In 2012, the plan focused on how to address agriculture research gaps. The plan was revised in 2014, and again in 2017 after the new Secretary released new strategic goals. Describing research efforts, Dr. Toombs noted several items, including an antimicrobial resistance task force that is developing a federal-wide action plan; a federal pollinator task force involving the Environmental Protection Agency and USDA; Urban Agriculture; OCS plant breeding activities; and scientific integrity.

For ERS, Dr. Greg Pompelli, Associate Administrator, described the Service as one of the 13 main federal statistical agencies. ERS anticipates trends and conducts research on emerging issues to inform public- and private-sector policy, program, and business decisions. But it does not make policy recommendations. During discussion he addressed concerns about the ERS relocation, reassuring Board members that ERS could handle the losses of staff and was working on that issue.

Ms. Esch asked for Executive Committee nominations and explained the voting process, which would be completed on the following day.

Members discussed Board meeting dates, with clear interest shown in holding a meeting in Kansas City and members mentioning other possibilities, including Florida and California.

Two requests were made for public comments to the Board. First, Dr. Steve Pierson, the Director of Science Policy at the American Statistical Association (ASA), spoke on behalf of Dr. Gale A. Buchanan, former Under Secretary for REE, who had sent a letter expressing great concern about the relocation of NIFA and ARS outside of Washington, DC. For ASA, Dr. Pierson said his organization urges USDA to fund the National Academy of Sciences to conduct a study on REE organizational needs and does not endorse the relocation, conclusions he hoped the Board would support. Second, John McNamara, a retired professor of Animal Sciences at Washington State University, seconded everything Dr. Pierson said and urged continuing to fully fund and support USDA NIFA, and ARS in providing money for truly relevant integrated science, from basic to applied.

During discussion, a Board member said that it was painfully clear during Dr. Pompelli's presentation that the decision to move ERS and NIFA to Kansas City was decided in August, with the site selected and all decisions done in less than a year, and it is clear that it takes much more time and consultation. There was not much evidence of real analysis and the Board should discuss whether to comment and what comments should look like. Board members raised a number of concerns about the ERS/NIFA relocation: the effects on program leaders and their retention rate; NIFA employees are unhappy, and it is not inconsequential how many have been lost; there will be frustration regarding NIFA grants, moving paper, and administration of the program; expertise in the Kansas City region will better position USDA in the heartland; the main problem is that USDA cannot give good packages to keep scientists on the payroll; locating one or both agencies outside DC puts them in a political home with a member of Congress advocating for them in his or her district; A member recommended that the Board members read the CBA materials provided by Ms. Esch and then discuss what members wanted to say on the relocation issue.

July 18, 2019

Ms. Esch opened the meeting by awarding a plaque to Ms. Shirley Morgan-Jordan in recognition of her 30 years with the U.S. government. Discussion continued regarding the ERS/NIFA move, and Ms. Esch agreed to share Secretary Sonny Perdue's press releases describing his relocation decision to help Board members understand the decisions made. Members emphasized their responsibility to ensure evidence-based policies and the need for the USDA process to be transparent. Members feared a loss of experience at ERS/NIFA. The Board has a responsibility to give guidance to USDA but should avoid micromanaging. The Board agreed to establish a process with a subgroup to produce a framework letter to the Secretary that the entire Board could comment on in the public meeting. If necessary, a conference call could be held to address further details.

Mr. Josh Stull, who conducts Congressional and Stakeholder Affairs for NIFA, gave an overview of Title VII, on Research and Extension, of the Agriculture Improvement Act of 2018. Title VII is mostly about NIFA, but ARS, ERS, NASS also have provisions. Some Farm Bill provisions have no leeway, but USDA "conveners" elevated extension, risk management, and education provisions because there are a couple of options to implement them. During discussion members

asked Mr. Stull to share a list of appropriations decisions with the Board members and he agreed to do so. He noted that many Hill staff require education in the basics of NIFA. One Farm Bill provision called the Agriculture Advanced Research and Development Authority (AGARDA) was adopted but no money was provided to run the program. Mr. Stull reviewed the Congressional appropriations process, noting its unpredictability.

The Board turned to the Relevance and Adequacy Review process. Ms. Esch noted that two questions would guide the discussion: 1) Does the process work? and, 2) How can we streamline? She reviewed the statutory requirements of the R&A process and the history of the program's establishment, including the creation of seven overarching questions to guide reviewers. Ms. Esch showed members the status of the proposed 5-year R&A cycle, listing the topics drawn from the REE Action Plan and noting that the Board lost a quorum for the years 2018, 2019, and 2020, so some of the topics need to be reviewed. Members discussed the relationship between the REE Action Plan goals and USDA Science Plan goals, which are now under review and which the Board should review and comment on.

The Board elected an Executive Committee, including a chair and vice chair, to serve as the steering committee for the NAREEE Advisory Board as a whole. A list of nominees was posted and the results of voting were that David Baltensperger was elected Chair, Edmund Buckner Vice Chair, and seven additional members were chosen: Robin Beck; Mike Oltrogge; Jayson Lusk; Sarah Francis; John Coupland; and Richard de los Santos.

Dr. Scott Hutchins provided an overview of his strategic themes. The five themes were: 1) Sustainable Ag Intensification; 2) Ag Climate Adaptation; 3) Food and Nutrition Translation; 4) Value Added Innovation; and 5) Ag Science Policy Leadership, which addresses an expectation that the United States should lead the world in ag science, in contrast with the European Union's use of hazard-based precautionary principle approaches, not risk management. Dr. Hutchins then described overarching process themes that apply to all REE agencies and include 1) Empowerment and Delegation; 2) Program Metrics and Key Performance Indicators; 3) Customer-centric Outreach; 4) Mission-wide Op Excellence; and 5) Strategic Hiring Priorities. He noted that Secretary Perdue is passionate about metrics and is investing money to build a dashboard for obtaining data to manage using metrics. Regarding overarching people themes, Dr. Hutchins spoke about five: 1) Team REE-Connect Missions; 2) Professional Career Growth; 3) Talent Succession Training; 4) Science/Management Leadership Development; and 5) Recognition and Advocacy.

During discussion with Dr. Hutchins he identified Ag Climate Adaptation as a priority for feedback in the R&A review, noting that he wanted to demonstrate whether REE is on track from an adaptation standpoint. He said that as the Board discusses ERS/NIFA, members should give REE good strategies for building up the agencies and getting through the transition, helping to define what the next model for those agencies should look like. A member asked how the REE's five themes align with USDA's Strategic Plan goals and how the draft Science Plan goals align. Dr. Hutchins said that Secretary Perdue mapped existing programs to the strategic goals. Wanting USDA programs to be fact-based, science-based, and to benefit the ag community, the question is what a Science Plan should look like. Dr. Hutchins emphasized the importance of good communication. He said that he has no language or narrative around his themes yet and

wants that done in an impactful way. He wants clarity on the “dials” REE should be trying to move; for instance, a metric could be helping U.S. agriculture GDP grow faster than the international standard. The desired environmental outcome would be another metric. Dr. Hutchins said he wants clarity first before speed. Asked about the issue of foreign partners stealing intellectual property (IP), Dr. Hutchins said the concern is a genuine one, but there are risks both of doing too much or too little and thereby ending in a bad place because scientific integrity would be affected. After his departure, some members recounted how their organizations are dealing with concerns about IP theft and China’s attempt to hire foreign researchers.

Newly elected NAREEE Board Chair Dr. David Baltensperger opened the business session by noting various items that were on the table: 1) the ERR/NIFA relocation; 2) the Ag Climate Adaptation theme; 3) R&A actions to take; 4) a U.S. ag innovation strategy; 5) extension input for NIFA Director Dr. Scott Angle; and 6) IP—working with foreign entities; 7) Youth and workforce development.

Members voted to discuss the ERS/NIFA relocation toward the goal of producing a statement on how the Board wants to advise the Secretary on the issue. With the understanding that the Board did not think the process was handled correctly, Board language was discussed and an amendment was proposed. It read:

The NAREEE Advisory Board recommends that the Secretary seek broad stakeholder input before making major operational changes that affect policy and the functioning of science programs, as the Board does not feel this process was satisfactory in regard to the decision to relocate ERS and NIFA.

The amended motion passed unanimously, with members commenting that it seemed like language the Board could support. Members offered thoughts in favor of the statement and possible minor additions that could be made later. Members wanted their letter to the Secretary to note their concerns about potential impacts on administrative and scientific capacity and to ask for USDA to show that no interruption in delivery of programs will occur and projected savings will be reinvested directly toward science. To that end, USDA should in the short-term establish a timeline and short-term performance metrics.

The Board voted for the Chair and a subcommittee to draft the letter to the Secretary with the various points discussed and any additional points. Chair Baltensperger appointed members to work with him on drafting a letter to submit to the group for review: John Coupland, Edmund Buckner, Jayson Lusk, with DFO Esch assisting.

The Board took up the topic of extension. Ms. Esch reminded the Board that Dr. Angle indicated he wanted feedback but was not specific about specific questions he wanted feedback on. Chair Baltensperger said the Board would need to establish a process to conduct a review, so a motion was adopted for the Board to provide input on extension activities through a working group that will develop a plan for going forward. Working group volunteers included Roch Gaussoin, Sarah Francis, Michael Oltrogge, and Govind Kannan. The working group efforts will be the focal point of a future meeting.

The Board voted to launch its R&A review, focusing on Ag Climate Adaptation and mitigation. The Board also voted to request from REE a crosswalk report showing the links between the REE goals, the draft Science Plan, and Dr. Hutchins' overarching program themes so the Board can review the links and provide input.

Caron Gala, Government Relations Liaison with the Agriculture Applied Economics Association (AAEA), made a public comment, underscoring that ERS is very important to AAEA members' profession and that attrition from NIFA and ERS is very concerning, with staff cut in about half. AAEA is working with members of Congress and requested that the Board include economics in its letter to USDA's top leaders. She requested that the Board encourage the Secretary to slow the ERS/NIFA move.

July 19, 2019

Chair David Baltensperger called the meeting to order and the Board reviewed and approved the draft letter the Secretary and Under Secretary regarding the ERS/NIFA relocation. The Board next reviewed and approved the September 28, 2019, NAREEE Board conference call minutes.

DFO Michele Esch gave a slide presentation that provided more detail on the NAREEE subcommittees: 1) the National Genetic Resources Advisory Council; 2) the Specialty Crop Committee, which members agreed should have three, not six, Board representatives, who are now Richard de Los Santos, Kenrett Jefferson-Moore, and Chad Ellis; 3) the Citrus Disease Subcommittee, which Richard de los Santos volunteered to serve on as Board liaison until an alternative is found; 4) the Science Advisory Council (SAC), whose operation is up to the Under Secretary's discretion, not statutory. Members voted unanimously to maintain the current SAC structure.

The Board discussed the R&A review committee, which will address the Ag Climate Adaptation theme area as its focus and will request the exact questions of interest to the Under Secretary for that area. The Board appointed the following members to the committee: James Allen, David Baltensperger, Robin Beck, Roch Gaussoin, Kenrett Jefferson-Moore, and Jayson Lusk. Liz Hobart also joined the committee after the end of the meeting.

The Board discussed the Data Management Working Group established in 2014 as a NAREEE panel to respond to data issues, though Board expertise is currently lacking.

Dr. Hutchins spoke to the Board, saying he appreciated the Board's weighing in on the ERS/NIFA move and that USDA will consider the Board's thoughts. For the ERS/NIFA Version 2 model, he asked how REE can take the agencies to the next level. He said that he looked forward to future interactions with the Board and would work closely with Ms. Esch and Dr. Baltensperger to be sure REE does the right thing going forward.

The Board then discussed a location for its next meeting, with Kansas City as a priority, and other locations mentioned: Nebraska, San Antonio, North Carolina, Florida, Arizona, and California's Central Valley. Ms. Esch will conduct a Doodle Poll for a two-week window to determine the best dates for members.

The Board discussed the Executive Committee's monthly calls and it was established that they will take place on the first Friday of every month, starting with a call on August 2, from 1:00-2:00 pm EST. At that meeting, the Executive Committee will focus on settling locations and times for the next two Board meetings.

Rebecca Boehm, an economist with the Union of Concerned Scientists food program, gave a public comment, speaking about two concerns: she encouraged the Board to prioritize sustainable ag and to tell the USDA to stop the ERS/NIFA move.

Ms. Esch noted two important items: first, Govind Kannan has been with the Board for 6 years, and with his term ending in September, he might not attend future meetings. She said Dr. Kannan will receive a certificate of gratitude for his service, and a group picture was organized. The second item was the Delta/Plus Activity, focusing on what worked at the meeting and what can be done better. Members offered various suggestions, such as the meeting space needing microphones or an acoustical arrangement that works and a preference for scheduling meetings a year out, among other ideas.

RESOLUTIONS AND RECOMMENDATIONS

1. The Board members elected the Executive Committee's nine members: David Baltensperger (Chair); Edmund Buckner (Vice Chair); members: Robin Beck, John Coupland, Richard De Los Santos, Sarah Francis, Liz Hobart, Jayson Lusk, Michael Oltrogge.
2. The Board unanimously approved drafting a letter about the ERS/NIFA relocation, with key points and language to be reflected in the letter, and unanimously approved the creation of an *ad hoc* group of members to work with Chair Baltensperger and Michele Esch to draft a letter for the Board's consideration the following day. The *ad hoc* group's members were Edmund Buckner, John Coupland, and Jayson Lusk.
3. The Board unanimously approved the creation of a working group to develop an action plan for responding to NIFA Director Scott Angle's request for feedback on extension activities and nominated working group members: Sarah Francis, Roch Gaussoin, Govind Kannan, and Michael Oltrogge.
4. The Board unanimously approved a motion to start the annual R&A review focusing on Ag Climate Adaptation and mitigation.
5. The Board unanimously approved a motion to request from REE a crosswalk report showing the links between the REE goals, the draft Science Plan, and Dr. Hutchins' overarching program themes so the Board can review the links and provide input.
6. The Board approved, with minor proofreading adjustments, the September 28, 2018, NAREEE Board conference call meeting minutes.
7. The Board unanimously approved restructuring the membership of the Specialty Crop Committee, reducing the NAREEE Board representation to three members working with six industry representatives. The three Board representatives are: Richard De Los Santos, Chad Ellis, and Kenrett Jefferson-Moore.
8. The Board unanimously approved maintaining the current composition of the Science Advisory Council.

9. The Board appointed members of the R&A Committee: James Allen, David Baltensperger, Robin Beck, Roch Gaussoin, Kenrett Jefferson-Moore, and Jayson Lusk. Liz Hobart also joined the committee after the end of the meeting.

ACTION ITEMS

- Michele Esch will send to Board members copies of the USDA press releases announcing the decision to relocate ERS and NIFA.
- USDA's Josh Stull will share with Board members his compilation of congressional appropriations for the Department.
- Michele Esch will provide Board members copies of responses by former USDA Chief Scientist Dr. Catherine E. Woteki to a completed NAREEE Advisory Board R&A report on food safety and childhood nutrition and obesity.
- Michele Esch will provide to Board members the documentation each REE agency uses for its R&A review processes.
- Michele Esch will provide Board members with the draft Science Plan so they can provide feedback on the draft.
- Dr. Scott Hutchins will work with the REE leadership team to draft narrative language on the five themes he described to Board members after he has clarity on the "outcome goals" for which he sought Board input. Dr. Hutchins specifically asked for help on the Ag Climate Adaptation goal area.
- Michele Esch will ask NIFA Director Scott Angle for specific questions on which he would like Board advice regarding extension activities.
- Michele Esch will inquire with Dr. Hutchins and the Office of the Chief Scientist about a crosswalk tying the Under Secretary's overarching program themes to the REE Action Plan and the draft Science Plan.
- Michele Esch will provide Board members with information on what must be done for members to seek reappointment.

Respectfully submitted,

Dr. David Baltensperger
Chair

Edmund Buckner
Vice Chair

Michele Esch
Executive Director

APPROVAL BY ADVISORY BOARD:

Date

Initials
Chair

Initials
Executive Director

Wednesday, July 17, 2019

Orientation Session

Ms. Michele Esch, the NAREEE Executive Director and Designated Federal Officer (DFO), opened the Orientation Session for new members. She thanked members for attending and reviewed the binder of materials provided for the meeting, including minutes from the Board's September 2018 conference call. Members briefly introduced themselves, stating their names, organizations, and the stakeholder categories they represented. Deputy Under Secretary for Research, Education, and Economics is Dr. Scott Hutchins was also present and introduced himself.

Ms. Esch introduced herself, giving her professional background and describing her role as DFO. She gave a slide presentation, noting that of the Board's 15 members 10 are new, and membership has been reduced by Congress from 25 members. She presented a USDA organizational chart, showing NAREEE's place within the Department as one of seven mission areas led by an Under Secretary.

Ms. Esch described the NAREEE Advisory Board's duties, briefly outlined the Federal Advisory Committee Act (FACA) requirements, and described NAREEE's general operating procedures regarding membership, meetings, minutes, and reporting processes. Board work is done through subcommittees: 1) the Citrus Disease Subcommittee (CDS), 2) the Specialty Crop Committee (SCC), and 3) the National Genetic Resources Advisory Council (NGRAC), as well as the 4) Science Advisory Council (SAC) made up of Board members. The new Board must decide whether to continue a previously established Data Management Working Group (DMWG).

Through the Board's Relevancy & Adequacy (R&A) reviews, the members develop recommendations that are delivered to the USDA Secretary. All NAREEE Board and subcommittee recommendations must be routed back through the full Advisory Board and discussed in a public forum. Dissenting views must be stated in writing. The USDA Secretary is required by statute to provide a response back to the Board, and the REE Under Secretary may provide additional feedback to the Board.

After her presentation, Ms. Esch answered questions from Board members. She explained that previous responses to the R&A report have been from the Under Secretary, and she also works with the REE agencies to determine if any Board recommendations would encounter legal or budgetary limitations preventing their implementation. Members expressed interest in seeing agency responses. Ms. Esch also cautioned Board members to avoid simply recommending more money for programs; it is assumed all programs could use more money. Rather, the Board could recommend investing in specific programs as a higher priority and provide the rationale for such a recommendation. Dr. Hutchins suggested that if the Board felt strongly enough about a priority to suggest reprogramming funds from elsewhere, it would be helpful for the Secretary to understand the strength of the Board's views.

Ms. Esch did not know the reason Congress cut NAREEE Board membership to 15; the current surplus will be reduced through attrition. The practice of staggering membership terms will not be interrupted by there being 10 new members, some with 2- and others with 3-year terms. NAREEE will be part of the review process under President Trump's June 14, 2019, Executive Order on Evaluating and Improving the Utility of Federal Advisory Committees, which calls for reviewing

federal advisory boards and reducing discretionary panels by one-third. But NAREEE is statutorily established under the Farm Bill and therefore will not be affected by any reorganization. Ms. Esch will keep Board members informed as the review proceeds at a fast pace.

As part of the Orientation, Andrew Tobin, Deputy Director of the USDA Office of Ethics, gave a presentation on Ethics for the NAREEE Advisory Board using a handout provided to the Board members. He noted the differences under ethics rules for three types of advisors: 1) federal employees, 2) representatives, and 3) special government employees. As “representatives” with a challenging job of recommending spending priorities, unlike the other two categories, NAREEE Board members are expected to be full-throated advocates for the interests they represent, not unbiased experts. But Board members should “check your guns at the door” because the aim is to achieve consensus if possible. Members noted the potential for sound science and advocacy to conflict and asked if “blatant self-interested” advice was acceptable. Mr. Tobin responded that members are expected to bring “educated opinions” to the table. Members also noted both the difficulty and importance of communicating science well to stakeholders who, for example, might otherwise confuse genetically modified organisms with gene editing.

NAREEE Board members are not subject to conflict of interest (COI) rules, and unlike special government employees, do not have to submit an Office of Government Ethics 450 financial disclosure, but they should be aware of the potential for an appearance of COI. Members are allowed to update their colleagues and institutions on their Board work, but if they speak to members of Congress or staff they should be clear not to represent their individual views as Board positions.

NAREEE Advisory Board Meeting

Ms. Shirley Morgan-Jordan, Program Support Coordinator for NAREEE, reviewed travel policies and procedures, stressing that members should provide original receipts when seeking reimbursement for expenses. Ms. Morgan-Jordan can negotiate the NAREEE special hotel rates if members need to arrive early or stay after the Board meeting.

Introduction of Members

DFO Michele Esch officially convened the summer 2019 NAREEE Advisory Board meeting, introducing herself. She welcomed and thanked members for participating. The members then introduced themselves and offered one or two big issues impacting their area.

- Dr. Govind Kannan, representing National Food Animal Science Societies, noted that he was pained by the decline in size of his sector’s conferences as the four societies previously involved in a cluster have gone their separate ways. Animal health, food safety, food security, animal well-being, water, and climate change are all important for the sector, but it comes down to training the future workforce because otherwise challenges cannot be met.
- Dr. Sarah Francis, representing National Nutritional Science Societies, noted the issues of medical nutrition therapies, how food can prevent chronic disease, and the “-omics” sciences, as well as microbiome metabolic issues.

- Dr. Edmund Buckner, representing National Aquaculture Associations, noted the issues pertaining to catfish—the cost of regulations, and the consistently low prices producers are getting.
- Mr. Richard de los Santos, from the Texas Department of Agriculture representing National Consumer Interest groups, noted such issues as the Food Safety Modernization Act, the transportation of agricultural products and adherence to related rules; food safety and outbreaks are a major concern, with the goal of minimizing them and helping both U.S. and world consumers.
- Dr. Jayson Lusk, representing National Conservation or Natural Resource Groups, noted such issues as changing consumer demand, communications, sustainability, farm income, trade and tariffs, and the impending move and reorganization of ERS.
- Ms. Lisabeth (Liz) Hobart, representing Farm Cooperatives, noted the issues of telecommunications infrastructure, stating that Internet interconnectivity is critical in rural areas for access to precision tools, as well as agricultural economic stewardship, including nutrient management, and in general environment and social aspects of issues.
- Dr. Michael Oltrogge, representing 1994 Tribal Colleges and Institutions, noted the issues of equity in funding for Tribal colleges, the potential loss of expertise as ERS/NIFA move to Kansas City, climate change, and water and food concerns.
- Dr. John Coupland, representing National Food Science Organizations, cited such issues as technologies to change how we think about food, non-animal proteins, the “-omics” technologies, genetic methods for foodborne pathogen outbreaks, and technology acceptance by the public; often, there is competition about risks of foods, and a more science-based discussion is desirable.
- Dr. Robert Zeigler, representing Private Sector Organizations Involved in International Development, noted concerns over companies’ dependence on ERS and possibly losing the ability to see clearly what is happening on international trade; seed and agriculture company concerns about the ability to access the top science from Land Grant and other universities; the NIFA move; maintaining a U.S. competitive edge in academia as China aggressively recruits faculty to capture global talent for China’s R&D, potentially leaving the United States behind, with a severe timeline to catch up; identifying reliable sources of unbiased credible data; workforce talent; and tariffs.
- Mr. Chad Ellis, representing National Conservation or Natural Resource Groups, cited the issues from the producer lens of water and soil management, and bringing more technology to help producers be more sustainable and efficient, through the transfer of science-based information down to producers.
- Dr. Mark Lawrence, representing American Colleges of Veterinary Medicine, cited such issues as animal health and antimicrobial use and resistance, including producers’ need for access to antimicrobials and concerns about their entering the human food chain; managing public perceptions of antimicrobial use; rural access to veterinary care; and livestock, poultry, and aquatic resources needing protection from diseases.
- Dr. James Allen, representing National Forestry Groups, cited the issues of forest health, including threats from fire, bark beetles, and ash borers; climate change threats; the need to find better markets for lower-value wood; concerns about carbon sequestration; and workforce development and diversity.
- Ms. Robin Beck, representing Animal Producers, noted concerns about livestock production and trade, a huge issue for pork producers facing a market glut, with American producers

unable to compete with New Zealand and Australia and a desire to build more domestic production and processing capabilities; and the ERS/NIFA move.

- Dr. David Baltensperger, representing 1862 Land Grant Universities, cited such issues as the need for hemp rules and “hype versus reality” regarding hemp; soil health; climate adaptation; technology incentives, a broad concern—the plant variety protection system worked well, but the GMO program does not and there is a need to learn from the GMO disasters; a huge issue regarding Roundup lawsuits targeting the safest pesticide on the market and a need to deal with the issues on a scientific basis; “kinks” in the process of the recently adopted cost-sharing for grants; reduced paperwork on grants, especially for longer grants where in the third year awardees ask for details that do not make sense.

Welcome and Overview of USDA/REE and NAREEE Changes

Ms. Esch thanked the Board members for their introductions and noted that the 30-member Biomass Research and Development (BR&D) Technical Advisory Committee (TAC), or BR&D-TAC, had assumed responsibility for the discontinued NAREEE Renewable Energy Subcommittee. Briefly reviewing an earlier discussion of the new Farm Bill’s impact on NAREEE, she added that the Board’s charge when considering research was slightly modified to include a priority focus on NIFA’s Agriculture and Food Research Initiative (AFRI) priorities.

Remarks from the Research, Education, and Economics Mission Area

Dr. Scott Hutchins, Deputy Under Secretary for REE, thanked the Board members for their participation and introduced himself, reviewing his 31-year career with Dow, Eli Lilly, and later with the merged Dow-Dupont companies, serving as overall R&D leader for Dow AgroSciences before retiring. He gave a slide presentation on overarching themes that will guide his USDA work. He reiterated the importance of the NAREEE Board in helping steer REE and USDA to cutting-edge science through a high-level overview and stating that, as agricultural science changes, he wants to be at the table with government science.

In his presentation, Dr. Hutchins described his professional and personal perspectives on the OneUSDA teamwork management principles, noting such ideas as the need to prioritize, to invest in compelling value propositions rather than simply spending money, to work efficiently, and to think big about what is possible and needs to occur to achieve progress so that USDA can be a beacon to the world. He noted the need for healthy conversations and challenges but urged Board members to be constructive and work toward a positive intent. Members also should identify programs that should stop.

Dr. Hutchins gave an overview of each REE agency: the Agricultural Research Service (ARS); the Economic Research Service (ERS); the National Agricultural Statistics Service (NASS); the National Institute of Food and Agriculture (NIFA); and the Office of the Chief Scientist (OCS) serving as an umbrella organization. He described the agency administrators and director of OCS as his leadership team whom he meets with once a month for three hours to work through issues. In the Farm Bill, NIFA received the most attention, and in a relatively flat budget environment Congress provided ARS a bump up with capital improvement funds and additional NIFA grant funding. His goal is to make sure that REE continues to focus on how to put research forward to support policy formation.

Dr. Hutchins discussed current REE topics:

- The ERS/NIFA relocation to Kansas City is being pursued. The relocation goals are to save on costs and to reinvest in the agencies, to attract young professionals in an affordable environment, and to achieve proximity to stakeholders and Land Grant Universities. His goal is for REE to support employees in the relocation process to ensure mission continuity and later to build and reinvest savings. The NAREEE Board can help as REE looks to the agencies' next era.
- National Bio and Agro-defense Facility (NBAF) is an excellent project that received \$1.25 billion for its construction and commissioning. NBAF has a new Memorandum of Agreement with the Department of Homeland Security and is receiving a lot of focus from Congress.
- The NASS 2017 Census of Agriculture is a big event this year, with millions of new data points.
- Farm Bill implementation, a high priority, affects all REE agencies.
- USDA is meeting with stakeholders and a lot of groups have come in for listening sessions at which USDA solicits their views on how the department can do better. Dr. Hutchins provided a list of the many participants.

Q&A with Dr. Hutchins

Board members noted the goals of the ERS/NIFA relocation, suggesting that the agencies will experience significant staff cuts for years out. Dr. Hutchins responded that in trying to adopt a customer focus, REE wants to be closer to the agricultural community. Kansas City is in the heart of ag organizations and farms and is in proximity to universities within a 300-mile radius, with 1,500 agricultural degrees within that radius. Also, in Washington, DC, it is too expensive to bring in young interns. For the ERS budget, the goal is to achieve “more bang for the buck,” and even more visibility for ERS’s work. About one-third of ERS/NIFA headquarters personnel will remain in Washington, DC, and will be tasked with collaborating with other federal agency staff. One Board member questioned why in a digital society proximity is an issue, with expertise accessible from anywhere.

A Board member noted the perception that the relocation is a plan to dismantle the agencies and said that fundamentally the members want ERS and NIFA to work wherever their location. The member urged REE to solicit the Board’s help with the relocation. Dr. Hutchins responded that he wants the Board’s help in ensuring that “Version 2” of ERS/NIFA has a bigger impact,

A Board member said that a critical mass of experts resides in the Washington, DC, region, and Land Grant Universities use trips here for advocacy, a function that must be maintained. Dr. Hutchins said that advocacy is important and the relocation was designed with that expectation. He reminded Board members that every organization undergoes change over time. A Board member suggested that instead of saving \$300 million, as USDA’s analysis suggests, the move could cost \$280 million. Dr. Hutchins said that REE is aggressively working to replace employees who declined to move to Kansas City and instead are resigning.

A Board member suggested that animal producers, who depend on crops to feed their animals, are greatly concerned that climate change will have an impact on arable land and parasitic control.

Producers are concerned that with the ERS/NIFA relocation climate change will be removed from the conversation by the current administration, a concern that scientists share. Dr. Hutchins responded that USDA has done nothing to diminish support for climate change and agriculture's climate adaptation is a key issue. To the extent possible, USDA wants to mitigate agriculture's environmental footprint. The Office of the Chief Economist manages climate change in USDA but REE has a part to play, helping ensure that U.S. agriculture does not suffer from the change over time. For forests there is a big research component, and a forestry expert is an adjunct member to the REE leadership team. Dr. Hutchins reiterated his request for the Board to help with REE priorities and to see the big picture.

REE Agency Updates

The REE agencies gave presentations, including on their top issues, and took questions from Board members.

Agricultural Research Service

Dr. Mojdeh Bahar, Assistant Administrator, Office of Technology Transfer gave a presentation for ARS Administrator Chavonda Jacobs-Young on *Nurturing a Culture of Innovation*. Dr. Bahar reviewed key ARS statistics, including the agency's 690 research projects within 15 national programs, with 90 locations nationwide, and an approximately \$1.2 billion a year budget. ARS supports USDA's intramural research with scientists paid by USDA to do "public good" research that industry might not do because of risk or too lengthy timelines. The research supports action by the regulatory agencies. ARS also maintains germplasm collections of global importance. She presented the ARS organizational chart and a program pie chart showing the distribution of ARS programs, including 36% for crops, 18% for environmental stewardship, and other percentages. In Fiscal Year (FY) 2019 ARS budget received a \$100.5 million increase, and the budget was raised for a variety of research programs, including alfalfa, chronic wasting disease, citrus germplasm, and others.

All ARS research efforts are innovation and technology transfer programs, Dr. Bahar noted. ARS publishes in many journals, the fastest way to transfer technology. Dr. Bahar described two impactful initiatives: 1) the Innovation Fund, which has program elements to avoid the "valley of death" in moving research to development, including a license fund to move the technology to a higher level so that research becomes products; 2) Small Business Innovation Research (SBIR) Technology Transfer, an interagency collaboration under OneUSDA to make sure all agencies are pulling in the same direction. To create an innovation ecosystem, ARS supports the Agricultural Research Partnership Network, with 320 members, such as accelerators, incubators, and others connected to USDA and to each other. The USDA FY2018 Technology Transfer Report statistics revealed 51 new cooperative R&D agreements, 4,138 new peer reviewed scientific journal papers, and other accomplishments.

During follow-up questions, a Board member asked about ARS watershed research. Dr. Bahar said 18% of the ARS research goes to natural resources but she was not sure what the specific amount was for watersheds and offered to provide the information later. Responding to an inquiry about negotiations with Land Grant Universities and any process to negotiate intellectual property (IP), Dr. Bahar noted there were issues because of turnover, creating difficulties when a new person comes in and renegotiates the IP language. Now, the head of an office renegotiates IP, but not

confirmatory licenses, which entail completely different stakes. For ARS researchers using government resources, they are obliged to assign their IP rights. Dr. Bahar also emphasized the vital need to ensure ARS research is used, and attempts are under way to determine how often ARS studies are cited in regulations and policies.

National Institute of Food and Agriculture

Dr. Scott Angle, Director, said he was disinclined to speak about the NIFA relocation and instead addressed himself to where NIFA has been, where it is now, and where it will go in the future. Some priorities have changed. Using a paper handout, Dr. Angle discussed the Agriculture and Food Research Initiative (AFRI), the flagship program for competitive extramural funding of agricultural research. The program is approximately \$500 million, and in the past exclusively supported Land Grant Universities. But AFRI is changing and accelerating support for other academic and industry experts. For example, now MIT, Georgia Tech, and Yale, are getting funds because Land Grants don't have all answers for technology and other needs. For the future of NIFA, more technology will be key, and the NIFA mission is changing as the agency is becoming more high-tech, employing data analytics specialists to integrate all agricultural data, and using drones, sensors, and robotics to help with labor needs. NIFA will be engaged in very applied extension work and very high-tech research, maybe using high-tech analytics to address on-the-ground issues in the future.

Dr. Angle noted that suicide rates are high in rural areas and NIFA is striving to ensure that farmers and rural economies are healthy, shifting more funding toward agricultural systems, supporting families, and K-20 workforce development through community colleges and trade schools where communities need skills. Extension and teaching are needed. NIFA listens to stakeholders a lot, asking rural audiences what the Land Grant system can do. AFRI is investing in production agriculture, encompassing food safety, nutrition, farmer stress, and rural resiliency, with 10% of the \$500 million budget going to workforce development proposals. The U.S. extension system is unique, having been tried in other countries but failing; however, the system of many extension agents will change and Dr. Angle welcomed the NAREEE Board's advice on what extension should look like in the future amid a large ongoing debate about whether NIFA can fund extension changes nationally or in states. Additionally, the National Institutes of Health (NIH) director of clinical studies wants to know about rural health and how NIH can be involved, not just represent urban populations. Through extension programs, USDA could deliver more than just agricultural information, as is now done for diabetes information.

During discussion, when asked if NIFA has considered a secondary school component for extension, Dr. Angle said some of that is done, using agriculture to teach STEM sciences to middle and high school students. He noted that today's farm labor needs GPS and other technical skills, but NIFA and Land Grant Universities have not restructured pay for such expertise, so rural young people with good educations enter higher-paying non-ag careers. Recruiting young people into agriculture is a challenge, and workforce is a major issue for the entire sector.

Regarding discretion to allocate funds for competitive versus capacity grants, or more broadly across NIFA, Dr. Angle said half of the budget is provided for capacity and half for competitive funding. Congress determines how to spend half the budget and 25% is flexible. The NAREEE Board's input on spending will be important. Under the Farm Bill's research title, a new initiative

focuses on management issues, with support for research on fertilizer application to maximize yield, cut releases into water, and other such topics.

A member commented that extension work is needed for producers and broadband access is essential because extension could do so much more if agriculture had access. Dr. Angle noted that helping farmers get broadband access has been a USDA priority for many administrations, but concerns exist about whether broadband will be used for high speed video games or for productivity on farms. With broadband, farms could access artificial intelligence terabytes of data, better weather forecasting, self-driving tractors, and the like. Dr. Hutchins noted that Secretary Sonny Perdue has made broadband a top priority as part of the rural development plan and has met with the Federal Communications Commission on the issue. Congress is also energized on the topic. However, another Board member emphasized that for education, broadband is not the answer; extension customers want face-to-face relationships. But tomorrow's producer will be different from yesterday's, with many growing up in the city and with different educations. Dr. Angle said that every state will evolve extension differently and NIFA can learn from successes.

National Agricultural Statistics Service

Mr. Hubert Hamer, Administrator, in his slide presentation, *All About NASS and You!* described his organization as the official statistics agency of USDA, working for the agriculture community through data collection for decision making in the sector. He described NASS's history, noting that the first crop report was issued in July 1863, and also noting that today NASS has 33 satellite offices, five data-call centers for surveys, and about 850 full-time field enumerators who knock on doors and collect data using the internet, phone, and farm visits. NASS is pushing electronic data systems. Wanting policymakers to use NASS information, the agency's goal is to be objective and to maintain credibility among users and the trust of data providers. NASS publishes about 450 reports annually, with statistics on crops, livestock, economics, environment, and other topics, and coordinating with state agriculture departments. The hope is that using NASS data to make smarter decisions will help take the guesswork out and make farms more profitable.

ERS is a hungry user of NASS data for Farm Bill administration. In agriculture's future, evidence-based policy will be critical, with more data sharing across government departments. NASS is using precision agriculture to reduce the burden of collecting data, with several strategic initiatives: 1) Data Collection Dashboard; 2) NASS Operating Model Reimagined; and 3) Improving the Agricultural Data User Experience. The 2017 Census of Agriculture has about 6.4 million data points released, covering all the states, Puerto Rico, and outlying areas. Its response rate is about 72%, Mr. Hamer said, and provided data on the number of farms, farm acres, average farm size, and other statistics. NASS is starting on the 2022 census.

During discussion, Mr. Hamer said that NASS works with the Food and Agriculture Organization, the Agency for International Development, and the Gates Foundation, to help countries measure agriculture production with the goal of determining if enough crops are being grown to feed populations. Responding to a question about California providing the lowest response rate to the survey and how that affects the data, Mr. Hamer said NASS was concerned. NASS has overhauled its survey, which is stable at around 75% responses, with some areas at 95%, but it is still a struggle. Asked if there would ever be a time when no survey is needed, he said NASS is researching that now. Digital data collectors on combines and other equipment must be calibrated and NASS is

checking for bias, using satellite data, and taking other steps, but it is early in the planting season and thus hard to figure things out.

Office of Chief Scientist

Dr. Dionne Toombs, Director, began by reviewing the OCS organizational chart, noting that there are vacancies in senior advisory roles. Under the new Farm Bill, advisors must commit to 3-year terms, in contrast with the previous 12-month commitments. In its R&A review the NAREEE Board members will work with the OCS advisors. Dr. Toombs noted changes in the REE Action Plan. In 2012, the plan focused on how to address agriculture research gaps. The plan was revised in 2014, and again in 2017 after the new Secretary released new strategic goals. The REE Action Plan is a living document that can be updated.

Dr. Toombs discussed the USDA-wide customer service experience initiative, with such goals as effectively communicating research and improving coordination among scientists. A 10-seminar series has been held, dealing with such topics as scientific rigor, industrial hemp, gene editing, and others, with over 500 participants.

Describing research efforts, Dr. Toombs noted the following:

- In the area of antimicrobial resistance, a task force is developing a federal-wide action plan and, under the rubric of “One World, One Health” that recognizes human and animal health are linked, the G20 adopted a resolution to continue sharing information.
- Regarding pollinators, there is a federal pollinator task force involving the Environmental Protection Agency and USDA. Pollinated crops contribute \$15 billion to farm income.
- A big workshop on the Spectrum of Urban Agriculture led to other workshops, dealing with the technology gradient and such issues as community rooftop soil. The Farm Bill provided \$10 million per year for a national program on the indoor agriculture environment.
- The OCS plant breeding activities include a USDA work group on biotechnology that will meet with stakeholders at a workshop in the near future.
- On scientific integrity, Dr. Toombs noted that USDA develops and implements training materials aiming to foster a scientific community free from political manipulation.

During discussion, Dr. Toombs responded to an inquiry about urban agriculture by noting that the American Seed Trade Association is looking at breeding for vertical agriculture and its specialized challenges. Discussion is being held on whether varieties should be developed for vertical agriculture. Regarding the USDA hemp rule, Dr. Toombs said that a ruling on what can be done with hemp is under development and there is a hemp transport report. The rule will need public notice and comment. The Agricultural Marketing Service wants the rule out so farmers can plant in the 2020 season. There is a NIFA hemp site and a USDA industrial hemp site. Noting the number of vacancies in the OCS advisory slots, Dr. Toombs said the office is reaching out, but employees leave for academic institutions and other agricultural agencies, so it is a challenge to fill vacancies. He welcomed any suggestions from the Board on people who could serve. A member noted that the 3-year commitment takes a lot of paperwork at a university.

Economic Research Service

Dr. Greg Pompelli, Associate Administrator, gave a slide presentation describing the ERS mission, organization, and programs as one of the 13 main federal statistical agencies. ERS anticipates trends and conducts research on emerging issues to inform public- and private-sector policy, program, and business decisions. But ERS does not make policy recommendations. It uses NASS and other resources. The biggest data source is food apps that collect information about what people eat and other data. ERS directly serves USDA's long-term national goals and addresses questions with short-term implications or immediate policy implications.

ERS priority programs focus on agricultural markets and trade; the rural economy and its well-being; farms, conservation, and agricultural research; and food nutrition and food safety. Staff conduct hundreds of analyses each year, but never make policy presentations or evaluate programs. ERS has an \$87 million budget this year, mostly going to salaries. ERS's research program employs a root-and-tree model in which root foundational data and models feed into the branches of priority research issue areas. ERS sets program priorities by communicating with stakeholders about current trends and issues and by receiving constructive feedback through external reviews of the program. The ERS organization's four divisions under the agency administrator are the Information Services Division, Food Economics Division, Market and Trade Economics Division, and Resource and Rural Economics Division.

During discussion, a member asked about turf grass data, noting that it may be the crop demanding the highest input of any crop, with environmental impacts on water and other factors. Users struggle to find good data on that. Dr. Pompelli said that the Forest Service's Maryland station can provide that information. On another question about the availability of any antimicrobial studies from the producer perspective, Dr. Pompelli said that there are none, with studies mostly about food on the way to the market. He also addressed the concern about the ERS relocation, reassuring Board members that ERS could handle the losses of staff and was working on that issue. ERS has to figure out where it needs to replace people who leave and noted that many staff will still be in Washington, DC. Many were retirement eligible and cannot be deemed indispensable. ERS cannot say right now where the agency will have problems or what it will do about them.

A Board member noted the real struggle to get people interested in agriculture. Dr. Pompelli noted that many economists came out of ERS, which hires at GS9 levels and develops new hires as well-trained government agriculture economists, but ERS loses them to other agriculture agencies that bring them in at a higher pay scale. ERS is keeping PhDs longer; they hone their skills for longer years, but they will not stay forever. ERS is working hard to attract good economists. Today, huge farms with all the necessary resources are different from farms of the past decades.

Board Business

DFO Michele Esch said the first order of business was to elect an Executive Committee, including a chair and vice chair, to serve as the steering committee for the NAREEE Advisory Board as a whole. The Executive Committee meets monthly to make sure reports are moving, and usually holds a one-hour call, which any Board member can attend. There are nine members on the Executive Committee. Attempts to implement a chair, past chair, and chair-elect proved difficult because of the way terms rotate.

Ms. Esch explained the process for electing the Executive Committee, requesting that for the ballot, members list two name for the chair slot; the person with the most votes would be the chair and with the second most votes would be vice chair, who becomes the chair-elect for the next year.

Nominees listed on a slide were: 1) Robin Beck; 2) Mike Oltrogge; 3) Jayson Lusk; 4) Liz Hobart; 5) David Baltensperger; 6) Sarah Francis; 7) John Coupland; 8) Edmund Buckner; 9) (b) (6) 10) Richard de los Santos.

Ms. Esch noted that on September 30 some terms will end, but all members are eligible for a second term with the NAREEE Board and she will work with members to get them a next term. She said that the Executive Committee election will be finalized before lunch on Thursday and members were invited to continue into the evening offering nominations.

Ms. Esch asked if there was any other Board business.

A member asked if the winter meeting would be in the field. Ms. Esch responded affirmatively, noting that typically one meeting is held in Washington, DC, and one in the field, with the field location aligned with the topic that is the Board's R&A focus—for example, if the Board focuses its R&A on extension that would affect the field meeting location. A member suggested that if a component of ERS/NIFA is moving to Kansas City, it would be good to hear from new people in the move and alleviate difficulties in any way the Board can. Ms. Esch agreed that such a topic could combine with the extension topic and members would need to think about the meeting's timing. A member commented that winter on the prairie is not good time for extension.

In the past, the Board meetings kicked off with a field visit on the R&A topic, then held its fall meeting in Washington, DC. The July 17-19 gathering was a summer meeting. The earlier the meeting dates could get on members' calendars, the more likely the Board will have a quorum. Member David Baltensperger said he would be happy to host a meeting in Texas, but the Board needs to get to Kansas City soon. It was noted that California has a big extension program, uses new technologies, and is the biggest agriculture state. The California Agricultural Leadership Foundation is impressive. Other comments included a suggestion for Maine if the Board looks at aquaculture, but not in the summer. The Board has met on campuses, including Iowa State and University of Florida. Kansas should be priority, and a visit to a Tribal College is important. The National Bio and Agro-defense Facility was mentioned, with a note that the level 4 bio facility is being decommissioned and the new facility will be level 5. Because the Board has been short on meetings, a member suggested one of two or three meetings should be in Kansas City.

Public Comment

Two requests were made for public comments to the Board.

Dr. Steve Pierson, the Director of Science Policy at the American Statistical Association (ASA) spoke on behalf of two perspectives:

- Dr. Gale A. Buchanan, former Under Secretary for REE, sent his comments, which Pierson read, expressing great concern about the relocation of NIFA and ARS outside of Washington, DC. Dr. Buchanan noted that he cared deeply about the success of education programs for the future of agriculture. In his view, Secretary Perdue was making changes

with no input or study and analysis and no support by those engaged in the agricultural research process. Having known and worked with Secretary Perdue for many years, he took no pride in questioning the Secretary's decision. He requested that the Board not endorse the relocation and asked that USDA with the Association of Public and Land-Grant Universities fund the National Academies of Science (NAS) to convene a blue-ribbon panel on agriculture education.

- For ASA, Dr. Pierson said the association opposes the ERS/NIFA relocation and urged the Board to recommend that USDA fund the NAS study and not endorse the relocation. ASA's concerns arose because USDA rushed its study on the move's impact, the lack of transparency, lack of consultation with the stakeholder community, as well as concerns about the integrity of USDA science. The decision to move was unilateral; if moves are worth making, they should be done with a methodical process with NAREEE Board and stakeholder input. He said he would give his comments in writing.

John McNamara, a retired professor of Animal Sciences at Washington State University, seconded everything Dr. Pierson said. His message was that there is a need to continue supporting USDA, NIFA, and ARS in funding truly relevant integrated science, from basic to applied. He noted he had a long history in agriculture and research, and taught pet nutrition, and he was really speaking for the fully integrated nature of all agencies that research and teach, advocating for fully funding basic and applied research, secondary education, challenge grant programs, and aquaculture, noting the immediate and practical application of research from farm to table. There is no reason why the Board cannot demonstrate the need for four to five times as much as \$4-6 billion and the high return on investment.

During discussion, a Board member said that it was painfully clear during Dr. Pompelli's presentation that the decision to move ERS and NIFA to Kansas City was decided in August, with the site selected and all decisions done in less than a year; it is clear that it takes much more time and consultation. There was not much evidence of real analysis and the Board should discuss whether it should comment and what the comments would contain. Another member said that the relocation was a done deal, but a member replied that this fact was irrelevant. Ms. Esch reminded the Board that Secretary Perdue had made his decision and people were being hired in Kansas City, and the final location was being worked on

A member said that most ERS employees would be members of his Agricultural and Applied Economics Association (AAEA), which has been staunchly opposed to the relocation. While not agreeing with everything the AAEA has said, the member noted the fact that "the train has left the station." If the Board complains, then the agencies would be gutted and no one would want to work there. The Board should offer a constructive message and point out that if the relocation creates real cost savings but the budget is reduced, this seems incongruous. The Board should ask to see that any savings go to more research. The relocation is not totally unprecedented, and there were once many ARSs across the country.

Another member said that the public is seeking a proper analysis, an understanding of what problem is being fixed, what opportunities derive from the change, and why Kansas City was selected. The Board needs to ask that to ensure public dollars are used properly. The Board has a right to ask if USDA is saving money what tradeoffs are entailed; does anyone know? Ms. Esch noted that there is an in-depth cost-benefit analysis (CBA) and she said she would send it and an AAEA analysis to the

members immediately. A member said the question was what plausible alternatives there might be to Washington, DC, or Kansas City. Another member said the Board had not seen the USDA CBA; however, another member said that two CBAs had reached diametrically opposite results. The basic concern was not wanting NIFA or ARS gutted because that would not serve our nation or citizens. Another member said that deans and administration heads of Land Grant Universities who were surveyed were not convinced the relocation was a good idea.

Other remarks Board members made about the ERS/NIFA relocation were: the effects on program leaders and their retention rate are concerns; NIFA employees are unhappy, and it is not inconsequential how many have been lost; there will be frustration on NIFA grants, moving paper, and administration; expertise in the Kansas City region will better position USDA in the heartland; the main problem is that USDA cannot give good packages to keep scientists on the payroll; locating one or both agencies outside DC puts them in a political home with a member of Congress advocating for them in his or her district;

A member recommended that the Board members read the CBA materials provided by Ms. Esch and then discuss what members wanted to say on the relocation issue. It was suggested that a subgroup could draft a Board position for the members to review.

The meeting adjourned for the day.

Thursday, July 18, 2019

Welcome and Review/Overview

DFO Michele Esch opened the meeting by announcing Shirley Morgan-Jordan's 30-year anniversary in U.S. government service. Ms. Esch presented Ms. Morgan-Jordan a plaque and thanked her for her service, whereupon Ms. Morgan-Jordan gave a brief overview of her career and thanked everyone for recognizing her service.

Ms. Esch reviewed the day's agenda and relevant binder materials, noting that on the previous day she had sent the two CBAs for the ERS/NIFA move to the Board members, one by USDA and the other by AAEA. She also said that she would share with Board members Secretary Sonny Perdue's press releases about the move. A Board member commented that it was unclear how government decisions are made. Ms. Esch responded that the Secretary has some discretion to make such decisions and had deliberated with his senior team before making his decision. It was noted that the lease for a USDA Waterfront building was ending and the owner protested the relocation, but the Waterfront is prime real estate, expensive per-foot property, and that was one of the original reasons for considering a move. Although House members of Congress in the 2020 appropriations bill have included language saying ERS/NIFA should not move, such conference language is non-binding; there has been no news about comparable Senate action.

Ms. Esch asked if Board members wanted to discuss the direction they will take in responding to the ERS/NIFA relocation and asked if there was any information they needed. One member suggested that if the Board was going to comment it might be on procedural issues, stating that the NAREEE Board would like to be consulted on decisions involving USDA's scientific resources. One Board responsibility is to ensure USDA is making evidence-based policies, but it is unclear if the Board's remit calls for being consulted on such an issue. The relocation involves the strategic

deployment of resources, and entails costs associated with personnel turnover. If USDA wants to get rid of people, it should say so—"this is what we want and here's how" to achieve it. But it would be lamentable for extraneous considerations to drive decisions on an important resource for industry and the government. In any case, the process should be transparent; the USDA CBA suggested big salary savings, but it is unclear how they will be realized. Ms. Esch explained that all government employees receive a base salary, then extra locality pay depending on where they live; in Washington, DC, employees get 28 percent locality pay atop their base salary, while in Kansas the locality pay is 16.6 percent.

A member questioned whether the extensive loss of experience would enable ERS/NIFA to meet challenges and whether that loss is a savings. Ms. Esch noted that both agencies have many employees eligible for retirement, and that is a consideration. The CBA outlines assumptions about costs to hire and train employees. Another member referenced a statistic that more than half of NIFA employees have declined to relocate or to respond. Ms. Esch said that employees were asked to report on whether they will move by Monday July 15; many said they will not move, but have until the report date at the new location to change their minds. The exact building for the Kansas City ERS/NIFA relocations is being worked on now, and an existing Kansas City building has more than 200 spaces. A Board member expressed a hope that part of the Board's remit is to be guardians of the integrity of science and to remind USDA of the need for unbiased independent analysis of the need for addressing costs in USDA and potential options; there is an obvious concern that relocation is an attack on science, and a demonstration that the concern is not valid is needed. The member alluded to the public comments of Wednesday urging an NAS analysis, but another member said, while NAS has a high reputation in science, it is not equipped to do a cost analysis. There has been a lot of pressure on USDA locations for a long time, and the cost of square footage is a long-standing issue; the USDA bid process included more local options that did not come through.

A Board member said everyone supported positive change. The controversy does not come down to the CBA alone; other factors include perception and rhetoric, concerns about negative disruption of science research, delay of grants, and what will happen when experienced people fall off. As a Board, the members must say something about the move. Another member suggested that the question of structure and location broadly were suitable for outside advice; the Board could make constructive recommendations and suggest commissioning input on an optimal structure. Another member said the question is how employees will be impacted and whether the agencies will be better off 10-15 years from now if ERS/NIFA move to Kansas City. Other members agreed that more than dollars are at stake. A member said the closer to scientific guidance the better for the Board's comments; the Board should not get involved in how agencies move around buildings.

For context, Ms. Esch cautioned that news stories can be misleading, with reports suggesting that USDA is not conducting climate change research, even though ARS in the past few years has published 500 climate papers, compared with 200 before. That fact does not comport with claims that USDA is not doing climate research.

Ms. Esch told members that they should decide how to proceed and what issues to comment on. But someone must take the lead, guiding deliberations on what a Board resolution will look like. A member felt strongly that the Board's package must be based on what is essential that USDA handle properly, including how ERS/NFA plan to get things in place to process grants, and the bureaucracy needed to keep the machine moving. The Board's comments need to seek assurances regarding what will ensue once the move occurs. Without micromanaging, the Board could, for example, say

that it has three concerns about the relocation that it would like the Secretary to address in a response. Ms. Esch noted that if there were specific questions for now, REE could try to obtain answers during the face-to-face meeting, or members could ask later for more information. Although a member suggested a subgroup phone call to hash out questions for the Secretary, Ms. Esch recommended that because the issue is so important and controversial, it would be best to do as much as possible in the public setting. For off-line conclusions, a call would have to be set up for people to hear the Board's recommendations.

The Board agreed to establish a process with a subgroup to produce a framework letter to the Secretary that the entire Board could comment on in the public meeting. If necessary, a conference call could be held to address further details.

2018 Farm Bill Changes and Implementation

Overview of Title VII, Research and Extension, of the Agriculture Improvement Act of 2018,

Ms. Esch introduced Mr. Josh Stull, Congressional and Stakeholder Affairs, NIFA, and Board members briefly introduced themselves. Mr. Stull explained his work reaching out to stakeholders and spoke about the 2018 Farm Bill. He explained that Title 7 mostly concerns NIFA, but ARS, ERS, and NASS have provisions; for NIFA, there are also provisions outside Title 7. In all, Mr. Stull said, he had 18 pages of NIFA provisions.

Mr. Stull said that the USDA process before the Farm Bill was signed into law involved the Secretary consulting with a Farm Bill working group, including the Deputy Secretary and senior leaders. Now, working group "conveners" are tasked with tackling Farm Bill issues that entail a choice; some Farm Bill provisions provide no leeway and are thus not discussed. But in late July the working group elevated extension, risk management, and education provision because these include a couple of implementation options. The group laid out options and recommendations and got sign off, so USDA will now move forward. Title 7 has many provisions authorizing a program with mandatory and discretionary funding—for example, with statements stipulating spending "such as necessary" or "up to \$40 million." Since 1996, appropriators have not passed regular individual bills. A USDA FY19 appropriations bill was passed in March 2019, so the Department already has its appropriations. NIFA is doing its best to implement programs funded by the Farm Bill, because one-year funding must be allocated or it goes back to the Treasury. Mr. Stull then asked what Board members were interested in hearing about.

Discussion

A member asked how appropriated money is translated into research. Mr. Stull explained that capacity funding is paid quarterly, but competitive funding needs a peer review process and is much slower. A member said that the capacity programs include Tribal Equity and endowment funds that are the most consistent from year to year, but no capacity program is on par with 1862 and other programs for research and extension. The American Indian Higher Education Consortium asked for equivalency in the Farm Bill but did not get a capacity line item; sometimes requesters have to ask more than once. Funds have been mostly obligated, including 1-, 2-, and multi-year obligations. One-year funds must be out the door by September, even as some ERS/NIFA staff are moving. Mr. Stull noted that there are 50 programs and he would share the appropriations list with Board members.

Asked how difficult it is to advocate for NIFA funding, Mr. Stull replied that he does not lobby. Instead, congressional staff ask for funding rates for programs and whether the program has enough funding. The House has a high turnover rate of staff—usually within 5 years. The Senate staff remain longer. Some staff are unaware that USDA has a peer review process for competitive funds. Part of Mr. Stull’s job is to know what stakeholders are advocating on the Hill. Stakeholders can ask USDA what has been funded, and other information. For lawmakers’ personal staff, it is basic information that is needed; committee staff are different because they focus on the agricultural portfolio every day, whereas personal staff cover many topics. The NAREEE Board can help USDA by doing its work; on the Hill, Mr. Stull does not discuss budget, just NIFA 101. Mr. Stull described the new Agriculture Advanced Research and Development Authority (AGARDA), noting that the Farm Bill established the program but no money was provided to run it, although Congress provided for “up to \$50 million.” The law also provided for a new USDA Office of Urban Agriculture and Innovative Production to boost sustainable growing methods and an office has been established.

On the question of the USDA budget, Mr. Stull reviewed the process, noting that the House Agriculture Committee has begun subcommittee hearings to receive testimony defending the administration’s budget proposal. Later, a full committee will consider several appropriations bills. The aim is to mark up a bill by March. The Senate has not even marked up the FY20 budget proposal at the subcommittee level as Senators await a bigger cap on spending limits. Rumor has it that next year Congress will pass another continuing resolution. Mr. Stull noted that for NIFA it is harder to do its job with one-year funding. In the old days, Congress completed all appropriations bills before the August recess. So many moving parts operate in Congress that appropriations bills are predictably unpredictable—each side wants something and a bill can happen suddenly.

Relevance and Adequacy Review

Overview of Relevance and Adequacy Process

DFO Michele Esch noted that two questions would guide the discussion: 1) Does the process work? and, 2) How can we streamline? She reviewed the statutory requirements of the Relevance and Adequacy (R&A) process, briefly covering past experience when USDA received very individual recommendations, up to 30 from different Board members. Because 30 were too many, NAREEE set up strategic process to compete reviews in which R&A reviewers would not look at everything across the four agencies but instead for all agencies would look at one or two goal areas on an annual basis over a 5-year cycle. For R&A topics, the agencies provide existing data to the Board, including action plans, reports, and so on. The OCS established a role of creating an executive summary of materials for the Board to review, with dialogue involving agency leaders during the Board’s Fall meeting to support written information provided.

During the time of establishing the R&A process, the Board developed seven overarching questions to guide determining if R&A: The questions are:

- What is being addressed by this program? Does the research advance agricultural science?
- Have the investments in this program accomplished the goals for which it was developed?
- Is there a complementary and adequate balance of intramural and extramural projects for relevant results?

- Do the current activities in the program achieve the correct balance between short- and long-term research among formula, capacity, competitive, and intramural funding?
- What has this program accomplished relative to the current state of agricultural science?
- What are the information gaps? What does this program area need to do to address the gaps between this program's activities and accomplishments and the current state of agricultural science?
- Is there adequate funding for the program?

Ms. Esch said the seven questions have been good, but asked if they still make sense to answer the two guiding questions for the R&A discussion. When the Board conducted the R&A for climate and energy, members relied on the Board's natural resource and forestry experts. Because R&A review is done annually, expertise can be changed for each year's topic. Basically, the NAREEE Board's output addresses the questions regarding agency research: Is it relevant? Is the funding adequate? USDA uses Board reports to avoid duplication.

Ms. Esch showed members the status of the proposed 5-year R&A cycle, listing the topics drawn from the REE Action Plan and noting that the Board lost a quorum for the years 2018, 2019, and 2020, so the topics need to be reviewed:

- 2016: Nutrition and Childhood Obesity (Goal 4) and the Food Safety (Goal 5) is done.
- 2017: Responding to Climate and Energy Needs (Subgoals 2A and 2B) is done.
- 2018: Sustainable Use of Natural Resources (Subgoals 3A and 3B) is not completed.
- 2019: Sustainable Intensification of Agricultural Production (Subgoals 1A, 1B, 1C, and 1D) is not completed.
- 2020: Education and Science Literacy (Goal 6), Rural Prosperity/Rural-Urban Interdependence (Goal 7) are to be determined. They are new strategic themes.

Ms. Esch presented the R&A review timeline. The reviews start in late summer when the REE agencies give the OCS data in time for OCS to draft syntheses before the Board's fall face-to-face meeting that kicks off the R&A review. Between the fall and spring, the appointed Board committee writes a draft report for review by all members at the spring meeting in a public forum. Dr. Govind Kannan recounted that the R&A review was a great experience in which he learned a lot, but cautioned that a format be adopted upfront for how the report should be written to avoid spending a lot of time rewriting and repeatedly shortening drafts. His first draft was 20 pages, but it was eventually cut to 6 pages after a format was adopted that presented a set of recommendations with an accompanying rationale.

In discussion, Ms. Esch referenced a slide comparing REE Action Plan goals and USDA Science Plan goals. She asked what the next Board topic would be. The Board can choose to focus on a different topic than had previously been considered. A member asked if the Board should take USDA goals as a given or can ask if the goals are right. Ms. Esch noted that a Science Plan referenced by Dr. Dionne Toombs from the OCS might not be final. The Board should look at the draft plan as part of its charge. She noted that Under Secretary Hutchins would attend the meeting later and present his strategic themes, at which point the members' question could be discussed. However, the Board could comment on whether other priorities were more relevant to the strategic goals than REE agency priorities. A member commented that it would be useful for the Board to receive the feedback comments of the REE agencies in response to prior R&A review reports. Ms. Esch said she would share the responses of Dr. Catherine E. Woteki, former USDA Chief Scientist,

to the R&A report on food safety and childhood nutrition and obesity. The responses to the Climate and Energy R&A report are not yet final but are on the agenda.

A Board member asked how reviewers would know if research is not relevant. Another member responded that the agencies constantly receive feedback on what are mostly long-term projects and they adjust in response. As for whether a summary is available of relevant research versus all research, a member suggested that the research must be linked to goals, so it should all be mappable. Sometimes Congress can mandate certain research. The Board's final product is conveyed to the agencies, the Under Secretary, the Secretary, Congressional committees, and is posted on the website.

Noting that the USDA Science Plan goals are being revised now, a member asked what the Board's role will be in looking at the new plan. Ms. Esch replied that, although not final, the Board needs to look at the draft. A member said that the Board should review and provide input to plans before they are final, not simply comment on a completed five-year plan. The new science goals must merge with Under Secretary Hutchins' goals and be confirmed, so the science goals will need to be in place before the Board does an R&A review for a specific goal area. The REE Action Plan goals are not that different from the new Science Plan goals. Ms. Esch said that she would send the Science Plan goals to the Board and noted that Under Secretary Hutchins had already said he wants Board input on whether it makes sense to continue in areas and what new emerging topics should replace current ones. It would be good to get the Board's feedback on the draft Science Plan.

A member asked if the Board should expect major changes from past priorities and what would happen to midway projects. William Hoffman of NIFA noted that projects are funded through the AFRI and will continue to get funds; for example, workforce development was identified as a priority that some 2-year community colleges and non-Land Grant colleges could help advance, so projects were built into AFRI. AFRI is not abandoning ongoing projects. Sustainable intensification, which was former USDA Secretary Tom Vilsack's concept, will continue, although there might be gaps to fill.

Board Business (Vote on Chair, Vice Chair, Executive Committee)

DFO Michele Esch posted the list of 10 nominees for the Board's Executive Committee and handed out ballots. Members were asked to list two nominees for Chair, thereby in effect selecting the Vice Chair as the person with the second highest number of votes, and to vote for the seven other members. Ms. Esch asked if any listed Board members were unwilling or willing to serve as Chair. Five members were willing to serve and one was unwilling.

Members voted and the results were that Dr. David Baltensperger was nominated as Chair and Dr. Edmund Buckner was nominated as Vice Chair. All other nominees were elected to the Executive Committee except (b) (6).

Overview of Strategic Themes

Ms. Esch introduced Dr. Hutchin's presentation of strategic themes by noting the Board members' interest in knowing how the REE Action Plan aligned with the Science Plan to understand how the pieces tie together, perhaps with an eye to reviewing the draft Science Plan.

Dr. Hutchins explained that when he came to USDA he worked to build a leadership team, relying on an overarching theme that staff could get more done if they work together. With that in mind, he began a dialogue, asking staff what they were hearing about from stakeholders regarding big issues, and he solicited ideas for how the leadership team could be most efficient. Although some knitting together of priorities is needed, he said, it was not his intent to rework individual agency plans but to frame them with leadership behaviors and organizational goals applicable to all topics and agencies, such as the need to put external customers first and to work with clarity, speed, and agility.

After brainstorming, the leadership team developed an affinity diagram that identified overarching program themes, with action areas put in context so that what REE must achieve can be clearly understood. Dr. Hutchins touched on the five themes:

- *Sustainable Ag Intensification* is used a lot; in his view, it means farmers need to be more productive and profitable, and if they can achieve growth, then it can provide more opportunity to put land in conservations, either to lie fallow or to be put back into forestry to sequester carbon. Under the theme, Dr. Hutchins listed three items: 1) productive and profitable ag ecosystems; 2) sustainable land management by building healthy soils; and, 3) national ag/bio defense.
- *Ag Climate Adaptation*, an issue on which REE must be at the forefront, encompasses the subtopics of 1) Best Management Practices and 2) the Ag/Bio Economy and Reclamation, including bioethanol.
- *Food and Nutrition Translation*, a concept encompassing USDA's commitment to consumers not just producers, includes 1) Nutrition Research Authority and 2) Food Safety and Health Promotion.
- *Value Added Innovation*, a theme for which ARS especially has many opportunities to develop new crops and new products from crops and the bio-economy—for example, looking at creating new markets for hemp—includes 1) Agricultural Products and Services and 2) Finished Uses and Applications.
- *Ag Science Policy Leadership* addresses an expectation that the United States should lead the world in ag science, Dr. Hutchins said; the European Union uses hazard-based precautionary principle approaches, not best risk management, and there have not been opposing forces; the U.S. should build a coalition in the Western hemisphere to stand up for science. The subtopics are: 1) Beacon for Science-based Policy, and 2) Trade and Commerce Friendly Ag.

Dr. Hutchins then described overarching process themes that apply to all REE agencies and include 1) Empowerment and Delegation; 2) Program Metrics and KPIs; 3) Customer-centric Outreach; 4) Mission-wide Op Excellence; and 5) Strategic Hiring Priorities. He noted that Secretary Perdue is passionate about metrics and is investing money to build a dashboard for obtaining data to manage using metrics. The Department also needs to improve the way it manages the ag narrative, articulating science and describing the value of the outcomes USDA is working on. REE will invest in stakeholder engagement, and in pursuing strategic hiring will employ interns and work with universities, 4H clubs, and others to connect the dots.

Regarding overarching people themes, Dr. Hutchins spoke about five: 1) Team REE-Connect Missions; 2) Professional Career Growth; 3) Talent Succession Training; 4) Science/Management Leadership Development; and 5) Recognition and Advocacy. Dr. Hutchins noted that it is important

to define expectations for senior scientists' impacts and to build a system where good scientists do not feel compelled to leave federal science jobs and where breakthroughs come, not trying to make good scientists into "not good managers."

In discussing a REE Inventory Assessment, Dr. Hutchins showed funding for each agency by each of the five theme areas he had presented. All four agencies are spending the majority of their budgets on Sustainable Ag Intensification (ARS \$599, 769, 490; ERS \$23,473,455; NIFA \$701,156,530; and NASS's entire budget, \$177,265,800). Using the analysis of how agencies are directing their funds for the five themes, the next step will be to conduct deeper analysis to assess if there is duplicative effort and whether there is a gap, depending on REE's goals. Dr. Hutchins said that he wants Board feedback and Ms. Esch said that members could follow up on a conference call about Board themes.

Discussion with Dr. Hutchins

A member noted that the Board has been tasked with conducting an R&A review and asked if Dr. Hutchins had any topic he wanted feedback on most now. Dr. Hutchins identified Ag Climate Adaptation as a priority for feedback, noting that he wanted to demonstrate whether REE is on track from an adaptation standpoint. The goal is to be action oriented, to have a program now based on what REE might achieve. Another member said more ag climate mitigation is needed, even more than adaptation, and added that the United States should claim leadership in ag science policy. Dr. Hutchins responded that soil health is important and he would love to have a goal of cutting ag greenhouse gas emissions 20% by 2025, but research must be done. For mitigation, he is not worried about soybeans and other big crops but about perennial and orchard crops; sustainable ag will require technology. Another member suggested that perhaps USDA should work with Land Grant institutions to attach importance to government service.

Dr. Hutchins said he welcomed more one-on-one discussions with scientists. As the Board discusses ERS/NIFA, members should give REE good strategies for building up the agencies and getting through the transition, helping to define what the next model for those agencies should look like. A member expressed appreciation for Dr. Hutchins' presentation and the recognition that sustainable ag is technology-intensive. The Board has focused on the ERS/NIFA vacancies as a challenge, but maybe it is an opportunity and the Board can contribute to understanding the potential opportunity. The member was especially supportive of REE being an ag science leader; the Trans-Pacific Partnership was an ideal vehicle to provide leadership but the U.S. is cut out and if the U.S. is excluded from the EU, that would not be forward-looking. The member asked where the U.S. can take on a leadership role. Dr. Hutchins said he was bothered by what Europe does and by exports to Africa. He wants the U.S. to be an opposing force and rebuild a case for how science drives decisions, noting that hazard-based decisions disable science.

Generally, Dr. Hutchins asked the Board's thoughts on whether the approach he presented was the right one for the REE executive team and whether anything was blatantly missing or inappropriate. A member who was also intrigued by the goal of policy leadership asked what Dr. Hutchins would do to advance the goal. Noting that Secretary Perdue is passionate about the goal, Dr. Hutchins said that there are strategies, including in Codex and other venues. USDA is not saying replace existing venues, but if there is a big Tokyo conference, for example, USDA must make sure to have someone present to make the case for science by having a clear message, being consistent, and

making the case over and over, including through the State Department helping effect changes. It is a long process but the journey must start and the Board is ideally suited to provide guidance. He indicated that the analysis breaking out REE agency spending showed disproportionate budget allocations and asked if more proportional allocations should be considered. Sustainable ag is a big area, but that could change; the key is to take the next step and conduct a depth look at the five themes. Responding to a question, Dr. Hutchins said that REE has not yet looked at the outlying projects for each thematic column to see if the outliers are important, but he welcomed Board guidance.

A member asked how the REE's five themes align with USDA's Strategic Plan goals and how the draft Science Plan goals align. Dr. Hutchins said that Secretary Perdue mapped existing programs to the strategic goals. Wanting USDA programs to be fact-based, science-based, and to benefit the ag community, the question is what a Science Plan should look like. There is no U.S. ag innovation strategy using all public and private resources, but understanding the direction the private sector is going can help USDA provide breakthroughs the private sector can use. Both sectors want to provide solutions, not just spend more money. Dr. Hutchins said he welcomed the Board's thoughts on a national ag innovation strategy. The REE leadership team spoke about how to measure success; if \$500 million is invested, what will be promised on the other end? More ag security? What is the value proposition for funders? Dr. Hutchins said that in his world, all dollars are mapped against a business case for making investments. Transformation is the watchword, with gene editing done, digital ag on the way, and solutions for dealing with endangered species and other environmental issues needed.

Dr. Hutchins emphasized the importance of good communication. He said that he has no language or narrative around his themes yet and wants that done in an impactful way. A member asked about Dr. Hutchins' priorities for receiving the Board's input, and the timelines, so members can provide effective input into the process. The Board should know deadlines for feedback. Dr. Hutchins said that he would work with Ms. Esch on timelines but first wanted to focus on choosing the outcome goals, not activities or reports, to achieve. He wants clarity on the "dials" REE should be trying to move; for instance, a metric could be helping ag GDP grow faster than the international standard. The desired environmental outcome would be another metric. Dr. Hutchins said he wants clarity first before speed. Noting that industry is doing a lot on its own, a member asked if there was any way to assess how many firms are working on an issue. Dr. Hutchins responded that if the Board concludes it is a good idea, that information could be gathered through NASS.

A member inquired about the direction of urban ag. Dr. Hutchins responded that not everything fits into urban ag, which is intense if 15 levels of a building are engaged in the practice; the question is how to make sure it is successful. With innovation, everything should be on the table, and issues to consider are how all the parts fit together and whether USDA has a role. Some will oppose and some will support urban ag, but USDA must be neutral and focus on innovation. Asked about the issue of foreign partners stealing intellectual property (IP), Dr. Hutchins said the concern is a genuine one, but there are risks both of doing too much or too little and thereby ending in a bad place because scientific integrity would be affected. He closed by thanking the Board and asking the members to consider the big opportunities for USDA. After his departure, some members recounted how their organizations are dealing with concerns about IP theft and China's attempt to hire foreign researchers.

Discussion of Priorities, Programmatic/Strategic Themes, and Relevance and Adequacy

Newly elected NAREEE Board Chair Dr. David Baltensperger opened the session by noting various items that were on the table: 1) the ERR/NIFA relocation; 2) the Ag Climate Adaptation theme; 3) R&A actions; 4) a U.S. ag innovation strategy; 5) extension input for NIFA Director Dr. Scott Angle; 6) IP—working with foreign entities; 7) youth and workforce development.

Members offered motions to discuss the ERS/NIFA relocation toward the goal of producing a statement on how the Board wants to advise the Secretary on the issue. The motion was seconded, and members then discussed the possible substance of their statement. A member suggested options to comment on the process for deciding to relocate ERS/NIFA, including: to accept it as a given; to suggest that the process was inadequate; or to call for NAS to study the matter. The comments should address the implications of going ahead for both program administration and science, addressing short-term risks and benefits; the risk is that grants will not being issued, while the opportunity is to fill various gaps in expertise.

With the understanding that the Board did not think the process was handled correctly, Board language was discussed and an amendment was proposed. It read:

The NAREEE Advisory Board recommends that the Secretary seek broad stakeholder input before making major operational changes that affect policy and the functioning of science programs, as the Board does not feel this process was satisfactory in regard to the decision to relocate ERS and NIFA.

The amended motion passed unanimously, with members commenting that it seemed like language the Board could support. Members offered thoughts in favor of the statement and possible minor additions that could be made later. A member commented that the statement strikes a balance between alternative perspectives, noting that if the relocation wasn't legal it wouldn't have gone this far; it isn't a question of whether it is legal but of what the right thing is to do long-term. The USDA Office of Inspector General was asked to review the legality of the authority and budget authority to relocate; that analysis is not finished yet, but it will not change anything. Other members made comments. The Board's role is to bring diversity of views, not to endorse USDA actions. The justification for the relocation is convincing in some aspects but hasn't reached all stakeholders; to get more buy in, USDA could do a better job of communicating that it has a game plan for tackling concerns about the move's potential impacts on science. Members wanted their letter to the Secretary to note their concerns about potential impacts on administrative and scientific capacity and to ask for USDA to show that no interruption in delivery of programs will occur and that projected savings will be reinvested directly toward science. Any details described in the meeting minutes would help support the concerns raised in the letter.

Members offered specific language to consider including in the letter. For example:

The Board recommends that the anticipated positive aspects of the move be better communicated to the stakeholders, particularly that the science and programs will not be disrupted. Risk mitigation also needs to be clearly addressed. USDA should in the short-term establish a timeline and short-term performance metrics.

Comments were aimed at holding USDA accountable for the relocation's potential impacts. Members said they would like metrics around the efficiency of grant delivery, positions filled, and refilled positions supporting the strategic needs of ERS and NIFA. The suggested timeline could cover 3-5 years, even though Dr. Angle suggested that a successful relocation could be done in one year.

A member made the motion that a subcommittee be established to work with the Chair to draft a letter to the Secretary and Under Secretary to address the points raised. It was noted that the Board could review the draft on Friday, the final day of the meeting. The vote was taken. All voted to approve the motion, with no abstentions.

Chair Baltensperger appointed members to work with him on drafting a letter to submit to the group for review: John Coupland, Edmund Buckner, Jayson Lusk, with DFO Esch assisting.

The Board returned to the list of items to be covered and took up the topic of extension. Ms. Esch reminded the Board that Dr. Angle indicated he wanted feedback but was not specific about questions he wanted feedback on. Chair Baltensperger said the Board would need to establish a process to conduct a review, so a motion on establishing a process to review, not on substantive recommendations, might be appropriate. He asked for any ideas on a process that could help the group. Ms. Esch noted that the Board had visited an experimental station in Ohio and met with ag researchers and ARS, discussing in part how the food products company J.M. Smucker engages in public-private collaboration with ARS. A 2012 Board meeting at Texas A&M on extension was not Texas-centric, but was attended by industry and some other state representatives; the Board's recommendation about funding for extension remains an issue, with funding still flat. A member suggested a survey of extension directors at a national meeting to find where they want to go, which could guide the Board on where it wants to go on the issue. The survey would convey more than a regional perspective. Because times have changed since 2012, perhaps a new study is needed. The Board could also invite extension leaders to discuss progress since 2012.

Ms. Esch noted that the Board meets in locales but tries for a national perspective regardless of the location. It might be useful to get information before the Board's next field visit by bringing people in as panelists, even in a video conference. It is time to do an extension review. Ms. Esch said she will talk to Dr. Angle about any key questions he might have; perhaps part of a Board meeting could address extension, with a task group on the issue, concurrent with an R&A session. A member noted that Dr. Angle said extension will change in big way and suggested Dr. Angle and others, including extension organizations, could give the Board their perspectives. Labor is drying up for harvesting crops, lettuce, and tomatoes; technology is an area extension will move toward and the Board must offer suggestions on that.

A motion was needed on the Board's review of extension. A motion was made for the Board to provide input on extension activities through a working group that will develop a plan for going forward. It was suggested that the working group could possibly include recommendations for a meeting host, place, and so forth. The motion was seconded and voted on. All members voted in favor, with no abstentions. Working group volunteers included Roch Gaussoin, Sarah Francis, Michael Oltrogge, and Govind Kannan. The working group efforts will be a focal point of a future meeting.

Ms. Esch noted that Ag Climate Adaptation could be tied in with the R&A review. A member noted that Dr. Hutchins said that the topic is a priority. Asking whether the Board's R&A review could examine sustainable ag intensification, a member commented that it is huge topic that might have a lot of climate issues and thus could be worth considering. Members asked whether they would use Dr. Hutchins' Science Plan or the REE Action Plan. Ms. Esch noted that Dr. Hutchins is tying the language of his themes to the Science Plan and thus is aligned with USDA's Strategic Plan; next, alignments with the REE Action Plan will be made. Ms. Esch said she will talk with the OCS and Dr. Hutchins about the crosswalk among the plans. A member commented that with Dr. Hutchins asking for guidance, the Board should step up its activities and get REE agencies engaged in providing information. For both Ag Climate Adaptation and extension, the Board will need specific questions to guide their discussion.

A motion was made for the Board to launch its R&A review. A motion was made to start the annual R&A review focusing on Ag Climate Adaptation and mitigation. The motion was second and passed unanimously, with no abstentions.

Another motion was made for the Board to request from REE a crosswalk report showing the links between the REE goals, the draft Science Plan, and Dr. Hutchins' overarching program themes so the Board can review the links and provide input. The motion was seconded and unanimously approved with no abstentions.

Members mentioned other topics of concern, including IP and foreign activities and ag innovation, which are outside the R&A process. One member emphasized the need to elevate youth and workforce development; with the ERS/NIFA moves happening, there is a lot of activity and more latitude to hire, making the issue of the adequacy of the workforce relevant right now. A member noted that a recent USDA report found that about 50,000 jobs open up each year in agriculture, but only 35,000 are filled; the gap is filled with non-ag people. Rural access to internet connectivity was added to a list of items titled Other Areas of Concern.

A member noted that Dr. Hutchins expressed the need for a comprehensive picture of what's happening in ag in United States and how to stimulate it; cloud-computing, remote sensing, private, small company innovation, and other developments are relevant. The member asked if there was any way those developments were being captured: What's being covered? Is it adequate? Where are there gaps? The members said the issue is important but is a big request to handle. Perhaps REE will consider funding an assessment and the Board should wholeheartedly support the idea.

Public Comment

Caron Gala, Government Relations Liaison with the Agriculture Applied Economics Association (AAEA), made a statement. She said AAEA appreciates the NAREEE Board's involvement in discussing REE mission areas, noting especially the importance of issues pertaining to research on ag economics and the rural economy, which grew from \$14 million in 2012 to \$21-22 million last year. The portfolio has grown because professionals taken the time to communicate priorities, which AAEA experts want maintained, along with capacity and extension funding, as NIFA is relocated. AAEA wants to partner with the NAREEE Board to strengthen contacts. ERS is the intramural research agency and is very important to AAEA members' profession; attrition from NIFA and ERS is very concerning, with staff cut in about half. AAEA is working with members of Congress and requested that the Board include economics in its letter to USDA's top leaders. She

requested that the Board encourage the Secretary to slow the ERS/NIFA move. It would be most appropriate if employees had the option to move when a final location is identified, so employees can make a clear decision about where to buy a house. AAEA's main concern is maintaining the structure and function of the programs; AAEA does not want anything dropped. The organization wants to see the agencies stay functional and investment to be upheld in a high-integrity manner. He provided written testimony signed by AAEA's leadership.

No other public comments were made.

Friday, July 19, 2019

Remarks from Chair

Chair David Baltensperger called the meeting to order and said that the first order of business was for the Board to review the draft letter the Secretary and Under Secretary regarding the ERS/NIFA relocation. Members offered minor changes and discussed the long- and short-term recommendations aimed at the ultimate concern of making the system work in Kansas City. The first four recommendations were about human capital, reflecting the Board's major concern about the move's impact on human capital. Following the discussion, a motion was made to approve the letter; the motion was seconded and approved unanimously, with no abstentions.

The Board next briefly reviewed the September 28, 2019, NAREEE Board conference call minutes. Minor edits were suggested. A motion was made to approve the minutes with minor edits, was seconded, and adopted unanimously with no abstentions.

Subcommittee Updates and Discussion

DFO Michele Esch gave a slide presentation that provided more detail on the NAREEE Science Advisory Council and three subcommittees.

- The **National Genetic Resources Advisory Council** (NGRAC) is housed in NIFA and provides advice on germplasm conservation. A Safety 21 report on the balance of GMO and non-GMO crop research recommended evaluating the adequacy of seed supplies for all seed types; the report asked NGRAC to address the GMO-non-GMO balance question and the NGRAC report will be given to the Board for approval before going final. NGRAC has issued a recent solicitation for vacancies. NGRAC also recently wrote a report approved in 2018 on animal and aquatic resources.
- The **Specialty Crop Committee** (SCC) previously had six members from the NAREEE Board, but that was when there were 25 Board members; six Board members might not make sense now with only 15 members on the Board. Richard de Los Santos serves as the Board liaison along with Kenrett Jefferson-Moore. The Board can decide not to have six members. The SCC meets once a year and has a broad charge to offer advice on specialty crop research and the NIFA grant program R&A review to make sure grants are relevant to industry.

Members discussed the issue of Board participation on the SCC. A motion was offered for the NAREEE Board to have three representatives on the SCC and for the SCC to include six industry members. The motion was seconded and passed unanimously. A second vote to approve the three

Board members on SCC was taken and passed unanimously. The Board representatives on the SCC are: Richard de Los Santos, Kenrett Jefferson-Moore, and Chad Ellis.

- The **Citrus Disease Subcommittee (CDS)** was established to provide advice on citrus disease research, responding to citrus greening disease. Originally there were nine members, but the 2018 Farm Bill increased California's members to five; Florida has five; and Texas has one. The CDS is actively soliciting new members. There has been no Board liaison for several years. Dr. Mark McClellan served on the CDS and his presence was helpful because initially California wanted to keep greening disease out, while Florida wanted to fight it, so there was a disagreement on priorities that Dr. McClellan managed well. With the disease moving into California, there is now common ground for fighting the disease. Richard de los Santos said that citrus disease is important and offered to serve on the CDS if no other Board members would; it was agreed he should serve until an alternative is found.
- The **Science Advisory Council (SAC)** was established by USDA as a result of the President's Council of Advisors on Science and Technology report on ag preparedness. The SAC advises the Under Secretary on emerging issues. The SAC took up the issues of scientific rigor and reproducibility and gene editing. The Board's science members participated, including social scientists, and Land Grant representatives. NAREEE Board members are SAC members, but specifically a select subgroup who are members of science societies. Previously, there were nine membership categories, but with a new structure, maybe not all categories will be filled. Membership could be less than but not more than nine. The SAC is up to the discretion of the Under Secretary, not statutory. A member expressed concern about the lack of a conservation representative on the SAC. Ms. Esch noted that expertise can be added as needed, depending on the topic. Dr. Hutchins had not previously heard of the SAC.

A motion was made to move forward with the current composition of the SAC, adding expertise as needed; the motion was seconded, and the members voted unanimously to maintain the current structure.

The Board discussed the R&A review committee, which will address the Ag Climate Adaptation theme area as its focus and will request the exact questions of interest to the Under Secretary on climate adaptation for that area. It was agreed R&A review committee members should be appointed and the following members were named to the committee: James Allen, David Baltensperger, Robin Beck, Roch Gaussoin, Kenrett Jefferson-Moore, and Jayson Lusk. Liz Hobart also joined the committee after the end of the meeting.

The Board discussed a Data Management Working Group established in 2014 as a NAREEE panel to respond to data issues. A member noted that data management is a big topic for which the Board lacks expertise. The Board would need to bring in that expertise; it is where new policies and new questions are occurring, but it was unclear how the Board would elevate it.

General Board Discussion

Chair David Baltensperger gave Dr. Hutchins an opportunity to speak with Board members. Dr. Hutchins thanked members for taking on difficult issues. His preference is to put tough issues on the table and solicit constructive solutions. He appreciated the Board's weighing in on the ERS/NIFA

move and said USDA will consider the Board's thoughts. For the ERS/NIFA Version 2 model, he asked how REE can take the agencies to the next level. If Board members believe the move is designed to reduce or diminish the impact of the two agencies, he wants to convince the members that this is not true, and he asked for help in designing Version 2. All ideas are on the table. A major challenge and goal are to demonstrate the outcome value of REE investments, and he asked the Board to help REE make a case, noting: If we create the value, the money will come. At an industry-academia dinner roundtable with the Office of Science and Technology Policy, the Department of Energy, and other agencies, there was significant interest in agriculture, with many applications of technology and science. Ag will be one of the next two topics receiving attention. He said that he looked forward to future interactions with the Board and would work closely with Ms. Esch and Dr. Baltensperger to be sure REE does the right thing going forward.

The Board then discussed a location for its next meeting. A meeting in Kansas City was discussed as a priority, likely next April. Other locations were discussed: Nebraska, which is not good for a winter meeting; San Antonio might be good, with the American Soybean Association meeting there November 14-15. North Carolina, Florida, Arizona, and California's Central Valley were mentioned as well. Ms. Esch will conduct a Doodle Poll for a two-week window to determine the best dates for members.

The Board discussed the Executive Committee's monthly calls and it was established that they will take place on the first Friday of every month, starting with a call on August 2, from 1:00-2:00 pm EST. At that meeting, the Executive Committee will focus on identifying locations and times for the next two Board meetings. Members were also urged to bring ideas to the meeting for offsetting any shortcomings that Kansas City transition creates.

Public Comment

Rebecca Boehm, an economist with the Union of Concerned Scientists (UCS) food program, spoke about two concerns. She encouraged the Board to prioritize sustainable ag and to tell the USDA to stop the ERS/NIFA move. Sustainable agroecology can be a win-win that helps protect natural assets while benefitting farmers, but farmers might need help in adopting practices. USDA provides a small amount of funds for agroecology, but the Board should prioritize such practices. On the ERS/NIA move, she said ERS/NIFA will lose up to 90 percent of their staff, producing delays to Land Grant funds and affecting ERS reports and the quality of work from both agencies. Long-term, it could take a decade to replace the lost expertise. The UCS thinks the move's goal is to keep ERS/NIFA out of earshot of Washington, DC, with an eye to cutting budgets and staff and making sure the scientific discoveries by REE's own scientists are kept out of the public eye. The Board should call for a halt until the merits of the move can be assessed. She thanked the Board for allowing UCS to share its concerns.

A member asked about the definition of agroecology and expressed uncertainty about whether it would be part of sustainable ag. Ms. Boehm said that UCS used the broadest definition in assessing how funding was sliced from the REE competitive grants budget for the topic. She offered to share links to fact sheets for definitions and Ms. Esch agreed to share those documents with everyone. A UCS expert on agroecology could provide more details if the Board wanted that. Asked about what REE data had been withheld from the public, Ms. Boehm cited a *Politico* story about ARS research on climate and ag production, with many studies not given press releases or the attention the studies would get in other administrations.

Ms. Esch noted two important items: first, Govind Kannan has been with the Board for 6 years, and with his term ending in September, he might not attend future meetings. She said Dr. Kannan will receive a certificate of gratitude for his service, and a group picture was organized. The second item was the Delta/Plus Activity.

Delta/Plus Activity (What worked? What can we do better?)

Ms Esch said she wanted the Board to discuss the two questions to help make improvements to the Board meeting process or to continue doing what works well, including in administrative areas, such as travel, lodging, the agenda, and so forth.

Members offered a variety of thoughts.

- The meeting space needs microphones or an acoustical arrangement that works.
- There was a lack of background material because the Board had not met for a year, which led to more updating than advising.
- A member said onboarding was a struggle and suggested one-on-one calls to new members, or mentoring relationships for new members. Ms. Esch noted that she is creating an onboard manual and asked members to send her any ideas.
- Scheduling meetings a year out would be helpful.
- The balance of presentations and discussion was good, as was the smaller group and meeting in hotel without the security screening done at federal buildings.
- For their presentations to the Board, REE agencies should be encouraged to ask Board members about areas in which members can give help and guidance, allowing members to hear agencies' needs; also, it would be good to have all agencies attend.
- Members asked what the members whose terms are expiring would need to be reappointed. Ms. Esch will provide the members with that information.

Ms. Esch followed the discussion by noting that the Board's input will be used to improve meetings, and for the next meeting the new chair will have input on the agenda. Ms. Shirley Morgan-Jordan reminded members about travel logistics and reimbursement rules. Chair Baltensperger thanked all attendees for participating in the meeting.

The meeting was adjourned.

RESOLUTIONS AND RECOMMENDATIONS

10. The Board members elected the Executive Committee's nine members: David Baltensperger (Chair); Edmund Buckner (Vice Chair); members: Robin Beck, John Coupland, Richard De Los Santos, Sarah Francis, Liz Hobart, Jayson Lusk, Michael Oltrogge.
11. The Board unanimously approved drafting a letter about the ERS/NIFA relocation, with key points and language to be reflected in the letter, and unanimously approved the creation of an *ad hoc* group of members to work with Chair Baltensperger and Michele Esch to draft a letter for the Board's consideration the following day. The *ad hoc* group's members were Edmund Buckner, John Coupland, and Jayson Lusk.
12. The Board unanimously approved the creation of a working group to develop an action plan for responding to NIFA Director Scott Angle's request for feedback on Extension activities

- and nominated working group members: Sarah Francis, Roch Gaussoin, Govind Kannan, and Michael Oltrogge.
13. The Board unanimously approved a motion to start the annual R&A review focusing on climate adaptation and mitigation.
 14. The Board unanimously approved a motion to request from REE a crosswalk report showing the links between the REE goals, the draft Science Plan, and Dr. Hutchins' overarching program themes so the Board can review the links and provide input.
 15. The Board approved, with minor proofreading adjustments, the September 28, 2018, NAREEE Board conference call meeting minutes.
 16. The Board unanimously approved restructuring the membership of the Specialty Crop Committee, reducing the NAREEE Board representation to three members working with six industry representatives. The three Board representatives are: Richard De Los Santos, Chad Ellis, and Kenrett Jefferson-Moore.
 17. The Board unanimously approved maintaining the current composition of the Science Advisory Council.
 18. The Board appointed members of the R&A Committee: James Allen, David Baltensperger, Robin Beck, Roch Gaussoin, Liz Hobart, Kenrett Jefferson-Moore, and Jayson Lusk. Liz Hobart also joined the committee after the end of the meeting.

ACTION ITEMS

- Michele Esch will send to Board members copies of the USDA press releases announcing the decision to relocate ERS and NIFA.
- USDA's Josh Stull will share with Board members his compilation of congressional appropriations for the Department.
- Michele Esch will provide Board members copies of responses by former USDA Chief Scientist Dr. Catherine E. Woteki to a completed NAREEE Advisory Board R&A report on food safety and childhood nutrition and obesity.
- Michele Esch will provide to Board members the documentation each REE agency uses for its R&A review processes.
- Michele Esch will provide Board members with the draft Science Plan so they can provide feedback on the draft.
- Dr. Scott Hutchins will work with the REE leadership team to draft narrative language on the five themes he described to Board members after he has clarity on the "outcome goals" for which he sought Board input. Dr. Hutchins specifically asked for help on the Ag Climate Adaptation goal area.
- Michele Esch will ask NIFA Director Scott Angle for specific questions on which he would like Board advice regarding Extension activities.
- Michele Esch will inquire with Dr. Hutchins and the Office of the Chief Scientist about a crosswalk tying the Under Secretary's overarching program themes to the REE Action Plan and the draft Science Plan.
- Michele Esch will provide Board members with information on what must be done for members to seek reappointment.

APPENDIX A: LIST OF MEETING ATTENDEES

A list of public attendees is available from the NAREEE Advisory Board Office.

Wednesday, July 17, 2019

NAREEE Members Present: James Allen, David Baltensperger, Robin Beck, Edmund Buckner, John Coupland, Richard de los Santos, Chad Ellis, Sarah Francis, Liz Hobart, Govind Kannan, Mark Lawrence, Jayson Lusk, Michael Oltrogge, Robert Zeigler

Ex-Officio Members Present: Dr Scott Hutchins

NAREEE Members Absent: Roch Gaussoin, Kenrett Jefferson-Moore

NAREEE Advisory Board Staff: Michele Esch, Shirley Morgan-Jordan

Other USDA Staff: Dr Scott Angle, Dr Mojdeh Bahar, Jada Clark, Sara Federman, Mr Hubert Hamer, Dr Ann Marie Thro, Dr Dionne Toombs, Paul Zankowski

Invited Guests: Rebecca Boehm (UCS), Genevieve Croft (CRS), Steve Davies (Agri-pulse), Jason Gollaghes (Lewis-Burke), John McNamara, Steve Pierson

Thursday, July 18, 2019

NAREEE Members Present: James Allen, David Baltensperger, Robin Beck, Edmund Buckner, John Coupland, Richard de los Santos, Chad Ellis, Sarah Francis, Liz Hobart, Govind Kannan, Mark Lawrence, Jayson Lusk, Michael Oltrogge, Robert Zeigler

Ex-Officio Members Present: Dr Scott Hutchins

NAREEE Members Absent: Roch Gaussoin, Kenrett Jefferson-Moore

NAREEE Advisory Board Staff: Michele Esch, Shirley Morgan-Jordan

Other USDA Staff: Dr Mojdeh Bahar, Dr Ann Marie Thro

Invited Guests: Caron Gala (AAEA), Jason Gollaghes (Lewis-Burke)

Friday, July 19, 2019

NAREEE Members Present: James Allen, David Baltensperger, Robin Beck, Edmund Buckner, John Coupland, Richard de los Santos, Chad Ellis, Sarah Francis, Liz Hobart, Govind Kannan, Mark Lawrence, Jayson Lusk, Michael Oltrogge, Robert Zeigler

Ex-Officio Members Present: Dr Scott Hutchins

NAREEE Members Absent: Roch Gaussoin, Kenrett Jefferson-Moore

NAREEE Advisory Board Staff: Michele Esch, Shirley Morgan-Jordan

Other USDA Staff: Jada Clark, Dr Ann Marie Thro, Laura Shray

APPENDIX B: Presentations

All presentations given at the NAREEE Advisory Board meeting are available from the NAREEE office upon request.

**National Agricultural Research, Extension, Education, and Economics (NAREEE)
Advisory Board**

MINUTES OF THE NAREEE BOARD CONFERENCE CALL

September 28, 2018
11:30 am-1:30 pm EDT
Virtual Access Only
1-888-844-9904; Access Code: (b) (6)

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EXECUTIVE SUMMARY

National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board

MINUTES OF THE NAREEE ADVISORY BOARD CONFERENCE CALL

September 28, 2018
11:30 am-1:30 pm EDT
Virtual Access Only
1-888-844-9904; Access Code: (b) (6)

The National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board convened for a public Conference Call, accessible only virtually, on Friday, September 28, 2018, to review three draft reports and vote on NAREEE approval of them:

- *Use of Gene Editing in USDA Research* (September 30, 2017), drafted by the NAREEE Science Advisory Council (SAC)
- *2017 Relevance and Adequacy (R&A) Review Responding to Climate and Energy Needs* (May 13, 2017), drafted by the NAREEE R&A Committee
- *Strengthening Strategic Genetic Resources for Livestock, Poultry, and Aquatic Species in the United States* (April 2018), drafted by the NAREEE National Genetic Resources Advisory Council (NGRAC)

NAREEE Executive Director Michele Esch opened the conference call by reviewing the agenda and taking roll call, which showed that a quorum of 17 out of 25 members was present. The call was held at the NAREEE Executive Committee's request in lieu of the NAREEE Board's usual face-to-face meetings held twice a year that could not be scheduled because of difficulties managing appointments. Ms. Esch noted that USDA's Fiscal Year 2019 appropriations bill and Farm Bill reauthorization, which authorizes NAREEE, were both pending congressional approval. Absent a Farm Bill, the NAREEE Board would enter into a hiatus, but a face-to-face meeting is nevertheless being planned for January 23-25, 2019. The three reports were presented and Board members were invited to comment and ask questions before voting on whether to approve each report for submittal to the Secretary of Agriculture Sonny Perdue.

Dr. Mark McLellan (Vice President for Research & Graduate Studies, Portland State University), former NAREEE member and Chair of the SAC, presented the report, *Use of Gene Editing in USDA Research*. The report was organized around 11 questions provided by the USDA Office of the Chief Scientist (OCS), the last one focusing on recommendations to the OCS on steps to address the issues around gene editing (GE) with CRISPR/Cas discussed in the report, with a strong emphasis on the need for USDA to play a leadership role in educating the public and communicating the benefits of GE. During follow-up discussion, it was noted that the European Union recently decided to treat GE the same as genetically modified organisms (GMOs), a divergence from the USDA and SAC view. In unanimously approving the report, NAREEE members recommended two footnotes to improve the draft, one on the July 25, 2018, European Union Court of Justice GE-GMO ruling and the other on the March 28, 2018, USDA Animal and Plant Health Inspection Service (APHIS) ruling approving the use of GE methods. Dr. Paul

Zankowski (OCS) noted that in late September USDA held a workshop on education and communication, and it was agreed that NAREEE would ask for a report on OCS communication and education efforts.

Dr. Steven Daley-Laursen (University of Idaho), the former NAREEE Board Chair, presented the *2017 Relevance and Adequacy (R&A) Review Responding to Climate and Energy Needs* report, noting that the annual R&A review is statutorily required and focuses on the REE Action Plan—including the National Institute of Food and Agriculture (NIFA), National Agricultural Statistics Service, Economic Research Service, and Agricultural Research Service (ARS) components—as well as, in 2017, on U.S. Forest Service research and development. For R&A reviews, the Board uses data and information to assess how relevant the REE entities’ current programs are to the REE Action Plan. The report’s climate section was produced by a workgroup chaired by Dr. Daley-Laursen and the energy section by a workgroup chaired by former member Dr. Carrie Castille (Agriculture and Natural Resources Consultant). Dr. Daley-Laursen reviewed the report’s recommendation in both areas, which each had their own strategies; for climate, there were four strategies, while the energy there were three.

Dr. Terry Tiersch (Louisiana State University), the NGRAC Chair presented the draft report, *Strengthening Strategic Genetic Resources for Livestock, Poultry, and Aquatic Species in the United States*, first describing NGRAC, which has struggled somewhat with membership and is working to expand its focus from the original emphasis on crops to now encompass all genetic resources. Accordingly, the NGRAC membership will include stakeholders involved with not just crops but with animal and other genetic resources. The report being reviewed was the first in a series of five. In all, the reports will deal with 1) animals, 2) crops, involving 43 crop groups, 3) microbes, 4) wild relatives of crops, and 5) microalgae. Dr. Tiersch noted that genetic materials need to be stored in repositories, with samples and information interconnected, which necessitates computing and database capabilities. The National Animal Germplasm Program (NAGP), part of USDA’s ARS, has one facility in Fort Collins, Colorado, responsible for collections across all of the animal resources. While NAGP is likely the best in the world, it nevertheless needs strengthening through, for example, information technology. The report’s “models for further advancement” section provides examples of success stories showing the clear benefits of placing germplasm into NAGP. Dr. Tiersch reviewed the report’s eight recommendations, which were grouped into four areas: capabilities, increasing participation, increasing cooperation, and assessing the economics.

RESOLUTIONS AND RECOMMENDATIONS

- The Board unanimously approved the draft report, *Use of Gene Editing in USDA Research*, with two footnotes to be added.
- The Board unanimously approved the draft report, *2017 Relevance and Adequacy Review Responding to Climate and Energy Needs*.
- The Board unanimously approved the draft report, *Strengthening Strategic Genetic Resources for Livestock, Poultry, and Aquatic Species in the United States*.

ACTION ITEMS

- For one of the footnotes to be added to the *Use of Gene Editing in USDA Research* report, Dr. Paul Zankowski will provide draft wording to Ms. Esch for a reference on the

July 25, 2018, European Union Court of Justice ruling that gene-edited crops should be subject to the same stringent regulations as conventional GMOs¹ and Dr. McLellan will review and add the footnote to the report.

- A GE report referencing the USDA March 28, 2018, APHIS ruling approving the use of GE methods will be linked elsewhere in the GE report as necessary. Seemingly contradictory statements in question 1 of the GE report, regarding APHIS's decision to not regulate CRISPR/Cas and referencing APHIS global leadership in regulations, will be clarified using a footnote.
- NAREEE will ask NIFA for a report on the its efforts directed at GE education and communication.
- Ms. Esch and Program Support Coordinator Ms. Shirley Morgan-Jordan will send additional information to Board members regarding the January 23-25, 2019, NAREEE Advisory Board meeting.

¹ Court of Justice of the European Union Press Release, July 25, 2018, <https://curia.europa.eu/jcms/upload/docs/application/pdf/2018-07/cp180111en.pdf>

Respectfully submitted,

Julia Sabin
Chair

Don Villwock
Vice Chair

Michele Esch
Executive Director

APPROVAL BY ADVISORY BOARD:

Date

Initials
Chair

Initials
Executive Director

Friday, September 28, 2018

Roll Call and Establishment of Quorum

The National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board convened for a public Conference Call, accessible only virtually, on Friday, September 28, 2018, at 11:30 am EDT. NAREEE Executive Director Michele Esch opened the conference call by reviewing the agenda and taking roll call, which showed that a quorum of 17 out of 25 members was present.

Welcome and Overview

Ms. Esch explained that the conference call purpose was to review three draft reports and vote on NAREEE approval of them:

- *Use of Gene Editing in USDA Research* (September 30, 2017), drafted by the NAREEE Science Advisory Council (SAC)
- *2017 Relevance and Adequacy (R&A) Review Responding to Climate and Energy Needs* (May 13, 2017), drafted by the NAREEE R&A Committee
- *Strengthening Strategic Genetic Resources for Livestock, Poultry, and Aquatic Species in the United States* (April 2018), drafted by the NAREEE National Genetic Resources Advisory Council (NGRAC)

The call was held at the NAREEE Executive Committee's request in lieu of the NAREEE Board's usual face-to-face meetings held twice a year that could not be scheduled because of difficulties managing NAREEE appointments. Ms. Esch noted that USDA's Fiscal Year 2019 appropriations bill and Farm Bill reauthorization, which authorizes NAREEE, were both pending congressional approval. Absent a Farm Bill, the NAREEE Board would enter into a hiatus, but a face-to-face meeting is nevertheless being planned for January 23-25, 2019. During the call, the three reports that had been provided to members were scheduled to be reviewed and Board members were invited to comment and ask questions before voting on whether to approve each report for submittal to the Secretary of Agriculture Sonny Perdue, together with USDA agencies' responses and summaries of any activities they are undertaking to meet the reports' recommendations.

Opening Remarks

NAREEE Advisory Board Chair Julia Sabin (Vice President, The J.M. Smucker Company) thanked Ms. Esch and the USDA team for their effort in arranging the conference call, as well as the Board members for attending and the report presenters for participating.

Presentation of the Science Advisory Council Report on Gene Editing

Dr. Mark McLellan (Vice President for Research & Graduate Studies, Portland State University), former NAREEE member and Chair of the SAC, presented the report, *Use of Gene Editing in USDA Research*. In developing the report, the SAC asked the USDA Office of the Chief Scientist (OCS) to provide the issue that the Council was being asked to consult on along with a series of guiding questions to focus the SAC's deliberations. The report was organized around 11 questions provided by the OCS that Dr. McLellan described, noting salient points:

1. *Does USDA need to establish or adopt an existing definition of gene editing, and if so, for what purpose; if establishing a new definition, does this need to relate to other existing definitions?* The report notes that the proposed Animal and Plant Health Inspection Service (APHIS) focused on gene editing (GE) and concluded that GE using CRISPR/Cas technology would not be regulated. The SAC considered APHIS's conclusion appropriate. The SAC clearly agrees that APHIS is the appropriate place of oversight and authority and guidance for regulation as needed.
2. *USDA has not in the past focused on the use of specific techniques for plant and animal improvement but has rather focused on developing solutions to particular agricultural problems. Is there an overriding reason for changing that approach in the case of gene editing?* The SAC agreed that USDA should “stay the course” in its focus on a “product-based regulatory framework,” but a strong educational framework is needed. Over decades, society has learned that the introduction of any new technology requires an educational component; even milk pasteurization should have included a public education effort.
3. *What should be USDA's role in applying gene editing in innovation (developing tools, techniques and methodologies), in meeting needs (applying to specific agricultural problems), both or neither?* The SAC concluded that USDA needs to be proactive in applying GE as an innovative tool to meet agricultural needs.
4. *Does USDA need to make statements on how it plans to use, or is using, gene editing in agricultural research? Why or why not?* The SAC concluded USDA must be proactive in making statement on its planned use of GE, and strongly emphasized the need for early education, building a “roadmap of communications” to support a proactive communications stance, a theme that recurs throughout the SAC report.
5. *What are the respective roles of the public sector and private sector (as it relates to research) in gene editing, and where do they overlap?* The SAC recognized that both the private and public sectors are making rapid advances in GE, with an extraordinary rate of publications around GE being witnessed. Both sectors need to be engaged in GE.
6. *Are there any USDA priorities that can only be accomplished through gene editing that cannot be accomplished through conventional techniques?* The SAC recognized GE as a powerful tool that will later lead to a full understanding of the genetic map and its functionality, which is the true goal because such understanding would enable control of gene expression and phenotypical points of breeding. There is no single silver bullet, so SAC is not calling for any specific targeting only for a recognition of GE's power as a tool.
7. *What Priority should USDA give to gene editing in relationship to USDA's existing priorities, and why?* The SAC concluded that GE is one of many tools, but with its unique power to identify and elucidate complete genetic maps, CRISPR/Cas should have support and encouragement to bring it to the forefront. The SAC sees the potential for a new green revolution using GE tools.
8. *What should or can REE do, if anything, to enable a more democratized availability of gene editing technologies? (So that it is not only big companies that can use this technology.)* The SAC recognized that GE is already widely used and reasonably priced, so democratization is

not even a question. It should be adopted and supported with education, both intra- and extra-mural funding, and communications underscoring the power and usefulness of GE.

9. *Does USDA's role change if gene editing can be detected in some or all products and, if so, how? Does USDA's role change if gene editing cannot be detected in products and, if so, how?* The question deals with what should happen as the science advances and researchers can detect when a gene is turned on or off, and the SAC concluded there should be no regulatory change, that education and communication should continue apace, as should expanded use of GE to meet agricultural challenges.
10. *What is USDA's role, if any, in researching and/or communicating the social implications of gene editing? (Note: USDA-NIFA programming in this area at the end of the provided current research information.)* When dealing with social implications, the SAC concluded that communication and education are the operative words. So much has been learned from experiences with other technologies, so the SAC's number one feedback to USDA and the National Institute of Food and Agriculture (NIFA) is to "not go it alone" in advancing GE. Build an exceptional educational program to go along with promoting the technology.
11. *What actions, if any, need to be taken by the Chief Scientist to address issues raised in this report and are yet to be addressed?* Dr. McLellan did not review the SAC's seven specific recommendations but noted that many of them center on both advancing GE in conjunction with a strong educational outreach effort.

Discussion and Deliberation on the Gene Editing Report

NAREEE Board Vice Chair Don Villwock (Villwock Farms) noted that the report's discussion of question 9 alluded to the absence of clear direction from the European Union (EU). But on July 25, 2018, the EU Court of Justice ruled that gene-edited crops should be subject to the same stringent regulations as conventional Genetically Modified Organisms (GMOs). Dr. Robert Zeigler (International Rice Research Institute) clarified that the decision was made by the EU Court of Justice, which declared that CRISPR/Cas fell within the original EU definition of GMOs made in the 1970s. The EU is likely to review the original definitions. Dr. Zeigler recommended explicitly referencing the EU decision in the GE report, and it was agreed that a footnote would be added to the report. Dr. Paul Zankowski (OCS) had the EU citation and it was agreed he would send draft wording for a footnote to Ms. Esch for Dr. McLellan to add to the report.

Dr. McLellan noted that, based on an APHIS review of GE, in March 2018 USDA formally announced that the technology would not be regulated like GMOs, provided that no plant pests were used in developing and applying the tools. The USDA decision represented a "parting of the ways" between the EU's and the United States' perspectives. It was agreed that the GE report's reference to the USDA March 28, 2018, APHIS ruling approving the use of GE methods would be linked elsewhere in the GE report if necessary.

Dr. Annette Levi (California State University, Fresno) noted that question 1 stated CRISPR/Cas would not be regulated, but also stated APHIS oversight would "enhance USDA's global leadership in regulating genetically engineered organisms," seemingly contradictory statements. Dr. McClellan explained that the intent was to recognize APHIS's authority, but when the report was drafted, the

APHIS decision was not yet final, so the SAC was uncertain how the rulemaking would turn out. Because the decision was made in March 2018, the matter could be clarified through a footnote.

Robert Fay (Vice President, Seminole Gulf Railway LP) asked about the fact that GE tools are already widely in use and the possibility that a stronger message is needed on early education and communication about GE, given the extant negative views on GMOs and “Franken-foods.” Dr. McLellan commented that more than half the report is about communication and the SAC recognized USDA must “step up in a big way” in that regard. GMOs already have a bad name, but GE may not. So now is the time to educate and communicate, with USDA and NIFA funding driving the effort. Without such leadership, public support for GE and its benefits could be lost.

Mr. Villwock, seconding Mr. Fay’s comments, added that question 11, recommendation “e,” states OCS should “urge” land-grant colleges and others involved in GE to advocate for GE. But “urging” is not working. Any USDA grants should stipulate that a professional with experience in promotion, publicity, and education should almost be mandated as part of any grant-receiving team. Dr. McLellan responded that it might be time to hear from the OCS as to whether they are in discussions with NIFA about requiring grants to have a communication and educational component. Dr. Zankowski added that NIFA has discussed the matter and the week before the Tech Coordinating Group hosted a workshop on communicating about agricultural biotechnology in which NIFA representatives participated. As a past NAREEE member, Dr. McLellan urged the Board to consider reaching out directly to NIFA to request a report on communication and education given the urgency of the need for GE. Dr. Sabin welcomed the suggestion. Dr. Zeigler commented that putting an “unfunded mandate” in NIFA grants—which are already tiny and inadequate to support proposed work—would be misguided, but asking NIFA to launch a serious communication and education program would be the right approach. Dr. John Coupland (Pennsylvania State University) also expressed concern about mandating a communications role for individual researchers, which would likely lead to an exclusive focus on the benefits of the new technology and a neglect of potential unintended consequences.

Ms. Esch added that OCS definitely has a role to play. Currently, Agricultural Research Service (ARS) Director Dr. Chavonda Jacobs-Young is serving as OCS Acting Director, but once a permanent REE Undersecretary receives Senate confirmation, that person will also serve as USDA Chief Scientist and a good opportunity would be available to speak with the appointee about the GE recommendations and priorities.

Following the discussion, the NAREEE Board unanimously approved adoption of the GE report, which will be amended to include the two footnotes discussed.

Presentation of the Science Advisory Council Report on Gene Editing

Former NAREEE Board Chair Dr. Steven Daley-Laursen (University of Idaho) presented the *2017 Relevance and Adequacy (R&A) Review Responding to Climate and Energy Needs* report, noting that the annual R&A review is statutorily required and focuses on the REE Action Plan—including the NIFA, National Agricultural Statistics Service (NASS), Economic Research Service (ERS), and ARS components—as well as, in 2017, on U.S. Forest Service research and development (R&D). For R&A reviews, the Board uses data and information to assess how relevant the REE entities’ current programs are to the REE Action Plan. The review also assesses the adequacy of funding for

carrying out the REE priorities. The first R&A review was on Food Safety and Nutrition and Childhood Obesity, Goal 4 of the REE Action Plan.

The NAREEE Board's Climate and Energy R&A Committee included approximately 10 members, each with climate and energy expertise. Dr. Daley-Laursen and former member Dr. Carrie Castille (Agriculture and Natural Resources Consultant) were invited to chair the review's climate and energy subcommittees, respectively. For the NAREEE Board review, the OCS collected information from internal and external review processes that focused on the technical and academic credibility of all REE agencies' programs. Dr. Daley-Laursen reviewed the six questions that governed the R&A review of the REE Action Plan's Goal 2, Responding to Climate and Energy Needs.:

1. What are the key research, education, and extension programming and their specific goals consistent with REE Action Goal(s)?
2. What documented client/stakeholder needs are addressed by the programming for this Action Goal(s)?
3. Does the research, education, and extension for the Action Goal(s) advance agricultural and/or natural resource science and its application? [Address strengths and limitations in answering this question.]
4. Is the funding of this Action Goal(s) adequate to achieve its specific goals and how has its investment accomplished these?
5. What does this Action Goal(s) need to do to address remaining gaps between the activities and accomplishments, evolving stakeholder needs, and the current state and application of agricultural science?
6. Is there complementarity and collaborative effort across the REE agencies and FS R&D in intramural, extramural, and infrastructure funding, short, and long-term research, education, and extension that does not duplicate effort in REE or other federal effort?

Regarding responding to climate needs, Goal 2(A), Dr. Daley-Laursen said the review group offered several general observations about USDA's climate efforts, some of which may be changed under the new administration. For example, USDA plans and implements its climate change research, outreach, and education programs guided by the United States Global Change Research Program, which coordinates 13 federal agencies and departments that contribute to the government's climate change research agenda. USDA's plan has climate-related strategies and actions, and the Climate Change Program Office, or CCPO, coordinates USDA responses and conducts scientific work. The USDA Climate Hubs are on-the-ground delivery services for climate information and strategies. The REE Action Plan has four strategies for climate, including 1) increasing understanding of climate change impacts on natural and managed systems; 2) developing knowledge and tools to enable adaptation and improve resilience of systems; 3) mitigating greenhouse gases (GHGs); and 4) providing information to stakeholders and collaborators to improve their decisions. For each strategy, the R&A reviewers provided a rationale for their recommendations.

Dr. Daley-Laursen highlighted a few recommendations for each strategy. Under Strategy 1, for example, the reviewers recommended that REE, in 2017-18, conduct a review of climate-related priorities in an integrated manner across all REE agencies and Forest Service R&D and urged increased funding for a variety of research areas within each of the REE agencies. Under Strategy 2, the reviewers called for NIFA's research agenda to focus on quantifying the effects of climate change and variability on both agricultural productivity and ecosystem services and urged clearer

definitions of key terminology, such as “stakeholders.” Under Strategy 3, which produced 15 recommendations, the reviewers urged, for example, increasing efforts toward meeting present and future workforce training needs to address climate change issues in general and GHG mitigation in particular and an increased emphasis on the strategic communication of compelling GHG data to key policy decision makers who may have different viewpoints about climate change. Lastly, under Strategy 4, the reviewers recommended requiring grant recipients to formulate a communications plan for policy makers to strengthen science-based decisions by policy/political stakeholders and also increasing surveys of end users’ perception of data/results availability; adoption of research-based information; and meaningful impact assessment on a larger-scale accountability metric.

Ms. Esch noted that when the current NAREEE Board has its first face-to-face meeting, the R&A review process will be discussed. In addition, USDA/REE with OCS leadership are revising the REE Action Plan, which defines the strategic pathway for research and science, to realign it with the new USDA strategic goals adopted by the incoming administration. The revisions are slated for completion in the next quarter and will be discussed at the next NAREEE Board meeting. In 2019, the next R&A topic was supposed to be Sustainable Use of Natural Resources, Goal 3, but with the pending Action Plan revisions that focus will have to be reconsidered.

In reviewing the report’s section on Bioenergy/Biofuels and Biobased Products, Goal 2(B), Dr. Daley-Laursen commended the work of Dr. Castille and her group. A statement from the report encapsulated the biomass issue: “Over the past several decades a variety of agriculture, forestry, energy, and other stakeholders have articulated a clear need for the United States to invest in fuel resources in addition to traditional fossil fuels. USDA has responded to this development with various programs because alternative fuels and a thriving bioeconomy would support the U.S. economy in general and the agricultural and forestry sectors in particular.” The REE Action Plan contained three strategies: 1) increasing biomass production efficiency to cut costs; 2) incorporating biomass and dedicated feedstock crops into agriculture and related systems to diversify the rural economy; and 3) addressing uncertainties regarding expanded biomass and biofuel production to avoid negative community and ecosystem impacts. Importantly, the Biomass Research and Development Initiative Technical Advisory Committee (BRDI-TAC) is an important advisory committee to USDA and other entities. The NAREEE Board coordinated with BRDI-TAC.

Some of the bioenergy-related recommendations included the following: Under Strategy 1, the reviewers recommended that REE create a “feedstock-to-fuels” pathway to map approaches that could meet cost-effective targets and work with the Department of Energy to provide evidence-based analyses for projects to demonstrate supply-chain improvements. Under Strategy 2, the reviewers, noting that “engagement with multiple partners can accelerate ideas and lead to success,” recommended that REE require the use of new scientific and technological approaches from academia and laboratories and assess long-term market-oriented bioenergy-technology R&D using partnerships and collaborations. Under Strategy 3, the reviewers recommended that REE explore the unintended consequences of an expanded biomass industry and consider targeted or joint Funding Opportunity Announcements to encourage the use of agricultural residues, non-recyclable municipal solid waste, and/or biosolids. Regarding funding adequacy, the reviewers recommended reauthorizing BRDI-TAC funding and agreed with the 1) 2015 BRDI call for funding and managing “a greater number of smaller R&D projects to establish a balanced R&D portfolio that will identify disruptive technologies offering the greatest opportunities for cost reduction” and 2) the 2016 BRDI call for expanded R&D to cut costs and achieve other goals.

Discussion and Deliberation on the R&A Report

When Dr. Daley-Laursen solicited any questions or comments on the R&A climate portion of the report, Dr. James Allen (Northern Arizona University) asked if the report's recommendations were in random or priority order. Dr. Govind Kannan (Fort Valley State University), who helped write the report, and Dr. Daley-Laursen both responded that the recommendations they worked on were in random order; however, among an even larger set of recommendations, the reviewers selected those in the report as priorities.

Regarding the R&A biofuels section, it was noted that Don Villwock served on both the climate and energy working groups and should be listed as such. Dr. Daley-Laursen added that he would welcome any Board member contacting him to clarify aspects of the report.

Following the discussion, the NAREEE Board unanimously approved adoption of the R&A report.

Presentation of the National Genetic Resources Advisory Council (NGRAC) Report on Aquatic and Animal Genetic Resources

NGRAC Chair Dr. Terry Tiersch (Louisiana State University) presented the draft report, *Strengthening Strategic Genetic Resources for Livestock, Poultry, and Aquatic Species in the United States*, first describing NGRAC, which has struggled somewhat with membership and is working to expand its focus from the original emphasis on crops to now encompass all genetic resources. Accordingly, the NGRAC membership will include stakeholders involved with not just crops but with animal and other genetic resources. The Council recognized the need to raise awareness of the diversity and importance of genetic resources, which are a foundation of agricultural activity, biomedical research, ecosystem resources, and other benefits. Genetic resources issues will overlap with the GE and climate and energy issues.

To broaden the NGRAC focus, the members are trying to identify common developments across the unified genetic resources community. The focus will not be on individual commodities but on broad groupings, such as crops, animals, or microbes. NGRAC generated the first in a series of short status documents intended to provide a big picture on the genetic resource groups and to make actionable recommendations to USDA. Five have been set up dealing with 1) animals, 2) crops, involving 43 crop groups, 3) microbes, 4) wild relatives of crops, and 5) microalgae.

The first document, which the NAREEE Board was reviewing, was to address animals, covering hundreds of species distributed across livestock, poultry, and aquatic species. Traditionally, such a summary would include individual commodity reports, such as for cattle, dairy, and so forth. Instead, NGRAC chose to look at broad trends within animal genetic resources. The document illustrates the trends using examples from particular commodity groups, including pigs and chickens, followed by recommendations.

Dr. Tiersch reviewed the report's structure, which includes an executive summary and introductory materials defining genetic resources. The background section delves deeper, emphasizing the economic impact of genetic resources, all of which are based on the "genetic base." There is a genetic base, for example, for all the dairy cows and swine in the United States, and the bases have genetic trends. In agriculture, the genetic bases are narrowing as breeders seek to improve their animals through more uniformity and lower genetic variation that improves production but causes

unintended consequences elsewhere. From genetic bases, the report addresses industry structure issues. With livestock, most genetic improvements come from the private sector, motivated by short-term goals to stay in business. Breeders' genetics are turned over rapidly and reflect short-term goals, which at times are unhelpful in terms of long-term goals. NGRAC is studying the trends and making recommendations to address obvious problems. Livestock collections and breeding have been around a long time, but aquatic species (aquaculture) are in very early stages of domestication, with a tremendous need for aquatic genetic resource collections to catch up with livestock. The report deals with wild, feral, and semi-domesticated animals that provide genes that currently are not recognized as valuable but could be massively important as conditions, such as climate or diseases, change. Public collections are held by public institutions; the general trend is that universities lack the money to maintain particular chicken or swine populations, and they simply eliminate them, thereby routinely losing decades of work.

Genetic materials need to be stored in repositories, with samples and information interconnected, which necessitates computing and database capabilities. The National Animal Germplasm Program (NAGP), part of USDA's ARS, has one facility in Fort Collins, Colorado, responsible for collections across all of the animal resources. While NAGP is likely the best in the world, it nevertheless needs strengthening through, for example, information technology. The report's "models for further advancement" section provides examples of success stories showing the clear benefits of placing germplasm into NAGP.

Describing the report's recommendations, Dr. Tiersch said they fell into broad categories: 1) capabilities, 2) increasing participation, 3) increasing cooperation, and 4) assessing the economics. Some of the eight recommendations are fairly specific, while others are more open-ended, and they are grouped but not prioritized. The recommendations were:

1. To recognize the tremendous value of the NAGP efforts at Fort Collins and provide greater support for its information systems and other elements as the program manages massive amounts of material and expands, for example, into aquatic species.
2. Aquatic species have tremendous requirements, with hundreds of species needing to be placed in the NAGP repository. ARS has not yet done a good job collecting its own materials, much less materials from industry sources. Unlike with dairy, for aquatic resources, it is hard to interact with hundreds of industries. The Louisiana State University (LSU) facility is unique, possessing capabilities unavailable elsewhere for aquatic species, so the NGRAC recommends placing a USDA scientist at the LSU facility to get through the aquatic resources backlog.
3. Foster improved participation of small and disadvantaged farmers in germplasm collections through USDA's Sustainable Agriculture Research and Education Program.
4. Genes of feral and wild populations of cattle, pigs, and aquatic species whose genes could be extremely important in the future should be collected.
5. Native American communities have fantastic genetic diversity in their livestock and other species, so NGRAC urges making collections of the material, providing training and workshops, linking Department of Interior activities with these communities.
6. Research populations, which are declining due to funding shortages, should interact with NAGP so that material can be stored with its relevant information.
7. Many other programs exist, within the National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service, and other agencies that address common interests in genetic resources, and stronger cooperation among these institutions should be pursued to facilitate delivering materials into the national collection.

8. Despite the importance of genetic resources for society, there is very little economic analysis available. For example, there is little economic analysis of the germplasm cells of poultry, swine, or beef, so NGRAC is recommending that the NASS and ERS place more emphasis on valuing the germplasm of such commodities to better understand the markets involved.

Discussion and Deliberation on the NGRAC Report

During discussion, Mr. Villwock noted that page 7 of the report, and Dr. Tiersch's overview, touched on the short-term market demands for Angus-like traits. The agricultural community is aware of what the Agnus program has accomplished over its 10-year span. Without seeking to change the report text, Mr. Villwock noted that it is unknown how "short-term" the market will be. Dr. Tiersch responded that each year producers seek to make more Angus-like traits, that is a response to short-term demand, even if it unknown how long the response will occur. Another factor is that when working with genetic resources, researchers project out decades because materials frozen today can be used 100 years from now, a conscious concern for germplasm scientists, so even 10 years appears short-term from that perspective. The genetics are millions of years old and added to that are hundreds of years of very active industrial breeding.

A member asked for clarification of the recommendation that a scientist be placed in LSU. Dr. Tiersch explained that the LSU facility is unique in the world and is recognized as such. For example, among its capabilities, the facility can package and freeze half a million fish sperm in one week. Globally, the entire output of frozen fish sperm for the past 10 or 15 years does not equal the LSU capability. With that output, NAGP could catch up with its aquatic specimen backlog. Other facilities conduct research, and might handle 100 samples with the goal of publishing papers, but no other facility could accomplish the LSU high-throughput productivity. The term aquatic species encompasses oysters, wild fisheries, fish farming, threatened and endangered species, and biomedical research species, such as zebra fish that are replacing mice and laboratory mammals.

Following the discussion, the NAREEE Board unanimously approved adoption of the NGRAC report.

Public Comments

There were no public comments.

Closing Remarks

Ms. Esch thanked the three report presenters whose efforts helped resolve unfinished business. She noted that NAREEE Advisory Board Program Support Coordinator Ms. Shirley Morgan-Jordan had polled members on their availability for a face-to-face meeting, and the dates when a majority are available for a meeting in Washington, DC, are January 23-25, 2019, with two full days and a half day set aside to orient the new Board members. Ms. Esch and Ms. Morgan-Jordan will send additional information out via email about the January meeting. Responding to a query, Ms. Esch assured members who would need to travel and arrive in Washington, DC, on January 22 and depart on January 26 that their expenses would be covered, though they must book flights through Ms. Morgan-Jordan to receive reimbursement.

Board Chair Sabin thanked the members and presenters for their patience and diligence, leading to approval of the three reports. She reiterated that comments and questions from members were always encouraged, the more the better.

The meeting adjourned at 11:20 pm EDT.

RESOLUTIONS AND RECOMMENDATIONS

- The Board unanimously approved the draft report, *Use of Gene Editing in USDA Research*, with two footnotes to be added.
- The Board unanimously approved the draft report, *2017 Relevance and Adequacy Review Responding to Climate and Energy Needs*.
- The Board unanimously approved the draft report, *Strengthening Strategic Genetic Resources for Livestock, Poultry, and Aquatic Species in the United States*.
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ACTION ITEMS

- For one of the footnotes to be added to the *Use of Gene Editing in USDA Research* report, Dr. Paul Zankowski will provide draft wording to Ms. Esch for a reference on the July 25, 2018, European Union Court of Justice ruling that gene-edited crops should be subject to the same stringent regulations as conventional GMOs² and Dr. McClellan will review and add the footnote to the report.
- A GE report referencing the USDA March 28, 2018, APHIS ruling approving the use of GE methods will be linked elsewhere in the GE report as necessary. Seemingly contradictory statements in question 1 of the GE report, regarding APHIS's decision to not regulate CRISPR/Cas and referencing APHIS global leadership in regulations, will be clarified using a footnote.
- NAREEE will ask NIFA for a report on the its efforts directed at GE education and communication.
- Ms. Esch and Ms. Morgan-Jordan will send additional information to Board members regarding the January 23-25, 2019, NAREEE Advisory Board meeting.

² Court of Justice of the European Union Press Release, July 25, 2018, <https://curia.europa.eu/jcms/upload/docs/application/pdf/2018-07/cp180111en.pdf>

APPENDIX A: LIST OF MEETING ATTENDEES

A list of public attendees is available from the NAREEE Advisory Board Office.

Friday, September 28, 2018

NAREEE Members Present: Dr James Allen, Dr David Baltensperger, Dr Robin Beck, Dr Edmund Buckner, Dr John Coupland, Robert Fay, Dr Roch Gaussoin, Lisabeth Hobart, Dr Kenrett Jefferson-Moore, Dr Govind Kannan, Dr Mark Lawrence, Dr Annette Levi, Dr Jayson Lusk, Dr Molly McAdams, Julia Sabin, Richard De Los Santos, Don Villwock, Dr Robert Zeigler

NAREEE Members Absent: Dr Patsy Brannon, Chalmers Carr III, Chad Ellis, Dr Sarah Francis, Wathina Luthi, Dr Agnes Mojica, Dr Michael Oltrogge

NAREEE Advisory Board Staff: Michele Esch, Shirley Morgan-Jordan

Other USDA Staff: Dr Shanker Reddy, Dr Paul Zankowski

Invited Guests: Dr Steven Daley-Laursen, Dr Mark McLellan, Dr Terry Tiersch

APPENDIX B: Presentations

All presentations given at the NGRAC meeting are available from the NAREEE office upon request.

Use of Gene Editing in USDA Research (September 30, 2017), drafted by the NAREEE Science Advisory Council

2017 Relevance and Adequacy Review Responding to Climate and Energy Needs (May 13, 2017), drafted by the NAREEE R&A Committee

Strengthening Strategic Genetic Resources for Livestock, Poultry, and Aquatic Species in the United States (April 2018), drafted by the NAREEE National Genetic Resources Advisory Council

**National Agricultural Research, Extension, Education, and Economics (NAREEE)
Advisory Board**

MINUTES OF THE NAREEE BOARD MEETING

May 16-18, 2017
Hilton Crystal City at Washington Reagan National Airport
2399 Jefferson Davis Highway
Arlington, VA 22202

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EXECUTIVE SUMMARY

National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board

HIGHLIGHTS OF THE NAREEE BOARD MEETING

May 16-18, 2017

Hilton Crystal City at Washington Reagan National Airport
2399 Jefferson Davis Highway
Arlington, VA 22202

The National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board met in public session from May 16-18, 2017, in Crystal City, Virginia, to discuss the board's 2017 Relevance and Adequacy (R&A) review of the Research, Education, and Economics (REE) activities for the REE Action Plan Goal 2, Responding to Climate and Energy Needs. The meeting's main goals were to discuss and approve the approach taken in the draft R&A report for Goal 2 and to hold a breakout session of the board's Science Advisory Council (SAC) to discuss issues regarding gene editing and their significance for USDA. The board heard from various NAREEE agencies, approved NAREEE letters to the USDA Secretary, and completed other board business. During a reception on the evening of May 17, NAREEE presented certificates of appreciation to retiring board members and heard remarks from Brian Klippenstein, who led the USDA transition team for the administration of President Donald Trump and now serves as a senior advisor to USDA Secretary Sonny Perdue.

May 16, 2017

After Dr. Carrie Castille opened the meeting and reviewed the agenda, NAREEE board members introduced themselves and touched on their sector's priority issues of concern.

NAREEE Acting Under Secretary Dr. Ann Bartuska reviewed five points of discussion, including the budget, priority initiatives, data infrastructure, accomplishments, and a look ahead, followed by a discussion with board members about the issues. Regarding the fiscal year (FY) 2017 omnibus budget, Dr. Bartuska described it as a very positive budget that includes a \$25 million (M) increase for the Agriculture and Food Research Initiative (AFRI), \$99M for the Agricultural Research Service's (ARS) buildings and facilities, as well as additional funds for the National Agricultural Statistics Service (NASS) Census and for the Economic Research Service's (ERS) drought and risk management programs. She presented a table on the budgets of the four REE agencies: ARS (\$1,269M); National Institute of Food and Agriculture (NIFA) (\$1,367M); ERS (\$86M); NASS (\$171M). She also included the U.S. Forest Service (USFS) research and development (R&D) (\$289M). The REE discretionary budget is \$2.9 billion (B). Major infrastructure legislation is under discussion and Dr. Bartuska wants to ensure that physical and human infrastructure needs of science are part of the discussion. Dr. Bartuska noted that the new Office of the Chief Scientist (OCS) Director is Dr. Dionne Toombs, (b) (6)

During a question and answer (Q&A) period, board members discussed the impact of a required across-the-board 20% cut in USDA's budget; the translation of research supported through the Foundation for Food and Agriculture Research (FFAR) into information that agricultural producers can use; measuring the impact of USDA-funded research; communicating science; and training workers for agricultural jobs.

Officials from each NAREEE agency provided brief updates on their programs: NASS Administrator Dr. Hubert Hamer described the service's role as the provider of timely, accurate, and useful statistics to help agriculture. For the first time, the FY2017 census cycle will collect information on military veterans' involvement in agriculture. To help producers at the local level, NASS uses data to quantify the potential damage from storms. ARS Administrator Dr. Chavonda Jacobs-Young gave an overview of the service, which is USDA's principal intramural scientific research organization. ARS has allocated 36% of its FY2017 budget of \$1.171B to crops; 18% to food safety and nutrition; 18% to environmental stewardship; and 4% to the National Agricultural Library and "other". ERS Administrator Dr. Mary Bohman provided an update on her service, which received an additional \$1.5M in FY2017 for pay costs and for increasing drought resilience, one of the new administration's priorities. NIFA Associate Administrator Meryl Broussard, on behalf of Director Dr. Sonny Ramaswamy, described the institute's role as USDA's extramural research arm. NIFA is pursuing a "Call to Conversation" series with stakeholders, seeking to define a broad shared vision for many program areas. OCS Deputy Director Dr. Richard Derksen, on behalf of Director Toombs, described the office's function of supporting the chief scientist. The Office of Inspector General (OIG) in April released a report providing data on USDA's scientific integrity; the OIG found that 83% of the respondents believe USDA promotes a culture of scientific integrity. USDA laboratories are addressing the issue of antimicrobial resistance (AMR), with OCS coordinating an AMR effort involving eight federal agencies.

Following the agency update session, NAREEE Executive Director Michele Esch reviewed the R&A process. Each year, one or two of the seven REE Action Plan goals undergoes an R&A review, starting last year with Food Safety and Nutrition, focusing this year on Responding to Climate and Energy Needs, and focusing next year on Sustainable Use of Natural Resources. The current focus could change following the new administration's review of the REE Action Plan. The goal is to ensure the R&A review results are actually used in USDA decisions.

Dr. Steve Daley-Laursen, who led this year's review, remarked that the board and USDA have progressed together in a "spirit of partnership" to produce a smoothly functioning critical R&A assessment. Dr. Daley-Laursen reviewed the draft report sections and solicited board member comments on specific report text, taking notes on suggested changes and issues to include in the next iteration of the draft.

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The meeting's second day commenced with Dr. Castille's review of the previous day's accomplishments and the day's agenda, including a SAC meeting to which all members were invited. She emphasized the importance of the REE Action Plan as a means to focus the board's deliberations. Responding to board member's comments about the need for "communicating science" as a top priority for USDA, Ms. Esch noted that communication is being approached differently since January, with a greater demand for evidence and the translation of research into

terms a lay audience can understand. Members expressed concerns about policy driving science and widespread scientific illiteracy.

Because nine members are rotating off the NAREEE board as of September 30, a *Federal Register* (F.R.) notice will be published in June to recruit replacements. Dr. Castille urged members to nominate replacements for themselves. Ms. Esch agreed to inform board members about the membership categories that require replacements and to send them the F.R. notice. She also stated that NAREEE is upgrading its website and will establish a Linked-in page that will help with recruitment and enable retired board members to stay in touch on NAREEE activities.

Members discussed dates and locales for the next board meeting and several suggestions were offered. Ms. Esch requested that board members send any further recommendations for locales to her and NAREEE Advisory Board Program Support Coordinator Shirley Morgan-Jordan, along with information about how the locale would be suitable in light of the next R&A review's focus on Sustainable Use of Natural Resources. Several possible meeting dates were identified; the week of November 6-10 was deemed the likely fall meeting date.

The R&A review was continued from the previous day, concentrating on the energy topic. Dr. Daley-Laursen invited board members to send additional proposed changes to him and Dr. Castille for approximately another week after the meeting, so that work can begin on preparing the penultimate draft for board review before the fall meeting. Members continued their comments on the draft. One member noted the tension between using farmland to grow either food or fuel crops. Growing fuel crops would directly compete with food at a time when by 2050 9.6B people will need to be fed. Another added that food is clearly highlighted as the priority in the R&A review. Several members remarked on the need for choices to be based on the "highest best use of the land," considering that some lands are unsuitable for row cropping or such renewable energy technologies as wind and solar. But another member countered that much of biofuels derives from biomass residue and that, because oil and gas are finite non-renewable fuels, a biofuels industry must be cultivated. Members said that the draft should clearly make the point that that free markets, not government quotas, should drive land use choices.

Members discussed the observation that some recommendations appear to exceed NAREEE's scope and should be revised to better fit the NAREEE mission. For example, the first recommendation under 2.2(b) calls for "removing barriers to sustainable use of domestic biomass resources," but it was unclear what entity would be responsible for barrier removal. Members suggested revisions that would urge NAREEE to conduct "impact analysis that explores the potential barriers," thereby staying within appropriate REE functions. Members urged the inclusion of text to note their concerns about "unintended consequences" of actions. After discussion about 2.2(b) recommendations 5 and 6, members agreed that the two items should be merged into a single recommendation, with a slightly revised 6 coming first. Members also discussed the meaning of "market-oriented R&D" used in recommendation 3. They generally agreed that its intent was to underscore the board's view that the free market must drive biofuels expansion and the text should be revised.

Dr. Bartuska observed that the draft frequently made suggestions exceeding NAREEE's scope, such as 2.2(b) recommendation 2. It would not be helpful to have the board suggest that

NAREEE analyze the implications of these various non-REE topics. But if topics beyond NAREEE's scope have value, the board could include a section in the report titled "Beyond REE," or "Beyond Research," for the Secretary's consideration or for other agencies, such as the Department of Energy (DOE), to pursue. In addition, Dr. Bartuska said that she was puzzled by the statement in 2.3(b) recommendation 4 that, "USDA lacks a robust statistical information base". Board members stated that ERS and the Biomass Research and Development Initiative Technical Advisory Committee (BRDI-TAC) were the source of that language. Dr. Bartuska requested that the board ask ERS to clarify the language's meaning and that recommendation 4 then be modified to clarify what action the board is recommending.

Members suggested that 2.3(b) recommendation 2 might be part of overarching non-REE suggestions to be submitted to the USDA Secretary. One member pointed out that the draft has many "tone issues," such as its reference to an "honest" assessment when "objective" would be a preferable modifier. In addition, recommendation 2 could be reframed as REE communication with broader audiences, and systems thinking should be referenced but is not. In general, section 2.3 should be reviewed to strike any political, agenda-driven tone and to focus on scientific method and objective information.

Dr. Bartuska expressed her appreciation for the thought and effort that had gone into the R&A review. She noted USDA's broader emphasis on rural prosperity and economics. Also, the food, water, and energy nexus is not in the REE Action Plan, but perhaps might be part of the next iteration, reflecting the evolving science.

The board formally voted on the draft R&A report. Members unanimously approved the basic approach while recognizing that revisions will be made and some language will be pulled out and presented separately as high-level recommendations to the USDA Secretary. The board will have an opportunity to review the next version of the report and give its final approval via email. A web conference call can be scheduled for review before September 30. An F.R. notice will be required to comply with Federal Advisory Committee Act public notification requirements.

Ms. Esch provided an overview of a brochure-style document NAREEE has been developing for a general audience and for the board as a whole. It will describe NAREEE and the R&A review process, followed by summaries of the board's findings from each year's review. In addition, she and Elizabeth Dann, the OCS Strategic Planning and Performance Officer, are starting to solicit information from REE agencies on steps they have taken to implement the board's recommendations. Noting that 2017 is an unusual year because so many members are rotating off the board, one member said that in future years NAREEE should pay close attention to board members' retirement schedules to avoid a recurrence. In general, members agreed the R&A process is now well organized. The materials describing agency activities are extremely helpful and do not hamper the board's objectivity as reviewers. Dr. Bartuska noted that the new administration is very concerned to avoid duplication of efforts both within USDA and with other federal agencies, and the board's review helps avoid duplication.

Ms. Esch gave an overview of the 1996 Farm Bill language establishing the board's role in setting priorities. She also drew attention to language in section 1492 of the 2014 Farm Bill regarding requirements for competitive grant matching funds, with exemptions possible. As of

October 1, 2014, the USDA Secretary was authorized to waive for a year the research/extension grants match requirement for any grant “that the NAREEE Advisory Board has determined is a national priority”. The board considered a draft letter to Secretary Perdue on 2017 national priorities, generally agreeing with the REE Action Plan priorities, and approved it unanimously.

National Agricultural Library (NAL) Director Paul Wester gave a presentation on NAL data activities to support USDA and NAREEE. The 2014 REE Action Plan calls for NAL to make data more available. But significant data challenges exist, such as diverse file formats and issues in linking NAL with other repositories. For FY2016-17, the NAL is pursuing an Ag Data Commons Pilot; so far, it has more than 100 self-submission accounts and 270 datasets. Now that NAL has completed technology actions, future activities include developing, promulgating, and implementing the USDA Digital Scientific Data Policy and developing a funding model for the Ag Data Commons project to move from the pilot phase to production. During follow-up discussion, a board member commented that USDA lags behind other federal agencies in implementing a digital scientific data policy, despite excellent models and extensive discussion, and urged NAL to accelerate its pace. Another member noted that the NAREEE board’s data management working group had been quiescent for the past 18 months but should be kept active as a liaison to the NLA. Ms. Esch noted that USDA held a daylong update session on data-related activities and SCINet provided scientists a means to access data.

SAC Chair Dr. Mark McLellan led a breakout session focused on the question of what actions USDA should take, if any, to better understand, leverage, and/or communicate gene-editing (GE) technology. The OCS had requested that the board’s involvement. Dr. McLellan posted a list of specific questions, starting with whether USDA needs to establish a definition of GE or adopt an existing one, and members responded to each item. Members expressed a fundamental concern about how to win public acceptance of GE, given widespread scientific illiteracy and fears of new technologies. The SAC members agreed to draft a summary of their discussion as a “living document” that they can then pass on to the next board to help with the continuing discussion. Board members volunteered to help write sections and a conference call will be scheduled to review the draft. Volunteers were: Dr. Mark McLellan; Dr. Mark Lawrence; Julia Sabin; Dr. Adriana Campa; Dr. Patsy Brannon; Dr. Roch Gaussoin; Dr. Dawn Thilmany.

During an evening reception, NAREEE presented certificates of appreciation to retiring board members and heard remarks from Brian Klippenstein, a senior advisor to USDA Secretary Sonny Perdue.

May 18, 2017

On the meeting’s final day, the board heard from Dr. Tom Jerkins, the chair of the Citrus Disease Subcommittee (CDS), who updated members on the subcommittee’s February 2-3, 2017, meeting in San Antonio, Texas. He emphasized that the Florida citrus industry is suffering massively from citrus greening disease. In light of that, the CDS ranked the FY2017 priorities in the following order:

1. Therapies to prevent or suppress CLas bacteria within trees;
2. Development of tolerance or resistance in commercial citrus in all production areas with a focus on delivery of new cultivars (or rootstocks and scions) using all available strategies;

3. Systems for delivery of therapies into the phloem;
4. Culturing or cultivating the CLas bacterium;
5. Early detection of the bacterium in host and vector;
6. Pre- and post-harvest tools to maximize fruit quality for fresh and processed.

The board unanimously approved a draft CDS letter to the USDA Secretary.

Ms. Esch summarized the activities of the two other NAREEE subcommittees: the Specialty Crop Committee (SCC) and the National Genetic Resources Advisory Council (NGRAC). The SCC will meet in late August and the NGRAC might meet in June.

Dr. Bartuska thanked board members for their service and commented on the board's evolution into a highly focused and engaged body. It was announced that Dr. Brannon would replace Dr. McLellan as chair of the SAC. Members agreed they would welcome the participation of FFAR representatives at the board meetings to hear about the foundation's investments and progress. Dr. Bartuska noted that the DOE Advanced Research Projects Agency (ARPA-E) is partnering with the Transportation Energy Resources from Renewable Agriculture (TERRA) program and ARPA-E/TERRA is working on advanced technology, such as sensor arrays, for use in agriculture.

The board unanimously approved the October 18-21, 2016, NAREEE meeting minutes.

Members discussed the next R&A review on Goal 3, Sustainable Use of Natural Resources, with significant support for focusing on water as the nexus for a holistic approach to sustainability issues. Members volunteered to work with incoming board Chair Ms. Julia Sabin in developing the report. Volunteers were: Dr. Govind Kannan; Mr. Chalmers Carr III; Dr. Michael Oltrogge; Dr. Kenrett Jefferson-Moore; Ms. Robin Beck; Mr. Don Villwock; Ms. Wathina Luthi; and Dr. Annette Levi.

Ms. Sabin gave a slide presentation from a trip she took to Peru, showing photos of the highly sustainable ancient practices developed by the Indigenous People living in the mountains.

The board's next meeting will be in November 2017

RESOLUTIONS AND RECOMMENDATIONS

- The board unanimously approved the basic approach of the R&A draft report while recognizing that revisions will be made and some language will be pulled out and presented separately as high-level recommendations to the USDA Secretary.
- The board unanimously approved a draft letter to USDA Secretary Perdue on 2017 national priorities.
- The board unanimously approved a draft CDS letter to the USDA Secretary.
- The board agreed that its data-management working group should be maintained as a liaison to the USDA National Agricultural Library.
- Dr. Patsy Brannon will replace Dr. Mark McLellan as SAC chair.
- The board would welcome the participation of FFAR representatives at its meetings to hear about the foundation's investments and progress.

- The board unanimously approved the October 18-21, 2016, NAREEE meeting minutes.
- Board members volunteered to work on the next R&A review report addressing Goal 3, Sustainable Use of Natural Resources.

ACTION ITEMS

- DFO Michele Esch will inform board members about the membership categories that require replacements as a result of retirements occurring September 30 and will send to the members a *Federal Register* notice that REE will publish to recruit new members.
- Board members should recommend replacements for those categories that will be losing stakeholder representatives as a result of retirements.
- DFO Michele Esch will provide board members a report on REE Action Plan progress.
- Board members should send suggestions to Michele Esch and Shirley Morgan-Jordan for locales at which to hold the board's November 2017 meeting.
- A web conference call will be held before September 30 for the board to conduct a review and final approval via email of the revised 2017 R&A draft report on Responding to Climate and Energy Needs.
- Science Advisory Council members will write a summary of their discussion on GE and will hold a conference call to review the draft, which will be delivered to the next NAREEE board.

Respectfully submitted,

Dr. Carrie Castille
Chair

Julia Sabin
Vice Chair

Michele Esch
Executive Director

APPROVAL BY ADVISORY BOARD:

Date

Initials
Chair

Initials
Executive Director

Tuesday, May 16, 2017

Welcome

NAREEE Advisory Board Chair Dr. Carrie Castille called the meeting to order and welcomed all participants, noting that for some board members the meeting would be their last. She expressed her gratitude for the opportunity to serve as the board Chair. NAREEE DFO Michele Esch welcomed members and reviewed the agenda and the Federal Advisory Committee Act (FACA) rules governing the meeting. Noting that many members would be retiring from the board as of September 30, 2017, she requested that the board consider potential new members and put forward their names.

Safety and Hospitality

NAREEE Advisory Board Program Support Coordinator Shirley Morgan-Jordan reviewed safety instructions.

Introduction of Members

Dr. Castille asked board members to introduce themselves and describe the major concerns of the stakeholder categories they represented. Issues included climate change, immigration and labor shortages, the Food Safety Modernization Act (FSMA), rural development, the Food & Drug Administration's Veterinary Feed Directive, trade, low enrollment in agricultural programs, food retailing and labeling, Genetically Modified Organisms (GMO), the Farm Bill, science illiteracy, and others.

Ms. Esch noted that board members (b) (6)

Remarks from the Research, Education, and Economics Mission Area

NAREEE Acting Under Secretary Dr. Ann Bartuska introduced her background as an ecosystem ecologist and noted her bias toward 1) the emergence of a landscape approach to forestry and farming and 2) urban agriculture for training and education. She then reviewed five points of discussion.

Budget: On the fiscal year (FY) 2017 omnibus budget, Dr. Bartuska described it as a very positive budget that includes a \$25 million (M) increase for the Agriculture and Food Research Initiative (AFRI), \$99M for Agricultural Research Service (ARS) buildings and facilities, as well as additional funds for the National Agricultural Statistics Service (NASS) Census and for the Economic Research Service (ERS) drought and risk management programs. She presented a table on the budgets of the four REE agencies: ARS (\$1,269M); National Institute of Food and Agriculture (NIFA) (\$1,367M); ERS (\$86M); NASS (\$171M). She also included the U.S. Forest Service (USFS) research and development (R&D) (\$289M).

Priority Initiatives: NAREEE's FY2017 discretionary budget of \$2.9 billion (B) is allocated in the following way: NIFA (48%); ARS (43%); NASS (6%); and ERS (3%). The budget is inflation-adjusted, but has been flat over the years.

Data infrastructure: Dr. Bartuska described two systems: 1) GRIN-Global, the Germplasm Resources Information Network, contains information on thousands of plant samples. 2) The Global Open Data for Agriculture and Nutrition, or GODAN, involves more than 400 voluntary partners from non-governmental, international and private sector organizations, and national governments that are making agriculture and nutrition data available for unrestricted use worldwide.

Accomplishments: Dr. Bartuska noted that public-private partnerships have been highly successful in working with industry on science leading to products, including 62 new and 230 active Cooperative Research and Development Agreements in FY2013 and 78 patents issued in FY2014. NAREEE wants to be certain that its science is used; the USDA Climate Hubs are helping farmers, ranchers, foresters, and water districts to develop adaptation strategies.

Look ahead: Dr. Bartuska noted that global agricultural productivity must double to meet 2050 food, feed, fiber, and fuel demand. Guided by such goals as maintaining scientific leadership and sparking innovation, a USDA strategic plan will be completed by September 30 that the board members will receive but not review. The REE Action Plan will be refreshed as the likely first task when a new REE Under Secretary is appointed. For the FY2018 budget, which will impose a 20 percent cut across USDA, the NAREEE board members should expect to be shocked because the NAREEE budget will be cut. The Foundation for Food and Agriculture Research (FFAR) soil health initiative aligns with USDA's goals and FFAR's activities bear watching. A "challenge area" is soil productivity. USDA is making sure there is no redundancy in its programs and FFAR efforts.

Major infrastructure legislation is under discussion and Dr. Bartuska wants to ensure that physical infrastructure needs of science and the human infrastructure supported through extension activities are part of the discussion. Rural prosperity is a priority of the new administration. Precision agriculture, sensors, and other technologies rely on data and information technology (IT) systems. NAREEE will stay the course on pollinator health, antimicrobial resistance (AMR), and other activities that the new administration supports.

Dr. Bartuska noted that the new Office of the Chief Scientist (OCS) Director is Dr. Dionne Toombs, who was present at the meeting but only on her second day as Director, (b) (6)

Discussion with Dr. Bartuska

During a question and answer period, board members discussed the impact of a 20% cut in USDA's budget, which they noted would set back funding to 2010 levels. Dr. Bartuska noted that the detailed budget to be released May 22 would provide more information. There is a clear emphasis on trade. NAREEE has had more interaction with Congressional staff as the infrastructure bill is discussed. One board member urged NAREEE to obtain more information about how much of the research conducted by FFAR is translated into information agricultural producers can use, but such a metric, while a good idea, would be difficult to produce. Members urged greater accountability regarding the practical application of USDA-funded research. The decline of extension specialists works against getting science and publications applied in the field.

A board member asked whether regulatory rollbacks could have unexpected impacts on agriculture. Dr. Bartuska noted that many discussions have been held about exemptions from immigration

restrictions for agriculture and about the agricultural needs associated with the coming 9.6B world population. The administration wants to grow businesses, not publications. On the issue of educating the public about agriculture's value, the 4H wants to grow its membership to 10 million, and the Association of Science and Technology Centers want to feature agriculture. Other efforts are positive with regard to the recognition of USDA's contributions, including ARS research that eradicated the screwworm in Florida. A member noted that the USDA Animal Meat Research Center provides an excellent case study of the Department's work with industry. The idea was mentioned of perhaps building on the administration's interest in economic growth and rural development to foster support for an integrated campaign on job training and other efforts to support agriculture.

Agency Updates

National Agricultural Statistics Service

NASS Administrator Dr. Hubert Hamer described the service's role as the provider of timely, accurate, and useful statistics to help agriculture, with a staff of almost 1,000 employees nationwide and oversight of 3,000 enumerators collecting data from producers. NASS administers USDA's Statistical Estimating Program, with 120 crop and 45 livestock estimates and 450 publications per year. The NASS Five-Year Census of Agriculture covers more than 3,000 counties and other jurisdictions and engages with diverse stakeholders as well as USDA and NASS professionals. NASS relies on an expert panel to advise the Service on farm operator demographic content to include in the census. Dr. Hamer reviewed the five-year cycle, starting with Year 1 Direction and ending with Year 5 Release. This year is Year 3 Reference, during which one million forms will be mailed for the Classification Survey to improve census coverage. For the first time, the FY2017 census cycle will collect information on military veterans' involvement in agriculture. Responding to a question about "disaster assistance," Dr. Hamer explained that NASS seeks to help producers at the local level using data to quantify the potential damage from storms. But NASS does not explain storm causal factors, such as climate change. On the issue of organic certification, the census collects data on organic farmers to measure the size of the industry and other factors.

Agricultural Research Service

ARS Administrator Dr. Chavonda Jacobs-Young gave an overview of the service, which is USDA's principal intramural scientific research organization. ARS employs 8,000 people, including 1,800 PhD scientists working on 700 research projects in 90 locations. The research serves "public good" interests and supports regulatory agencies and actions. ARS priorities of the last administration were food security and hunger; sustainable energy and bio-products; food safety; climate change and sustainability; and human nutrition and obesity. The program allocates 36% of its FY2017 budget of \$1.171B to crops, 18% to food safety and nutrition, 18% to environmental stewardship, and 4% to the National Agricultural Library and "other". Many familiar products in grocery stores have been impacted by ARS research.

Members asked about the stages of completion for existing ARS facilities and Dr. Jacobs-Young said that only the capital investment strategy document has been approved, covering two Texas facilities. Regarding the speed at which ARS can respond to emerging diseases, she described the process that begins with surveillance and enables funds to be redirected if necessary. ARS is strictly following animal welfare guidance and employs a staff person to ensure staff members receive training, which is recorded.

Economic Research Service

ERS Administrator Dr. Mary Bohman provided an update on her service, which received an additional \$1.5M in FY2017 for pay costs and increasing drought resilience, one of the new administration's priorities. ERS's core program informs the administration's priorities, and data and models can be quickly directed to assess emerging issues in agriculture, which is a non-partisan sector in the House and Senate. ERS analyzes the implications of drought for agriculture, and studies groundwater economics in the three largest U.S. aquifers, where agriculture accounts for 95% of withdrawals. ERS collaborates with universities to study the links between groundwater, USDA conservation programs, and drought resilience. To understand the drivers of the rural economy, ERS has developed typologies for classifying rural areas and produces data on rural economy trends. A 2017 report on rural manufacturing resilience, *Rural Manufacturing Resilience: Factors Associated with Plant Survival, 1996-2011*, found that annual plant survival rates are higher for rural than urban plants. Agricultural trade is an important issue for USDA Secretary Sonny Perdue and ERS collects data on market demand and other issues. ERS has expertise in the agricultural conditions and policies of China, the number one importer of U.S. soybeans.

During discussion, Dr. Bohman noted that interest has surged in an ERS report on the North American Free Trade Agreement examining the biggest markets today compared with 20 years ago. A member commented on the U.S. as a risk-averse society that lacks education on risk; Dr. Bohman responded that ERS emphasizes risk communication, as seen in various cost-benefit documents.

National Institute of Food and Agriculture

NIFA Associate Administrator Dr. Meryl Broussard, on behalf of Director Dr. Sonny Ramaswamy, described the institute's role as USDA's extramural research arm. With a \$1.5B research portfolio, NIFA has a highly complicated budget that includes 60 lines, making it hard to manage in an integrated way. In the FY2017 budget, the AFRI received a slight increase, and a new \$5M initiative was created for military veterans transitioning to agriculture. NIFA is pursuing a "Call to Conversation" series with stakeholders, seeking to define a broad shared vision for many program areas. The first meeting was held in September 2016 with 1994 and 1862 land grant universities. The second meeting was held in February 2017 on "tactical sciences," defined as complementary programs that offer tools to protect the integrity, reliability, sustainability, and profits of the U.S. food and agriculture system against various pests and other threats. The third meeting, to be held in June 2017, will focus on the Expanded Food and Nutrition Education Program. A fourth meeting will be held in August on the issue of Positive Youth Development, using 4-H as a model. NIFA has a committee examining Farm Bill issues.

Asked what Dr. Broussard would identify as the top three issues for the coming year, besides the budget, he replied that they would be 1) the science enterprise, where there is a significant under-investment, although USDA is regarded as a science resource; 2) the quest for a systems-based approach; and 3) overall planning and accountability, including marketing the need for resources and measuring impacts. Dr. Jacobs-Young added that the rate of retirement of employees and the need for future leaders is a major issue. Bioinformatics experts are needed but USDA is competing with many others needing that expertise.

Office of the Chief Scientist

OCS Deputy Director Dr. Richard Derksen, on behalf of Director Toombs, described the office's function of supporting the chief scientist as the leading communicator of USDA science nationally

and internationally and in her other roles. OCS metrics include 3,600 peer reviewed and 738 non-peer reviewed publications. USDA science investments leverage an additional \$2.2B in funding. The Office of Inspector General (OIG) in April released a report providing data on USDA's scientific integrity. The OIG found that 83 percent of the respondents believe USDA promotes a culture of scientific integrity. The Union of Concerned Scientists also reviewed the USDA's 2016 revised scientific integrity policy and gave it high marks. USDA laboratories are addressing the issue of AMR as the United States becomes more defenseless against microbes, with OCS coordinating an AMR effort involving eight agencies. Water is another major issue because agriculture is responsible for 80 percent of U.S. water consumption. Other issues are nutrition and food safety, and precision agriculture, remote sensing, and big data.

Relevance and Adequacy

Overview of Relevance and Adequacy

Following the agency update session, NAREEE DFO Michele Esch reviewed the R&A process. NAREEE Advisory Board members are tasked with reviewing whether NAREEE agency activities are relevant to REE priorities and the adequacy of funding for those activities. Given the breadth of topics to review, the R&A process was reviewed in 2014 and a five-year cycle was adopted. Each year, one or two of the seven REE Action Plan goals undergoes an R&A review, starting with Goals 4 and 5, Food Safety and Nutrition last year, and focusing this year on Goal 2, Responding to Climate and Energy Needs. The focus for next year is Goal 3, Sustainable Use of Natural Resources. The current focus could change following the new administration's review of the REE Action Plan. Once the board's R&A report is completed, Ms. Esch will work with agency staff to receive their responses and a complete package of all those materials will be submitted to the Secretary. The goal is to ensure the R&A review results are actually used in USDA decisions.

Relevance and Adequacy – Presentation and Discussion of the Draft Report on the Climate and Energy Needs Program in REE and the Forest Service

Dr. Steve Daley-Laursen, who led this year's review, remarked that the board and USDA have progressed together in a "spirit of partnership" to produce a smoothly functioning critical R&A assessment, for which he thanked all board and NAREEE agency participants. Dr. Carrie Castille added that the R&A reviewers included a review of the Biomass Research and Development Initiative Technical Advisory Committee (BRDI-TAC) recommendations, so two separate groups contributed to a single climate and energy R&A draft report. She thanked board member Dr. Patsy Brannon for pioneering the basic R&A report structure.

Dr. Daley-Laursen reviewed the draft report, prefacing his review by describing the draft as a rough version requiring additional work. He solicited board members' comments on the specific text that discusses the three strategies and their associated recommendations; he took notes on suggested changes and issues to include in the next iteration of the draft. Comments included:

- Under 1.2(b) Recommendations, the text was revised to add "consumers" as a focus of NIFA research quantifying the effects of climate change and variability on agricultural productivity and ecosystem services.
- Wherever "cropping" occurs in the text add "grazing".
- One member urged that the draft contain a strong commitment to linking agricultural researchers and climatologists looking into future impacts.

- Members emphasized the importance of strategic communications and mindfulness about the timelines for board recommendations because they often are implemented years later.
- A recommendation regarding “access to capital” that goes beyond REE to implicate other entities, such as the Department of Energy (DOE), would be appropriate, even if inter-agency collaboration is challenging.
- Tables that were left out must be re-imported into the draft.
- Recommendations about increasing funding for priorities should be phrased carefully because in last year’s R&A review that areas received the most pointed feedback from REE officials. The board is not close enough to the details regarding decisions to cut funding to make such calls, especially with a 20% across-the-board cut. The board can show the impact of insufficient funds without recommending program reductions or picking winners and losers.
- One member commented that the board’s views about inadequate funding must be placed in context so that statements about inadequate funding are not mistaken as criticism that OCS is not doing enough.

Public Comment

There were no public comments.

Wednesday, May 17, 2017

Welcome and Overview of the Day

Board Chair Dr. Carrie Castille called the meeting to order. She reviewed the previous day’s accomplishments and day’s agenda, including a Science Advisory Committee (SAC) meeting to which all members were invited. She emphasized the importance of the REE Action Plan as a means to focus the board’s deliberations.

DFO Michele Esch reviewed the reference materials in the binder provided to the board members, including a list of all the past topics that the NAREEE Advisory Board has discussed at its meetings starting in 1997 to the present.

Discussion of Future Programs, Timelines, and Membership of the NAREEE Advisory Board and its Committees

Board members offered a number of observations. One member stressed the need to “future proof” the U.S. agricultural system through greater outreach at the elementary and high school levels. Another stated that without the USDA’s new Strategic Plan it would be difficult for the board to deliberate on the next initiatives and asked if the board could provide input. Responding to comments, Ms. Esch stated that board members would have an opportunity to provide input on the REE Action Plan. A member commented that researchers do not report back on the impact of their research, and that lack of information should be rectified, perhaps with USDA playing a role.

A member noted that USDA constantly responds to “the crisis of the day” and asked what the USDA’s 21st century communication plan would be. Communicating with a scientifically illiterate public is an urgent necessity, especially with gene editing issues emerging. Translating the role of science in food production will be critical. Ms. Esch noted that communication is being approached

differently since January, with a greater demand for evidence and for research to be translated into terms a lay audience can understand. One member offered wholehearted support for the view that communication should be a top priority for USDA to educate the public on science and technology. Another stated that incentives must be created for communication, such as additional credit in NIFA awards if a proposal includes an education or communication component. Dr. Steve Daley-Laursen noted that many working in agriculture lack agricultural studies degrees and suggested that perhaps the board should focus more on education issues. He also noted the broader trend of fewer PhD graduates entering academia, with an astounding one-third of climate scientists aspiring to be science communicators. A member expressed concerns about policy driving science and widespread scientific illiteracy.

Dr. Castille noted that nine members are rotating off the NAREEE board as of September 30 and urged members to nominate replacements for themselves. Ms. Esch added that because of FACA requirements a *Federal Register* (F.R.) notice would be published in June to recruit replacements. NAREEE has a list of 500 agriculture-related organizations, including universities and non-profit entities; they will be asked to nominate board members within two months of receiving nomination packages. Ms. Esch agreed to inform board members about the membership categories that require replacements and to send the members the F.R. notice. Nominations for the National Genetic Resources Advisory Council (NGRAC), Specialty Crop Committee (SCC), and Citrus Disease Subcommittee (CDS) will occur simultaneously. Ms. Esch also stated that NAREEE is upgrading its website and will host a Linked-in page that will be both helpful for recruitment and enable retired board members to stay in touch on NAREEE activities.

Members discussed dates and locales for the next board meeting and several suggestions were offered. Ms. Esch requested that board members send any further recommendations for locales to her and NAREEE Advisory Board Program Support Coordinator Shirley Morgan-Jordan, along with information about how the locale would be suitable in light of the next R&A review's focus on Sustainable Use of Natural Resources. Several possible meeting dates were identified; the week of November 6-10 was deemed the likely date for the fall meeting.

Relevancy and Adequacy – Continued

Relevance and Adequacy

When the R&A review was continued from the previous day, Dr. Steve Daley-Laursen thanked the individual board members who contributed to sections of the draft report. He invited board members to continue sending proposed changes to him and Dr. Carrie Castille for approximately another week after the meeting so that work can begin on preparing the next draft for board review before the fall meeting.

As board members continued commenting on the draft, one member noted the tension between using farmland to grow food or to grow fuel crops. Another observed that growing fuel crops would directly compete with food at a time when 9.6B people will need to be fed. Another added that food is clearly highlighted as the priority in the R&A review. Several members remarked on the need for choices to be based on the “highest best use of the land,” considering that some lands are unsuitable for row cropping or such renewable energy technologies as wind and solar, and suggested the draft make clear that land use choices should be driven by free markets, not government quotas. But another member countered that much of biofuels derives from biomass residue and that, because oil

and gas are finite non-renewable fuels, a biofuels industry must be cultivated. Members emphasized the need for the R&A text to promote a cooperative rather than antagonistic relationship between the fossil fuel sector and biofuels, with one member noting that policy mandates should not pit the two sectors against each other.

Members discussed the observation that some recommendations appear to exceed NAREEE's scope and should be revised to better fit the NAREEE mission. For example, the first recommendation under 2.2(b) calls for "removing barriers to sustainable use of domestic biomass resources," but it was unclear what entity would be responsible for barrier removal. One member said that the barriers were related to the inability of biofuels to access distribution networks that are controlled by oligopolistic contracts that Big Oil companies set with distributors. Members suggested revisions that would urge NAREEE to conduct "impact analysis that explores the potential barriers," thereby staying within appropriate REE functions. Members suggested including additional text to note their concerns about "unintended consequences" of actions and the need to cognizant of all fuel sectors.

After discussion about 2.2(b) recommendations 5 and 6, members agreed that the two items should be merged into a single recommendation, with a slightly revised 6 coming first. Education or training of young people should be included in the recommendation. Members also discussed the meaning of "market-oriented R&D" used in recommendation 3 and generally agreed that its intent was to underscore the board's view that the free market must drive biofuels expansion and the text should be revised. However, one member cautioned that there is an appropriate time for public-private pre-competitive research as a basic government function and for public information to be made available so that startup companies can enter the marketplace without having to do research that would be prohibitively costly. The member said that better wording was needed to account for REE's legitimate research funding role while also letting the market dictate what applied research should be conducted by private companies. Dr. Castille agreed to revise the language for recommendation 3. It was also agreed that the word "tremendous" in the rationale for 2.3(a) should be deleted as insufficiently scientific and the words "informed to develop" in the 2.3(b) recommendations were unclear and needed revision.

Dr. Ann Bartuska observed that the draft frequently made suggestions exceeding NAREEE's scope, such as 2.2(b) recommendation 2. As a way to adjust the problem it would not be helpful to have the board suggest that NAREEE analyze the implications of these various non-REE topics. But if topics beyond NAREEE's scope have value, the board could include a section in the report titled "Beyond REE," or "Beyond Research," for the Secretary's consideration or for other agencies, such as DOE, to pursue. In addition, Dr. Bartuska said that she was puzzled by the statement in 2.3(b) recommendation 4 that, "USDA lacks a robust statistical information base". Board members stated that ERS and BRDI-TAC were the source of that language. Dr. Bartuska requested that the board ask ERS to clarify the language's meaning and that recommendation 4 then be modified to clarify what action the board is recommending.

Members suggested that 2.3(b) recommendation 2 might be part of the overarching non-REE suggestions to be submitted to the USDA Secretary. One member pointed out that the draft has many "tone issues," such as its reference to an "honest" assessment when "objective" would be a preferable modifier. In addition, recommendation 2 could be reframed as REE communication with broader audiences, and systems thinking should be referenced but is not. In general, section 2.3 should be reviewed to strike any political, agenda-driven tone and to focus on scientific method and objective information.

Dr. Bartuska offered her appreciation of the thought and effort that had gone into the R&A review. She noted USDA's broader emphasis on rural prosperity and economics. Also, the food, water, and energy nexus is not in the REE Action Plan, but perhaps might be part of the next iteration to reflect the evolving science.

The board formally voted on the draft R&A report. Members unanimously approved the basic approach while recognizing that revisions will be made and some language will be pulled out and presented separately as high-level recommendations to the USDA Secretary. The board will have an opportunity to review the next version of the report and give their final approval via email. A web conference call can be used for review before September 30, thereby enabling departing board members to provide their final input. An F.R. notice will be required to comply with Federal Advisory Committee Act public notification requirements.

Ms. Esch noted that the NAREEE website is being updated and that she has been working on a communications plan for the board and the R&A process with an intern, Ms. Mary Ellen Tokar, and Ms. Elizabeth Dann, the OCS Strategic Planning and Performance Officer. Ms. Esch gave an overview of a brochure-style document NAREEE has been developing for a general audience and for the board as a whole that will describe NAREEE and the R&A review process, followed by summaries of the board's findings from each year's review. In addition, she and Ms. Dann are in the preliminary stages of soliciting information from REE agencies on steps they have taken to implement the board's recommendations.

Commenting that 2017 is an unusual year because so many members are rotating off the board, one member said that in future years NAREEE should pay close attention to board members' retirement schedules to avoid a recurrence. In general, members agreed the R&A process is now well organized. The materials describing agency activities are extremely helpful and do not hamper the board's objectivity as reviewers. Dr. Bartuska noted that the new administration is very concerned to avoid duplication of efforts both within USDA and with other federal agencies, and the board's review helps avoid duplication.

Establishment of National Priorities

NAREEE Advisory Board DFO Ms. Michele Esch gave an overview of the 1996 Farm Bill language establishing the board's role in establishing priorities. She also drew attention to language in section 1492 of the 2014 Farm Bill regarding requirements for competitive grant matching funds, with exemptions possible. As of October 1, 2014, the USDA Secretary was authorized to waive for a year the research/extension grants match requirement for any grant "that the NAREEE Advisory Board has determined is a national priority". The board considered a draft letter to Secretary Perdue on 2017 national priorities, generally agreeing with the REE Action Plan priorities, and approved it unanimously.

Update on Open Access to Data and Big Data Management at USDA/REE

USDA Activities and Policy Update

National Agricultural Library (NAL) Director Mr. Paul Wester gave a presentation on NAL data activities to support USDA and NAREEE. The 2014 REE Action Plan calls for NAL to make data

more available. But significant data challenges exist, such as diverse file formats and issues linking NAL with other repositories. Among its high-level goals, NAL aims to serve as a central catalog for USDA-funded research metadata, to provide data management/repository services for data that have no other home, and to support data re-use for bigger, better science and commercial use. For FY2016-2017, the NAL is pursuing an Ag Data Commons Pilot; so far, it has more than 100 self-submission accounts and 270 datasets. Now that NAL has completed technology actions, future activities include 1) developing, promulgating, and implementing the USDA Digital Scientific Data Policy and 2) developing a funding model for the Ag Data Commons project to move from the pilot phase to production.

Discussion

During follow-up discussion, a board member commented that USDA lags behind other federal agencies in implementing a digital scientific data policy, despite excellent models and extensive discussion, and urged NAL to accelerate its pace. Another member noted that the NAREEE board's data management working group had been quiescent for the past 18 months but should be kept active as a liaison to the NLA. Ms. Esch noted that USDA held a daylong update session on data-related activities and that SCINet provided scientists a means to access data.

Public Comment

There were no public comments.

Breakout Session

Science Advisory Council

The SAC Chair Dr. Mark McLellan led a discussion focused on the question of what actions USDA should take, if any, to better understand, leverage, and/or communicate gene-editing (GE) technology. The OCS had requested the board's involvement. Dr. McLellan posted a series of specific questions and members responded to each (*for a complete list of the questions, see Appendix C*). Three USDA GE experts joined the discussion: Dr. Michael Schechtman, USDA Office of Pest Management Policy Biotechnology Coordinator; Dr. Seth Murray, OCS Senior Advisor; and Dr. Ann Marie Thro, OCS Senior Advisor.

In general, members expressed a fundamental concern about how to win public acceptance of GE, given widespread scientific illiteracy and fears of new technologies. Dr. McLellan emphasized that GE can be used for good or bad purposes and is already proliferating across the globe. Human health applications are especially controversial, raising concerns about “designer babies”. The Food and Drug Administration (FDA) science advisory board was scheduled to hold its own GE meeting within several weeks, another sign of the issue's importance.

The SAC members agreed to draft a summary of their discussion as a “living document” that they can then pass on to the next board to help with the continuing discussion. Board members volunteered to help write sections and a conference call will be scheduled to review the draft. Volunteers were: Dr. Mark McLellan; Dr. Mark Lawrence; Julia Sabin; Dr. Adriana Campa; Dr. Patsy Brannon; Dr. Roch Gaussoin; Dr. Dawn Thilmany.

Some issues raised regarding specific questions were as follows:

1. Does USDA need to establish or adopt an existing definition of gene editing, and if so, for what purpose; if establishing a new definition, does this need to relate to other existing definitions? Members noted that multiple definitions exist, and there is a NIFA effort directed at gene drives, but there is a difference between gene drives and GE. Definitions matter, but a proposed rule by the USDA Animal and Plant Health Inspection Service (APHIS), published in the F.R. January 19, 2017, may serve to answer the definitional question. As with the APHIS proposal, the focus should be on results, not GE technology being used. One member asked if current definitions are appropriate for USDA to apply. The scientific community will regulate GE, except in the industry regulatory context. Dr. McLellan highly recommended an NPR program, “New Gene Editing Techniques Hold the Promise of Altering the Fundamentals of Life”.
2. USDA has not in the past focused on the use of specific techniques for plant and animal improvement but has rather focused on developing solutions to particular agricultural problems. Is there an overriding reason for changing that approach in the case of gene editing? Members remarked on process-based versus product-based regulations, with the latter focused on crop varieties. A “social license” through public acceptance is needed, as was given to address the Zika virus problem. At times, Congress has been responsible for a focus on GE techniques rather than end results. The cost of using versus not using GE is an issue.
3. What should be USDA’s role in applying gene editing in innovation (developing tools, techniques and methodologies), in meeting needs (applying to specific agricultural problems), both or neither? Most universities are working in the GE field, and innovation experts are focused on GE systems to achieve solutions. GE applications are independent of efforts to develop the technology. It should be used flexibly as a tool, accessed and used as needed. It is assumed GE will go into food production and may be undetectable, but the choice regarding GE is a basic right.
4. Does USDA need to make statements on how it plans to use, or is using, gene editing in agricultural research? Why or why not? For transparency’s sake, USDA should be open. GE is a solution to society’s needs and can be managed and regulated. Lessons can be drawn from the experience with GMOs, with a communication strategy as a top priority to get ahead of the issues and address attacks by anti-technology zealots. Social psychology can provide insight. Good examples of GE acceptance are its use in insulin and in the American chestnut. Landscape plants also are a “safe path of implementation”. FFAR could be a partner with ERS to understand potential consumer concerns. The focus should be on how GE contributes to health.
5. What are the respective roles of the public sector and private sector (as it relates to research) in gene editing and where do they overlap? The USDA role is to educate the public, develop the domain, provide training, and support pre-competitive research. The private sector role is to pursue applications and market-driven solutions. But even for major crops, there are still needs for public sector solutions. New product barcodes can lead consumers to detailed explanations.
6. Are there any USDA priorities that can only be accomplished through gene editing that cannot be accomplished through conventional techniques? All the big problems are relevant, including plant tolerance to salt, drought, yield maximization, and genes that control major issues. But GE is not a silver bullet and should not be proposed as a solution to major problems, which have multiple causes. Time is an important factor, as with citrus greening

that urgently needs a solution, but the solution should focus on changing the insect responsible for the disease, not the citrus fruit.

7. What priority should USDA give to gene editing in relationship to USDA's existing priorities and why? GE is a top-priority technology of the future. It is a great tool for single-gene traits, as with certain disease outbreaks. For traits involving complex genes, those are harder to affect with GE.
8. What should or can REE do, if anything, to enable a more democratized availability of gene editing technologies? (So that it is not only big companies that can use this technology). USDA could provide innovative incubators. It could focus on a short- and long-term campaign. Over time, a changing environment in which the world is hungry will change perceptions.
9. Does USDA's role change if gene editing can be detected in some or all products and if so, how? Does USDA's role change if gene editing cannot be detected in products, and if so, how? USDA must be on the side of transparency. Internationally, in Europe, the member states have different views on GE acceptability and this is relevant to the United States. The U.S. Defense Department and Intelligence- Advanced Research Projects Agency (ARPA) are seeking ways to detect technology misuse; if GE is detectable, anti-technology advocates could oppose it.
10. What is USDA's role, if any, in researching and /or communicating the social implications of gene editing? Communication is an important USDA role, but it is hard to change people's minds. Change happens slowly. Research is needed. The message must be worked on. There is a lack of trust. Public health and safety are paramount concerns. Individual health trumps public health.

Evening Reception

During an evening reception, NAREEE presented certificates of appreciation to retiring board members and heard remarks from Brian Klippenstein, a senior advisor to USDA Secretary Sonny Perdue. Mr. Klippenstein noted the huge challenges as the population grows and emphasized the need to focus on 2050 world food demand, expected to grow by 70-100%. Less land and water must be used. Secretary Perdue understands these challenges and has reorganized USDA rapidly to focus on trade.

Certificates of appreciation were presented to: Dr. Adriana Campa, Dr. Carrie Castille, Dr. Steve Daley-Laursen, Mr. James Goodman, and Dr. Mark McLellan. Dr. Dawn Thilmany was not present but received her certificate earlier in the day and two members who were absent, Mr. Jeremy Liley and Dr. Milo Shult, will receive their certificates by mail.

May 18, 2017

Welcome and Overview of the Day

NAREEE Advisory Board Chair Dr. Carrie Castille welcomed participants to the final day of the meeting and reviewed the day's agenda.

Subcommittee Updates

Presentation of Letter of Recommendation from the Citrus Disease Subcommittee

NAREEE DFO Michele Esch introduced Dr. Tom Jerkins, the Chair of the Citrus Disease Subcommittee (CDS), who updated members via teleconference on the subcommittee's February 2-3, 2017, meeting in San Antonio, Texas. After providing background on the CDS, Dr. Jerkins said the subcommittee was positive about its progress but he emphasized that the Florida citrus industry is suffering massively from citrus greening disease and help might not come in time. In light of that, the CDS ranked the FY2017 priorities in the following order:

1. Therapies to prevent or suppress CLas bacteria within trees;
2. Development of tolerance or resistance in commercial citrus in all production areas with a focus on delivery of new cultivars (or rootstocks and scions) using all available strategies;
3. Systems for delivery of therapies into the phloem;
4. Culturing or cultivating the CLas bacterium;
5. Early detection of the bacterium in host and vector;
6. Pre- and post-harvest tools to maximize fruit quality for fresh and processed.

Discussion and Approval of the CDS Letter

Dr. Jerkins reviewed the draft CDS letter to the USDA Secretary. The CDS underscores the importance of short-term solutions and the need for project Principal Investigators (PIs) to be aware of regulatory requirements to commercialize promising discoveries. Members commented on the excellent meeting the CDS held at which PIs provided in-depth information that members discussed. The board unanimously approved the CDS draft letter.

Summary of Other Subcommittee Activities

Ms. Esch summarized the activities of the two other NAREEE subcommittees: the Specialty Crop Committee and the National Genetic Resources Advisory Council. The SCC will meet in late August and the NGRAC might meet in June. CDS, SCC, and NGRAC are the three statutorily mandated NAREEE subcommittees. Dr. Mark McLellan is the CDS liaison from the NAREEE board and the committee welcomes volunteers. NGRAC has focused on ensuring a viable seed supply but is now focusing more on livestock, bee, and aquatic genetic issues as well as crop genetic vulnerabilities. The SCC met in Portland, Oregon, August 2-4, 2016, and will meet again this August, with PIs present.

Closing Comments and Discussion

Dr. Ann Bartuska thanked board members for their service and commented on the board's evolution into a highly focused and engaged body. She urged retiring members to stay in touch. She also expressed appreciation for the SAC's focus on GE issues, which are important for USDA. Board discussions should continue.

It was announced that Dr. Patsy Brannon would replace Dr. Mark McLellan as chair of the SAC. Translating science to make it clear to all members and the user community is critical. A member expressed appreciation for that idea, noting that complex science can leave breeders behind. The REE Action Plan is on hold awaiting the new REE Under Secretary's appointment and attention.

Meanwhile, REE is gathering information to demonstrate progress. The idea of inviting FFAR representatives to join NAREEE meetings was discussed and members welcomed that participation to hear about the foundation's investments and progress. A member commented that NIFA's processes are too slow; in 2009 a disease hit the catfish industry and it took four years to receive NIFA funding. Dr. Bartuska noted that two forestry processes are nimble: university research cooperatives with industry and mechanisms for forestry insect issues that have two-year funding. But Farm Bill language would be needed to change NIFA authority. A member remarked on the broader significance of the April 22 March for Science as a reaffirmation of the wonders of science. Researchers must speak to Congress about the looming 2050 challenges.

Ms. Esch reviewed the meeting accomplishments, including agency updates, approval of the draft R&A report and draft letters. She reiterated Dr. Bartuska's point that the board should keep in mind duplication of efforts because USDA seeks to avoid that, and she reminded members to suggest locales for the November meeting. Dr. Bartuska noted that the DOE ARPA program (ARPA-E) is in partnership with the Transportation Energy Resources from Renewable Agriculture (TERRA) program and ARPA-E/TERRA is working on advanced technology, such as sensor arrays, for use in agriculture.

The board unanimously approved the October 18-21, 2016, NAREEE meeting minutes.

Members discussed the next R&A review on Goal 3, Sustainable Use of Natural Resources, with significant support for focusing on water as providing the nexus for a holistic approach to sustainability issues. Members also emphasized the importance of soil health, a major FFAR issue. Sustainability must be understood more broadly than simply reducing carbon dioxide footprints. Goal 3 has strong links to the U.S. Forest Service, especially landscapes and watersheds. If the overarching goal is sustainable agricultural food production to feed 9.6B people in 2050, are water efficiency and soil health sufficient to meet that challenge? A member suggested that the Goal 3 R&A might benefit from being organized not around goals and sub-goals but more holistically around complex systems. But another member cautioned that the NAREEE board's specific charge is to focus on REE activities and their adequacy. Dr. Castille urged members to trust the R&A process to produce the necessary focus and recommendations and noted that volunteers for the review would be needed.

Members volunteered to work with incoming board Chair Ms. Julia Sabin in developing the report: Dr. Govind Kannan; Mr. Chalmers Carr III; Dr. Michael Oltrogge; Dr. Kenrett Jefferson-Moore; Ms. Robin Beck; Mr. Don Villwock; Ms. Wathina Luthi; and Dr. Annette Levi.

Closing Remarks

Board members offered various other observations. One stated a preference for discussion sessions rather than PowerPoint presentations. Another noted technology's importance, especially irrigation technology, as a board topic. A roundtable might focus on the three issues that most concern each board member. Water use data are important, with comparisons between urban and agricultural use; public anger over water withdrawals is also an issue. But urban and rural water use cannot be pitted against each other.

Ms. Sabin gave a slide presentation from a trip she took to Peru, showing photos of the highly sustainable ancient practices developed by the Indigenous People in the mountains. The ancient

Peruvians lacked written language but had sophisticated math and architectural genius that they used to capture all available water.

Public Comment

There were no public comments.

The board's next meeting will be in November 2017

RESOLUTIONS AND RECOMMENDATIONS

- The board unanimously approved the basic approach of the R&A draft report while recognizing that revisions will be made and some language will be pulled out and presented separately as high-level recommendations to the USDA Secretary.
- The board unanimously approved a draft letter to USDA Secretary Perdue on 2017 national priorities.
- The board unanimously approved a draft CDS letter to the USDA Secretary.
- The board agreed that its data-management working group should be maintained as a liaison to the USDA National Agricultural Library.
- Dr. Patsy Brannon will replace Dr. Mark McLellan as SAC chair.
- The board would welcome the participation of FFAR representatives at its meetings to hear about the foundation's investments and progress.
- The board unanimously approved the October 18-21, 2016, NAREEE meeting minutes.
- Board members volunteered to work on the next R&A review report addressing Goal 3, Sustainable Use of Natural Resources.

ACTION ITEMS

- DFO Michele Esch will inform board members about the membership categories that require replacements as a result of retirements occurring September 30 and will send to the members a *Federal Register* notice that REE will publish to recruit new members.
- Board members should recommend replacements for those categories that will be losing stakeholder representatives as a result of retirements.
- DFO Michele Esch will provide board members a report on REE Action Plan progress.
- Board members should send suggestions to Michele Esch and Shirley Morgan-Jordan for locales at which to hold the board's November 2017 meeting.
- A web conference call will be held before September 30 for the board to conduct a review and final approval via email of the revised 2017 R&A draft report on Responding to Climate and Energy Needs.
- Science Advisory Council members will write a summary of their discussion on GE and will hold a conference call to review the draft, which will be delivered to the next NAREEE board.

APPENDIX A: LIST OF MEETING ATTENDEES

A list of public attendees is available from the NAREEE Advisory Board Office.

Tuesday, May 16, 2017

NAREEE Members Present: Dr Robin Beck, Dr Patsy Brannon, Dr Adriana Campa, Chalmers Carr III, Dr Carrie Castille, Robert Fay, Dr Roch Gaussoin, James Goodman, Dr Steven Daley-Laursen, Dr Govind Kannan, Dr Mark Lawrence, Dr Annette Levi, Wathina Luthi, Dr Molly McAdams, Dr Mark McLellan, Dr Kenrett Jefferson-Moore, Dr Michael Oltrogge, Julia Sabin, Richard De Los Santos, Dr Dawn Thilmany, Don Villwock

Ex-Officio Members Present: Dr Ann Bartuska, Dr Mary Bohman, Dr Dionne Toombs

NAREEE Members Absent: Jeremy Liley, Dr Agnes Mojica, Dr Milo Shult, Richard Tracy

NAREEE Advisory Board Staff: Michele Esch, Shirley Morgan-Jordan, Mary Ellen Tokar (intern)

Other USDA Staff: Dr Michael Bowers, Dr Meryl Broussard, Dr Timothy Conner, Dr Richard Derksen, Dr Sheila E. Fleischhacker, Dr Hubert Hamer, Eric Hoffman, Dr Chavonda Jacobs-Young, Dr Cheley Miniati, Dr Ali Mohamed, Dr Ann Marie Thro, Dr Luis Tupas,

Invited Guests: Dr Elizabeth Stulberg

Wednesday, May 17, 2017

NAREEE Members Present: Dr Robin Beck, Dr Patsy Brannon, Dr Adriana Campa, Chalmers Carr III, Dr Carrie Castille, Robert Fay, Dr Roch Gaussoin, James Goodman, Dr Steven Daley-Laursen, Dr Govind Kannan, Dr Mark Lawrence, Dr Annette Levi, Wathina Luthi, Dr Molly McAdams, Dr Mark McLellan, Dr Kenrett Jefferson-Moore, Dr Michael Oltrogge, Julia Sabin, Richard De Los Santos, Dr Dawn Thilmany, Don Villwock

Ex-Officio Members Present: Dr Ann Bartuska, Dr Mary Bohman

NAREEE Members Absent: Jeremy Liley, Dr Agnes Mojica, Dr Milo Shult, Richard Tracy

NAREEE Advisory Board Staff: Michele Esch, Shirley Morgan-Jordan, Mary Ellen Tokar (intern)

Other USDA Staff: Dr Sheila E. Fleischhacker, Dr Ephraim Leibtag, Dr Rachel Melnick, Dr Cheley Miniati, Dr Seth Murray, Dr Michael Schechtman, Dr Ann Marie Thro, Dr Luis Tupas, Paul Wester

Invited Guests: Dr Elizabeth Stulberg

Thursday, May 18, 2017

NAREEE Members Present: Dr Robin Beck, Dr Patsy Brannon, Dr Adriana Campa, Chalmers Carr III, Dr Carrie Castille, Robert Fay, Dr Roch Gaussoin, James Goodman, Dr Steven Daley-Laursen, Dr Govind Kannan, Dr Mark Lawrence, Dr Annette Levi, Wathina Luthi, Dr Molly McAdams, Dr Mark McLellan, Dr Kenrett Jefferson-Moore, Dr Michael Oltrogge, Julia Sabin, Richard De Los Santos, Dr Dawn Thilmany, Don Villwock

Ex-Officio Members Present: Dr Ann Bartuska

NAREEE Members Absent: Jeremy Liley, Dr Agnes Mojica, Dr Milo Shult, Richard Tracy

NAREEE Advisory Board Staff: Michele Esch, Shirley Morgan-Jordan

Other USDA Staff: Invited Guests:

APPENDIX B: Presentations

All presentations given at the NGRAC meeting are available from the NAREEE office upon request.

APPENDIX C: USDA-NAREE Board Science Advisory Council Gene Editing Questions

Main Question: What actions should USDA take, if any, to better understand, leverage, and/ or communicate gene-editing technology?

Given the proposed rule currently out for public comment involving regulation, responses should focus on research, application, and communication.

Sub-Questions:

- Does USDA need to establish or adopt an existing definition of gene editing, and if so, for what purpose; if establishing a new definition, does this need to relate to other existing definitions?
- USDA has not in the past focused on the use of specific techniques for plant and animal improvement but has rather focused on developing solutions to particular agricultural problems. Is there an overriding reason for changing that approach in the case of gene editing?
- What should be USDA's role in applying gene editing in innovation (developing tools, techniques and methodologies), in meeting needs (applying to specific agricultural problems), both or neither?
- Does USDA need to make statements on how it plans to use, or is using, gene editing in agricultural research? Why or why not?
- What are the respective roles of the public sector and private sector (as it relates to research) in gene editing and where do they overlap?
- Are there any USDA priorities that can only be accomplished through gene editing that cannot be accomplished through conventional techniques?
- What priority should USDA give to gene editing in relationship to USDA's existing priorities and why?
- What should or can REE do, if anything, to enable a more democratized availability of gene editing technologies? (So that it is not only big companies that can use this technology).
- Does USDA's role change if gene editing can be detected in some or all products and if so, how? Does USDA's role change if gene editing cannot be detected in products, and if so, how?

- What is USDA's role, if any, in researching and /or communicating the social implications of gene editing? *(Note: USDA-NIFA programming in this area at the end of the provided current research information)*

**National Agricultural Research, Extension, Education, and Economics (NAREEE)
Advisory Board**

MINUTES OF THE NAREEE BOARD MEETING

May 23-24, 2016
Grand Hyatt Washington
1000 H Street NW
Washington, D.C., USA, 20001

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EXECUTIVE SUMMARY

National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board

HIGHLIGHTS OF THE NAREEE BOARD MEETING

May 23-24, 2016
Grand Hyatt Washington
1000 H Street NW
Washington, D.C., USA, 20001

The National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board met in public session from May 23-24, 2016, in Washington, DC. Board Chair Dr. Steven Daley-Laursen reviewed the main goals of the meeting, which were to take action on the draft Relevance and Adequacy (R&A) Report on the REE Action Goals in Human Nutrition and Food Safety, advance the new R&A review group focused on Energy and Climate, and make decisions about the NAREEE board's Technology Assessment (TA) activities, with presentation on current TA mechanisms in REE. A new Roundtable process allowing board members to engage with USDA officials was successfully pilot tested. A Delta/Plus exercise was conducted that generated a number of suggestions for improving the NAREEE board meetings and processes. At the meeting, a number of presentations were made, notes from which are available through the NAREEE Advisory Board Office.

May 23, 2016

USDA Chief Scientist Dr. Catherine Woteki provided board members with an update on USDA's fiscal year 2017 budget request and strategic planning under the Government Performance and Results Act (GPRA) and the contributions that the board's R&A reviews make to that REE process. Since 2014, REE has been operating under a new Action Plan and is striving to develop three pillars of its strategic planning: 1) a strategic deep dive on two areas per year for R&A review; 2) customer satisfaction, using customer surveys and other means for improvement; and 3) improvements of operational metrics. Dr. Woteki emphasized the critical role of the NAREEE R&A reviews. The REE Action Plan feeds into the budget plans and requests, as well as the USDA research plan. She requested board members' help in identifying the potential for measurable targets and outcomes as well as best practices for identifying short/long term successes and impacts. She asked also how successes could be shared more effectively. She also reviewed the transition planning process in preparation for a new administration and board members asked questions about how their activities might be affected by the process. She reassured members that the infrastructure is in place to ensure that the NAREEE work continues and impacts future planning.

R&A committee co-chairs Dr. Patsy Brannon and Dr. Carrie Castille provided an overview of the grueling process their committee went through to produce a very rough draft "Relevance and

Adequacy Report 2016” on the REE Action Goals in Human Nutrition and Food Safety. The report was the first one developed under a new REE process to dive deeply into a limited number of Action Plan goals rather than attempting to cover them all. They reviewed the draft report’s recommendation on Goal 4, Nutrition and Childhood Obesity and Goal 5, Food Safety, as well as recommendations for addressing remaining and emerging gaps. The co-chairs thanked NAREEE DFO Michele Esch, the Office of the Chief Scientist (OCS), the REE agencies and other agency staff members for their extraordinary support in the R&A review process and resulting recommendations. A final report is expected in July. Michele will lead a “lessons learned” review to benefit future R&A processes using the new review approach.

Board members continued discussing the Action Plan and expectations for the transition with a new administration. They discussed who the REE customers were and distribution of the board’s R&A recommendations, with members suggesting that they should be sent to university presidents, not just the USDA Secretary and college deans. Ms. Esch stated that congressional committees also receive the recommendations and she would follow up with NAREEE staff member Shirley Morgan-Jordan to determine who else receives the board reports. Members also continued discussing the draft R&A report for human nutrition and food safety and the ultimate goal of wanting to see the report’s recommendations implemented. Members underscored that after 25 years of advice on healthy consumption of fruits and vegetables, the obesity problem and diets have not improved, even as the science supporting the recommendations has strengthened. Greater message marketing is needed. Recognizing that the members were discussing the R&A report at different levels, Chair Daley-Laursen, Ms. Esch, and Drs. Brannon and Castille adjusted the agenda slightly to obtain maximum benefit from the board’s discussion of the draft R&A report, with three processes 1) to ensure board members all understood the differences between the former and new R&A process; 2) to review the report’s statements; and 3) to obtain Dr. Woteki’s comments on the draft. One member urged inclusion of a question on international issues in the list of questions for the board’s R&A session, noting that a large amount of the United States’ food comes from overseas, especially Latin America, and food safety will affect this country hugely. Dr. Woteki commented that the level of recommendations in the R&A report was appropriate and actionable. Dr. Brannon raised the question of whether the R&A report should create three overarching recommendations applicable to goals 4 and 5 and thanked the board members for their feedback on the draft report. The board members adopted a motion that the R&A committee draft reflects a reasonable sense of the committee’s input and is acceptable, so the committee should proceed with the amended draft.

Ms. Esch posted slides for a review of “Relevance and Adequacy: Lessons Learned” from the first deep dive R&A report development process, thanking the committee members and OCS staff who provided information. Data were critical. The R&A committee met for the first time in December 2015, so the schedule was compressed. However, for the next deep dive R&A committee, members will meet earlier and have more time. There was no template or example to follow, but there is a clear process moving forward. Committee members offered comments on why the process worked, such as the openness of discussions and the provision of executive summaries about detailed reports, and needed improvements, such as an outline. Ms. Esch noted that she has gathered feedback from every NAREEE committee on ways to make processes easier and developed a list with OCS Strategic Planning and Program Evaluation Officer

Elizabeth Dann. The list includes a data repository; a crosswalk of NAREEE questions and programming efforts, with sources cited; and a timeline.

Dr. Daley-Laursen introduced the second R&A focus, climate and energy (C&E). He presented two slides containing the wording of Subgoal 2A of the Action Plan, “Responding to Climate Variability,” and Subgoal 2B, “Bioenergy/Biofuels and Biobased Products.” Board members offered observations and volunteered to serve on the new C&E Committee, adding their names to a list to work on either the energy or climate issues under the committee’s purview.

Ms. Esch introduced the discussion of Technology Assessment (TA), presenting slides on the NAREEE board’s charge to review USDA’s TA mechanisms and raising the basic question of how to define TA. The introductory slides by Ms. Esch were followed by presentations from REE officials on current activities relating to TA. Presenters were Dr. Robert Griesbach, Deputy Assistant Administrator of the Office of Technology Transfer (OTT) and Mojdeh Bahar, Assistant Administrator OTT; Dr. Luis Tupas, Deputy Director, Institute of Bioenergy, Climate and the Environment; Donald Buysse, Chief, Census Planning Branch; and agricultural economists Dr. Kelly Day-Rubenstein and Dr. Paul Heisey. NAREEE board members offered comments and asked questions, including how the board might move forward on the TA issue. A motion was made for the board to evaluate the efficacy of adopting new technologies in the NAREEE R&A reporting process and other NAREEE efforts where relevant. Members discussed wording options for the motion and a member suggested adding a TA question to the current list of R&A questions. The motion was withdrawn and placed on hold for further consideration later.

Dr. Daley-Laursen announced that NAREEE board member Dr. Rita Green of Mississippi State University would be departing the board. Ms. Esch presented her with a certificate from USDA Secretary Tom Vilsack thanking her for her service.

May 24, 2016

Dr. Daley-Laursen opened the meeting and reviewed the NAREEE board executive committee roster, noting that the committee meets monthly to keep the board’s work moving forward. He reviewed the C&E membership and noted the board’s commitment to addressing the TA issue directly.

The Action Plan’s seven priorities were posted on a slide, starting with Goal 1, Sustainable Intensification of Agricultural Production and ending with Goal 7, Rural Prosperity/Rural-Urban Interdependence. Members agreed that the national priorities are well thought out. A question was raised about the issue of who is eligible for waivers from the new requirement for financial matching of some of NIFA’s competitive awards. Agriculture and Food Research Initiative (AFRI) awards are exempt. It was agreed that NAREEE board members should review the Action Plan and provide their input before the end of the fiscal year on any changes they would recommend. Ms. Esch will send out the plan to members and process recommendations through the executive committee.

Members discussed the transition process for a new administration and whether to wait before providing input on the USDA strategic plan or take an active role now. The strategic plan would

have to map to the Action Plan. A motion was made for the NAREEE board to support the USDA planning process on the Action Plan, then withdrawn and revised to state that the NAREEE board continues to support paragraph 3 of its August 21, 2014, letter to Dr. Woteki regarding waivers from competitive award matching requirements. Members discussed the process for adjusting national priorities and unanimously approved the motion. A member commented that the new deep dive R&A process is less effective because not all Action Plan goals are reviewed. Dr. Daley-Laursen said he would defer the issue to the executive committee.

A roundtable session was held in which five REE leaders and xx NAREEE Board members presented one to two issues that are impacting their agency or category of representation, respectively.

Agricultural Research Service (ARS) Administrator Dr. Chavonda Jacobs-Young discussed ARS facility audits to certify that animal care facilities are meeting standards; scientific integrity; and the ARS “grand challenges” goal of improving productivity 20% by 2050 while cutting environmental impacts by that amount. Economic Research Service (ERS) Administrator Dr. Mary Bohman discussed the rise in requests for data coupled with a decline in budgets and an initiative to understand gaps in ERS’s understanding of consumer purchases. National Agricultural Statistics Service (NASS) Administrator Mr. Joe Reilly discussed how the Cybersecurity Act of 2015 allows the Department of Homeland Security to access data collected by NASS and other statistical agencies, jeopardizing NASS’s ability to collect survey data from farmers who demand confidentiality; in addition, a marked decline in survey responses is affecting every statistical agency. NIFA Associate Director for Programs Dr. Meryl Broussard discussed the goals of expanding AFRI and the program’s challenge areas that are stretched because the administration has added its own priorities, such as microbiomes and pollinators. OCS Director Dr. Kim Green solicited board input on a troubling issue of filling OCS term positions and described efforts to highlight OCS successes. It was agreed that if the NAREEE board members have additional questions regarding the roundtable presentations they should write and send them to Ms. Esch.

Board members discussed initiatives and issues, including agricultural sustainability and consumers’ negative responses to certain technologies. Board member Wathina Luthi stated that agricultural sustainability is an overarching issue requiring “all hands on deck” to meet food challenges. Dr. Dawn Thilmany of Colorado State University offered to forward webinars from her Council for Food Agriculture and Research on “wicked problems” for which there is no single answer. Dr. Chandra Reddy stated that for 1890 Land Grant Universities the top issue was the establishment of Centers of Excellence focused on educating more minorities, international engagement, and small farms, ranches, and landowners. Board member Mr. Chad Waukechon of the College of Menominee Nation noted that tribal colleges are unable to help students complete their educations and he was asked to convey a message from the American Indian Higher Education Consortium meeting in March asking why USDA’s endowment is shrinking. Dr. Woteki responded that she would follow up. Dr. Neil Olson of the University of Missouri gave a presentation on the One Health Initiative that recognizes human, animal, and environmental health are interlinked. Board member Robert Fay emphasized large-scale global issues such as food spoilage that can be reduced through refrigeration and shorter supply chains.

NAREEE Citrus Disease Subcommittee (CDS) Chair Dr. Etienne Rabe reported via telephone on the status of CDS activities to tackle the citrus greening disease that is affecting Florida, Texas, and California growers. Board member

The Science Advisory Committee (SAC) held a meeting in which the main topic was how adequately the factors for scientific research reproducibility applied to social and biomedical science apply to agricultural research. Members reviewed a chart listing factors and issues and recommended adjustments to recognize the unique factors affecting agricultural studies. SAC Chair Dr. Mark McLellan of Utah State University will draft a strawman document resulting from the meeting and send it to the committee members as soon as possible for review.

The Climate and Energy Committee convened and reviewed the scope of its work and a targeted date of October 19-21 to meet in Fort Collins, Colorado. It was agreed that a pre-meeting conference call was necessary to introduce materials for the R&A review. Ms. Esch, Dr. Daley-Laursen, and Dr. Castille will organize a mailing group and take next steps to move forward on the C&E Committee.

Dr. Daley-Laursen asked the board members to review Tab 7 “Roundtable Discussion—Issues by Category of Representation” in their notebooks and offer comments.

Ms. Esch, Dr. Daley-Laursen, and Dr. Woteki presented certificates from USDA Secretary Vilsack to three NAREEE board members who will be leaving the board and whose replacements will need to be found: Dr. Chandra Reddy of Tennessee State University; Dr. Robert Taylor of Florida A&M University; and Mr. Chad Waukechon. Ms. Esch also stated that some members are finishing their first terms and will need to be renominated: Dr. Govind Kannan of Fort Valley State University and Dr. Neil Olson. The rural economic development category will need to be filled.

The NAREE Board conducted a Delta/Plus exercise that generated multiple suggestions for improving the board’s meetings.

The board’s next meeting will be October 19-21, 2016, in Fort Collins, and will be a half-day, full-day, half-day format. Ms. Esch will conduct a Doodle Poll to set the spring meeting 2017 date.

RESOLUTIONS AND RECOMMENDATIONS

- On the list of bulleted questions for the board’s R&A session, a bullet regarding international issues should be added.
- The board adopted a motion that the R&A committee draft reflects a reasonable sense of the committee’s input and is acceptable, so the committee should proceed with the amended draft.
- On the list of bulleted questions for the board’s R&A session, a bullet regarding Technology Assessment issues should be added.
- The board adopted a motion stating that it continues to support paragraph 3 of its August 21, 2014, letter to Dr. Woteki regarding waivers from competitive award matching requirements.

ACTION ITEMS

- DFO Michelle Esch will determine the full list of audiences who receive the NAREEE board's R&A reports and recommendations.
- NAREEE board members should review the Action Plan and provide their input on any changes they would recommend before the end of the fiscal year. Michele Esch will send out the plan to members and process recommendations through the executive committee.
- Dr. Steven Daley-Laursen will defer an issue to the executive committee regarding the fact that under the new deep dive R&A process not all of the Action Plan goals are reviewed.
- If NAREEE board members have additional questions regarding the roundtable presentations by REE leaders they should write and send them to Michele Esch.
- Dr. Dawn Thilmany will forward to the board the webinars from the Council for Food Agriculture and Research on “wicked problems” for which there is no single answer.
- SAC Chair Dr. Mark McLellan will draft a strawman document resulting from the committee's meeting and send it to the committee members as soon as possible for review.
- Dr. Catherine Woteki will follow up on an inquiry about why USDA's tribal college endowment is shrinking.
- DFO Michele Esch, Dr. Steven Daley-Laursen, and Dr. Carrie Castille will organize a mailing group and take next steps to move forward on the C&E Committee.
- Board members will review Tab 7 “Roundtable Discussion—Issues by Category of Representation” in their meeting notebooks and offer comments.
- DFO Michele Esch will conduct a Doodle Poll to set the spring meeting 2017 date.

Respectfully submitted,

Dr. Steven Daley-Laursen
Chair

Dr. Carrie Castille
Vice Chair

Michele Esch
Executive Director

APPROVAL BY ADVISORY BOARD:

Date

Initials
Chair

Initials
Executive Director

Monday, May 23, 2016

Welcome and Introduction of Members

Board Chair Dr. Steven Daley-Laursen called the meeting to order and welcomed the NAREEE board members to the spring meeting before asking all participants to introduce themselves.

Safety and Hospitality

DFO Michele Esch presented an overview of the Federal Advisory Committee Act (FACA) process, and NAREEE's function and operations, noting that written comments could be submitted until June 10, 2016. She reviewed safety instructions.

Opening Remarks

Dr. Steven Daley-Laursen received board approval of the December 16-18, 2015, meeting minutes. He reviewed the agenda and the main meeting goals, which were to take action on the draft Relevance and Adequacy (R&A) Report on the REE Action Goals in Human Nutrition and Food Safety, advance the new R&A review group focused on Energy and Climate, and make decisions about the NAREEE board's Technology Assessment (TA) activities, with presentation on current TA mechanisms in REE.

Remarks from the Research, Education, and Economics Mission Area

USDA Chief Scientist Dr. Catherine Woteki provided board members with an update on USDA's fiscal year 2017 budget request and strategic planning under the Government Performance and Results Act (GPRA), noting that for the first time the president's budget requested full funding for the Agriculture and Food Research Initiative (AFRI) at \$700 million and an additional \$25 million in discretionary spending. Both the House and Senate bills flat line USDA's appropriations. National Agricultural Statistics Service (NASS) Administrator Mr. Joe Reilly is retiring in the first week of June and Hubert Hamer, Director of the NASS Statistics Division, is the incoming replacement. The more than 270 partners in the Global Open Data for Agriculture and Nutrition (GODAN) initiative have made their open data plans available and the GODAN 2016 Summit is scheduled for September 15-16. The goal is for participants to affirm that agriculture and nutrition data are a public good and to adopt open data as part of worldwide open government. Precision agriculture and nutritional data are two GODAN working groups that have been established.

Discussion on REE Activities

Dr. Woteki noted that President Obama has issued a memorandum instructing all departments to support an orderly transition process for the next administration and plans are already written. She reviewed the career and political appointee positions but declined to discuss her plans, which under government ethics rules cannot be made until after she submits a letter of resignation. No active Farm Bill development project is under way but NIFA is keeping a list of technical corrections the next administration may want to propose. Responding to a concern that the NAREEE board's work could be dismantled, Dr. Woteki emphasized that in the transition USDA is ensuring that the infrastructure is established to keep work going, and Michele Esch and others are working with Dr. Kim Green. If Congress refuses to confirm political appointees, acting career personnel would be in

place until confirmation. On the question of whether the board's priorities will be ongoing in 2017, any new administration will begin its own strategic planning, but the Office of the Inspector General recommended that USDA's research priorities should be set through the Action Plan and R&A reviews. It likely would be at least one year before the Action Plan was called into question under a new strategic plan.

She also reviewed the transition planning process in preparation for a new administration and board members asked questions about how their activities might be affected by the process. She reassured members that the infrastructure is in place to ensure that the NAREEE work continues and impacts future planning.

Part I: Relevance and Adequacy

Dr. Daley-Laursen explained that the R&A review process has been adjusted so that it no longer encompasses all topics and instead focuses on a few areas. Nutrition and food safety was selected as the first area for a deep dive, and this year climate and energy will be the second. He then introduced Dr. Patsy Brannon and Dr. Carrie Castille who co-chair the committee, and they provided an overview of the committee managing the R&A deep dive for Human Nutrition and Food Safety. USDA mission area efforts are being reviewed by the R&A committee according to the following seven criteria:

Questions for the Board members to consider during the Relevance and Adequacy Session:

- *What are the key research, education and extension programming and their specific goals for this REE Action Goal(s)?*
- *What documented client/stakeholder needs are being addressed by the programming for this Action Goal(s)?*
- *Does the research, education and extension for the Action Goal(s) advance agricultural and/or natural resource science and its application? [Address strengths and limitations in answering this question.]*
- *Is the funding invested accomplishing the goals of this program area?*
- *Is there a complementary balance of intramural and extramural funding and short- and long-term research in this Action Goal(s)?*
- *What does this Action Goal(s) need to do to address remaining gaps between the activities and accomplishments, evolving stakeholder needs, and the current state and application of agricultural science?*
- *Is there complementarity and collaborative effort across REE in terms of intramural, extramural, and infrastructure funding and short- and long-term research, education and extension that does not duplicate efforts in REE or other federal efforts?*

Introduction

Dr. Brannon and Dr. Castille presented the very rough draft report making recommendation on Goal 4, Nutrition and Childhood Obesity, and Goal 5, Food Safety, as well as recommendations for addressing remaining and emerging gaps. The report was developed under the new R&A process with support from NAREEE DFO Michele Esch, the Office of the Chief Scientist (OCS), National Institute of Food & Agriculture (NIFA) and other agency staff members whom Dr. Brannon thanked for their extraordinary support in the R&A review process and resulting recommendations. Without an executive summary of materials the process would have been much harder, and as it was

the committee struggled to develop the draft. Because review using the seven bulleted questions was too challenging, the committee focused on the goals and employed food safety consultant Dr. Mike Doyle of the University of Georgia. Evolving the R&A process as they went, the committee established two working groups for each goal to focus on strategies. For Goal 4, questions regarding client/stakeholder needs, complementary/collaborative effort, funding adequacy, and recommendations were best addressed across all strategies for the goal. For Goal 5, the six strategies were clustered into two working team areas: generating science-based knowledge and applying knowledge. Each R&A committee will have to decide which expertise to bring into its process. Rather than trying to redo the Action Plan, the committee reviewed whether it was good at the 30,000-foot level. A final report is expected in July with various refinements, but the NAREEE board was asked to provide feedback and approve the spirit of the recommendations.

Relevance and Adequacy Contributions to REE Strategic Planning

Dr. Woteki provided the broader context of the R&A activity to inform the board's discussions, lessons learned, and next steps. Noting the board's interest in the USDA strategic planning activities and continuation of the REE work in the next administration, Dr. Woteki stated that the Government Performance and Results Act (GPRA) requires a strategic plan with performance targets that the new administration will review. In addition, the 2008 Farm Bill created the Office of the Chief Scientist (OCS) to coordinate USDA science. The Inspector General audited the OCS implementation and endorsed the Action Plan. She presented a handout of slides on tying NAREEE's R&A into the REE strategic planning and evaluation process, reviewing REE's history with strategic planning and the strong legal underpinnings of the planning. The NAREEE R&A plays a critical role; the R&A report serves as the output for the strategic pillar of REE's three-pillar approach to planning. The REE Action Plan feeds into the budget plan and requests, and into the research plan. In discussing how the NAREEE board can contribute more, Dr. Woteki cited four areas: identifying the potential for measurable targets and outcomes in an interim update; identifying ways to share success stories more effectively; sharing successes; and advising on other techniques to assess R&D and statistical organizations.

Discussion with Dr. Woteki

The NAREEE board members engaged in a discussion with Dr. Woteki during which the following points were made:

- Board members as stakeholder representative should consult with their communities when the next administration develops a new GPRA strategic plan and provide input to USDA.
- NAREEE customers are any user of REE information, such as major research and education stakeholders and the 25 categories listed by Congress in NAREEE's authority. Better communication of REE's successes is needed.
- It is within the board's purview to share its perspective on international issues with the new administration if it has views to share.
- The land grant maze could be clarified in the strategic plan if a map were provided showing the web of relationships of food and agriculture R&D agencies with the REE "mother ship".
- The R&A recommendations should be sent to university presidents, not just college deans and the USDA Secretary, because it would help scientific societies and scientists. Michele Esch noted that the report also goes to congressional committees and she will follow up to

determine the full list of audiences who receive the NAREEE board's R&A reports and recommendations.

Presentation of the Draft Report on the Relevance and Adequacy of the Food Safety and Nutrition Programs in REE

Dr. Brannon and Dr. Castille presented slides summarizing the R&A report, starting with an overview of three themes that cut across the report's 14 recommendations: 1) integration across agencies; 2) focus on consumer behavior and acceptance of new technologies and enhanced nutritional quality; and 3) seek additional funding and partnerships.

The first recommendations Dr. Brannon reviewed were for Goal 4, on nutrition and childhood obesity. The recommendations addressed "big data" and integrating key databases; consumer behavior; the need for REE agencies to expand their relationships with the National Institutes of Health, the Food and Drug Administration (FDA), and other federal agencies; the need for REE to seek additional funding from Congress; and the need for more REE and OCS leadership to integrate and coordinate REE agencies' interactions. The second recommendations were for Goal 5, on food safety/generating knowledge. They addressed the need for REE agencies to prioritize the research directions across their respective portfolios to achieve maximum funding impact; the need for REE and the OCS to lead REE agencies through strategic planning to address a critical gap in understanding how consumers accept new and existing practices and technologies; the need for a multidisciplinary approach; and the need for REE to seek additional funding and partners to leverage resources for the issue area. For Goal 5, food safety/applying knowledge, the recommendations addressed the need for REE and its agencies to prioritize translational research and extension; the need to prioritize the rapidly changing needs of key stakeholders under the Food Safety Modernization Act (FSMA); the need to emphasize expanded research on antibiotic alternatives; and the need for more behavioral research on consumers' awareness of the food safety system.

In their responses to the R&A recommendations, board members raised the following questions and issues:

- On the question of what the board was trying to achieve with the recommendations, it was noted that ultimately the goal is to take action on the recommendations.
- It is unclear what is driving consumers' choices and the acceptability of practices and technologies. Some research has been done on this aspect of consumer behavior, but it has not been conducted as systematically as possible.
- The obesity problem is not improving; extension is under-used or disappearing, but it can be used to translate the science to communities. Once children's preferences are set, they are hard to change, so place-based programs are needed that consider ethnicity and other key issues.
- After 25 years of promoting fruits and vegetables, 25% of the U.S. public consumes half the recommended fruits and vegetables and some consume none, even though the science is stronger to support the diet.
- It makes sense to focus on consumer behavior as a top priority. Why are consumers making bad dietary choices? Is it marketing? Extension must be the focus, but there is not enough money. A reduction is needed in the number of hospital visits for children because of food issues.

- A fast food culture and lack of grocery stores in some neighborhoods are issues.

Because the discussion was occurring at multiple levels, Dr. Daley-Laursen, Michele Esch, and the two R&A committee co-chairs met during lunch to adjust the agenda for maximum benefit from the board's discussion of the draft. The adjusted agenda focused on three processes 1) to ensure board members all understood the differences between the former and new R&A process; 2) to review the report's statements; and 3) to obtain Dr. Woteki's comments on the draft. The board was asked to consider if the new R&A process is on the mark.

Discussion and Approval of Recommendations

Dr. Castille stated that the R&A review is the most critical function the board provides but reviews can become unfocused because there are many REE agencies to examine. An executive summary provided to the R&A committee helped with the process, which aimed to address such issues as the program goals, who the goals support, and the adequacy of funding. The review took a 30,000-foot perspective on how REE research would affect stakeholders and end users. The bulleted questions listed for board members to consider are critical. The R&A committee's recommendations are stated with various degrees of emphasis, from simple encouragement to "strong" encouragement and other language.

Dr. Woteki commented that the recommendations are at the right level for the intended audiences of Congress and the USDA Secretary and are actionable. USDA could implement them. Secretary Vilsack is sympathetic to the recommendation that more funding is needed, but Congress is tightening budgets, so it would be preferable to couch funding requests with reference to priorities. Responding to a question about shifting dollars among priorities, Dr. Woteki stated that it is difficult for agencies to move funding from one area to another; the Secretary has limited discretion, although a limited amount of money is available for emergency allocation. But it is always helpful for R&A reviews to suggest priorities that should be built into REE's budget. Members noted that budget adequacy relative to priority goals was the issue and that partnerships can be expanded to enhance ongoing programs. Dr. Woteki noted that she would be traveling to China for a meeting of agricultural agency chief scientists and they would be discussing the vision of globally coordinating research to support goals of feeding the world's growing population. A board member emphasized the importance of adding an item about international issues to the bulleted list of questions for the board to consider. That would reinforce the Feed the Future project and other related G-20 activities.

It was noted that under FMSA the FDA is now conducting field visits, although FDA lacks manpower and expertise and is seeking private sector help in its food safety efforts. A board member commented that a large amount of the U.S. food supply comes from overseas, especially Latin America, and therefore food safety will greatly affect this country. Regarding a suggestion that international issues might be added to the draft R&A report, it was noted that the committee would have to discuss that idea before it could be added because no consensus has been reached on the matter. A member asked if the United States was producing enough graduate students in food safety and international food systems. Professional societies should focus on workforce issues. Currently, the focus of food safety is between the farm and the fork, but the public must be educated about basic food safety practices, such as not placing raw chicken on counters. Members commented on how long it took to change public practices such as smoking and littering on

highways. In addition, although 80%-90% of the innovation is in the food safety area, training in how to use the new technologies is deficient. The economic loss from food safety events is large, so improving safety would have a huge impact. The Institute of Medicine would like to study opportunities in food nutrition but is having difficulty in finding partners.

At the conclusion of the discussion, a motion was unanimously adopted that the R&A draft report goals reflect a reasonable sense of the committee's input and it is acceptable to proceed with the amended draft. By July, a draft will be ready for Dr. Woteki to receive.

R&A Process—Lessons Learned

Michele Esch posted slides for a review of “Relevance and Adequacy: Lessons Learned” from the first deep dive R&A report development process, thanking the committee members and OCS staff who provided information during the process. Data were critical. For food safety alone, the R&A committee had several hundred pages of information. The R&A committee met for the first time in December 2015, so the schedule was compressed. However, for the next deep dive R&A committee, members will meet earlier and have more time. There was no template or example for the committee to follow, but there is a clear process moving forward.

R&A committee members offered comments on why the process worked. The openness of discussions was important and it was acceptable to have a somewhat unorganized process to bring out ideas. Members courageously stated what did not work for them and the process allowed the freedom to write down text and rearrange it later. The provision of executive summaries about detailed reports was very helpful, and it was important to have clarity from REE officials about the exact questions to be answered using the data provided. An outline is needed. To improve the process, it would be helpful to obtain committee members' schedules to set conference calls months in advance because it was difficult to mesh schedules. Periodic check-ins to be certain the board members' work is on the right path would be useful.

Ms. Esch noted that she has gathered feedback from every NAREEE committee on ways to make processes easier and developed a list with OCS Strategic Planning and Program Evaluation Officer Elizabeth Dann. The list includes a data repository, with a roadmap of all the questions advisory panels are being asked to answer in a single place; an OCS crosswalk of NAREEE questions and programming efforts, with sources cited; and a timeline, with dates for agencies to submit data to OCS (July), the deadline for creating executive summaries for delivery to NAREEE (September 1), and review (October to March or April). Participants commented on the benefits of 10-15-minute agency presentations followed by a roundtable. Specific examples of inadequate research are needed and perhaps could be solicited when the draft R&A report is submitted to agencies for comment. The R&A committee would like feedback from REE agencies on the draft report; the OCS will obtain review comments from agencies on the draft R&A report within 2-3 weeks of the meeting (mid-June).

Establishment of the R&A Committee for Climate and Energy Needs and Discussion on Timeline

Dr. Steve Daley-Laursen reviewed the Action Plan goals for climate and energy. For climate, Subgoal 2A deals with “Responding to Climate Variability,” while for energy, Subgoal 2B deals with “Bioenergy/Biofuels and Biobased Products”. He requested that board members volunteer to

work with him on the C&E committee based on their stakeholder interests. The C&E committee will reach out to the U.S. Department of Energy and other agencies involved in the two subgoal areas when drafting its report. A board member noted the importance of having agriculture represented in discussions of climate and energy issues. Another member stated that it will be important to examine USDA's climate-related activities, such as carbon sinks and cover crops, that have had a significant effect. Members volunteered to serve on the committee, adding their names to a list that was circulated.

Part II: Technology Assessment

Overview of Charge—what is technology assessment?

DFO Michele Esch presented slides providing background on NAREEE's charge to review USDA technology assessment (TA) programs and also defining TA. She reviewed NAREEE's existing TA work arising from the R&A and Action Plan reviews and concluded by asking how the board wanted to proceed on the TA charge.

Current Mechanisms of Technology Assessment in REE

Following the introductory overview by Ms. Esch, REE officials made presentations on current activities in their agencies relating to TA.

Dr. Robert Griesbach, Deputy Assistant Administrator of the Office of Technology Transfer (OTT), and Mojdeh Bahar, Assistant Administrator OTT, defined TA as a multi-faceted scientific, interactive, and communicative process that aims to contribute to the formation of public and political opinion on societal aspects of science and technology and discussed what TA mean for technology transfer (TT). The transfer of technology as a broad public and economic benefit, not income, is TT's primary objective. The goal is to move from TT in response to crises to TT focused on important but not urgent projects. OTT is fostering an entrepreneurial culture and offers on-demand TT training through its online AgLearn system and in-person training, with direct support for scientists who want to form and execute commercialization plans. OTT is working with TT approaches involving intellectual property that is protected as well as unprotected. The Agricultural Research Partnership Network helps at all stages. Efforts are made to communicate the OTT program's impacts using the annual USDA TT report, success story write-ups, and other means. During a brief discussion, it was noted that some technologies can be transferred by putting them in the public domain, while others are protected. In Florida, an extraordinarily successful process was adopted that involved placing all technologies to fight citrus greening disease in the public domain with an "intent to negotiate". In some cases there is a move toward some protection of genetic technologies.

Dr. Luis Tupas, Deputy Director, Institute of Bioenergy, Climate and the Environment, gave a slide presentation on the USDA Small Business Innovation Research (SBIR) program that encourages domestic small businesses to engage in federal research/research and development (R/R&D) that has the potential for commercialization. Some of the key SBIR program features are that it awards grants only, based on investigator-initiated ideas, with awards given on the basis of a proposal's scientific and technical merit and other factors, including commercial potential. Proposals undergo confidential peer review by outside experts from non-profit organizations. Awards are given within certain topic areas, such as forests and related resources; animal and plant production and

protection; air, water, and soil; food science and nutrition; aquaculture; biofuels and bio-based products; and others. The SBIR program supports a diverse range of technology areas, including engineering, physics, chemistry, precision agriculture, and genetic engineering. Unlike academic-type proposals, SBIR proposals are narrowly oriented, have a more applied focus, and most deal with a product or service. SBIR program staff works directly with the OTT to transfer USDA-developed technologies to the marketplace using small businesses. Dr. Tupas gave examples of SBIR success stories.

Donald Buysse, Chief, Census Planning Branch, gave a presentation on the National Agricultural Statistics Service (NASS) and its role in technology transfer. NASS provides baseline statistics for the who, what, when and where of production agriculture. The NASS census of agriculture is used for a number of purposes, including as a component for assessment mechanisms and to capture trends that are often realized from technological advancements. Examples of data points were horses and mules; land use practices; renewable energy; and Internet access. The census identifies subpopulations and provides a frame for collecting baseline data for more targeted policy decisions pertaining, for example, to irrigation technology and marketing practices that are changing as computers and mobile devices enable the opening of new places to sell crops at local food markets. The census contributes to farmers living in the information age, which requires data, and to the insatiable need for more information with the expanding use of mobile devices that have become a “game changer”. Although inundated with requests for more information, NASS is being impacted by reduced response rates, raising questions about the future of data collection, including issues of big data and the real-time contribution of data through devices. During a brief discussion, the issue was raised of ensuring that data is not being collected on buggy whips when the agriculture system is more akin to a fast race car and how to decide when to stop collecting data over time as products evolve. It was noted that the National Institutes of Health faces similar problems and encounters complaints when it decides to no longer collect data about certain diseases about which some people care a lot. It is critical to obtain data about what is occurring in the agricultural marketplace.

Agricultural economists Dr. Kelly Day-Rubenstein and Dr. Paul Helsey of the USDA Economic Research Service (ERS) gave a slide presentation on “Research Benefit Measurement: Implications for Technology Assessment.” They reviewed TA questions, which try to determine how a technology benefits society as a whole, such as extending life expectancy. They noted that the attribution of research benefits is generally complicated because there are multiple actors and R&D builds on previous findings; research lags, with most benefits occurring considerably after the research investment; and the high cost of conducting economic analysis, even for measuring market benefits. Quantitative research assessments examine cost-benefit ratios and rates of return that are good for comparisons but are costly and must address nonmarket benefits that often are unquantifiable. Bibliometric counts are limited to *ex post* assessments. For qualitative assessments, peer review is the most common assessment method and is widely used both by the Agricultural Research Service (ARS) and other federal research institutions to assess scientific merit, but with qualitative assessments it is difficult to quantify market impacts or assess the ultimate social benefits. Narratives, such as case studies and anecdotal reports, are well suited for R&D characterization but not for comparing research efforts or technologies. The presenters described three ERS case studies of ARS research programs on 1) bovine quantitative genetics and genomics; 2) water quality and watersheds research; and the Nutrient Data Laboratory. For each, they showed information on the R&D environment, such as who the other public sector and private research providers are and who the stakeholders and end users are. They noted the types of technology transfer ERS analyzes and specific technologies the program has examined.

Discussion on Implementation of Charge

DFO Michele Esch asked what TA means for the NAREEE board and how to move forward on the issue. It was noted that a decennial census is outdated and more digital approaches are needed for quicker data availability. With the response rate for surveys declining, issues arise about what is an adequate rate; although the Office of Management and Budget says 80% is needed for mandatory biostudies, that rate is not achieved for other ERS studies. Changing survey definitions would result in a large drop in the number of farms that are counted.

After the presentations and discussion, a motion was made that the board should consider the efficacy of adopting new technologies in the existing R&A reporting process and other NAREEE efforts where relevant. Members suggested additional language and the motion was withdrawn so that editing the exact language of the motion could be done later. A suggestion was made to add technology assessment to the bulleted list of questions for R&A reviewers to consider. Members discussed the NAREEE board's role in TA and wanting to avoid relying on non-board professionals to review the members' TA discussions.

Dr. Daley-Laursen announced that NAREEE board member Dr. Rita Green of Mississippi State University would be departing the board. Ms. Esch presented her with a certificate from USDA Secretary Tom Vilsack thanking her for her service.

Public Comment

There were no public comments. The meeting adjourned for the evening and the R&A committee members met separately immediately following adjournment.

Tuesday, May 24, 2016

Summary of Day One and Overview of the Agenda

Dr. Steve Daley-Laursen opened the meeting and reviewed the nine-member NAREEE board executive committee roster, noting that the committee meets monthly to keep the board's work moving forward. He reviewed the topics Dr. Catherine Woteki had discussed the previous day, including the transition efforts under way in preparation for a change of administration, appropriations, open data, and others. He noted that after reviewing the draft R&A recommendations for the REE Action Goals in Human Nutrition and Food Safety the board approved a motion to support the draft, with diverse input offered. The R&A committee met following the previous day's meeting and the lessons learned are already helping the new C&E Committee as it forms and prepares to conduct its R&A review. The board will review the TA issue in the R&A process and the wording of the board's motion regarding involvement in TA will be refined.

On the agenda, the issue of granting waivers for competitive grants was to be discussed in the context of national priorities. The day's agenda also included a roundtable discussion with pre-selected NAREEE members and leadership, a Science Advisory Council meeting, and a Delta/Plus activity.

Part III: Establishment of National Priorities

Revisit Charge

DFO Michele Esch opened the discussion of national priorities by reviewing the Farm Bill's charge to the NAREEE board to review and consult on USDA priorities. Under the 2014 Farm Bill, the USDA Secretary is authorized based on national priorities to waive for one year the new requirement for financial matching of some of NIFA's competitive awards, although Agriculture and Food Research Initiative (AFRI) awards are exempt from matching requirements. The waivers were first used in October 2014. The board went through the process of defining national priorities and in an August 21, 2014, letter from then-board Chair Dr. Milo J. Shult to Dr. Woteki stated that it would use the Action Plan priorities as the basis for further responses on waivers. Ms. Esch asked if the board wanted to continue using the Action Plan for defining national priorities or in fiscal year 2017 to take up issues outside the plan.

Discussion of Past and Future Process

A member noted that many current board members worked on the Action Plan, which is four years old and was updated in 2014. The member cautioned about the need for great care before going outside the Action Plan, which required a huge amount of work to develop. The Action Plan's seven priorities were posted on a slide: Goal 1, Sustainable Intensification of Agricultural Production; Goal 2, Responding to Climate and Energy Needs; Goal 3, Sustainable Use of Natural Resources; Goal 4, Nutrition and Childhood Obesity; Goal 5, Food Safety; Goal 6, Education and Science Literacy; and Goal 7, Rural Prosperity/Rural-Urban Interdependence.

The issue of waivers from matching requirements was raised. Members agreed that the national priorities are well thought out and include such key issues as family science and other social sciences, though social science is specifically highlighted only in Goal 7. It is more difficult to encompass social science in the subgoals, but social scientists would like to be brought into the process more because, for example, community aspects are often ignored. Goal 6 would be useful to examine closely to assess how well the national priorities encompass social sciences. Dr. Daley-Laursen noted that the national priorities and Action Plan have staying power but that board members should review them and provide feedback before the end of the fiscal year if parts need strengthening. Ms. Esch will send out the plan to members and process recommendations through the executive committee.

One member commented that any substantive changes would require a much bigger discussion because the Action Plan was ratified by a large group of people. Members offered views on how the national priority goals encompass social sciences throughout, although one member stated that family development is not part of every goal. It was noted that the board's aim is not to rewrite the Action Plan but to offer any suggestions for improvements, which would be welcome. In the spring of 2017, USDA's GPRA strategic plan will be revised, and any revisions could influence Action Plan modifications. After discussing whether to actively offer changes now or to wait until a new strategic plan is completed, members showed their support for the USDA planning process and NAREEE processes for recommending changes and a motion was made. The motion stated that the board affirms the national priorities and continues to support paragraph 3 of its August 21, 2014,

letter to Dr. Woteki regarding waivers from competitive award matching requirements. The members unanimously approved the motion.

A member raised an issue regarding the fact that the new R&A process calls for a deep dive on one or two goals, so the entire set of goals is not reviewed. The five-year cycle could leave goals unaddressed. The board chair, noting that no process is without its limitations, stated that the concern was valid and he would defer the issue to the executive committee.

Part IV: Roundtable Discussion

Presentation of Initiatives/Issues and Discussion

A session was held to pilot a roundtable discussion in which five REE leaders presented one to two issues that call for significant involvement and/or input.

1. Agricultural Research Service (ARS) Administrator Dr. Chavonda Jacobs-Young stated that ARS had impressed upon lawmakers the importance of agricultural research and was able to obtain funding for the Southeast Poultry Station in Georgia, but Congress also withheld 5% of the budget, or \$57 million, until the USDA Secretary certifies that ARS animal care facilities are meeting standards. Facility audits by the USDA Animal and Plant Health Inspection Service were completed on May 27 and went well. The facilities' animal welfare practices have been revised and an employee has been hired to implement the new policies and procedures. Dr. Jacobs-Young also stated that a scientist had charged that the ARS scientific integrity policy had been violated, but an independent review confirmed that no violation had occurred. The fiscal year 2017 budget is making its way through Congress and includes funding for antimicrobial resistance, avian flu, climate change, and water initiatives supported by the White House. ARS has adopted as its "grand challenge" the goal of improving productivity 20% by 2050 while cutting environmental impacts by that amount and is consulting with scientists on how to measure improvements. The National Arboretum has received international positive attention after installing cameras at a bald eagle nest to enable the public to observe the eagles' eggs hatch and the chicks fledge. During a brief discussion, a board member suggested that NAREEE board members might want to be involved early in the process of developing the ARS grand challenge, not just reacting after the fact.
2. Economic Research Service (ERS) Administrator Dr. Mary Bohman explained that her organization provides information to support decisions. It is important to understand how people make food safety decisions. Good, timely data are needed for statistical analyses, and Congress wants regional and demographic data from last year that costs money to produce. But budgets remain flat, leaving ERS at 2010 levels even as the demand for information rises. ERS spends between \$13-\$15 million a year to buy data so it can understand consumer nutrition decisions. Data are lacking for practices mandated under the Food Safety Modernization Act (FMSA), but ERS and National Agricultural Statistics Service (NASS) have risen to the challenge, conducting surveys for which data were available in April 2016. Scientists are reviewing the data and five commodity case studies are under way. The next step is an initiative to understand gaps in ERS's understanding of consumer purchases, including through the use of the National Health and Nutrition Examination Survey, eating surveys, and the purchase of data from scanner companies. ERS has a goal of redoing a food

acquisition survey in 2018, but neither the House nor Senate spending bills includes the initiative. ERS is seeking new partners for the revamped survey. Responding to a question about the absence in the survey of the private sector who bear the costs, Dr. Bohman noted that ERS knows not all issues are covered, but the program held workshops with various stakeholders to obtain extensive consultation when setting priorities.

3. NASS Administrator Mr. Joe Reilly discussed how the Cybersecurity Act of 2015 allows the Department of Homeland Security (DHS) to access data collected by NASS and other statistical agencies, jeopardizing NASS's ability to collect survey data from farmers who demand confidentiality. NASS and other statistical agencies are working hard with DHS to preserve data confidentiality but have yet to secure an agreement. In addition, a marked decline in survey responses is major issues affecting every statistical agency. There is a voracious appetite for data coupled with a shrinking pool of providers, undercutting the ability to perform a probabilistic analysis. Everyone depends on the data, so NASS is exploring new technologies and administrative data. Approximately 3,100 U.S. counties and 30 commodities are covered under two Farm Bill safety nets, requiring NASS to provide 90,000 relevant estimates, but it cannot do so for fringe counties in which the commodities are not central. NASS is back to its 2008 budget. A Washington, D.C., data working group involving associations concerned about data integrity is supporting an effort to highlight the problems if funding for data collection is lost. NAREEE board members noted their concerns that USDA survey data are already 18 months old, but younger users need data "here and now," so there is a risk of losing a customer database for market decisions. NASS, however, by law must release monthly economic indicator data by the 12th day of the month.
4. NIFA Associate Director for Programs Dr. Meryl Broussard discussed the program goals of expanding AFRI, maintaining capacity, and growing minority programs. This year, for the first time the budget request for AFRI was the full \$700 million, but Congress kept funding level. With a flat budget, AFRI is limited in what it can achieve toward its food safety, climate change, and other challenges, and the program's challenge areas are further stretched because the administration has added its own priorities, such as microbiomes and pollinators. Facility maintenance has been deferred, limiting the ability to conduct 21st century research. The Association of Public and Land-grant Universities has a major initiative on water and health. A question remains as to what NIFA will do regarding agricultural biomes. For fiscal year 2017, NIFA took a systems approach, using the nexus of agriculture, global climate change, and water. Grant processing is being modernized, which will help institutions applying for grants. A member commented that the board should add facility maintenance as a priority.
5. OCS Director Dr. Kim Green solicited board input on a troubling issue of filling OCS term positions. The Office of the Inspector General was critical of the fact that experts depart after one year. However, USDA and the Department of Energy (DOE) are building bridges between the agencies on bioenergy and in August USDA and DOE will hold their first-ever national summit. Under an Intergovernmental Personnel Agreement (IPA), USDA has brought in experts from the California Department of Water Resources. OCS continually seeks IPA candidates, and the board might want to suggest personnel from academia or elsewhere to learn about USDA. OCS is formalizing how it highlights successes and progress reports. The office wants to communicate with Congress and stakeholders and has

revamped its report to tell a story. OCS also is working with the FDA on arsenic and rice issues as well as other issues the board has highlighted. Federal agencies are coordinating on antimicrobial resistance concerns and USDA has received support for its priorities from the Foundation for Food and Agricultural Research. Vector control to address the Zika virus and the high standards for scientific integrity also are priorities.

It was agreed that if the NAREEE board members have additional questions regarding the roundtable presentations they should write and send them to Ms. Esch.

Board members discussed priority initiatives and issues. Board member Wathina Luthi of Luthi Farms stated that a key overarching issue is agricultural sustainability, which will require broad participation to meet the challenge of satisfying human needs while increasing environmental sustainability. How humans care for animals affects water quality, carbon emissions, and other conditions. Agricultural profitability is essential, both locally and internationally, but new technologies are needed, such as alternatives to antibiotics. Consumers do not know the source of their foods, or accept science that benefits farmers, so the gap between consumers and farmers must be bridged. Consumers are negative toward technologies, so the science must be translated for them.

Board member Dr. Dawn Thilmany of Colorado State University offered to forward webinars from her Council for Food Agriculture and Research on “wicked problems” for which there is no single answer. In social sciences, people have different values, and as economists the best that such experts can do is discuss the trade-offs, such as a loss of efficiency if certain technologies are rejected. New labels are proliferating and social scientists are concerned about barriers to entry for entrepreneurs from outside the current dominant supply chain system. A member noted that most farmers are age 58 or older and are not technically sophisticated; attention must be focused on communicating with the next generation of farmers. Members discussed the concern about overburdening farmers with surveys and the need to eliminate redundancies. In an information-craving society, mostly for economic reasons, there is a trade-off between good, well-vetted data and one-off data to make decisions. Dr. Thilmany emphasized that research must be framed so that its results will have a positive impact on society.

Dr. Chandra Reddy of Tennessee State University noted that a top issue for stakeholders was the proposed establishment of three new 1890 Land Grant Universities Centers of Excellence. The centers in Historically Black Land-Grant Colleges and Universities would be focused on 1) supporting the science, technology, engineering, agriculture, and mathematics (STEAM) pipeline of minority students to meet future workforce needs; 2) international engagement and global food security to increase international cooperation, trade and development; and 3) an integrated center to benefit Small Farms, Ranches and Forest Landowners in high poverty areas. The \$10 million requested in the President’s 2017 budget proposal was zeroed out by both the House and Senate, a major concern for 1890 universities. Dr. Reddy asked the NAREEE board to help reprioritize the centers in the next fiscal year.

Board member Mr. Chad Waukechon of the College of Menominee Nation noted that tribal colleges are unable to help students complete their educations and he was asked to convey a message from the American Indian Higher Education Consortium meeting in March asking why USDA’s endowment is shrinking. Dr. Woteki responded that she would follow up.

Board member Dr. Neil Olson of the University of Missouri gave a presentation on the One Health Initiative that recognizes human, animal, and environmental health are interlinked. The One Health recognizes the importance of the human-animal bond, with 75% of infectious diseases in domestic and wild animals being transmissible to humans. The U.S. public health infrastructure is fragile, with millions of dollars directed at the Zika virus. The Clinical Translational Science Award One Health Alliance (COHA), comprising 11 veterinary academic centers, is working to advance the understanding of diseases that animals and humans share. Clinical trials often fail because the wrong animal models are used; the pig, which is a good model, was for the first time modified to express cystic fibrosis. It was noted that USDA has a One Health working group, with NFIS and APHIS senior-level involvement, and it has been used for anti-microbial resistance coordination. Also, many of the Global Health Security agendas involve USDA programs.

Robert Fay of Seminole Gulf Railway emphasized the goal of solving large-scale global issues amid unchecked population growth and declining resources. Technology is critical; for instance, refrigeration could cut the spoilage of meat and crops 20% globally. Shorter supply chains through urban crop production may be part of the solution along with simple practices such as using plastic bags to store foods.

Dr. Daley-Laursen asked the NAREEE board members to review Tab 7 “Roundtable Discussion—Issues by Category of Representation” in their notebooks and offer comments. It further defines significant issues raised by NAREEE board members. The majority of members submitted issues for consideration.

Science Advisory Board Council Meeting

The Science Advisory Committee (SAC) held a meeting in which the main topic was how adequately the factors for scientific research reproducibility applied to social and biomedical science apply to agricultural research. Members reviewed a chart listing factors and issues and recommended adjustments to recognize the unique factors affecting agricultural studies. SAC Chair Dr. Mark McLellan of Utah State University will draft a strawman document resulting from the meeting and send it to the committee members as soon as possible for review. Dr. McLellan updated the full board on the SAC meeting (*see Appendix C for complete SAC meeting minutes*).

Part V: Board Business

Subcommittees and Working Group Updates

DFO Michele Esch noted that the National Genetic Resources Advisory Council had met in Griffin, Georgia, April 21-22, and the Specialty Crop Committee is meeting August 2-4 in Portland, Oregon. NAREEE Citrus Disease Subcommittee (CDS) Chair Dr. Etienne Rabe reported via telephone on the status of CDS activities to tackle the citrus greening disease that is affecting Florida, Texas, and California growers, noting that the committee met in Riverside, California, February 17-18 to consider the third round of requests for applications (RFAs) and after deliberations centered on four key topics: 1) culturing or cultivating the CLas bacterium; 2) early detection of the bacterium in host and vector; 3) developing tolerance or resistance in commercial citrus in all production areas; and 4) therapies to prevent or suppress CLas bacteria within trees.

Projects receive a relevancy review and there is a dire need for good industry relevancy reviewers. The goal is to very widely advertize the RFAs because breakthrough solutions might be proposed from outside the circle of citrus scientists. Responding to questions, Dr. Rabe described heat-treatment therapies that have been used to suppress the CLas bacterium, but the goal is to develop resistant or tolerant germplasm. Eventually, if genetically resistant trees can be developed, the citrus industry would have to be totally replanted, a project that would take a decade to obtain production 20 years from now.

Climate and Energy R&A Committee

The new Climate and Energy R&A Committee took the opportunity to hold a brief organizational meeting during a board-meeting break. Committee Chair Dr. Steven Dailey-Laursen thanked participants for joining the second R&A deep dive group, which will draw on lessons learned from the first group and will seek to launch as soon as possible. The goal is to hold a first meeting is Oct. 19-21, 2016, in Fort Collins, Colorado, at which the group will examine such issues as infrastructure programs and regional climate hubs. A member recommended visiting the National Renewable Fuels Laboratory in Golden, CO. It also was noted that the Department of Energy's (DOE) National Renewable Energy Laboratory is sponsoring the first-ever research summit between USDA and DOE for an interagency national laboratory coordination effort. On climate, the majority of full-time employees working on the issue are in universities. A new USDA report on the bioeconomy has been released.

A member noted that a face-to-face kick-off meeting is essential for the success of an R&A committee, perhaps at the July 12-14, 2016, Bioenergy 2016 conference in Washington, DC, to enable a wide range of government officials to meet with C&E committee members and share information. The committee will focus on the bulleted questions listed on the NAREEE board meeting agenda to review USDA programs relevant to the C&E areas, with a goal of presenting recommendations at the spring 2017 NAREEE board meeting. Michele Esch will work with Dr. Daley-Laursen and Dr. Carrie Castille to organize a mailing group and take next steps to move forward on the C&E committee.

The members of the C&E committee's climate group, chaired by Dr. Daley-Laursen, are: James P. Goodman; Dr. Adriana Campa; the replacement for Chad Waukechon; Don Villwock; the replacement for Dr. Robert Taylor; Dr. Govind Kannan; and Julia Sabin.

The members of the C&E committee's energy group, chaired by Dr. Carrie Castille, are: Chalmers Carr III; Don Villwock; Robert Fay; and Julia Sabin.

Presentation of Certificate of Appreciation

Ms. Esch, Dr. Daley-Laursen, and Dr. Woteki presented certificates from USDA Secretary Vilsack to three NAREEE board members who will be leaving the board and whose replacements will need to be found: Dr. Chandra Reddy of Tennessee State University; Dr. Robert Taylor of Florida A&M University; Dr. Rita Green; and Mr. Chad Waukechon.

Ms. Esch also stated that some members are finishing their first terms and will need to be renominated: Dr. Govind Kannan of Fort Valley State University and Dr. Neil Olson. The rural economic development category will need to be filled.

Discussion of Future Programs, Timeline, and Membership of the NAREEE Advisory Board and its Committees

Michele Esch explained that the NAREEE board Delta/Plus exercise would focus on the group's meeting to determine what members believe is working and what needs to be changed, as well as additional topics to be discussed.

Delta/Plus Activity

Members offered their views on what works:

- Accommodations
- Having the Metro location at the hotel
- Authorization includes flights and hotel together
- New members sit next to seasoned members
- Roundtable worked (with some edits)
- Best meeting because everyone talked

Members' views of what needs to change included the following recommendations, a number of them focused on helping members to better understand their function as board members:

- Roundtable – start took too much time. Need to be 5 minutes with 2-3 initiatives
- Need handouts for administrator presentations – preferably info beforehand, otherwise hard to follow
- Was one of the better organized meetings, but it took time for board members to figure out their role, the goal of board members
- Incoming members need onboarding to describe role, feedback from stakeholders, job description. Maybe hold training workshop
- Set up NAREEE mentor
- Have time at the beginning of the meeting to bring people up to speed; focus orientation on specific role as board member, not USDA overview
- Spring and fall hard time for farmers on the board; December better
- Provide sample of work products from the previous meeting
- Balance of representing stakeholders versus agriculture as a whole
- Speed up reimbursements; also, concern about private information being hacked during email transmission (bank info/SSN), so change process for submitting paperwork
- Limit Agency speaking or tie them in better to discussion
- Need clarity that board members can share all meeting information with their stakeholders; mixed messages from USDA lawyers at first meeting
- Acronym listing
- Smaller group discussions
- Include bios on members
- NAREEE Program Support Coordinator Shirley Morgan-Jordan needs to provide a response to members when they send travel documents

On the question of how to structure the meetings, members were split over option 1) two full days, and 2) half day, whole day, half day. The next meeting will be October 19-21 in Fort Collins, CO, and will be structured using the half/full/half day option. Michele Esch will conduct a Doodle Poll to set the spring 2017 meeting.

Closing Comments and Discussion

Dr. Catherine Woteki reviewed the requirement for a new GPRA strategic plan for each federal department by the first week of February 2014 to inform the new administration's budget. She thanked the members for their work and said it would be taken to heart in the fall. The new NAREEE Science Advisory Committee responds directly to a recommendation by the President's Council of Advisors on Science and Technology. The board's discussion will be on her mind as she meets with other G-20 chief science advisors in China. Dr. Woteki was pleased that the board agreed that technology assessment will pervade its work.

Closing Remarks

Dr. Steve Daley-Laursen thanked Michele Esch for a good meeting and all of the participants for their attendance. The remaking of the R&A report process will take a lot of work.

Public Comments

There were no public comments.

The meeting adjourned at 4:00 p.m.

RESOLUTIONS AND RECOMMENDATIONS

- On the list of bulleted questions for the board's R&A session, a bullet regarding international issues should be added.
- The board adopted a motion that the R&A committee draft reflects a reasonable sense of the committee's input and is acceptable, so the committee should proceed with the amended draft.
- On the list of bulleted questions for the board's R&A session, a bullet regarding Technology Assessment issues should be added.
- The board adopted a motion stating that it continues to support paragraph 3 of its August 21, 2014, letter to Dr. Woteki regarding waivers from competitive award matching requirements.

ACTION ITEMS

- DFO Michele Esch will determine the full list of audiences who receive the NAREEE board's R&A reports and recommendations.
- NAREEE board members should review the Action Plan and provide their input on any changes they would recommend before the end of the fiscal year. Michele Esch will send out the plan to members and process recommendations through the executive committee.
- Dr. Steve Daley-Laursen will defer an issue to the executive committee regarding the fact that under the new deep dive R&A process not all of the Action Plan goals are reviewed.

- If NAREEE board members have additional questions regarding the roundtable presentations by REE leaders they should write and send them to Michele Esch.
- Dr. Dawn Thilmany will forward to the board the webinars from the Council for Food Agriculture and Research on “wicked problems” for which there is no single answer.
- SAC Chair Dr. Mark McLellan will draft a strawman document resulting from the committee’s meeting and send it to the committee members as soon as possible for review.
- Dr. Catherine Woteki will follow up on an inquiry about why USDA’s tribal college endowment is shrinking.
- DFO Michele Esch, Dr. Steve Daley-Laursen, and Dr. Carrie Castille will organize a mailing group and take next steps to move forward on the C&E Committee.
- Board members will review Tab 7 “Roundtable Discussion—Issues by Category of Representation” in their meeting notebooks and offer comments.
- DFO Michele Esch will conduct a Doodle Poll to set the spring meeting 2017 date.

APPENDIX A: LIST OF MEETING ATTENDEES

A list of public attendees is available from the NAREEE Advisory Board Office.

Monday, May 23, 2016

NAREEE Members Present: Dr Patsy Brannon, Dr Adriana Campa, Chalmers Carr III, Dr Carrie Castille, Robert Fay, James Goodman, Dr Rita Green, Dr Govind Kannan, Dr Steven Daley-Laursen, Wathina Luthi, Dr Mark McLellan, Dr Neil Olson, Dr Chandra Reddy, Julia Sabin, Dr Robert Taylor, Richard Tracy, Dr Dawn Thilmany, Don Vilwock, Chad Waukechon.

Ex-Officio Members Present: Dr Mary Bohman, Dr Meryl Broussard, Dr Kim Green, Dr Chavonda Jacobs-Young, Joe Reilly, Dr Catherine Woteki.

NAREEE Members Absent: Twilya L’Ecuyer, Dr Annette Levi, Jeremy Liley, Dr Molly McAdams, Dr Agnes Mojica, Dr Milo Shult

NAREEE Advisory Board Staff: Michele Esch

Other USDA Staff: Dr Mojdeh Bahar, Donald Buysse, Elizabeth Dann, Dr. Kelly Day-Rubenstein, Dr Robert Griesbach, Dr Paul Helsey, Dr Luis Tupas, Dr Rich Derksen, Dr Ann Marie Thro

Tuesday May 24, 2016

NAREEE Members Present: Dr Patsy Brannon, Dr Adriana Campa, Chalmers Carr III, Dr Carrie Castille, Robert Fay, James Goodman, Dr Rita Green, Dr Govind Kannan, Dr Steven Daley-Laursen, Wathina Luthi, Dr Mark McLellan, Dr Neil Olson, Dr Chandra Reddy, Julia Sabin, Dr Robert Taylor, Richard Tracy, Dr Dawn Thilmany, Don Vilwock, Chad Waukechon.

Ex-Officio Members Present: Dr. Mary Bohman, Dr Meryl Broussard, Dr. Kim Green, Dr. Chavonda Jacobs-Young, Joe Reilly, Dr Catherine Woteki.

NAREEE Members Absent: Twilya L'Ecuyer, Dr Annette Levi, Jeremy Liley, Dr Molly McAdams, Dr Agnes Mojica, Dr Milo Shult,

NAREEE Advisory Board Staff: Michele Esch

Other USDA Staff: Dr Mojdeh Bahar, Donald Buysse, Elizabeth Dann, Dr. Kelly Day-Rubenstein, Dr Robert Griesbach, Dr Paul Helsey, Dr Luis Tupas

Invited Guests: Dr Etienne Rabe

APPENDIX B: Presentations

All presentations given at the NGRAC meeting are available from the NAREEE office upon request.

APPENDIX C: Science Advisory Committee Meeting Minutes

National Agricultural Research, Extension, Education, and Economics Advisory Board

Science Advisory Council Subcommittee

Meeting Summary

May 24, 2016, 12:00 pm – 1:00 pm EST

Committee Members in Attendance: Patsy Brannon, Adriana Campa, Steve Daley-Laursen, Govind Kannan, Mark McLellan, Neil Olsen, Robert Taylor, Dawn Thilmany

REE Staff in Attendance: Dr. Catherine Woteki, Dr. Doug Bannerman

REE Advisory Board Staff: Michele Esch

1. Welcome and Introductions

Mark McLellan called the meeting to order. He received members' approval of the April 8, 2016, SAC meeting minutes and stated that the meeting goal was to get a sense of the direction the Office of the Chief Scientists wants the SAC to take. He acknowledged Doug Bannerman's extensive help in planning the meeting and developing questions.

2. Comments from the Chair

Mark McLellan proposed that the SAC use the factors presented in a poster on Reproducibility and the Conduct of Research for the social and biomedical sciences as a template for mapping the reproducibility issues and possible solutions facing agricultural research.

3. Discussion of Questions for Reproducibility and Transparency in Science

The SAC members discussed the items on the poster applicable to the social and clinical sciences, focusing on whether the six issues that can compromise reproducibility and the seven possible strategies for addressing them are also applicable to agricultural science or need modification.

The six issues presented in the poster were:

1. Data dredging to find significant results;
2. Omitting null results—because negative results are never published, a huge loss of understanding occurs;
3. Underpowered study—i.e., insufficient power to support a decision;
4. Errors, such as contaminated cell lines and other flaws that can occur in any field;
5. Underspecified methods, a common occurrence that prevents others from reproducing studies;
6. Weak experimental design, or inappropriate design, for the proposed assessment.

Members agreed that these six issues occur in agricultural science and then discussed additional factors impacting the field. It was noted that it is difficult to generalize study results because the interactions between genetics and the environment are not understood sufficiently to guide the power of a study. Plants and soil variability, for example, is an issue. A member stated that public education is needed about animal research; the public wants fewer animals used in experiments, but would limited samples reduce the value of expensive animal studies? Sampling is thus an important additional issue for agricultural science. Other points made were the following:

- It was noted that in agricultural science there are no true controls, and members agreed that this was an issue of weak experimental design (6).
- Microenvironments cannot be accounted for, even when working with the same soil type.
- Weather cannot be controlled, but statisticians would say that a study design could control for that issue, so it would be covered at the top level of a study.
- Researchers do not want to use minimum resources for maximum power, but preliminary data are needed to calculate the required study power.

Mark McLellan turned to the seven possible strategies for addressing reproducibility issues and members offered comments:

1. Open data: this will be driven by federal open access policies for intra- and extra-mural research. However, a lot of data are generated outside of competitive grants—for example, through appropriated funds.
2. Pre-registration of a researcher's protocol raises concerns about others stealing research ideas if they must be disclosed in advance, but pre-registration is demanded for clinical trials. For example, to obtain funding from the National Institutes of Health, researchers must pre-register their hypothesis, specify their primary outcomes, and provide other information, and some journals will not accept studies without pre-registration. A concern is to prevent researchers from “shopping” for statistical methods if they did not obtain the right results.
3. Collaboration is seen as a way to obtain more robust studies because relying on an expanded working team is less insular. Collaboration also becomes a form of peer review.
4. Automation is a way to standardize practices and can be helped by professional societies providing guidance on collecting data and other matters. Good Laboratory Practices and standard reference materials and methods are encompassed by this strategy. Determining the variability across laboratories to enable comparing of results is another example.
5. Open methods—for example, societies require adherence to standard methods if researchers want their work published in journals.
6. Pre-publication review should be complemented by post-publication review, which can serve as the first open discussion of a study as feedback on the work comes in. The idea of “post-award review” was added to the list as a marker.
7. Reporting guidelines is an area in which publishers have significant influence. The use of checklists that must be met varies by discipline, but RCT must satisfy checklists. Researchers can be required to provide a checklist and justification deviations.

A member commented that the topic of grants reviews was missing from the list. Grant reviewers have been reluctant to support research to replicate studies, but that is starting to change and replication research is receiving grants.

Mark McLellan asked what other groups should be part of the SAC discussions and three groups were noted:

- *Sponsors*, such as the National Institute of Food and Agriculture, for both intra- and extra-mural research, can foster collaboration by emphasizing its value;
- *Publishers* can provide information about what their scientists are doing and should do;
- *Societies* can help to address reproducibility issues.

A member asked if there are limits to reproducibility for agricultural science. But it was noted that taxpayers might demand to know why they are funding research if it is not reproducible. It was also noted that the Soil Science Society of America would have useful insights about soil research reproducibility.

Next Steps

Mark McLellan will draft a strawman document and send it to the SAC members quickly for their review and comment.