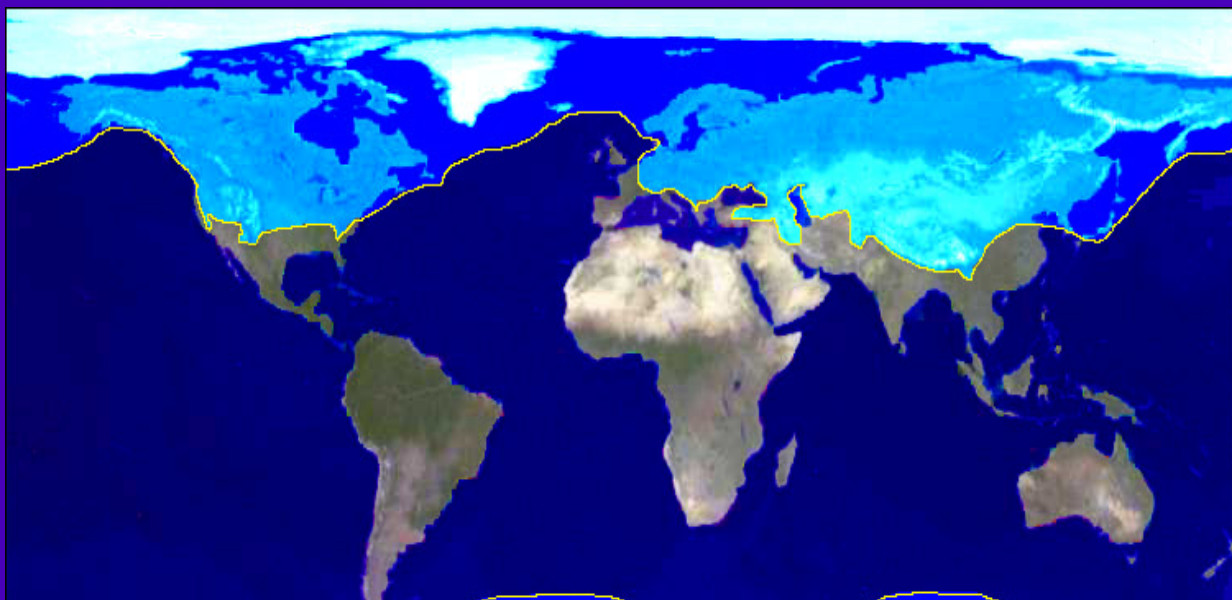
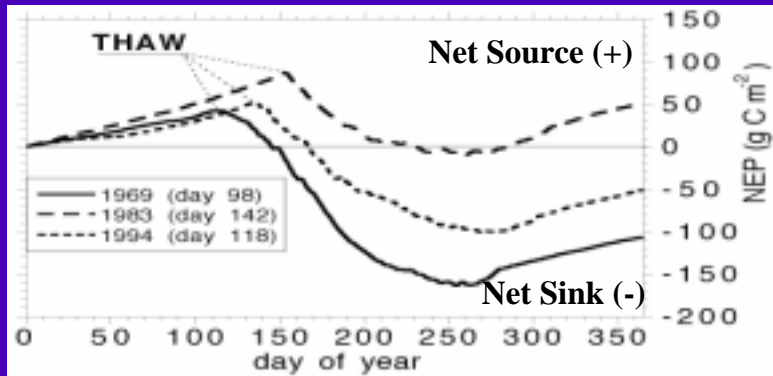
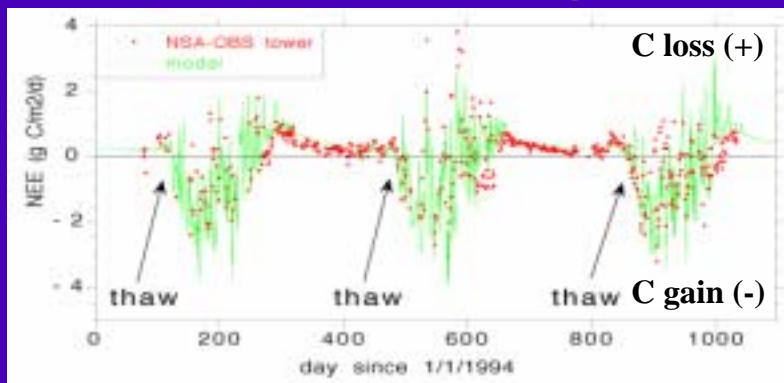


# Research Products

*Product Manager:*  
*Kyle McDonald, JPL*

## Terrestrial Cryosphere



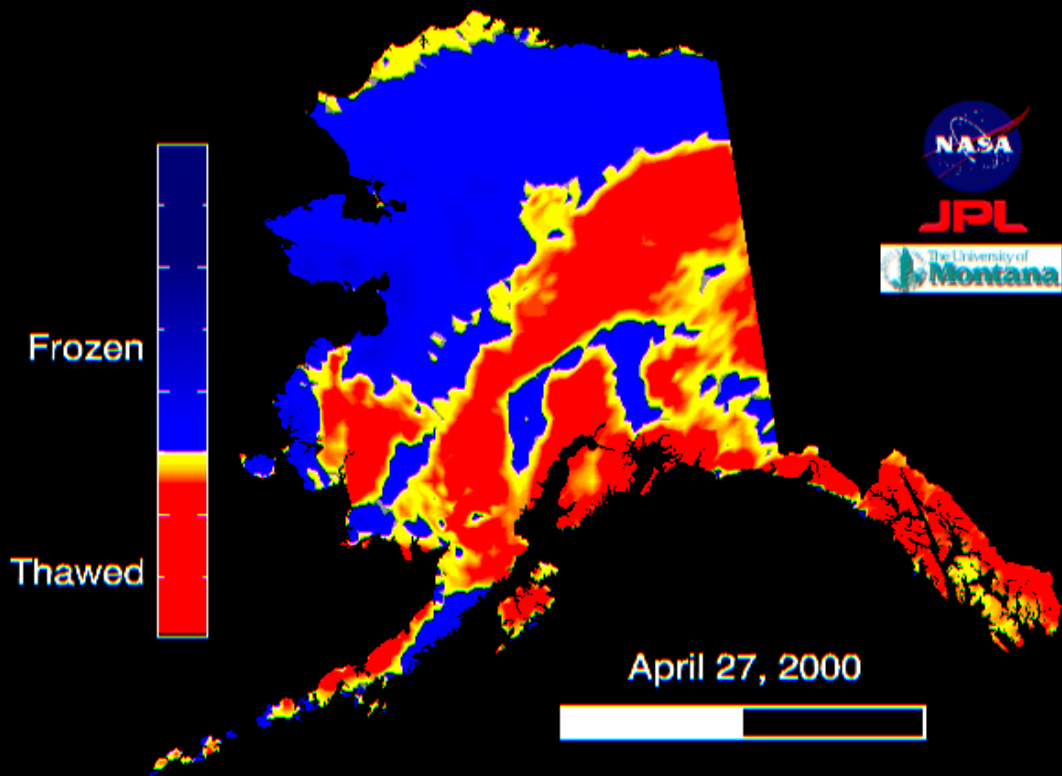


# Boreal Freeze/Thaw Research Products

Three Research Products:

- Date of Thaw onset
- Thaw transition duration  
(this will have to be done in synergy with other data sources with higher temporal resolution)
- Date of Autumn freeze-up
  - Less critical for quantifying carbon exchange
  - L-band is better than existing techniques (Ku-band)
  - Allows derivation of growing season bound.

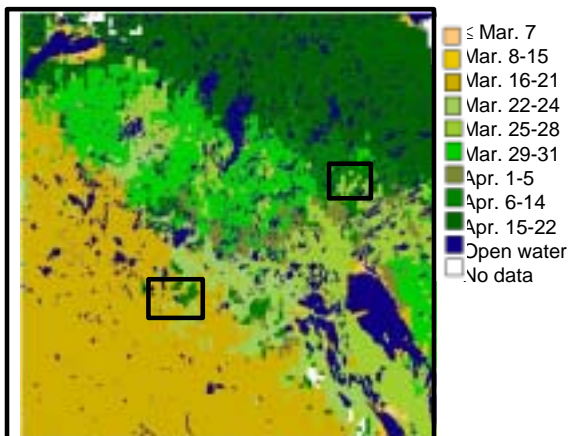
- Targeted Users:



# Boreal Research Products

## Thaw onset date

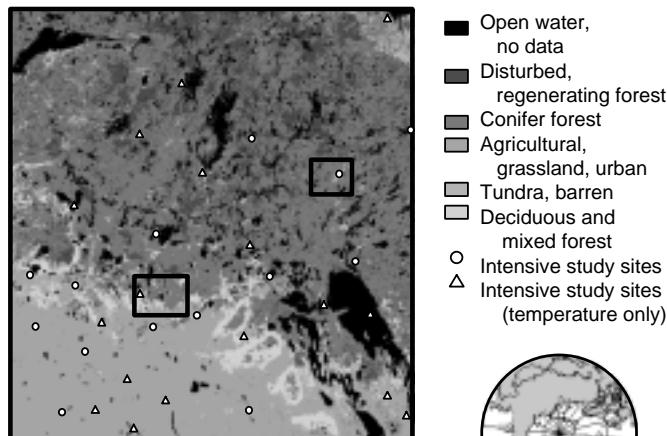
Initial Thaw Date



—BOREAS study areas

0 200 km

BOREAS Region Landcover

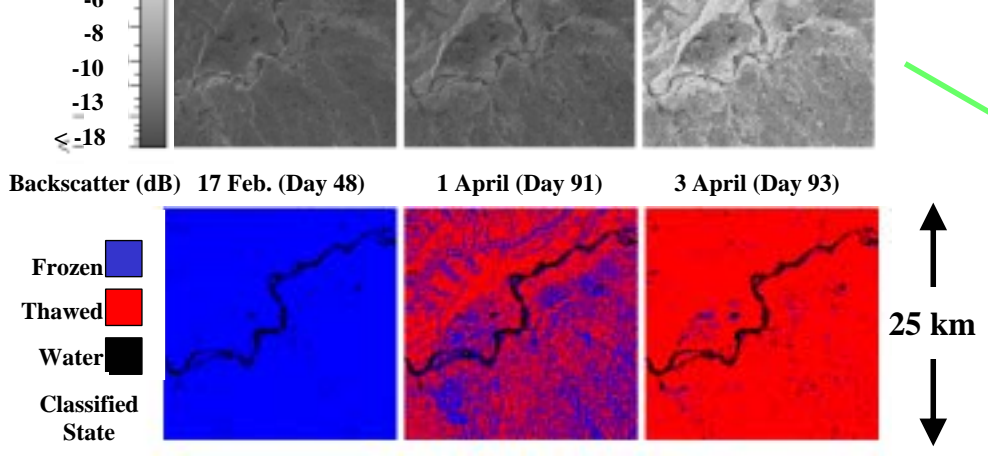


—BOREAS study areas

0 200 km



**NSCAT** data were applied to map the spatial and temporal domains of the spring thaw transition within the BOREAS study region of Canada. **At left, date of initial thaw is shown over the 1,000,000 km<sup>2</sup> region. At right, a landcover map shows locations of the 31 intensive study sites used for freeze-thaw product derivation and validation. The locations of the BOREAS North and Southern study areas are outlined. Landcover**

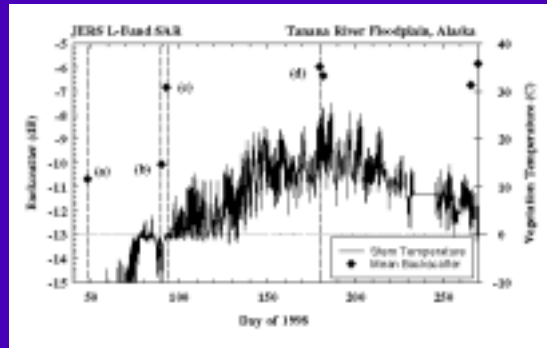


ALECTRA

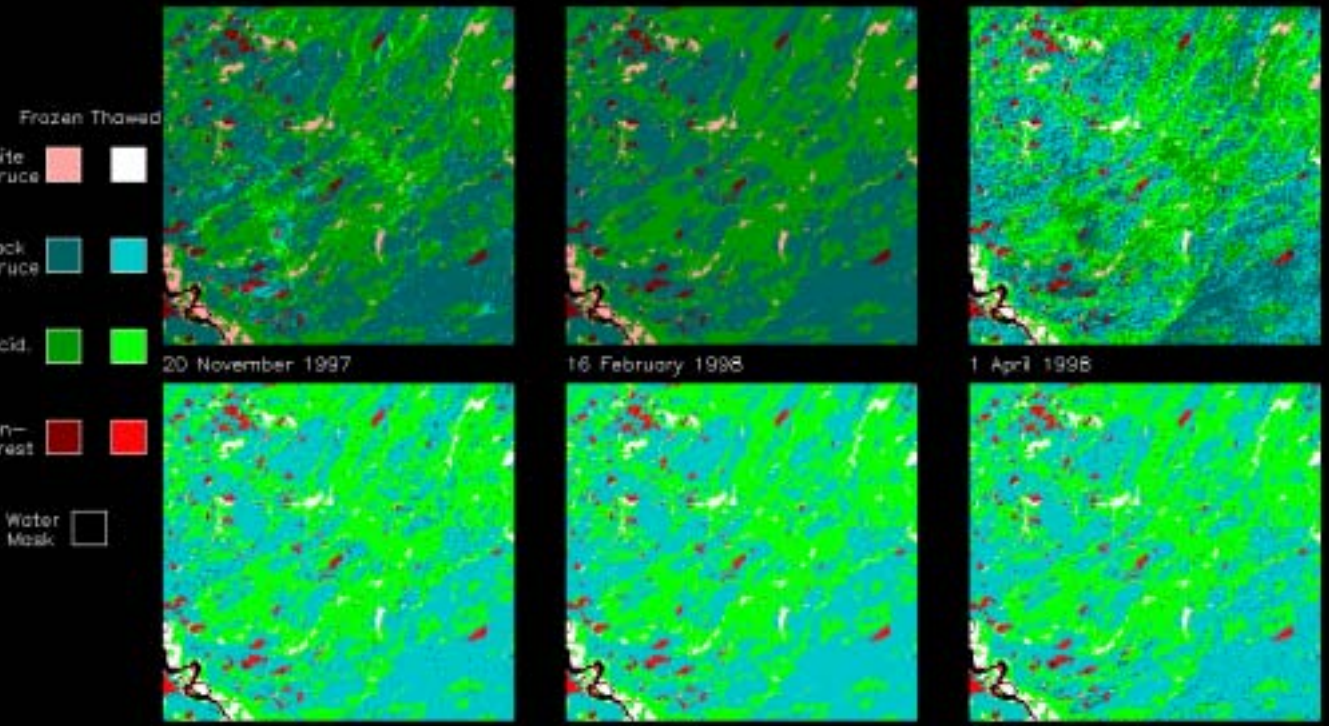


Validation with *in situ* Biophysical Measurements

Also have extensive plan developed for HYDRoS utilizing integrated *in situ* networks



JERS SAR Thaw Classifier, Interior Alaska



- Requirements for realization:
    - NASA funding(?; TBD)
    - High temporal monitoring from April-July  
maximum possible repeat observation,  
until transition is complete
    - September-November for freeze-up
    - Product derivation is data intense
  - Level of Ambition: Pan-boreal
    - Focus on regional sites (Alaska, Siberia II, BOREAS)
    - One year's transition cycle as demo
    - Each spring for inter-annual variability measure,  
and for operational development
  - HH-pol ScanSAR; variable incidence angle algorithm needed
  - Synergy with scatterometer will improve temporal fidelity
-