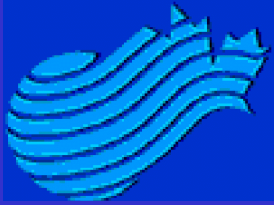




Satellite Observations of Boreal Forest Land Cover: Methods, Data Sets and Applications

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Presentation Overview:

- **Program Introduction**
- **Progress Report**
- **International Co-operation**
- **Methodological Issues**
- **Data Issues**



Specific Project Objectives:

- **Develop robust methodologies for both fine and coarse resolution LC mapping.**
- **To produce national land cover maps over the period 1993-2001 using coarse satellite data.**
- **To develop validation methods for coarse products based on fine resolution satellite data and other information sources.**
- **To prepare a national wetlands data base.**
- **To derive higher level products and statistical summaries to support studies of surface-atmosphere interactions and the role of land cover in carbon and hydrological cycles.**



Satellite Information for Land Cover of Canada (SLIC)

A program to develop an integrated approach to coarse and fine resolution land cover mapping.

Broad Integration Activities:

- utilization of fine resolution scenes to validate national coarse resolution products**
- develop a harmonized land cover legend**
- investigate a range of LC mapping strategies**
- extend approaches to a national context**



VGT/SPOT DATA ANALYSIS

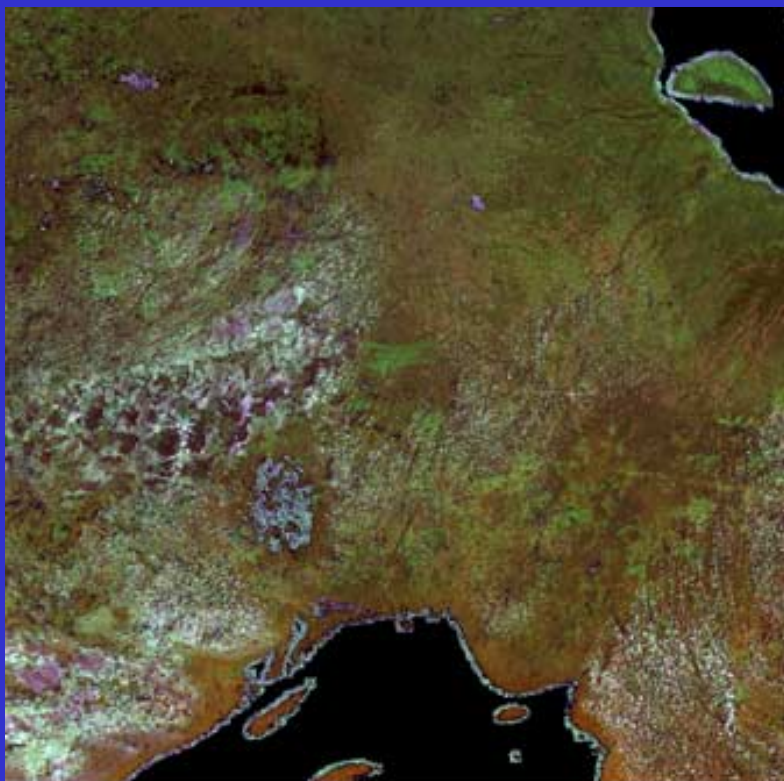


VGT/SPOT Analysis Objectives

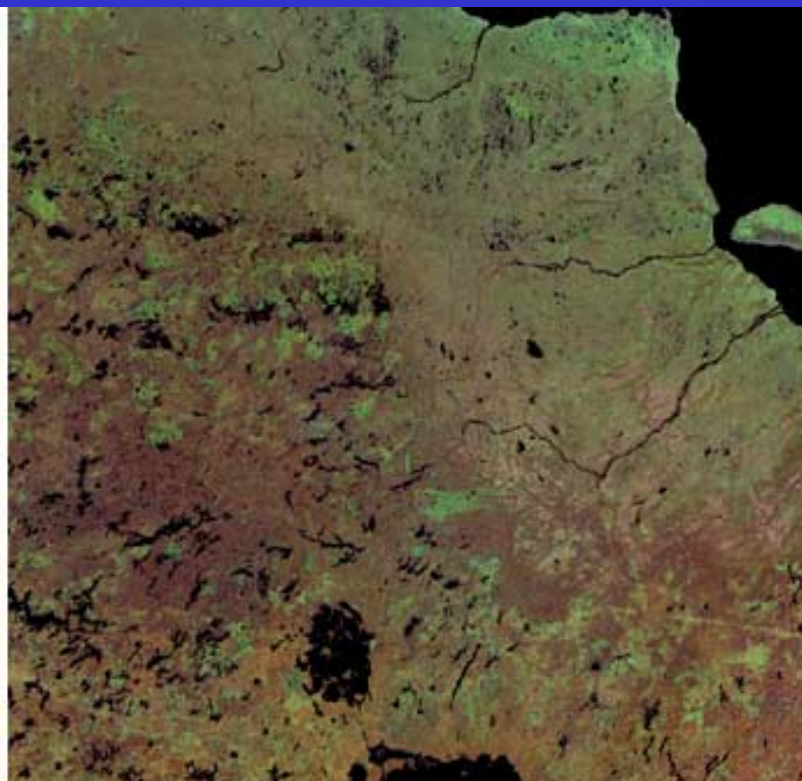
- **To extend and refine the methodology previously developed for processing AVHRR data to the VGT/SPOT system.**
- **To assess the advantages of VGT spectral bands in deriving biophysical parameters.**
- **To explore the usefulness of VGT/SPOT for vegetation carbon budget estimation in comparison with AVHRR.**
- **To investigate the operational use of VGT as a substitute for AVHRR for crop and forest fire monitoring.**



SPOT VGT
Uncorrected 10 day composite 1998 06 01-10



SPOT VGT
Corrected 10 day composite 1998 06 01-10



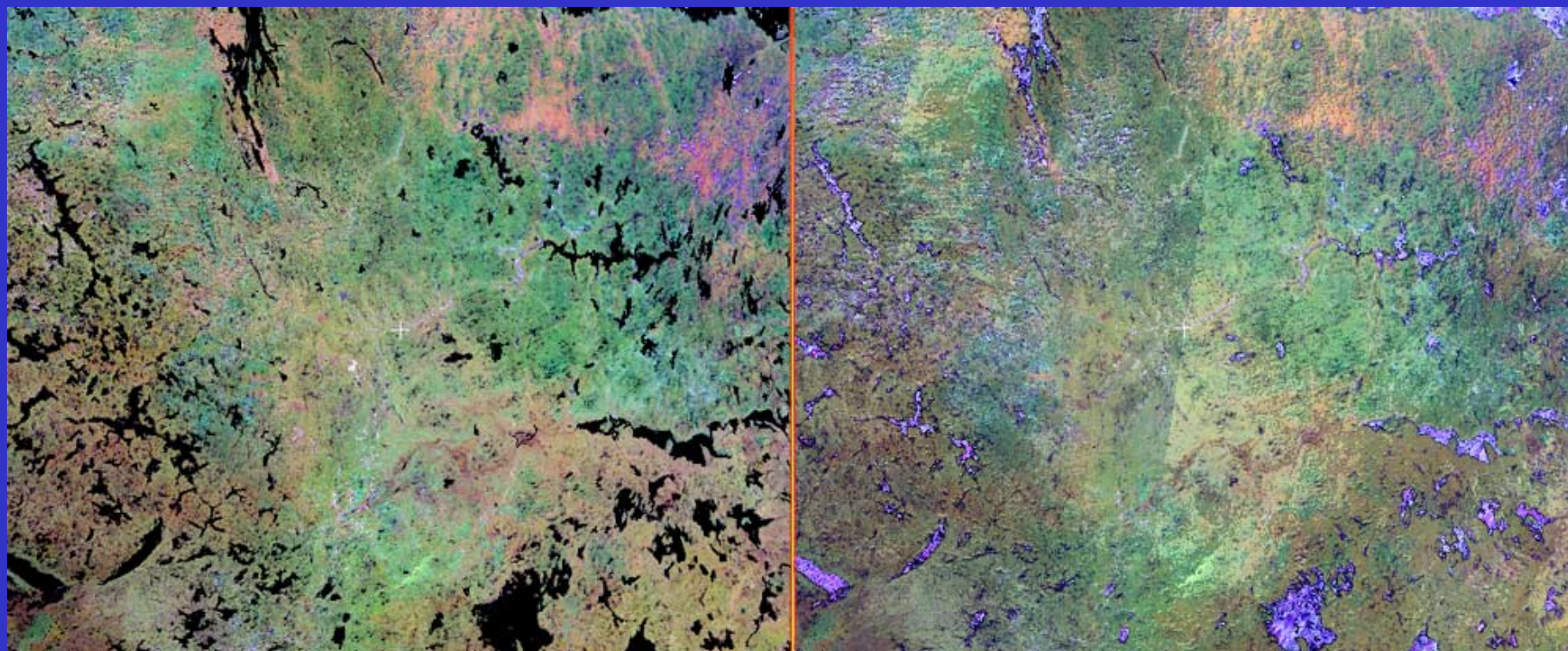


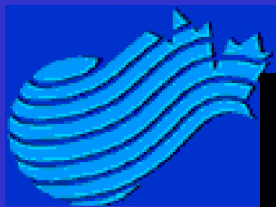
SPOT VGT

Corrected for BRDF effects 10 day composite 1998 08 11- 20

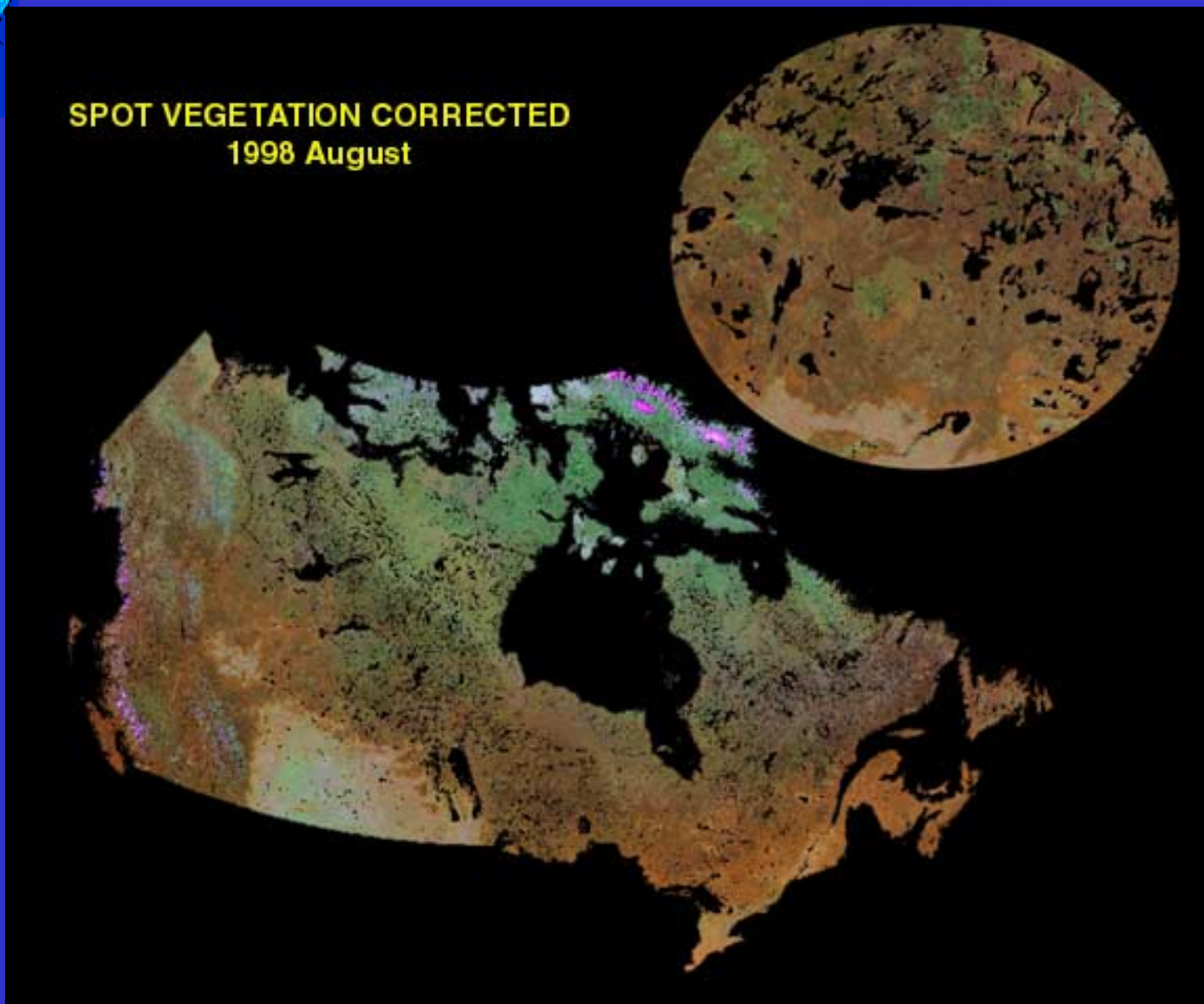
SPOT VGT

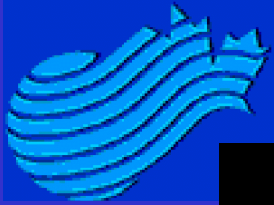
Uncorrected for BRDF effects 10 day composite 1998 08 11-20





SPOT VEGETATION CORRECTED
1998 August





Land Cover of CANADA

from VGT - SPOT satellite data 1998

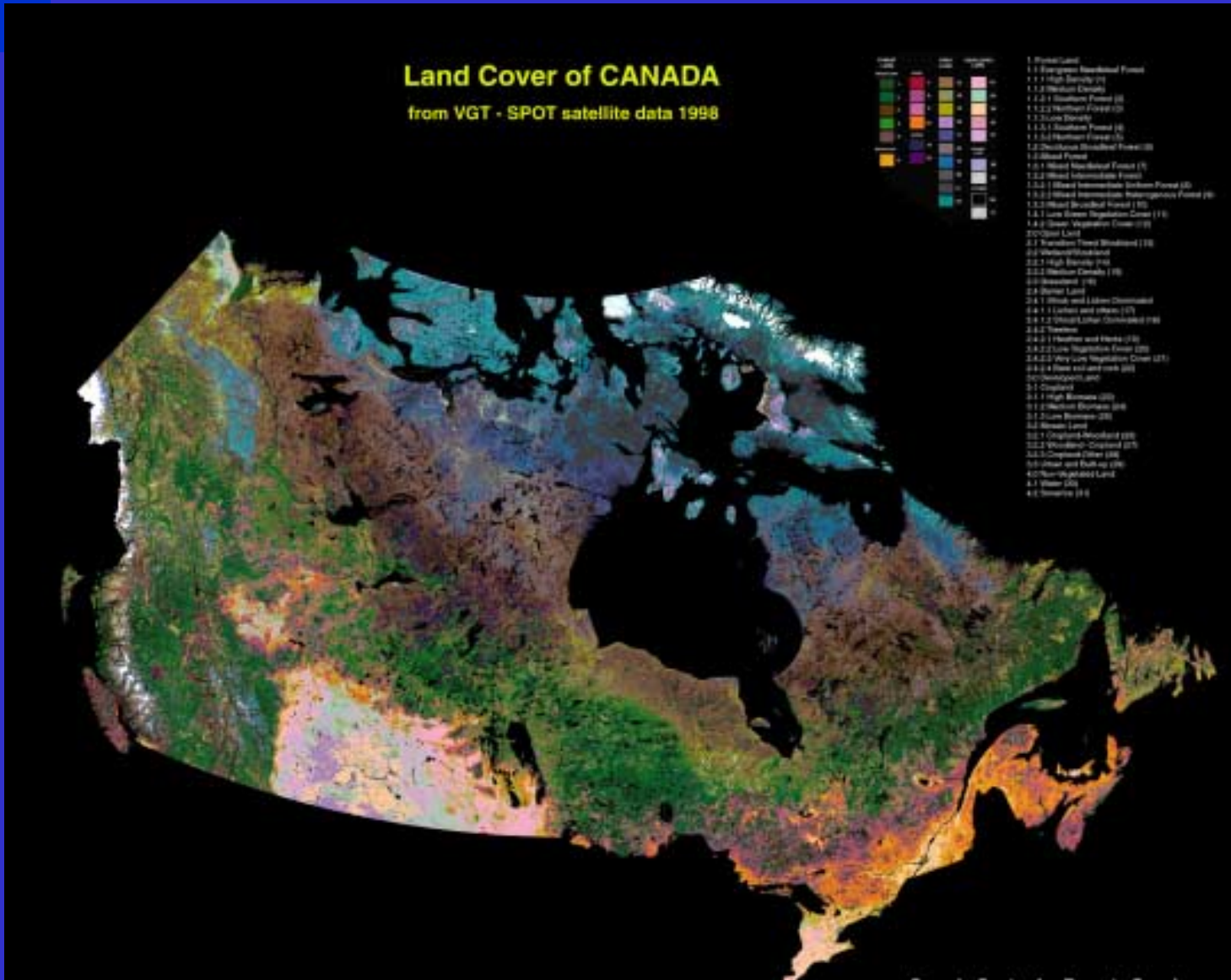


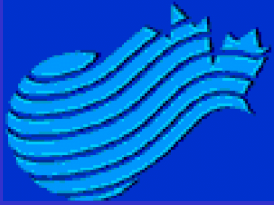


IMAGE CLASSIFICATION STUDIES

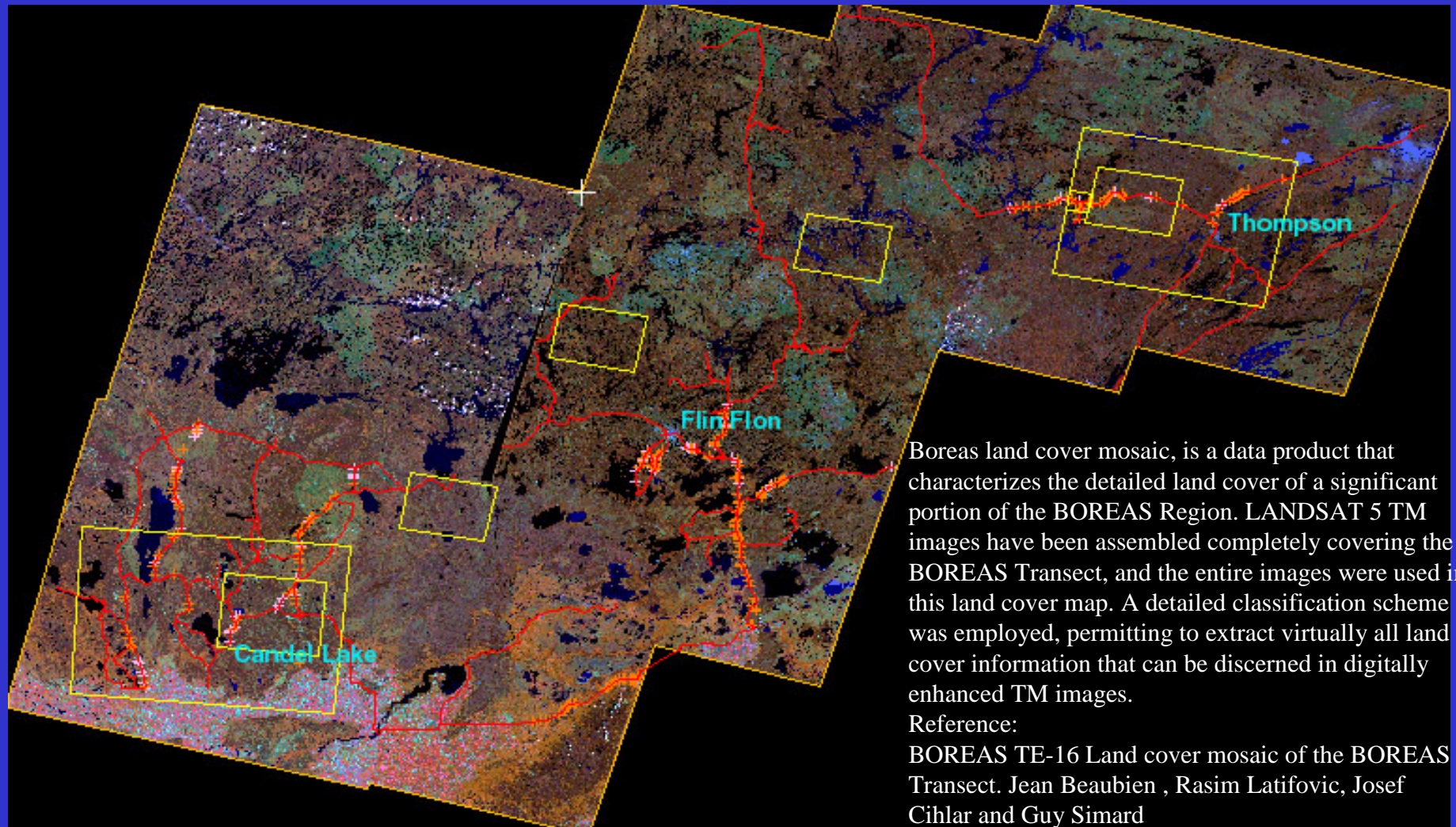


Land cover classification

- **Enhancement Classification Method (ECM)**
Land cover characterization based on land cover spectral characteristics
- **Classification by Progressive Generalization (CPG)**
Land cover characterization based on land cover spectral and spatial characteristics
- **Temporal Profile Classification**
Land cover characterization based on matching phenological and spectral characteristics of clusters average temporal profile
- **Pixels land cover type fraction**
Land cover characterization carried out by estimating the proportions of major cover type within each pixel



BOREAS forest cover types classification



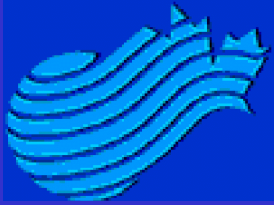
Boreas land cover mosaic, is a data product that characterizes the detailed land cover of a significant portion of the BOREAS Region. LANDSAT 5 TM images have been assembled completely covering the BOREAS Transect, and the entire images were used in this land cover map. A detailed classification scheme was employed, permitting to extract virtually all land cover information that can be discerned in digitally enhanced TM images.

Reference:

BOREAS TE-16 Land cover mosaic of the BOREAS Transect. Jean Beaubien , Rasim Latifovic, Josef Cihlar and Guy Simard

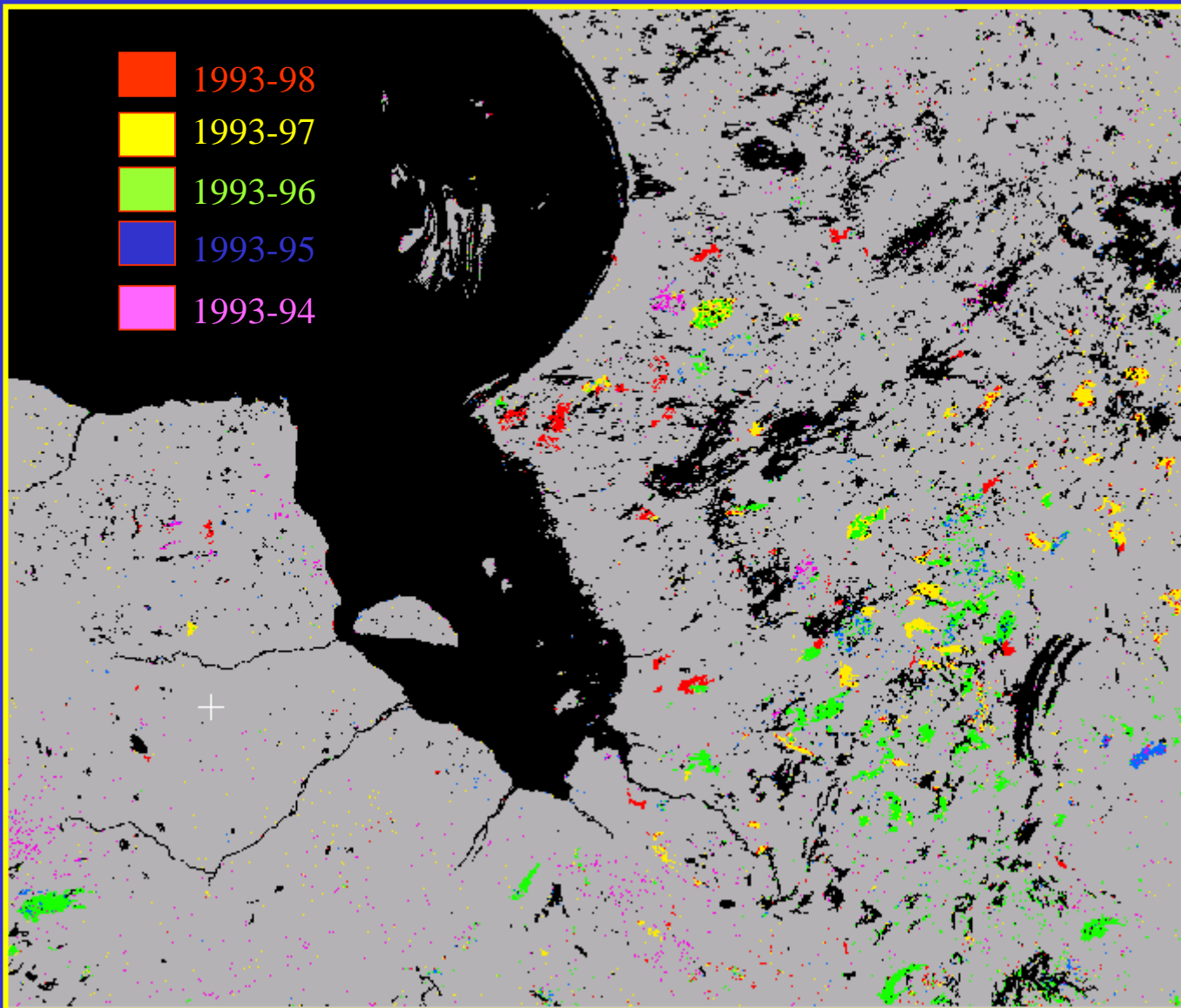
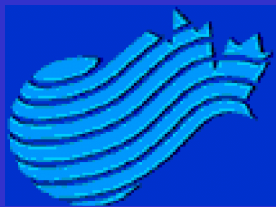


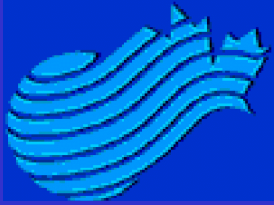
CHANGE DETECTION STUDIES



SPECTRAL CHANGE IDENTIFICATION METHODS

- Multi Temporal Vector Change Detection Method
- Correlation Analysis Change Detection Method
- Texture Change Detection Method
- Pixel Fraction Change Detection Method





Methodological Issues

- **Coarse resolution pixel un-mixing**
- **Alternate labelling approaches**
- **Model-based classification**
- **Intra-scene radiometric balancing**
- **Strategies for large area, fine resolution LC mapping**
 - Great Lakes basin project in conjunction with the US EPA