Applied Sciences Program
NASA Earth Science

AGENDA:

Opportunities to Apply Remote Sensing in Boreal/Arctic Wildfire Management and Science

April 4-6, 2017 | University of Alaska Fairbanks

Organized by the Alaska Fire Science Consortium (AFSC) with support from the NASA Applied Sciences Program.
All sessions in Regents' Conference Room (109 Butrovich)

Tuesday, April 4

Day Organizer: Kristi Bulock
Facilitator: Vince Ambrosia

0730 Registration and coffee

0800 ***Introductory Session***

- Welcome, Introductions (name and affiliation)
- What we hope to get out of this workshop
  - Origins of Workshop
  - Who Is Here
  - Discussion of Goals and Products
- Jenn Jenkins, Randi Jandt, Robert Ziel: *Overview: Current Uses of Remote Sensing for Wildland Fire in High Latitudes (35 min)*

Keynote presentations

0910 Bud Cribley*: A View from the Bridge: Why Alaska's Management Agencies Need Science*

0930 Everett Hinkley, USDA Forest Service – National Remote Sensing Program Manager: *Remote Sensing Support to Interagency Fire Management*

0950 BREAK

Introduction to the State of the Science

1010 Anita LeRoy: *Short-term Prediction Research and Transition (SPoRT) Center Datasets and Products for Wildland Fire Potential and Prediction*

1030 Wilfrid Schroeder: *S-NPP/VIIRS and Landsat-8/OLI global active fire data sets*

1050 E. Natasha Stavros: *Use of New NASA Technologies for Pre-, Active, and Post-Fire Applications*

1110 Eric Stevens: *Warts and All: The Current State of the University of Alaska's Near Real Time Satellite Imagery and Derived Products Available to the Alaska Wildland Fire Community*

1130 Discussion

1145 LUNCH (on your own)

Potential fire risk: *Can remotely sensed data (e.g., daily snow extent, others) estimate spring soil moisture and surface and subsurface fuel moisture and fuel conditions, and thus provide critical inputs for fuel moisture indices used to predict fire danger and risk?*

1330 Laura Bourgeau-Chavez: *Assessing Fuel Moisture in Boreal and Arctic Ecosystems with Active and Passive Microwave Satellite Imagery*

1350 Brigitte LeBlon: *An overview of twenty years of research at the Faculty of Forestry and Environmental Management, University of New Brunswick, Canada on fuel moisture estimation using optical, thermal infrared and radar remote sensing in boreal forests in Alberta, the Northwest Territories, and Alaska*

1410 Kurtis Nelson: *LANDFIRE Remap: opportunities for incorporating new remotely sensed data into vegetation and fuels characterization across Alaska*

1430 BREAK

1445 George J. Huffman: *NASA Precipitation Datasets for High-Latitude Applications*

1505 Nancy French: *Improving fuel characterization and maps useful for emissions modeling*

1525 BREAK

1545 Ignite Session with Wednesday's Poster Session Presenters (4 min/2 slide intros to people and their projects)

1730 ADJOURN

Evening Buffet Dinner at Pike's in the Binkley Room
Cash bar, estimated dinner cost $40
UAF history professor Terrence Cole will speak on the history of forestry and fire in Interior Alaska

Wednesday, April 5

Potential fire risk, continued: *Can remotely sensed data (e.g., daily snow extent, others) estimate spring soil moisture and surface and subsurface fuel moisture and fuel conditions, and thus provide critical inputs for fuel moisture indices used to predict fire danger and risk?*

Organizer: Nancy French
Facilitator: Vince Ambrosia

0800 Welcome back

0810 Laura Bourgeau-Chavez: *Improving Remote Sensing Capability for Assessing Wildfire Effects in North American Boreal Peatlands*

0830 Dan Thompson: *Hydrological and phenological monitoring of wildfire potential in boreal and taiga wetlands: remote sensing approaches*

0850 Panel on Potential Fire Risk: moderated discussion of how to advance capabilities to estimate conditions associated with high fire danger. Robert Ziel, moderator.

- Managers: Kristi Bulock, Jay Wattenbarger, Larry Weddle
- Researchers: Dan Thompson, 2 TBD

0930 BREAK

Near Real-Time Fire Behavior: *Which remotely sensed data are best and most timely for fire detection, plume tracking of fire emissions, fire behavior modeling, mapping of flaming fronts, fire intensity, active fire perimeters, and response for ongoing fires?*

0945 Keynote: Robert Ziel

1015 Eric Stevens: *Challenges and Opportunities: Using the University of Alaska's Near Real Time Satellite Imagery to Support Alaska Wildland Fire Community*

1035 Curtis Seaman: *VIIRS Imagery Applications for Fire Weather Monitoring*

1055 BREAK

1110 Chris Waigl: *Improved operational approaches to high and low-intensity fire detection in Alaska using the VIIRS I-band Fire Detection Algorithm for High Latitudes (VIFDAHL)*

1130 Patricia Oliva: *Near real-time estimation of burned area in boreal forest using VIIRS 375 m active fire product*

1150 LUNCH

AFTERNOON

1330 Eric James: *High-Resolution Rapid Refresh with Smoke (HRRR-smoke) modeling system for experimental smoke forecast guidance*

1350 Taylor McCorkle: *Verification of the Experimental High Resolution Rapid Refresh in Alaska using the USArray Transportable Array Network*

1410 Fengjun Zhao: *Applications of Chinese FY series meteorological satellites in boreal forest fire management*

1430 Panel Discussion on Near Real-Time Fire Behavior: moderated discussion of how to advance capabilities in active fire applications. Jenn Jenkins, moderator.

- Managers: Mike Butteri, Mike Roos, Kent Slaughter
- Researchers: TBD

1515 BREAK and relocate

1530 ***Poster Session: Special Topics in Wildfire & Remote Sensing*** (UAF Pub)

- Peter A. Bieniek (presenting for Hiroski Hayasaka): *Synoptic-scale fire weather conditions in Alaska*
- Elizabeth Hoy: *Changing fire frequency and carbon consumption in Alaskan black spruce forests*
- Maija Wehmas: *Wildfire Consumption of Deciduous Stands during Large Fire Years*
- Jiaying He: *Lightning Distribution and Wildland Fire Occurrence in Alaska tundra*
- Jessica Young-Robertson: *Deciduous trees are a large and overlooked sink for snowmelt water in the boreal forest*
- Jess Walker: *Burn, grow, repeat: Toward an improved understanding of causes and consequences of shortened fire return intervals in northwest boreal forests*
- Kiunnei Kirillina: *Effects of weather and climate on forest fire behaviour: Case study of Northern boreal forest in Republic of Sakha (Yakutia), Russia*
- Arleen Lunsford: *APRFC Produced QPE and QPF grids*
- Keshav Dev Singh: *Airborne hyperspectral remote sensing in the real-time detection and management of wildfire*
- Eric Miller (presenting for Benjamin Jones): *Remotely sensing post-fire land surface changes in the Arctic using repeat airborne LiDAR*
- Yongqiang Liu: *Differences in wildfire induced land-surface changes between cold and warn U.S. eco-regions detected by satellite remote sensing*
- Dong Chen: *Fire-induced surface forcing of the Siberian larch forests since 2000 in the context of climate change*
- Tatiana Loboda (for Liza Jenkins): *Satellite Synthetic Aperture Radar detection of soil moisture condition and associated post-fire physical and ecological changes in single and repeated burning in North American tundra*
- Yongwon Kim: *Carbon exchange rate in burned black spruce forest in interior Alaska*
- Elizabeth Wiggins: *Environmental controls on regional trace gas variability and emission factors in Alaska*
- J.J. Frost: *Ecosystem Dynamics and Fate of Warm Permafrost after Tundra Wildfire and Lake Drainage on the Yukon-Kuskokwim Delta*
- Tom Maiersperger: *LP DAAC Products and Services for the Wildland Fire Community*

1730 ADJOURN

Thursday, April 6

***Post-fire effects**: Can we improve analytical methods for remotely sensed data to assess fire severity, consumption/CO_2 balance, active-layer changes, and successional trajectories of high latitude vegetation communities?*

Organizer: Jen Hrobak
Facilitator: Vince Ambrosia

MORNING

0800 Welcome back

0810 Mary Miller: *Rapid response tools and datasets for post-fire modeling in Boreal and Arctic Environments*

0830 Tatiana Loboda: *Evaluating characterization of fire extent and fire spread in boreal and tundra fires of North America from coarse and moderate resolution MODIS and VIIRS data*

0850 Amber Soja: *Decades of Change in the Former Soviet Union: Current Assessment and New Possibilities*

0910 Sander Veraverbeke, Elizabeth Wiggins: *High resolution carbon emissions estimates from boreal fires*

0930 Ellen Whitman: *Improving remotely sensed multispectral estimations of burn severity in western boreal forests*

0950 BREAK

1005 Jurjen van der Sluijs: *Assessing Boreal Forest Burn Severity using UAS-based Photogrammetric Mapping*

1025 Kirsten Barrett: *Post-fire vegetation index recovery patterns in the taiga-steppe ecotone of southern Siberia (by phone)*

1045 Rachel Loehman: *Spatial, temporal, and ecological trends in repeat fires within Alaska, 1940-2016*

1105 John Qu: *An Investigation of Impacts of Large Wildland Fires on Land Surface Properties in Alaska by Combining Satellite Remote Sensing and In-situ Measurements*

1125 Panel Discussion on Post-Fire Effects: moderated discussion of how to advance capabilities to assess post-fire conditions. Rachel Loehman, moderator.

- Managers: Lisa Saperstein, 2 TBD
- Researchers: TBD

1210 LUNCH (on your own)

AFTERNOON

Partnerships: *can we leverage other data collection and analysis efforts to advance our objectives?*

1400 Chip Miller: *An Overview of the 2017 Airborne Campaign for NASA's Arctic Boreal Vulnerability Experiment (ABoVE)*

1420 Hans-Erik Anderson: *A USFS-NASA partnership to leverage advanced remote sensing technologies for forest inventory*

1440 Charge to breakouts: Next steps to synthesize and advance our objectives

1500 BREAK and breakouts

1615 Report out

1715 Wrap up and evaluation

1730 ADJOURN

Organizing Committee

- Vince Ambrosia, NASA-Ames
- Laura Bourgeau-Chavez, Michigan Tech Research Institute
- Amy Breen, University of Alaska Fairbanks (UAF)
- Jessica Cherry, UAF
- Evan Ellicott, University of Maryland
- Mike Flannigan, University of Alberta
- Tom Heinrichs, UAF
- Everett Hinkley, US Forest Service
- George Huffman, NASA-Goddard
- Go Iwahana, UAF
- Randi Jandt, Alaska Fire Science Consortium
- Jennifer Jenkins, Alaska Fire Service
- Tatiana Loboda, University of Maryland
- Rachel Loehman, USGS Alaska Science Center
- Tim Lynham, Canadian Forest Service
- KT Pyne, Alaska Division of Forestry
- Christine Waigl, UAF
- Robert Ziel, Alaska Fire Science Consortium

Contact AFSC coordinator Alison York with any questions (907-474-6964 or ayork@alaska.edu).

Goals

- advancing co-developed investigations into new management & scientific uses of remote sensing data
- increasing the scientific foundation and operational efficiency of northern fire management
- improving understanding of climate-induced changes in northern fire regimes and ecosystem components and potential feedbacks to the global climate system
- leading to expanded application and use of remotely sensed data for fire management and fire science in high latitudes

Products

- AFSC will publish workshop proceedings, including presentation abstracts, results, and consensus recommendations. This project is a contribution to the Interagency Arctic Research Policy Committee's Wildfire Collaboration Team.

Associated Training Opportunity

- On Monday, April 3, NASA's Applied Remote Sensing Training (ARSET) project and/or Short-term Prediction Research and Transition Center (SPoRT) will offer an optional day of hands-on training for integrating NASA Earth Science data into wildland fire science, decisionmaking, and management.