

ABoVE Full SDT Meeting III- December 3rd – 5th, 2013

Attendees: Natalie Boelman, Steve Colt, Scott Goetz, Peter Griffith, Guido Grosse, Dan Hayes, Jeremy Karchut, Eric Kasischke, Libby Larson, Dave McGuire, Donald McLennan, Juha Metsaranta, Chip Miller, Mike Rawlins, Rob Striegl, Colm Sweeney, Ruth Varner, Stan Wullschleger; Rapporteur: Elizabeth Hoy

Teleconferencing in at various times: Josh Fisher, Sharon Billings

Day 1: December 2nd, 2013

Overview and Discussion of ACEP Themes

The co-chairs began the meeting by outlining the various scientific and organizational themes developed for Chapters 1-3 of the ACEP including: developing the scientific rationale, emphasizing the importance of research to society, identifying relevant research and objectives needed, highlighting the critical role of NASA in ABoVE, engaging stakeholders and decision makers, and emphasizing collaboration. It was made clear that the ACEP should resonate with outside groups to ensure effective collaboration.

Following this initial presentation, a discussion followed in which SDT members discussed these themes.

Action Items from this discussion included:

- Chapter 2 – Revisit and ensure that stakeholders and ecosystem services are well represented throughout the chapter (consider the structure of the vulnerability diagram)
- Chapters 3 – Revisit the order of the themes to ensure that ecosystem services/society is emphasized
- Overall ACEP Action Item – Ensure that interdisciplinary nature of ABoVE is well represented

Discussion of ACEP Chapter 4

Following a discussion of the themes within the ACEP, co-chair Hayes discussed additional objectives for the meeting, including dialog needed for Chapter 4 issues, such as the study domain, field study strategy, remote sensing strategy, modeling strategy, data analysis, synthesis, integration and scaling.

The large group discussed the study domain, and over the course of the three day meeting, a draft study domain was determined which includes areas of Alaska and western Canada, determined based on the locations of watersheds, known areas of intensive study, caribou migration routes, ecoregions, and political boundaries, among others. A draft of the study domain can be seen at <http://bit.ly/1afucK1>.

The 'methods' groups (field studies, remote sensing and modeling) created to develop content for Chapter 4 each gave progress reports. The field studies group discussed the need to determine the locations of gaps in current measurements, the remote sensing group discussed the issues of scaling up field research, and the modeling group discussed the use of multiple models and model types in ABoVE. Calibration and validation needs (for remote sensing and models) were noted by all groups. An outcome from this discussion was:

- Chapter 4: Each method group should review its group objectives and key processes (1-2) needed to answer these objectives (refer to Chapters 2-3 of the ACEP for objectives).

Discussion of Method Groups

The different Methods groups spent time in breakout discussions and rejoined to further discuss the overall strategy for Chapter 4. Main topics discussed by each group are included below:

Field studies – Determining baseline measurements/variables needed for ABoVE (encompassing the needs of field research, remote sensing and modeling components of the study), as well as the geographic location in which measurements should be taken is challenging. It will be important for the SDT, and NASA, to consider ways to leverage resources and share datasets across existing projects when appropriate. An idea to have field research groups examine the broad interactions occurring in the arctic and boreal regions was proposed – integration and scaling will be important issues.

Remote Sensing – This group is focusing on summarizing the types of remote sensing needed to provide the variables to address the Tier 2 Questions (Chapters 2 and 3). This group is also considering the importance of scaling field data for use in modeling. Progress by this group has included a summary of what remote sensing products are currently available as well as how remote sensing will be used to address variables important to ABoVE. Next steps include determining key variables based on ABoVE's priorities – what needs to be measured, as well as what should and could be measured during ABoVE. Meeting the needs of decision makers and coordinating with ongoing efforts will be important in furthering the efforts of this group.

Modeling – This group discussed the general categories of model types that simulate ecological processes that impact ecosystem services, and also discussed the generic needs for data to simulate these processes (including data for driver initialization and calibration/validation). Issues of when to begin modeling efforts in ABoVE were discussed (early in the process such that modeling needs can influence further field and remote sensing data collection would be ideal). It was also discussed that modeling can be a powerful tool for integration, although it is not the only method of integration. A 'portfolio' approach to modeling was proposed for ABoVE, in which specific models are used for the individual questions posed by ABoVE. This initial approach could be augmented by model integration in later phases of ABoVE.

Day 2: December 3rd, 2013

Discussions of an overall strategy for Chapter 4, as well as an overall study domain, continued on Day 2 of the meeting.

The SDT expressed the desire to include areas of disturbance (both biological and anthropogenic) within the study domain, as well as including aspects of permafrost dynamics and hydrology.

A discussion of the study design included the importance of representing the interdisciplinary themes within ABoVE (such as permafrost, wildlife, etc.) and addressed how to incorporate these themes into the field, remote sensing and modeling studies to be carried out within ABoVE. Creating a field study approach which focuses on interaction elements between the different themes was again discussed. Also, the issue of scaling field research strategies to be used by remote sensing and modeling studies was addressed.

Canadian Government Representatives Meeting

The afternoon of Day 2 included a meeting with Canadian government representatives (from CAS, CFS, Environment Canada and others).

A series of presentations were given by the different groups showcasing the depth and breadth of arctic and boreal research in Canada (including field research and remote sensing research).

Issues of data sharing and coordination across agencies were raised. It was noted that IPY included coordinating activities, and CHARS is now working to coordinate efforts. Additionally, government-academia interactions are encouraged across Canada. An attempt is underway to develop integrated modeling for Canadian systems. A modeling framework is under development by CFS and further discussions could be arranged to discuss this effort if desired. It was noted that identifying shared priorities and available infrastructure and knowledge could form the basis of valuable partnerships for both Canada and the United States.

Action Items from the meeting included:

- Sharing the presentations from the meeting with the SDT
- Sharing the datasets the CCE Office has collected on the AGOL system with Canadian partners
- Further discussing opportunities to partner with Canadian groups.

Day 3: December 4th, 2013

Further discussions of the study domain included greater detail into the core and extended/contributing areas of the domain. Action items are to:

- Investigate the intersection and union of different geospatial data layers (such as hydrology, watersheds, soil carbon, flora/fauna (caribou range maps), etc.)
- Review the geographic domain write-up by each method group for Chapter 4 to ensure all core areas are considered for the study domain

Following this discussion of the study domain, the methods groups discussed additional progress within their groups:

Remote sensing – There is a desire that ABoVE ensure new data products are represented in the campaign, and that proven methodologies are used for historical and newly collected data. This group will continue to craft a strategy for ABoVE that will ensure these needs are met.

Field Studies – There are three sections this group is considering as they draft text for Chapter 4: 1) Ensuring a focus on the complex interactions occurring in the ABoVE study domain, 2) Ensuring the appropriate selection of field sites, and 3) Considering how to scale field studies to meet the needs of remote sensing and modeling studies.

Modeling – This section of Chapter 4 will discuss how field studies can be used to calibrate/validate models, and will also discuss conceptual issues relevant to modeling. The ‘portfolio’ approach to modeling will also be discussed.

Integration/data analysis – While not one of the three ‘methods’ groups, data integration and analysis is important in ABoVE and sections of Chapter 4 and 5 will be devoted to this topic. Each method group

was encouraged to include detail in their sections relating to this topic, such that it can be synthesized by the co-chairs at a later date. The SDT will need to consider the linkages over different system components, and across different scales, to ensure that integration is addressed within ABoVE.

Discussion of Chapter 5 Outline and Wrap-up

The first two days of the meeting included progress in outlining Chapter 4 and developing the study domain. Discussions of the top-level implementation requirements (Chapter 5) included additional direction to the SDT (such as clearly articulating the strategy/approach investigators should consider, recommending the type of project office support needed, detailing the types of data management, sharing and distribution needed to best empower the science, and detailing the educational and outreach components of ABoVE). It will be important for the ACEP to discuss milestones needed during ABoVE, as well as the training and education opportunities to be available during ABoVE (past field campaigns have offered opportunities for capacity building and undergraduate/graduate/post-doc training).

Chapter 5 will also have a section on partnerships and collaborations. While it is not within the scope of the SDT to make collaborations, the SDT can discuss within the ACEP how they would like collaborations to function and can discuss partnerships that are currently solidified.

Action Items from this discussion include:

- Scheduling follow-up telecons prior to the next SDT meeting (in early February 2014)
- CCE Office to provide initial draft of the data management text needed for Chapter 5 to the SDT for review. A small working group will review this text prior to the SDT (composed of C. Sweeney, D. Hayes, S. Wullschleger, D. McLennan, and P. Griffith).
- R. Varner to draft text for the training and education section of Chapter 5, with assistance from D. McLennan on capacity building.
- Continue to investigate and develop collaboration/coordination opportunities, including further investigating opportunities to collaborate with foreign organization (CCE Office to review Summer 2013 Trip Report for potential collaboration opportunities).