



National Advisory Council for Environmental Policy and Technology Meeting

**1201 Constitution Avenue, NW
William Jefferson Clinton Federal Building East, Room 1132
Washington, D.C.**

Call-In Number: 866-299-3188, Conference Code: 202-233-0068

Monday, August 22, 2016

12:00 – 4:00 p.m. EDT

MEETING SUMMARY

Welcome, Introductions and Overview of the Agenda

Eugene Green, Designated Federal Officer (DFO) for the National Advisory Council for Environmental Policy and Technology (NACEPT), Federal Advisory Committee Management Division (FACMD), Office of Resources, Operations and Management (OROM), Office of Administration and Resources Management (OARM), U.S. Environmental Protection Agency (EPA); William Ross, Jr., NACEPT Chair, The University of North Carolina at Chapel Hill

Mr. Eugene Green (NACEPT DFO, EPA) welcomed the NACEPT members and thanked them as well as the others present for their attendance. With the support of the EPA's Office of Research and Development (ORD) staff, the Council has expended significant effort during the past year, and especially during the past 2 months, to develop a report that responds to the NACEPT's charge regarding EPA's possible use of citizen science in achieving its mission. Mr. Green expressed EPA's appreciation of the Council members' commitment to the advisory process and then asked the members to introduce themselves. A list of meeting participants is provided in Appendix A.

Following the official roll call, which confirmed a quorum was achieved, Mr. William Ross, Jr. (NACEPT Chair, The University of North Carolina at Chapel Hill), also extended his welcome to the NACEPT members and other participants. He expressed his appreciation for the members' efforts in writing and reviewing the draft report. Regarding the agenda for this meeting (included as Appendix B), Mr. Ross proposed that each member provide brief, high-level feedback on the draft report, Ms. Shannon Dosemagen (Public Laboratory for Open Technology and Sciences) and Dr. Alison Parker (ORD, EPA) will lead a discussion of specific issues, and the meeting will conclude with a section-by-section discussion of the report by the Council.

Dr. Parker and Ms. Dosemagen reviewed the actions that Council members had suggested were needed to complete the NACEPT report, including drafting an Executive Summary, incorporating case studies, developing a glossary, finalizing the acknowledgements, describing current support of citizen science by EPA, and ensuring that all photographs have proper attribution. A draft of the report will be distributed to the Council members on October 1, 2016, for the Council's consideration during its October 17, 2016, meeting, which will be held via teleconference. Mr. Mark Joyce (OARM, EPA) added that at that meeting, the Council members will have the opportunity in a public forum to vote on whether to approve the report. Mr. Howard Learner (NACEPT Vice Chair, Environmental Law and Policy Center) volunteered to review the draft Executive Summary.

Dr. Parker summarized the process of reorganizing the material that had been prepared by the three NACEPT working groups. The reorganized draft comprises an introduction to citizen science and its potential role in the Agency (Chapter 1), proposed guidelines for EPA's use of citizen science (Chapter 2), resources needed to support the use of citizen science at EPA (Chapter 3), and a description of the range of ways that the Agency might engage in citizen science (Chapter 4).

Ms. Dosemagen expressed her appreciation for the case studies that Council members had submitted, as well as the tables and charts that they had prepared. The case studies span the landscape of EPA environmental and health protection activities, from community engagement to enforcement. She noted that the case studies have not yet been integrated into the report.

Public Comments

Eugene Green, DFO, NACEPT, FACMD, OROM, OARM, EPA

Mr. Green indicated that Dr. Judy Cameron (University of Oregon) had provided written comments prior to this meeting. These comments are included in Appendix C. Mr. Green asked Dr. Cameron and her colleague, Dr. Sonja Kolstoe (Salisbury University), who also was attending the teleconference, to provide the Council members with an overview of the issues that Dr. Cameron had raised.

Dr. Cameron explained that in her research, she uses data from the eBird project (www.ebird.org) to monetize the societal worth of environmental benefits. Such data are used by economists to estimate the "tradeoffs" that individuals make when deciding to travel. Information is missing on individuals' motivations for participating in citizen science projects, which is needed to complete such analyses. This information would facilitate extrapolation of the valuation of environmental benefits from the community of citizen science participants to the general population. Dr. Kolstoe concurred with Dr. Cameron's summary.

Mr. Ross asked Drs. Kolstoe and Cameron to explain for the Council how such data would be useful to EPA. Dr. Cameron offered to provide the NACEPT members with a copy of a manuscript, currently in review, that describes the needed data in more detail (i.e., the differences between non-eBird members and eBirders). Mr. Ross thanked Drs. Kolstoe and Cameron for their public comments and their offer to provide the Council with a copy of their manuscript.

Discussion on Initial, Integrated Draft of NACEPT's Report on EPA and Citizen Science: A Strategic Approach to Protecting Human Health and the Environment

William Ross, Jr., The University of North Carolina at Chapel Hill

Mr. Ross chaired the discussion of the initial, integrated draft report on EPA and citizen science.

High-Level Feedback on the Draft Report

Each NACEPT member provided high-level feedback on the initial integrated draft of the report. Members generally agreed that the draft was well organized, rich in detail and fairly complete. The following additional comments were made:

- **Mr. Clinton Woods (Association of Air Pollution Control Agencies):** A few areas could be described in greater depth. For example, the spectrum of data quality requirements needed for citizen science data that will be used by EPA in activities ranging from community engagement to enforcement could be described more fully. The Agency will need to balance citizen science data requirements with the promotion of citizen science. In addition, the report would benefit by being

unified under an overarching theme. Also, he has some suggestions that might make the recommendations more actionable that he will send to EPA.

- **Dr. Graciela Ramirez-Toro (InterAmerican University of Puerto Rico):** The report could be made more inclusive by including U.S. citizens living in U.S. territories. Greater clarity is needed regarding the uses that the Agency will emphasize for citizen science data (e.g., risk protection, regulation).
- **Dr. Olufemi Osidele (Southwest Research Institute):** Case studies and an Executive Summary that includes high-level recommendations are needed. Also, there are too many recommendations in the report.
- **Mr. Ross:** The report currently contains too many recommendations.
- **Dr. Ronald Meissen (Baxter International, Inc.):** The Executive Summary will play an important role in the report, providing focus and articulating what the Agency should try to achieve through its support of citizen science. EPA could act as a champion for citizen science within the U.S. government, leveraging its efforts by collaborating with other agencies. Youth engagement is important to encourage young people to pursue scientific careers. EPA's regional offices might sponsor citizen science initiatives (e.g., workshops).
- **Mr. Jeffrey Mears (Oneida Nation):** The Executive Summary should include an "elevator speech" on the importance of supporting citizen science to achieving EPA's mission.
- **Mr. Learner:** More focus is needed on implementing citizen science within the Agency rather than demonstrating its general relevance to society.
- **Mr. Karl Konecny (Northwest Motion Products):** Citizen science efforts already are widespread and focused on what is important to communities. EPA should assume a leadership role in government support for citizen science and in dispelling the perception that authorities do not regard citizen science data as high quality.
- **Mr. Robert Kerr (Pure Strategies, Inc.):** The Executive Summary will need to be brief, concise and targeted to its intended audience (i.e., politicians and the administration transition team). There are too many recommendations included in the report. More focus is needed on what the Agency already has done to support citizen science.
- **Ms. Barbara Jean Horn (Colorado Parks and Wildlife):** A compelling case needs to be made for why the Agency needs to take the lead on citizen science and why this should be done now. The discussion of what would be lost if EPA does not support citizen science at this time was not captured sufficiently in the draft. Also, reference should be made to how citizen science can help achieve the United Nation's Millennium Development Goals. In addition to directly supporting citizen science, Ms. Horn emphasized the importance of EPA's indirect support of citizen science through forming partnerships.
- **Mr. John DeVillars (BlueWave Capital, LLC):** The "voice" of the Preface is appropriate for engaging the interest of the EPA Administrator. Suggested points to emphasize in the Executive Summary include the potential role of citizen science in democratizing policy making and strengthening public support for EPA's mission, as well as the significant resources that the Agency already has invested in citizen science. The call-out boxes and tables are useful. He suggested including an appendix providing historical examples of citizen science. Mr. Ross replied that Dr. Caren Cooper (North Carolina Museum of Natural Sciences) is assisting the Council by writing a section on historical citizen science efforts.

- **Dr. Ramesh Chawla (Howard University):** Regarding Recommendation 3.3, a resource guide providing information about developing new technologies and tools would be useful.
- **Ms. Lauren Boles (New Jersey Environmental Justice Alliance):** Categorizing recommendations as short- versus long-term would be helpful. More examples are needed from different regions, environmental media and sizes of organizations performing citizen science projects.
- **Ms. Ondrea Barber (National Tribal Air Association):** The Executive Summary is important because that is the only section of the report that will be read by some readers. It needs to reflect the document and highlight key points.
- **Ms. Erica Bannerman (Prince George's County Maryland):** More information is needed about improving partnerships between state and federal agencies to support citizen science, as well as possible roles for local government. This information could be included in the section of the report related to operationalizing sustainability.
- **Mr. David Rejeski (Woodrow Wilson Center):** Background information should be provided on current EPA activities in support of citizen science, particularly with regard to environmental media other than water. Projects that have been successful in helping EPA achieve its regulatory mission should be highlighted.

In reply to a question from Ms. Horn, Mr. Joyce stated that NACEPT's second report on citizen science can include topics not addressed in this current report because of limited time and space. He noted that the second report also will reflect the Agency's response to the recommendations in the first report. The second report will be discussed at NACEPT's upcoming face-to-face meeting, which likely will take place in March 2017.

In response to the suggestions of the Council members, the NACEPT editing team will draft text regarding current EPA support of citizen science.

Executive Summary

In reply to a question from Mr. Learner, Mr. Joyce and Dr. Parker explained the difference between the transmittal letter, which will be brief (i.e., 1–1.5 pages in length), with the Executive Summary (3–5 pages in length). The Executive Summary will include key points, messages and other material central to understanding the report. Mr. Jay Benforado (ORD, EPA) suggested that the Executive Summary emphasize the actions that EPA can take to be a leader in citizen science and integrate citizen science into the fabric of environmental protection. The report headings should correspond to the messages conveyed in the Executive Summary.

Drafting a separate document from the Executive Summary that would be written with the administrative transition team in mind was discussed. Mr. Kerr suggested that the document include key messages, benefits and actions. Ms. Dosemagen proposed drafting a 1-page nontraditional summary that could stand alone, separate from the report. Mr. Joyce pointed out that the abstract represents a placeholder in the report for the nontraditional summary.

The Council members agreed on a process for drafting, reviewing and revising the Executive Summary. The NACEPT editing team will draft an Executive Summary and then revise it based on comments from Mr. Learner and send it to EPA. The revised draft Executive Summary will be distributed by EPA via email to the NACEPT members for review (distribution date: September 9).

Case Studies

The placement of the case studies within the report was discussed. Mr. Benforado suggested that the case studies be integrated within the body of the report to give them greater visibility rather than be included in an appendix. Mr. Kerr suggested that an example of each type of case study be included in the report body, and similar case studies be included in an appendix. The Council members agreed to integrate the case studies within the body of the report.

Mr. Benforado stated that the figure on the spectrum of data requirements, currently part of the introduction to the case studies, also merits inclusion in the body of the report. Ms. Dosemagen credited Mr. Rejeski with developing an early version of the data requirements spectrum figure. She proposed moving it to Chapter 1 of the report and adding definitions to the figure. The data requirements spectrum could be added to the top of each page of the report. The Council members agreed that during editing, the data quality spectrum graphic (with the appropriate box highlighted) will be included at the top of each case study.

The participants discussed the format for the case studies. For ease of reading, Ms. Bannerman suggested organizing the case study descriptions around a common template with such headings as location, year, design, methodology and strategy. The Council members agreed to add section headings (e.g., location, year, design/methodology, strategy) to the case studies during editing.

Ms. Dosemagen raised the issue of the case studies' diversity. Geographically, the case studies are diverse, and all are not ecology-based, but more representation of environmental media other than water (e.g., air) might strengthen the report. Mr. Ross, Dr. Parker and Mr. Benforado suggested adding case studies on toxics and public health; data analysis (e.g., image analysis, image identification, data transcription); and the right-hand side of the data requirements spectrum. Ms. Bannerman referenced a community air monitoring project that is being developed in Baltimore. Mr. Benforado cited EPA's Village Green Project, a community air quality monitoring project, and offered to provide the NACEPT editing team with more information about that project. Mr. Kerr volunteered to develop case studies illustrating relationships between the private sector and EPA in supporting citizen science. Ms. Horn advocated for emphasizing case studies that illustrate the breadth of scope and possibilities inherent in citizen science—the “magic” of citizen science. Mr. Woods noted that the current set of case studies emphasize screening and threshold studies. The treatment of bridging strategies between low- and high-quality data requirements should be expanded. Dr. Irasema Coronado (University of Texas at El Paso) proposed adding examples of businesses conducting citizen science with their workers and international examples of citizen science. Ms. Dosemagen asked NACEPT members to send ideas for additional case studies to EPA.

Title

The NACEPT editing team will distribute a survey of candidate report titles to the NACEPT members for review (distribution date: August 22). The six current candidates are the following:

1. EPA and Citizen Science: A Strategic Approach to Protecting Human Health and the Environment.
2. EPA and Citizen Science: How to Engage and Protect Humans and the Environment.
3. Citizen Science and EPA: Protecting Human Health and the Environment Together.
4. Environmental Protection Belongs to the Public: A Vision for Citizen Science at EPA.
5. Science Belongs to the Public: A Collaborative Approach to Environmental Protection at EPA.

6. Creating a Shared Agenda: The Unrecognized Opportunity of Citizen Science.

Dr. Parker requested that the Council members provide additional candidate titles. Initial support was voiced by Mr. DeVillars and Dr. Osidele for the fourth title, which emphasizes belonging to the public. Dr. Coronado proposed that the titles should be assessed by a Web search evaluator. Ms. Horn recommended that people outside of the Council be polled for an unbiased reaction. Dr. Chawla suggested adding the title “Citizen Science: Take Charge of Environmental Protection.” Ms. Dosemagen asked the NACEPT members to respond to the survey to select a title, adding new candidates if desired (survey close date: August 29).

Environmental Justice

Dr. Parker noted the importance of ensuring that environmental justice concerns related to citizen science be well covered in the report. Mr. Green stated that the National Environmental Justice Advisory Council is developing a report on the importance of environmental monitoring in environmental justice communities. Ms. Dosemagen stated that the community-driven citizen science working group considered environmental justice when drafting its recommendations. Ms. Horn added that the link between citizen science and environmental justice could be made clear in the glossary. The Council members agreed that more prominent reference to environmental justice issues related to EPA’s support of citizen science should be made. The NACEPT editing team will draft the appropriate text.

In response to the suggestions of the Council members, the NACEPT editing team will develop a glossary.

Other Revisions and Specific Issues

The layout of the report was discussed. The current version was produced using Microsoft Word. Ms. Bannerman suggested using different software to decrease the amount of white space. Mr. Joyce responded that The Scientific Consulting Group, Inc. (SCG), which is providing contractor support to EPA for editing and desktop publishing the report, will produce a desktop-published print-ready version of the final report after the Council approves it. The final design of the report will be high-quality, similar to the 2008 NACEPT report and reports produced by EPA’s Good Neighbor Environmental Board.

Dr. Parker and Ms. Dosemagen suggested specific areas that the NACEPT editing team recommended streamlining. In this regard, Dr. Osidele emphasized removing redundancy without sacrificing quality. The following areas were discussed:

- **Sections 1.1 through 1.9 in Chapter 4.** The Council members agreed that secondary recommendations are too numerous and need to be combined.
- **Figure 2 and Table 4.** These present similar information in different formats. Although the figure has greater visual impact, the table is easier to read. The Council members agreed that during editing, SCG will redraft Figure 2, possibly combining it with information from Table 4.
- **Figure 3.** Dr. Ramirez-Toro had suggestions for adding information to the figure that she will provide to EPA. SCG will redraft Figure 3 to add information about the benefits of each data use.
- **Figure 4.** Water monitoring networks are covered extensively in the report in the recommendations, call-out boxes and case studies. Mr. Benforado suggested redrafting the figure to emphasize the range of water monitoring activities being conducted by citizen scientists (e.g., youth engagement, pipeline conditions). The Council members agreed that SCG will redraft

Figure 4, adding headings to the case studies in the figure that describe the range of citizen science activities.

- **Table 3.** The NACEPT editing team suggested that the information in this table is redundant. The Council members decided to retain the table for emphasis.
- **Tables 5 and 6.** The NACEPT editing team suggested merging these tables. The Council members agreed that SCG will merge Tables 5 and 6 during editing.

In response to the suggestions of the Council members and a comment by Ms. Bannerman, the NACEPT editing team will add an explanation of place-based citizen science.

The numbering system for the recommendations was discussed. Currently, recommendations are numbered by chapter, but the Executive Summary will highlight recommendations from all of the chapters. As suggested by Dr. Meissen and Dr. Osidele, the NACEPT members agreed that the recommendations should be numbered sequentially rather than by chapter to avoid confusion. During editing, SCG will renumber the primary and secondary recommendations.

Ms. Horn raised the issue of the timescale of the recommendations. Some can be addressed immediately using current federal agency resources, whereas others are applicable over longer timescales (e.g., 4 years). A symbol could be used to distinguish among recommendations with different timescales. The Council members agreed that including information on timescales would be valuable. Dr. Parker suggested clarifying the timescale of each recommendation using descriptive text, which will be less confusing to the reader. The NACEPT editing team will clarify whether each recommendation is short- or long-term.

Mr. Benforado advocated for editing the report to place greater emphasis on the key messages. The Agency could make a bold change to the way it performs science by using citizen science. He proposed consolidating some of the recommendations, emphasizing key points in the Executive Summary, and revising the Table of Contents.

Mr. Learner noted that the enforcement of environmental laws by EPA and the Department of Justice has been criticized in recent years. He recommended that citizen science be treated in the report as complementary to EPA's core enforcement mission rather than an alternative to it. Mr. Benforado responded that citizen science has the potential to increase the public's understanding and support of environmental protection.

Action Items and Next Steps

William Ross, Jr., The University of North Carolina at Chapel Hill; Council Members

The NACEPT members agreed that all major issues had been addressed in the preceding discussion and that a section-by-section discussion of the draft was not needed. Mr. Benforado commended the Council members for a productive discussion.

Mr. Joyce expressed his appreciation to the Council members for their efforts in drafting and commenting on the report. Mr. Joyce and Ms. Dosemagen reviewed the following deliverables needed from the Council members discussed during this meeting:

- **Comments and Suggestions.** NACEPT members should send additional comments and suggestions on the text, figures and tables of the draft report to EPA (due date: August 29).

- **Executive Summary.** The NACEPT editing team will draft an Executive Summary and revise it based on comments from Mr. Learner. The revised Executive Summary then will be sent to the Agency. EPA will distribute via email the revised draft Executive Summary to the NACEPT members for review (distribution date: September 9).
- **Case Studies.** NACEPT members should send additional case studies (particularly studies related to toxics and human health, data analysis, environmental media other than water, and the right-hand side of the data requirements spectrum) to EPA (due date: August 29).
- **Photographs.** NACEPT members should send photographs to EPA (due date: August 29). SCG will evaluate whether their image quality is sufficient for publication and, if necessary, obtain publishing rights.
- **Acknowledgments.** NACEPT members should send additional acknowledgments to EPA (due date: August 29).

Mr. Joyce indicated that EPA will send a meeting invitation to the NACEPT members for the next Council meeting, scheduled for October 17, 12:00 – 4:00 p.m. Eastern Time, which will be conducted via teleconference and will be announced in the *Federal Register*.

Adjournment

Mr. Ross thanked the NACEPT members for a productive meeting and then adjourned the meeting at 2:37 p.m. EDT.

Action Items

By August 29, NACEPT members should:

- Send additional comments and suggestions on the text, figures and tables of the draft report to EPA.*
- Send additional case studies (particularly studies related to toxics and human health, data analysis, environmental media other than water, and the right-hand side of the data requirements spectrum) to EPA.*
- Send photographs to EPA.*
- Send additional acknowledgments to EPA.*
- Respond to the survey to select a title, adding new candidates if desired.

The NACEPT editing team will:

- Draft an Executive Summary.
- Distribute a survey of candidate report titles to the NACEPT members for review (distribution date: August 22).
- Revise the draft Executive Summary based on comments from Mr. Learner and send it to EPA.
- Draft text making more prominent reference to environmental justice issues related to EPA's support of citizen science.
- Draft text regarding current EPA support of citizen science.
- Add an explanation of place-based citizen science.
- Develop a glossary.
- Clarify whether each recommendation is short- or long-term.

EPA will:

- Send a meeting invitation to the NACEPT members for the next meeting, October 17, 12:00 – 4:00 p.m. Eastern Time.
- Distribute the revised draft Executive Summary via email to the NACEPT members for review (distribution date: September 9).

SCG will:

- Renumber the recommendations sequentially.
- Integrate the case studies within the body of the report.

* All materials sent via email to EPA should include among the recipients Mr. Joyce, Mr. Green, Ms. Dosemagen and Dr. Parker.

- Edit the case studies to add section headings (e.g., location, year, design/methodology, strategy).
- Merge Tables 5 and 6.
- Redraft Figure 2 to emphasize the network aspect of citizen science.
- Redraft Figure 3 to add information about the benefits of each data use.
- Redraft Figure 4, adding headings to the case studies in the figure that describe the range of citizen science activities.
- Add the data quality spectrum graphic (with the appropriate box highlighted) to the top of each case study.
- Produce a desktop-published, print-ready version of the final report (due date: post-October 17).

Appendix A
National Advisory Council for Environmental Policy and Technology (NACEPT)
Meeting Participants

NACEPT Members

Ms. Erica Bannerman

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Appendix B
Agenda for the August 22, 2016 NACEPT Meeting



**National Advisory Council for
Environmental Policy and Technology**

Agenda

Monday, August 22, 2016
12 p.m. – 4:00 p.m. EDT

U.S. EPA William Jefferson Clinton East Building, Rm 1132
1201 Constitution Avenue NW
Washington, DC 20460
Call in number: 866-299-3188 Conference code: 202-233-0068

- 12:00 pm Welcome, Introductions, and Overview of Agenda**
- Eugene Green
NACEPT Designated Federal Officer
- Bill Ross
NACEPT Chair
- 12:15 pm Public Comments**
- 12:30 pm Discussion on Initial Integrated Draft of NACEPT's Report on EPA and Citizen
Science: A Strategic Approach to Protecting Human Health and the Environment**
- Bill Ross
NACEPT Chair
- Council Members
- 3:30 pm Action Items and Next Steps**
- Bill Ross
NACEPT Chair
- Council Members
- 4:00 pm ADJOURN**

Appendix C

Public Comments Submitted in Writing

To: Eugene Green, NACEPT Designated Federal Officer, U.S. EPA

From: Trudy Ann Cameron, Mikesell Professor of Environmental and Resource Economics, University of Oregon

Date: August 18, 2016

Re: Public comment—Environmental Citizen Science Projects and Benefit-Cost Analysis

For benefit-cost analysis of public policies with respect to environmental protection, it can be very difficult to measure the benefits. This is because environmental goods tend to be non-market public goods. Citizen science projects (CSPs) can provide copious amounts of crowd-sourced scientific observations about the natural world, often collected as citizen scientists submit reports in the course of their normal interactions with nature. However, CSPs can sometimes also provide valuable opportunities to gather information about the preferences of citizen scientists themselves, with respect to the environmental good being studied. For example, if participants travel to observe nature, there can be opportunities to study their tradeoffs between travel costs to the destination (measured in dollars) and the bundles of environmental attributes that characterize the different sites at which they may choose to report their observations of nature. Or, if no travel is involved, membership in a CSP often includes member profile data and email address information that can facilitate the conduct of targeted surveys of members concerning the types of policy tradeoffs (costs versus effectiveness) that they might be willing to make.

However, participation in CSPs is voluntary. People self-select to participate as a function of their level of interest in the topic of the project. Participants are not representative of the general population and can be expected to value the environmental good more highly than the average in the population. To maximize the value of CSPs for identifying society's overall willingness to incur the costs of environmental protection (i.e. the social benefits derived from the protection or improvement of environmental assets), it is important to understand the determinants of individuals' decisions to participate in CSPs. With this information, statistical corrections for the non-representativeness of CSP members can be undertaken. This argues strongly for CSP-specific analysis of participation decisions, if we are to maximize the value of information about CSP participants' preferences and behaviors for benefit-cost analysis of environmental protection.

Chair Certification

I, William Ross, Chair for the National Advisory Council for Environmental Policy and Technology (NACEPT) certify the meeting minutes for August 22, 2016 (teleconference) are complete and accurately reflect the discussions and decisions of said meeting.



William Ross
NACEPT Chair

November 8, 2016

Date