Royal Netherlands
Meteorological Institute
Ministry of Infrastructure
and Water Management

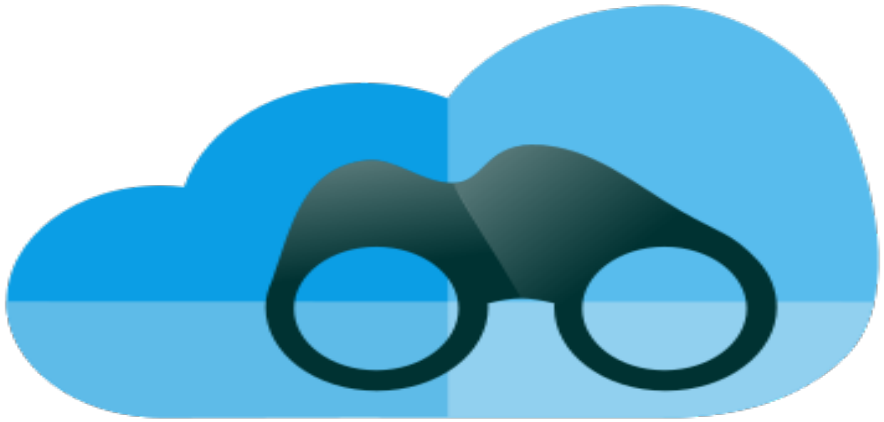
Developing GeoWeb, a browser-based meteorological workstation

EGOWS 2018

ECMWF (Reading)

2018-10-15

Ernst de Vreede (KNMI)



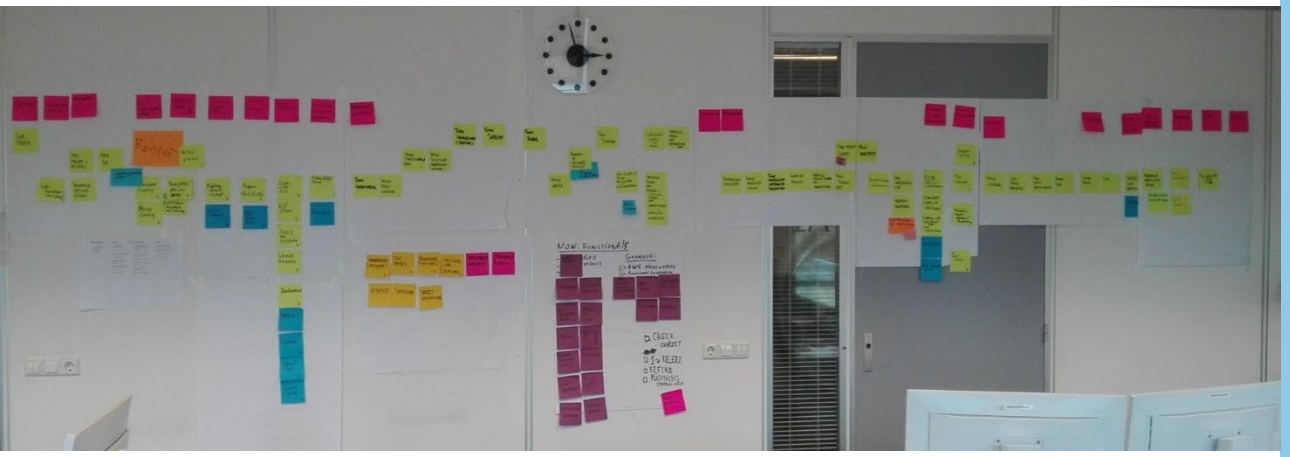
Overview

1. Start situation
2. Plans
3. Make or buy?
4. Pilot project
5. SESAR project
6. Current status
7. Outlook

Start situation

- Large set of diverse production tools
- > 12 screens per forecaster
- Legacy software in the weather room (MWS, radar, satellite displays etc)
- Legacy software in the producing pipelines (model data postprocessing, satellite products etc)
- Legacy meaning maintenance nightmare
- And of course big plans for the future!

Big plans



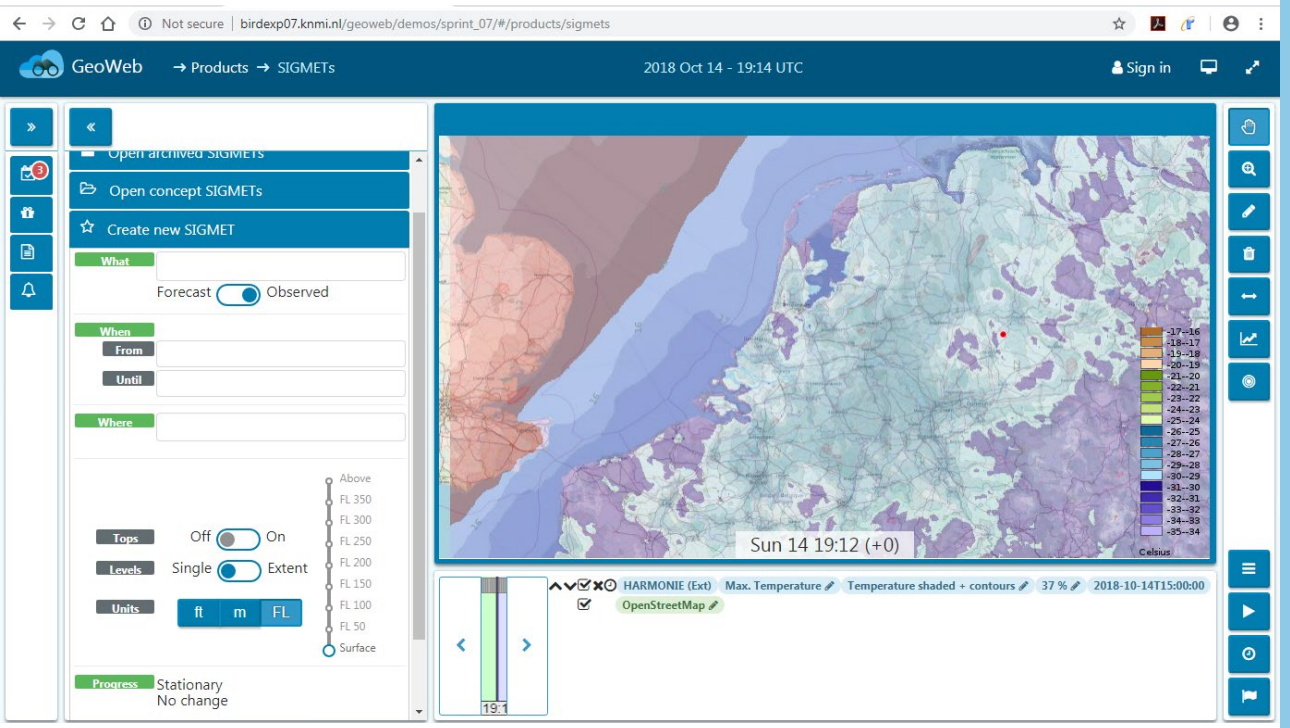
- Modernize production
- Early warning centre
- Homogenize hosting (stability, costs)
- Lower maintenance costs
- Easier development of SW
- Easier incorporation of new data (types) and research developments

First phase

Make or buy?

- **Plan for Q1/Q2 2017:**
- Parallel tracks:
  - Pilot for in-house development: Build a forecaster workstation based on ADAGUC web-services (WMS, WCS, WPS)
  - Market exploration
- Resulted in a decision for an in-house development project

Pilot project

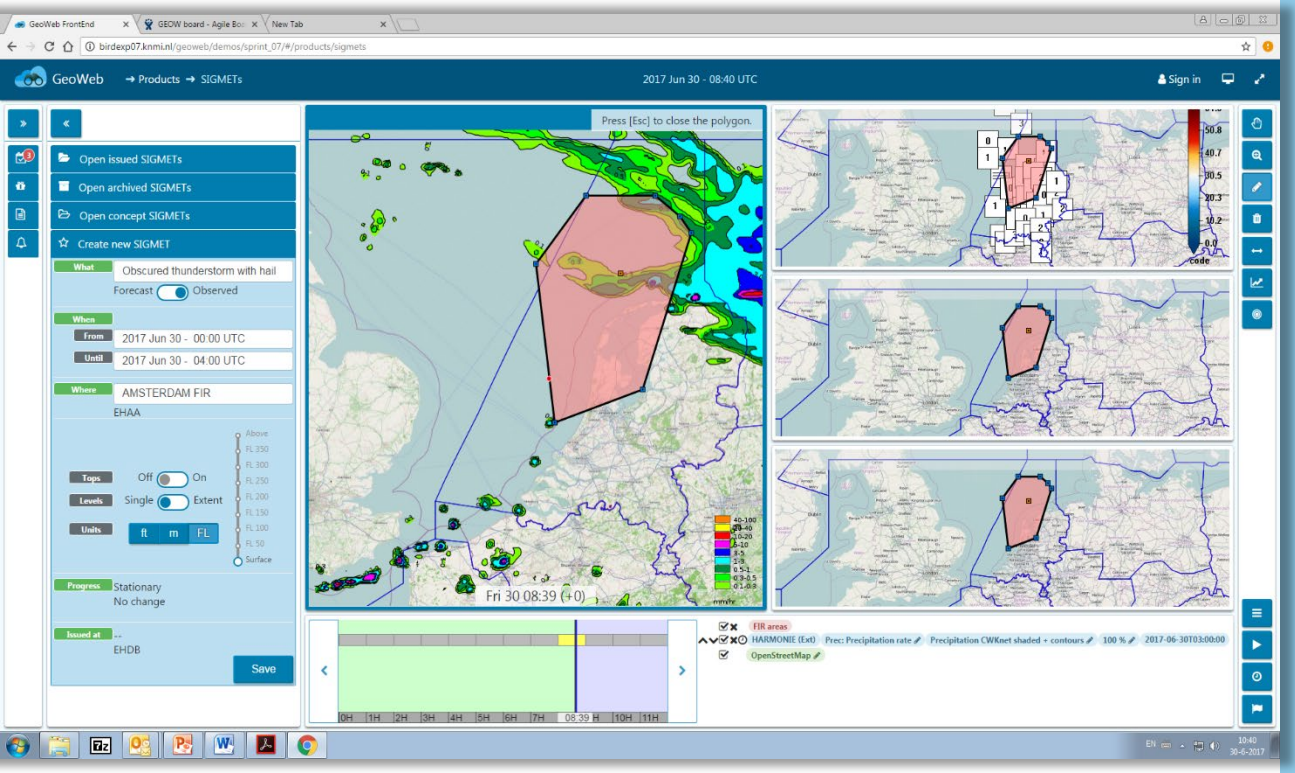


- Proof of concept showing a number of features:
  - Visualise a variety of data sources
  - Product generation (SIGMET as a proof-of-concept for SEASR PCP EHAM)
  - Triggering on data events
  - Agile development with a small scrum team in two-week sprints
- Result: a working system in May 2017 for evaluation
- React front-end, Java back-end. ADAGUC for visualization (WMS)

Sesar PCP EHAM

- September 2017:
- Start of SESAR PCP EHAM:
  - Visualising relevant information for production of TAF, SIGMET, AIRMET
  - Production tools for TAF/SIGMET/AIRMET in IWXXM format
- IWXXM code development in cooperation with FMI.
- Agile development team with 4 developers, 3 forecasters as product owners, a scrum master, a systems manager.

Where we are now

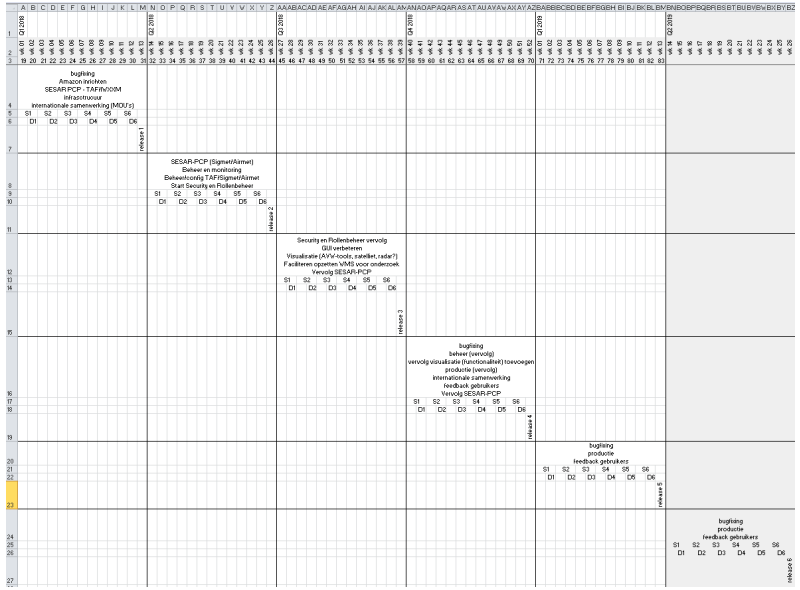


- Basic visualisation of HARMONIE, radar, satellite (composites), observations
- TAF production: in testing with LVNL
- SIGMET production: starting tests with LVNL
- AIRMET: up next

Delays

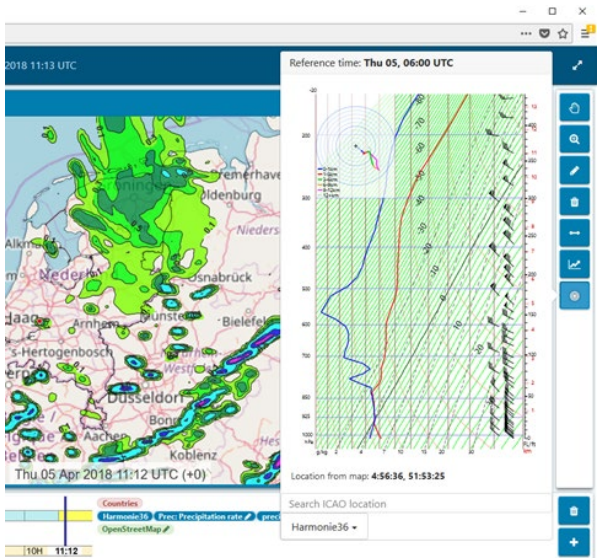
- Going from proof-of-concept to full functionality
- One developer left the team
- IWXXM standards are complex
- Hosting: shift from in-house to AWS cloud and soon to KNMI general AWS environment

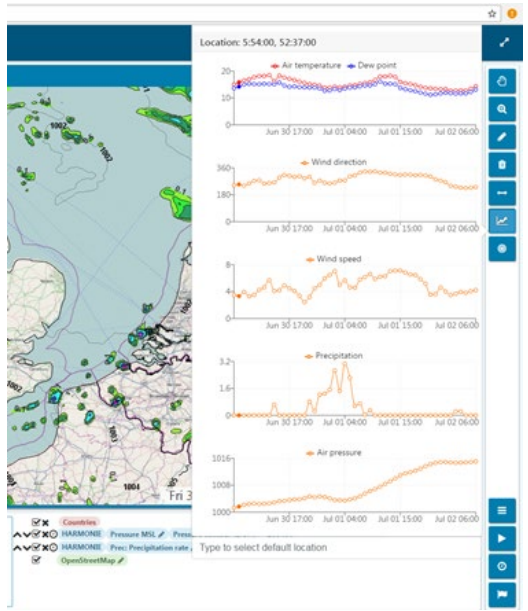
Road map



- Q4: finish AIRMET, large scale testing of IWXXM products with LVNL
- Q1 ‘19: operational GeoWeb for TAF/SIGMET/AIRMET production
  - Access control
  - Database for product storage
  - Automated testing/deployment
  - High availability
- Q2 ‘19: radar and satellite (sub)application
- … (Agile!!!)

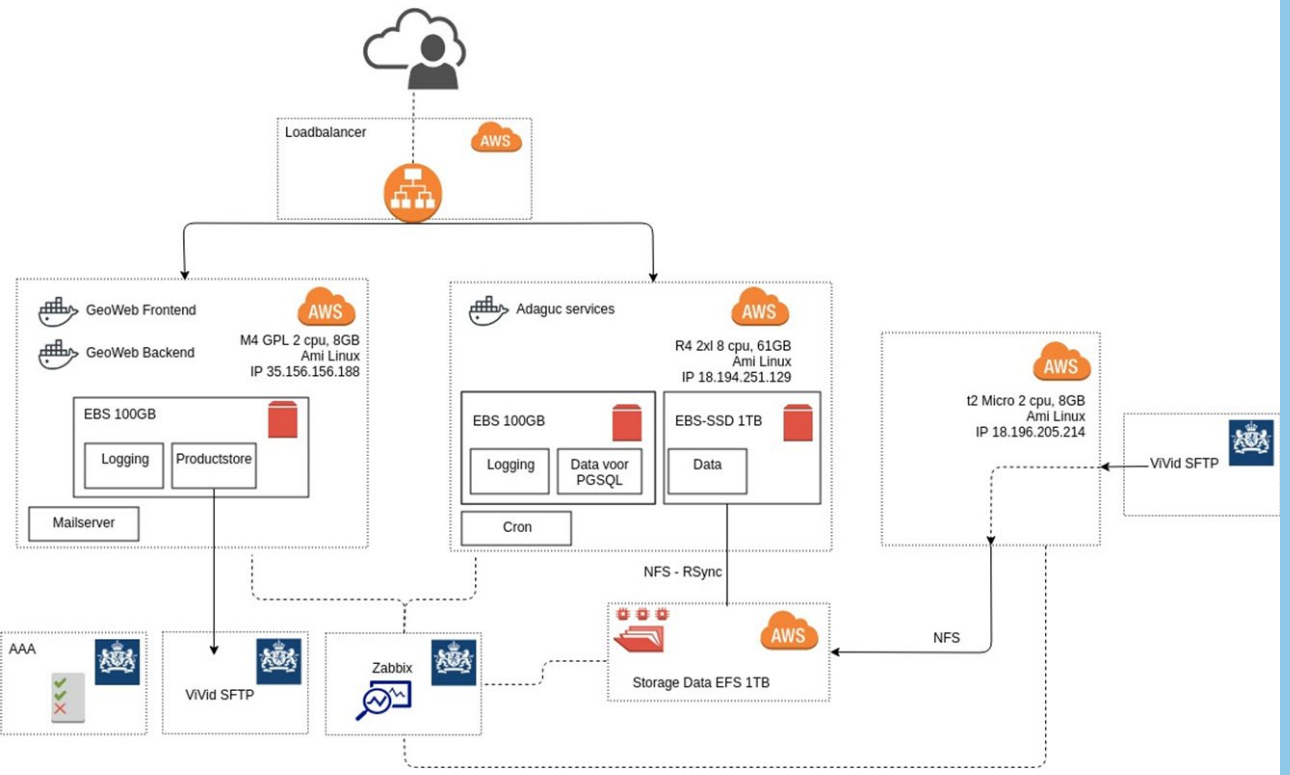
System goals





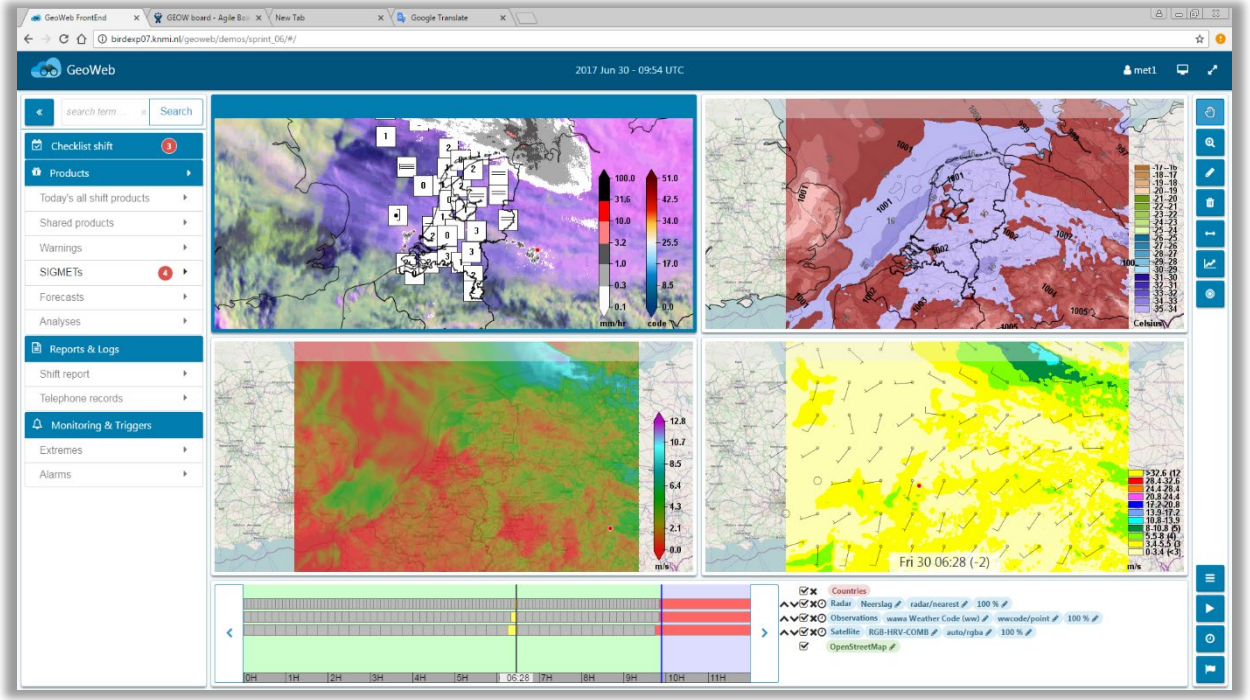
- Combined display of diverse data: maps and graphs
- Flexible and easy to extend
- Production tools (TAF, SIGWX, weather map, etc.)
- Open for external services (research products)
- Interactive data processing tools, like model layer calculations.

System architecture



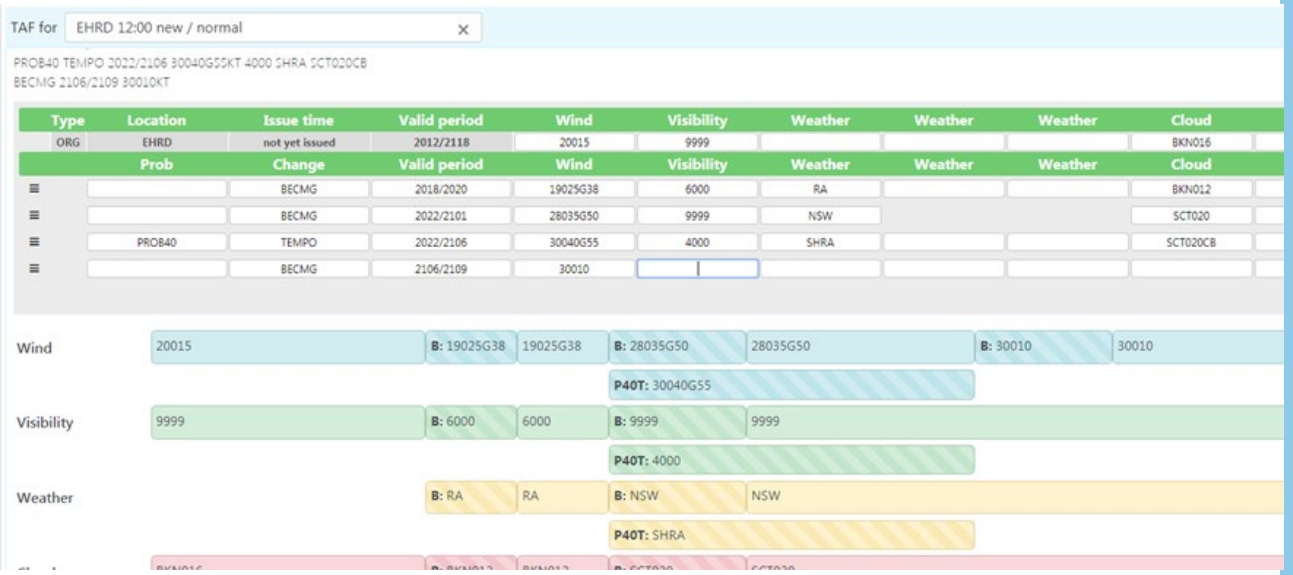
- Front-end browser application: React with ADAGUC viewer component
- Back-end server: Java Spring server providing product services (store, retrieve, generate IWXXM and TAC) and general services like login, data catalog etc.
- Visualisation services: ADAGUC service instances providing WMS (and WCS) services on NetCDF datasets

Front-end



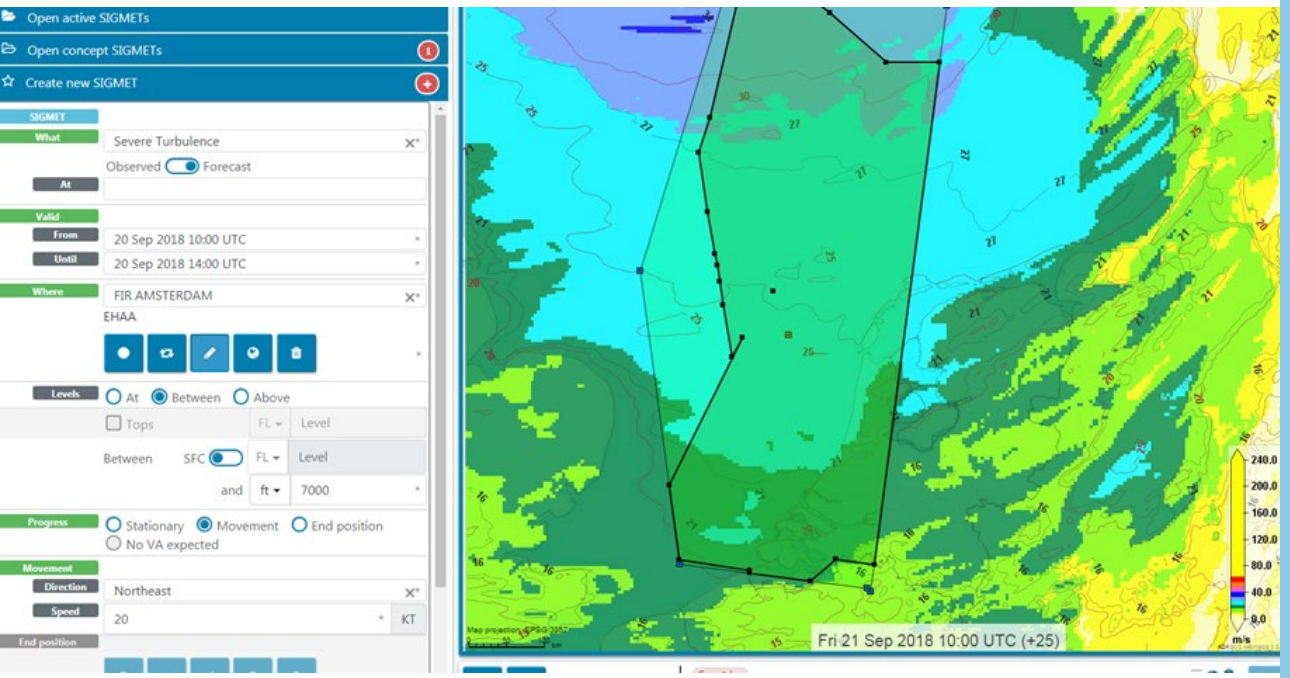
- Map viewer: modularized ADAGUC WMS viewer
- ReactJS with Redux state
- Progtemp display
- Time series display

TAF Production



- Forecasted entered “like TAC”
- Story board display
- Immediate validation of input against set of rules (ICAO/KNMI) by means of JSON schema validation
- Life cycle handling (concept, publish, amend, correct, cancel)
- No IWXXM collect functionality

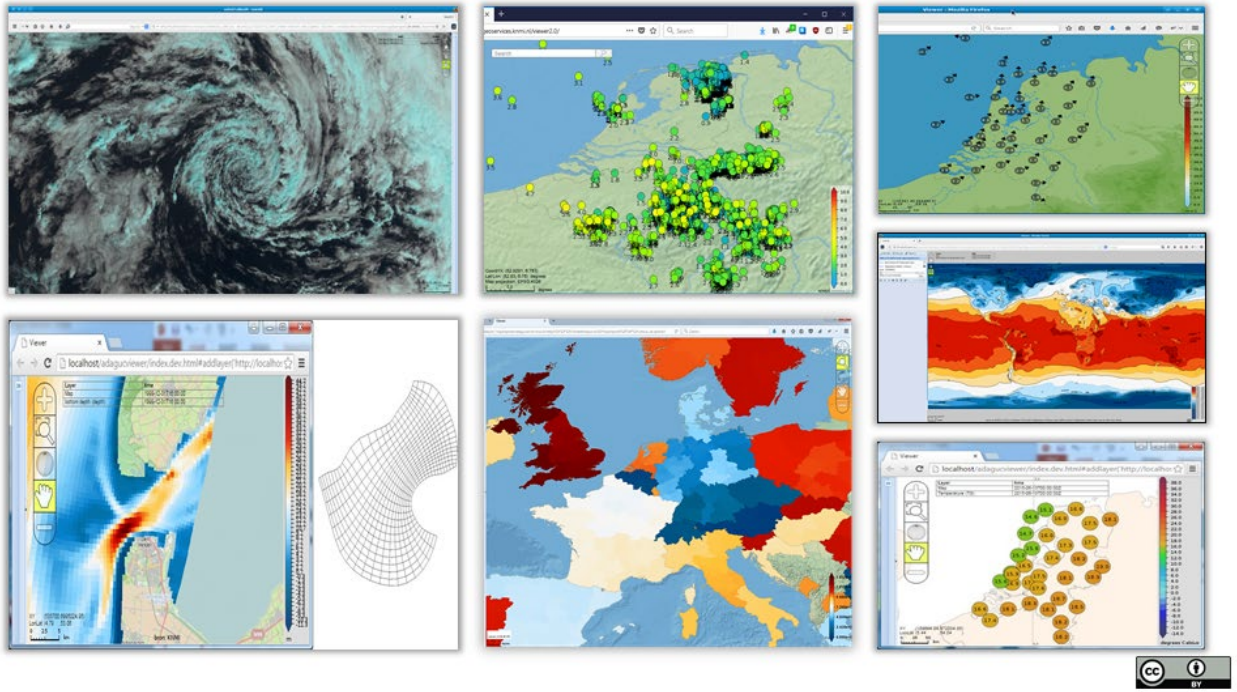
SIGMET production



- Forecast phenomenon entered in form
- Geographical extent specified by drawing on map
- IWXXM version always gets polygon–style geometries, but if possible special TAC clauses are generated for TAC version (“NORTH OF ..”)
- Life cycle handling (concept, publish, numbering, cancel)

Visualisation

- HDF5, NetCDF, PNG and GeoJSON are currently supported by ADAGUC



- ADAGUC server – in-house developed WMS/WCS service for NetCDF data
- Fast, versatile
- http://adaguc.knmi.nl
- Open-source
- ADAGUC workshop@KNMI in Nov 2018

Cooperation

- Components are dockerized
- Deployment as independent of hosting provider as possible for wide applicability
- Open source license conditions are being determined
- Should be deployable anywhere
- Opportunities for cooperation!

Thank you.

- Demo on Tuesday

- Links:
- ADAGUC:
- https://github.com/KNMI/adaguc-services
- https://github.com/KNMI/adaguc-viewer
- ADAGUC Workshop:
- https://dev.knmi.nl/projects/adagucserver/wiki/Workshop_2018
- GeoWeb:
- https://github.com/KNMI/GeoWeb-FrontEnd
- https://github.com/KNMI/GeoWeb-BackEnd
- https://github.com/KNMI/GeoWeb-Aviation-MessageConverter