**Project/Activity Number:**  NCAC 16 and SAC 16

**Project/Activity Title:** Biological and Agricultural Engineering

**Period Covered:** Feb 1-2, 2018

**Date of This Report:** May 7, 2018

**Annual Meeting Date(s):** Feb1-2, 2018

**PARTICIPANTS:**

Bajwa,Sreekala- North Dakota State University

Carrier, Julie - University of Tennessee

Donahue, Darrell - Michigan State Univesity

Dorota, Haman -University of Florida

Drollinger, Darren - ASABE Headquarters

Engel, Bernie - Purdue University

Fasina, Oladiran -Auburn University

Fox, Garey-North Carolina Univesity

Heinnemann, Paul - Penn State University

Jenkins, Bryan - University of California, Davis

Jones, David -University of Nebraska, Lincoln

March, John - Cornell University

Mickelson, Steven - Iowa State University

Miller, Bruce - Utah State University

Montross, Mike - University of Kentucky

Mostaghimi,Saied -Va Tech

Livingston, Peter - California Polytechnic University

Runge, Troy -University of Wisconsin

Sands, Gary - University of Minnesota

Searcy . Steve - Texas A & M

Straub, Richard - Univesity of Wisconsin - Madison

Wolfe, Mary Leigh - Va Tech

Veenstra, John- Oklahoma State University

Verma, Lalit - University of Arkansas

**MINUTES OF ANNUAL MEETING**:

At 8:00 a.m.the meeting started on February 1, 2018 reviewing NCAC/SAC 16 projects.

PURPOSE OF OF NCAC / SAC 16 Meeting

The principal responsibilities of NCAC and SAC committees are to advise the directors on multistate research priorities; to review ongoing multistate research and proposals for new multistate projects/committees; and to advise the directors on overall quality control for the program of multistate research. In 2018, the committee reviewed:

NC-1023 Engineering for food safety and quality

S-1041 The science and engineering for a biobased industry and economy (2 reviewers)

S-1063 Quantification of best management practices effectiveness for water protection at the watershed scale

S-1069 Research and Extension on unmaned systems application in U.S. Agriculture and natural Resources

NCERA197 Agricultural Safety and Health Research

The reviewer comments and discussion may be found in the Impact section of this report.

AMERICAN SOCIETY OF BIOLOGICAL AND AGRICULTURAL ENGINEERING UPDATE

1. Darrin Drollinger, Executive Director of the American Society of Agricultural and Biological Engineering, discussed summarized the results of a consultant-led review of ASABE publications aimed at developing a path forward for managing publications. The consultant, Joe Esposito, explained many facets of academic and scientific publishing and opportunities for ASABE journals to increase their readership and impact. Drollinger posted the report per a request for members of EOPD-210 to review. Two key outcomes of the study were: the acceptance rate for Transactions of the ASABE (>60%) was too high and the editorial programs at the ASABE journals could be improved. He also explained that the ASABE technical library is keeping publications afloat with a net to ASABE of $340,000 annually. The board of trustees was meeting Monday, February 5 to discuss the matter and determine if a request for proposal for publishers to take over the journals will be distributed. The RFP issuance was estimated to be a $45,000 process. Searcy pointed out that college deans and trustees should be made to understand since Ag Engineering was slower to get data and wrap up experiments than other disciplines, that publications from Ag Engineering faculty will naturally be fewer in number.

2. There was discussion as to how to improve the editorial process and accessibility of the ASABE journals. It was stated that the ASABE journals have an open access option for a price. Leaving the publishing business was also discussed. One complication of this is that publishing accounts for 1/3 of the ASABE budget. There were concerns expressed over the time to publish in ASABE journals which is exceeds a year. Targeting reviewers that are appropriate to a particular submission and the level of complication with the publishing software were also problems to be overcome. It was suggested that the journals could publish more review articles to increase impact. Hongda Chen (NIFA) pointed out that impact factor does not show up in reviews at NIFA.

3. Other happenings within the ASABE organizations include:

1. In press articles in ASABE publications will now be available online.
2. The ASABE website overhaul will be rolled out in late spring and was a collaborative effort with stakeholders and, in particular the young professionals group in ASABE. Lee Wang, a senior IT manager is leading the effort.
3. Online forums are now updated an post to the old forums will not work.
4. There is new software for awards nominations that is easier to use. There are fewer than desired nominations for both women and industrial candidates.
5. There will be a new AE-50 award coming, the Davidson Prize, named after J.B. Davidson, the founder of Ag Engineering.
6. E.class is an engineering centralized app system that has been introduced.
7. ASABE is taking over the standards for Management Systems for Food Safety.
8. Wolfe needs nominations for ASABE president coming from industry.

4. Wolfe and Jenkins discussed the concept of digital object indicators (DOIs) and how they could be used for the digital Biological Engineering Library that Wolfe is currently working on.

5. Another area of discussion was on how to convert student members of ASABE into full members. It was concluded after much discussion that the best way to get conversion would be to better demonstrate the clear value that membership holds.

FEDERAL AGENCY UPDATES

1. Sally Rockey, Executive Director, Foundation for Food and Agricultural Research (FFAR), discussed FFAR which is a public-private partnership awarding grants with an industry match in the agricultural space. She discussed the New Innovator in Food and Agricultural Research for junior faculty. Mid-career faculty are eligible for the NAS food prize ($100,000). Dr. Rockey discussed FFAR’s lobbying efforts and requested ASABE provide a letter of support. Researchers may submit research concepts to FFAR through their online portal at <https://foundationfar.org/>.

2. Sonny Ramaswamy, NIFA Director, provided an update on NIFA activities and vision to reduced ecological footprint for food and agriculture. The target reduction was 50% over the next 30 years. This reduction would be in water and energy use as well as pollution. The reduction would have many prongs for each area. For example, water reduction would be realized through irrigation improvements as well as plant breeding.

There are programs at NIFA for engaging undergraduates (REUs) and work aimed at engaging other agencies, like NSF. Ramaswamy requested NCAC / SAC 16 members track where their graduates are being employed. Providing this information to NIFA enables the agency to have a quantified clear value proposition when lobbying congress. He stated 1/6 of all US patents were from Hatch funds and every dollar invested in NIFA has a net return of $20 to the US economy. Attendees were implored to read the budget narrative for each agency, including NIFA to learn what priorities should be targeted in a given funding year.

There were five ways new faculty could become engaged with NIFA:

1. Travel to Washington D.C. to meet personally with your NIFA liaison and get to know them.
2. Serve on NIFA and other agency grant review panels.
3. Send white papers to NIFA and other funding agencies describing the work the faculty member is proposing to do and why it is important.
4. Get face time with elected representatives to make the case that the faculty member’s research is important to the state.
5. Engage on teams with older, more experienced researchers.

Ramaswamy listed collaborative items that were happening with NIFA:

1. The INFEWS program with $5 M from NIFA and $75 M from NSF.
2. Dual use/dual benefits program in which farm animals are used for medical research with $5 M from NIFA and $100 M from NIH.
3. FACT: Food and Agriculture Cyberinformatics and Tools

3. Richard Dickinson, Director of Chemical, Bioengineering, Environmental and Transport Systems (CBET) Division of NSF provided an overview of his organization. He mentioned the collaborative INFEWS program with NIFA.

4. Brad Rein (NIFA) demonstrated how to locate the budget priorities online and the Water for Food Systems program was also discussed.

ABET UPDATE

1 Mary Leigh Wolfe (VA Tech) discussed the new ABET curricular requirements 1-7 which replace A-K. She mentioned that criterion 5 had been changed. The board of delegates represents societies at ABET (new structure) and ASABE is well-represented. For ASABE an EOPD-204 delegate takes information and concerns from ASABE to ABET. Mark Crossly (ASABE) is the liaison to ABET. For departments transitioning to 1-7 from A-K, a plan of transition needs to be developed and reported to ABET.

2. Searcy asked about ABET reviews from people who had recently been through one. An answer was given that faculty depth in all areas represented in the curriculum was necessary. PEVs were considered helpful in all areas. One problem/solution discussed was the lack of institutional memory at ABET for department name changes. ABET previously only knew departments by the name they most recently have had. That has changed and now there is a database to keep track of all name changes provided that the department’s report them.

NCAC / SAC 16 MEMBER UNIVERSITY UPDATE

1. The group discussed items of interest and concern for each of their institutions with particular attention being paid to 1. What programs do each department offer, 2. How departments interact with industry (suggested by Wolfe) and 3. What percentage of their budgets came from the state (suggested by Straub). The overall mood between departments was upbeat. Highlights touched on included:

a. Many schools have advisory councils that consist of members of industry. Many of these councils come to campus to help judge senior design projects and hold mock interviews. Assessments from these programs were that the interactions benefited students and the department.

b. The percentage of state support at most departments was between 10 and 20, with most departments reporting a decrease in state support over the years.

c. At least 3 programs reported new building space.

d. Steve Mickelson (IA State) talked about the benefits to the department of having key political players at the state level on the advisory board. Other departments with advisory boards discussed the benefit of having fundraisers and donors as participants.

INTERNATIONAL CONFERENCE UPDATE

1. Searcy talked about the upcoming Global Water Security Conference in Hyderabad, India. The academic administrators meeting will be on the 3rd of October. There will be 25 international attendees and 20 attendees from EOPD-210. A discussion was held around the format and content of that meeting. Darell Donahue (MI State) suggested that smaller breakout meetings would be beneficial. There was discussion around what items could be useful to all participants and that would lead to a more collaborative atmosphere. Limiting presentation times was discussed to facilitate more meaningful interactions.

2. Showcasing senior design was discussed in response to a desire (explained by Lalit Verma (U. AR)) by our Indian counterparts of ways to deal with a very centralized curriculum. There is funding available through NRES for up to 10 students to attend the conference. Industrial engagement was suggested as a good topic for discussion in smaller breakout sessions. Verma mentioned that conference display areas can be purchased by departments if desired. The budget for the meeting as drafted was $100 K but this did not anticipate the fees collected by the Indian government. Carrier suggested a session on how Indian students can negotiate the process for coming to study in the US. This included preparing students for international study and exposing them to new technology. There was a follow on discussion of exposing international students to entrepreneurial training. It was suggested that USAID could be a partner.

PARTNERING WITH OTHERS

1. There was discussion on fostering professional societies to better engineering education. How does ASABE partner with other societies to move a joint educational and professional agenda forward? The Society for Food Engineers and the Institute of Biological Engineering (IBE) were discussed as strategically beneficial partners. Chen mentioned the international efforts being made in food engineering as a good example of what can be accomplished with partnering. David Jones (U. NE), President of IBE, suggested that sharing objectives on education would be a good starting place.

2. Searcy provided an ASABE update on partnering with other organizations. En example was IEEE partnering in SmartAg. This partnership resulted in the Michigan State University hosting a meeting this past fall. It was suggested that the next SmartAg meeting could occur in Detroit at the AIM, possibly before the technical meeting. Searcy put the question to the group, “Is ASABE dong enough in Smart/digital Ag and if not, what can they do?” Bernie Engel (Purdue U.) suggested that ASABE highlight all the SmartAg talks at AIM. Jenkins mentioned that the next meeting on big data was in Bamberg, Germany and that ASABE could get involved in that.

3. There was a suggestion at closing that we include industrial representatives at future EOPD-210 retreats.

Meeting Adjourned on February 2, 2018 at 11:30 a.m.

**ACCOMPLISHMENTS:**

FIVE KEY ACCOMPLISHMENTS

1. Research – open discussion on improving ASABE impact factor and publishing processing to increase value to other NCAC / SAC committees and communities of scientist and researchers
2. International – How to maximize outcomes of the October 3, 2018 joint academic administrators meeting during the Global Water Security Conference in Hyderabad, India. There will be 25 international attendees and 20 attendees from EOPD-210. Focus on format and content of that meeting, breakout sessions, limiting presentation times and highlighting senior design projects of North American Universities.
3. ABET - The new ABET curricular requirements 1-7 which replace A-K. A transition plan needs to be developed and reported to ABET. Faculty depth in all areas represented in the curriculum is necessary which might influence new faculty hires and program direction.
4. Advisory Councils - Advisory councils that consist of members of industry and are program benefits include involvement with senior design, mock interviews, program review, philanthropy, and political advocacy. Advisory councils provide linkages between academics and industry.
5. Federal Agencies – Discussions with federal agencies provided opportunity to learn how to engage new faculty with federal agencies and insights into new program initiatives. This interaction strengthens the linkages between federal agencies and academic communities.

**IMPACT:**

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Follow is a summary of the reviewer comments and discussion.

1. NC 1023: The reviewers concluded that this project is moving along as it should and that there are no concerns at this time.

2. S-1041: John March (Cornell) led the review and stated that there was no activity on the website for 2017. At that time Julie Carrier (U. Kentucky) and Troy Runge (U. Wisconsin), who are the new leadership (and were in attendance) for this multistate project announced that they had filed the report and that it was not yet posted. They sent the report and progress updates to March who, after this meeting confirmed that the project was moving along nicely and that the proposal to continue this project was in order. The group had met in 2017. This information was sent to Richard Straub (U. Wisconsin).

3. S-1063: Garey Fox (NC State) led the review. The group met once in 2017. The project was at a mid-year evaluation stage. Fox stated that there were many products coming out of this multistate project. The project had wide representation and that the work being done was successfully quantifying best management practices using a combination of models and research. At the time of the meeting there was no report. Steve Searcy (Texas A.M.) expressed concern that the mid-year evaluation form did not align well with the reports that had previously been given and that some effort needed to be undertaken to get better agreement between the two.

4. S-1069: Paul Heinnemann (Penn State) led the review. The project looks at the roles of unmanned aerial vehicles (UAVs) across agriculture in the southern region. The group met once in 2017. Agricultural engineers are well-represented on the project. Heinnemann was concerned that the project overlaps with other work being done around the country and that perhaps it should be expanded outside the southern region. Sreekala Bajwa (ND State) agreed that the project should broaden its scope to include UAVs in other regions. She also pointed out that a survey had been set up but the results were not yet available. Data science programs were discussed but information was missing on what type of data science and what applications they would focus on. It was pointed out that NSF also has a parallel program to S-1069 and that synergy between the two efforts would be beneficial. There was concern expressed that Natural Resources may be underrepresented in the in the applications. Also, there was concern that data science was missing from the objectives, specifically: analytics, transfer and storage. There was a suggestion that the project look into broadband in rural settings and that the project work more to bring in industry since so much activity was going on there. Straub asked if they were looking for collaborative funding from industry and the answer from Bajwa was that there was a proposal to do so. Searcy was concerned about the amount of extension in the project. He concluded that there should be more extension activity and that the project would do well to take advantage extension.org to disseminate information of UAV operation to the farming community. Also, Searcy pointed out that crop consultants could be leveraged for their connections to industry. Straub agreed that the project should be expanded (re-publicized) and that they should have more extension activities. Bryan Jenkins (UC Davis) mentioned that Davis had a lot of activity in this area but was not on the project. Straub wondered if the experiment station was not getting the word out.

5. There was a long discussion of Western and Northern projects which are not reviewed at this meeting. Searcy asked if other regions were missing opportunities in not being able to participate in these projects. Straub pointed out that projects have to ask to be reviewed and that the Western and Northern states have their own regional reviews that are long-standing. The experiment stations in those regions have not asked to be reviewed which Brad Rein (NIFA) clarified was necessary for them to be reviewed at this meeting.