**National Aeronautics and Space Administration**

**Science Mission Directorate**

**Earth Sciences Division**

**Applied Sciences Advisory Committee**

**NASA Headquarters**

**Washington, DC**

**April 17, 2014**

**Meeting Minutes**

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**Peter Meister, Executive Secretary Kass Green, Chair**

**Applied Sciences Advisory Committee**

**NASA Headquarters**

**Washington, DC**

**April 17, 2014**

**Meeting Minutes**

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 ***Meeting Report prepared by***

***Bergit R. Uhran, Consultant***

***P B Frankel, LLC***

Session 1: Overview and Meeting Objectives

Mr. Peter Meister, Applied Sciences Advisory Committee (ASAC) Executive Secretary, welcomed everyone to the meeting. The meeting was conducted by telecom. Mr. Meister noted that there were three main topics to be covered in the meeting: first, to review missions and applications; second, to establish a style structure for the meeting itself; and third, to synthesize what was accomplished last January and during the current meeting. The synthesis will be used to prepare a letter for the Earth Sciences Division.

Session 2: Earth Sciences Division and Applied Sciences Program

Dr. Lawrence Friedl, Director, NASA Applied Sciences Program (ASP), Earth Sciences Division, NASA Headquarters (HQ), reminded everyone about the ASAC charter. He stated that the purpose for the meeting is to be briefed on mission planning and to determine a structure for future meetings. He noted that the President’s fiscal year 2015 budget allocates roughly $1.8 billion (B) to the Earth Sciences Division and shows small growth through 2019, allowing for the missions that have been planned and for some missions to have additional scope. There will be more focus on climate issues but there are no additional funds for that, so it will be necessary to cover a larger scope with the same amount of money. He noted that the Orbiting Carbon Observatory-3 (OCO-3) has been defunded in 2015 in order to provide funding for other items. Rather than spread budget reductions across the Division, the budget was cut for OCO-3. OCO-2 remains funded and will launch in early July--it is “safe.”

Dr. Friedl explained that the President submitted a budget “plus up” allocating an additional $900 million (M) to NASA, including $187 M to the Earth Sciences Division for OCO-3 and the Pre-Aerosol Clouds and Ocean Ecosystem (PACE) mission; however, this additional funding probably will not be passed by Congress.

The International Space Apps Challenge was held April 12-13, 2014. Half of the 40 submissions were related to Earth sciences and the environment. NASA will pursue the more promising applications. The Challenge helped spur innovation in using NASA data and provided feedback from the software development community as to where there may be data access issues.

Session 3: Missions & Applications

Dr. Friedl noted that the National Research Council’s first Decadal Survey for Earth science in 2007 discussed developing science applications to support quality of life and recommended that “stewarding” the planet should be taken into account when developing future projects in Earth sciences. He asked: How should NASA examine an application’s value? In October 2012, a recommendation was made [Scrivener’s note: the source was not identified] to increase the consideration of applications. Dr. Friedl asked whether there are things that the Division should do in preparation for the next Decadal Survey. He described NASA’s life cycle for space flight programs and projects. There is a pre-formulation phase (pre-phase A), a project formulation phase (phases A and B), and a project implementation phase (phases C through F). The majority of the Division’s missions are in phases E and F, with many of them lasting longer than their design life.

Dr. Friedl discussed the Soil Moisture Active Passive (SMAP) program. It has early adopters, community events and publications, workshops, and tutorials. The early adopters conduct pre-launch applications research with simulated data to accelerate the use of data after launch. Organizations with a clear defined need for SMAP data put their own funds into the program. Ice, Cloud, and land Elevation Satellite 2 (ICESat-2) is also using early adopters. Hyperspectral Infrared Imager (HyspIRI) is in pre-phase A and is using the applications traceability matrix and application readiness levels.

Ms. Christine Bonniksen, SMAP’s Program Applications (PA) lead, was introduced by Dr. Friedl. Ms. Bonniksen explained that NASA Procedural Requirement (NPR) 7120.5 is the document that must be used for developing flight projects. Projects are graded at multiple “gates” to ensure compliance with the document. Each time a mission matures and is ready to advance a letter, there is a formal Agency review. This process covers the project status and the risk level. Any adjustments to better adapt to the applied science community should be made in pre-A and A phases. Small changes can be made after phase C if additional funds are procured. She noted that the applied science community’s best opportunity to impact a project is when it is in pre-A and A phases. This is the gestation period for projects; once a project gets into implementation, changes are rare. The Mission Concept Review (MCR) is responsible for determining what the Agency wants to obtain from a mission, such as the scientific progress that will be made. The Mission Design Review (MDR) discusses how to implement requirements. There is typically a 10-year timeline from pre-A through launch.

Ms. Kass Green suggested that applications should be made a requirement in the proposal process. She noted that the Decadal Survey had recommended that applications be included in proposals, and she questioned why science-driven language is being used instead. Ms. Bonniksen replied that she did not know the exact answer, but believes that science is science whether it is research science or application science and that NASA did not want to constrain the Principal Investigators’ (PIs) proposal formulations. Proposals that include applications are well received, but they are not given an advantage.

Dr. Friedl discussed the following question: “How does NASA inject ideas about applications and applied science more fully into the next Decadal Survey?” He remarked that the “good news” is that the Agency is making progress towards combining research with applications. He noted that the United States Global Change Research Program (USGCRP) Strategic Plan highlighted four goals, including “informing decisions,” which concerns expanding the ability to provide global change information for use in decision making. Going into the next Decadal Survey, NASA needs to more directly impact mission priorities with societal benefit considerations. NASA also needs recommendations on how to expand the ability to integrate Earth system science results with social science and socioeconomic factors in order to inform decisions. He explained that an unpublished capabilities framework chart has been created to assess a mission based on how it fills seven key areas.

Dr. Philip Ardanuy expressed agreement with Dr. Friedl and presented a slide showing how the Agency’s knowledge has matured with respect to disasters, weather, energy, climate, health, STEM, food, and water. This knowledge can be used to identify gaps in knowledge most important to society that can be filled using missions and applications. He added that NASA also has a stronger focus on national security issues, such as food and water security, than academia. The critical step right now is to create a charter that clearly requires specific expertise and functionalities on the survey panel so that the right people are on it.

Dr. William Gail stated that the Earth sciences and applications study was initiated due to community concerns surrounding the Decadal Survey. Prior to the survey, there had been a workshop at Woods Hole Oceanographic Institute to discuss whether a study was needed and what its parameters should be. Decisions by that group led to the current balance between science and science applications.

Ms. Green asked whether each panel can include science and applications and noted that this would be a potential recommendation. Mr. Friedl agreed that her suggestion could serve as the basis for an actionable recommendation. Ms. Green remarked that there is a need to have a recommendation on the role of applications in mission planning

Ms. Bonniksen commented that if NASA does an application review at the same time as the science and technology trade-off, then the Agency could say “what are the trades that we need to do” and put that into the formulation agreement document. The outcome of those studies, which are done in Phase A, informs the first version of the level one requirements. If there is an applications review prior to phase A, NASA can codify what is needed into the level one requirements, which are then applicable to the rest of the project. Dr. Susan Moran suggested putting those concepts into a one-sentence, actionable recommendation. An unidentified meeting attendee commented that an application review at the same time as the science and technology trade-off will drive the level one requirements.

Ms. Bonniksen clarified that (i) the Committee wants a mission applications review to inform the Key Decision Point A (KDP-A) on any future projects, and (ii) recommendations from the mission applications review should include level one requirements and trades where application consideration can be evaluated.

Dr. Friedl noted that the Committee had previously recommended a study on the value of information. There are two aspects to this. One is how NASA determines the applications value in a potential mission. The second is applications knowledge and how NASA quantifies that. What can be done to increase the value of information from an application? What are the broader socioeconomic impacts from applications? He noted that the Committee members may have suggestions for the Earth Sciences Division or Applied Sciences to take specific actions prior to the next Decadal Survey, and that specifying those actions in the letter would help make those actions a priority.

Dr. Moran asked how the Committee can better utilize the Distributed Active Archive Centers (DAACs). Mr. Friedl replied that if the Committee thinks there are things that Applied Sciences has not done with regards to the DAACs, please let them know. Ms. Bonniksen remarked that the simulated data stored in the DAAC is very useful for training users on how to best access the data. She suggested that this could be the basis for a recommendation.

Session 4: Advisory Committee Meeting Styles and ASAC

It was noted that the Committee’s current meeting structure does not allow sufficient time for the Committee to address in-depth the issues that Mr. Friedl wants the Committee to consider. The Committee may need to create subcommittees to discuss issues. Dr. Nancy Dickson explained that she liked the format at the January Committee meeting, where non-members were permitted to discuss their own experiences; however, she did not feel that there was sufficient time for real discussion. Dr. Pietro Ceccato stated that it is difficult to provide advice on topics that are beyond his expertise. He would like information about meeting topics to be provided in advance. The Committee decided that there should be more time at Committee meetings for discussion and that this should be balanced with time for fact finding. Discussion time should be specified in the meeting agenda. This will allow the Committee to prioritize its work in areas where advice is needed. It was noted that the Committee needs good presentations to better understand the issues, as well as time to discuss them. Mr. Friedl agreed that a sentence about the structure for the Committee’s meetings could be added to the letter; he noted, however, that a formal recommendation is not necessary because he is hearing the advice now.

Session 5: Public Comments and ASAC Meeting Synthesis

There were no comments from the public.

Dr. Moran commented that it is very effective to have users attend and speak during Committee meetings. She described a video that she made where SMAP program users were interviewed. Ms. Green concurred. An unidentified person proposed that the next meeting should cover socioeconomic issues and societal needs, either through discussion or having speakers. Dr. Dickson stated that she would prefer the Committee meeting minutes to be a shorter document that covers the discussion, concluding comments, actions taken, and next steps.

An unidentified person suggested a Committee recommendation that the Decadal Survey include science applications and an emphasis on the role of the Applied Sciences program at NASA. Dr. Gail agreed to draft language for the recommendation. Dr. Moran agreed to draft a recommendation concerning the DAAC and how simulated data has been important in making early adaption possible.

Ms. Green advised that the Committee should say something to emphasize how success stories from users are a critical form of communication.

An unidentified person remarked that NASA missions are to some extent based on requirements and that the Decadal Survey is a mechanism for providing those requirements. That person suggested recommending that Applied Sciences should provide the Decadal Survey with specific information about the applications that Applied Sciences wants the next study to focus on.

The meeting was adjourned at 4:00 pm.

**Appendix A**

NASA EARTH SCIENCE DIVISION

 APPLIED SCIENCES ADVISORY COMMITTEE

April 17, 2014 • 1:00-4:00 PM EDT

via teleconference

*Annotated Agenda – Final*

**Background**

The Applied Sciences Advisory Committee (ASAC) serves as a community-based, multi-sector

forum to discuss Earth science applications and provide strategic and programmatic guidance to

the Earth Science Division (ESD) and the Applied Sciences Program. The ASAC provides

analysis, findings, advice and recommendations to inform decisions on the programmatic scope,

ambition, and priorities regarding applied research, knowledge utilization, and applications.

Within ESD, the Applied Sciences Program has a specific focus on expanding Earth science

applications, building applications knowledge and capacity, and enhancing the applications value

of satellite missions. There are some topics, such as data access, that are ongoing issues and cut

across ESD overall.

**Purpose & Objectives**

The meeting serves to inform the ASAC of key issues facing ESD on applications and to enable

the formulation and receipt of ASAC advice and recommendations. The primary purpose of this

meeting is to address topics that were postponed and deferred from the recent January 2014

ASAC meeting. The specific set of topics for this teleconference-based meeting includes:

• Budget Information for FY15

• Applications & Mission Planning

• Format and Style of ASAC Meetings

Important objectives of the meeting include:

* Feedback on ESD progress toward applications support within mission planning,
* including identification of issues for upcoming decadal survey
* Gather ASAC views on current and alternative meeting formats and styles

A product of the meeting is a draft summary or outline of the ASAC’s findings and

recommendations.

**April 17, 2014**

***Set-up and Introductions*** 12:50 – 13:00

**Session 1: Overview and Meeting Objectives** 13:00 – 13:05

**Opening Remarks** (Green, Friedl, Meister)

This session will briefly review the agenda and purpose of the meeting.

(We will notify members of the public when time is allocated for their remarks.)

*ASAC Decision or Action*

None planned.

**Session 2: ESD and Applied Sciences Program** 13:05 – 13:20

**ESD and Program Activities** (Friedl)

*Background*

This session will briefly summarize major changes or issues since the January 2014 ASAC

meeting, such as information about the FY15 President’s requested budget.

*ASAC Decision or Action*

Program and budget information is primarily to provide context and engender feedback.

**Session 3: Missions & Applications 13:20 – 14:45**

**Introduction of Topic & Summary of Activities (Friedl)**

**Speakers:**

**Applications in Mission Planning and Life Cycle** (C. Bonniksen, ESD-Flight Program)

 **Perspectives on Missions, Applications and Decadal Survey** (R. Friedl, NASA-JPL)

**Discussion** (Led by Friedl and Green)

**Recap and Advice/Recommendations** (Green)

*Background*

ESD and the Earth science community have been looking for ways to support applications –

and to shorten the time it takes users other than research scientists to work with our data in

their own applications. ESD has initiated several steps to engage the applications community

and to integrate them into the mission planning, formulation, and development efforts.

This topic of applications role in satellite mission planning was addressed in depth at the

ASAC meeting in October 2012. ASAC recommended that “NASA Earth Science should

increase the consideration of applications in mission planning, including the incorporation of

applications into criteria for mission selection.”

This session will describe recent and upcoming activities in this area for particular missions,

and it will describe a possible way to introduce applications into the formal satellite planning

and formulation process. This session will also cover efforts for a proposed study on the

“applications value” (aka, benefits, return) of future satellites missions, including indicators

of this value and the effectiveness of activities to affect the value. The session will also

provide perspectives on application s in Earth science decadal surveys as well as a possible

framework to assess research and applications capabilities in Earth science satellite missions.

*ASAC Decision or Action*

An ASAC action is to provide feedback to ESD and Applied Sciences on this topic, including

on progress, merits, and deficiencies. ASAC might provide advice or recommendations on

metrics or indicators to consider the “applications value” of missions as well as advice or

recommendations on consideration of applications in the satellite planning process.

**Session 4: Advisory Committee Meeting Styles and ASAC 14:45 – 15:30**

**Introduction of Topic** (Green, Friedl)

**Discussion** (Led by Green)

*Background*

The session will discuss the format of the ASAC meetings overall. Traditionally, each

ASAC meeting has addressed numerous topics related to aspects of Earth science

applications. Other Federal agencies and non-governmental organizations use different

formats for their advisory committees, such as ones that address fewer topics in greater

depth. This session will solicit input from ASAC on the traditional format as well as other

effective formats and approaches that ESD/Applied Sciences might consider.

*ASAC Decision or Action*

ASAC should provide feedback on the ASAC meeting format as well as input on preferred

methods and formats for ASAC activities or meetings.

**Session 5: Public Comments and ASAC Meeting Synthesis** 15:30 – 16:00

**Open Period for Public to Make Statements for the Record**

This session allows for members of the public to make statements for the record.

If there are significant numbers of public commenters, we will ask for written statements.

*ASAC Decision or Action*

None planned. ASAC can determine whether to formulate actions in response to comments,

topics, or issues raised by the public.

**Review of January & April 2014 Meetings, Findings, Recommendations** (Green)

This session will review key findings and recommendations from this meeting together with

those from the January 2014 ASAC meeting in discussion of the ASAC report to NASA.

The session will also discuss the timeframe for the next ASAC telecon/meeting (which may

depend on the discussion in Session 4 about ASAC meeting style).

*ASAC Decision or Action*

One output is a set of key topics for the letter/report, identification of writing assignments,

and agreement on a schedule for production.

Additional outputs include a list of actions and timeframe for next ASAC meeting.

***Adjourn ASAC 16:00***

**Appendix B**

**ESD Applied Sciences Advisory Committee**

**NASA Headquarters**

**Washington, DC**

**April 17, 2014**

Committee Membership:

|  |  |
| --- | --- |
| **Ms. Kass Green,** Chair | Kass Green and Associates |
| **Dr. Philip E. Ardanuy** | Raytheon Company |
| **Dr. Pietro Ceccato** | International Research Institute for Climate and Society |
| **Dr. Nancy Dickson** | Harvard Kennedy School |
| **Dr. Molly Macauley** | Resources for the Future |
| **Dr. Bill Hooke** | American Meteorological Society |
| **Dr. William B. Gail** | Global Weather Corporation |
| **Dr. Susan Moran** | USDA |

**Appendix C**

**ESD Applied Sciences Advisory Committee**

**NASA Headquarters**

**Washington, DC**

**April 17, 2014**

**ATTENDEES**

Committee Members (Attending Remotely)

|  |  |
| --- | --- |
| Name | Affiliation |
| Ms. Kass Green, Chair | Kass Green And Associates |
| Dr. Philip E. Ardanuy | Raytheon Company |
| Dr. Pietro Ceccato | International Research Institute for Climate and Society |
| Dr. Nancy Dickson | Harvard Kennedy School |
| Dr. William B. Gail | Global Weather Corporation |
| Dr. Susan Moran | USDA |

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Attending In Person, NASA Attendees

|  |  |
| --- | --- |
| Name | Affiliation |
| Peter Meister (Executive Secretary) | NASA HQ  |
| Lucien Cox | NASA HQ |
| Kathy Carroll | NASA HQ |
| Lawrence Friedl | NASA HQ |
| Andrew Paries | NASA HQ |
| Bradley Doorn | NASA HQ |
| Jeffrey Stehr | NASA HQ |

Attending Remotely, NASA Attendees

|  |  |
| --- | --- |
| Name | Affiliation/Role |
| Christine Bonniksen | NASA HQ |
| Dalia Kirschbaum | NASA Langley  |
| Ethan McMahon | NASA HQ |
| Randall Friedl | NASA/JPL |
| Shahid Habib | NASA Goddard |
| Courtney Brewer | [No Affiliation Indicated] |

Attending in Person, Non NASA Attendees

|  |  |
| --- | --- |
| Name | Affiliation |
| Bergit Uhran | PB Frankel LLC |

**Appendix D**

**ESD Applied Sciences Advisory Committee**

**NASA Headquarters**

**Washington, DC**

**April 17, 2014**

**List of Presentation Materials:**

1. Overview and Meeting Objectives (Green, Friedl, Meister)
2. ESD and Applied Sciences Program (Friedl)
3. Missions and Applications (Friedl, Bonniksen, Friedl)
4. Advisory Committee Meeting Style and ASAC (Green, Friedl)