

# Daily National Snow Cover Maps

Richard Fernandes, Anita Simic, Rasim Latifovic, Bill Park, Project 28 (A. Trichtenko Project leader)



Reducing Canada's vulnerability to climate change

## INTRODUCTION

The presence of snow cover is directly related to land surface energy and water cycles and wildlife habitat. In addition, the temporal change in snow cover patterns is related to runoff, forest fire danger levels and can also be used to assess regional or global climate models.

## OBJECTIVE

To generate/acquire and validate daily Canada wide maps of snow cover from 1985 to present.

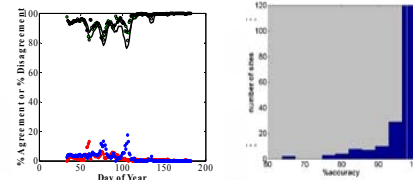
## SOLUTION

satellite imagery : daily ~1km resolution Canada wide measurements  
 MSC snow courses – 500+ each day used to calibrate and validate satellite imagery  
 Phase 1 – 1998-current validate existing maps, Phase 2 - 1985-1997 produce maps from NOAA AVHRR

## PHASE I – Validation of Daily Satellite Maps using In-Situ Snow Courses



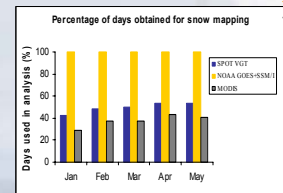
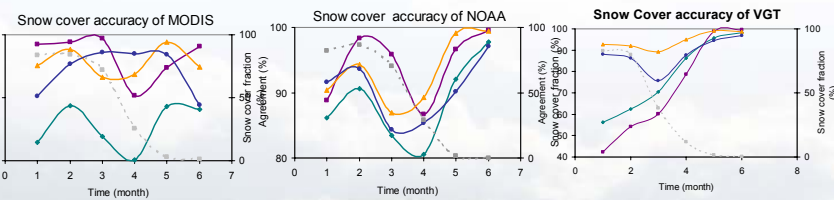
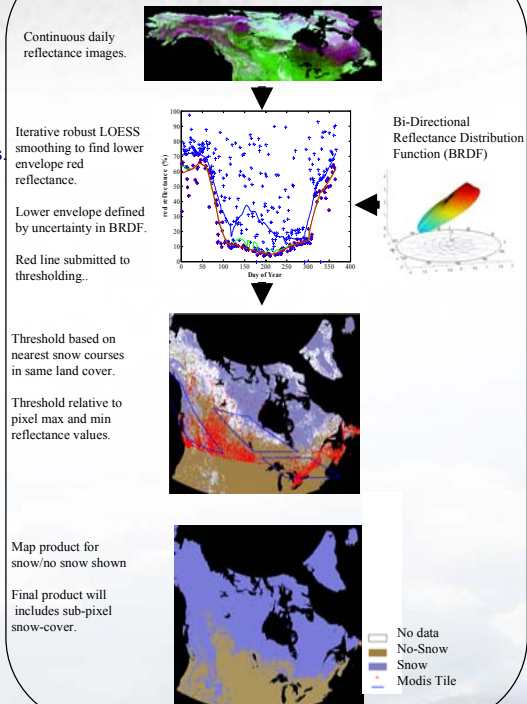
Agreement between Daily Snow Cover and In-Situ Barren Land Cover Sites



## Phase II: Results

- Currently limited to SPOT-VGT imagery.
- Results are for 100% retrieval frequency.
- Accuracy over 80% (most pixels above 90%).
- Omission and commission errors balanced.

## Algorithm: Iterative Temporal Analysis



## Phase I: Results

- SPOT-VGT Maps suffer from large omission errors over forests.
- MODIS and NOAA maps show reasonable agreement to in-situ snow data, with equal omission and commission errors.
- NOAA Map provides 100% retrievals, MODIS & VGT <50% MODIS cloud screening to conservative.

## OUTPUTS

- Peer-reviewed publication of Phase I and II.
- Blending of MODIS and NOAA products underway for submission to CRYSYS.
- NOAA –AVHRR algorithms to be implemented for 1985-2000 reanalysis of snow cover maps.
- First validated snow cover maps for all of Canada.

## OUTCOMES

- CFS intends to make use of Phase I outputs for wildfire danger.
- MODIS Science team releasing less-conservative cloud screened maps.
- VITO is reprocessing snow cover maps.
- NOAA will collaborate on North American snow cover reanalysis.