# Vegetation Structure and Function

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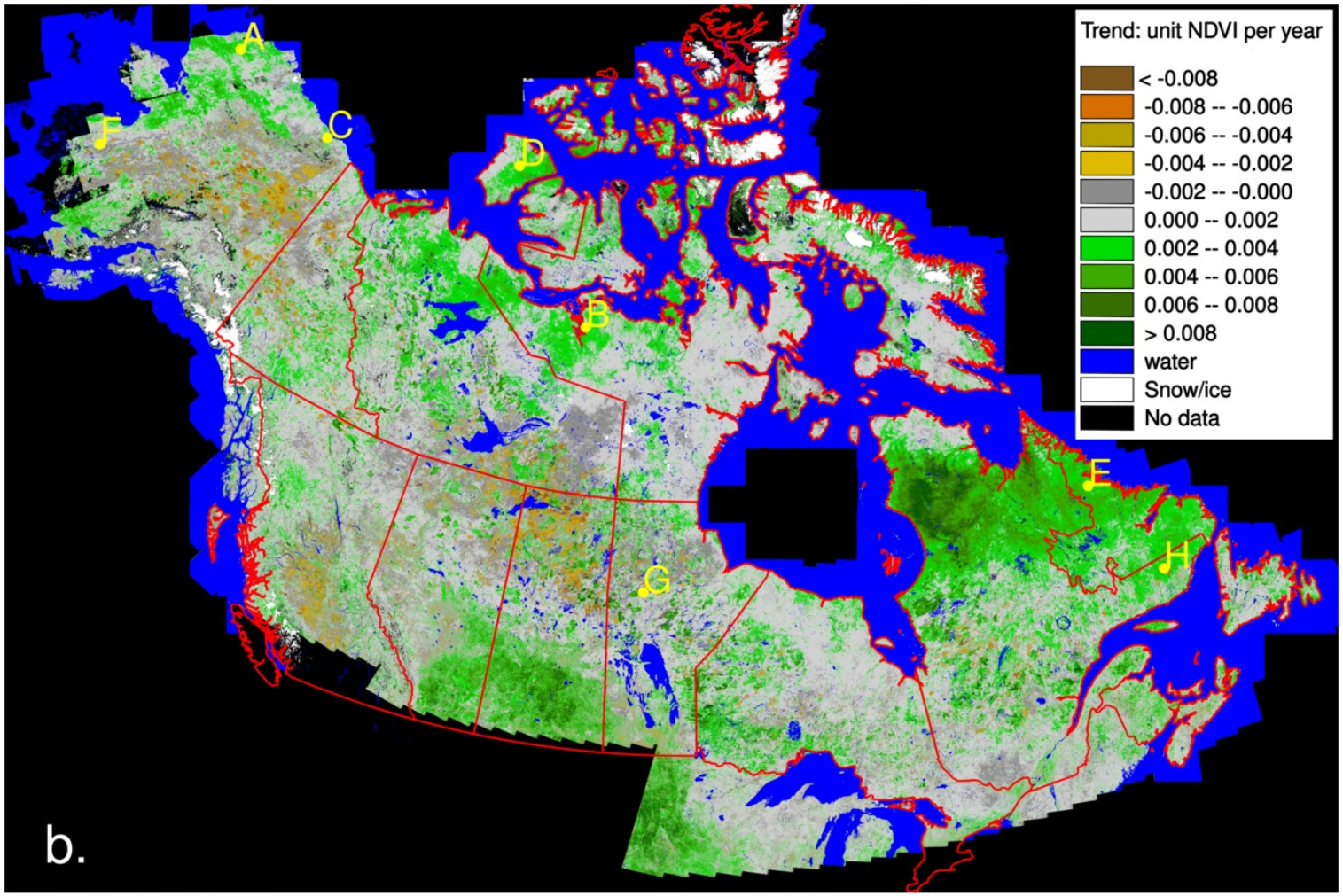
** Also member of Vegetation Dynamics and Distribution WG*

# Potential Partnerships and Collaborations

- ***Local observations, community feedback and stakeholder needs are highly valued!***
- ***Educational opportunities*** exist through NASA Internships and postdocs (next gen scientists)
- ***NASA planned satellite missions*** (e.g., ICESat-2, Landsat 9, HyspIRI)
- ***Form collaborations around airborne acquisitions and targets of opportunity*** (e.g., G-LiHT data collected for Toklat River in Denali NP; research plots; wilderness areas where helicopters are not permitted)
- ***Parallel research outside AST*** (e.g., Landsat greening-browning analysis by Ju and Masek, 2016)
- ***USFS 10-year plan to inventory forests in interior Alaska*** with a combination of ground plots and airborne image data.

# Landsat-derived Artic Trends

## (Ju and Masek, RSE, 2016)



# Summary of your AIP input completed thus far and plans for advancing your drafts at the meeting

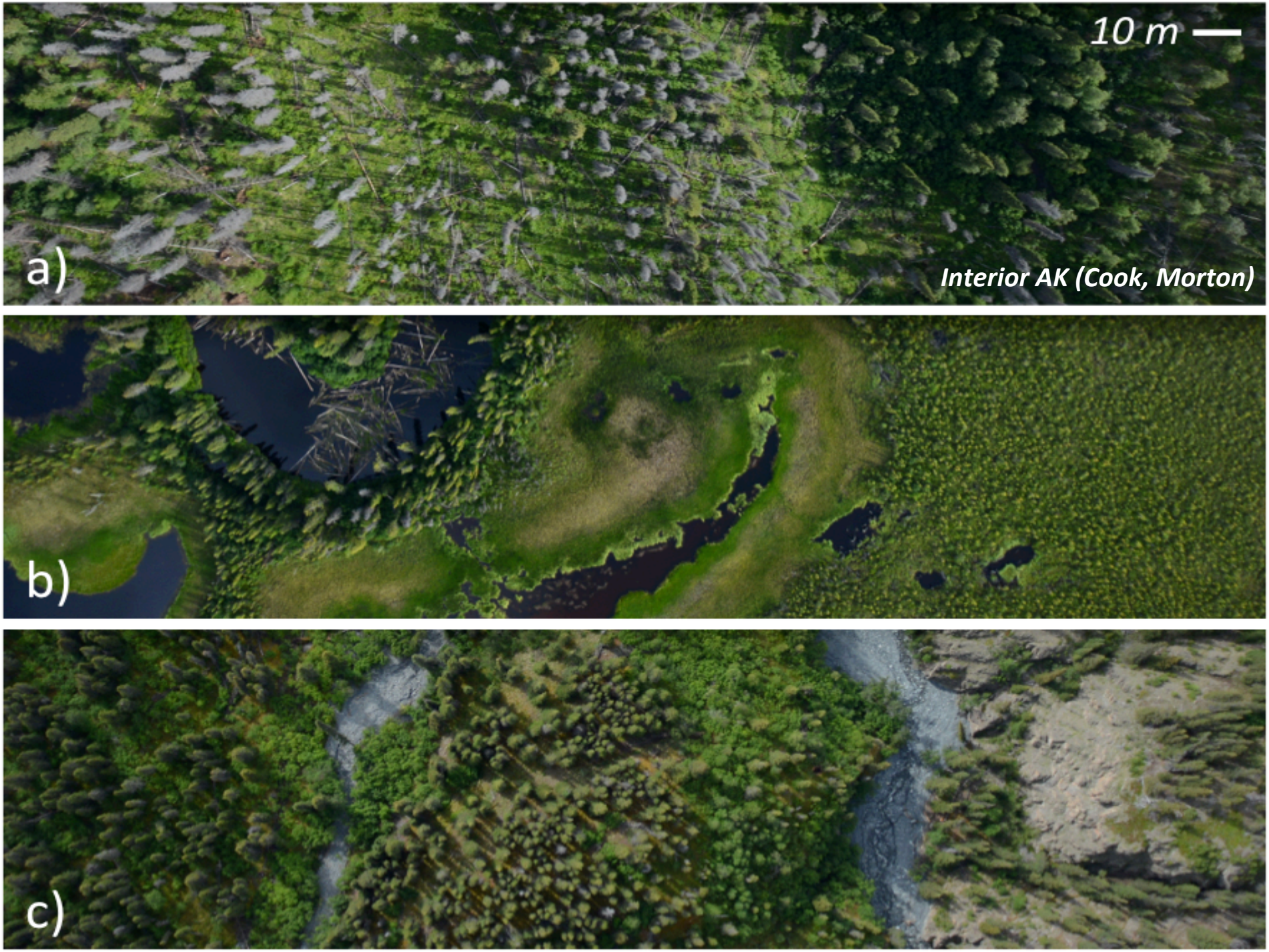
- ✓ Field measurement efforts & expected datasets
- ✓ Remote sensing efforts & expected products
- ✓ Modeling efforts & expected outputs

*Need help editing!!*

- ○ Timing & coordination & synergies among WG projects and between WGs
- ○ Identified data gaps / needs
- ○ Airborne observation desires

***NOTE: Has been challenging, given overlapping membership and similarity with other Vegetation Dynamics & Distribution WG***

***Are we having fun yet?***

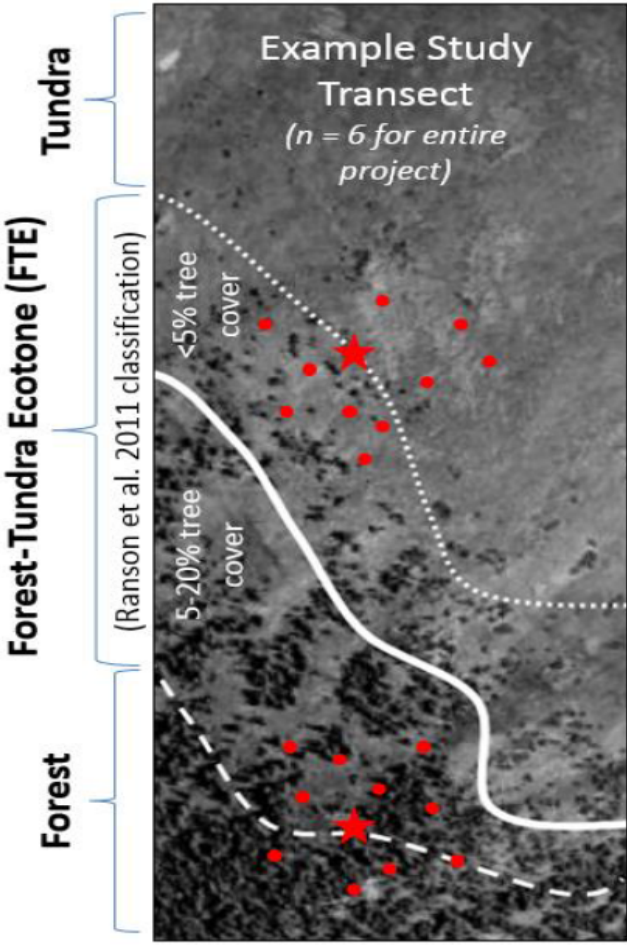

10 m
a)
Interior AK (Cook, Morton)
b)
c)

# Examples of Canopy Analysis

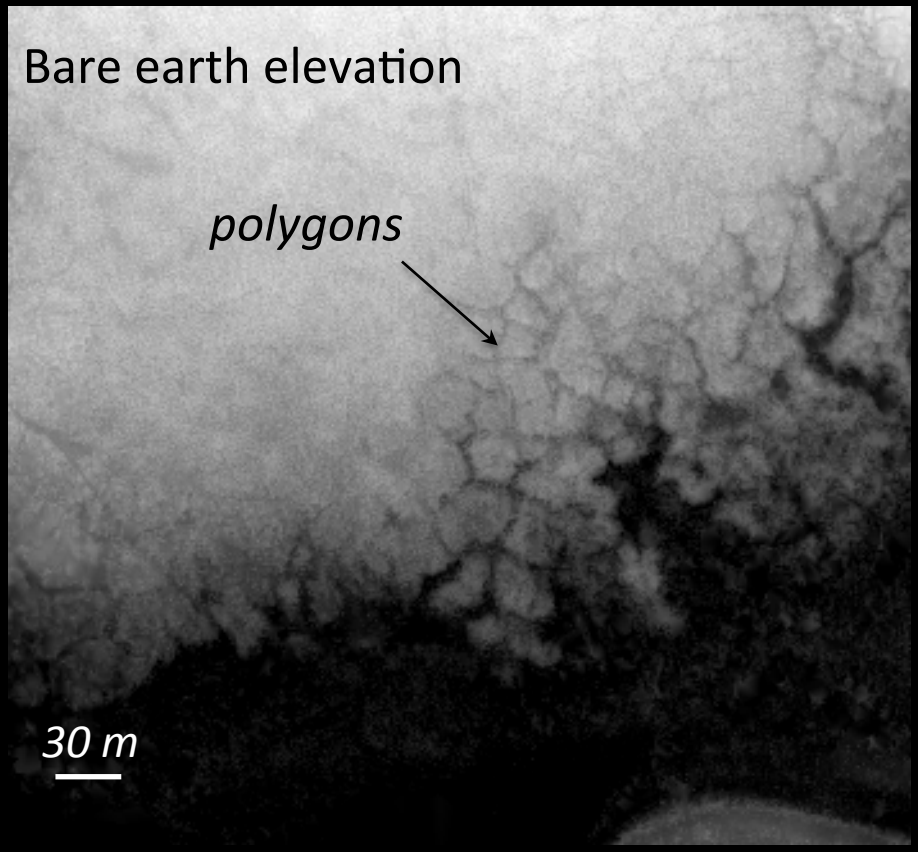
North Slope (Chopping)

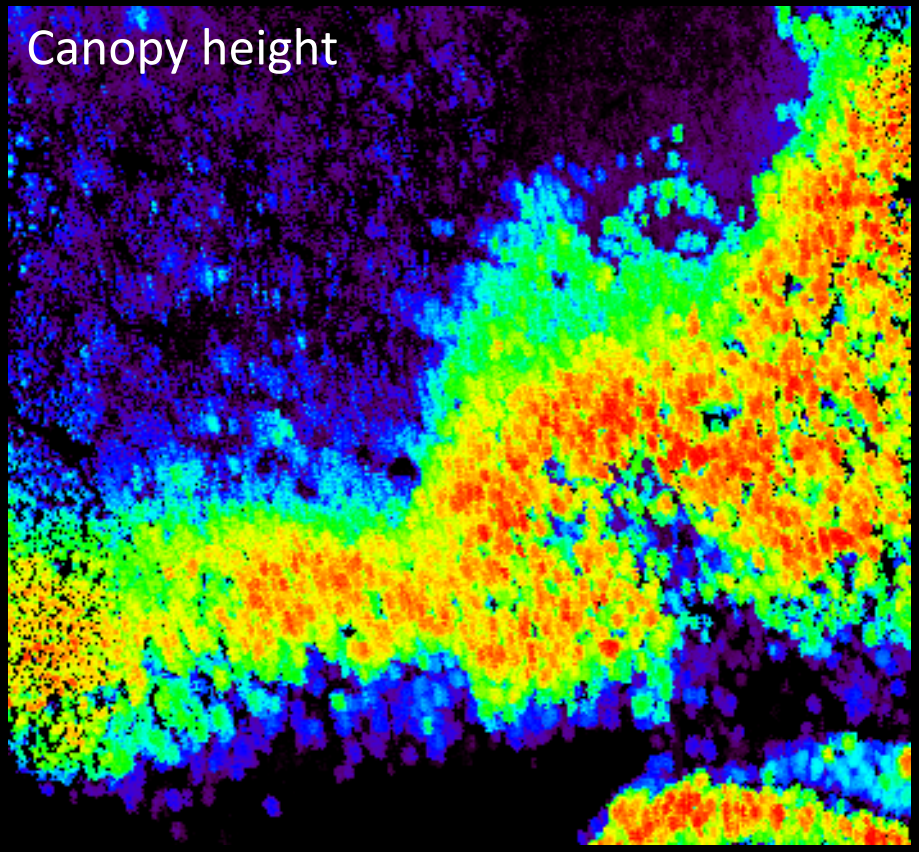
***NGA Nextview 2010 ©DigitalGlobe***

Taiga-Tundra ecotone (Eitel)

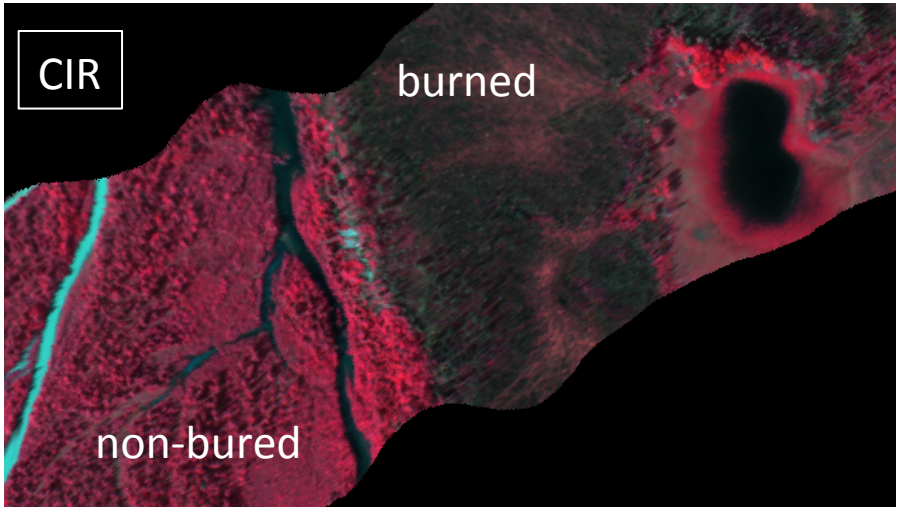


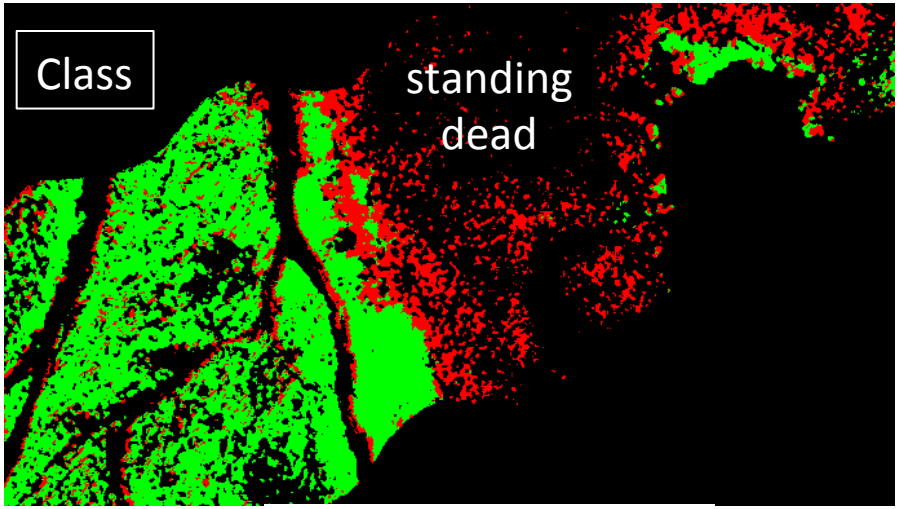
# Forests on Permafrost



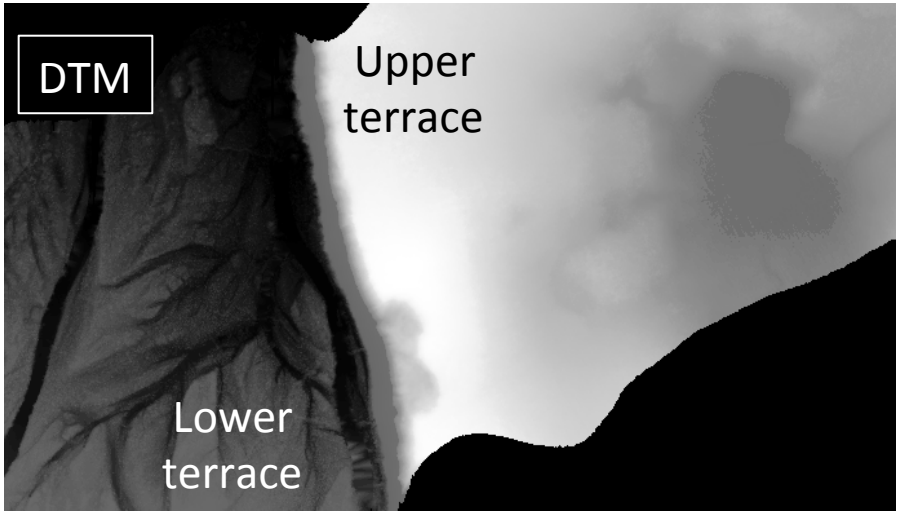



# 1 year-old Burn




Broadleaf Conifer




- A steep river terrace stopped the 2013 Chisana River Fire at this location.
- Unburned remnants on either side of the river terrace provide an indication of pre-burn conditions.
- Standing dead stems are misclassified here as broadleaf trees.

# E.g., Airborne Study

- **Science Question:** How does organic matter consumption during fires in boreal forests alter surface topography and subsidence from subsequent melting of permafrost? There are five or six study teams in ABoVE that specifically target fire in boreal forests, including both short and long-term changes in carbon stocks, ecosystem structure, and forest composition. Airborne data acquisition, especially seasonal coverage, would be very important to differentiate post-fire changes due to organic matter consumption (C losses) from surface elevation changes due to melting/subsidence. In talking with Michelle Mack, appreciable melting can occur during the same season, especially for May-June fires in Alaska. Airborne remote sensing data could be very helpful to better constrain these processes, especially if a chronosequence of recent fires could be flown early, mid, and late in the growing season.
- **Likely areas of interest:** Yellowknife, Interior AK (Tanana or Yukon watersheds), YK Delta
- **Airborne data:** small footprint lidar data, high-resolution (≤1m) imagery for context (air photos, hyperspectral, thermal or other multi-spectral data in the VNIR/SWIR region). The sensor(s) of interest would depend on the specific questions of interest for characterizing fire effects (e.g., ground cover composition, forest composition, or characteristics of burn severity).
- **Campaign mode:** Seasonal data collection, with repeated flights over a selected chronosequence of recent fires.
- **Targets of opportunity:** Possibility to collect pre-post fire data for burns in 2017, if flight conditions permit data acquisition in the likely path of actively burning fires.