

GEOSummit Meeting

January 31, 2014

NASA Goddard, Greenbelt, MD

See Appendix A for Attendee List

1. Introductions and opening remarks

Katrine Gorham: It has been four years since the last GEOSummit Meeting. All participants introduce themselves.

John Burkhart: Summit is a one of a kind facility. It is a unique site because it was developed specifically for science purposes, and is the only high elevation research station in the Arctic. There is a lot of science interest in the station – SCO wants to see it grow and to be made available for other users. While embracing all types of science and a diverse group of researchers, the focus needs to be on what is best for the long term science horizon at Summit.

Discussion of 'White Paper' topics is a focus for this meeting, and the SCO needs to gather input from the science community. The SCO wants to improve interaction and communication within the science community.

There is a need to focus on the big picture objectives for Summit and Isi Station and the surrounding area. Summit is an extremely expensive site to operate, and the objective is to optimize the site to meet the needs for all users. Moving forward there may be enough interest and a need to have a GEOSummit meeting on an annual basis.

2. White Paper discussion:

Renee Crain: The original White Paper document was developed by the SCO and NOAA in 2010, with the objective to justify the existence of Summit Station. It is an expensive station to maintain with challenging clean air and snow requirements. With new science interests on the horizon, the plan is to shift science that does not have a clean air / snow requirement to a new station called Isi. The White Paper exists as a mechanism to explain the motivation for research at Summit and Isi so the National Science Board, as well as existing stakeholders. The paper is a living document and will continue to develop. Any input is welcome and very important.

Renee Crain: The Science Coordination Office (SCO) is funded through a grant (RSL), and has been active for approximately eight years. The SCO exists to help the research community use Summit Station as a shared resource by de-conflicting impacts between science experiments and assisting with planning for science support.

3. Summary of State Department interest in folding in Greenland participants / students (presented by the NSF)

The NSF is interested in focusing outreach activities that are useful and helpful to Greenland. Moving forward, internship and training opportunities will be developed for students in Greenland.

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The JSEP and IGERT / Dartmouth programs are examples of NSF supported programs that have been successful in Greenland. The JSEP program includes Greenlandic students, and is led by an Einstein fellow. The NSF does a nationwide search for JSEP applicants, and the jointly sponsored program (US, GL, DK) has been quite successful.

The NSF is interested in pursuing cross-country interactions which could include Greenlandic students visiting US institutions. Possibilities could include internship and training programs, and the PolarTREC program could maybe engage Greenlandic teachers. The NSF encourages PIs to consider how they can contribute to provide further opportunities for Greenlandic students.

There is currently internship program in place at the Thule AB. The program is run by the Thule contractors, and there are 25 Greenlanders on base doing training (carps, electricians, etc.). Following their internship, participants return to their communities with the skills that have been developed.

Representatives from the US Embassy in Denmark (participating via phone) indicated that there is opportunity for growth and focus on basic skills (i.e. electricians, plumbers, etc.). As Greenland develops as a country, there are opportunities to be an active part in the development. The existing internship model at Thule AB is a good example. There is also potential for these sorts of opportunities at Station Nord or near Nuuk, though none currently exist.

Mary Albert: The IGERT/Dartmouth program focusses on polar environmental change, and provides an opportunity for interaction and discussion of science with people in Greenland. The program mixes culture, science, and politics, and has formed a good partnership with Greenlandic students. IGERT had interacted with JSEP, which has been a mutually beneficial interaction between different cultures. These interactions give the IGERT students context for their own research and allow them to reach outside of their specific research and think in broader terms. One of the IGERT objectives is to increase cultural sensitivity while conducting multidisciplinary work across cultural, science, and policy disciplines. Albert is also developing an REU proposal and has discussed possible funding opportunities with Bill and Hedy.

Hedy Edmonds: Encourages people to keep exploring ideas - funding is available.

Von Walden: The ICECAPS project at Summit was also involved with activities for the JSEP students.

Ideas for training / opportunities Greenlanders include, (1) basic meteorological observations, (2) being involved with measurement / sampling activities, (3) training in basic computer skills, (4) teacher training, (5) technical skills, (6) science technician 'shadowing'.

Representatives from the US Embassy in Denmark noted that it would be valuable to consider what programs the Danes have developed for Greenlandic involvement. This may be helpful in understanding what programs may be most useful for the US to pursue. The traverse operation may be a good opportunity to train and engage with locally hired staff. NASA and NOAA may be able to become involved with IT training.

Renee Crain: Goal is to expand Greenlanders horizons. Many Greenlanders never get to access the ice sheet, and it would be valuable to demonstrate to them what exciting research opportunities exist within their own country. Interaction with US researchers also provides the opportunity for Greenlandic students to practice their English speaking skills, which is highly

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beneficial. It is important to pursue opportunities for these connections.

Renee will be the coordination point for developing opportunities, and the SCO can also assist with questions.

4. Short Science Presentations (future plans and recent findings)

Please see presentation slides.

5. Summary of Summit / Isi Plans

Please see presentation slides.

6. Greenland Traverse

Please see presentation slides

7. Discussion of Summit / Isi Plans and Greenland Traverse

Pat Haggerty: The NSF is collaborating with the Government of Greenland on the planned development activities for Summit / Isi Station. There is an interest in using local Greenland labor and possibility of Greenlandic provision of products.

Jack Dibb: We have to encouraged EU proposals, and EU stakeholders could potentially be involved with cost sharing for station development / operation.

Renee Crain: There is NSF interest in collaborating but there so far there hasn't been much interest. If Greenlandic companies wanted to manage Isi, the NSF would be open to this but there is no interest. Time on the 12-meter radio telescope will be offered to the host country, as well as other interested entities.

John Burkhart: There seems to be little interest in EU involvement, and there are other Arctic sites of interest for EU researchers (i.e. Svalbard).

There is NSF interest in partnering with companies to develop alternative energy solutions. There are numerous power options being investigated, and some of the funds are coming from NSF but funding also needs to come from elsewhere. Possible opportunities with Taiwanese firms, and their funds may be more flexible. The current power systems are not sustainable, and there is motivation to be as efficient as possible. This would require higher capital but better in the long run.

Question about possible bare-bones camp to the north of the Isi site for comparison purposes?

Response / Comments:

- A bare-bones flask sampling station might be feasible, and maybe it could be a mobile camp on north wind days.
- Contaminated data from north wind pollution (at the current Summit TAWO) is less than 15%.
- Consider shutdown of power system on north wind days?
- Telescope will not continuously use high power, so it may be possible to mitigate north wind impact.

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Question regarding bandwidth capabilities.

Response / Comments:

- The current bandwidth is working well for ICECAPS.
- More data is possible, but increasing the bandwidth is very expensive. Need to evaluate the cost and what data is critical.
- The telescope team should have a seat within the existing power group (Tracy Dahl will follow up on invite).

The current plan is to transmit power from Isi to Summit via power cable.

Question regarding location of future Isi station / telescope and potential impact to the ICESat satellite validation transect.

Response / Comments:

- What do we do if there is impact? How far away does it need to be? Is it possible to shift the station location so it does not impact NASA? The skiway is a concern because changing the orientation could result in a wind direction issue, which is not good for the ANG.
- There has already been a lot of discussion as to where the station should be.
- Is it possible that the telescope could move to the east?
- The ANG does not routine traffic and crossing of the skiway.
- There are only ~20 ANG flights to Summit each year, compared to ~300 / yr at South Pole. So, is this less of a concern?
- Maybe the satellite track should be moved. Kelly, Bob, and Tom will discuss further to better understand whether or not the ICESat transect is being influenced by camp drafting.
- Suggestion to extend the existing transect, and overlap with the existing line. Maybe this would allow for better understanding of the impact after a couple years of data collection.

Comments regarding future traverse capabilities and direction.

- The science traverse is very important, and there should be a grass roots (community meeting?) to determine what capabilities would be most useful for science. There needs to be investment in meetings and workshops, and thinking on a long-term basis.
- There is potential for further international collaboration.
- Options are being considered for a split fleet, and a drop zone for equipment and cargo. This will require permitting with the Government of Greenland.

Comments regarding space allocations at Summit and science transition to new structures.

- There is a need for dedicated lab and student space at Summit.
- Researchers will need to relocate to the future AWO structure.
- It may be possible to have future structures – such as the SCube – for future summer space and classroom type support. The modules could serve as flexible space.
- In past years the IGERT program has used the Rec WxPort as a classroom and it worked fine.
- The proposed new garage will not incorporate science space, so helium storage will need to be considered.
- Need to consider what will happen when the current SOB goes away. What will be available for science space?

8. Two-Way Communication

The SCO needs feedback and ideas from the research community regarding how best to communicate and keep the community updated on important changes. Recommendations and

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ideas regarding communication should be sent to the SCO or Katrine Gorham.

- How can CPS better facilitate dissemination of information to the research community? Do adequate venues exist to give feedback?
- The SCO currently updates the GEOSummit.org to share news on development activities, including newsletters and notes. How can this resource be better utilized.
- The GEOSummit.org site also includes a record of publications, which is updated quarterly.

Additional questions / comments:

- What is the plan for the White Paper, timeline and process? Development of the White Paper has been an 8 to 10 year process, with several iterations. It was an NSF request for the SCO to develop this document. It is a living document which is continuously being updated. The NSF would like to move forward with a schedule for the next iteration, including a date for input and the final version distribution. A title should also be assigned. A process needs to be established to more formally accept input and develop a comments matrix. Von Walden noted that the document should include more about the future direction, and is willing to help with development of that information. The NSF noted that the document needs to emphasize that the station is nimble and responsive, with a focus on how to respond to future science we know is coming and also what we don't know is coming. John Burkhart noted that it isn't a vision document and we need to develop a vision document, and maybe that should be separate.
- It was agreed that there may be a need for an annual GEOSummit meeting. It is beneficial to have the meeting in the DC area so the NSF can participate. There was some discussion regarding hosting the meeting at different sites with a rotation. Brian Vasel offered that it could be included as an add-on to the already planned NOAA GMAC in Boulder (May).

Appendix A: Attendee List

Name	Affiliation	Email
Albert, Mary	Dartmouth College	mary.r.albert@dartmouth.edu
Bergin, Mike	Georgia Institute of Technology	mike.bergin@ce.gatech.edu
Blundell, Raymond	Smithsonian Astrophysical Observatory	rblundell@cfa.harvard.edu
Brunt, Kelly	NASA	kelly.m.brunt@nasa.gov
Burgos, Roberto	Smithsonian Astrophysical Observatory	rburgos@cfa.harvard.edu
Burkhart, John	SCO / NILU	jburkhart@ucmerced.edu
Burnside, Jay	PFS	jay@polarfield.com
Casal, Tania	ESA	tania.casal@esa.int
Christianson, Knut	New York University	knut.christianson@gmail.com
Christopher Shuman	NASA	gov
Courville, Zoe	SCO / CRREL	zoe.courville@us.army.mil
Crain, Renee	NSF	rcrain@nsf.gov
Dibb, Jack	SCO/ University of New Hampshire	jack.dibb@unh.edu
Edmonds, Henrietta	NSF	hedmonds@nsf.gov
Fibiger, Dorothy	Brown University	dorothy_fibiger@brown.edu
Gorham, Katrine	PFS	katrine@polarfield.com
Haggerty, Patrick	NSF	phaggert@nsf.gov
Hawley, Robert	SCO / Dartmouth College	edu

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Helmig, Detlev	University of Colorado, Boulder	detlev.helmig@colorado.edu
Jacobel, Robert	St. Olaf College	jacobel@stolaf.edu
Koenig, Lora	NASA	lora.s.koenig@nasa.gov
Kramer, Louisa	Michigan Technological University	lkramer@mtu.edu
Limon, Michele	Columbia University	michele.limon@gmail.com
McConnell, Joseph	Desert Research Institute	joe.mccconnell@dri.edu
Morin, Paul	University of Minnesota	lpaul@umn.edu
Neumann, Tom	NASA	thomas.neumann@nasa.gov
Noone, David	University of Colorado, Boulder	dcn@colorado.edu
Petrenko, Vasillii	University of Rochester	vpetrenk@z.rochester.edu
Ray, Laura	Dartmouth College	laura.e.ray@dartmouth.edu
Sheeley, Tracy	PFS	sheeley@polarfield.com
Starkweather, Sandra	NOAA	vchelsea.stephens@colorado.edu
Stephens, Chelsea	University of Colorado, Boulder	
Twickler, Mark	University of New Hampshire	mark.twickler@unh.edu
Vasel, Brian	NOAA	brian.vasel@noaa.gov
Vieregg, Abigail	University of Chicago	avieregg@kicp.uchicago.edu
Walden, Von	University of Washington	v.walden@wsu.edu
Wissel, Stephanie	University of California, Los Angeles	swissel@physics.ucla.edu
Witty, Naomi	PFS	naomi@polarfield.com
Zager, Susan	PFS	susan@polarfield.com

Call-in:

Smith, David	CPS	david.smith3@ch2m.com
Mercer, Jennifer	NSF/ALEX	jmercerc@nsf.gov
Dahl, Tracy	PFS	tracy@polarfield.com