Fire Disturbance Working Group Breakout

Participants:
Angela Erb  UMassB
Liza Jenkins  MichTechRI
Merritt Turetsky  Uguelph
Xanthe Walker  UNArizona
Brent Thorne  Brock U
Jenn Baltzer  Wilfred Laurier U
Randi Jandt  U Alaska
Brendan Rogers  Woods HoleRC
Liz Hoy  NASA
Go Iwahana  U Alaska
Sander Veraverbeke  U Amsterdam
Fire Disturbance Working Group

Current Synthesis Activities – Boreal Only

- Wildfire soil carbon combustion synthesis
- Post-fire forest regrowth composition & trajectories (*with Veg Dynamics WG*)

Need to conduct a tundra fire synthesis, but resource limited. Will look into:

- Workshop proposal
- TWISK (sp?)

1. Need to develop resiliency framework for tundra fire
2. Post-fire tundra revegetation (tussocks, shrubs, bryophytes) – *Liza Jenkins*
3. Tundra combustion synthesis – *Xanthe Walker*
4. Post-fire tundra hydrology (ALT, soil moisture, subsidence) Lead?

- Current ABoVE tundra fire efforts are focused on Alaska – need to look into Canadian tundra fire
- Potential tundra fire datasets to include: Loboda, Schafer, Go I., Mack, Frost, Amy Breen, Natali, Brent Thorne, (NGEE), ...
New Fire Disturbance Synthesis Ideas

1. Boreal recruitment failure – 10% of synthesis data shows no tree recruitment – Jenn Baltzer
   a) What are the drivers?
   b) What are the sites transitioning to?
   c) Can these changes occur due to one fire event or only repeated burns?
      • In northern Alberta sites of Ellen Whitman reburned areas are shifting to grass

2. Future crosscutting activities – *some aspects addressed in Phase 2 grants*
   • Wildfire-permafrost
   • Wildfire-health
   • Wildfire-shrub-snow
   • Accounting for fire in modelling
How Might Data Inform Management Needs?

• Phase 2 Research to Operations (Fire Land Managers) Workshop
  • Follow-on to 2017 “Opportunities to Apply Remote Sensing in Boreal/Arctic Wildfire Management & Science: A Workshop”
  • 1.5 days before/after the 6th ABoVE Science Team Meeting in Fairbanks, AK
  • Interface with managers and scientists
  • Stakeholder engagement – Fire managers from AK and CAN
    • Soil moisture from remote sensing
    • Knowledge of burn severity to the surface organic layers
    • etc
  • Consortium can lead workshop proposal (Randi Jandt & Alison York)
New Wildfire Articles

• Environmental characteristics interact with fire to shape boreal forest plant community assembly: the importance of soil moisture and regeneration traits for information legacies Day et al. In prep Ecology

• Losing Legacies, Ecological Release, and Transient Responses: Key Challenges for the Future of Northern Ecosystem Science Turetsky et al 2017 Ecosystems


• Wildfire severity reduces richness and alters composition of soil fungal communities in boreal forests of western Canada Day et al. 2019 Global Change Biology

• Increasing wildfires threaten historic carbon sink of boreal forest soils Walker et al in Review Nature


• Soil organic layer combustion in boreal black spruce and jack pine stands of the Northwest Territories, Canada Walker et al. 2018 International Journal of Wildland Fire

• Cross-scale controls on carbon emissions from boreal forest mega-fires Walker et al. 2018 Global Change Biology

• Greenhouse gas forcings (Rogers et al., in prep)
New Wildfire Articles

• Influence of fire frequency, harvest, and ecosystem characteristics in the southern boreal (Dieleman et al., in prep)

• Modeling post-fire albedo under current & future climates (Potter et al., submitted shortly)

• Using combustion synthesis to model combustion across the ABoVE domain Rogers et al. in prep Earth Systems Science Data

• Regeneration Synthesis Baltzer et al. In prep Nature Climate Change

• Combustion Synthesis. Walker et al. In prep Nature Geosciences

• Climate Warming and Fire will Drive Expansion of High-Latitude Deciduous Plants and Decrease NBP Mekonnen et al. in review

• Developing a Landsat-8 algorithm for surface organic layer burn severity retrieval. French et al. to be submitted soon

• Analysis of Field data from 2014-15 NWT Wildfires on Peat Consumption and Tree Recruitment reveal Post-Fire Successional Trajectories. Kane et al. in prep

• Developing peatland soil moisture retrieval from C-band Polarimetric SAR data. Bourgeau-Chavez et al. in prep.

• Comparing patterns of wildfire severity in peatlands and uplands across NWT Shield and Plains. Bourgeau-Chavez et al, in prep

• Refinement of C-band soil moisture retrieval algorithms for regenerating fire-disturbed boreal ecosystems. Battaglia et al. in prep