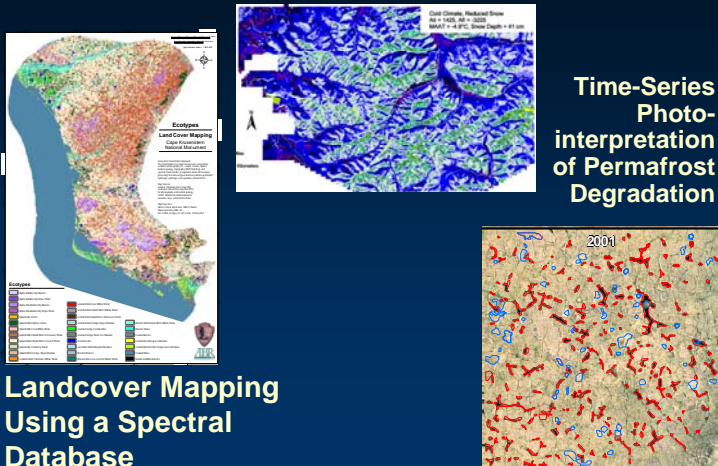


GIS Approaches to Assessing Landscape Change: Landcover Mapping and Permafrost Degradation



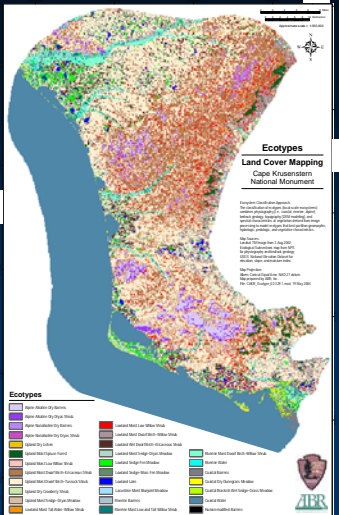
ABR inc. Torre Jorgenson
Joanna Roth
Matt Macander

Spatial Modeling of Permafrost Distribution



Time-Series Photo-interpretation of Permafrost Degradation

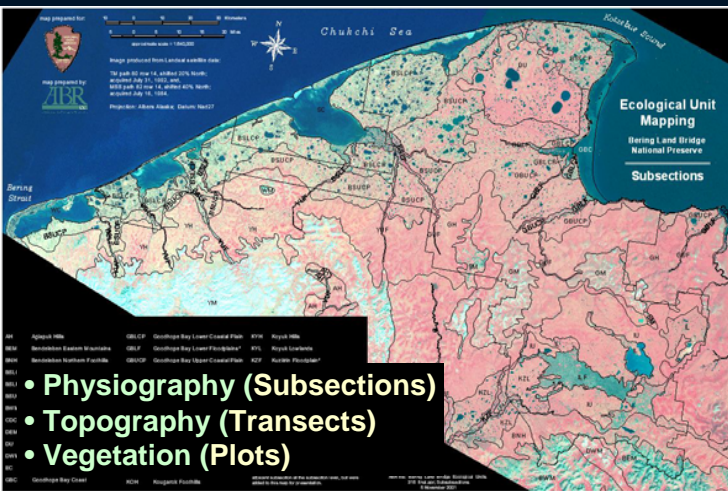
Landcover Mapping Using a Spectral Database



Landcover Mapping Using a Spectral Database

- Sampling Design
- Field Sampling
- Spectral Database
- Classification
- Thematic Mapping

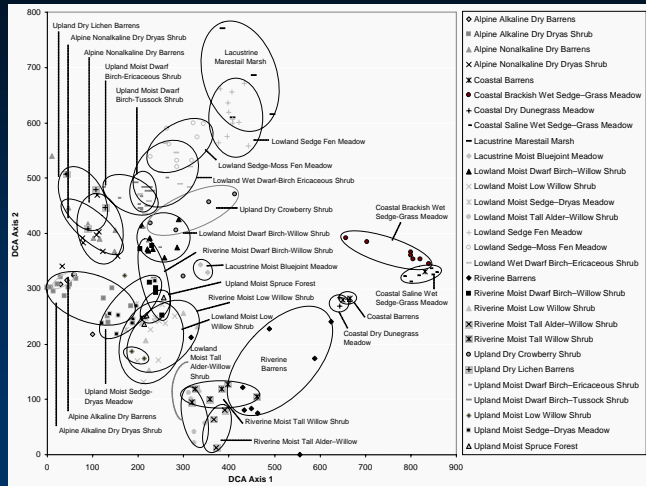
Stratified, Gradient-Directed Sampling



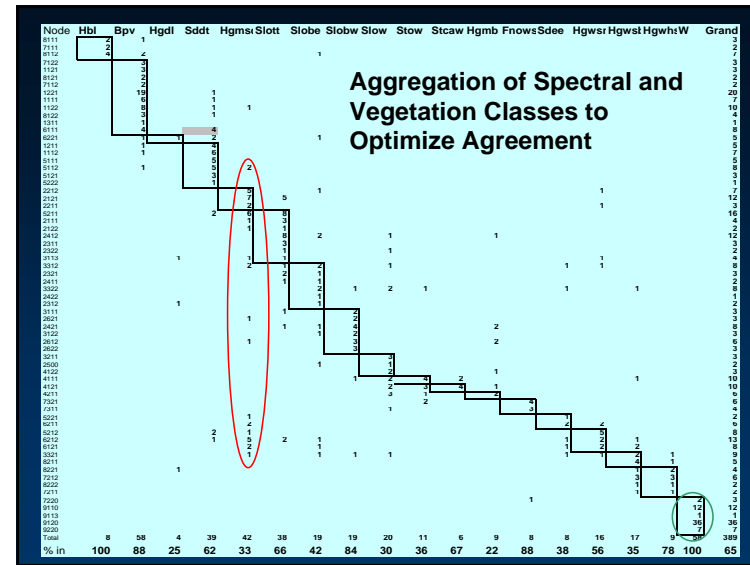
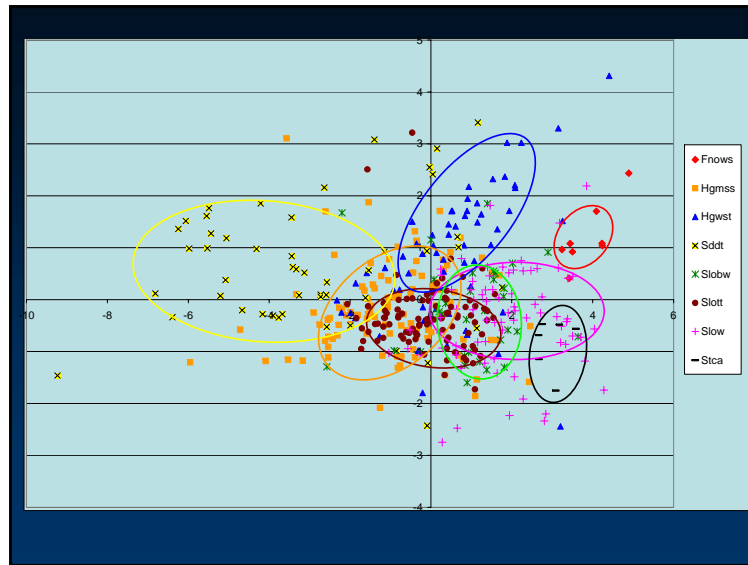
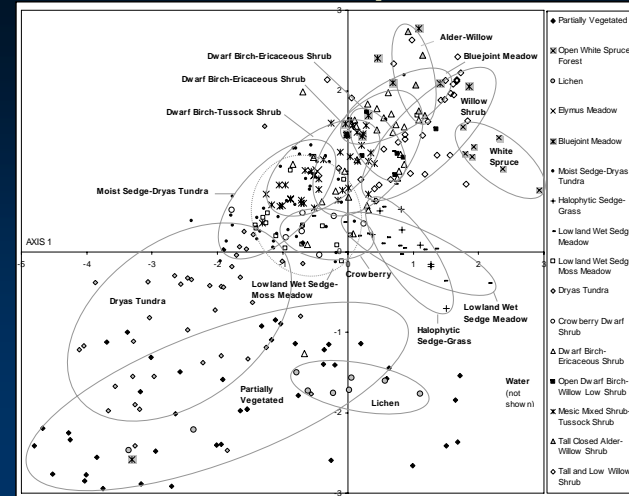
Ecological Unit Mapping
Bering Land Bridge National Preserve
Subsections

- Physiography (Subsections)
- Topography (Transects)
- Vegetation (Plots)

Classification: Ground Data



Classification: Spectral Data



Time-Series Photo-interpretation of Permafrost Degradation



Thermokarst Pits

Ice wedges occupy 20% or more of older terrain units



Stages of Ice-Wedge Degradation

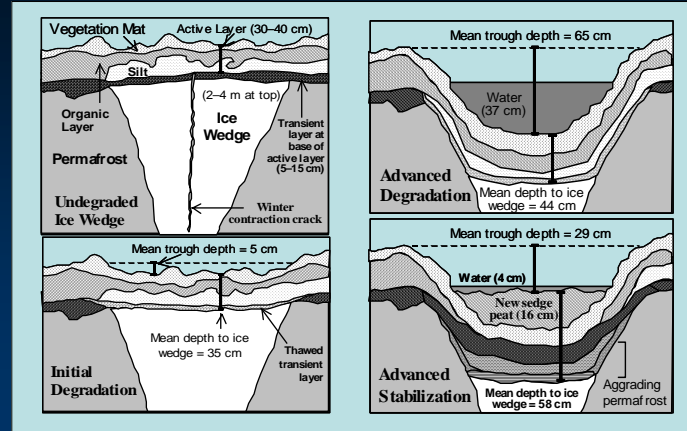
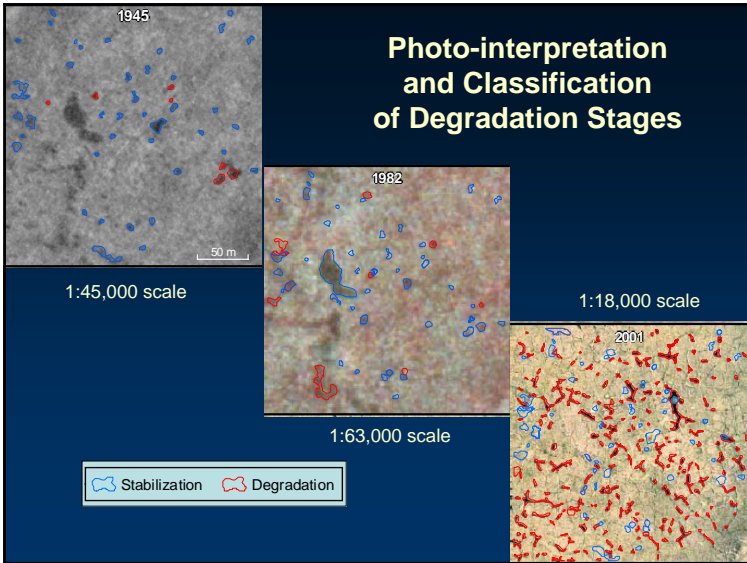
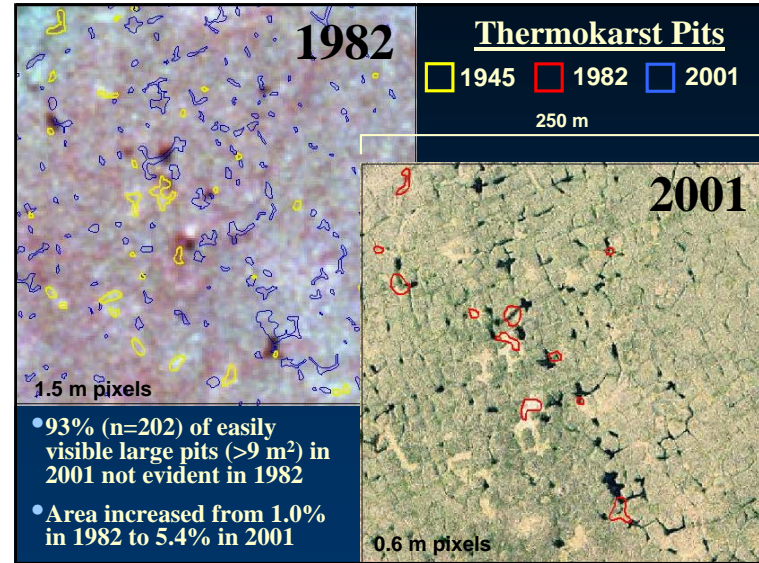


Photo-interpretation and Classification of Degradation Stages

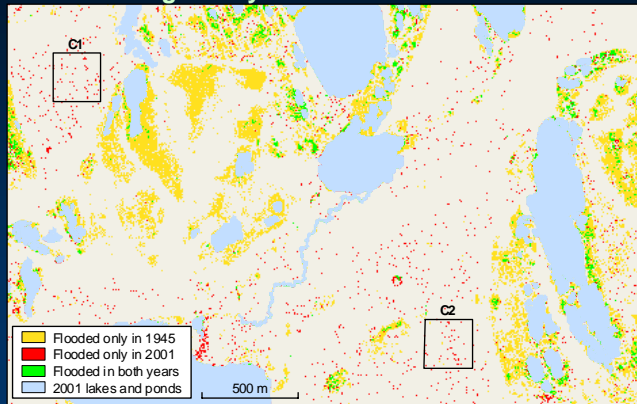


Thermokarst Pits



Spectral Analysis

- Density slice of 1945 B&W photo
- Unsupervised classification of 2001 Photos
- Change analysis



SUMMARY

- GIS analyses are strengthened by spatially representative field data
- Data linked at appropriate spatial scale
- Image processing and manual interpretation both useful techniques
- Airphotos can extend remote sensing data back to 1950

