



Royal Netherlands  
Meteorological Institute  
*Ministry of Infrastructure  
and Water Management*

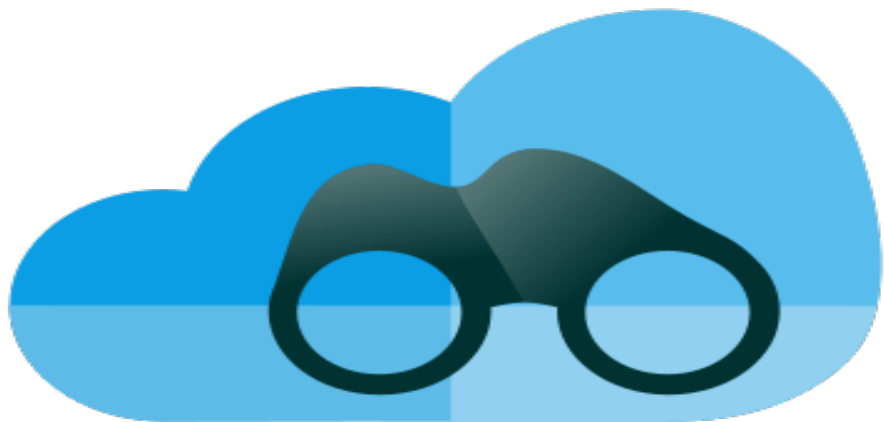
## Developing GeoWeb, a browser-based meteorological workstation

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



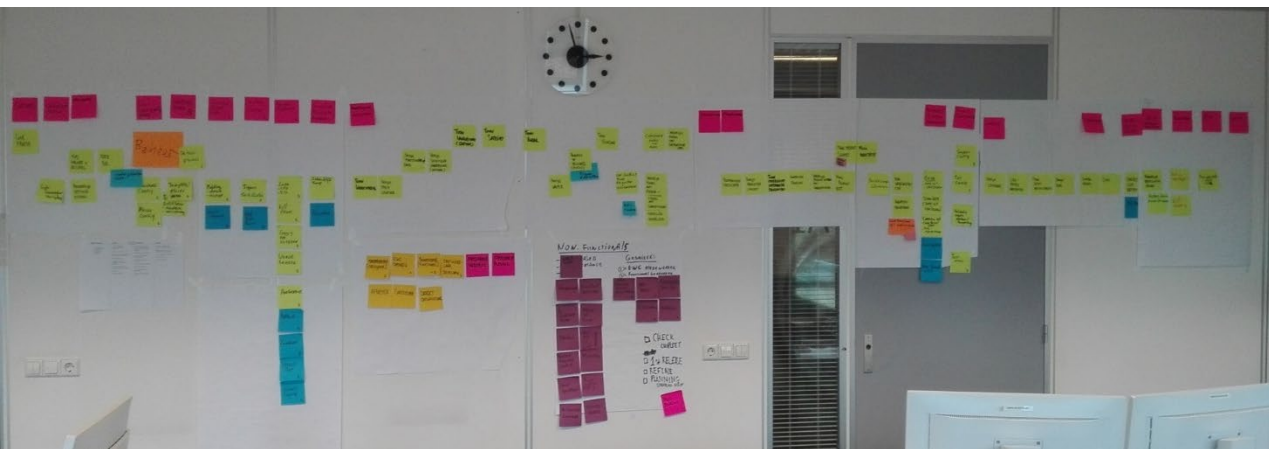
# Start situation



- > 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

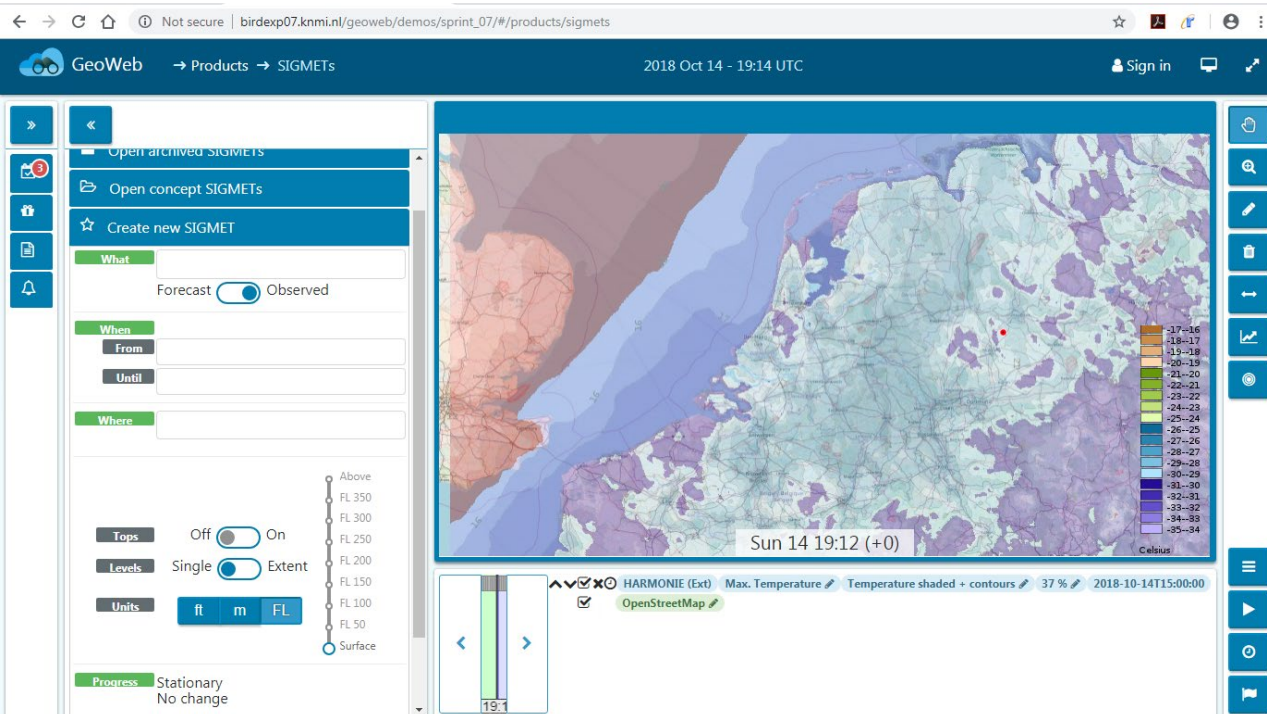
## *Make or buy?*

- > **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)



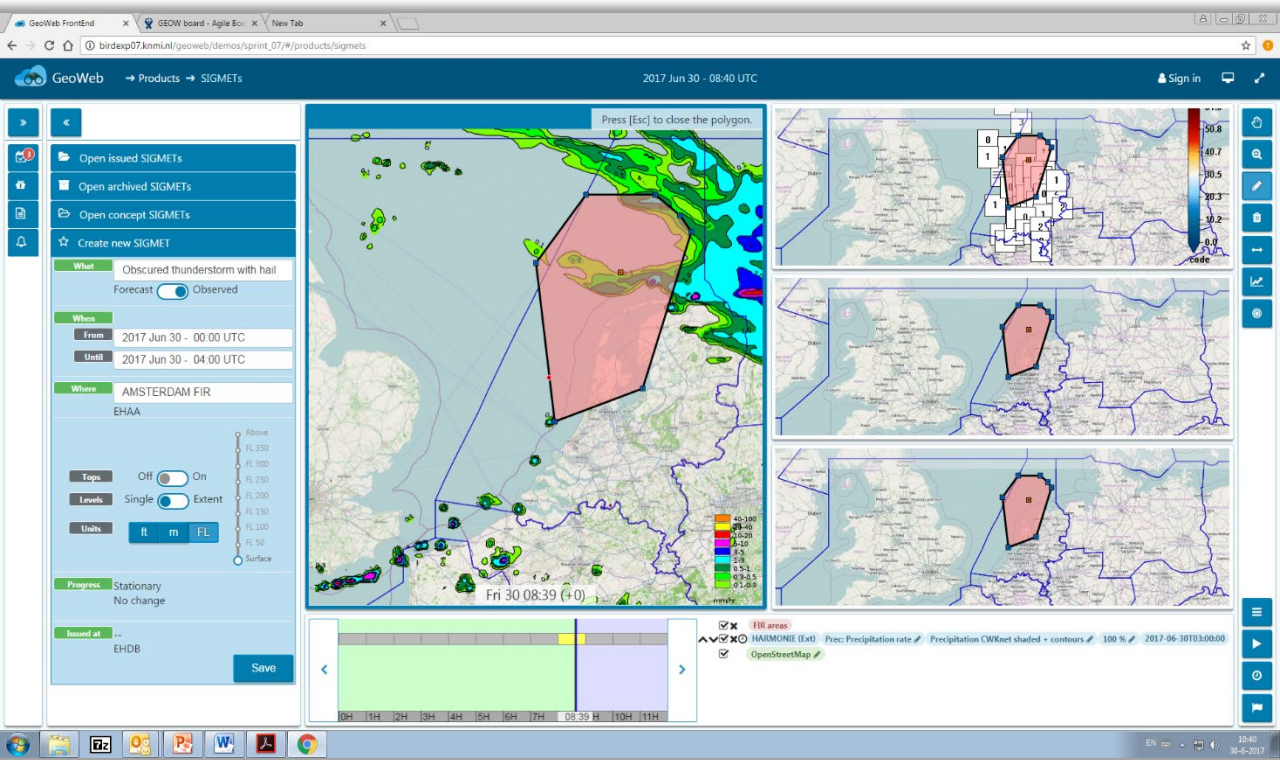
# Sesar PCP EHAM

- › 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.

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```



# 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

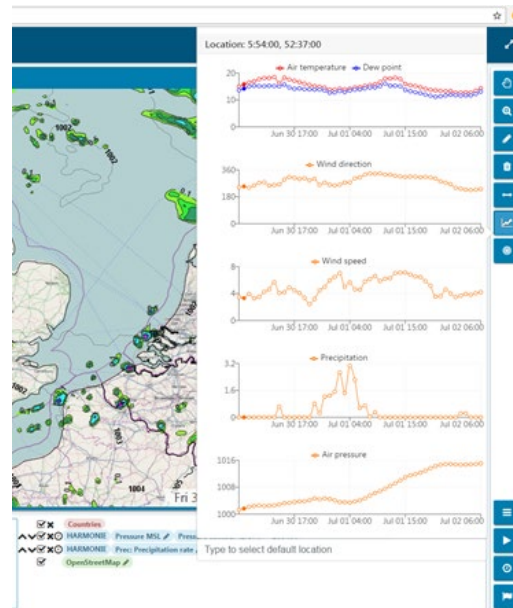
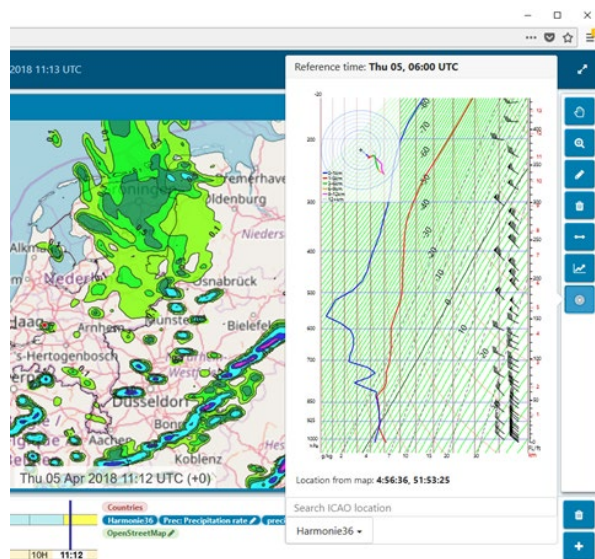


- › Going from proof-of-concept to full functionality
- › One developer left the team
- › IWXXM standards are complex
- › Hosting: shift from in-house to AWS cloud and soon to KNMI general AWS environment



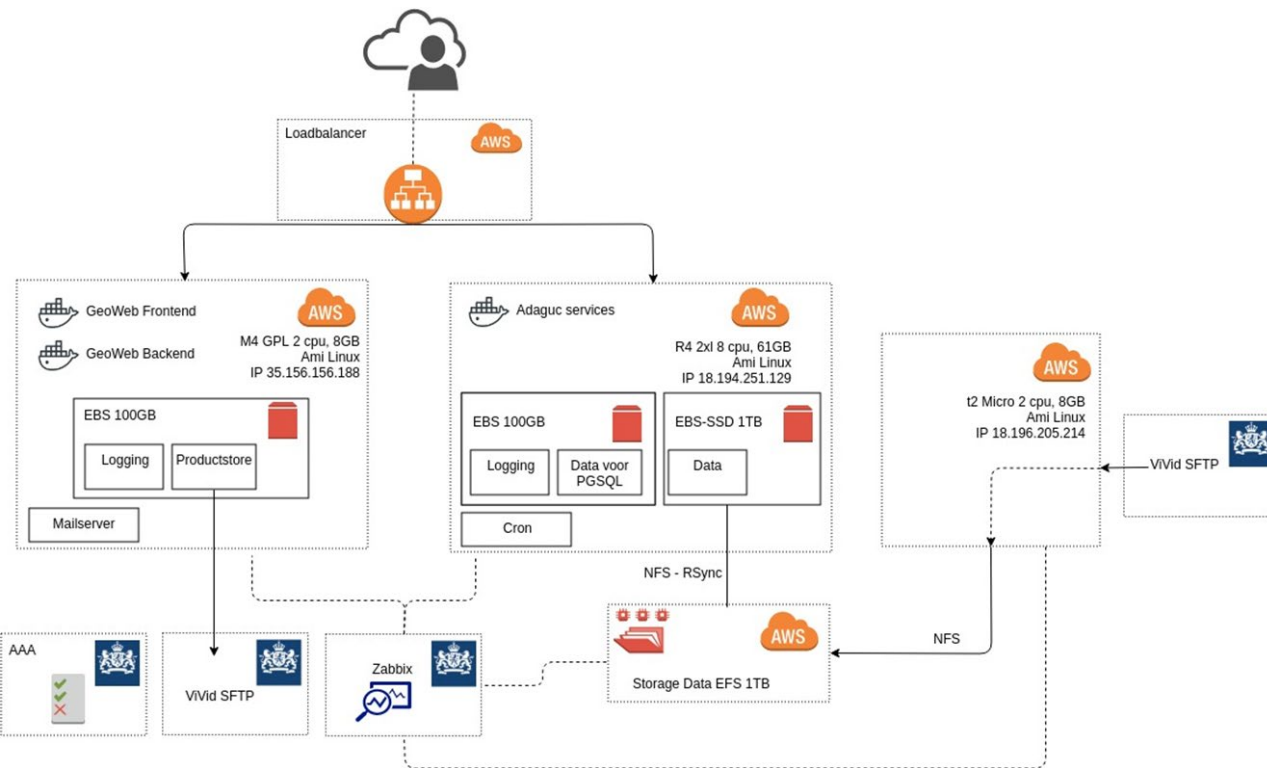
# System goals

- › 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



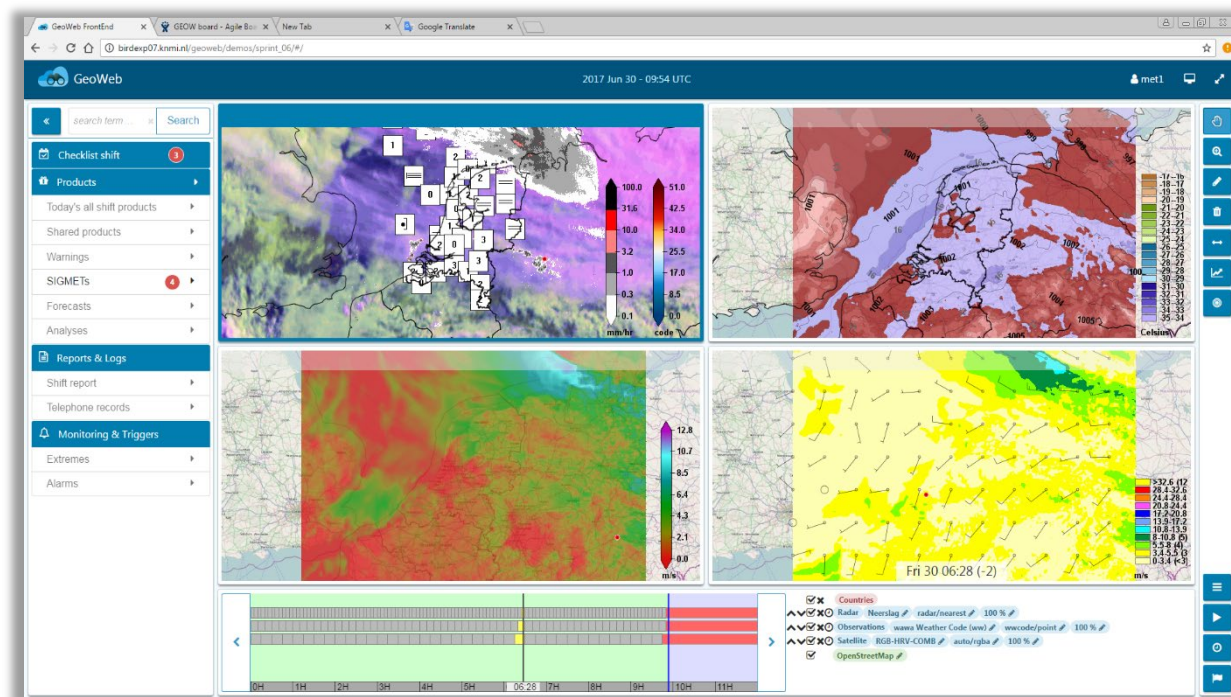
- > Front-end browser application: React with ADAGUC viewer component
- > Back-end server: Java Spring server providing product services (store, retrieve, generate IWXXM and TAC) and general services like login, data catalog etc.
- > Visualisation services: ADAGUC service instances providing WMS (and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

TAF for EHRD 12:00 new / normal

PROB40 TEMPO 2022/2106 30040G55KT 4000 SHRA SCT020CB  
BECMG 2106/2109 30010KT

Type	Location	Issue time	Valid period	Wind	Visibility	Weather	Weather	Weather	Cloud
ORG	EHRD	not yet issued	2012/2118	20015	9999				BKN016
Prob	Change	Valid period	Wind	Visibility	Weather	Weather	Weather	Cloud	
	BECMG	2018/2020	19025G38	6000	RA			BKN012	
	BECMG	2022/2101	28035G50	9999	NSW			SCT020	
PROB40	TEMPO	2022/2106	30040G55	4000	SHRA			SCT020CB	
	BECMG	2106/2109	30010						

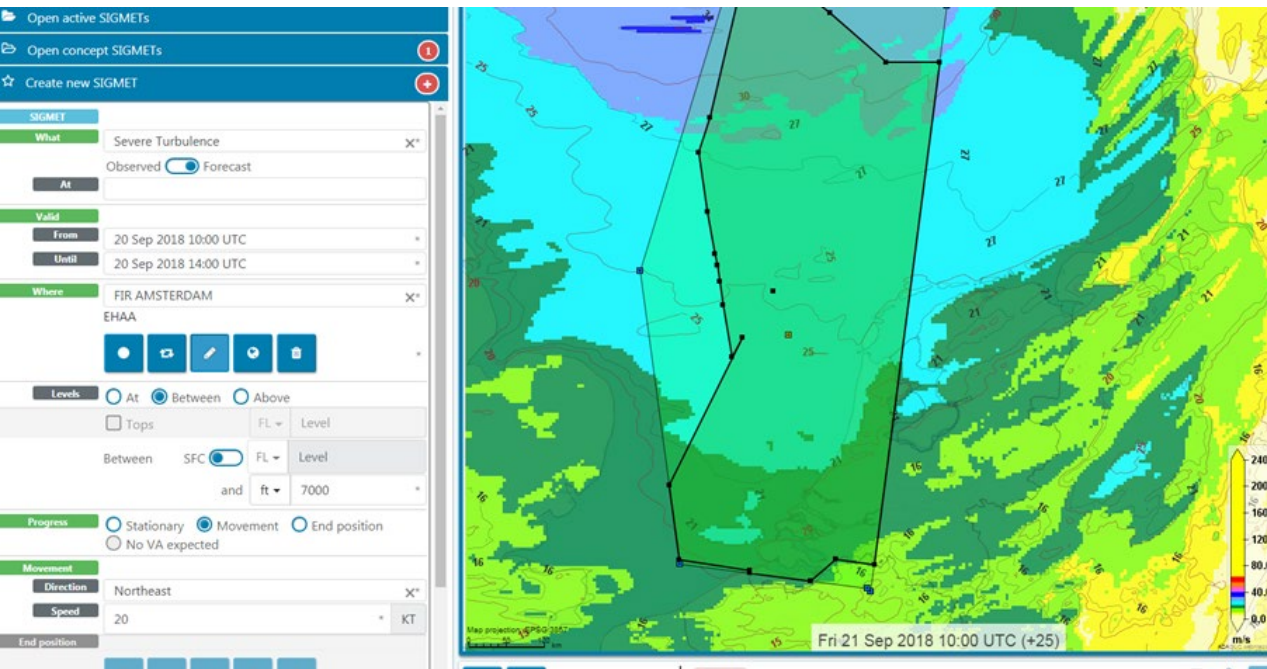
Wind: 20015, B: 19025G38, 19025G38, B: 28035G50, 28035G50, B: 30010, 30010, P40T: 30040G55

Visibility: 9999, B: 6000, 6000, B: 9999, 9999, P40T: 4000

Weather: B: RA, RA, B: NSW, NSW, P40T: SHRA



# SIGMET production



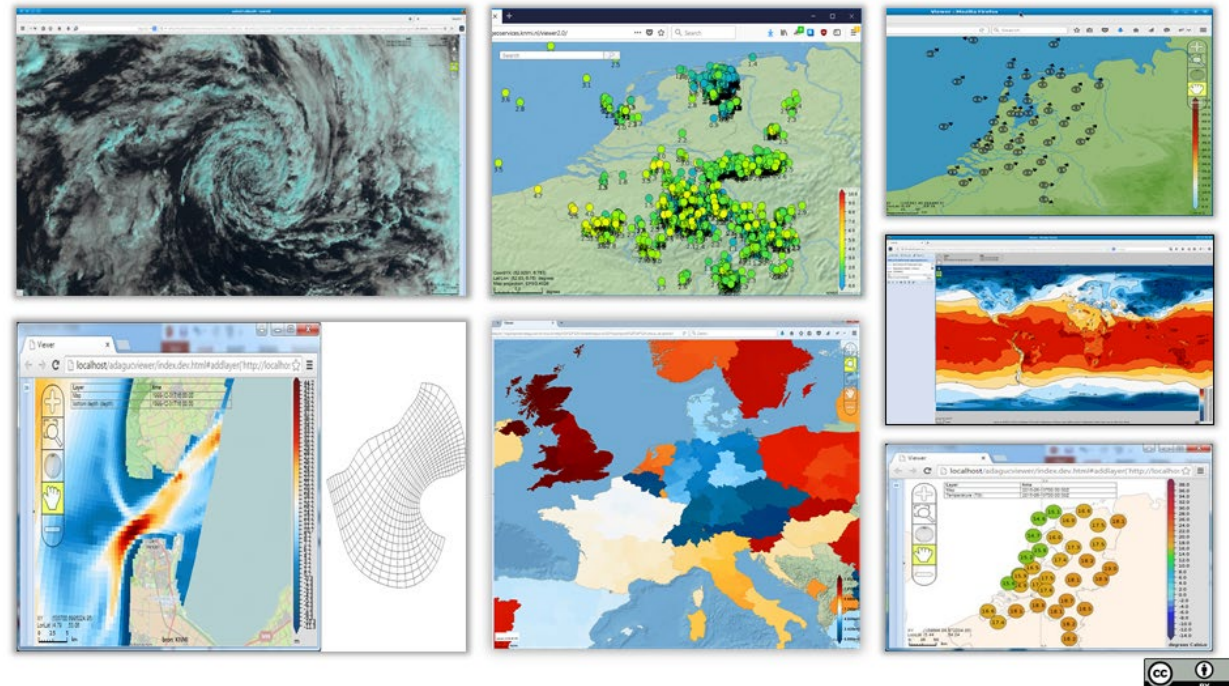
- › Forecast phenomenon entered in form
- › Geographical extent specified by drawing on map
- › IWXXM version always gets polygon-style geometries, but if possible special TAC clauses are generated for TAC version (“NORTH OF ..”)
- › Life cycle handling (concept, publish, numbering, cancel)





# 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.



KNMI GeoWeb



- > 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](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>