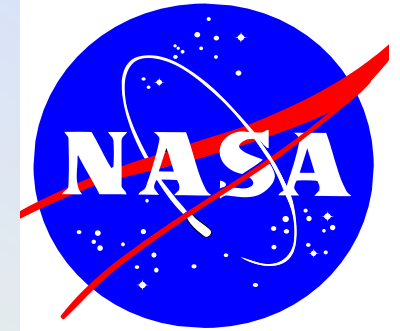




<http://above.nasa.gov>



The Arctic-Boreal Vulnerability Experiment

17 September 2013

Eric S. Kasischke, Daniel J. Hayes: *Co-Chairs: ABoVE Science Definition Team*

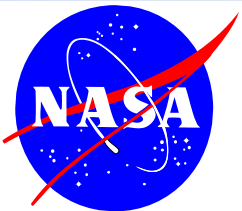
Diane Wickland: *NASA Headquarters*

Peter Griffith: *NASA Carbon Cycle and Ecosystems Office*

Libby Larson: *AAAS Science Policy Fellow, NASA HQ*

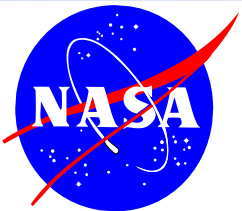
ABoVE Timeline

- October 2008 – NASA Terrestrial Ecology Program Solicits Proposals for Scoping Studies to define future field campaigns
- February 2009 – NASA Funds VuRSAL Scoping Study
- October 2010 – ABoVE Scoping Study Report submitted to NASA
- October 2011 – ABoVE Scoping Study report review completed and NASA decides to move forward
- July 2012 – Workshop convened to further refine ABoVE science questions
- **February 2013 – NASA selects Science Definition Team to produce ABoVE Concise Experiment Plan**
- April 2013 – NASA funds five pre-ABOVE projects to develop data products presumed to be of high relevance for ABOVE science
- *January 2014 – ABoVE Concise Experiment Plan completed*
- *Mid 2014 – Initial solicitation of proposals by NASA for ABOVE research. (ABOVE Concise Experiment Plan will serve as a resource to guide the development of this solicitation.)*



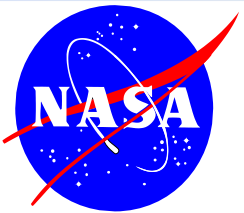
Overarching Science Question for research to be carried out during ABoVE

*How vulnerable and resilient are
ecosystems and society to environmental
change in Arctic and boreal regions?*



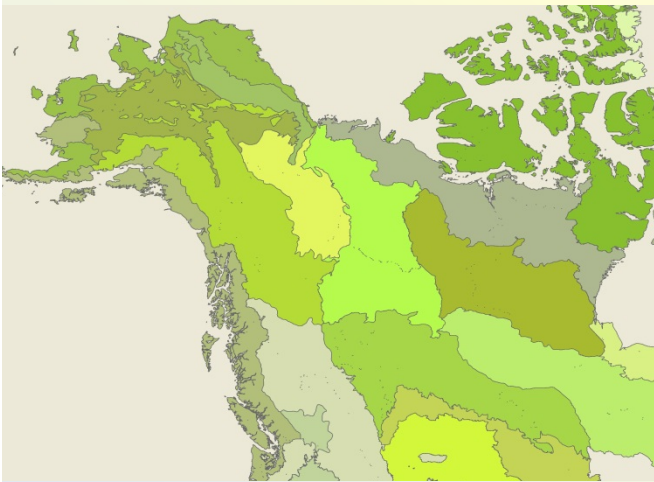
Overarching Science Objective for research to be carried out during ABoVE

To understand how complex interactions are controlling landscape transitions in Arctic-boreal ecosystems and how these changes are impacting human societies within and beyond this region.

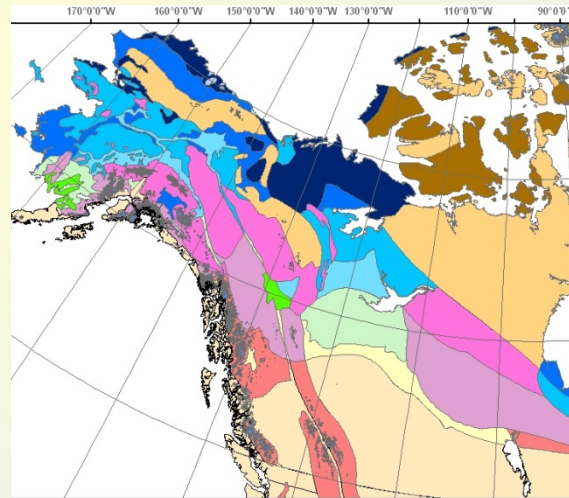


ABoVE Study Region

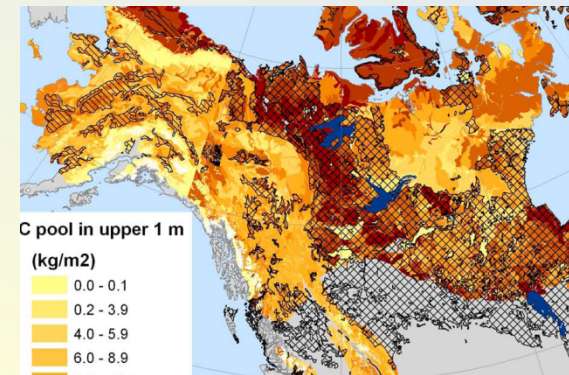
Ecoregions



Permafrost

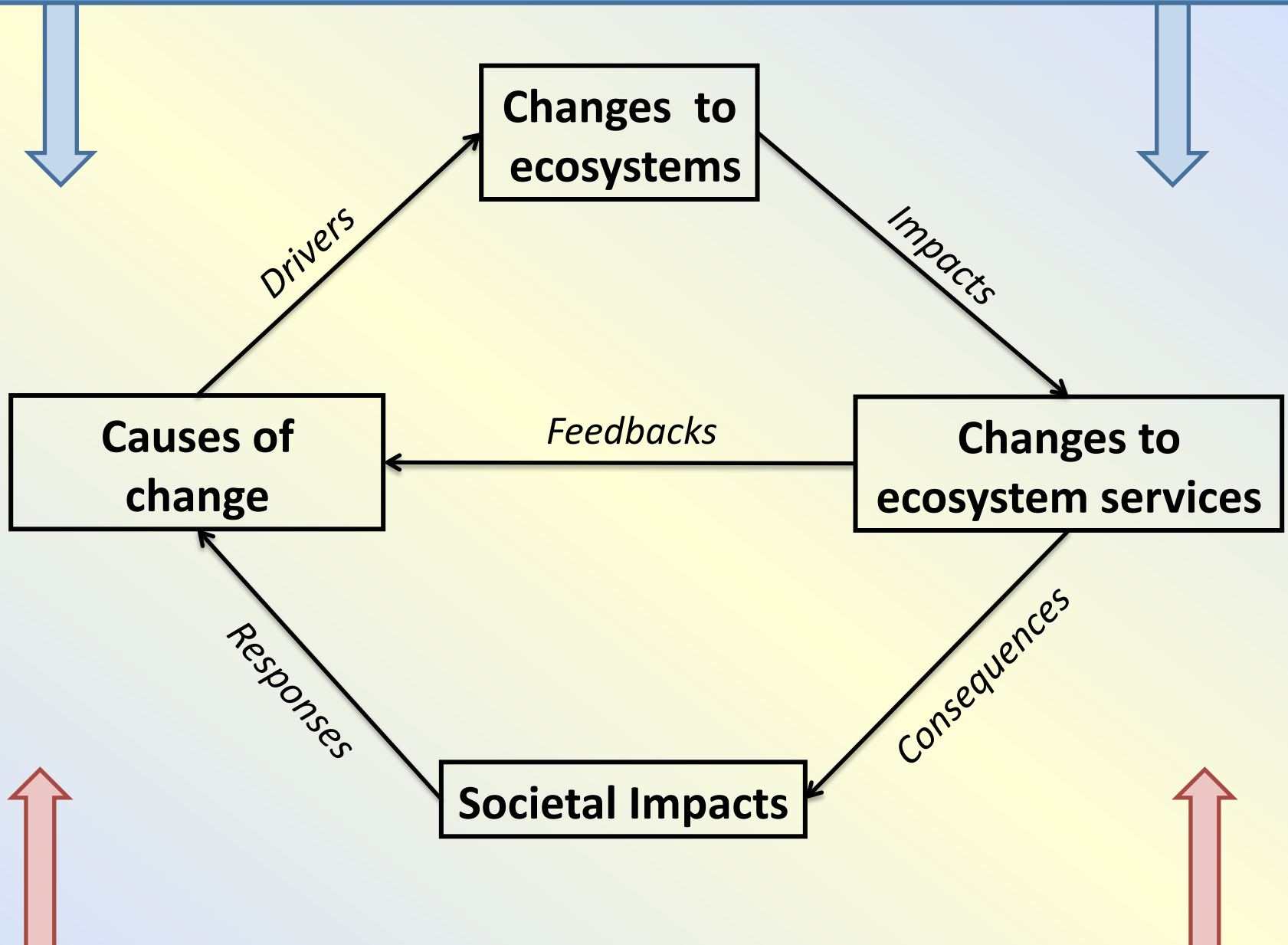


Soil Carbon



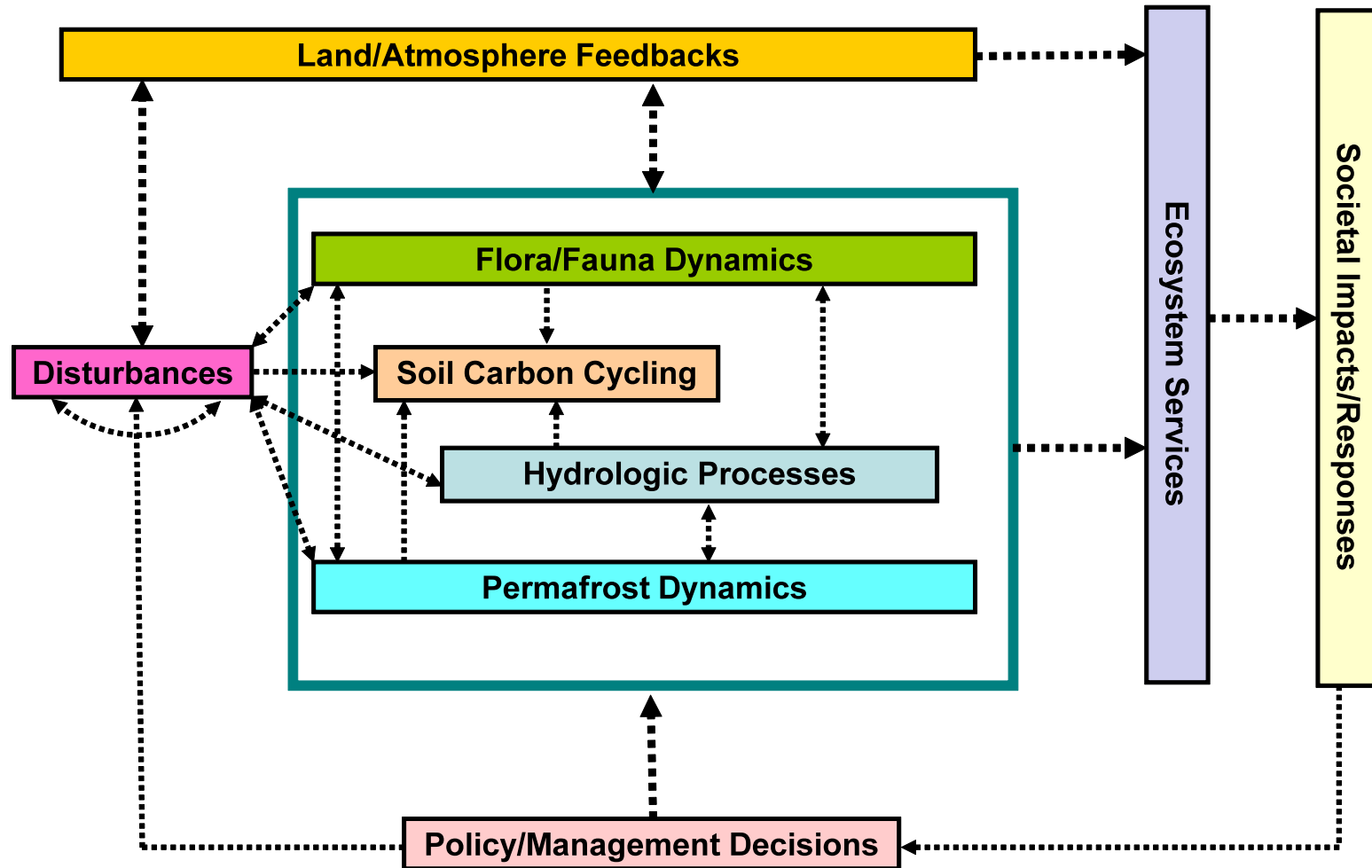
The ABoVE Study Region provides the opportunity to carry out research across gradients of ecosystems and land surface characteristics that are unique to the Arctic/Boreal Region

Global-Scale Climate Forcing



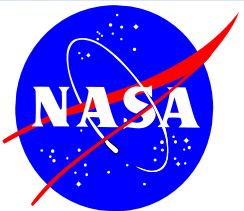
Regional-Scale Disturbances

Focus Areas For ABoVE



Tier 2 Science Questions

1. How are *disturbance regimes* in ABR changing and what processes are controlling those changes?
2. What are the changes in the distribution and properties of *permafrost* in the ABR and what is controlling those changes?
3. What are the changes in the spatial distribution of *water*, and the amount and timing of *water discharge* in the ABR and what is controlling those changes?
4. How is the magnitude and fate of *soil organic carbon* pools in the ABR changing, and what are the processes controlling the rates of those changes?
5. How are ABR *flora and fauna* responding to changes in biotic and abiotic conditions, and what are the impacts on ecosystem structure and function?
6. How do *complex interactions* affect the trajectory of ecosystem structure and function and ecosystem services in the ABR?
7. How are environmental changes in the ABR affecting *natural and cultural resources* and climate regulation, and how are *human societies* within and beyond the region responding?





Home

About

Study Area and Sites

Projects

Funding Resources

Field Operations

Geospatial Gallery

Documents

Publications

Contacts

Acronyms

Calendar

NASA pre-ABOVE Funded Research Projects

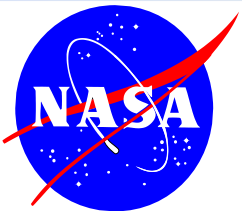
Project Lead	Project Title (view profile)
Carroll, Mark	Carroll-01: Determining the Extent and Dynamics of Surface Water for the ABoVE Field Campaign (view)
Loboda, Tatiana	Loboda-01: Long-Term Multi-Sensor Record of Fire Disturbances in High Northern Latitudes (view)
Munger, J. (Bill)	Munger-03: Development of a Data-Assimilation Framework for Integrating 25 Years of Surface and Airborne observations to assess patterns of net CO2 Exchange from Arctic Ecosystems (view)
Walker, Donald (Skip)	Walker-01: Recovery and Archiving of Key Arctic Alaska Vegetation Map and Plot Data for Long-Term Vegetation Analyses (view)
Zhang, Tingjun	Zhang-02: Remotely-Sensed Active Layer Thickness (ReSALT) Product Derived from InSAR Data Over North American Arctic Regions (view)

Tier 2 Science Questions and Objectives

How are disturbance regimes in ABR changing and what processes are controlling those changes?

Objectives:

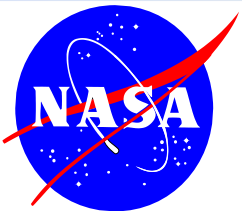
- (a) Determine the controls on the spatial and temporal patterns of the primary natural disturbances in the ABR (fire, insects/pathogens, rapid permafrost thaw)
- (b) Understand the consequences of variations in disturbance regimes for ecosystems and landscapes



What research activities will be carried out during ABoVE?

Research activities that will be supported by NASA include:

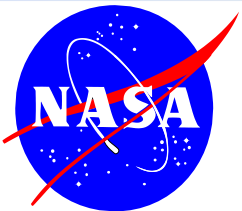
- Development and validation of information products from remotely-sensed data (spaceborne and airborne)
- Collection of field data (provide information to address critical uncertainties, including ecosystem processes and human-environment interactions, validation of remote sensing products)
- Integration, analysis, and synthesis
- Modeling activities (model development and validation, use of models for diagnosis and prognosis)



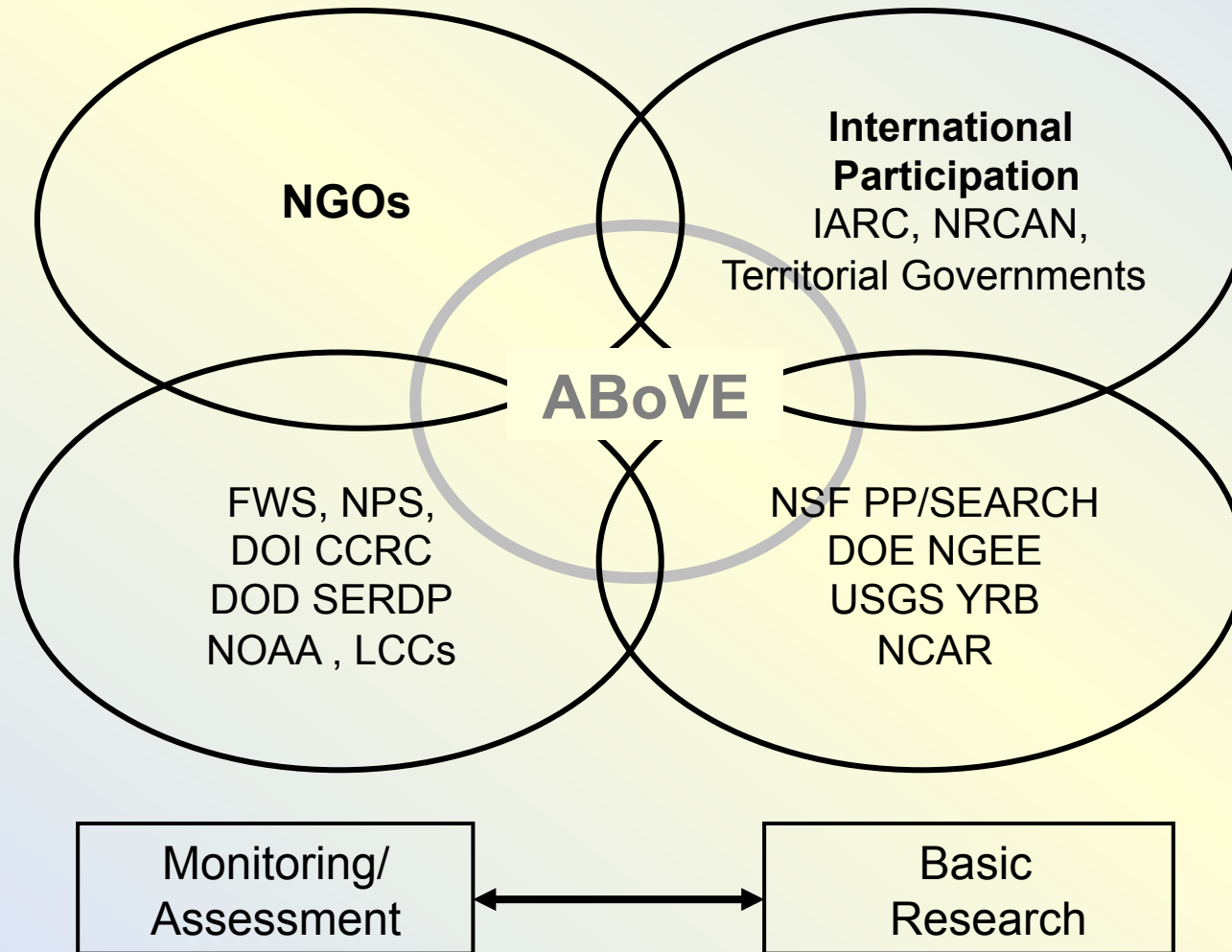
Strategic Vision for Development of ABoVE Field Campaign

Key steps in developing the ABoVE Concise Experiment Plan

- Insure that questions and objectives for ABoVE are consistent with those of other organizations
- Identify ongoing and planned monitoring activities being conducted by other organizations
- Identify partnerships/collaborations with other organizations in the ABoVE study domain
- Determine the research that needs to be carried out that will be funded by NASA



To be successful, ABoVE must coordinate with research and monitoring activities being carried out by a broad coalition of national & international organizations



ABOVE Partners/Collaborators

Advanced discussions

- Dept of Energy Next Generation Ecosystem Experiment
- Dept of Interior Landscape Conservation Cooperatives
- North Slope Science Initiative
- Bonanza Creek and Arctic LTERs
- Natural Resources Canada/Canadian Forest Service
- US Geological Survey
- Bureau of Land Management
- Alaska Fire Science Consortium
- Alaska Center for Climate Assessment and Policy

Ongoing discussions

- Changing Cold Regions Network (NSERC)
- Ducks Unlimited
- Government of the NWT
- Government of the Yukon Territory
- International Arctic Research Center/ Japanese Research Community