



PROGRAM OVERVIEW

Global Water Futures Inception Meeting

BWF
BOREAL WATER
FUTURES



@BWF_BorealWater



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BOREAL WATER FUTURES - TEAM

PI and co-PIs:

Mike Waddington (McMaster)

Rich Petrone (Waterloo)

Mike Flannigan (Alberta)

Co-Is:

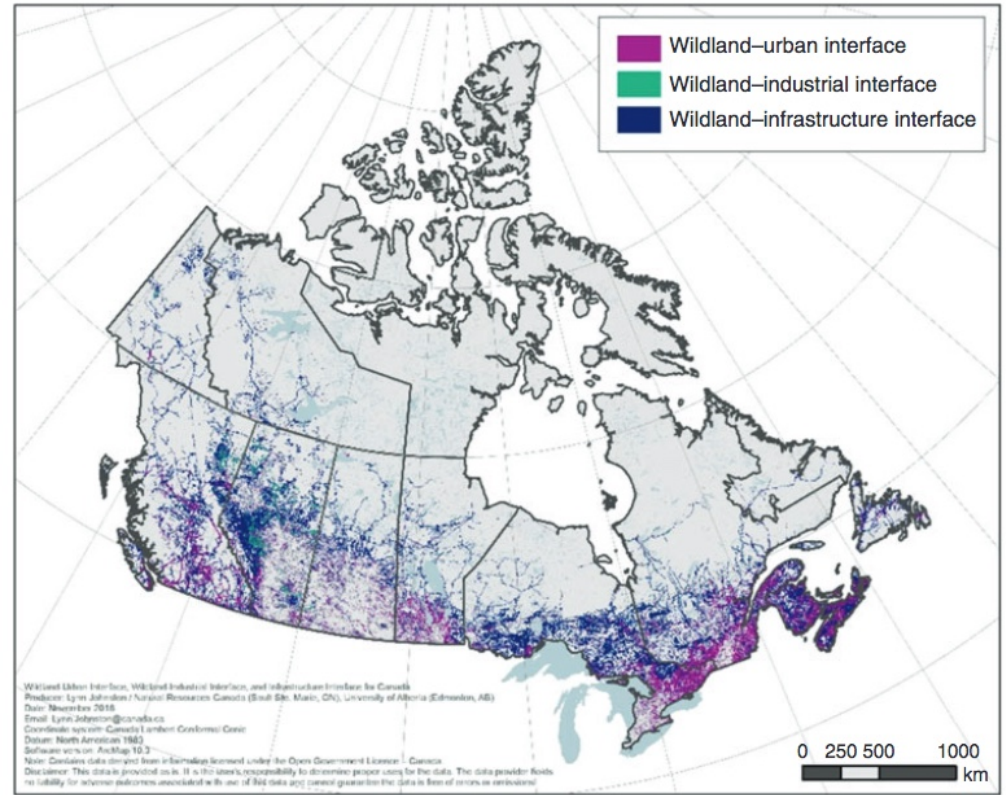
Lee Barbour (Sask), Sean Carey (McMaster), Pat Chow-Fraser (McMaster), Charles-Francois de Lannoy (McMaster), Nancy Doubleday (McMaster), Sylvain Jutras (Laval), Brent McKnight (McMaster), John Pomeroy (Sask), Jon Price (Waterloo)



BOREAL WATER FUTURES - AIM

To develop a water futures risk assessment framework to create a more resilient boreal wildland-society interface.

Urban interface
Industrial interface
Infrastructure interface



BWF Science Questions

- How will climate change, climate-mediated disturbance and human disturbance affect forest vegetation and trajectories and how will this affect future wildfire regimes?
- What wetland types are most vulnerable to catastrophic water ecosystem services collapse and how is this affected by hydrological feedbacks?
- What forest and wetland indicators are most sensitive to change and how can they be used as a 'hydrological tipping point' warning system to categorize watershed vulnerability?

BWF Science Questions

- How will changing boreal hydrology affect the maintenance and design of natural resource infrastructure, future mine closure plans and community source-water protection plans?
- What forest management, wetland management, and soil management practices can be adopted to enhance hydrological and societal resilience to reduce hydroclimatic risk exposure?
- What innovative strategies for poly-centric governance can be identified to meet diverse user needs within the boreal region, for greater certainty, reduced water risk exposure, and increased adaptive capacity?

BWF Science Themes

A: Future climate change, extreme weather and fire regimes

A1: Enhance future preparedness (links to EXTREME and Core Modelling)

A2: Produce future pan-boreal Fire Weather Index System indices

B: Boreal ecohydrology vulnerability

B1: Forest hydrology and vegetation change (CRHM and BON)

B2: Wetland ecohydrological feedbacks (PHI linked to CRHM)

B3: Changing boreal soils (hydrophobicity, hydraulic properties)

C: Water futures risk assessment

C1: Mine water management (CRHM, PHI, linked to C2)

C2: Wildland-society interface SES

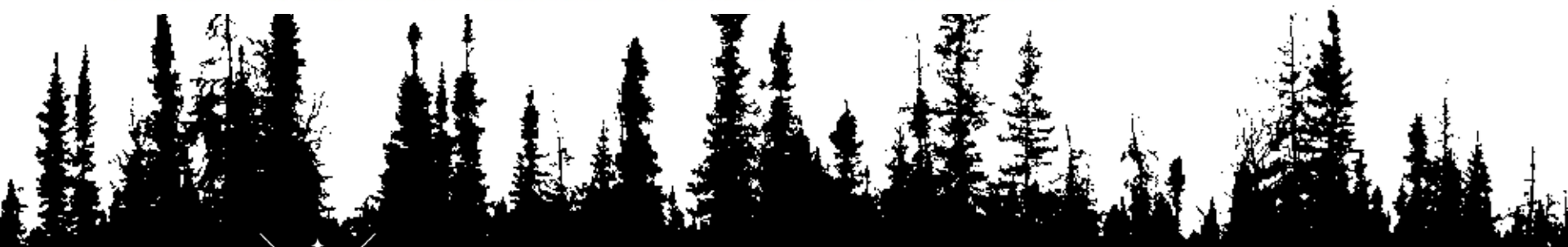


Progress -Boreal Observation Network

Table 1: Pan-Canadian Boreal Observation Network (BON)

Name, Location	Ecozone / HU(s)*	Disturbance(s)	Instrumentation*
Wolf Creek (Whitehorse, YT)	BC / Forest	None	EC, SW, GW, RS
P40/43 (Slave Lake, AB)	BP / Forest, Peatland	Harvested	EC, SW, GW, RS
Burnt Crow (Slave Lake, AB)	BP / Peatlands	Natural, Burned	EC, GW, RS
Pelican Mountain (Wabasca, AB)	BP / Forest, Peatland	Harvested, Burned	SW, RS
Syncrude BM (Fort McMurray, AB)	BP / Forests, Wetlands	Mining, Remediated	EC, SW, GW, RS
Poplar/H63 (Fort McMurray, AB)	BP / Forest, Peatlands	Drained, Burned	EC, SW, GW, RS
McKeown Lake (Timmins, ON)	BS / Forest	Harvested	EC, GW, RS
NOBEL (Parry Sound, ON)	BS / Forest, Peatlands	Harvested	EC, GW, RS
Victor (Attawapiskat, ON)	HP / Peatlands	Mining	EC, SW, GW, RS
BEREV (Forêt Montmorency, QC)	BS / Forests, Peatland	Harvested	EC, SW, GW, RS

* Ecozones: Boreal Cordillera (BC), Boreal Plains (BP), Boreal Shield (BS), Hudson Plains (HP)
 EC=eddy covariance and micrometeorology (rainfall, SWE, energy and radiation balance)
 SW=surface water (instrumented watersheds, discharge, water chemistry)
 GW=soil water and groundwater (soil moisture, soil properties, subsurface flow, water chemistry)
 RS=remote sensing products (e.g. specialized drone, digital elevation model, LiDAR)

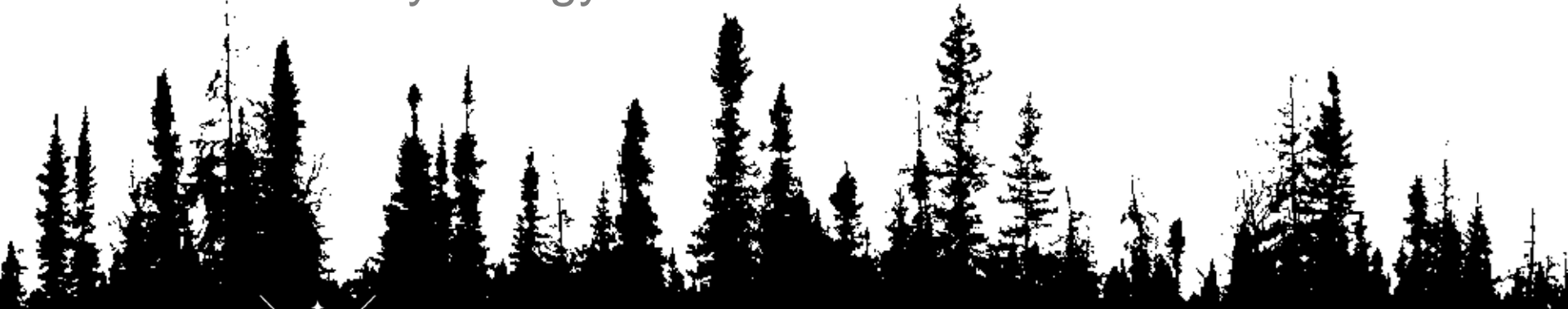


BWF- FORESEEN COLLABORATIONS

- Northern Water Futures
- Mountain Water Futures
- Southern Forest Water Futures

With a collaborative emphasis on:

- Mining water risk
- Wildfire prediction
- Wetland ecohydrology
- Forest ecohydrology



BWF- CORE NEEDS

Core support teams: The Knowledge Mobilization Team will facilitate user engagement and communication among project team members; The Computing and Data Management Teams will assist with the timely archiving of data, quality control and trouble-free delivery of data generated to the Core Modelling team.

Core modelling teams: We will make use of CRHM and CHM core modelling support including data assimilation support and assistance with integration with wildfire models (e.g. BurnP3) and the Peatland Hydrological Impacts (PHI) model.

BWF- USERS & KM PLAN

NGOs: FireSmart Canada, Ducks Unlimited, CSPMA, ICLR

Gov't: Canadian Forest Service, Parks Canada, Alberta Agr. & Forestry

Companies: Syncrude, CNRL, DeBeers, O'Kane

Form a water governance-risk reduction Boreal Knowledge Network.

Link BWF research with users and citizen science initiatives and public education activities to develop networked, emergent, responsive, polycentric, social-ecological systems based decision tools.

Mobilization via workshops, special conference sessions and prepared materials to communicate and test SES decision tools.



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