Boreal Wetlands Vegetation

Kyle McDonald, Mahta Moghaddam, Bruce Chapman

- Mapping of spatial features.

*- Contiguous regional acquisitions.*

Significance for Carbon Cycle Science

- The type and extent of high latitude wetlands are important indicators of methane source areas, while upland forests in the taiga are important methane-consuming sinks.

- Vegetation biomass stocks and their changes are one of the major indicators of carbon sequestration and/or release.

- Large-scale, accurate quantification of vegetation biomass at resolution scales of 1Km or better is key in improving estimates of the Carbon budget.

  – Spatially explicit biomass estimates also enable

Yukon-Kuskokwim Delta
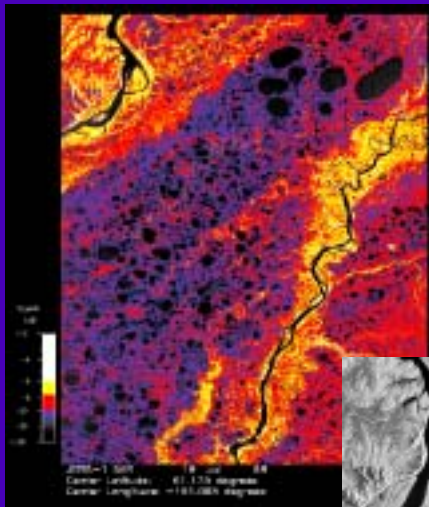
In the Yukon-Kuskokwim Delta, backscatter images at left, high biomass woodlands along the rivers (yellow) contrast strongly with shrublands (red), herbaceous wetlands (blue), ponds, and watercourses.
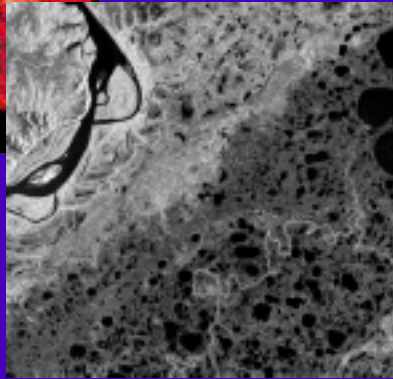
Wetlands Class Definitions

"Canadian Wetlands Classification System"

- **Bogs**
  - Surface raised or level with surrounding terrain
  - Water at or near surface
  - Dominate by sphagnum moss with tree or shrub cover

- **Fens**
  - Surface level with water table
  - Water flows at or under surface
  - Water level fluctuates
  - Dominated by graminoids and

- Tall shrubs, deciduous or coniferous trees

- **Marshes**
  - Shallow, fluctuating surface water
  - Emergent aquatic vegetation (reeds, grasses, sedges, floating macrophytes)
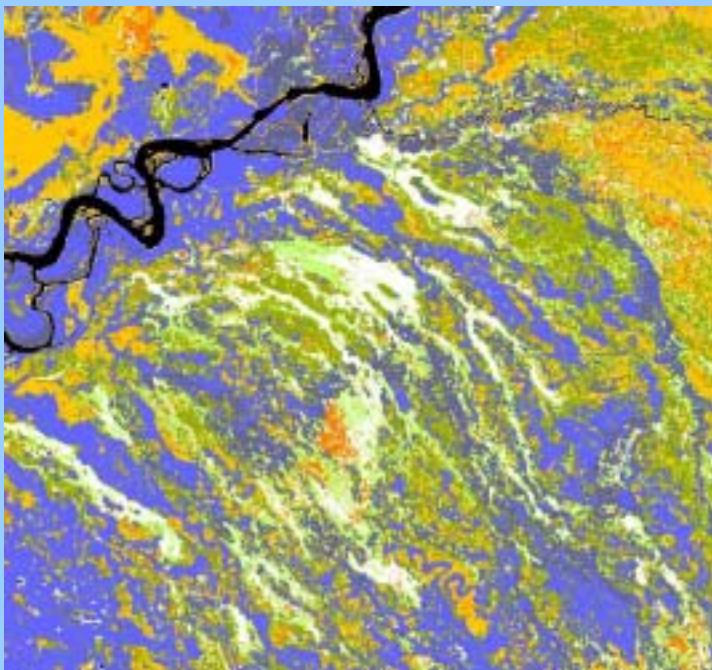

- **Shallow Water**
  - Transitional between seasonally wet wetlands (bogs, fens, marshes, swamps) and permanent deeper waters (lakes)
 - Ponds, pools, shallow lakes, sloughs, reaches, channels

Example: Tanana Flats, Alaska

Validation site classified using TM and ERS

Reference: Andrew Balser MS Thesis, University of Alaska, Fairbanks, 1996.

Legend:
- Water
- Deciduous Forest
- Conifer Forest
- Muskeg/Shrub
- Wetland Shrub
- Graminoid
- Wetland Graminoid
- Wetland Shrub/Graminoid
- Wetland/Cattail
- Wetland/Buckbean
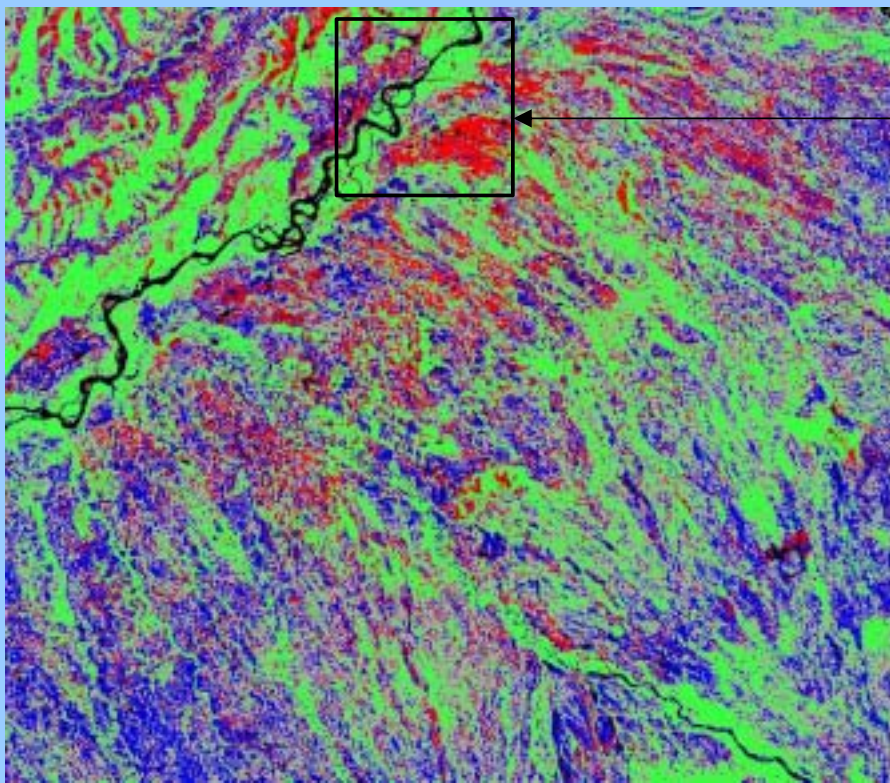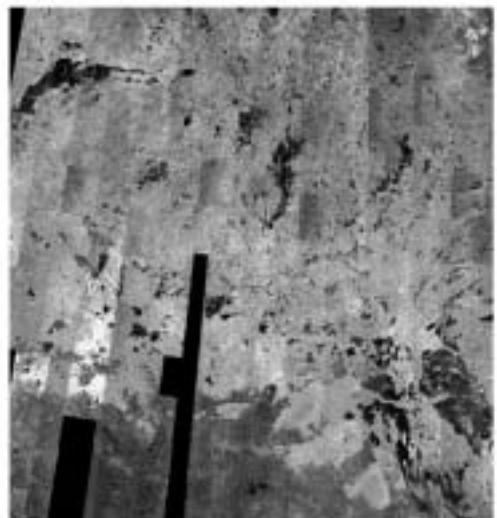
Training/validation site

Water
Forest/Swamp
Shrub/Bog
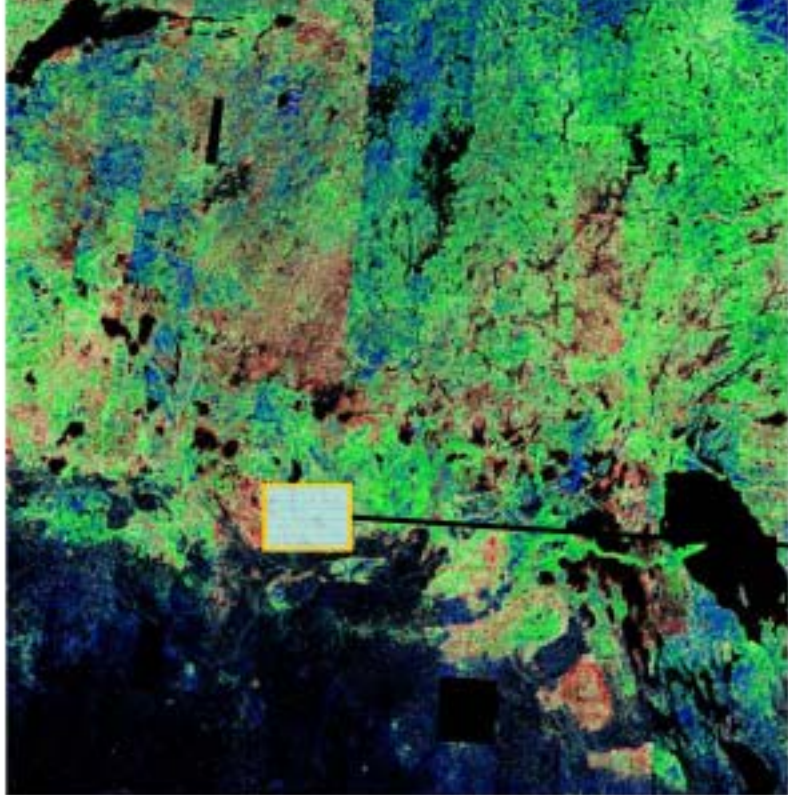Grass/Sedge/Marsh
Graminoid/Fen

BOREAS Grid (1000km x 1000km)

Training and Validation using TM mosaic

JERS-1 Summer

JERS-1 Winter

⬛	Water
🟩	Treed Muskeg/Swamp
🟥	Black Spruce and/or Bog
🟦	Fen/Bog (short veg)
⬜	Non wetland