Recent development of Weather Workstations at FMI

Finnish Meteorological Institute
Mikko Visa, Ari Kivioja, Janne Ylläsjärvi, Joonas Karjalainen
Joonas Moilanen, Ville Karppinen

Context

- SmartMet Analysis
- SmartMet Alert
- SmartMet Aviation – Cross-section
- SmartMet Aviation – SWC Editor
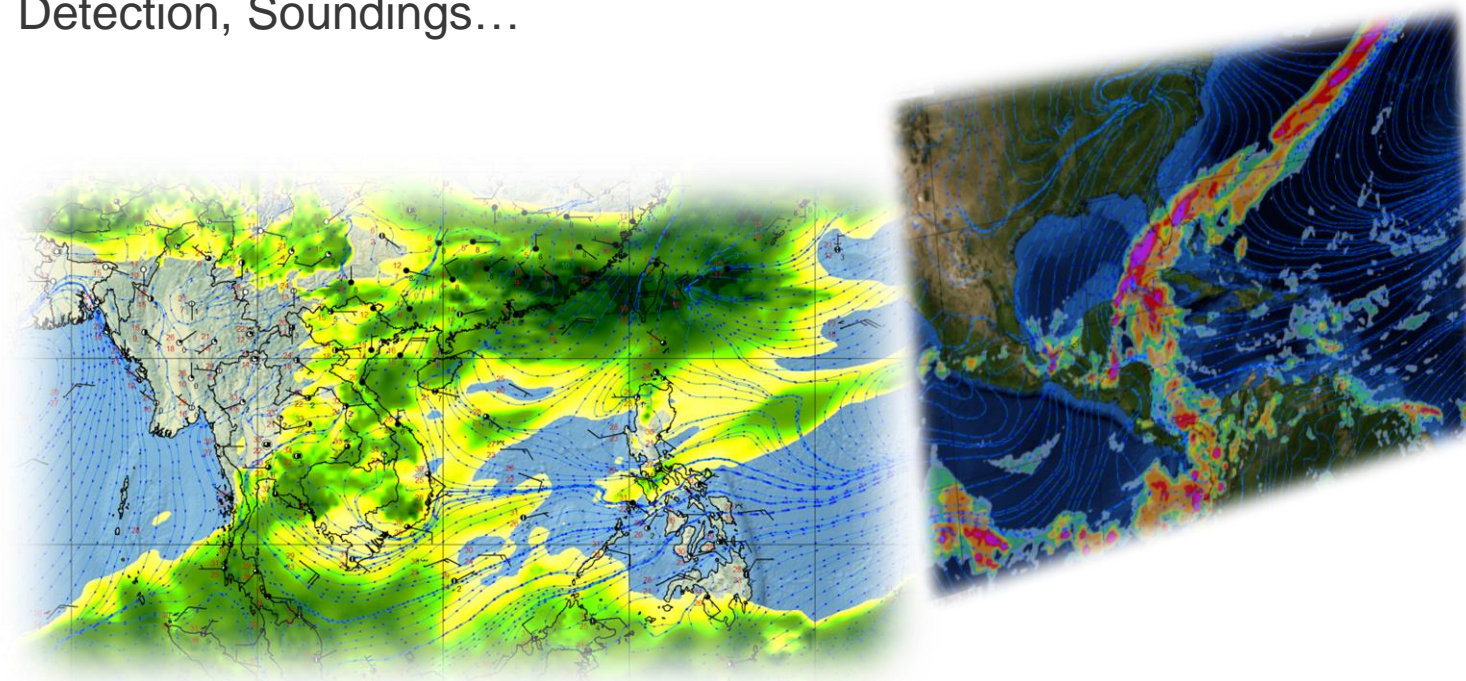- SmartMet Aviation – TAF Editor

- SmartMet Workstation

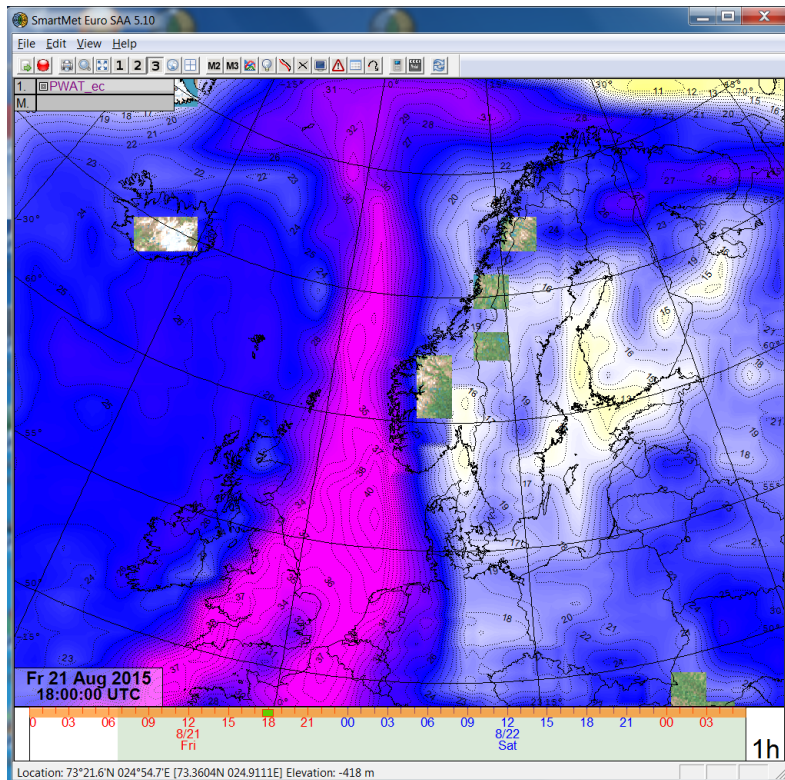- SmartMet Web

- Vanadis

SmartMet Workstation

- Tool for visualizing and editing meteorological data
- Support for all kind of meteorological data
  - NWP, Satellites, Weather Radars, Observations, Lightning Detection, Soundings…

Smartmet Workstation, operational visualization of meteorological and environmental data

- Used by operational forecasting departments in Europe by FMI, Estonian Weather Service and Latvian Meteorological Service and several others around the world.
- Windows-based application. Data handling engine is also available as a Linux serverside module
- SmartTool language used to derive parameters from NWP

FINNISH METEOROLOGICAL INSTITUTE

SmartMet Aviation (SWC)

- New tool for SigWx/SWC production

- Taken into production use May 2018 @ FMI and SMHI

- Installation and training in progress for Estonia (ESTEA)

- Replacement for Adobe Illustrator

- Met objects saved in database, could be utilized for other products in addition to SWC

- Background fields and initial guesses to ease drawing

   - Model data, observations, satellite, radar, …

   - 0°C level height, icing, turbulence, …

Editing the product

- Study the data:
    - Model data
    - Observations
    - SIGMETs
    - Other already published charts
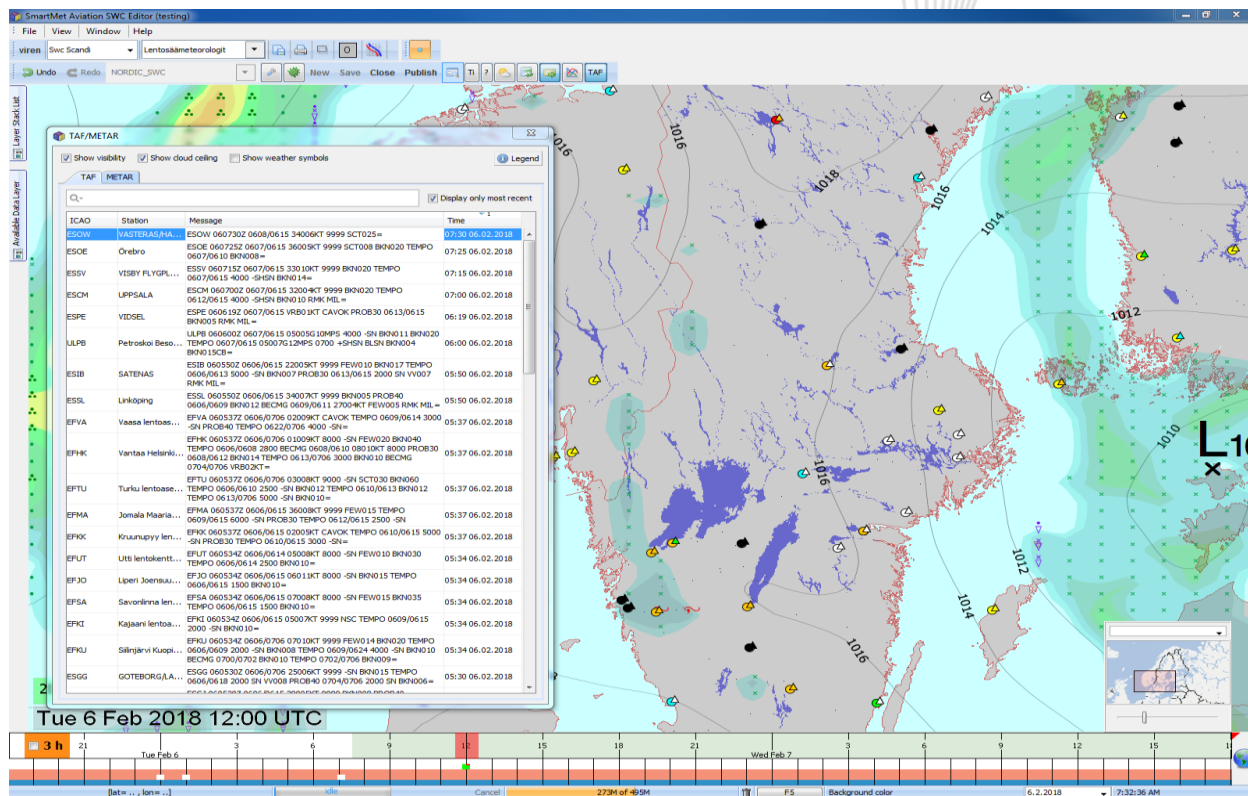- Draw meteorological objects such as fronts and SigWX areas while seeing the data in the background
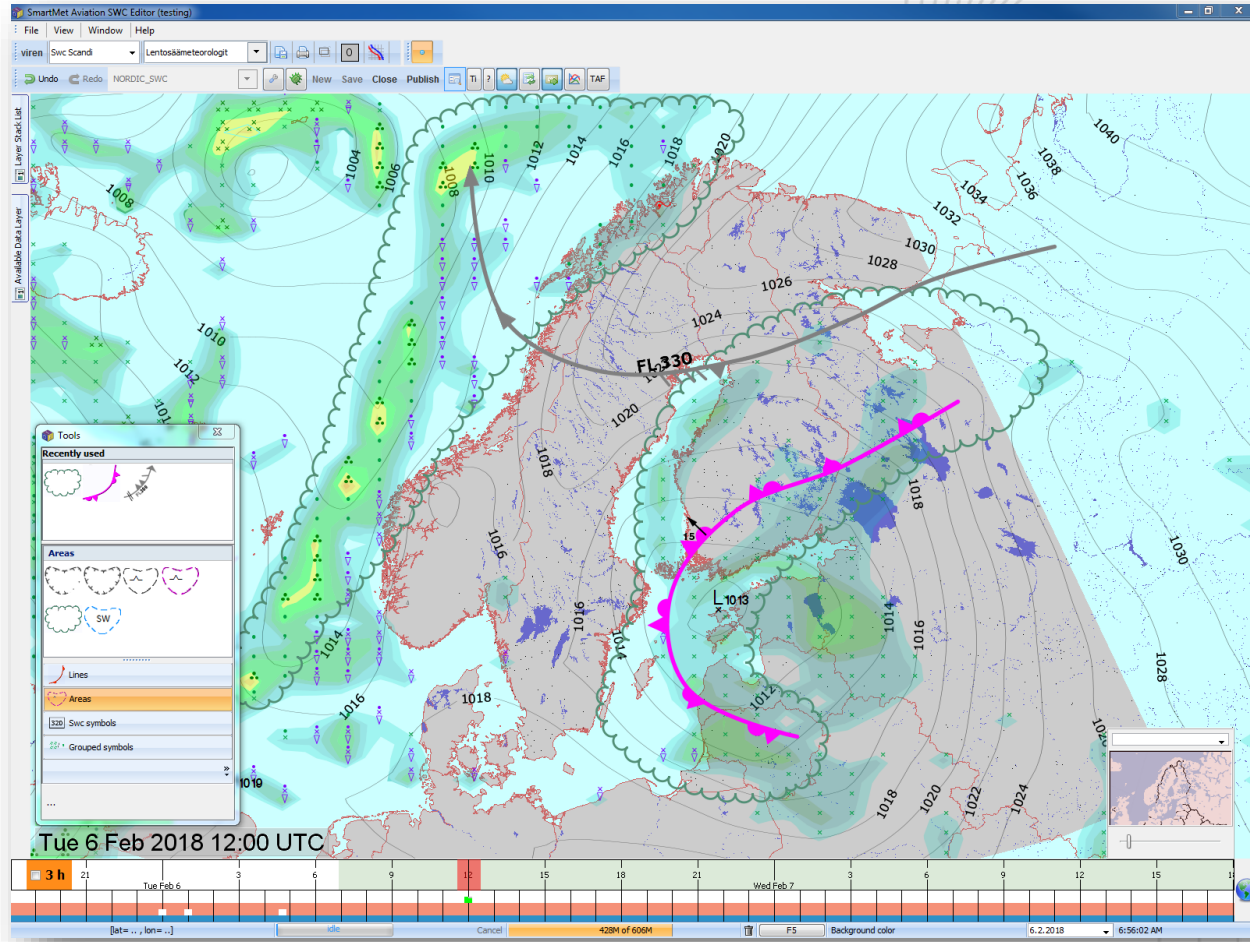
Editing the fronts, SigWX-areas, IMC-areas and other objects.
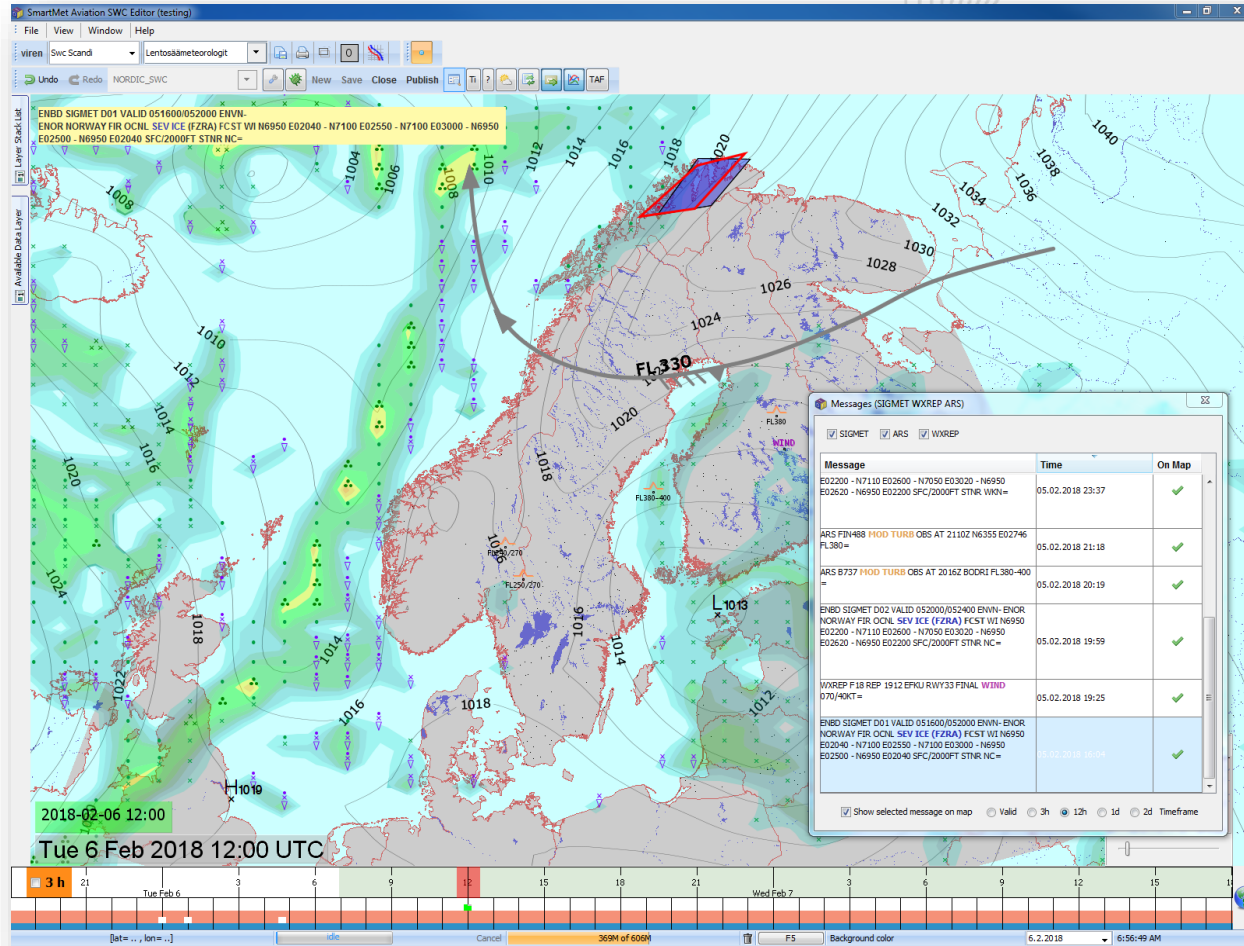
Editing the product

- Study the data:
  - Model data
  - Observations
  - SIGMETs
  - Other already published charts
- Draw meteorological objects such as fronts and SigWX areas while seeing the data in the background

TAFs

Editing the product

- Study the data:
  - Model data
  - Observations
  - SIGMETs
  - Other already published charts
- Draw meteorological objects such as fronts and SigWX areas while seeing the data in the background
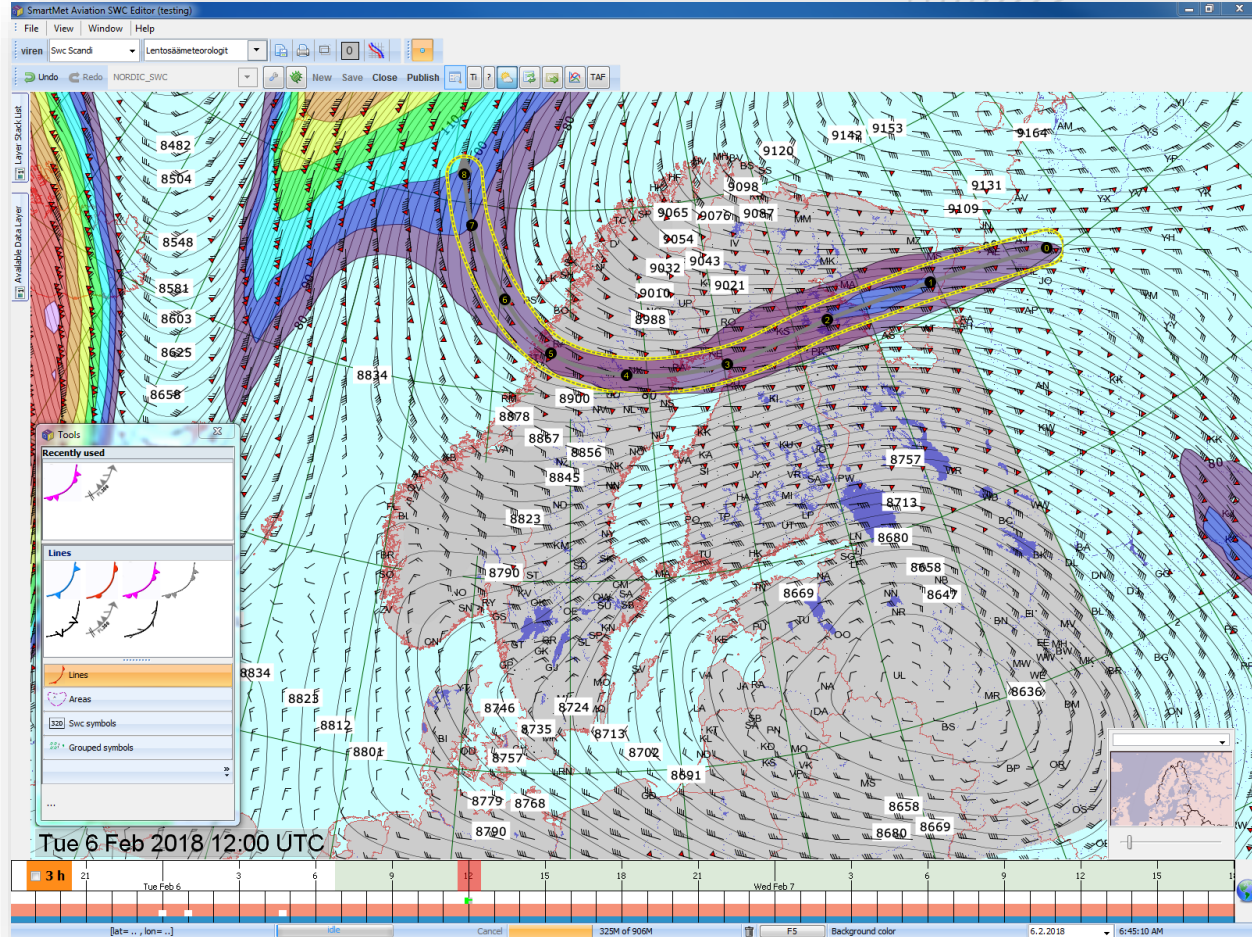

Valid sigmets on the same map.

Editing the product

- Study the data:
  - Model data
  - Observations
  - SIGMETs
  - Other already published charts
- Draw meteorological objects such as fronts and SigWX areas while seeing the data in the background
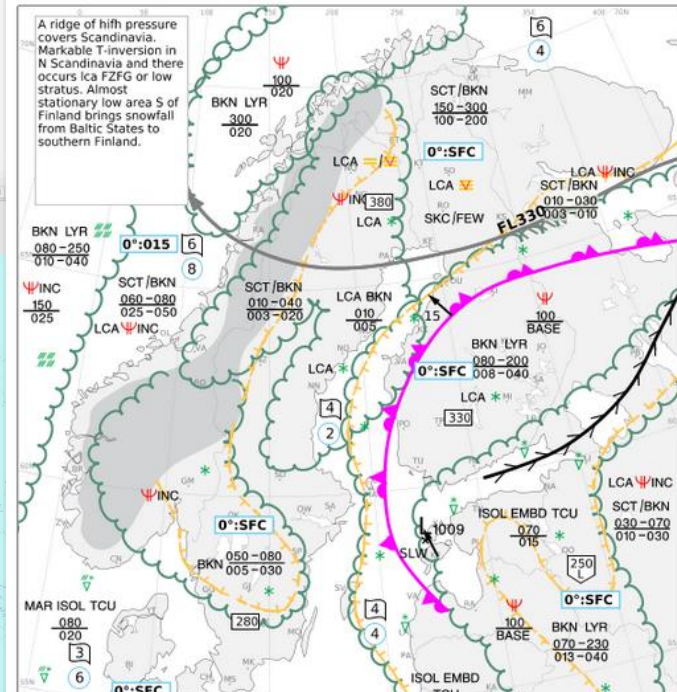

While seeing wind speed and vectors at 300 hPa in the background jet stream is easy to draw.

Publishing the product

- SmartMet Aviation automatically produces the necessary file formats and publishes the chart
- Different charts (different areas) can be published from the same data (e.g. Scandinavia and Northern Finland)
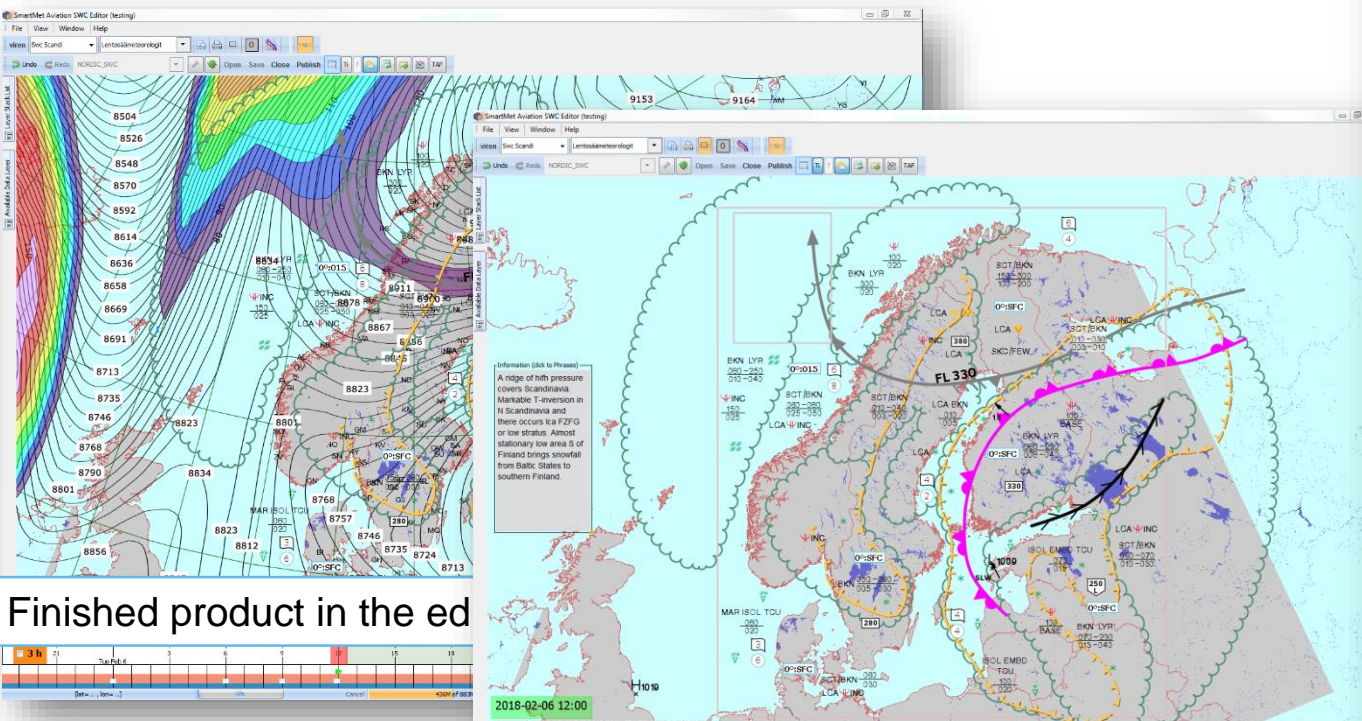- Corrections/amendments are easy to make and publish

Finished product in the ed[...]

Finished product without model data

The final product for customers

SmartMet Aviation (TAF/SIGMET)

- New tool for TAF/SIGMET/AIRMET

- MVP scheduled for 12/2018, production use 2019

- Installation and training in progress also for Estonia (ESTEA)

- SESAR SWIM compliant native output (IWXXM 2.1) as well as traditional TAC

SmartMet Aviation (TAF/SIGMET) – TAF features

o Auto sync with TAF order (will be connected to SMHI TAF Planner via API)

o Sharing of TAF responsibility between forecaster or regional offices

o TAF split into hourly data -> could be used in another product

o Visualization of observation and model data for TAF valid time

o Automatic distribution of finished TAF within send window

o Graphical editing of TAF from hourly data

o Native IWXXM output in addition to traditional TAC

SmartMet Aviation (TAF/SIGMET) – SIGMET features

○ Background fields to help choose SIGMET area

○ More advanced SIGMET coordination between neighbouring countries

○ Creation of VA-SIGMET from VAA message

FINNISH METEOROLOGICAL INSTITUTE

Aviation Message Editor

tamplentc | Finland | Lentosäämeteorologit |

07:38:19 UTC | 0 AutoMetar | 17 Ok | 3 Not O

Layer Stack List

Group | Owners

name | ...
STJ - Aerodromes (short) - na... | ✔
STJ - Base - namedlayers | ✔

Available Data Layer

Q.

Maps

Properties:

Event Manager Fra...

Event senders
eventtype:fi.fmi.mirri.core.event.da
component:Mirwa
component:Mirwa

Event subscribers
eventtype:fi.fmi.mirri.core.event.da
component:Mirwa
fi

Events
fi.fmi.mirri.core.plugin.PluginEven
servicetype:unknownspec#fi.fmi.r
servicetype:servicespec#fi.fmi.mir

0 event(s) in queue

Thu 15 Mar 2018 06:00 UTC

3 h | 9 | 12 | 15 | 18 | 21 | Thu Mar 15 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | Fri Mar 16 | 3

[lat= .. , lon= ..] | idle | Cancel | 121M of 282M | F5 | Background color | lar 15, 201 | 7:38:19 AM

TAF - monitoring

TAF – task list

TAF – editing view

SmartMet Web

- SmartMet Web is a lightweight web application for visualizing WMS layer products. Key features of the design are user friendliness, speed and the ability to define user specific settings that can be shared with others.

- Initially built to replace all kinds of internal websites for radar, satellite etc. data
    - Instead make them available as WMS layers
    - Ease maintenance burden

- Project is open source and it can be found from GitHub.

- GitHub: https://github.com/fmidev/metweb

- Contact: joonas.karjalainen@fmi.fi

SmartMet Web

- WMS product layers can be easily activated from the product menu
- Multiple products can be displayed on top of each other
- Map view allows basic functionality such as zooming, panning and animating in different time scales etc.
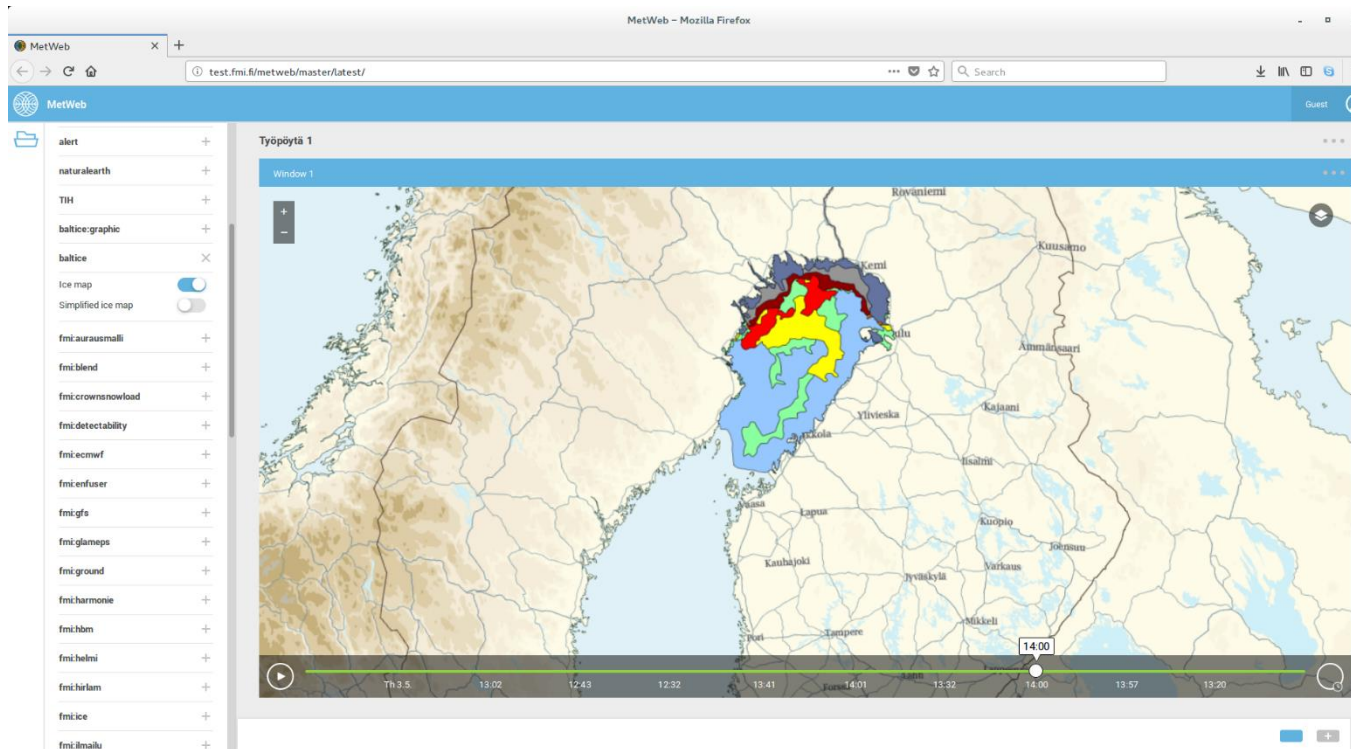
SmartMet Web

- Several customizable product windows can be added to a workspace
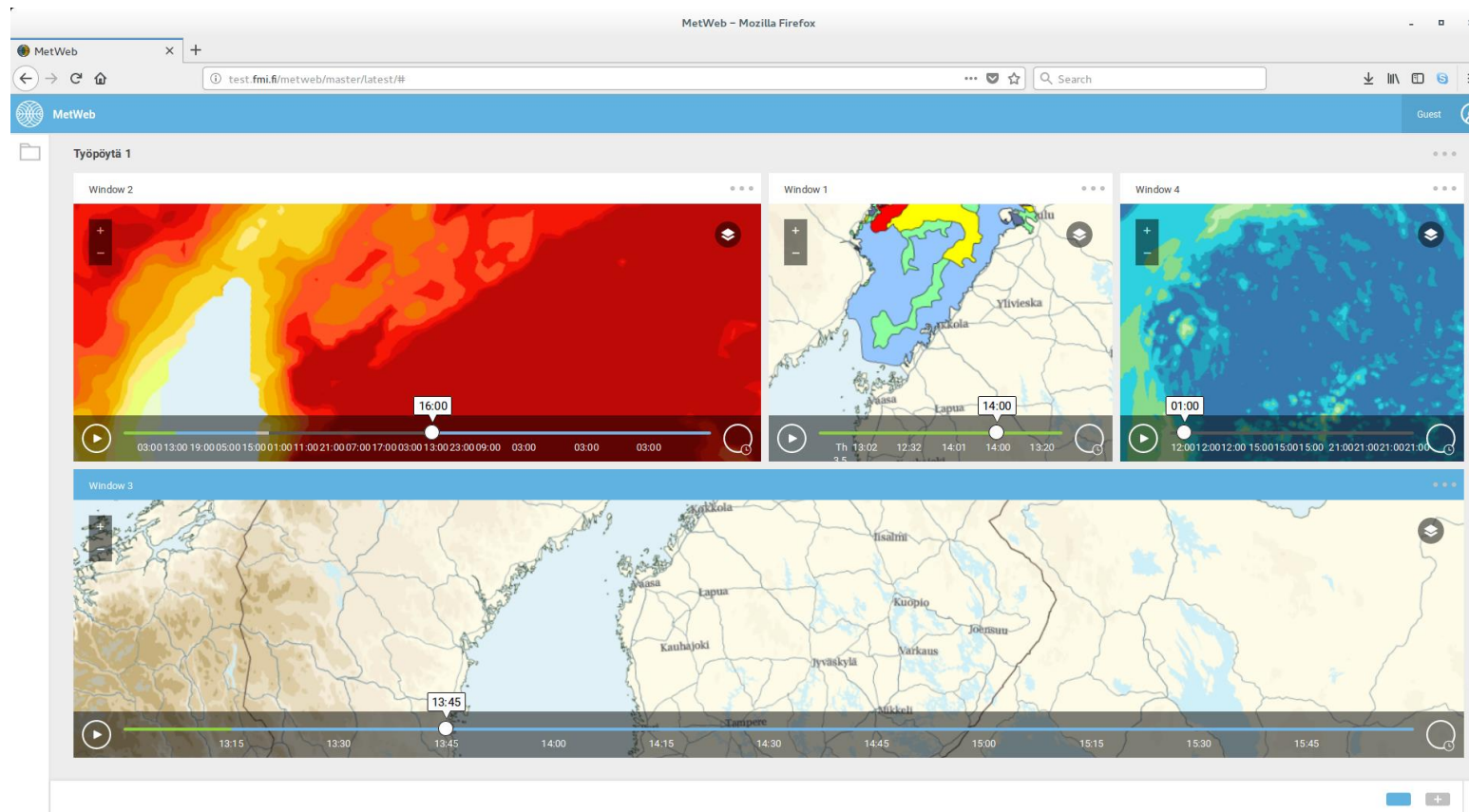- Multiple workspaces can be created and the configurations can be saved and shared between users

SmartMet Web

- Javascript
  - React – for building the user interface
  - Redux – manages state of application
  - Webpack – packaging
  - Babel – for compatibility with most browsers
- User API
  - NodeJS + Express + PostgreSQL + Atlassian Crowd (authentication)

FINNISH METEOROLOGICAL INSTITUTE

Development process

- Scrum as base development process
  - Development in 2-4 week sprints
  - Three roles: product owner, scrum master and development team
  - Three products: product backlog, sprint backlog, product release
  - Four events: sprint planning, daily meeting, sprint review, sprint retrospective
  - JIRA Agile used as issue management
- Key success factors
  - Active product owner and good/frequent communication with end users
  - Test periods before production use
- Code in internal Subversion or GitHUB
- Development method very well received within users
  - In fact we have requests to develop more/all projects in the same manner

FINNISH METEOROLOGICAL INSTITUTE