Disturbance – Vegetation Breakout

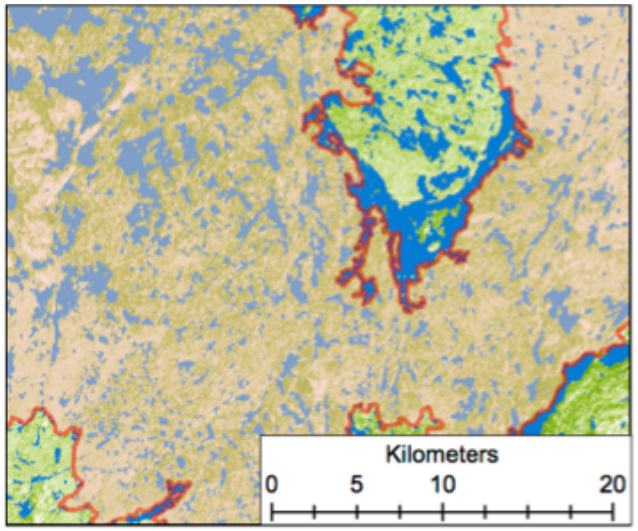
How can the various disciplinary (thematic WG) efforts inform more interdisciplinary efforts?

- **Leverage efforts *across* WGs**
- **Broaden the development of synthesis activities(?)**
- **Get into specifics re: data & knowledge gaps...**
  - **Field mmts & remote sensing**
  - **Modeling efforts**
- **Scaling considerations**
  - **How will we actually go from field to airborne to satellite?**
  - **Which data sets are most advanced to address this?**
  - **How can we best address scaling using models?**
- How would a future Airborne campaign help address these questions / objectives?

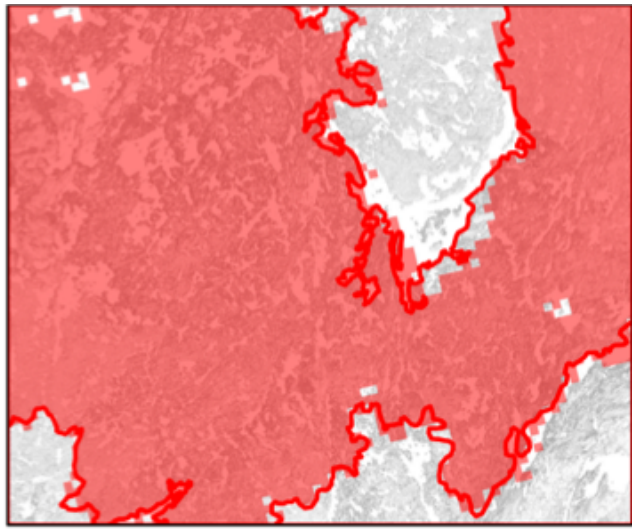
Data – Knowledge Gaps: Canada & AK Fire Databases

- Used for variety of fire-vegetation studies
- Missing records
- Changing reporting jurisdictions over time
- Changing detection efficiencies
- Perimeter ≠ burned area
- Commission/omission spatially and temporally dependent
- Goulden using Landsat to hindcast burned area, refine perimeters

Canadian NFDB



AKFED v2



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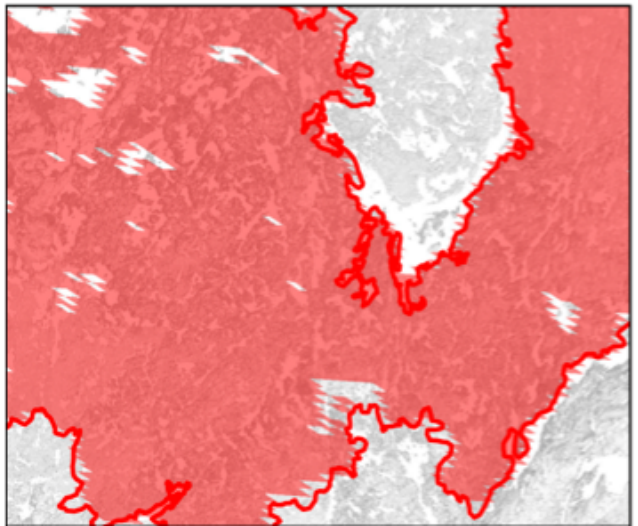
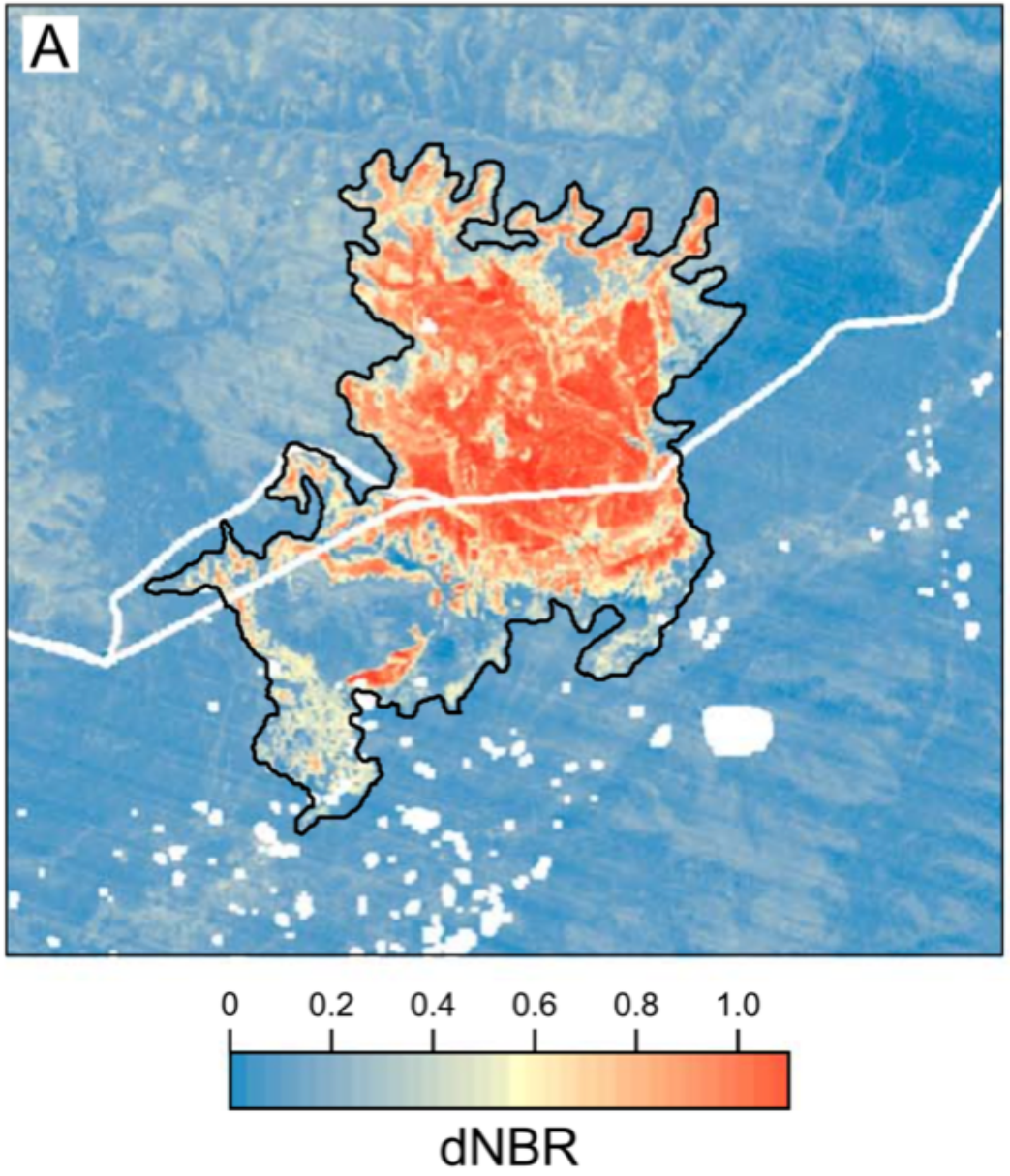


Landsat

Scaling considerations: fire severity

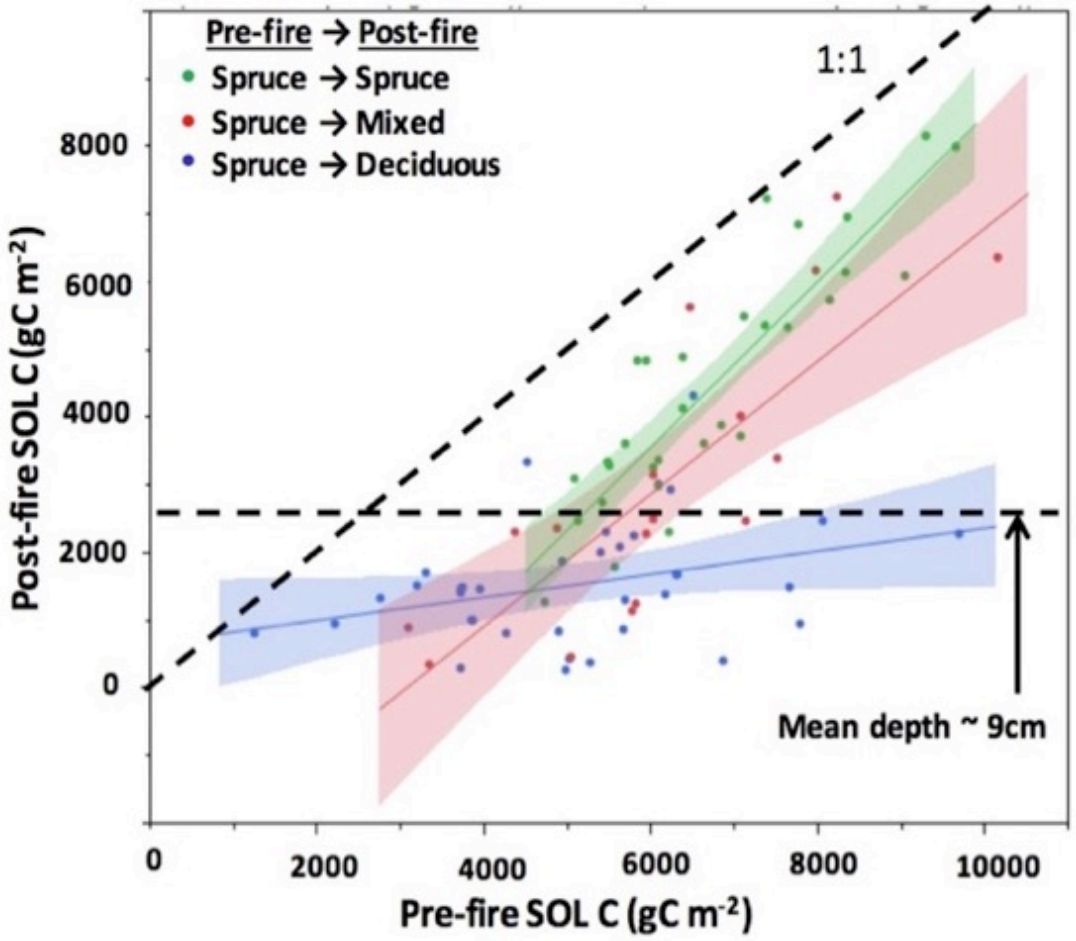
- Fire severity critical for emissions, succession
- What indices are best, what do they relate to on the ground?
- Residual SOL important for seedling establishment, how can we map? Airborne L/P band?
- Changes in severity over time related to changing successional trajectories/deciduous composition
- Differences in LST may be informative



Syntheses

Fire – Vegetation

- Synthesis of post-fire seedling regeneration measurements
- Test central hypotheses about proportional species changes
- Structural Equation Modeling



Fire – **Vegetation**

- Remote sensing to better characterize disturbance, successional trajectories
- How vary spatially?
- Evidence to say changing over time?
- Discussion of what RS-based succession means

Other Disturbances

- Ice on snow shrub mortality
- Fire-insect interactions: insect mortality can increase or decrease flammability depending on fuel structure
- Ability to detect with remote sensing, importance of aerial surveys
- Woodcock producing Landsat-based layers of insect disturbance
- Impact on C cycle can be as important as fire
- Vulnerability assessment
- High priority research area for Phase II

New knowledge/insights from ABoVE

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Greater appreciation for variability & drivers of varying successional trajectories, shifts towards deciduous landscape

- Accelerating regrowth
- Regeneration synthesis
- Deciduous mapping
- Changing post-fire albedo due to climate

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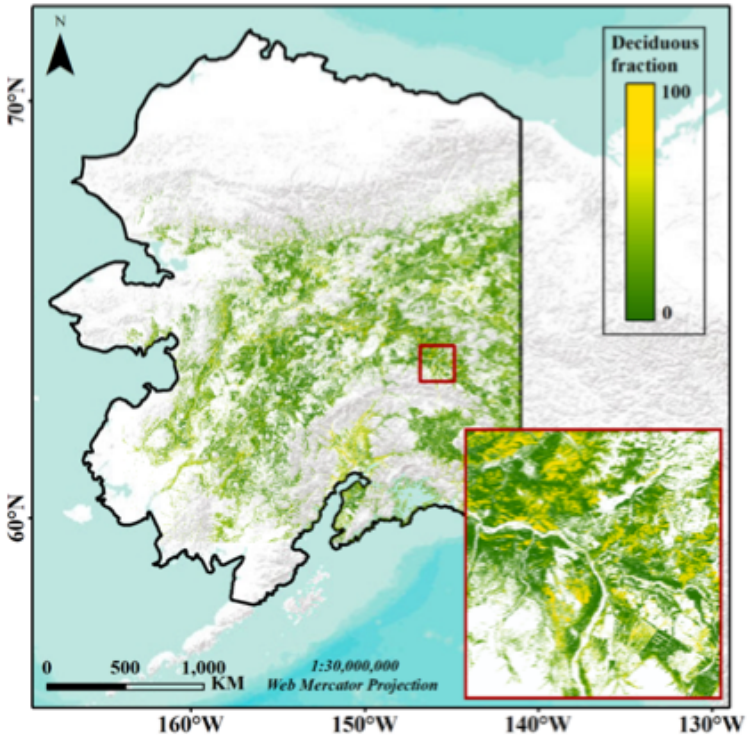

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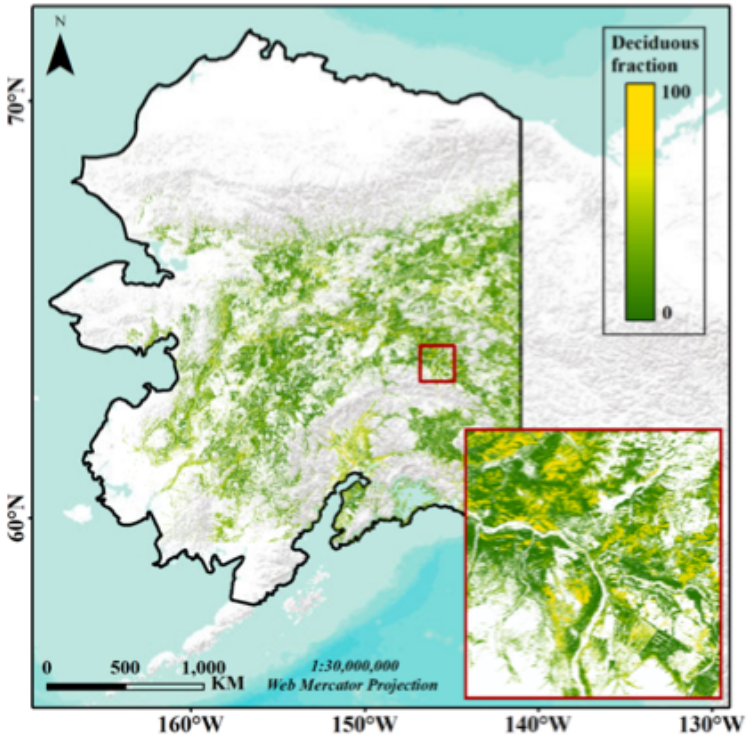
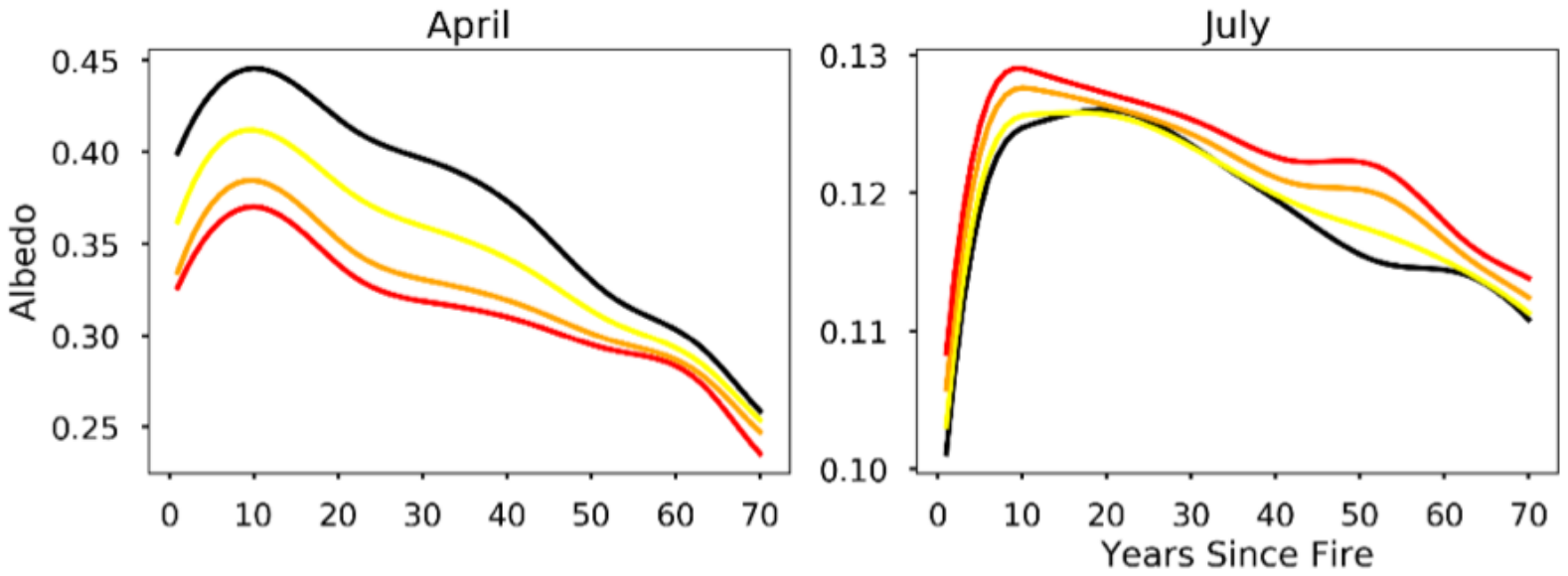
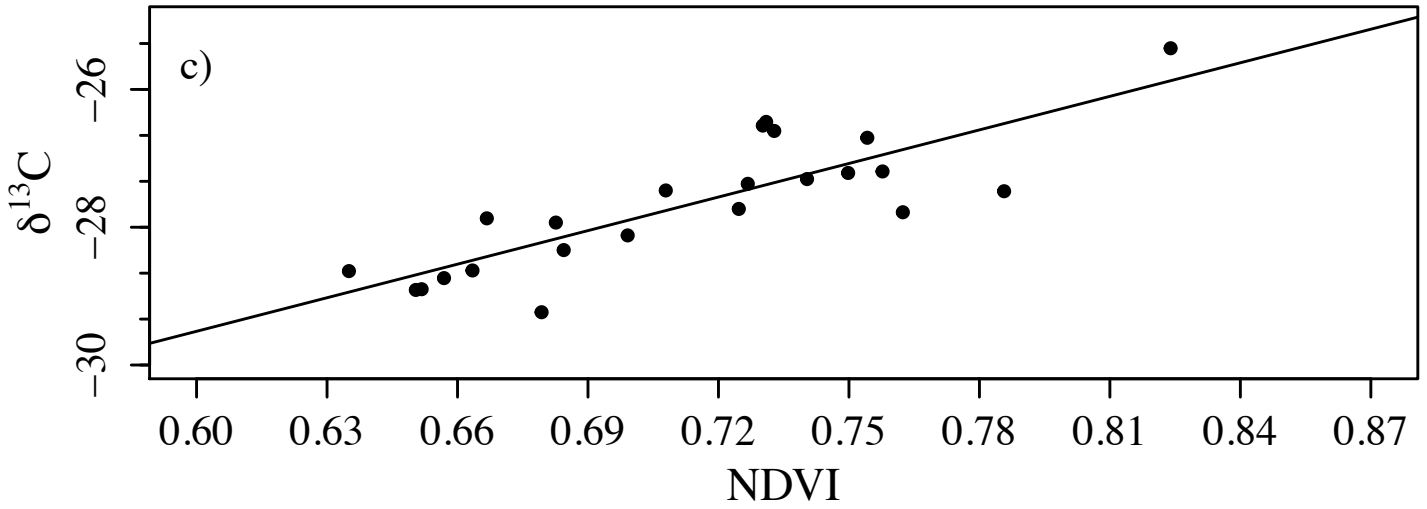




New knowledge/insights from ABoVE

Greater understanding of what NDVI dynamics mean

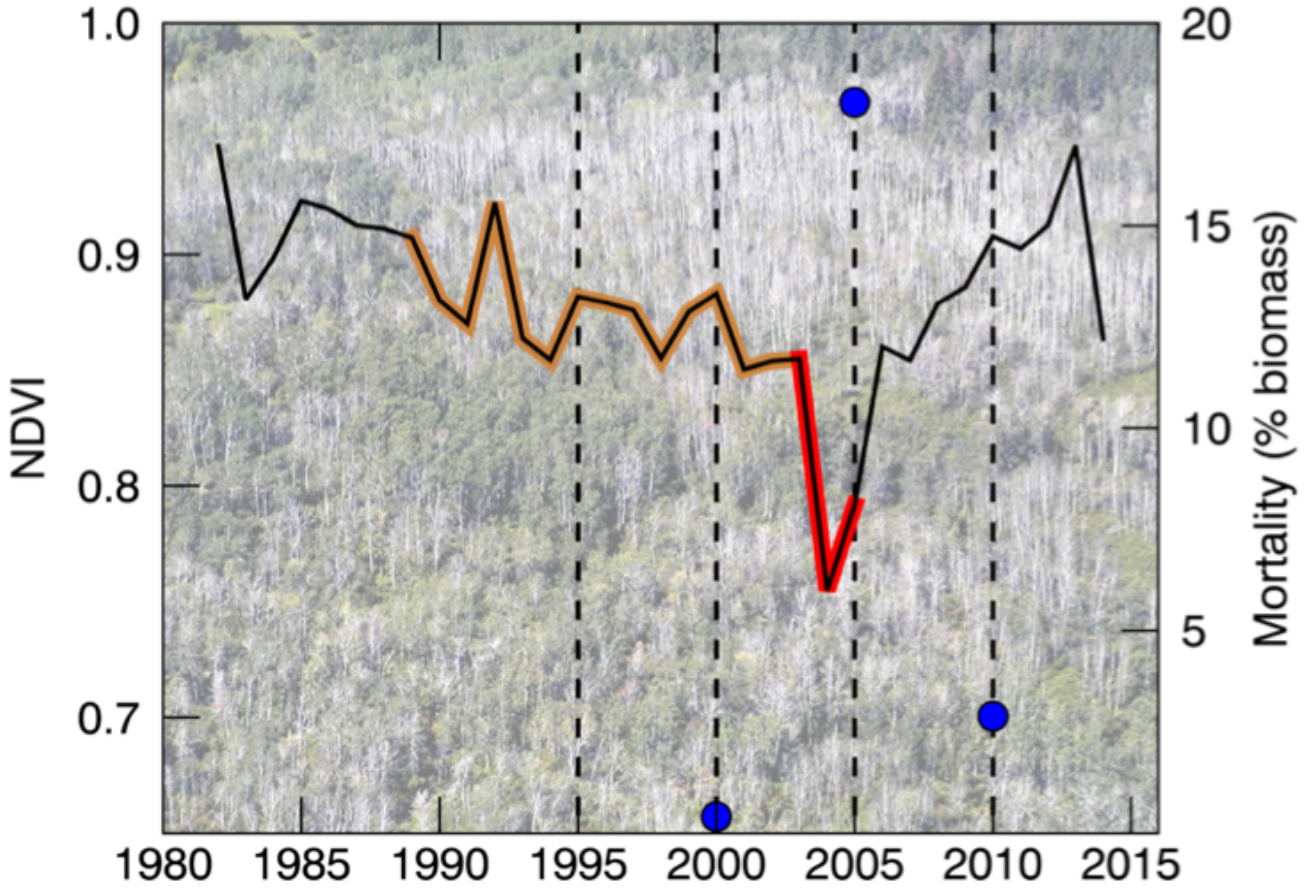
- Not always related to rind width productivity, indicative of infestation and changes in allocation



New knowledge/insights from ABoVE

Greater understanding of what NDVI dynamics mean

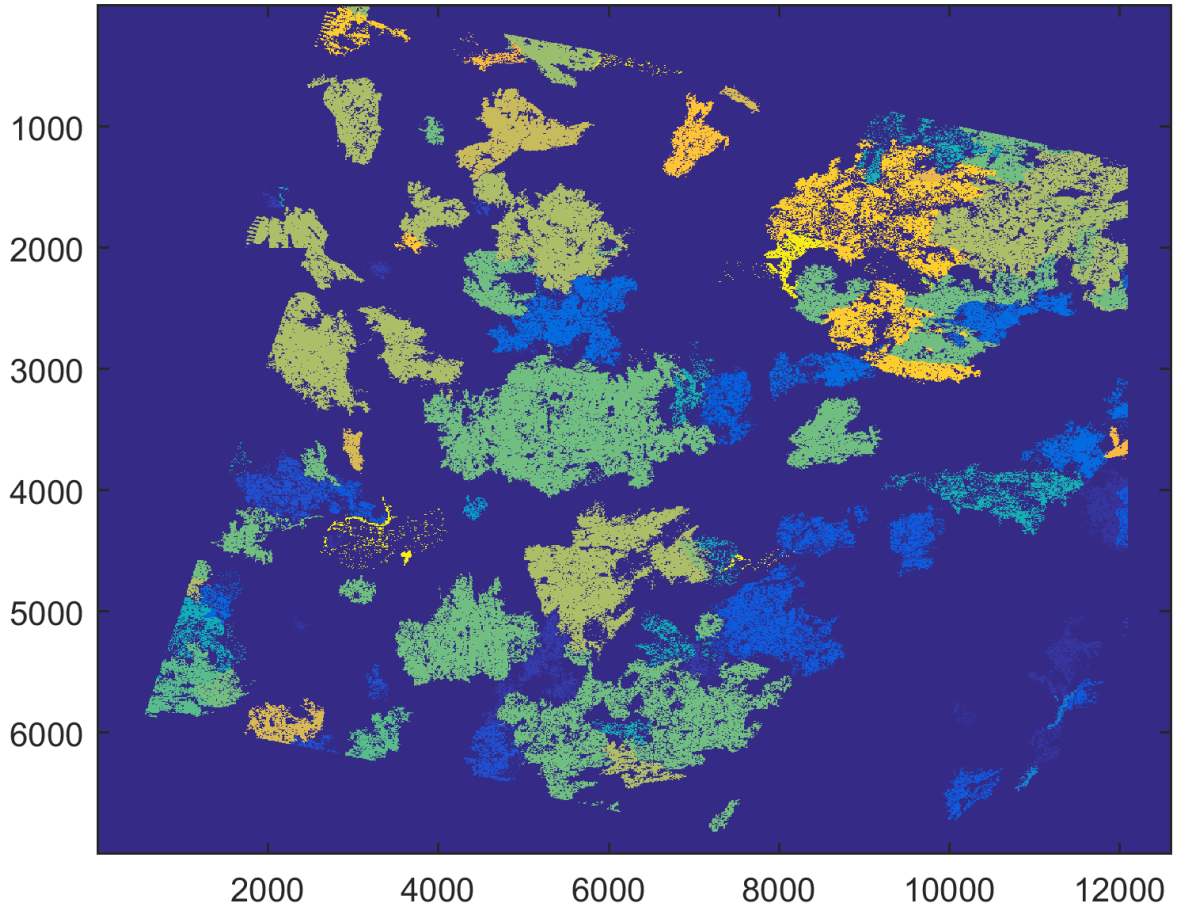
- Not always related to rind width productivity, indicative of infestation and changes in allocation
- Patterns indicative of eventual tree mortality



New knowledge/insights from ABoVE

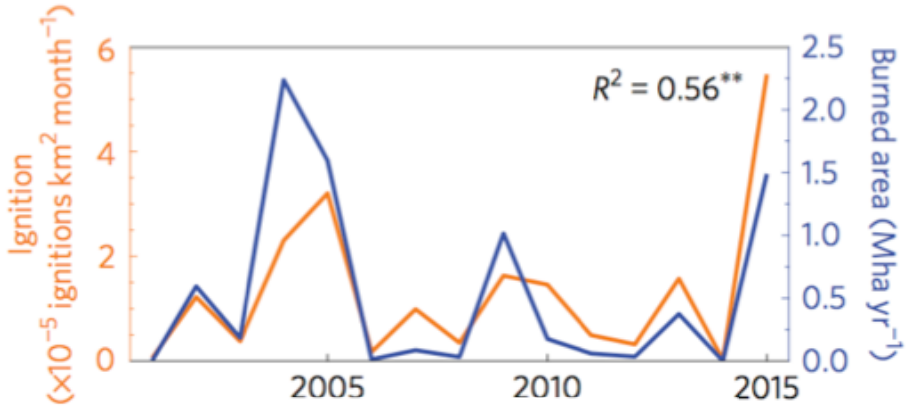
Landsat can be used to improve old fire perimeters

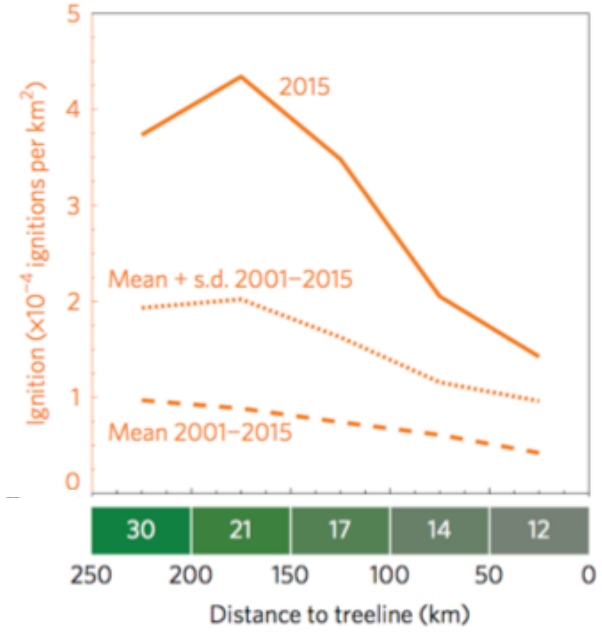
Spring dRed and Canada large Fire hybrid approach (1954-2014)



New knowledge/insights from ABoVE

- Importance of lightning in large fire years
- Lightning – fire – treeline migration – convection feedbacks





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Lightning as a major driver of recent large fire years in North American boreal forests

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