

The Arctic-Boreal Vulnerability Experiment (ABOVE)

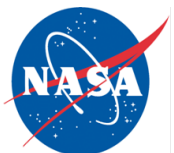


Photo: S.Goetz



Photo: Dennis Quintilio

**Stakeholders, Partners & Science Team meeting
Anchorage
Jan 2016**

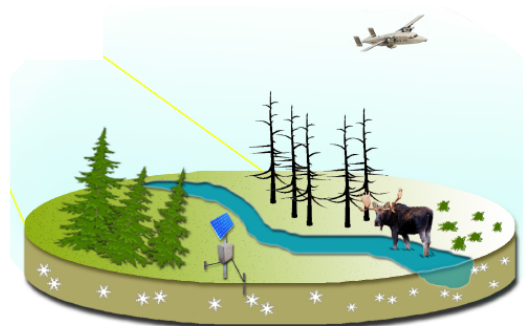


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Objectives of Part 1 of 2nd Science Team Meeting

- Learn from collaborating organizations about your goals, objectives, needs, activities & stakeholders
 - and benefit from your *experience* (e.g. LCCs)
- Convey information on current Science Team activities to your organizations (in Alaska)
- Advance discussions together re: collaborative potential beyond that already established



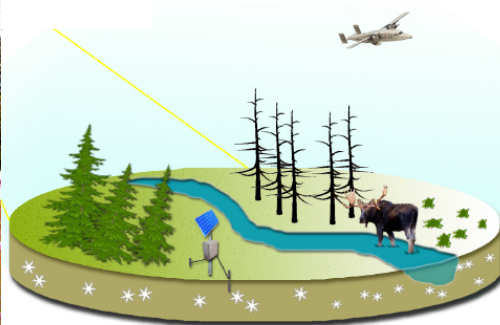
What ABoVE would like to learn from Partners & Stakeholders

1. Ongoing research and monitoring activities that are not already part of existing ABoVE Projects
 - Specifically, activities there may be interest in proposing as an ABoVE project through a partnership with NASA.
2. The key information needs of organizations for management and/or environmental change monitoring
 - We'll work together on coordinating with ABoVE research
3. What activities organizations are carrying out focused on #2
 - What environmental change information does your organization provide to your partners & stakeholders?
 - What are some examples of these organizational relationships?

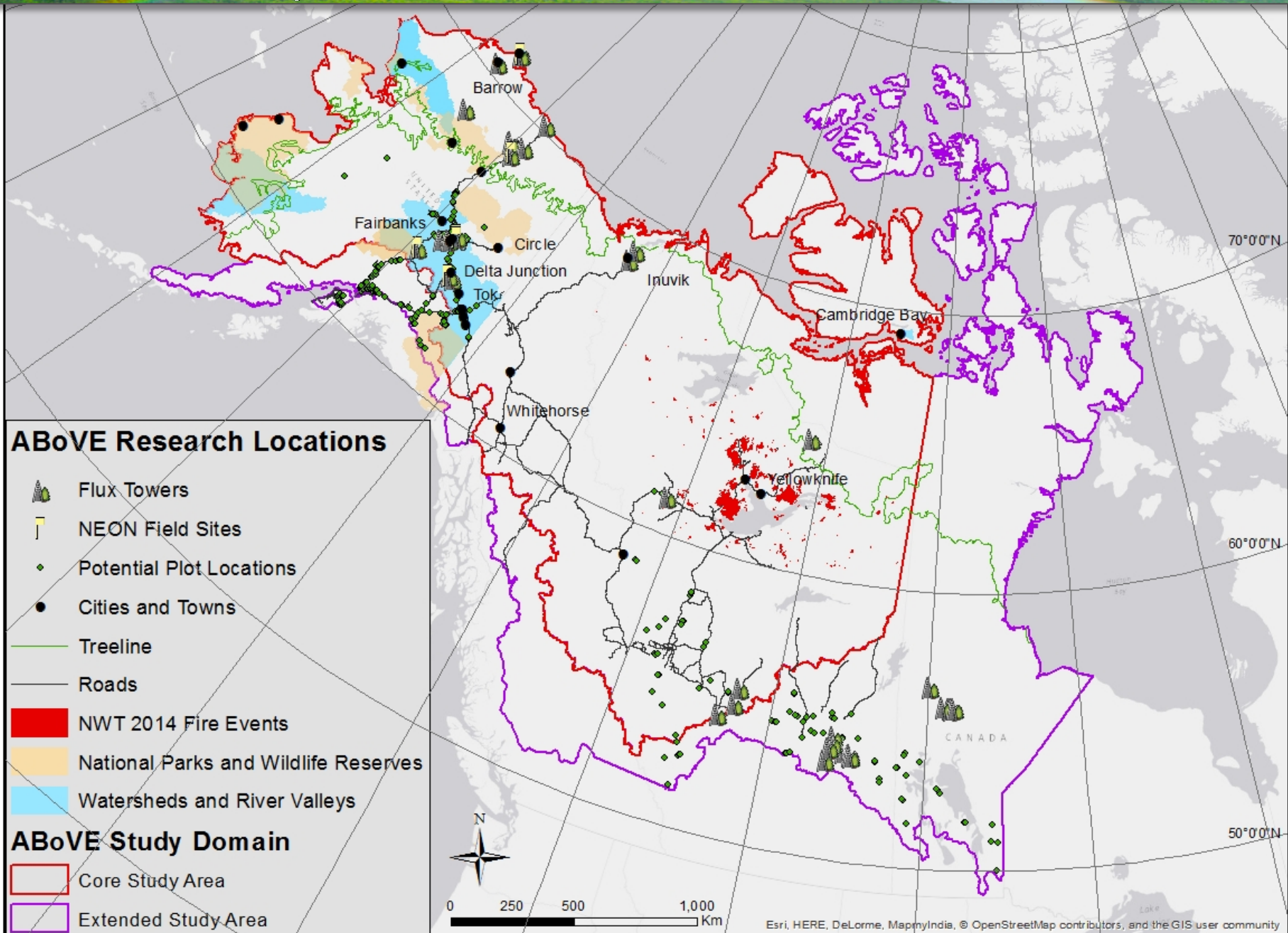




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ABOVE Overarching Science Question

How vulnerable or resilient are ecosystems and society to environmental change in the arctic and boreal region of western North America?



Photo: Torre Jorgensen



Photo: Ted Hogg

“Tier 2” Science Questions & Objectives

Tier 2 Science Questions

Section 3.1: How are environmental changes affecting critical ecosystem services - natural and cultural resources, human health, infrastructure, and climate regulation - and how are human societies responding?	Section 3.2: What processes are contributing to changes in disturbance regimes and what are the impacts of these changes?	Section 3.3: What processes are controlling changes in the distribution and properties of permafrost and what are the impacts of these changes?	Section 3.4: What are the causes and consequences of changes in the hydrologic system , specifically the amount, temporal distribution, and discharge of surface and subsurface water?	Section 3.5: How are flora and fauna responding to changes in biotic and abiotic conditions, and what are the impacts on ecosystem structure and function?	Section 3.6: How are the magnitudes, fates, and land-atmosphere exchanges of carbon pools responding to environmental change, and what are the biogeochemical mechanisms driving these changes?
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Tier 2 Science Objectives: Ecosystem Dynamics

1. Determine how interactions among vegetation, soil characteristics, hydrology, and disturbances influence surface energy exchange and mediate permafrost vulnerability and resilience to climate change.	2. Determine how and where interactions among microbes, plants, and animals exert control over ecosystem responses to climate change and disturbances.	3. Understand how vegetation attributes and hydrologic conditions interact, and respond and feedback to disturbance .	4. Quantify how changes in the spatial and temporal distribution of snow impacts ecosystem structure and function.
5. Determine the causes of greening and browning trends and their impacts on ecosystem form and function.	6. Elucidate how climate change and disturbances interact with above- and belowground communities and processes to alter carbon biogeochemistry , including release to surface waters and the atmosphere.	7. Determine how the spatial and temporal dynamics in both faunal abundance and characteristics of fish and wildlife habitat co-vary across gradients of climate and disturbance .	

Tier 2 Science Objectives: Ecosystem Services

1. Assess how future climate warming is likely to affect infrastructure and transportation networks.	2. Determine how changes to disturbance regimes, flora and fauna, permafrost conditions, and/or hydrology influence human health outcomes in the ABR.	3. Evaluate how changes to ecosystems will influence subsistence opportunities.	4. Analyze how changes to natural and cultural resources will impact local communities as well as influence land management policies and practices.	5. Determine the sources of variations in climate feedbacks from Arctic and boreal ecosystems and assess the potential for future changes to climate regulating services at regional to global scales.	6. Determine the degree to which changing environment and altered human activities result in synergistic or antagonistic changes in ecosystem services .
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Phases & Timing (2015 ~ 2024)

Phase I Focus on Ecosystem Dynamics Objectives			Phase II Focus on Ecosystem Services Objectives			Phase III Focus on Analysis and Synthesis		
Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	Yr8	Yr9
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2016	2017	2018	2019	2020	2021	2022	2023	2024

Currently 100 funded investigators & 130+ collaborators

>38 projects supported (21 from 1st NASA ABoVE call)

The size of ABoVE will grow & it ***must add up to more than the sum of the parts (projects)***. Partners & stakeholders can help (alot!)

Current Thematic / Disciplinary Working Groups

- Flora
 - Vegetation dynamics & distribution
 - Vegetation structure & function
- Fauna & Ecosystem Services
- Disturbance
 - Fire & insects
- Carbon dynamics / BGC
- Hydrology & Permafrost
- Modeling framework
- Airborne science
- *ad hoc* WGs formed as needed
 - Data, core variables, geospatial products, etc



Photo: Olof Carmel

*But it's really about coordinating & facilitating **interdisciplinary** science in a vulnerability / resiliency framework*

- Fauna – vegetation interactions
- Fire – vegetation recovery / interactions
- Permafrost – fire – BGC interactions
- Hydrology – permafrost interactions



Photo: Mike Loranty

Partner & stakeholder collaboration is essential

- Project level collaborations are already formed
- Can we extend those to additional projects?
- How can we best inform each others efforts?
- Where & what are the synergies?

Let's collectively advance each others efforts & broaden the base

