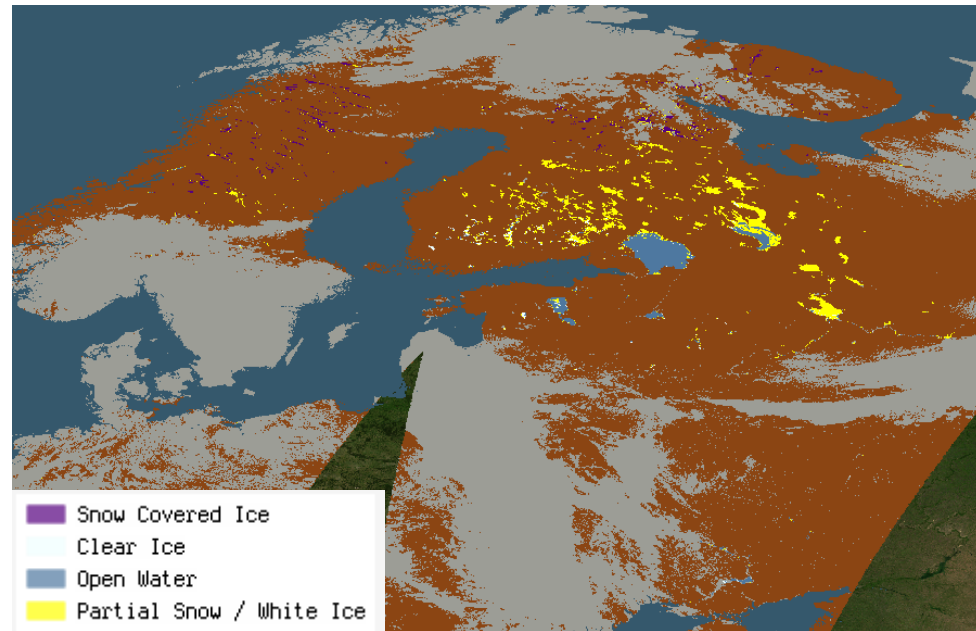


Baltic Lake Ice Extent LIE – product (SYKE)



•NRT Data production & delivery begun late January 2014

- Processing in collaboration with FMI (National Satellite Data Centre)
- Data available from: <http://neso.cryoland.enveo.at/cryoland/cryoclient/>



Parameter	Specification
Thematic variable	Lake ice extent
Thematic accuracy	Mapping accuracy: 74% (overall classification accuracy against operator interpreted SPOT-4 imagery)
Spatial coverage	Pan-European
Delivery time period	Spring (Feb-Jun) / Restricted by cloud cover and amount of day light
Temporal frequency	Daily 4-8 hours from image acquisition
Spatial resolution	0.0025 °
Sensor	MODIS/Terra
CryoLand status	Operational

Baltic LIE Product March 26th 2014

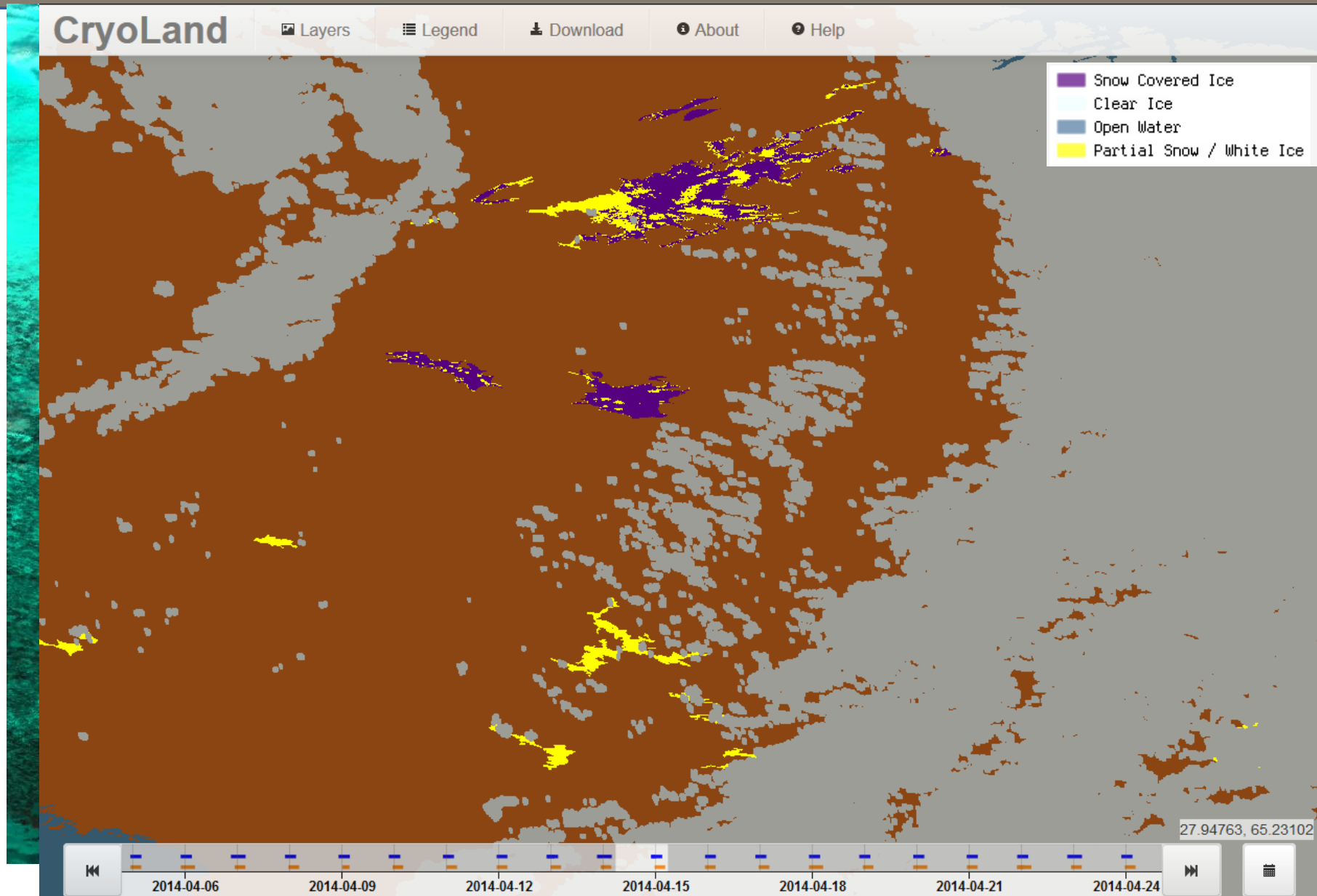


S Y K E



FMI

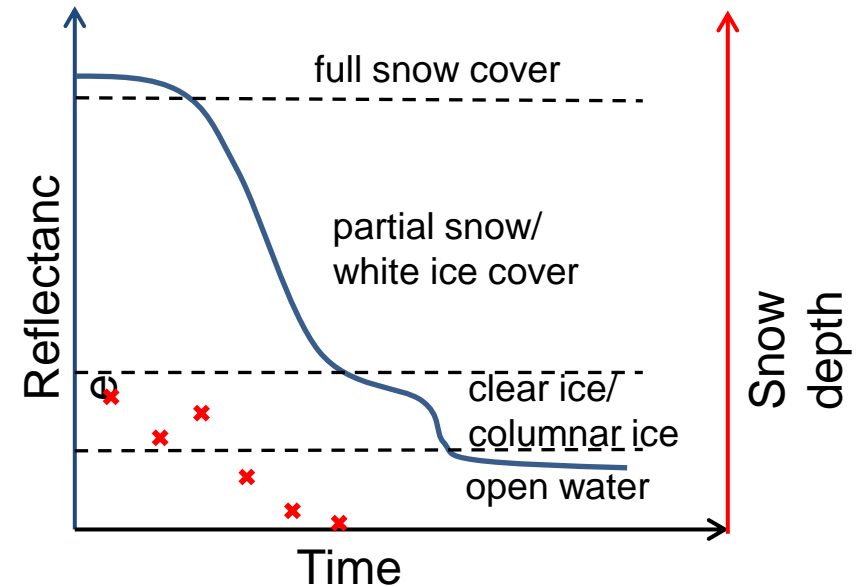
MODIS observations → LIE



Baltic Lake Ice Extent (SYKE) - Background



- Algorithm: Reflectance thresholds
 - Threshold reflectances derived by comparing snow-depth on ice in-situ observations and MODIS-reflectance time-series and compared to corresponding values from literature.
- The interpretation reduced to four class classification:
 - 1) Full snow cover
 - 2) Partial snow / white ice cover
 - 3) Clear ice
 - 4) Open water
- Spatial resolution 250m
 - Using MODIS Band-1 (620-670 nm)
 - Thresholds could be determined for other instruments as well.
- Daily product for melting season
- Restricted by
 - cloud cover
 - Restricted by season (i.e. amount of day light) → only spring season observed



The threshold reflectances were determined from time series of MODIS reflectance observations from the surroundings of in-situ measurements for snow cover thickness on ice.

Comparison of supervised (SPOT4) and un-supervised (MODIS) calssifications of SYKE Lake Ice Extent- algorithm

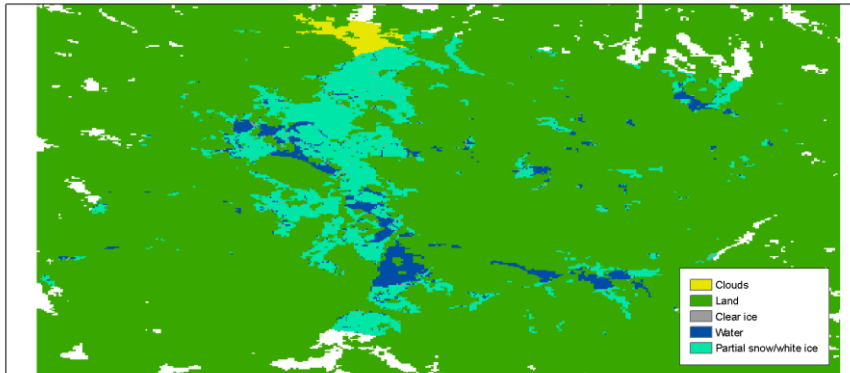


Classification accuracy ~80 %

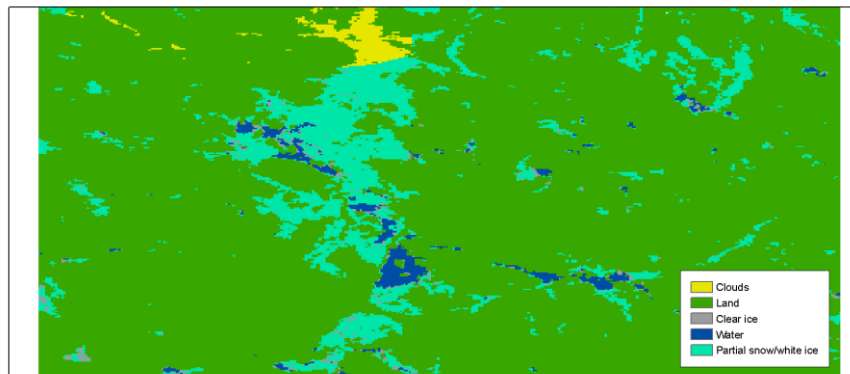
Good match

Confusion between clear ice and snow covered/white ice classes

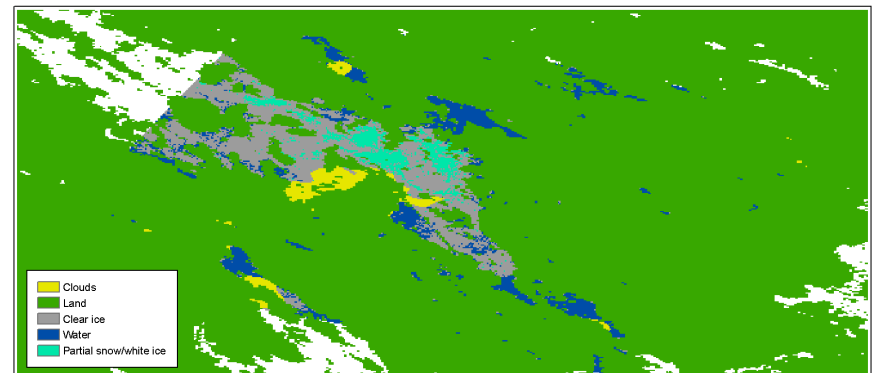
Supervised classification from SPOT4- image (09.04.2007)



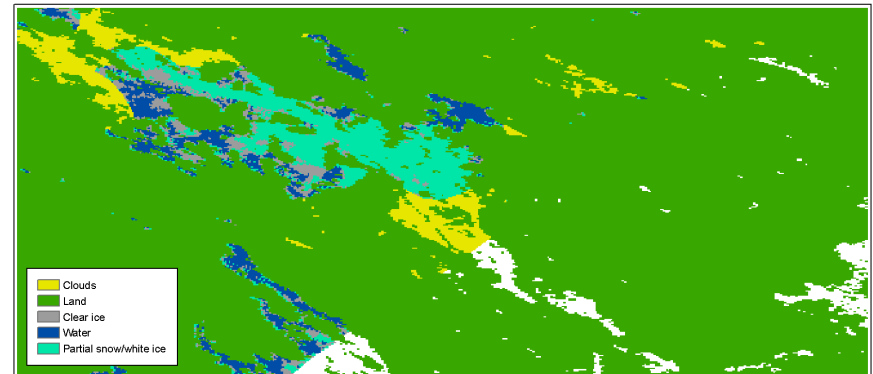
Un-supervised classification from MODIS Terra- image (09.04.2007)



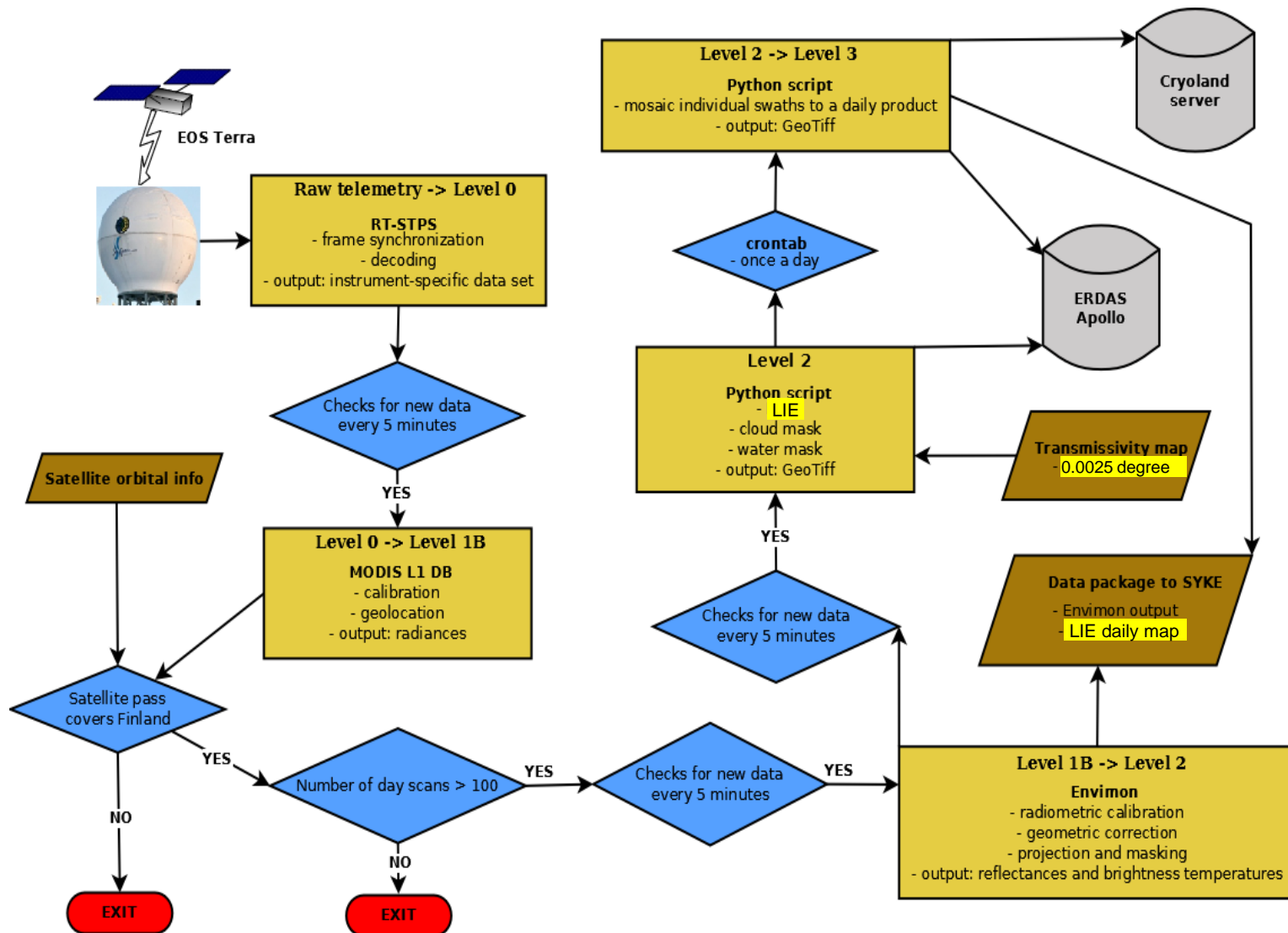
Supervised classification from SPOT4- image (07.05.2011)



Un-supervised classification from MODIS Terra- image (07.05.2011)



SYKE Lake Ice Extent – Processing chain (FMI & SYKE)



The processing chain of SYKE Lake Ice Extent (LIE) running at Sodankylä Arctic Research Station of Finnish Meteorological Institute servers

- SYKE in collaboration with FMI will continue the Baltic Sea regional service at least for next 4-5 years
- National satellite data processing Centre at Sodankylä will operate the production chains