Report of LTER ASM Working Group on the Disappearing Cryosphere, 12 Sept. 2012, Longs Peak/Chasm Lake Room, The Estes Park Center, CO.

This workshop was the latest in a series of meetings about the LTER cross-site research initiative on the Disappearing Cryosphere. The purposes of the meeting were to 1) brainstorm about priority scientific issues related to climate change impacts on the global cryosphere, as seen from LTER sites, and 2) try to map a way forward to energizing research (within or cross-site) in the area. The meeting was attended by 37 people representing 11 LTER sites (see Table appended).

A lively discussion ensued. This discussion can be distilled down to a list of six general themes that might be pursued in future LTER-site-based research and cross-site synthesis:

- Changing seasonality of winter (changing temporal patterns) and other seasons;
- Changing ecosystem connectivity;
- Changing spatial patterns in the land (or sea-) scape;
- Changes in foodweb structure (composition) and function (e.g., biogeochemical cycles);
- Quantifying the surface energy budget (balance) at sites, and
- Changing carbon cycle in cryosphere regions

Other topics were also raised, including the likelihood of sudden binary transformations versus more gradual shifts, how to categorize (e..g., physical, biogeochemical, biotic) and quantify changing connectivity, how changing temporal and spatial patterns interact (e.g., does changing seasonality cause changes in connectivity?), defining seasons (e.g., when is spring?), emergence of novel ecosystems, quantifying changes in ice mass/volume.

We also discussed how to raise the visibility of cryosphere change and loss, both within the scientific community and the general public.

Finally we talked about the way forward for pursuing organized research on the disappearing cryosphere in the LTER Network. Several opportunities were identified:

- Responding to the LTER Network call for Synthesis proposals
- Submitting a proposal for a Research Coordination Network (RCN)
- Submitting a focused Collaborative Research Proposal.

The RCN option seemed like the best opportunity, in terms of effort vs payoff. The session organizer observed that the Disappearing Cryosphere initiative has been proceeding along quietly at a low level, with one significant achievement (the recent article in BioScience[1]), but so far without payoff in a research proposal. We need a hero or heroes to step forward and pursue these action items.

References

1. Fountain, A.G., Campbell, J.L., Schuur, E.A.G., Sharon, E.S., Williams, M.W., Ducklow, H.W., 2012. The Disappearing Cryosphere: Impacts and Ecosystem Responses to Rapid Cryosphere Loss. BioScience 62, 405-415.

Appendix: Attendees, Disappearing Cryosphere Working Group, LTER ASM, Estes Park, CO, 12 Sept. 2012

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