

# **Global Land Cover Mapping North America Window**

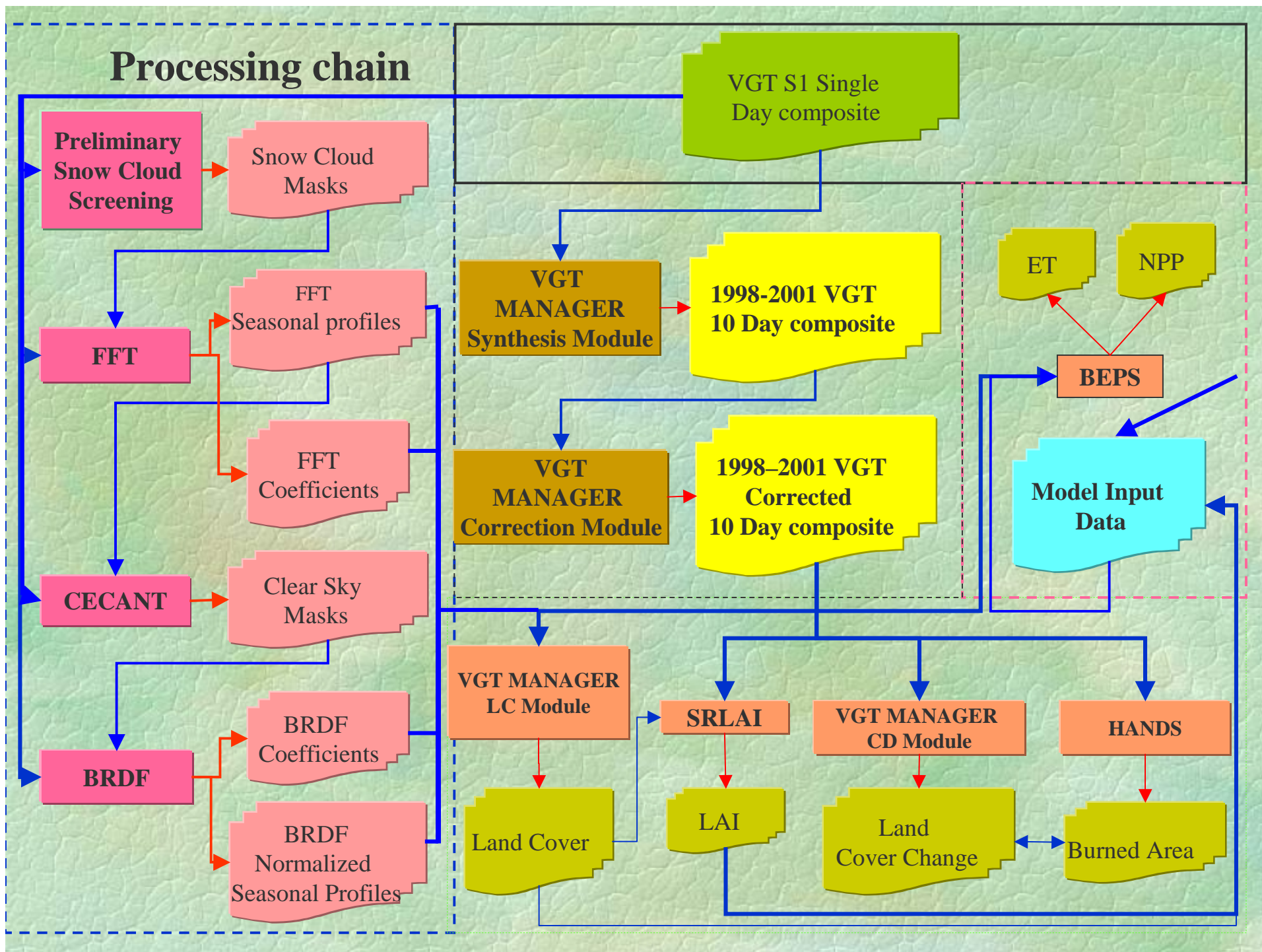
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**GLC 2000 Workshop  
JRC Ispra March 18-22, 2002**

**Canada Centre for Remote Sensing**

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## Processing chain





Analysis based on daily data

Time  
From 01-Nov-00  
To 01-Nov-00

Image size  
Pixels 18705 Lines 3921

Window  
Upper Left Corner  
Pixel 0 Line 0  
Low Right Corner  
Pixel 18705 Line 3921

Land cover  
Input Directory F:\NorthAmerica\  
Output Directory F:\glc2000\

Seasonal Profile Fast Fourier Transformation

- ☒ FFT NDVI Average
- ☒ FFT NDVI Max
- ☒ FFT + POLYN.

FFT

BRDF Normalization

- ☐ Roujean Model ☐ B0
- ☐ Modified Walthall Model ☐ B2
- ☐ Modified Walthall Temporal Model ☐ B3
- ☐ Ross - Li Model ☐ B4
- ☒ Nonlinear Temporal Angular Model

☐ Output normalized bands

BRDF

Clouds and snow screening

Clouds mask

Compositing

Input Directory F:\NorthAmerica\  
Output Directory F:\glc2000\

Compositing period starts at

01-Nov-00

Compositing period ends at

01-Nov-00

Image Size

Number of pixel 18705

Number of lines 3921

SM

CSS

Compositing criteria

- ☐ MVC NDVI
- ☐ Min RED
- ☐ Average
- ☐ Min VZA

Accessories

Time

From date 01-Nov-00

To date 01-Nov-00

Image Size

Pixels 18705

Lines 3921

Compression

Water mask

- ☐ Convert RAW into LP
- ☐ Convert LP into RAW format

Convert

Subset

Upper Left Corner X 7000 pixel

Upper Left Corner Y 2000 pixel

Low Left Corner X 7100 pixel

Low Right Corner Y 2100 pixel

Subset

Convert

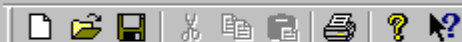
Convert HDF into RAW format

Input Directory F:\NorthAmerica\  
Output Directory F:\glc2000\

Cancel

Untitled - VGTManager

File Edit Project View Tools Help

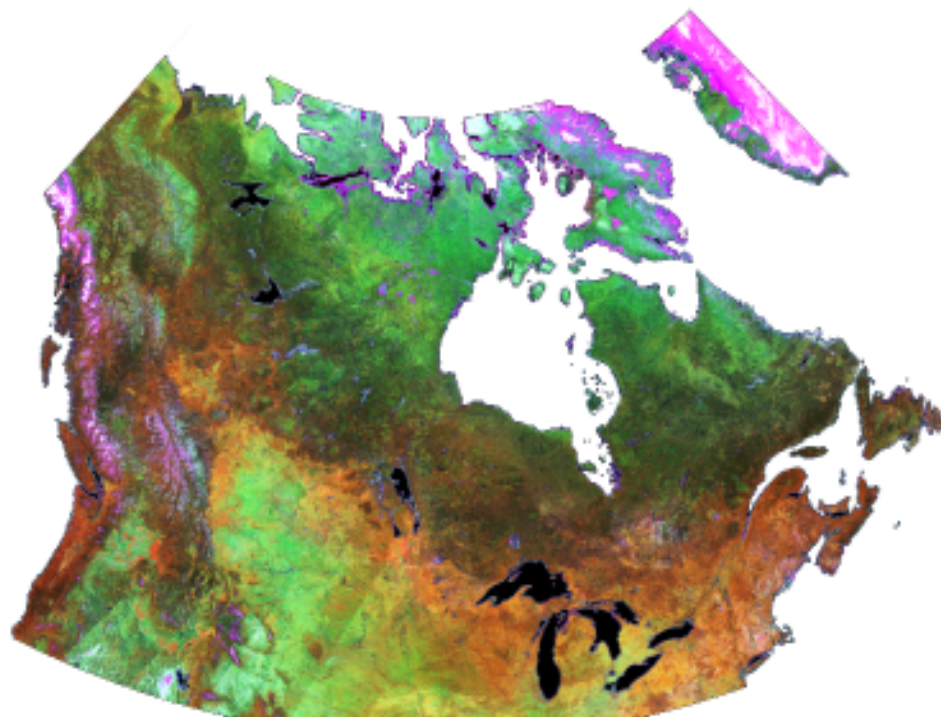


For Help, press F1

NUM

VGT Manager

**10 day composite**



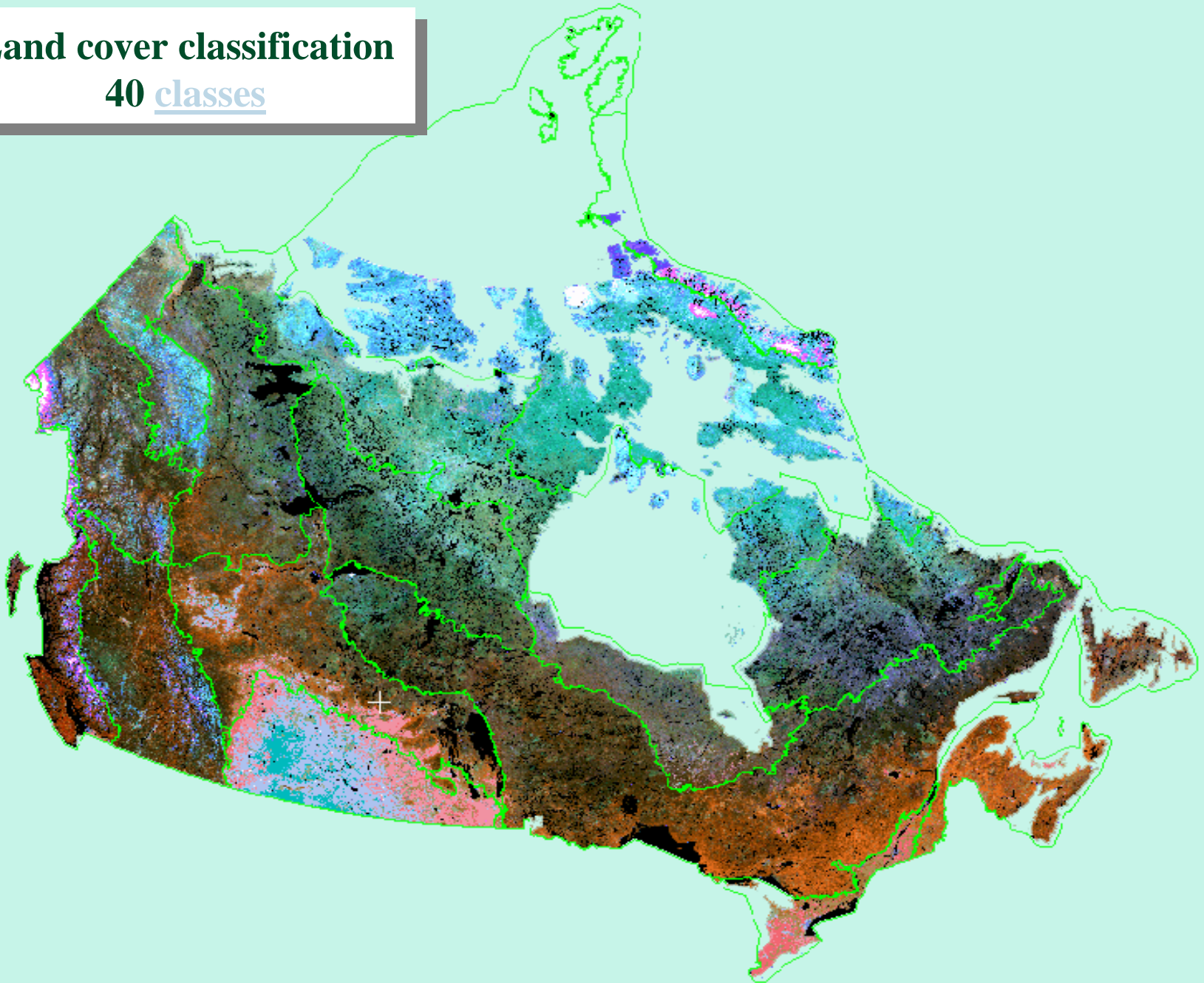
**10 day composite post seasonally  
corrected**





## Land cover classification

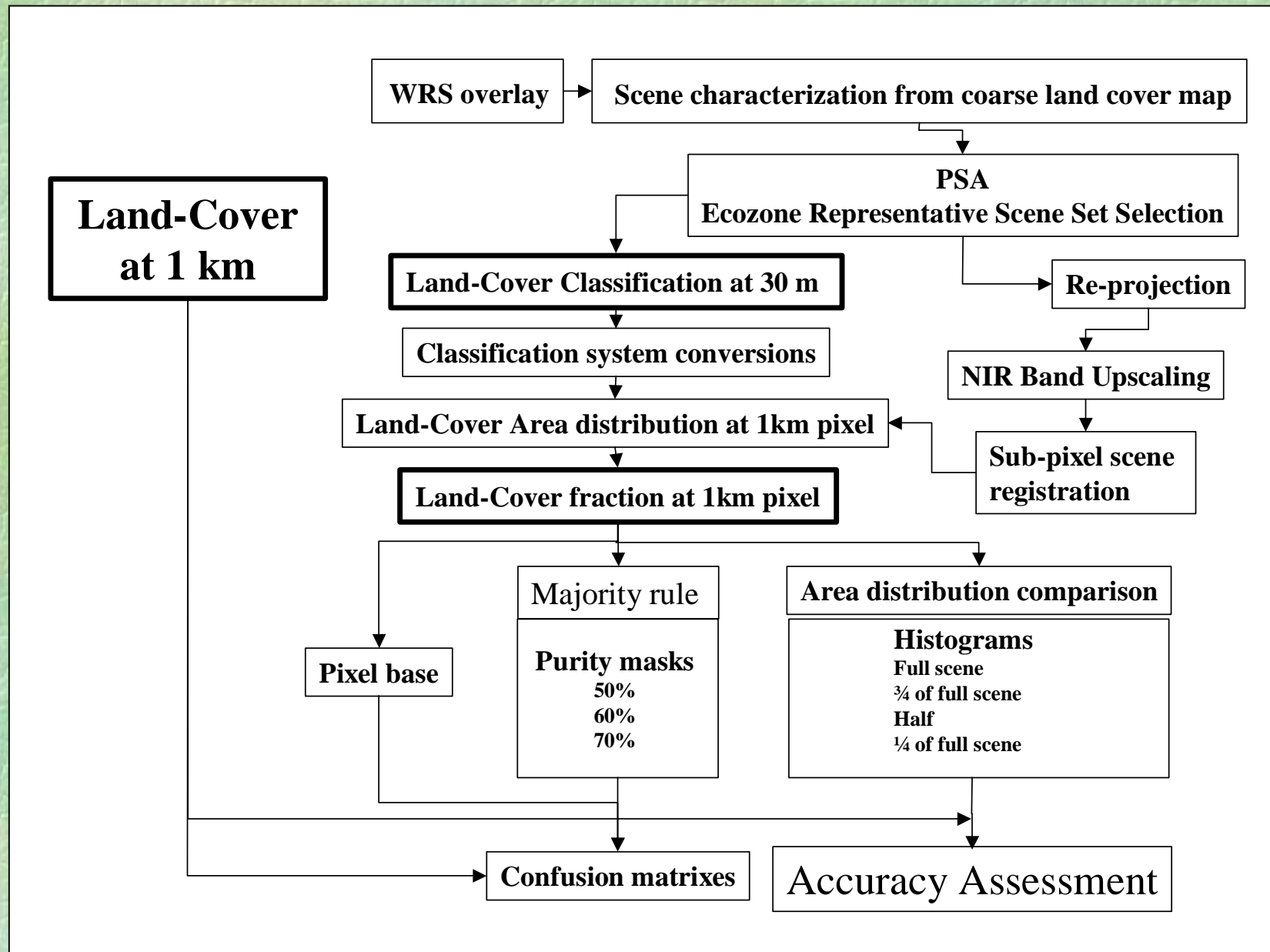
40 classes

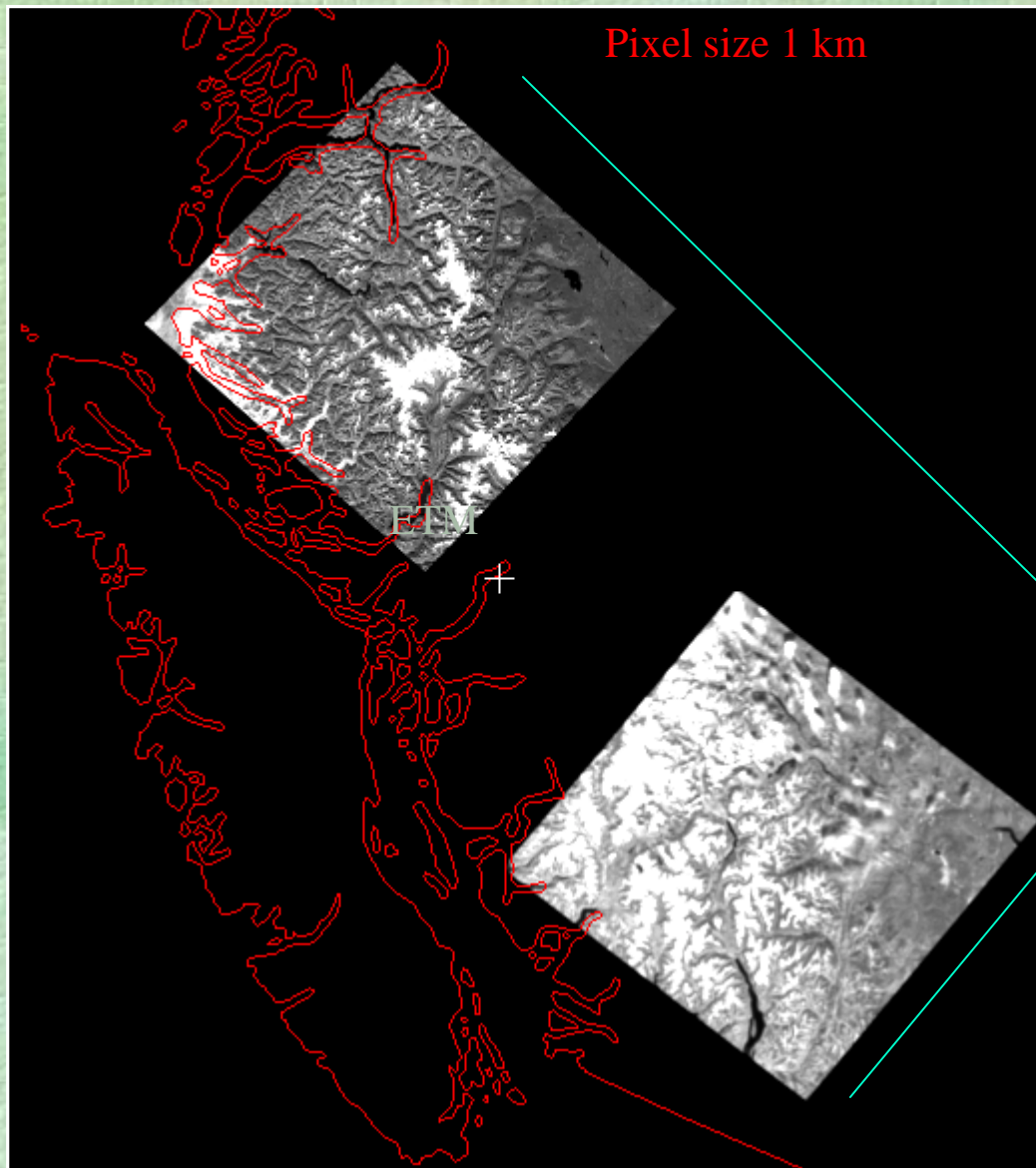


**Representative fine resolution data set**



# Accuracy Assessment Analysis





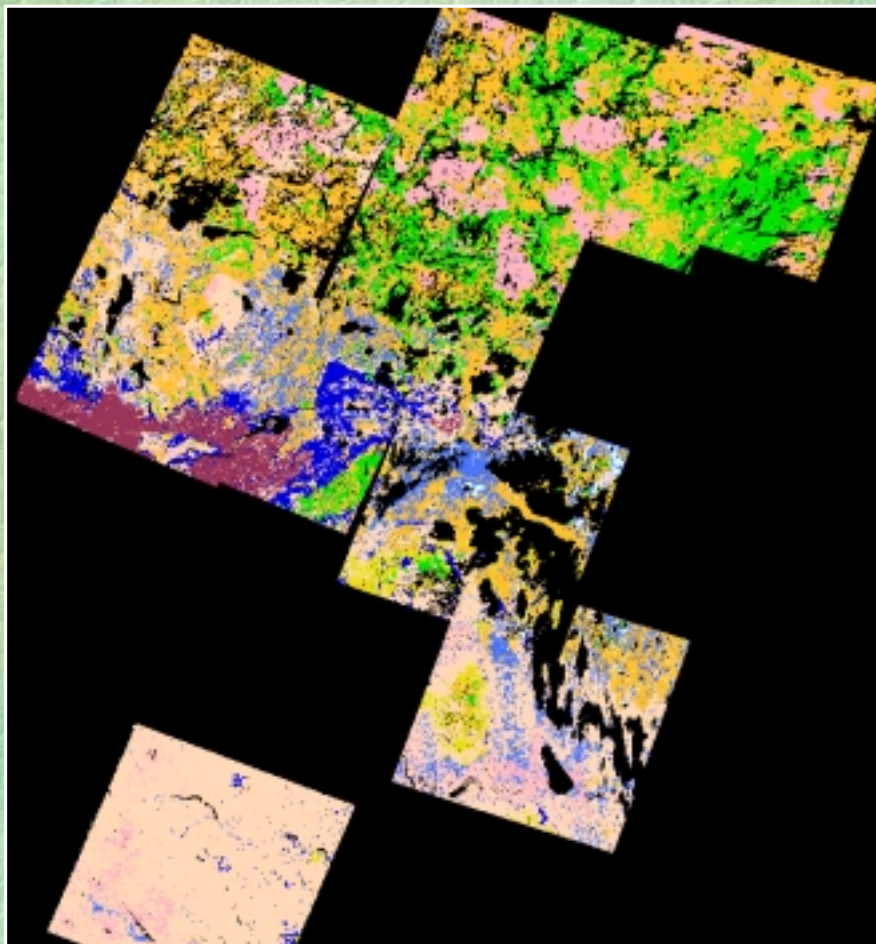
Georeferencing

Co-registration

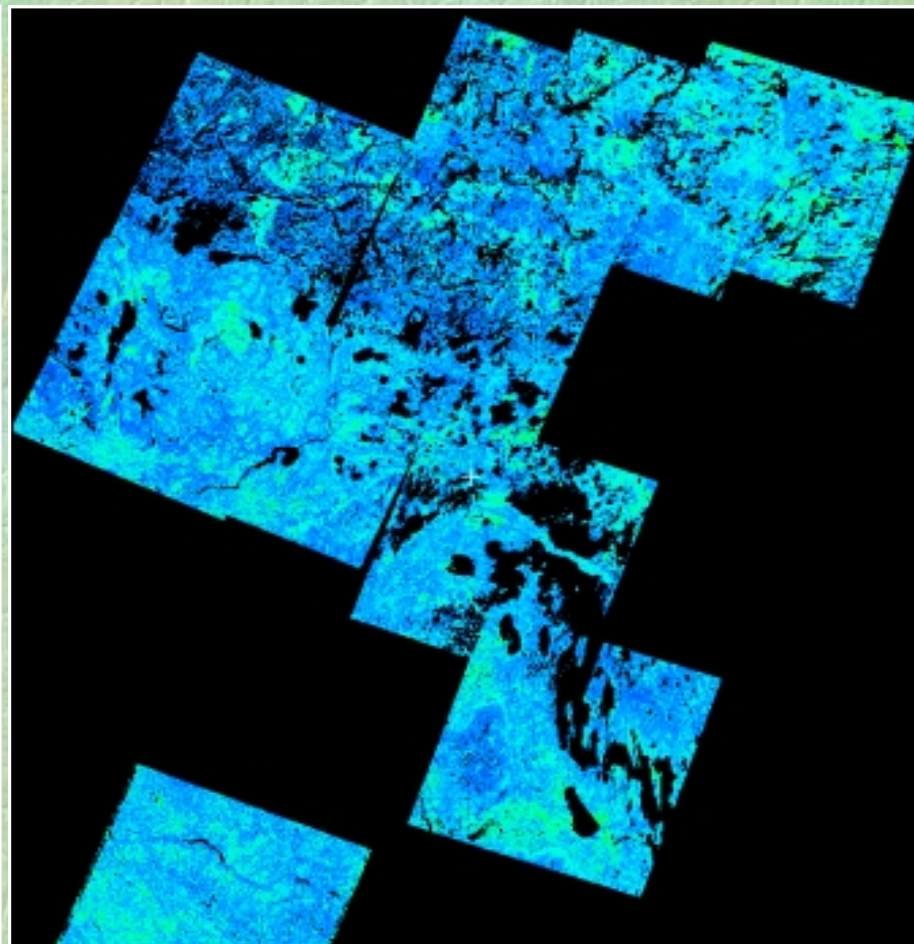
Re-sampling



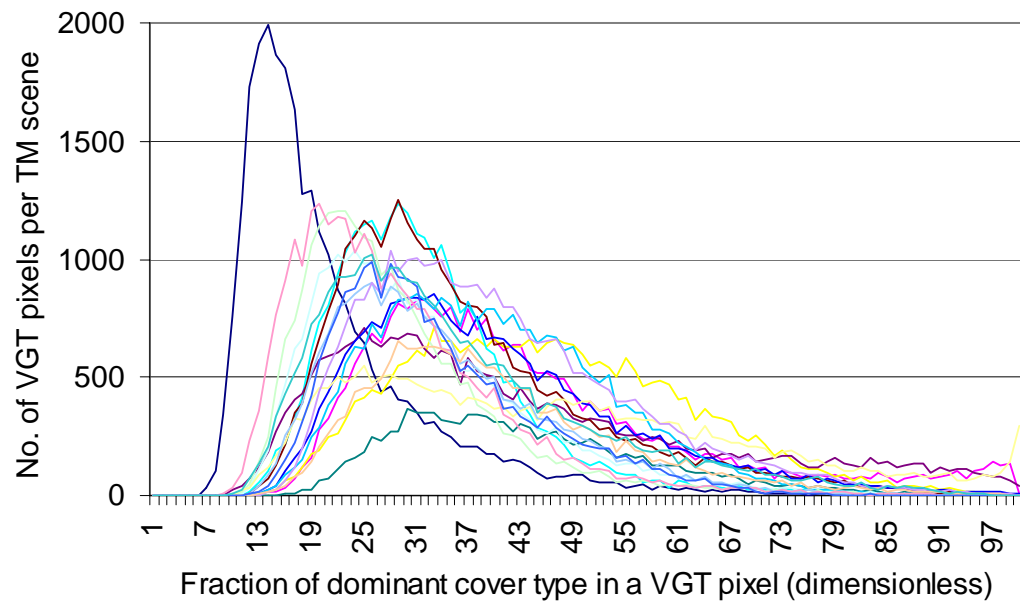




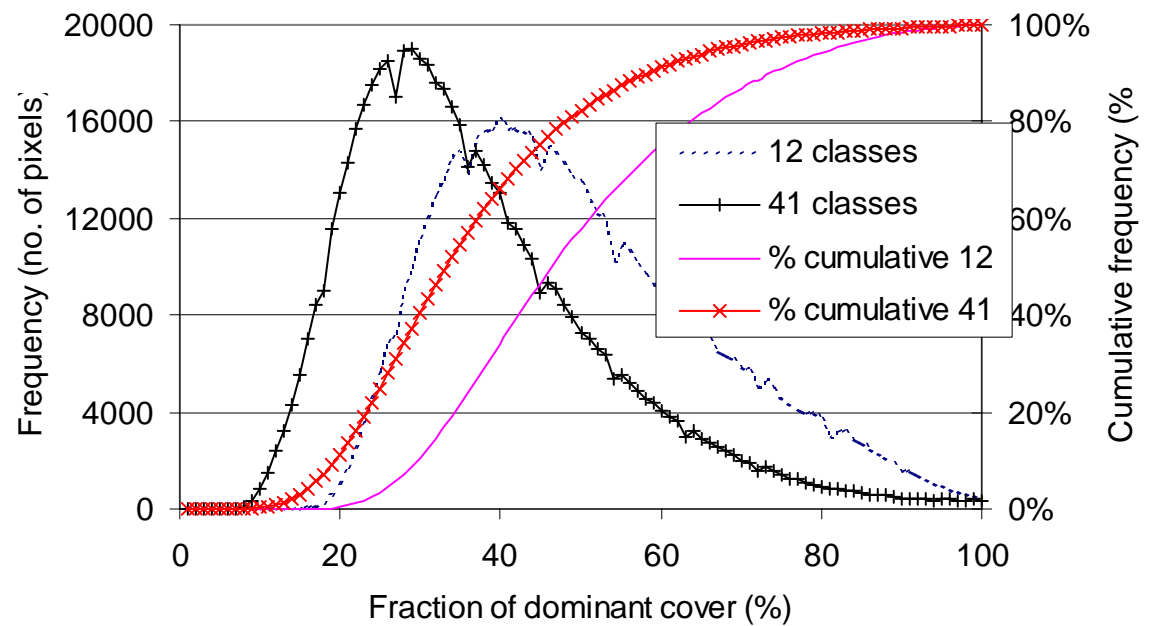
Most frequent type in 1 km pixel derived  
from Landsat TM



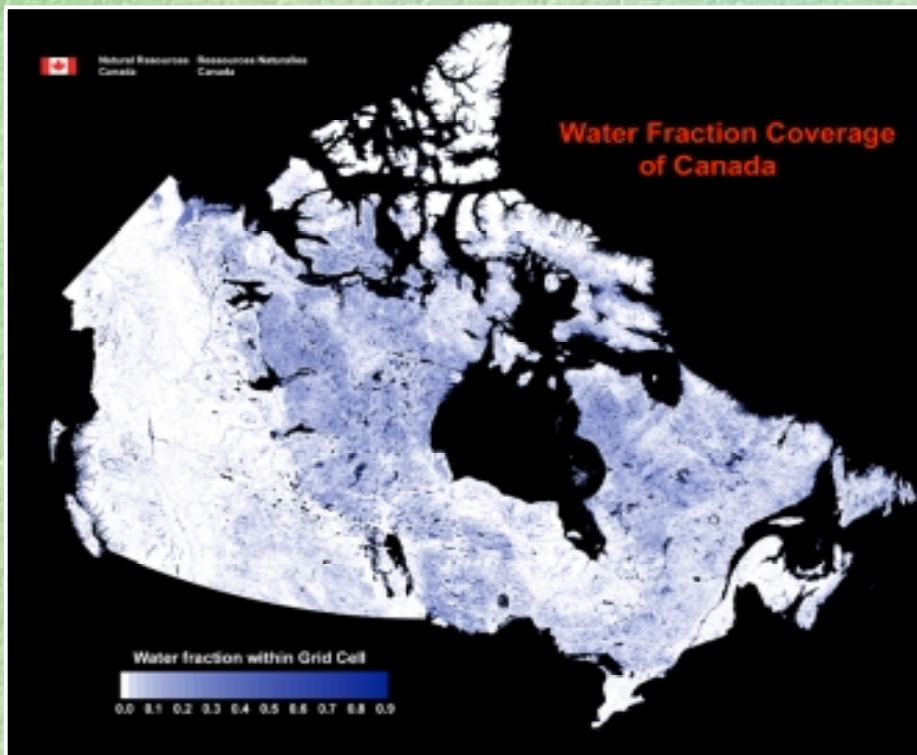
Percent of occupied area by the most  
frequent type in 1 km pixel



**Fraction of dominant  
land cover type  
in 1 km pixel**







Effect of sub-pixel water on reflectance  
(based on random 2% sample on Canadian Shield and 3-by-3 cell averaging)

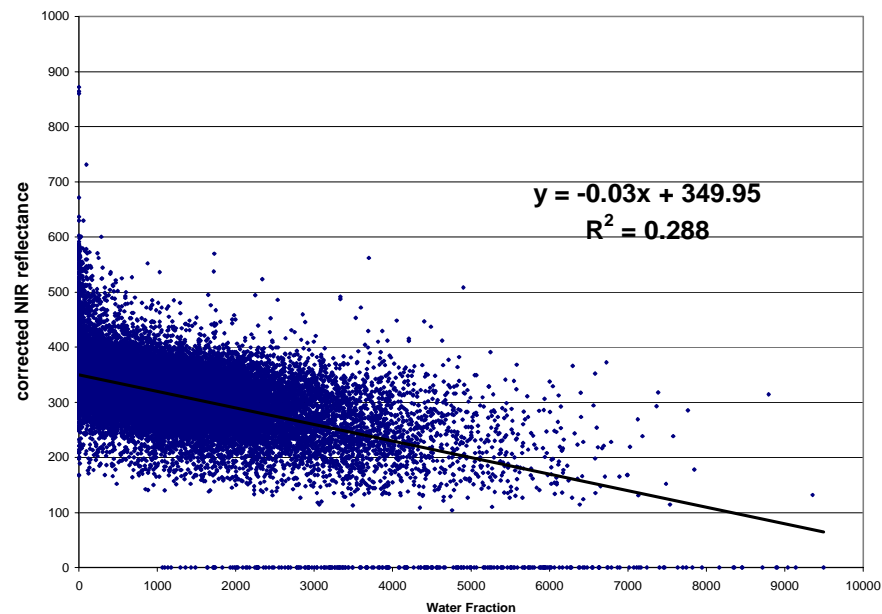
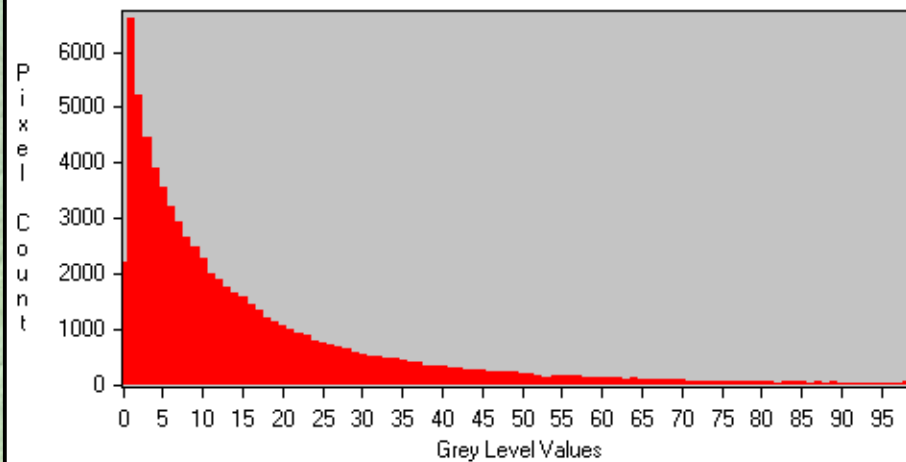
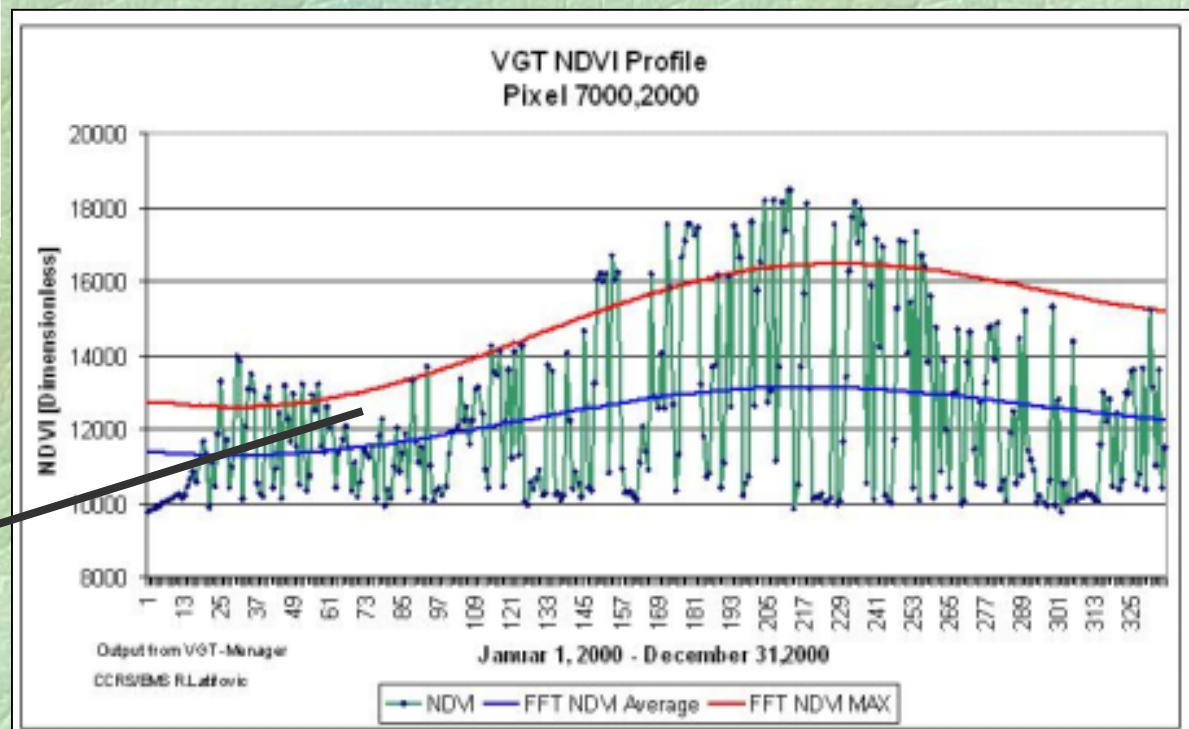
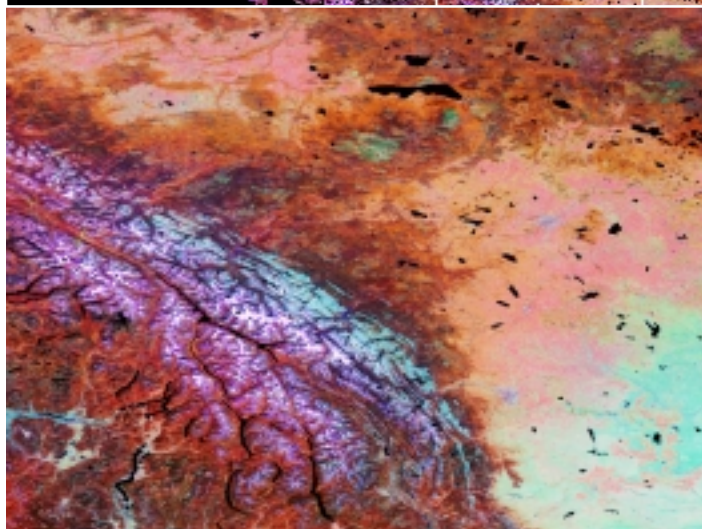
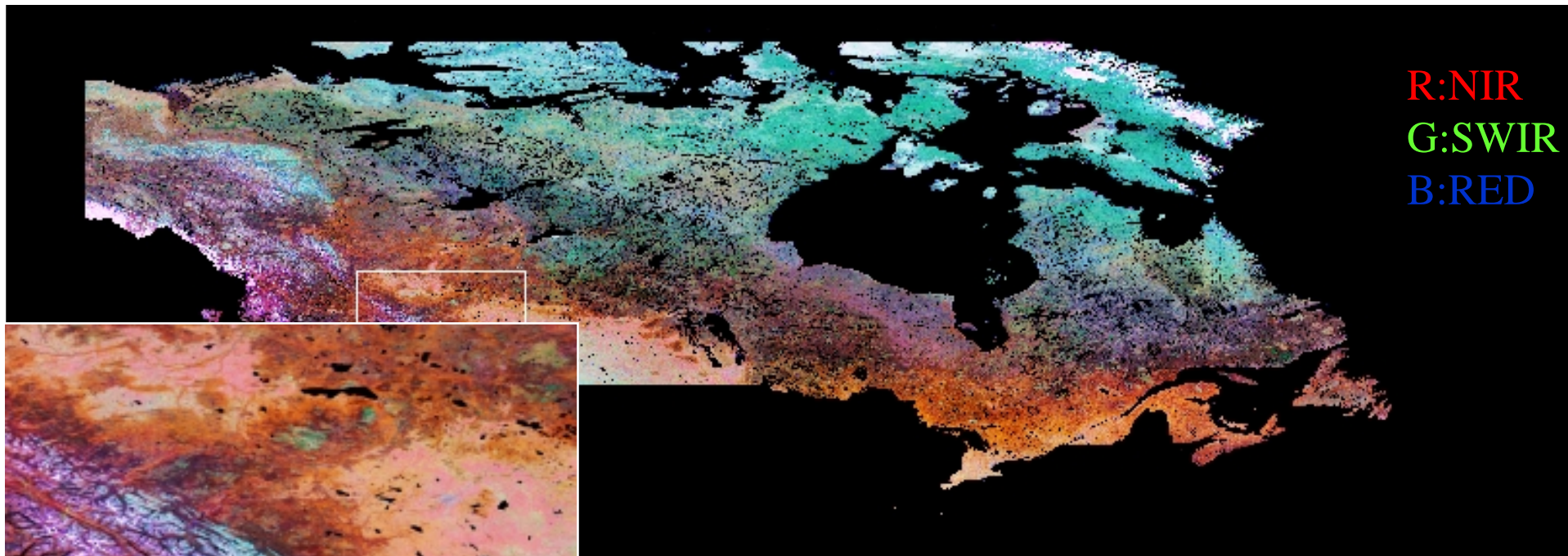


Image Plane 4 Histogram under Graphic 1



Water fraction >5% and <95%

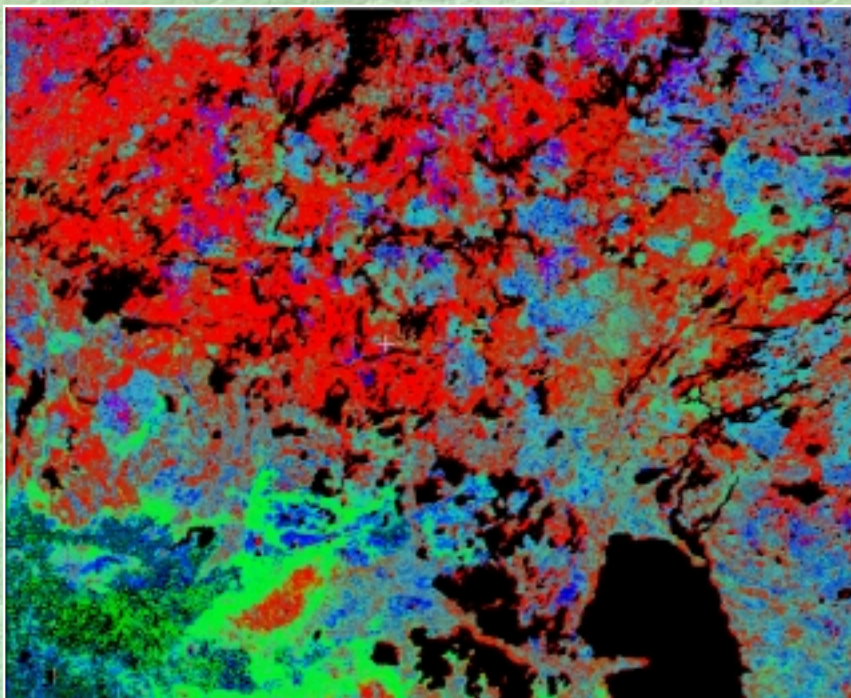




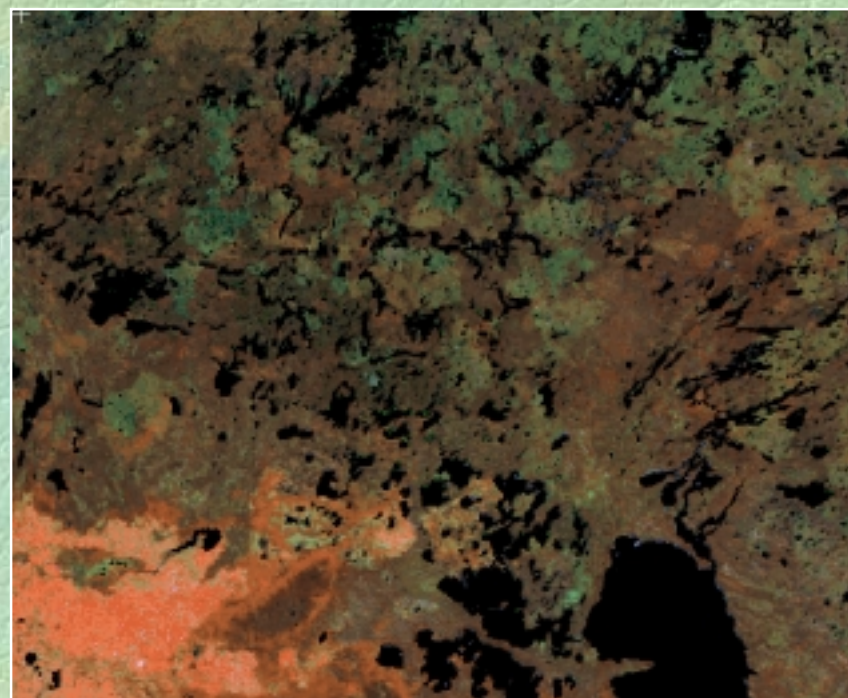


## Land cover characterization carried out by estimating the proportions of major cover type within each 1 km pixel

Fractions



Classification



Coniferous



Shrub and grass



Deciduous



Water



## Conclusion

- VGT Manager software for handling and pre-processing S1 and S10 SPOT/VGT data developed.
- Data received; North America window loaded and converted into common projection and format.
- 10-day composite generated and post-seasonal correction completed.
- Representative fine resolution data set (TM and ETM+ selected, acquired and classified into common classification system (FGDC)
- Land cover of Canada from VGT1998 'hard' classification generated and accuracy assessment performed.
- Temporal characteristics based on S1 2000 product derived.
- Directional characteristics based on S1 2000 product in progress.

### 🐼 **Our current priorities**

- Increase the TM,ETM+ sample set.
- Generation and validation of fractions data for Canada
- Continuation of land cover change detection.



## Reference:

J.Cihlar, R.Latifovic, J.Beaoubien, B.Guindon and M.Palmer, 2002 **The TM-based accuracy assessment of a land cover product for Canada derived from SPOT/VEGETATION data.** *Submitted to Canadian Journal of Remote Sensing*