Collaborations between Global Water Futures & ABoVE: 2017 Updates & Ideas for Future Activities

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Global Water Futures will position Canada as a:
- Global leader in water science
- Global partner of choice for water research
- Provider to Canada and the world of solutions to water threats

Our Global Team

18 Canadian Universities
8 Federal Government Agencies
28 Provincial Partners
7 Indigenous Communities and Governments
388 Researchers
34 Industrial Collaborators
45 International Research Institutions

3 Key Global Program Partners: UNESCO World Climate Research Program, Future Earth
Addressing a Broad Suite of Issues Related to Water Security

- Toronto Flood (2013)
- Great Lake Algal Blooms
- Cold Regions Losing Cold (+6.5 degrees)
- Permafrost Thaw
- Unprecedented Prairie Summer Flooding
- Extreme Wildfires
- Yukon’s Slims River Changes Flow Direction
Changing Biophysical Landscape
- Hydroclimatic changes
  - Wildfire
  - Permafrost thaw
- Habitat loss and fragmentation

Community health and wellbeing
- Food safety and security
- Drinking water safety
- Traditional livelihoods
- Harvester Safety

Sustainable development
- Infrastructure
- Reliable energy supply
- Responsible resource extraction
We provided ground truthing support at:
• Baker Creek
• Scotty Creek
• Trail Valley Creek
• Fire chronosequence

And helped finance ground truthing at Slave River Delta
AirSWOT support at Trail Valley
(Evan Wilcox, poster #102)
CFIS support at Sonnentag’s network of eddy covariance towers (poster #51,53)
Northern Water Futures

- Forest stand/vegetation characteristics
- Organic/mineral soil profiles
- Surface soil moisture at time of SAR overflights
- Inundation at time of SAR overflights
- Thaw depth at time of SAR overflights
- Soil moisture to 50 cm depth during August AirMOSS flights

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Future Goal: Capitalize on Research Potential in the Yukon (See Kevin Turner’s poster #67)

Data at Wolf Creek (PI Sean Carey):

- Three eddy covariance towers operating in tundra, taiga, forest. Ecosystem & micrometeorological measurements since 1993
- Frozen ground & soil moisture arrays
- Historical LiDAR & RS imagery

1) Can we assess ecosystem health using optical measures and scale ecosystem carbon/water flux measurements in heterogeneous, alpine (AVARIS)?
2) Can we use UAVSAR for change detection (interferometry) and wetland identification in the alpine?
3) How do UAVSAR DEM creation products compare with historical at planned TLS/SFM mission?
Future Goal: Coupled Alaska/NWT Data Syntheses

- Synthesis of long-term peatland data across the APEX/Bonanza Creek LTER and Scotty Creek peatland research stations (Turetsky, Baltzer, Sonnentaag, Quinton, Douglas, Waldrop, Euskirchen, others…)

courtesy Laura Bourgeau-Chavez and Jeremy Graham, MTI
Cross-scale threshold change

Regional wetting?

Basin drying

Local flooding
Future Goal: Coupled Alaska/NWT Data Syntheses

- Alaska/NWT synthesis of ground ice and geotechnical data (Anna Coles, Steve Kokelj, Merritt Turetsky, Sharon Smith, Tom Douglas, others.....)

- Capitalize on the potential for a synthesis-to-scaling knowledge pipeline
Permafrost and ground ice data on military lands in interior Alaska (NRCS)

Compiling data from >5000 boreholes drilled by the Geological Survey of Canada between 1954-2007. Initiating territory-wide EBA Tetra Tech data compilation
Tools to support communities in the Sahtú Region

Thermokarst Vulnerability
- Low
- Moderate
- High
- Very High

Important Wildlife Areas
- Barren Ground Caribou
- Peary and Dolphin Union Caribou
- Mountain Woodland Caribou
- Grizzly Bear
- Lynx
- Marten
- Moose
- Mountain Goat
- Beaver
- Muskox
- Muskrat
- Dall Sheep
- Wood Bison
Questions, comments, or ideas? Please be in touch

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