

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

MINUTES OF THE SPRING 2014 MEETING

May 5-7, 2014
Ohio Agricultural Research and Development Center
1680 Madison Avenue, Wooster, OH

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Respectfully submitted,

Dr Milo Shult
Chair

Dr Steven Daley-Laursen
Vice Chair

Michele Esch
Executive Director

APPROVAL BY ADVISORY BOARD:

Date

Initials
Chair

Initials
Executive Director

EXECUTIVE SUMMARY

The National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board (hereafter “the Board”) met in public session on May 5-7, 2014 in the Shisler Conference Center, located on The Ohio State University campus in Wooster, Ohio.

The meeting included a disciplinary focus on the Agricultural Experiment Station System. Board members took part in tours of the J. M. Smucker Company and Cedar Lane Farms, as well as the Ohio Agricultural Research and Development Center (OARDC) and United States Department of Agriculture (USDA) Agricultural Research Service (ARS) facilities located on and near The Ohio State University (OSU) campus in Wooster. The Board heard a presentation from the Experiment Station Committee on Organization and Policy (ESCOP) describing its activities and priorities. The Board also heard a presentation from the National Institute of Food and Agriculture (NIFA) and discussed the USDA’s role in the Agricultural Experiment Stations.

The Board heard a presentation from the National Agricultural Library (NAL) on the Open Data Initiative, including an overview of the USDA’s proposed implementation plan and updates on progress since the last Board meeting in September 2013. A revised version of the USDA’s plan was submitted to the Office of Science and Technology Policy (OSTP) on May 27, 2014, and will be made available to the Board when OSTP grants approval. USDA plans to deploy the first phase of PubAg (the protocol for scholarly publications) by September 30 and to develop a prototype of Big Ag Data (the protocol for scientific data) by December 31, 2014. The Board identified several issues of concern, including: 1) stakeholder involvement; 2) cost models; 3) responsibility for compliance; 4) perceptions of data value; and 5) privacy. The Board decided to form a working group that will discuss these issues in more detail and provide recommendations to the USDA on the Open Data Initiative.

In discussing the Board’s response to the [President's Council of Advisors on Science and Technology](#) (PCAST) report, the Board heard presentations from the Office of the Chief Scientist (OCS) and the Economic Research Service (ERS), describing the recommendations in detail and outlining a proposed report structure and timeline for delivery. It was noted that some important knowledge gaps exist. More information is required on research investments in both the public and private sectors and the extent to which such investments are complementary or competitive. It was suggested that a workshop and/or listening session with key stakeholders may be helpful. Issues that will need to be resolved for the Board to carry out its charge include: 1) distinguishing ‘public’ from ‘private’ investment; 2) differences in investment time horizons; 3) different investments between major and minor crops; 4) evaluation metrics; 5) maintaining national capacity; 6) commercial viability; and 7) consideration of current versus future needs.

As part of an orientation session for new members, the USDA Office of the General Counsel and the Office of Ethics provided guidance to the Board regarding its role as a Federal Advisory Committee. The Board was reminded to err on the side of openness in terms of public access to meetings and ongoing work. USDA Research, Education and Economics (REE) Agency administrators gave presentations to the Board regarding mission area priorities and activities. Generally, the agencies will see an increase in the 2014 budget compared to recent years, but will be cautious in using those funds for strategic investment priorities. The Board was also reminded

of agency responsibilities mandated by the passing of the Farm Bill in February 2014. The Office of the Chief Scientist (OCS) gave an overview of its role in coordinating science and prioritizing research areas within the USDA. The OCS has been restructuring over the past 10 months and is aiming to further develop its portfolio of activities in the near future.

In Board business, a Chair, Vice Chair and Executive Committee were nominated and elected to the Board. The Board heard updates from the Citrus Disease Subcommittee and Relevancy and Adequacy Committee, and discussed reports from the Specialty Crops Committee and National Genetic Resources Advisory Council (NGRAC). It was noted that NGRAC met at the end of September just before the government hiatus, and that therefore some of the recommendations in its report regarding AC21 will need further development and clarification.

Resolutions and Recommendations

- The Board approved the Report of the Specialty Crops Committee for forwarding to the Under Secretary, with a question attached regarding the breadth with which ‘relevancy’ is defined in the review process for research proposals.
- The Board accepted the Report of the National Genetic Resources Advisory Council.
- The Board decided to rejoin Relevancy and Adequacy as a single subcommittee.
- It was suggested that the fall Board meeting be scheduled close to the FDA meeting to be held on 18-19 November.
- It was suggested that voting for new Board positions be postponed from this coming fall until the following year, since terms for the newly-elected positions will be shorter than usual.

Action Items

- The Board decided to form a working group to discuss the aforementioned issues surrounding the Open Data Initiative and to develop recommendations for the USDA.
- The Board was asked to put together a working discussion document responding to the Under Secretary’s charge regarding the PCAST report within 3 months. The Board appointed a Chair and added new members to the working group that will prepare this report.
- To inform the report on PCAST, the Board will hold a listening session to gather more information from a wide range of stakeholders in both the private and public sectors.
- The Board will provide a report to ESCOP, which may include recommendations, on the programs run by the Agricultural Experiment Station System. A small working group was formed for this purpose.
- Board members were asked to research the purview and work of each subcommittee that reports to the Board and identify which subcommittee(s) they might best serve on. A call for interest in serving on committees will be sent out to all absent Board members.
- Executive Director will hold a webinar training session on the use of the Sharepoint website.
- Executive Director will set up folders with working documents on Sharepoint for working groups to store reports that are in progress.
- To improve the orientation component of future meetings, the Board suggested providing more guidance to REE Administrators for their presentations, including asking key questions ahead of time, and providing read-ahead material for new Board members.
- The Board agreed to hold a telephone conference call quarterly, between the regular semi-annual meetings, to comment on the progress of working groups and subcommittees. The call will be recorded and made accessible to any Board members who cannot join in.

MONDAY, 5 MAY 2014

PART I: Orientation for New and Incumbent Members

WELCOMING COMMENTS AND INTRODUCTIONS

Dr Steve Hamburg and Dr Milo Shult (Co-chairs, NAREEE Advisory Board, hereafter “the Board”) called the meeting to order at 8:04 a.m. and welcomed new and returning members.

Hamburg introduced Michele Esch, who was appointed Executive Director of the Board after the last meeting in September 2013.

Meeting participants introduced themselves. *Note: A list of attending Board members and other participants for each session of the meeting is provided in Appendix A of this report.*

Board members voted unanimously to approve the Minutes of the September 2013 Board meeting.

ETHICAL AND LEGAL CONSIDERATIONS OF FACA COMMITTEES

Andrew Tobin (Senior Ethics Specialist, USDA Office of Ethics) and Maureen O’Brien (Attorney-Advisor, USDA Office of General Counsel) gave a presentation entitled ‘FACA Committees and Ethics: a guide for the NAREEE Advisory Board’ via video teleconferencing. *Note: the presentation slides were made available to Board members through the Sharepoint website. A list of all meeting presentations made available to Board members is provided in Appendix C.*

Tobin and O’Brien provided guidance to the Board regarding its role as a Federal Advisory Committee. They reminded the Board that it is responsible for reporting to the Under Secretary for REE and for providing advice and recommendations to the Executive Branch, not the Legislative Branch. As “Representatives” to the government, Board members are not subject to the conflict of interest statutes but should be aware of any potential public appearance concerns associated with their service. Board members were reminded that FACA authorizes the public inspection and copying of almost all documents made available to or prepared by an advisory committee without a written Freedom of Information Act request.

Board Discussion

In response to questions, Tobin noted that the Board members are expected to represent their constituencies and bring those different perspectives to discussions. Hence, in the context of the Board, the use of the term ‘bias’ is welcomed and not intended to be negatively construed. Board members noted that the Board will operate most effectively when members bring perspectives and knowledge from their area to the table but strive to work together despite their different backgrounds.

In response to questions, O'Brien urged Board members to err on the side of keeping meetings open if an important issue is to be discussed, even though subcommittee meetings are not technically required to be open. Tobin added that information discussed at general Board meetings can be shared publicly since those meetings are open, even regarding work that is still in progress. Members were encouraged to solicit input from the groups they represent on any issue discussed in open sessions.

Tobin reminded the Board that members should be aware of public perceptions about conflicts of interest and should reach out to himself or O'Brien with any ethics questions.

REE MISSION AREA ACTIVITIES

For the benefit of new Board members, Michele Esch (the Board's Executive Director) provided an overview of the USDA's organization, the REE mission areas, and the various subcommittees that report to the Board, as well as the process for review and submission of subcommittee reports.

It was noted that much of the Board's work is carried out at the subcommittee level, and that effective communication between the subcommittees and the Board is very important. Although most subcommittee members are appointed by the Secretary of Agriculture, all Board members were encouraged to research the work of each subcommittee and identify which one(s) they might best serve on as a representative. Esch noted that a recent revision to the Board's operating procedures is to have 3 year terms for subcommittee members unless otherwise statutorily defined.

Updates from REE Agencies – ERS

Dr Mary Bohman (Administrator, USDA Economic Research Service [ERS]) gave a presentation entitled 'ERS Perspectives' via video teleconferencing.

Note: the presentation slides were made available to Board members through the Sharepoint website.

Bohman provided an overview of the ERS budget and goals for FY2014, noting that the FY2014 budget is increased relative to FY2013 but still below FY2011 levels. Bohman also noted that the FY2015 President's budget provides an increase over current funding but includes a transfer of the Agency's rent and security funding from a USDA central fund and contains a \$2 million decrease in program funding. One of the upcoming high impact products from ERS is a web-based product providing an overview of the different parts of the new Farm Bill, including research, which will be released next month. Other outputs underway for 2014 include: research publications on the adoption of farmer practices such as multicropping and the use of antibiotics; a congressional report on the value of pollinators; new information from a survey commissioned jointly by ERS and the Food and Nutrition Service (FNS) on food acquisition behaviors; research on child food poverty and rural food poverty; and the effect of new trade agreements on agriculture.

Bohman stated that the focus for ERS in 2014 is to rebuild “capital stock” and use the current budget to invest wisely in the future activity of the Agency through strategic new staff hires and investments in research and data. ERS is also committing funds towards a new activity in partnership with the National Agricultural Statistics Service (NASS) to redo a survey last completed in 1999 on land ownership and land tenure – now called the Tenure, Ownership, and Transition of Agricultural Land (TOTAL) survey. ERS is also implementing a budget initiative to expand the use of behavioral economics and statistical uses of administrative data to improve the effectiveness of the Agency. ERS is working with the Cornell Center on an initiative for nutrition research and will be announcing a call for proposals for a Center on Behavioral Policy in the next couple of weeks. Finally, Bohman noted that ERS is continuing to implement the Data Product Policy and providing leadership for the USDA with regard to open data. ERS aims to raise the visibility and value of its research and data, and hence is looking to increase easy access to content through mobile devices, tablets, applications and new publication formats.

Updates from REE Agencies – NIFA

Dr Sonny Ramaswamy (Director, USDA National Institute of Food and Agriculture [NIFA]) talked to the Board via video teleconferencing.

Note: since no presentation slides were used for this talk, a detailed description of this presentation is provided below.

With regard to the FY2014 budget, Ramaswamy noted that NIFA is focused on three guiding principles: seeking a significant increase in the competitive grants program, seeking increases in capacity funds to support extension, forestry, nutrition and the experiment stations, and seeking increases for Minority Serving Institutions (MSI). NIFA’s FY2014 budget includes \$1.28 billion in discretionary spending, which represents increases on the order of 11-12% for competitive grants and capacity funds. In addition to the funding increases in 2014, NIFA also proposed consolidating some programs – combining pest management programs into a single Crop Protection program, and including a single program line for Sustainable Agriculture programs.

Ramaswamy noted that within the approximately 450 sections of the 2014 Farm Bill, more than 80 sections have been ascribed to NIFA. There is a team within the Agency working on developing an implementation plan and providing input to the Deputy Secretary, who is overseeing the implementation of the Farm Bill generally. One significant area of work for NIFA is that the Farm Bill allows for Hispanic-serving Agricultural Colleges and Universities (HSACU) and McIntire-Stennis (“McStennis”) funded institutions to opt out of being designated with non-land grant status. Non-land grant university (“Non-LGU”) designation will be offered more widely soon. The non-LGU designation has significant implications for competitive grants with respect to the requirement for matching funds. The Farm Bill also offers exemptions – any institution that receives capacity funds or is designated as a non-LGU that offers degrees with majors in agriculture can be exempted, and a number of institutions have already approached NIFA asking to opt *in*.

Ramaswamy also noted some highlights and opportunities. In terms of Research Title, the Farm Bill provides authority to NIFA to run nearly all of its programs and restores mandatory funding, with an increase of approximately \$900 million over the next five years. This funding includes

\$400 million for the Specialty Crop Research Initiative (SCRI), \$100 million for the Beginning Farmer and Rancher Development Program (BFRDP), \$100 million for the Organic Agriculture Research and Extension Initiative (OREI), \$17 million for bioenergy programs, \$25 million for the Extension Risk Management Education Program, and \$41 million for community food projects. Many of the Requests for Applications (RFAs) will be issued soon. The Farm Bill also added new 1994 and 1890 institutions.

The Farm Bill also seeks funding for the creation of Centers of Excellence and for a set-aside program for Commodity Promotion Boards. For the new Centers of Excellence, NIFA is required to consider proposals from groups of organizations ahead of proposals from single institutions. Ramaswamy noted that NIFA is still figuring out what the “rules of the game” will be with respect to these centers. The stipulation for funding of commodity promotion boards – under which any promotion board can request funding from AFRI – will not become active until FY2015. Again, Ramaswamy noted that NIFA is still working out how this mandate will function operationally, and that the Farm Bill includes a caveat that NIFA can refuse to create such a fund.

Board members were asked to look at the NIFA Budget brochure provided prior to the meeting for details about the FY2015 budget proposal. Under this budget, AFRI would receive \$325 million with capacity funds set at the same level as 2014. The proposed budget also introduces a couple of new programs, including the Food and Agriculture Resilience Program for Military Veterans (FARM-Vets), which is an effort to bring veterans into the farming enterprise by promoting research, education and extension activity for veterans. NIFA will also partner with the Food and Drug Administration (FDA) on developing a project on food safety education and outreach for small farmers. The FY2015 budget proposal also seeks funding to launch three Innovation Institutes in the areas of Pollination and Pollinator Health, Antimicrobial Resistance, and Bioproducts Manufacturing Innovation. NIFA proposes to hold listening sessions in the future about how to proceed with development of these institutes. Outside of the main budget, the FY2015 budget proposal also seeks funding for an Opportunity, Growth and Security Initiative, including a \$60 million add-on to the AFRI request and \$20 million from multi-state add-ons to capacity funds. Ramaswamy noted that the FY2015 budget proposal was well received during hearings, but the Opportunity, Growth and Security Initiative proposal was met with less enthusiasm on the Hill.

The National Research Council (NRC) has been undertaking a review of AFRI and will release its report in June. In conducting that review, NIFA asked NRC to provide advice on the ideal balance that NIFA should achieve in making requests for large versus small grants. NIFA is also currently undertaking an internal review of all the science portfolios across all funding lines, which is a 5-year process.

Ramaswamy noted that the NIFA Strategic Plan is in the final stages of development and will go to the USDA – including the Board – for review and for stakeholder comment very soon, likely within a week. The plan contains four foci – science, people, processes and communications.

With respect to grant modernization, Ramaswamy stated that NIFA is undertaking a complete top-to-bottom review, which includes going paperless and partnering with the National Institutes

of Health (NIH) to undertake a fit-gap analysis. There has been a minor realignment within NIFA to increase operational efficiency, which includes reassigning current staff and making new hires for the Institute of Bioenergy, Climate and Environment and the Institute of Food Production and Sustainability.

Finally, Ramaswamy noted that next year marks the 125th anniversary of the second Morrill Act that ushered the 1890s institutions into the land-grant system. Ramaswamy is meeting with colleagues and making plans to host celebratory events, and hopes that the Board will be involved.

Board Discussion – NIFA

Note: since Dr Ramaswamy had to leave after his presentation, he answered questions from the Board immediately following his talk before the meeting proceeded with presentations from the other REE Agencies.

In response to questions, Ramaswamy provided more information about the Centers of Excellence described in the 2014 Farm Bill. He clarified that any group, including both universities and non-academic organizations, could collaborate to submit a proposal to NIFA for a center. NIFA is still developing a process for assessing such proposals, but it is likely that a group comprised of multiple institutions would have a greater chance of funding success than a group comprised of individuals from only one institution. Ramaswamy also provided further clarification on the difference between the Centers of Excellence and the Innovation Institutes. The Centers of Excellence will be funded through AFRI, whose work is focused on the foundational knowledge needed to help with food and agricultural enterprises, with an expected return on investment of 5-10 years before knowledge translates into economic benefits. Funding received through AFRI also does not carry any expectations regarding external matching funds. In contrast, the idea behind the Innovation Institutes is to create an innovation ecosystem that brings together public funding and intellectual resources provided by NIFA with non-government, non-public, private enterprise funding and resources. Also, it is expected that the return on investment for the Innovation Institutes will be closer to practice and application, resulting in economic benefits much more quickly than the Centers of Excellence.

Ramaswamy explained that the Bioproducts Manufacturing Innovation theme for the Innovation Institutes is intended to cover a suite of bio-based manufacturing, including all possibilities for taking renewable agricultural and forestry commodities and developing products, processes and manufacturing approaches that would result in outcomes that create jobs and economic enterprises.

Ramaswamy also expanded on the topic of pollination work. He stated that over \$30 million is spent collectively between ARS and NIFA on work in the area of pollination. With regard to the Innovation Institutes, the proposed topic will be pollination and pollinator health, and hence will be focused on a much wider range of topics than just bee colony collapse disorder. It is hoped that if the three proposed institute topics are approved by Congress for funding, NIFA would hold listening sessions to determine what the specific priorities should be within the larger topic of pollination and pollinator health.

In response to questions, Ramaswamy expanded on the mandate to provide funding for commodity promotion boards. He explained that there is language in the Farm Bill that allows for such boards to approach NIFA with a proposal in which a board would contribute a specific amount of funding and NIFA would be required to match that amount and create a competition solely for the interest of that particular commodity board. However, NIFA is still trying to understand how such a process would be operationalized. Ramaswamy also explained that not many non-program crops have established commodity promotion boards. NIFA tends to invest in research for non-program crops that don't have large amounts of private investment, and will be mindful of private enterprise investment as it develops rules for working with the commodity promotion boards.

Updates from REE Agencies – NASS

Joe Reilly (Administrator, USDA National Agricultural Statistics Service [NASS]) gave a presentation entitled '2012 Census of Agriculture Final Data Release' via video teleconferencing.

Note: the presentation slides were made available to Board members through the Sharepoint website.

Reilly noted that the first agricultural census was conducted in 1840 as part of a general population census. It has been conducted periodically since then, moving to a 5-year cycle in the early part of the 20th century, and then moving in the 1950s to a cycle that corresponds to the rest of the economic sector. The current census, completed in 2012, is the fourth census of agriculture conducted by the USDA. In the census, the term 'farm' means any place that produces \$1000 of agricultural production during the census year, a definition that has been used since 1974. Reilly described the process of conducting the census, which ended up with a response rate over 80%.

Reilly described many of the results from the census in metrics including farmland area, operator numbers and demographics, commodity specialization, land use practices, renewable energy generation, market value of sales organized by location and commodity, income and expenses, operator demographics and internet access. Some key findings were:

- The majority of farms occupy less than 180 acres each, but the majority of farmland is owned by a small number of farms occupying more than 2000 acres each. Increases in the size of these large farms represented the biggest increases in total farmland area;
- Production of beef cattle decreased significantly from 2007 to 2012, but production of soybeans, wheat and corn increased over the same period;
- Land use practices of no-till and conservation tillage occupy more farmland area than conventional tillage practices (questions about these practices were new on the 2012 census);
- The number of farms with renewable energy systems more than doubled from 2007 to 2012. The most popular form of energy production is solar panels, with fewer farms using geothermal systems, wind turbines or biodiesel;
- The number of farms with internet access increased significantly from 2007 to 2012, but nearly one third of all farms still do not have internet access and many with access rely on dial-up services for business purposes;

- Farms in higher sales classes (i.e. with sales above \$1 million) saw increases from 2007 to 2012, but those represent only 4% of all farms. Conversely, farms in lower sales classes (i.e. less than \$50,000) saw decreases in sales from 2007 to 2012;
- The value of sales increased for almost all crops and commodities from 2007 to 2012 except for nursery / greenhouse sales, with record high grain and soybean prices;
- The value of agricultural products sold increased significantly from 2007 to 2012, but the cost of production expenses increased at a faster rate over the same period. The biggest cost increases were in feed, fertilizer, seeds, chemicals and cash rent for land;
- Information about the number of farms with organic certification was collected for the first time, showing that organic product sales reached \$3.1 billion or 0.08% of the total agricultural production value;
- Direct sales to consumers increased from 2007 to 2012, with most direct sales occurring in the northeast and in California, close to large metropolitan areas;
- The average age of farming operators increased from 2007 to 2012, and most principal operators are older than 55 with more than 10 years working on the present farm.

Reilly noted that NASS has a query-able database for accessing the census results. Other products related to the census will be released later in 2014, including state and county profiles, results for Puerto Rico, and different demographic summaries such as race, gender and ethnicity profiles. NASS is currently undertaking a Census of Aquaculture, which will be released in September, and a Farm and Ranch Irrigation Survey, which is planned for release in October.

Updates from REE Agencies – ARS

Dr Chavonda Jacobs-Young (Administrator, USDA Agricultural Research Service [ARS]) gave a presentation entitled ‘ARS’ via video teleconferencing.

Note: the presentation slides were made available to Board members through the Sharepoint website.

Jacobs-Young provided an overview of the ARS structure and activities. She noted that ARS wants to make sure that its work does not stay in the lab but extends to the people who need it with a ‘farm to table’ research scope. ARS also maintains international collaborations aimed at combating disease or mitigating the damage of disease to the US. ARS operates about 90 research facilities in the US and 4 international facilities, with a large suite of national programs in the areas of animal production and protection, nutrition, food safety and quality, natural resources and sustainable agricultural systems, and crop production and protection. ARS is also responsible for 23 Experimental Watersheds and Ranges, some with more than 100 years of data collection.

Jacobs-Young also described ARS efforts in information and technology transfer, including mechanisms for working with private industry. ARS had 230 active Cooperative Research and Development Agreements (CRADAs) in 2013, including 116 with small businesses, and 100 active Material Transfer Agreements (MTAs) for conducting collaborative research on specific materials such as germplasm. ARS also has a large number of other active agreements. Jacobs-Young described selected metrics of ARS research, including the number of published journal

articles, collaborations, licenses and patents, sequenced genomes and trained scientists. She also noted that ARS maintains more than 20 genebanks.

Jacobs-Young described two new initiatives that are included in the FY2015 budget proposal: \$44 million for a program on Climate Resilient Land, Crop, Grazing and Livestock Production Systems, and \$25.9 million for a program on Advanced Crop and Livestock Genetic Improvements and Translational Breeding for Enhanced Food Production. ARS is also requesting \$4 million for work on pollinator health and colony collapse disorder.

Board Discussion – ERS, NASS and ARS

In response to questions, Jacobs-Young informed the Board that the latest swine virus has killed a little over 5 million pigs, primarily in Iowa. ARS has increased investment to \$540,000 this year to look at efficacious long-acting vaccines for pigs. She noted that this disease only became prevalent in 2013 so they have been focused on it for less than a year. She also noted that ARS is focusing on the issue within the US and that so far it has not impacted any trade activity. Bohman added that the research agencies partner with the animal and plant health inspection service, which has responsibility for monitoring and reporting on diseases like this.

In response to questions, Bohman explained that ERS has been working to bring concepts from behavioral economics into its activities for several years, with the intention of making that field an ongoing part of the ERS program. ERS is also looking at experimental design tools and wants to expand its use of administrative data to include that information in its modeling work.

When asked about data specific to food insecurity among college students, Bohman responded that the data ERS publishes annually related to food insecurity in the US provides some demographic information, for example specifying food insecurity amongst children, but Bohman was unsure if there were specific data on college students.

When asked about the impact of the current drought in California, Reilly noted that the 2012 census was conducted before the onset of that drought, but that drought was present in the Midwest at the time the census was being done. However, he also noted that the impact of the Midwest drought on yield or production was not as great as might have been expected 20 years ago due to better modern-day practices in irrigation and land management. NASS is currently working with some companies in California to do a water usage and production study this summer. Jacobs-Young added that ARS is looking at opportunities to address some of the issues in water use brought on by drought across the country, and conducting research into new varieties that are more drought and salinity tolerant. ARS is also developing a drought-prediction tool so that farmers can have a better idea of what conditions they are likely to face and plan accordingly. Bohman noted that ERS issued a report last year showing that farmers in drought-prone areas behave differently to those in water-abundant areas and are more likely to use drought mitigation behaviors. That is an area of research that ERS is also continuing to focus on.

In response to follow-up questions, Jacobs-Young stated that ARS is looking at opportunities to modify varieties of specialty crops, such as those currently grown predominately in California, to grow in different regions of the country. Bohman noted that consumers seem flexible in

switching between different types of fruit and vegetables depending on prices. Consumers will also likely see more imports in response to increasing prices due to impacts in California.

When asked about the policy for archiving census records, Reilly noted that when the agricultural census was conducted in conjunction with the population census, the public would have access to the agricultural records when the population census was released after 75 years. Since the agricultural census moved into the USDA's purview, there is no law that allows for the release of those records. However, the national archives have designated the Census of Agriculture as a historically significant record and believe that they have final control over those records. Hence there is an ongoing conversation between lawyers for the USDA and the national archives as to which title takes precedent and whether the records will be made public.

NATIONAL AGRICULTURAL LIBRARY AND OPEN DATA INITIATIVE

Presentation from Director

Dr Simon Liu (Director, National Agricultural Library) gave a presentation entitled 'Public Access to USDA Funded Research Results'.

Note: the presentation slides were made available to Board members through the Sharepoint website.

Liu provided an overview of the Open Data Initiative and updates on progress since the last Board meeting in September 2013. The USDA and its REE agencies are mandated to provide public access to both scholarly publications and scientific data resulting from federally-funded research. Liu noted that scholarly publications are likely to be more easily accessible through a centralized system because of their common formats, while access to scientific data is likely to be decentralized and more problematic because of their heterogeneous nature.

The Under Secretary for REE anticipated the mandate for open data sharing and convened the Scientific Data Management Committee (SDMC), which began operations about three years ago. The SDMC has members from all the USDA agencies and is working with other federal agencies and various stakeholders to develop an appropriate process for carrying out the mandate.

The SDMC has four major collaborators focused on access to scholarly publications – the publishing industry through Clearinghouse for the Open Research of the United States (CHORUS), the university community through Shared Access Research Ecosystem (SHARE), Google through Google Scholar, and the National Library of Medicine through PubMed Central. The USDA is also looking to other federal agencies with similar data sharing protocols for guidance, such as the NIH.

The USDA is adopting a hybrid solution: a centralized and modularized system for scholarly publications, and a decentralized and distributed system with a central catalog index for scientific data. The USDA has developed a draft policy for dealing with scholarly publications. Some of the key points are resolved but others are still under debate:

- *Who is responsible for compliance – the principal investigator (PI) or institution?* The NIH policy for the last 6 years has focused on the PI as an individual, but the USDA

acknowledges that behind every PI is an organization and so the question of responsibility is an ongoing debate.

- *What should be submitted?* Liu explained that they are looking at two forms of publication – the final peer-reviewed manuscript prior to publication, which doesn't entail any publisher copyright issues, and the published paper after copyediting is completed, in which case the journal and publisher have copyright. Therefore if the published paper is used as the standard for open data, the process requires negotiating with the publishing companies.
- *Where should publications be submitted?* The USDA is looking for a centralized repository since all scholarly publications look the same and follow a similar format. It is proposed to use the USDA public access archive system.
- *When should publications be submitted?* The USDA is adopting the policy that publications should be submitted upon acceptance for publication.
- *When should publications be made publicly available?* The USDA is adopting the policy that publications be made available no later than 12 months after the official date of publication. Liu noted that the publishing industry is pushing for a longer embargo period, but NIH uses 12 months and universities are pushing for shorter periods of less than 6 months. It may be possible for different disciplines to have different embargo periods.

Similar questions arise for the USDA's draft policy regarding scientific data:

- *Who is responsible for compliance – the principal investigator (PI) or institution?* Liu stated that no one has a good idea about who should be responsible for compliance with regard to data sharing.
- *What should be submitted?* Liu noted that the policy will need to specify what kind of data is required for sharing – the raw data collected during the initial stages of the project, the final data associated with the publication, or something in between. The USDA is currently adopting the position that data varies significantly between fields but would prioritize storing 'high value' datasets, with the project's PI or organization responsible for deciding which data are high value. Grant applications should include a data management plan that outlines what data will be collected, what will be produced and what will ultimately be submitted for storage. Any metadata associated with the data will also need to be submitted.
- *Where should data be submitted?* The USDA's current draft policy recommends that researchers who already have a recognized and publicly accessible database continue to store their data in that repository and send the associated metadata to the USDA for archiving.
- *When should data be submitted?* Currently the USDA is suggesting that data be submitted no more than 3 years after the completion of data collection, but Liu noted that this timing is still under debate and the final requirement could vary by field.
- *When should data be made publicly available?* No later than 3 years after completion of the data collection.

Liu described the scope of the scholarly publication issue through the example that the USDA currently publishes around 10,000 intramural articles per year, 90% of which are published in 1464 different journals run by 416 different publishers. He outlined the centralized and modularized solution proposed by the USDA. This system will be almost ready for deployment by September 30 of this year. Two components that won't be ready by September are compliance reporting and manuscript submission directly from publishers. (Manuscript

submission from authors will be functional by September.) Hence the first phase of PubAg (the protocol for scholarly publications) is planned for deployment by September 30, 2014.

A 2011 survey showed that 80% of researchers don't have sufficient funding for data curation, and most store their data in their own labs or university servers. Those locations may or may not be accessible by researchers elsewhere. The same survey also reported that 23% of researchers do not have the necessary within-lab expertise to analyze data as needed. Curation of agricultural data is also complicated by the fact that most data is generated and managed locally, the data tends to be dispersed and very heterogeneous, making data sharing difficult. Other challenges are that the data volume is large and varied and a lot of data is collected in real or near real time.

Due to these challenges, the USDA proposes a collaborative and distributed approach to the sharing and storage of scientific data. If a researcher already has access to an open data repository, they will be encouraged to continue using it. The USDA also proposes establishing its own data repository to be used by researchers who do not have an existing place for data storage. A prototype for Big Ag Data (the protocol for storing and sharing scientific data) is currently being developed and is scheduled for completion by December 31, 2014.

A revised version of the USDA's proposed implementation plan will be submitted to OSTP by May 27, 2014, and will be made accessible to the Board when OSTP grants approval.

Board Discussion

The Board engaged in substantial discussions on issues related to the Open Data Initiative. The following list summarizes the topics of concern that were raised during question time:

- 1) *Stakeholder involvement.* Concern was raised that some interested parties – e.g. ECOP, ESCOP, universities – have not been adequately involved in discussions thus far, and that further interactions with stakeholders are needed to get input into the data storage and sharing protocols.
- 2) *Cost models.* It was noted that data repositories require financing and that no one currently has a sustainable business model for data storage. Concerns were raised that the proposed method for USDA data access has not sufficiently accounted for the extra cost burden that existing repositories would acquire or for the trade-off that USDA budgets would face between funding new research and maintaining data repositories. It was also noted during discussions that if researchers were given a choice between paying for their own storage or handing data over to the USDA, they would probably choose to pass responsibility to the USDA. Liu noted that the USDA does not yet have a plan for dealing with the cost of data storage but is aware that such a plan is needed. It was suggested during discussions that the USDA require a budget justification in all its future grants for a data management plan. Liu noted that NIFA has been considering such a requirement for its future grants.
- 3) *Responsibility for compliance.* Questions were raised about whether an institution or an individual researcher (the PI) would ultimately be held accountable for ensuring public accessibility to publications and data. It was suggested during discussions that in the case of a legal or compliance issue, the institution should be held accountable and not the PI.

- 4) *Data value.* It was noted that different fields produce very different types and volumes of data, and also that data can vary substantially between the raw collection stage and the published product. Liu stated that the preservation period for data might vary between fields since not all data have equal value. If the format, duration and location of data storage will be based on some perceived value of the data, concerns were raised about how such decisions will be made. One suggestion put forward during discussions was to have a tiered process for storage, in which all data must be stored initially for a defined period of time at the expense of the research project. After said period of time, a decision could be made about the value of continuing to archive the data and it could be moved to a USDA repository. Such a tiered approach might give the USDA time to work out a more sophisticated policy.
- 5) *Privacy.* Concerns were raised about how personal identifiable information embedded within datasets will be handled, and how issues about privacy might impact human subject review and data forms. Liu noted that any data that is collected and stored openly should be non-sensitive, and therefore the protocol will need to have some sort of screening and de-identification process. It was noted that the USDA is seeking advice from NIH and also from ERS on this issue, but does not anticipate having a policy in place before the end of this year by the time the prototype system is deployed.

In response to questions, Liu said that the current data storage plan does not include retroactively storing existing datasets. However, the USDA recognizes the value of archiving long data records so a best effort will be made to do so.

Questions were raised about the format in which data is stored, and in particular how to ensure that a common user of the database can access data more familiar to the scientific community (e.g. if it is in raw form). Liu responded that the mandate is for shared data to be machine readable and ‘useful’. Therefore the USDA needs to create a metadata standard that all researchers will need to comply with, and as much as possible will attempt to preserve the tools and software that allow users to interpret and use each dataset.

In response to questions, Liu clarified that there will not be any distinction made between intramural and extramural research in terms of the data storage and sharing protocols.

USDA SCIENCE PORTFOLIO

Presentation from Director

Dr Charles Onwulata (Director, Office of the Chief Scientist [OCS]) gave a presentation entitled ‘USDA Office of the Chief Scientist’ via video teleconferencing.

Note: the presentation slides were made available to Board members through the Sharepoint website.

Onwulata provided an overview of the role of the OCS in coordinating science and prioritizing research areas within the USDA. One part of the OCS mission is to create action plans for the REE agencies and to conduct performance measures to evaluate funded research. The OCS also carries out reviews and reporting on complaints of misconduct within the USDA. Mission goals for the OCS include providing the Secretary of Agriculture with information needed for decision

making, facilitating collaborations between scientists at both universities and non-academic organizations, and providing a high quality data gateway.

Onwulata described recent OCS activities. The OCS has been working for the past 6 months on a compendium of high-level policies and the scientific evidence that was used to create those policies. This is the first time that such a compendium has been developed. The OCS has also run stakeholder workshops, which involved listening to the interests and needs of stakeholders and then working to align the programs of the USDA to address issues important to the US. This year the focus is childhood nutrition and obesity.

The OCS held a listening session in August 2013 with a focus on plant breeding. Some of the items stakeholders discussed include:

- more farmer engagement in regional breeding;
- maintaining traditional breeding methods;
- continued USDA support in cultivar development and open access to germplasm;
- collaboration between sectors to bridge gaps between small farmers and big plant breeders; and
- implementing non-traditional methods of training in elementary schools and trade schools to encourage the next generation of plant breeders into the profession.

Onwulata noted that a lot of time during 2013 was spent on the issue of data management. Thus far in 2014, the OCS has worked on issues related to climate change and regional hubs, antimicrobial resistance and nutrition, and continues to work on international joint commissions. He noted that the OCS has been restructuring over the past 10 months and is aiming to further develop its portfolio of activities in the near future.

In the future, the OCS hopes to change the image of USDA research from that of scientists in lab coats to work that is valued by people across the country as being relevant to their daily lives. Onwulata noted that currently the audience for USDA work is the agricultural community, but OCS hopes to expand that through education and outreach so that anyone who eats becomes the audience. He noted that the amount of funding the USDA receives is a very small part of the federal budget. The OCS would like to help recruit smart people into agricultural science and maybe increase USDA funding.

Board Discussion

In response to questions, Onwulata stated that the OCS is gradually developing a broader systems look at the problems of applying and developing science. The OCS is collating the work of all USDA plans and policies into one place, and will only be able to look at the whole USDA portfolio once that collation is complete.

Onwulata clarified that the role of the USDA Chief Scientist is to represent all science that is conducted through the USDA. He noted that not all the mission areas or programs are focused on science, and therefore those will not fall under the Chief Scientist's purview, but components of those mission areas or programs may conduct science and hence the Chief Scientist is required to talk about that science.

In response to questions, Onwulata explained that the operation of USDA research facilities is handled within each separate mission area, e.g. ERS facilities are within the ERS purview. Decisions about which facilities to close or continue operating are made based on a balance of budget and research areas that are considered high priority or no longer relevant. Each mission area ranks which programs to spend money on.

Onwulata also clarified that investigations into scientific integrity are handled by the agency that is accused of misconduct rather than transferring the investigation to a central agency. The USDA interacts with NIH and other agencies about the process of conducting reviews.

Onwulata stated that an action plan commissioned by the Chief Scientist in response to the August 2013 listening session on plant breeding is due in June 2014.

GENERAL BUSINESS

Voting Guidelines and Appointment of Chair

Michele Esch introduced the voting procedures for positions on the Board. She reminded the Board that the Chair provides leadership to the Board and ensures that the rules of order are followed in meetings. The Vice Chair also provides leadership to the Board and presides if the Chair is absent, unable to serve, or needs to be temporarily excused from a meeting. Members of the Executive Committee provide oversight to the Board and to administrative functions between meetings. The Executive Committee meets on the first Friday of each month to talk about upcoming reports for each subcommittee and to keep things moving for the Board throughout the year. The terms for both Chair and Vice Chair are 1 year, with re-election for a period up to 3 years or until Board membership expires. Esch noted that the Board welcomes consecutive terms by members to retain institutional knowledge.

Since a vote was not held in September 2013, new appointments would technically end in the fall of this year and hence the term would be shortened. Esch suggested that the Board have a discussion at the fall 2014 meeting to extend those positions through to the following year.

Esch provided an overview of major changes made to the Board's general operating procedures in 2013. Two changes were made after the 2014 Farm Bill: 1) if there is a tie for Chair, the Executive Committee will hold a separate vote to distinguish the Chair and Vice Chair, and 2) membership on a subcommittee will have a term of 3 years.

Only one member was nominated for Chair – Dr Milo Shult. Shult was accepted as Chair by a unanimous verbal vote. In accepting the position, Shult thanked former co-Chair Steve Hamburg for his dedication and continued commitment to the Board.

REMARKS FROM THE UNDER SECRETARY FOR REE

Dr Catherine Woteki (Under Secretary for USDA Research, Education and Economics [REE] / USDA Chief Scientist) gave a presentation entitled 'Update to the National Agricultural Research, Extension, Education, and Economics Advisory Board' to the Board.

Note: the presentation slides were made available to Board members through the Sharepoint website.

Woteki updated the Board on current and pending USDA business, including department budgets for 2014 and 2015 and implications of the 2014 Farm Bill. She noted that the USDA is implementing a policy to provide an official response to each report and set of recommendations provided by the Board. That response will accompany the Board's reports when submitted to the Secretary. She also noted that two subcommittee reports require review by the Board: those from the National Genetic Resources Advisory Council and the Specialty Crops Committee. Other reports that could not be submitted to the Secretary while the Board's authorization had lapsed will now be submitted, including 2012 reports from the Renewable Energy and Relevancy and Adequacy Committees.

Woteki explained that the 2014 Farm Bill resulted in 85 new responsibilities for NIFA, some of which are very time sensitive. All of the provisions have been reviewed, put on a calendar with due dates and assigned personnel. The highest priority for NIFA is the mandatory grants programs, ensuring that RFAs are issued soon so that funds for 2014 can be allocated.

Another big piece of work mandated by the Farm Bill is establishment of a new foundation for Food and Agriculture Research. The mandate is to provide matching funds for research in 7 areas of work, which are complementary to work already sponsored either in intra- or extramural programs. This provision names 5 *ex officio* members for the foundation's board, whose job is to 1) identify the board of directors, and 2) incorporate the foundation. The *ex officio* members are the Secretary of Agriculture, the Under Secretary for REE, the director of NIFA, the director of ARS, and the director of the National Science Foundation (NSF). The board of directors will have 15 members, 8 to come from a list provided by the National Academy of Sciences (NAS) and 7 from industry. Woteki said that they have not yet received a list of nominations from NAS. They have been running a public solicitation for nominations from industry, receiving over 200 unique names. They are now in the process of vetting those nominations and will convene later this spring to name the board of directors. They plan to incorporate the foundation this summer. Upon incorporation, the foundation will have an endowment of \$200 million to match funds coming from external partners in support of research. There is very little detail provided in the legislation about the foundation; it will up to the board to determine its operational programs.

In regard to the USDA's budget, Woteki outlined the 2014 appropriation for each of the REE agencies - \$1.15 billion for ARS (\$1.136 billion requested for 2015), \$1.42 billion for NIFA (\$1.49 billion requested for 2015), of which \$316 million is earmarked for AFRI, \$78 million for ERS (\$83 million requested for 2015), and \$161 million for NASS (\$179 million requested for 2015). Woteki noted that NASS is currently coming off its last census cycle so the budget is lower in 2014 but will go back up in 2015 based on their planning cycle. The 2015 budget emphasizes work on climate change, genetic improvement and translational breeding, pollinator health, and increasing funding for the competitive grants program (AFRI).

Woteki noted that there is a separate request in the 2015 budget affecting ARS and NIFA, which is not reflected in these numbers, for a fund called the Opportunity and Growth Initiative. For ARS the request is for an additional \$200 million, of which \$155 million would be earmarked for

replacement of the poultry infectious disease lab in Athens, Georgia. For NIFA, the extra funds would be requested for AFRI and for capacity funds. These requests are suggested avenues for allocating any extra available funding.

The 2015 budget requests also include funding for 3 of the 6 Innovation Institutes recommended by the PCAST report, in the amount of \$25 million per institute per year. Woteki noted that the USDA has followed the Board's guidance on soliciting input from the broader community – they have held 2 listening sessions so far and plan on holding more later this year. It is proposed that these 3 institutes focus on the following high priority areas: Pollinator Health, Antimicrobial Resistance, and establishment of a National Network for Bioproducts Manufacturing Innovation. The USDA plans for NIFA to issue RFAs for Innovation Institutes in these topical areas upon enactment of the 2015 appropriations.

Board Discussion

Woteki listed other activities she has been working on, which include international work on open data access for agriculture and nutrition, working with G20 countries on the upcoming meeting of agricultural chief scientists, and the President's initiative on antimicrobial resistance.

In response to a question, Woteki talked about the issue of germplasm exchange with China. Currently there is a 13-year-old research agreement in place, under which the two countries meet annually to review projects. There are 3 flagship projects in the areas of genebanking technologies, water saving technologies and biotechnology. The genebanking topic was proposed in an effort to gain more open access to the Chinese germplasm collection. Woteki noted that the number of exchanges from China has increased in the past couple of years from a couple of dozen to over 2000 per year. The USDA is in the process of negotiating a Memorandum of Understanding (MOU) with the Chinese Ministry of Agriculture, which has direct control over the germplasm collection. She noted that while there has been some progress, there is not yet an open exchange of information.

Woteki clarified that there is nothing that the Board currently needs to be doing with regard to the Science Advisory Board. The USDA intends to name a committee that will function under the Board, although for the time being implementation of the Farm Bill has taken priority.

In response to questions, Woteki clarified that the antimicrobial resistance topic for the innovation institute is intended to focus on antibiotic resistance in the agricultural system, from the perspective of reducing the development of antibiotic-resistant pathogens for both animal and human health and safety.

On the subject of pollinator health, Woteki said that there is enormous interest in the topic – the USDA has received letters from dozens of Congress members asking the department to take more action. There seems to be a great deal of frustration that more progress has not been made, which is one of the reasons why an innovation institute that combines fundamental research and development of specific interventions has a lot of merit. She noted that the budget is meant to cover the topic of pollinator health very broadly, with a separate component set aside for bee colony collapse. Dr Chavonda Jacobs-Young added that they have found there is no one culprit

responsible for bee colony collapse. They are looking at nutrition, mites and other insects that might be predatory, pesticide use, and land use change as possible causes.

In response to questions, Woteki explained that the FDA has adopted an approach of adding ‘approved uses’ labels for antibiotics and making antibiotics used in livestock operations available only with the approval of a veterinarian. This approach is intended to prevent the use of antibiotics for growth promotion, moving away from their use in sub-therapeutic realms and retaining their use for animal health. Woteki noted that the USDA works with the FDA on the development of resistance in human pathogens in livestock, but this case of antibiotic labelling was a regulatory decision made by the FDA.

On the subject of the Open Data Initiative, Woteki explained that the requirement for sharing is not only for scientific data but also for programmatic data across the department. She noted that privacy will be respected and so they will maintain the confidentiality associated with data from the private sector, but otherwise all USDA data will be made open.

In response to questions, Woteki clarified that the Innovation Institute for Bioproducts Manufacturing Innovation is intended to cover a spectrum of chemicals that can be produced from agricultural products and agricultural waste, including fuels, as well as chemicals that could be used for the synthesis of other substances important in manufacturing or in the pharmaceutical industry. It will also include an array of approaches to manufacturing that rely on microbial processes, including but not limited to energy production.

PART II: Discussion on the Balance of Crop Research (PCAST)

INTRODUCTORY REMARKS

Dr Milo Shult (Chair) introduced this session by noting that it was also discussed at the last Board meeting, with presentations from members of the President’s Advisory Committee on Science and Technology (PCAST) Agricultural Preparedness Working Group and the REE agencies. Shult stated that the objective for this meeting is for the Board to solidify a process for creating the set of recommendations that will be useful to the Under Secretary for REE and the USDA in general. Shult noted that the Executive Committee established a small working group to begin the process on behalf of the Board, and met with REE agency representatives. Shult then read out the Board’s charge from the Under Secretary for REE:

“Using advisory capacity from REE agencies including the Economic Research Service, Agricultural Research Service and the National Institute for Food and Agriculture, as well as expertise from other public and private organizations, [the Board] is requested to examine the recommendations in PCAST as stated above and within the entire document regarding crop research balancing.

The charge is to examine: what is the ideal balance of research on the main commodities versus expanding public research capabilities to other crops and plants? What research topics and projects and associated researchers could be shifted and what research must be maintained under USDA oversight, or in some cases “control?”

[The Board] should take into account the role that REE agency research play[s] in supporting the food regulatory agencies, and the need to protect U.S. agriculture as a whole including responding to new contaminants, diseases, crop failures, challenges to food security and other impediments to providing a safe, wholesome and abundant food supply for the American people. It should also comment on the role of government to government research projects and demands for all commodities in international trade.”

PRESENTATIONS FROM OFFICE OF CHIEF SCIENTIST AND ERS

Dr Ed Kaleikau (Senior Advisor, OCS) gave a presentation entitled ‘Report and Recommendations on the Balance of Crop Research’ via video teleconferencing.

Note: the presentation slides were made available to Board members through the Sharepoint website.

Kaleikau summarized the information received by the Board thus far to be used as input for the Board’s response, which includes the PCAST report itself, the Charge from the Under Secretary, the minutes of the Board’s September 2013 meeting, the responses to PCAST from ECOP and ESCOP, and the ERS, ARS and NIFA talking points from the September 2013 meeting.

Note: all of these documents should be available to Board members via the Sharepoint website.

Kaleikau then provided a suggested outline for the Board’s report, containing a description of the charge, a description of all the input received, and the specific Board recommendations.

Kaleikau asked the Board to consider what other information, if any, it requires in order to complete its report. It was suggested that the Board could convene a workshop that allows key stakeholders to interact with the Board, possibly even as a working workshop to help draft the report. The Board could also hold a listening session with key stakeholders to gather more input.

Kaleikau suggested that, at this meeting, the Board identify a Chair and any additional members for the working group that will develop the report. He also suggested that the Board have a report ready for discussion at the fall 2014 meeting.

Dr Paul Heisey (Economist, ERS) gave a presentation entitled ‘The Balance of Crop Research (PCAST): What do we know, what don’t we know?’ via video teleconferencing.

Note: the presentation slides were made available to Board members through the Sharepoint website.

Heisey described the PCAST recommendation in more detail. He noted that the PCAST report listed five crops as the focus majority crops – corn, soy, rice, wheat and cotton. These may have considerable interest from the private sector, but there is a different level of interest and private sector investment in those crops. Heisey showed that other commodity and specialty crops have substantial private investment. Heisey also summarized the data on existing public agricultural research expenditures, which could be used to prioritize future research areas, and described two previous exercises in agricultural research priority setting. He noted that the scientific ease and the economic value of research should be kept as separate considerations.

Heisey described the current allocations of public versus private agricultural research expenditures, and noted that there are two areas where the private sector contributes the bulk of funding – food and feed manufacturing, and farm machinery and engineering. In most other areas, the public sector contributes most or all of the funding. The closest balance between private and public funding dollars is in the area of crops and animal production. However, the USDA tends to fund more of the long-term basic research, while private companies tend to fund more of the short-term applied research.

Heisey noted that data is limited and more information needs to be acquired on research investments in both the public and private sector. However, from the studies conducted to date, the research suggests that the roles of public and private sector agricultural research are often complementary, not competitive. The existing research suggests that the relationship is complicated and should be investigated on a case-by-case basis to identify areas where funding is duplicative. Heisey also asked the Board to consider to what extent our assessment of future needs might change the evaluation of current research priorities.

DISCUSSION RE: DEVELOPMENT OF REPORT AND RECOMMENDATIONS

The Board engaged in substantial discussions on the work required regarding the balance of crop research. The following list summarizes the issues that were raised during question time:

- 1) *Distinguishing ‘public’ from ‘private’ investment.* It was noted that in some cases plant breeders and/or growers may financially support research done by public sector programs, and that mandatory check off programs might be considered a public source of funding. These and other situations complicate the definition of public versus private sector investment, which may make it difficult to determine the extent of funding from each sector and the associated need for rebalancing.
- 2) *Differences in investment time horizons.* It was noted that public and private sector programs often have different research time horizons, even when working with the same crop. Public investment is more likely to be in fundamental basic research, where the intended time horizon is 10 years or more, while private investment is more likely to be in shorter-term applications with time horizons of less than 5 years. It was also noted that initial basic research investments by the public sector may stimulate further research investments by the private sector. Hence the temporal relationship between public and private investment may be entirely complementary and necessary, but may appear duplicative if not investigated appropriately.
- 3) *Differences in investment between major and minor crops.* It was noted that the nature of complex temporal relationships, as noted in point 2) above, may differ significantly between major crops and minor crops like tomatoes, such that sweeping statements about the need for rebalancing may be inappropriate. It was also noted that the very definition of major versus minor crops might need to be reconsidered.
- 4) *Evaluation metrics.* It was suggested that a set of metrics to evaluate the impact of research investments might be helpful, as opposed to a single metric that will contain a lot of inherent bias. However, it was also noted that any suite of metrics would need to include all desirable outcomes of research investment including those that might be hard to quantify, such as training of the next generation of breeders and public access to germplasm.

- 5) *Maintaining national capacity.* It was noted that there are likely to be critical research areas that are in the nation's interest to maintain, including important crops and encouraging a new generation of people into farming and agricultural business. In those cases, even if private sector investment is significant, some degree of consistent public investment might be warranted to ensure continued national capacity and minimize the risk of waning interest from the private sector.
- 6) *Commercial viability.* It was noted that the private sector is likely to be motivated to invest in research only when the commercial viability of that research is evident. Hence when a long-term goal is in the nation's interest but is not currently commercially viable, such as diversification of the regions growing fruits and vegetables, the public sector might need to invest in research first in order to stimulate private sector investment.
- 7) *Consideration of current versus future needs.* It was suggested that any discussion about research investment priorities should account for both existing and future needs, such as training and encouragement for new emerging farmers, and crops that are profitable on small scales due to decreases in the land area of most farms. Consideration of future needs would also allow for some degree of proactive research and preparedness for anticipated crises, though again the difference between public and private interests would need to be explored.

As part of these discussions, several Board members noted that a workshop and/or listening session would be beneficial for gathering additional input on financial investments from multiple perspectives in the public and private sector. It was noted that input should be sought from all levels of producers, from small to large, as well as from some of the ranchers and farmers who are part of the USDA's programs.

It was suggested that the Board would benefit from creation of a matrix to identify case studies of research investment in different categories: public versus private, independent versus complementary investment, short-term versus long-term research time horizons, impetus on regionality versus generality in growing locations, major versus minor crops, and so on. Such a matrix would help to distinguish areas where funding might be duplicative or competitive from areas where funding is complementary.

In response to questions, Dr Catherine Woteki stated that Congress places strong pressure on the USDA to identify duplication with the private sector. The 2014 Farm Bill requires that the USDA submit an annual report that identifies where the department is duplicating research done by the private sector, states, the university community and other federal agencies. The first of these reports has just been delivered. Woteki noted that the USDA does not consider there to be a lot of duplication between the public and private sectors, and that there are mechanisms in place for collaborating with other federal departments, such as the Department of Energy and NIH.

During the Board discussion, it was suggested that the Board's report responding to the charge regarding crops (i.e. due for the fall 2014 meeting) should focus on crops but that the issue is much broader. It was suggested that the Board might consider widening its conversation and recommendations to include the nature of public versus private investment in agriculture more generally, as well as the relationship of agriculture to health with regard to food and nutrition.

WORKING SESSION

Establishment of Working Group to Address PCAST Charge

Dr Milo Shult called for volunteers for the working group that is developing a report to address the PCAST charge. The work will include more than one conference call and a workshop or listening session.

Dr Catherine Woteki noted that the USDA would like input from the Board soon but recognizes that additional information may be need to be acquired. Hence the Board should aim to provide a working discussion document within 3 months.

The following Board members volunteered to be members of the PCAST Working Group: Leo Holt, Twilya L'Ecuyer, Dr Mark McLellan, Julia Sabin, Dr Milo Shult and Dr Robert Taylor. McLellan agreed to chair the group.

Note: Dr Agnes Mojica was previously a member of this working group, but her continued participation could not be verified since she was not present at the meeting.

Appointment of Vice Chair and Nominations for Executive Committee

Dr Milo Shult called for nominations for the position of Vice Chair of the Board. Only one member was nominated for Vice Chair – Dr Steven Daley-Laursen. Daley-Laursen was accepted as Vice Chair by a unanimous verbal vote.

Shult then called for nominations for the Executive Committee. He explained that the Chair and Vice Chair are automatic members of the Executive Committee and the Board needs to elect an additional 7 people. Shult described the functions of the Executive Committee as follows: meet by conference call once per month; review any documents that are submitted to the Board from subcommittees for approval before providing to the entire Board; and initiate occasional working groups to address specific issues.

Board members created a list of nominations for the Executive Committee. Michele Esch handed out ballot papers to all present Board members. Votes were cast and the ballots collected.

PUBLIC COMMENTS

There being no public comment, the meeting recessed at 5:00 p.m. pending an informal evening session.

EVENING SESSION

An informal evening session began at 6:00 p.m. at the Barnhart Rice Homestead located on the Wooster campus of The Ohio State University (OSU).

Welcoming remarks were given by Dr Steven Slack (ESCOPE Chair and Director of the Ohio Agricultural Research and Development Center [OARDC]), Mark Smucker (President of

Smuckers' US Retail Coffee division), Dr Bruce McPheron (Vice President and Dean, College of Food, Agricultural and Environmental Sciences, OSU), Dr Robert Matteri (Area Director, Midwest Area ARS), and Dr Catherine Woteki (Under Secretary for USDA REE / USDA Chief Scientist).

The meeting was adjourned for the day at 6:50 p.m.

TUESDAY, 6 MAY 2014

PART III: Presentation of the Agricultural Experiment Station System

The meeting was reconvened at 7:10 a.m. at the Hilton Garden Inn for travel to the tours.

INDUSTRY AND FACILITY TOURS

This meeting included a disciplinary focus on the Agricultural Experiment Station System. Board members took part in tours of the J. M. Smucker Company and Cedar Lane Farms, as well as the Ohio Agricultural Research and Development Center (OARDC) and USDA ARS facilities located on and near the OSU campus in Wooster.

Julia Sabin (Board member and Vice President, Industry and Government Affairs, J. M. Smucker Company) provided introductory remarks about the J. M. Smucker Company en route to the company headquarters in Orville, Ohio.

Upon arrival at the J. M. Smucker Company, participants heard welcoming remarks from Richard Smucker (Chief Executive Officer, J. M. Smucker Company).

Meeting participants then travelled to nearby Cedar Lane Farms, where they were given a tour of the algae farming and greenhouse facilities by Tom Machamer (Owner, Cedar Lane Farms).

Returning to the OARDC and OSU campus, meeting participants were given tours of various facilities that included the Molecular and Cellular Imaging Center, BioHio Research Park and Secrest Arboretum.

Meeting participants then returned to the Shisler Conference Center for lunch.

WORKING SESSION

Dr Milo Shult (Chair, the Board) called the meeting to order at 1:30 p.m.

Resolutions Regarding Outgoing Chairs

Dr Steven Daley-Laursen presented two resolutions to the Board as follows:

- 1) Whereas, he has provided and we have benefited from:
his rich and varied career experiences in Ag and NR;

his extraordinary leadership and people skills;
his broad knowledge on the issues we address; and
his wisdom and wit,

Therefore, be it resolved that we the members duly and enthusiastically thank Dr Milo Shult for his dedicated service as co-chair of the NAREEE Advisory Board.

- 2) Whereas, he has provided and we have benefited from:
his energetic leadership;
his focus on quality and procedural precision;
his effective networking with USDA and other partners; and
his intelligence and ideas on the issues,

Therefore, be it resolved that we the members duly and enthusiastically thank Dr Steven Hamburg for his dedicated service as co-chair of the NAREEE Advisor Board.

Both resolutions were approved by a unanimous verbal vote. Hamburg and Shult both thanked the Board for the resolutions.

Announcement of the Executive Committee

Michele Esch (Executive Director) read out the results of the previous day's voting for the new members of the Executive Committee. The elected members were: Dr Charles Boyer, Dr Patsy Brannon, Dr Carrie Castille, Leo Holt, Dr Mark McLellan, Julia Sabin and Dr Robert Taylor.

Dr Milo Shult reminded the Board that any member, including those not elected to the Executive Committee, is welcome to participate in a conference call meeting of the Executive Committee at any time to provide input on an issue.

OVERVIEW OF THE AGRICULTURAL EXPERIMENT STATION SYSTEM

Presentation from OARDC

Dr Steven Slack (Chair, Experiment Station Committee on Organization and Policy [ESCOP] and Director of the OARDC) gave a presentation entitled 'Experiment Stations Provide a Critical Research and Development Link for Addressing State and Regional Constraints'.

Note: the presentation slides were made available to meeting participants in hard copy form.

Slack gave an introduction to his own background and provided an overview of the history of the ESCOP system. He then described how ESCOP fits into the broader network of the Association of Public and Land-Grant Universities (APLU). He showed a map of the regional network of experiment stations, and described the structure and function of both ESCOP and the Extension Committee on Organization and Policy (ECOP).

Slack summarized the content of the ESCOP publication 'A Science Roadmap for Food and Agriculture'. *Note: A hard copy of this publication was provided to all meeting participants.* He noted that ESCOP's roadmap is complementary to the USDA's own roadmap, engaging on similar issues from a different perspective.

Slack described the Agricultural Experiment Station (AES) national priorities for 2014. He noted that the impact reporting database is located at Texas A&M University, and that both ESCOP and ECOP will be submitting materials to that database to be used across the system, including by NIFA. Slack summarized the research that is supported by AESs, including the funding that is available and requirements for matching. He noted that the partnerships with NIFA and ARS are mutually beneficial, with considerable communication flowing between both partners.

ESCOP conducted an evaluation in 2004 to identify key focus areas for Ohio and named 3 signature areas: food security, production and human health; environmental quality and sustainability; and advanced bioenergy and bio-based products. Within those 3 areas, ESCOP tries to look at research value chains from basic science through to commercialization. Slack described the process by which ESCOP sets priorities, including advisory boards, field days and various meetings with industry, state and federal agencies.

Slack noted that a lot of ESCOP's communication is undertaken through the multistate project format. He provided examples of the multistate research awards from 2012 and 2013, and emphasized that, in these projects, researchers were working with producers and extension educators. This network was helpful in the case of the soybean rust invasion, and allowed for the development of Section 18 materials to control soybean rust relatively quickly.

In describing the 2013 funding for ESCOP, Slack noted that the primary sources from state and federal appropriations are used for infrastructure, facilities, programs and faculty salaries, i.e. the capacity funds go directly into academic programs. He also noted that the amount of funding from both state and federal sources has been almost constant for the past decade. This has led to fewer faculty hires and greater reliance on leveraging existing faculty resources. Slack noted that sources of increasing funding over the past few years include the USDA and colleges and universities with whom ESCOP has cooperative agreements. Slack summarized ESCOP's research productivity metrics for 2013.

Slack described the importance of agriculture for the state of Ohio. He noted that primary issues of concern include water and nutrient management (i.e. concerns about algal blooms), food safety and gut nutrition. He also noted that information on these subjects is acquired by interacting with different groups and communicating across populations, illustrating the importance of the ESCOP network.

USDA'S ROLE IN THE AGRICULTURAL EXPERIMENT STATIONS

Presentation from NIFA

Dr Meryl Broussard (Deputy Director for Programs, NIFA) gave a presentation to the Board via video teleconferencing. He provided a federal perspective on the AESs and described the importance of the system in terms of NIFA's mission.

Note: no presentation slides were used for this talk and no talking point notes were provided.

Broussard stated that having a strong national system of AESs is critical for food security, the economy and the educational and extension functions that are supported through the USDA.

NIFA views the relationship between itself and ESCOP as a partnership, where NIFA's role is to provide leadership and oversight for federal investment in conjunction with stakeholders and other partners. He noted that a large part of his job is to listen to the critical needs and priorities of different stations and researchers, at the state, regional and national level, and then to communicate back the capabilities and limitations of the agency.

In regard to funding, Broussard noted that there is approximately \$224 million of capacity funding available through the Hatch system, with 25% allocated for multistate activities, and \$50-52 million through the 1890 authority. There are about 7000 active Hatch or Evans-Allen projects and 129 multistate activities currently in the ESCOP system. The competitive grants program builds on the capacity funding, with about \$316 million available through Agriculture and Food Research Initiative (AFRI) now. Broussard noted that the authorized level of funding is \$750 million but little progress has been made toward reaching that target over the past 20 years. The land grant universities receive approximately 80-85% of the competitive grants, illustrating their competitiveness with regard to the 'Tier 1' institutions. He noted that the investment in competitive versus capacity funds should be roughly equal.

In terms of oversight, Broussard explained that NIFA is concerned about program relevancy, quantity, quality and performance. The definition of 'relevant' is not very prescriptive for capacity funds – NIFA allows considerable leeway for the university to determine what is important. Broussard noted that NIFA is not prescriptive in setting priorities, instead recognizing the ability of ESCOP directors to set appropriate priorities at the state level. NIFA also relies on annual state plans to outline research and extension activity at land grant universities.

Broussard noted that NIFA's challenge areas line up well with ESCOP's Science Roadmap, even at the state level in Ohio. He underscored the need for consistency in the priorities of the Administration, Secretary of Agriculture, Under Secretary for REE and the Board. He noted that an issue will present itself at the local, county or regional level before it becomes a national priority, and one advantage of the ESCOP network is to identify critical issues early.

BOARD DISCUSSION

In response to a question, Broussard noted that all states have requirements for integrated plans of work for the 1862 and 1890 institutions.

Slack noted that ESCOP has responded in several ways to begin dealing with issues of climate change. One method is through multi-institutional grant efforts, such as through AFRI, to investigate what will happen to certain crops under a changing environment. He explained that they may hire people with specific skills, such as climate modelling, for individual projects and programs, but will also ask existing faculty to build in elements of climate change into their existing research projects as they move forward.

The issue of agency representation at meetings of multistate projects was discussed during question and answer/discussion time. Slack explained the administrative structure of such projects, having both an ESCOP director (called an Administrative Advisor) and an assigned NIFA representative. It was noted that budgetary constraints have restricted travel for agency and

department representatives. Slack noted that in many instances conference calls have replaced in-person meetings, which ensures that messages aren't lost but does not lead to the same kinds of conversations that can be generated during regular in-person meetings. Slack also noted that there is value in having an Administrative Advisor present at multistate project meetings and he will be looking at the Farm Bill to see if there is money for increasing travel to meetings. Broussard added that NIFA's objective has been to attend multistate project meetings at least every other year to maintain the project dynamic. NIFA recognizes the negative impacts of not attending meetings.

In response to questions, Broussard and Slack talked about ways for the ESCOP system to optimize its work during times of budget constraints. Broussard noted that NIFA is looking at consolidation of Integrated Pest Management (IPM) lines, proposing to integrate the current 6-8 lines related to crop protection into one program. The aim is to make programs more efficient rather than trying to maintain many small project lines. NIFA is also looking to reach out within AFRI to other agencies and to build partnerships, aiming to have a diversity of funds coming into a station to increase stability and flexibility. Slack added that as the ESCOP Director he meets annually with college departments to discuss priorities with respect to programs and faculty, and to discuss the impact of activities undertaken over the previous year.

In response to a question, Broussard acknowledged that there is variability between the states with regard to the proportion of federal funding and matching funds. There is a wide range from states with a 1:1 match to other states like Ohio, Texas and California where the federal funds are a much smaller component of the total funding. He noted that one area of concern is that for Hatch funding there is a 1:1 requirement for matching, which many institutions are working to acquire. However, there is an option for 1890s institutions to obtain a waiver, which is granted when there is appropriate justification. Broussard also noted that the 2014 Farm Bill has created some confusion in terms of program administration by adding exceptions for land grant partners.

In response to a follow-up question, Broussard acknowledged that the issue of matching funds is controversial for the non-land grant institutions, some of whom feel that they are forced to partner with land grant institutions to get around the matching requirements. He noted that it is possible for a non-land grant institution to be the lead institute and primary recipient of a grant, but it would have to demonstrate a substantial and real partnership with a land grant institution.

On the subject of projects with an international component, Broussard explained that most programs will need to demonstrate that any international work has significance for US agriculture. As part of NIFA's realignment, Broussard is challenging the international programs to review all the portfolios and ensure that NIFA is a globally-engaged agency. He also noted that it is easier to justify international work in areas like climate change, pest management and food security. Broussard noted that NIFA is currently working on bilateral agreements with some countries. From NIFA's perspective, any proposal for international work has to be driven by direct benefits to US producers and industries, not by assisting another country to develop its own agriculture.

In response to a question about short-term versus long-term research goals and funding, Slack noted that faculty are generally hired with certain expertise in mind. Available funding in

specific areas goes through up and down cycles, so in many cases faculty need to make short-term decisions about how to run their programs based on funding, but they are counseled to keep long-term objectives in mind. Slack noted that the ESCOP system is fairly resilient and doing a good job of responding to short-term changes in funding, but that its flexibility is not what it was a decade ago and the system cannot continue to be squeezed.

ANIMAL RESEARCH – ZOONOTIC AND EXOTIC DISEASE THREATS

Presentation from OSU Department of Veterinary Medicine

Dr Y. M. Saif (Professor and Head Emeritus, Food Animal Health Research Program, OSU) gave a presentation entitled ‘Food Animal Health Research Program: People, Programs and Facilities’. *Note: a copy of the presentation slides can be requested from the Board office.*

Saif provided an overview of the Food Animal Health Research Program (FAHRP), which receives most of its financial support from ESCOP. FAHRP faculty are trained to work in infectious disease and consult with national and international agencies, including commodity groups. Saif noted that while ESCOP funds the facilities at FAHRP, research support comes from extramural sources. Facilities include a germ-free facility, where most of the infectious disease work has been done since 1962, and a newly-finished BSL3 facility. Saif noted that FAHRP got involved in food and environmental safety research some years ago.

Saif provided a description of the research conducted by FAHRP in the area of zoonotic disease, where the objective is to prevent or control animal disease. He gave detailed examples of projects about rotaviruses, which are the leading cause of gastrointestinal (GI) disease in both human infants and young animals. One line of work is investigating why oral vaccines have low efficacy against rotaviruses in field conditions in both humans and animals. Saif also gave examples of projects related to coronaviruses, which include looking for interspecies transmission of disease. One type of coronavirus is porcine epidemic diarrhea virus (PEDV), which emerged in the US in 2013 and has now spread to 50 states, killing millions of baby pigs. A growing area of research is in noroviruses, for which there are no vaccines.

Saif noted that the FAHRP group is in veterinary science and therefore does not create disease in animal models in order to pursue research about humans, but rather investigates cases where animals naturally acquire diseases that are also prevalent in humans. One example where FAHRP researchers have worked with human health agencies (i.e. the Centers for Disease Control and NIH) is on influenza viruses, which change every year. FAHRP researchers are looking for common antigens between the different viruses, some of which go back and forth between animals and humans while others do not. FAHRP also works on food borne pathogens. These don’t usually affect animals, but veterinary researchers are helping to identify animal- and farm-related methods of transmission.

Board Discussion

In response to questions, Saif explained that researchers are not sure why probiotics have an effect on rotaviruses. He noted that significant changes occur in gut microflora when someone is

given probiotics, but it is unclear whether those different bacteria are antagonistic against the virus or if there is some other mechanism. That line of research is still in the early stages.

Saif explained that there is an alpha and delta form of the transmissible GI disease CoV. Respiratory CoV is related to the GI form and shares antigens, so if an animal has had one form of CoV it prevents severe disease from the other form. In Europe, porcine epidemic diarrhea used to be very common but has decreased substantially. Researchers are not sure exactly why. They suspect it might have been replaced by a similar virus that doesn't cause severe disease.

POSTER SESSION

Board members were provided with an opportunity to talk informally with OARDC, OSU and ESCOP researchers about ongoing work and to view research posters at their leisure.

WORKING SESSION

Dr Milo Shult noted that the Board will need to develop a report on ESCOP, similar to what it did for ECOP previously, and called for volunteers to form a working group. Dr Dawn Thilmany volunteered to chair the working group. Dr Patsy Brannon and Rita Green also volunteered to join the group. It was suggested that the report follow a similar format as for the ECOP report.

Shult then noted that a number of issues were raised during the discussions about the Open Data Initiative, and asked Dr Steven Daley-Laursen to chair a working group on the issue. Daley-Laursen agreed. Dr Carrie Castille, Dr Govind Kannan, Dr Mark McLellan and Dr Dawn Thilmany also volunteered to join the group.

PUBLIC COMMENTS

There being no public comment, the meeting was adjourned for the day at 5:30 p.m.

WEDNESDAY, 7 MAY 2014

Dr Milo Shult (Chair, the Board) called the meeting to order at 7:40 a.m.

PART IV: Board Business – Committee and Subcommittee Reports

SPECIALTY CROPS COMMITTEE

Presentation from Chair

Dr Charles Boyer (Chair, Specialty Crops Committee) gave a presentation to the Board about the report that the Specialty Crops Committee (SCC) recently submitted to the Board for review. *Note: no presentation slides or talking point notes were used for this talk.*

Boyer noted that the report was generated in response to the 2014 Farm Bill, which gave additional responsibility to the SCC related to the desire for specialty crops brands. NIFA is

required to start a relevancy review process for the specialty crops initiative and to consult with the SCC in that process. To respond to this Farm Bill requirement, the SCC met via video teleconferencing in February with the Specialty Crops Research Initiative (SCRI) program managers, the Under Secretary for REE and other Board Executive Committee members. Two program leaders for SCRI outlined their plan for going forward with issuing RFAs. Boyer noted that NIFA was under time constraints to move forward with developing calls for proposals and awarding grants within this fiscal year.

Boyer described significant aspects of the report that developed from those conversations. Firstly, the SCRI program leaders laid out their criteria to be used in relevancy reviews of proposals. These criteria include: the significance of the challenges being addressed; how stakeholders are identified in developing project goals and objectives; how PIs plan to remain engaged with stakeholders as they enter into project activities; ways in which information developed from the project would be communicated to stakeholders; and how stakeholders would be used in evaluation of the project at the end. The second significant component of the report is a set of recommendations from the SCC. Boyer noted that this report represents a new relationship between the SCC and NIFA: it places the SCC in an active role of potential influence over the grant process and how that process works, as opposed to the SCC simply giving advice.

Boyer reflected that this development in the grant review process may have initiated in response to various stakeholders feeling that they have invested considerable energy into ensuring grant support for specialty crops but haven't received sufficient attention in the review process. The comments in the report are intended to complement the scientific review and provide input to the total review of projects in a way that reflects the stakeholders' perception of value.

Boyer noted that there is debate among the SCC about how 'relevancy' is defined. One perspective is that of an individual producer of specialty crops: if a project will provide information to me, then I would consider that project relevant. However, many people on the SCC represent large producers and are concerned about overall impact. Hence if a project is only relevant to a single grower, it will have a small impact. The recommendations made by the SCC include suggestions for how to have those sorts of issues available during the review process.

The SCC expressed concern that this year, particularly because of the shortness of the process and the 2 steps involved (relevancy review and scientific merit review), the review would not be done in a way that allowed the panel to discuss the collection of proposals to create some normalization of the reviews and broader discussion. Another concern was to ensure that information from the relevancy reviews was shared with the scientific merit review panel and considered as a significant portion of the final decision making process. Boyer noted that some SCC members argued for almost equal treatment/weighting of relevancy and scientific merit.

Boyer emphasized that the report was completed fairly quickly so that the SCC could give feedback to program leaders. Therefore in some ways the SCC's recommendations will continue to be discussed moving forward as they look at the current year's review process.

Board Discussion

During Board discussions, Michele Esch noted that in the coming year the SCC will comment on all grants awarded during the previous year and provide feedback to NIFA on the relevancy and impact of those grants. The purpose will be to provide advice on what worked and how NIFA could do better in the grant awarding process.

In response to questions, Boyer explained that the relevancy review panel is composed of people solicited broadly through the SCC. They often look for people who have research experience, although Esch noted that it was recently decided that a person could not serve on both the scientific merit and relevancy review panels.

Boyer noted that in the past program managers were found to be sharing information about RFAs that had not yet been released, which represented a conflict of interest and put the SCC in a difficult position. In response to questions, it was clarified that an RFA is public information after its official release, a submitted proposal is always considered confidential and not public, but the abstract of a funded proposal may be made publicly available.

Dr Milo Shult noted that the proposed review process represents an entirely different way of looking at peer review. He also noted that it is desirable to have strong input from user groups on relevancy, but that it may be difficult to arrive at a final review if scientific merit and relevancy reviews are weighted equally and a proposal suffers from lack of scientific merit. Shult noted that during the SCC discussions, it was suggested that a group be convened to develop criteria for assessing relevancy. Having an established set of commodity-neutral criteria would help to address the problem of relevancy being defined by every individual panel member. These criteria would be made available to PIs through the RFA.

It was mentioned that the new review process will need to be carefully communicated to PIs. Boyer noted that program leaders were working carefully to determine how to best advise PIs about presenting their case for relevancy in proposals.

It was noted during discussions that one potential benefit of the new relevancy review may be to open up opportunities for transdisciplinary research.

Shult called for any questions from the Board about the SCC's report before seeking a motion to approve it. In response, Boyer was asked if the report contains anything in particular that will be a challenge to follow through or that needs further clarification. Boyer then described the process for developing the report based on transcripts from the February meeting, editing by Boyer and 2-3 other committee members, and shared communication across the whole SCC. Boyer noted 2 issues that will need to be discussed further: 1) how much weight to place on the relevancy review compared to scientific merit, and 2) the feedback process to the SCC about reviews.

In follow-on questions, concern was raised from the Board that the definition of relevancy in the eyes of the SCC may be skewed by industry perspectives. It was noted that there are other aspects to a project's relevance, such as access to germplasm, public interest, natural resources and environmental impact, which may not be captured by a group from the private sector. It was

suggested that the definition of ‘relevance’ should be broadened and made more inclusive. However, it was understood that this topic will come before the Board again in the future, and it was agreed that the definition of relevance should not prevent the SCC’s report from being accepted now.

A motion was put forward to approve the report of the SCC for forwarding to the Under Secretary, with a question attached regarding the definition of ‘relevance’ in the review process. The motion was accepted by a unanimous verbal vote.

NATIONAL GENETIC RESOURCES ADVISORY COUNCIL

Presentation from Chair

Dr Manjit Misra (Chair, National Genetics Resource Advisory Council [NGRAC]) gave a presentation to the Board entitled ‘Update from the National Genetics Resource Advisory Council (NGRAC) to NAREEE Advisory Board’.

Note: the presentation slides were made available to Board members through the Sharepoint website. A hard copy of NGRAC’s report to the Secretary of Agriculture, dated September 30 2013, was also provided to all meeting participants.

Misra provided an overview of NGRAC’s function and updated the Board on NGRAC’s activity since the September 2013 meeting. He also talked about the report that NGRAC recently submitted to the Board for review.

Misra explained that genetic resources are essentially seeds, but to develop new seeds you need germplasm. Hence germplasm is the foundation of what we need to adapt to climate change and changing consumer needs, and is therefore very important for US agriculture. He noted that NGRAC was started in 1992 but went dormant in 1999 before being reactivated in 2011. However, there was no funding for NGRAC before it became a subcommittee of the Board. Misra described the scope and goals of NGRAC, and listed the appointed and *ex officio* members of the group.

Misra summarized the outcomes of NGRAC’s first meeting in March 2013, which addressed the recommendations of the Advisory Committee on Biotechnology and 21st Century Agriculture (AC21). He noted that there were two major issues: 1) matching decreasing capacity with increasing demand for plant genetic resources / information; and 2) international genetic resource access and exchange. Details of these issues were contained in the report provided to the Board. Misra briefly outlined a number of cross-cutting issues, highlighting tribal germplasm interests. He noted that not only the genetic resource material but also the human knowledge that accompanies the genetic material needs to be preserved.

Misra also described NGRAC’s second meeting in September 2013. One of the AC21 recommendations was to develop a seed access plan. NGRAC included the supply of organic, conventional and biotech seed as part of that request, even though AC21 didn’t specify the inclusion of organic material. AC21 recommended developing the seed access plan in collaboration with the seed industry, but NGRAC felt that it needed to involve a broader group

of stakeholders, including the plant breeding community and downstream food producers. NGRAC did not feel it had sufficient time to develop an adequate plan and needs additional time to develop a holistic and inclusive perspective from industry, research and user communities. Therefore NGRAC developed a set of interim recommendations. These included: conducting an assessment to determine the needs of all farmers and establish a baseline for seed access; increasing public-private partnerships; and encouraging organic seed varietal research.

A second recommendation was that the USDA should recommit to maintaining the original genetic identity of accessions in its germplasm banks. Misra noted that NGRAC is already developing a plan for this. He also noted that it is important for owners of varieties protected by Plant Variety Protection (PVP) certificates to declare whether the seed intentionally contains transgenes or not. He cautioned that some of the PVPs will soon expire. At the meeting, NGRAC considered the idea that stewardship fees be charged for germplasm users.

Misra noted that NGRAC addressed the AC21 recommendations because that directive was immediate, but NGRAC also feels strongly that it needs to look at long-term issues, e.g. what is the value of genetic resources to US agriculture and how do we promote and maintain that value? Developing long-term relationships with other countries, e.g. China and India, is also important, and hence the issue of ratifying international treaties needs to be addressed. NGRAC also discussed the topic of education and noted that many people working in genetic resources are near retirement. New genetic resources managers and seed curators will need to be trained before the institutional knowledge is lost.

Misra emphasized that many of NGRAC's recommendations need further clarification. The group met at the end of September just before the government hiatus and prepared the report quickly, so it is anticipating further work to flesh out the details of many recommendations.

Board Discussion

During discussion time, it was suggested that NGRAC placed an unusual degree of emphasis on the subject of tribal germplasm interests. Misra responded that NGRAC is not looking exclusively at tribal germplasm, but rather the topic hasn't been adequately addressed in the past. Hence the Secretary charged NGRAC with looking specifically at tribal germplasm issues. Other Board members added that the issue of tribal knowledge extends beyond traditional crops to native species, cultural and significant uses of species within tribes, and the potential impact of habitat encroachment and climate change on these species. It was noted that many tribes can offer hundreds of years of knowledge about relationships between humans and specific species and operating ecosystems, which can complement knowledge acquired through scientific means.

In response to questions about the consumer side of GE-free germplasm, Misra clarified that NGRAC considered the processor as well as the producer in its recommendations, but did not extend its work down to the consumer.

In response to questions about the definition of organic seed, Misra explained that the label 'organic' refers to seeds that are produced in accordance with the USDA's organic protocol, and hence does not simply refer to non-GE seeds. Organic seeds must be grown on a certified

organic farm and processed in a certified organic facility, and also must not have GE inserts. It was noted that there is currently no industry standard for how companies label their products as ‘non-GMO’ – all such labelling is done with voluntary guidance.

In response to questions, Misra explained the process for exchanges of genetic material. Plant breeders anywhere in the world can look through the seed database, which provides access to both descriptions and images. Usually requests for material are processed and filled very quickly. The seed is sent through the regular US or international mail. There are exchange protocols: the recipient will have to sign certain agreements depending on which country the seed is going to, and a nominal fee may be associated with the exchange. If the seed goes to a genebank, then it will be stored in accordance with that genebank’s protocols. Some methods are very simple – the genebanks store the seeds in environmental chambers where they maintain the temperature. Others are very elaborate and may use liquid nitrogen storage, depending on the species. The genebank will be responsible for reproducing the seed every so many years. They will grow the seed, harvest and test it, and then store the best seed to ensure that it is genetically pure and has high germination.

Dr Milo Shult called for any further questions from the Board about NGRAC’s report before seeking a motion to approve it. There were none, so a motion was put forward to approve the NGRAC report for forwarding to the Under Secretary. The motion was accepted by a unanimous verbal vote.

CITRUS DISEASE SUBCOMMITTEE

Report from Chair

Tom Jerkins (Chair, Citrus Disease Subcommittee [CDS]) updated the Board on the CDS’s activities via telephone. He also provided an overview of the structure and function of CDS. *Note: no presentation slides were used for this talk.*

Jerkins described the membership of the CDS. He noted that member appointments on the previous Citrus Disease Research and Development Advisory Committee (CDRDAC) were made by the Under Secretary of REE, while appointments on the current CDS are made by the Secretary of Agriculture. However, in essence the appointments are very similar and are strongly supported by industry stakeholders. He noted that members of CDS serve at the discretion of the Executive Committee of the Board, and that all CDS advice and recommendations go through the Board to the Secretary of Agriculture. Members are intended to be balanced geographically, with staggered terms and 3-year term limits. There were previously 7 industry stakeholders with 3 agency representatives. Now on CDS there are 9 industry stakeholders with no agency representatives. Currently CDS has 5 members from Florida, 1 from Texas, and 3 from California. Many of these members were also on the old CDRDAC so there is continuity to the new CDS. The CDS members will appoint a Chair and likely a Co-chair. A Designated Federal Officer (DFO) – a permanent federal employee – will also be assigned to serve all administrative purposes of the CDS. Currently the DFO is Michele Esch.

With permission from REE, CDS can create subcommittees for reporting solely back to the CDS.

Jerkins noted that CDS duties are more specific than those of the previous CDRDAC. Whereas CDRDAC was more advisory, relating to more general agency funding, CDS tasks are more actionable, relating to specific funding. CDS advises the Secretary on citrus research, extension and development needs; proposes research and extension budgets and agenda; evaluates ongoing research and extension; establishes annual priorities for grant solicitation and awards; and engages in regular consultation and collaboration with the USDA and other organizations conducting scientific research on and extension activities related to the causes or treatments of citrus diseases and pests (both domestic and invasive). CDS is charged with preparing a report summarizing its findings and recommendations within 180 days of its formation and annually thereafter.

Jerkins described the progress of the previous committee. It met 3 times formally over the past 2 years, with considerable informal overlap between the individual stakeholder members, industry visits and events sponsored by the California Research Board and Florida's CRDF, and other state Citrus Mutual events.

Jerkins noted that industry stakeholders are very up-to-date with the status of the current disease spread, pressure and economic impacts, as well as the current research and extension efforts to address citrus disease. Formal state stakeholder organizations that address citrus have made considerable progress with regard to basic research and developing potential solutions. In particular, Jerkins noted that Florida has spent nearly \$80 million of taxes over the past 6 years to sponsor research. Stakeholders are very aware of the differences between states in regard to production type as well as the different rates of disease spread and economic impacts.

Jerkins described the state of the US citrus industry. He noted that the disease is a classical vector-borne disease, with the known insect vector spreading through California and Texas and the bacteria pathogen not far behind. As such, California and Texas are threatened but not yet infected. In contrast, both the vector and pathogen are widespread in Florida, with the majority of Florida trees infected and symptomatic. Symptomatic trees produce much less fruit, which will be small and misshapen, and of lower quality. Hence without killing the trees, the disease renders the infected trees non-commercial.

In Florida, the problem has gone from a horticultural to an economic one. Jerkins noted that many farmers do not have enough income to hold on as grower wealth and borrowing capacity have been depleted in recent years. 10 years ago, Florida produced 280 million boxes of citrus but this year it will only produce 130 million. On this trajectory, the Florida industry has lost and will continue to lose the infrastructure it needs to survive (e.g. juice plants and packing houses). The different state industries are at different places on the disease curve and have vastly different terminal life spans. Whereas California and Texas will likely benefit from basic research, the Florida industry is in real trouble and will need a great deal of applied research, extension and product delivery to survive.

Board Discussion

Michele Esch noted that Dr Mark McLellan has offered to serve as an *ex officio* NAREEE Board member representative for the CDS and will be present at the next meeting in Washington, D.C.

In response to questions, Jerkins noted that there have been positive outcomes of the research into citrus disease. Progress has been made on genetic resistance to the pathogen, both in terms of regular hybrid resistance and GMO species. These are available as a commercial solution but that requires recapitalization, which may not be possible for many farmers.

In terms of vector control, Jerkins stated that the industry has reached a point of diminishing returns. They have learned a lot about controlling the vector but have almost exhausted themselves with different insecticides. There is a current project funded by NIFA about altering the genetics of the vector such that it can't transmit the disease, but a commercial solution from that project is still 3-4 years away.

Therefore farmers are channeled back into using a bactericide – killing the bacteria in the phloem where it resides. There is sufficient evidence that if the bacteria can be killed, the tree will recover. Other tests have used heat therapy, analogous to humans generating fever in response to infection. If you can heat the tree up, it will either kill the pathogen or drive a defense mechanism in the tree that reduces the presence of the disease.

The industry is looking towards small compound therapy, a highly charged ion something like an antibiotic, which can target the bacteria in the phloem. Jerkins noted that there are many options of that sort. There is a private register that lists a compound with some proprietary issues that seems to be the furthest along in development. The next trial will be the regulatory pathway. They are trying to use the citrus disease foundation, which is allowed to fund things besides basic research, to try to support registrants with promising compounds through the regulatory process. There is evidence that the bactericide kills the bacteria in the lab and in small tree assays, but they need to move to field trials. That is the current state of affairs in Florida.

RELEVANCY AND ADEQUACY COMMITTEE

Report from Co-chairs

Dr Carrie Castille and Dr Steven Daley-Laursen (Co-chairs of the Relevancy and Adequacy Committee [RAC]) updated the Board on the RAC's activities and discussed the latest (2012) report of the RAC that was recently forwarded to the Under Secretary for REE.

Note: no presentation slides or talking point notes were used for this talk.

Daley-Laursen summarized the function of the RAC, noting that it is statutorily defined. The Board has a responsibility to carry out an annual cycle of review and recommendations about the relevancy and adequacy of funding for agricultural research, education and extension conducted by the USDA. The relevancy component refers to the issues of concern, while the adequacy aspect refers to the funding that Congress and the USDA make available to programs to achieve their goals.

The latest report of RAC is now with the Under Secretary for REE. It was completed in September 2012 but the government hiatus affected its submission, so it could be considered the 2013 report. In developing the report, RAC looked at all of the documents that are defining for REE including the action plan, white paper and each of the strategic area documents. RAC

sought input from as many people as was considered reasonable, including the administrators within the USDA, interested parties, Board members, and a variety of people from the user community. Daley-Laursen led a sub-group focused on relevancy, while Castille led a sub-group focused on adequacy. The report is a consolidation of the work of those two sub-groups.

Daley-Laursen summarized the recommendations of the RAC report. In the area of relevancy, the main recommendations were to:

- 1) establish a set of guiding principles describing what relevancy entails. For example, a balanced use of both capacity and competitive funding, leveraging federal and state funding with private sector funding, and integration of research and outreach across the USDA should be stated principles;
- 2) actively engage stakeholders in developing the goals and strategies for the USDA;
- 3) establish whether the USDA should play a primary role or seek collaborative approaches in developing RFAs;
- 4) define goals to facilitate the assessment of measurable outcomes; and
- 5) clarify the role of the Board in developing plans for programs.

In the area of adequacy, the main points of concern were:

- 1) current funding is insufficient to achieve the research goals of REE; and
- 2) more information is required on the meaning and strategy behind the substantial reductions in funding of priority areas.

Castille noted that, as part of the process of developing the report, RAC created a list of questions that require answers from the USDA. These include:

- 1) Has the shift towards AFRI improved the goals of the USDA?
- 2) Does the current research portfolio achieve a balance between short-term and long-term research?

Castille noted that the Board discussions held during this meeting are very timely in relation to the action plan that RAC developed. She noted that the exercise of considering relevancy and adequacy as two separate components was beneficial for gaining an understanding of the relationship between the two. However, she noted that they are inclusive of each other and suggested that conversations would be richer by recombining relevancy and adequacy.

Board Discussion

Dr Milo Shult noted that the Board had originally separated relevancy and adequacy to gain more specificity, but acknowledged that now the dialogue suggests it would be more beneficial to return to a single committee. Shult asked the Board if there were any objections to recombining Relevancy and Adequacy into a single committee. There were none.

Shult then called for volunteers to serve on the Relevancy and Adequacy Committee. Dr Adriana Campa, James Goodman, Wathina Luthi, Dr Neil Olson, Julia Sabin and Dr Robert Taylor volunteered to join the new recombined committee. Castille volunteered to be Chair.

Note: Dr Agnes Mojica was previously a member of this working group, but her continued participation could not be verified since she was not present at the meeting.

Shult noted that 9 Board members were absent from the meeting. He recommended that the Board put out a call for interest in serving on the committee to all Board members.

Castille noted that input from all Board members on the RAC report is important and welcome. Shult added that the same is true for the Executive Committee – the members are elected by the Board but the committee membership does not replace input from the entire Board.

It was suggested that time be scheduled at the fall 2014 meeting of the Board for a roundtable brainstorming session, in which the entire Board could provide input to the RAC report.

REMARKS FROM THE DEPUTY UNDER SECRETARY FOR REE

Dr Ann Bartuska (Deputy Under Secretary for USDA REE) spoke to the Board via video teleconferencing.

Note: no presentation slides or talking point notes were used for this talk.

Bartuska congratulated the Board's new Chair, Vice Chair and the Executive Committee and thanked the members for their service. She noted that she was pleased to hear about the conversations and progress that has been made in this meeting thus far, and is looking forward to the reports that the Board will produce in the near future with regard to the PCAST charge and the Open Data Initiative. Bartuska also stated that she would welcome input from the Board about the balance of holding future meetings in Washington, D.C. compared to a location where Board members can visit USDA activities in action.

WORKING SESSION

Dr Milo Shult asked the Board for input on the timing of the upcoming fall meeting. After some discussion, it was suggested that the fall Board meeting be scheduled close to the FDA meeting to be held in Washington, D.C. on 18-19 November.

Shult reminded the Board that it will need to develop a report on the Agricultural Experiment Station System for ESCOP. A working group was formed for this purpose – Dr Patsy Brannon and Rita Green volunteered to join. Dr Dawn Thilmany volunteered to be Chair. The Board agreed with the suggestion that the report blend and integrate, where appropriate, the previous report written for ECOP, the report written by RAC and the PCAST roadmap.

Shult also reminded the Board that the other major task assigned to the Board is to put together a response for the Under Secretary on the balance of crop research, related to the PCAST report. The working group established yesterday will begin that process. Shult explained that the Board's report should focus on making recommendations about the process of how to prioritize research areas and review issues, without going into the management of specific crops. Michele Esch noted that if a listening session and/or workshop is to be held to gather input for that report, it should take place soon so that the report can be completed before the fall.

The Board discussed the Sharepoint website and how it could be made more useful for members. Esch agreed to create folders on the Sharepoint site for Board members to store documents that

working groups have in progress. Esch and Shult also noted that the current activities of the Board need to be shared on the website so that there is public transparency. Several Board members stated that they would welcome further training on how to use the Sharepoint website. Esch agreed to arrange a webinar training session on Sharepoint.

The Board agreed to hold a telephone conference call quarterly, between the regular semi-annual meetings, to comment on the progress of working groups and subcommittees. The call will be recorded and made accessible to any Board members who cannot join in.

The Board discussed the orientation session that was given on the first day of the meeting. It was suggested that some of the presentations, particularly by the REE agencies, went into too much detail, and that perhaps presenters should be given more guidance beforehand. It was acknowledged that the background information is necessary and even overwhelming for new Board members but may be repetitive for incumbent members. To improve the orientation session in future meetings and ensure that new Board members are provided with adequate information, it was suggested that the Board: 1) provide more guidance to REE Administrators for their presentations, including asking key questions ahead of time, and 2) provide read-ahead material for new Board members.

TRAVEL REIMBURSEMENT PROCEDURES

Shirley Morgan-Jordan (Program Support Coordinator) explained the logistics for booking travel and obtaining reimbursements for all Board members.

PUBLIC COMMENTS

There being no public comment, the meeting was adjourned at 11:10 a.m.

RESOLUTIONS, RECOMMENDATIONS AND ACTION ITEMS

Resolutions and Recommendations

- The Board approved the Report of the Specialty Crops Committee for forwarding to the Under Secretary, with a question attached regarding the breadth with which ‘relevancy’ is defined in the review process for research proposals.
- The Board accepted the Report of the National Genetic Resources Advisory Council.
- The Board decided to rejoin Relevancy and Adequacy as a single subcommittee.
- It was suggested that the fall Board meeting be scheduled close to the FDA meeting to be held on 18-19 November.
- It was suggested that voting for new Board positions be postponed from this coming fall until the following year, since terms for the newly-elected positions will be shorter than usual.

Action Items

- The Board decided to form a working group to discuss the aforementioned issues surrounding the Open Data Initiative and to develop recommendations for the USDA.
- The Board was asked to put together a working discussion document responding to the Under Secretary’s charge regarding the PCAST report within 3 months. The Board appointed a Chair and added new members to the working group that will prepare this report.
- To inform the report on PCAST, the Board will hold a listening session to gather more information from a wide range of stakeholders in both the private and public sectors.
- The Board will provide a report to ESCOP, which may include recommendations, on the programs run by the Agricultural Experiment Station System. A small working group was formed for this purpose.
- Board members were asked to research the purview and work of each subcommittee that reports to the Board and identify which subcommittee(s) they might best serve on. A call for interest in serving on committees will be sent out to all absent Board members.
- Executive Director will hold a webinar training session on the use of the Sharepoint website.
- Executive Director will set up folders with working documents on Sharepoint for working groups to store reports that are in progress.
- To improve the orientation component of future meetings, the Board suggested providing more guidance to REE Administrators for their presentations, including asking key questions ahead of time, and providing read-ahead material for new Board members.
- The Board agreed to hold a telephone conference call quarterly, between the regular semi-annual meetings, to comment on the progress of working groups and subcommittees. The call will be recorded and made accessible to any Board members who cannot join in.

APPENDIX A: LIST OF MEETING ATTENDEES

Monday, May 5

PART I: ORIENTATION FOR NEW AND INCUMBENT MEMBERS

Board Members Present: Dr Charles Boyer, Dr Patsy Brannon, Dr Adriana Campa, Dr Carrie Castille, Dr Steven Daley-Laursen, James Goodman, Rita Green, Dr Steve Hamburg, Leo Holt, Dr Govind Kannan, Twilya L'Ecuyer, Wathina Luthi, Dr Mark McLellan, Dr Neil Olson, Julia Sabin, Dr Milo Shult, Dr Robert Taylor.

Board Members Absent: Dr Nancy Childs, Leo Holt, Jeremy Liley, Dr Agnes Mojica, Ralph Paige, Dr Chandra Reddy, Richard Schlosser, Dr Dawn Thilmany, Chad Waukechon.

REE Advisory Board Staff: Michele Esch, Shirley Morgan-Jordan.

Other USDA Staff: Dr Simon Liu, Dr Catherine Woteki.

Other Attendees Present: Dr Steven Slack.

PART II: DISCUSSION ON THE BALANCE OF CROP RESEARCH (PCAST)

Board Members Present: Dr Charles Boyer, Dr Patsy Brannon, Dr Adriana Campa, Dr Carrie Castille, Dr Steven Daley-Laursen, James Goodman, Rita Green, Dr Steve Hamburg, Leo Holt, Dr Govind Kannan, Twilya L'Ecuyer, Wathina Luthi, Dr Mark McLellan, Dr Neil Olson, Julia Sabin, Dr Milo Shult, Dr Robert Taylor.

Board Members Absent: Dr Nancy Childs, Jeremy Liley, Dr Agnes Mojica, Ralph Paige, Dr Chandra Reddy, Richard Schlosser, Dr Dawn Thilmany, Chad Waukechon.

REE Advisory Board Staff: Michele Esch, Shirley Morgan-Jordan.

Other USDA Staff: Dr Catherine Woteki.

Tuesday, May 6

PART III: PRESENTATION OF AGRICULTURAL EXPERIMENT STATION SYSTEM

Morning tours:

Board Members Present: Dr Charles Boyer, Dr Patsy Brannon, Dr Adriana Campa, Dr Carrie Castille, Dr Steven Daley-Laursen, James Goodman, Rita Green, Dr Steve Hamburg, Leo Holt, Twilya L'Ecuyer, Wathina Luthi, Dr Mark McLellan, Dr Neil Olson, Julia Sabin, Dr Milo Shult, Dr Robert Taylor, Dr Dawn Thilmany.

Board Members Absent: Dr Nancy Childs, Dr Govind Kannan, Jeremy Liley, Dr Agnes Mojica, Ralph Paige, Dr Chandra Reddy, Richard Schlosser, Chad Waukechon.

REE Advisory Board Staff: Michele Esch, Shirley Morgan-Jordan.

Other USDA Staff: Dr Robert Matteri, Dr Catherine Woteki.

Other Attendees Present: Dr Steven Slack.

Afternoon session:

Board Members Present: Dr Charles Boyer, Dr Patsy Brannon, Dr Adriana Campa, Dr Carrie Castille, Dr Steven Daley-Laursen, James Goodman, Rita Green, Dr Steve Hamburg, Dr Govind

Kannan, Twilya L'Ecuyer, Wathina Luthi, Dr Mark McLellan, Dr Neil Olson, Julia Sabin, Dr Milo Shult, Dr Robert Taylor, Dr Dawn Thilmany.

Board Members Absent: Dr Nancy Childs, Leo Holt, Jeremy Liley, Dr Agnes Mojica, Ralph Paige, Dr Chandra Reddy, Richard Schlosser, Chad Waukechon.

REE Advisory Board Staff: Michele Esch, Shirley Morgan-Jordan.

Other USDA Staff: Dr Robert Matteri.

Other Attendees Present: Dr Steven Slack.

Wednesday, May 7

PART IV: BOARD BUSINESS – COMMITTEE AND SUBCOMMITTEE REPORTS

Board Members Present: Dr Charles Boyer, Dr Patsy Brannon, Dr Adriana Campa, Dr Carrie Castille, Dr Steven Daley-Laursen, James Goodman, Rita Green, Dr Govind Kannan, Twilya L'Ecuyer, Wathina Luthi, Dr Mark McLellan, Dr Neil Olson, Julia Sabin, Dr Milo Shult, Dr Robert Taylor, Dr Dawn Thilmany.

Board Members Absent: Dr Nancy Childs, Dr Steve Hamburg, Leo Holt, Jeremy Liley, Dr Agnes Mojica, Ralph Paige, Dr Chandra Reddy, Richard Schlosser, Chad Waukechon.

REE Advisory Board Staff: Michele Esch, Shirley Morgan-Jordan.

Other USDA Staff: Dr Manjit Misra.

Other Attendees Present: Dr Steven Slack.

APPENDIX B: BOARD APPOINTMENTS, WORKING GROUPS AND SUBCOMMITTEES

The following positions were voted upon, volunteered or appointed during the May 2014 meeting.

Since nine Board members were not present when the working groups were populated, the Board will send out a call for interest in serving on these groups. All interested Board members were also encouraged to participate in a working group at any time by contacting the Chair of that working group and the Executive Director.

CHAIR: Dr Milo Shult

VICE CHAIR: Dr Steven Daley-Laursen

EXECUTIVE COMMITTEE: Dr Charles Boyer, Dr Patsy Brannon, Dr Carrie Castille, Leo Holt, Dr Mark McLellan, Julia Sabin, Dr Robert Taylor.

WORKING GROUP FOR REPORT RESPONDING TO PCAST (Balance of crop research): Dr Mark McLellan (Chair), Leo Holt, Twilya L'Ecuyer, Julia Sabin, Dr Milo Shult, Dr Robert Taylor. *Note:* Dr Agnes Mojica was previously a member of this working group, but her continued participation could not be confirmed since she was not present at the meeting.

WORKING GROUP FOR OPEN DATA INITIATIVE: Dr Steven Daley-Laursen (Chair), Dr Carrie Castille, Dr Govind Kannan, Dr Mark McLellan, Dr Dawn Thilmany.

WORKING GROUP FOR REPORT ON AGRICULTURAL EXPERIMENT STATION SYSTEM: Dr Dawn Thilmany (Chair), Dr Patsy Brannon, Rita Green.

RELEVANCY AND ADEQUACY SUBCOMMITTEE: Dr Carrie Castille (Chair), Dr Adriana Campa, James Goodman, Twilya L'Ecuyer, Wathina Luthi, Dr Neil Olson, Julia Sabin, Dr Robert Taylor. *Note:* Dr Agnes Mojica was previously a member of this working group, but her continued participation could not be confirmed since she was not present at the meeting.

CITRUS DISEASE SUBCOMMITTEE: Dr Mark McLellan will join as an *ex officio* NAREEE Advisory Board member.

APPENDIX C: PRESENTATIONS AND RESOURCES

Presentations made available to Board members via Sharepoint or in hard copy:

- ‘FACA Committees and Ethics: a guide for the NAREEE Advisory Board’, from Andrew Tobin (Senior Ethics Specialist, USDA Office of Ethics) and Maureen O’Brien (Attorney-Adviser, USDA Office of General Counsel)
- ‘ERS Perspectives’, from Dr Mary Bohman (Administrator, ERS)
- ‘2012 Census of Agriculture Final Data Release’, from Joe Reilly (Administrator, NASS)
- ‘ARS’, from Dr Chavonda Jacobs-Young (Administrator, ARS)
- ‘Public Access to USDA Funded Research Results’, from Dr Simon Liu (Director, National Agricultural Library)
- ‘USDA Office of the Chief Scientist’, from Dr Charles Onwulata (Director, Office of the Chief Scientist)
- ‘Report and Recommendations on the Balance of Crop Research’, from Dr Ed Kaleikau (Senior Advisor, Office of the Chief Scientist)
- ‘The Balance of Crop Research (PCAST): What do we know, what don’t we know?’, from Dr Paul Heisey (Economist, ERS)
- ‘Experiment Stations Provide a Critical Research and Development Link for Addressing State and Regional Constraints’, from Dr Steven Slack (ESCOP Chair and Director of OARDC) – presentation slides provided in hard copy to all meeting attendees
- ‘Food Animal Health Research Program: People, Programs and Facilities’, from Dr Y. M. Saif (Professor and Head Emeritus, Food Animal Health Research Program, The Ohio State University)
- ‘Update from the National Genetics Resource Advisory Council (NGRAC) to NAREEE Advisory Board, May 2014’, from Dr Manjit Misra (Chair, NGRAC) – report of NGRAC dated September 30, 2013, provided in hard copy form to all meeting attendees

Links and resources recommended by presenters:

2012 Census of Agriculture available from: www.agcensus.usda.gov

ERS Data Product Policy: www.ers.usda.gov/about-ers/information-quality/ers-data-product-policy-recommendations-and-standards.aspx

Amber Waves Magazine: www.ers.usda.gov/amber-waves

Charts of Note: www.ers.usda.gov/data-products/charts-of-note

A complete copy of the PCAST Report is available at:

www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_agriculture_121207.pdf