Lake ice monitoring and modelling at SYKE

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FRESHWATER CENTRE

SYKE

Needs for lake ice information

- Research (climate change and variability, biology)
- Transport and safety (military, ice roads, vessels)
- Recreation
  - Lots of Finns have summer cottages on islands in the lakes
  - Ice fishing, skating and skiing, snow mobiling etc.

SYKE

Ice thickness and freeze-up and break-up observations

- **Ice thickness**
  - Manual measurements (drill and stick)
  - Longest time series from the 1910s
  - Approx. 50 sites, mainly in lakes, measured 3 times per month (10th, 20th 30th day of a month)
  - Official recod is an average of three drilling holes
  - Total ice thickness, snow ice, black ice, snow, free bound

- **Ice freeze-up and break-up**
  - Observed at all ice thickness sites as well at most of water level station (visual observation)
  - Longest time series from lakes since the 1820s
  - Different stages (shores frozen/melted, ice within a observation area)
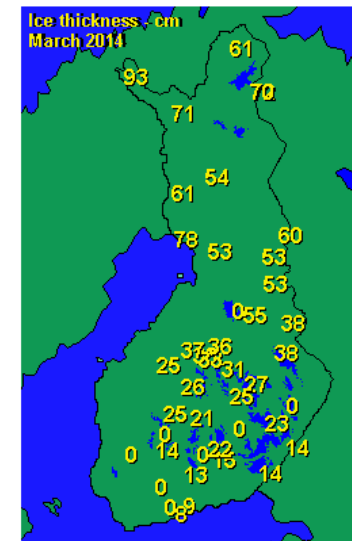 - Published as daily maps, forecasts, status reports, statistics

www.ymparisto.fi

Monthly hydrological reports | Finnish Environment Institute (SYKE)
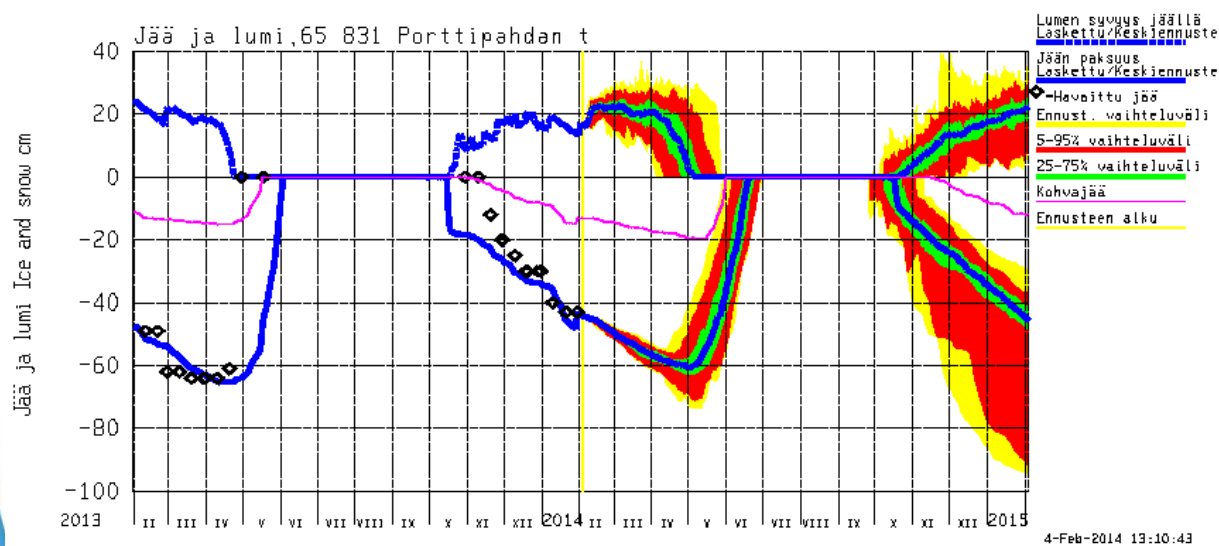
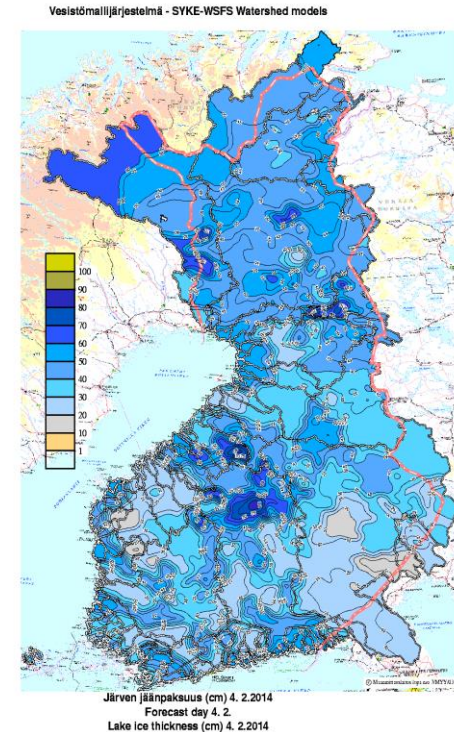**THICKNESS OF ICE COVER**

MARCH 2014

Ice thickness 30.03.2014

Ice modelling at SYKE

- Ice freeze-up, ice growth and ice break-up included in the WSFS
- Growth calculated based on the Stefan's law (heat transfer)
  - Total ice, snow ice, black ice growth + slush simulated
- Break-up calculation based on the degree-day factor

Ice thickness, modelled and observed)

Cryoland lake ice classification (LIE product)

- **LIE used to verify the lake ice situation on daily basis (e.g request by citizens, several official ice status reports during spring)**

- **LIE provides snow-on-ice vs. clear ice information: very useful**

- **Access to Lake ice information must be fast and easy!**
  - **Cryoland interactive geo-portal too slow**
  - **Also original RBG-data would be very useful**
  - **Not every user has a capability of using GIS-system**
  - **Colour system of LIE not very good…fetching of the legend should be easier**

SYKE finds png-images provided by NASA easier to use, e.g. http://rapidfire.sci.gsfc.nasa.gov/cgi-bin/imagery/single.cgi?image=crefl1_143.A2014017092500-2014017093000.250m.jpg)

→ Provision of RBG-quicklooks in 2015 through SYKE web-pages

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