



ADAGUC Open source visualization utilized in the KNMI GeoWeb project

Maarten Plieger, Ernst de Vreede, Maarten Terpstra, Wim van Moosel, and John van de Vegte
Royal Netherlands Meteorological Institute (KNMI), R&D Observations and Data Technology, De Bilt, Netherlands
(maarten.plieger@knmi.nl)

ADAGUC is an Open Source geographical information system to visualize scientific data formats like NetCDF, HDF5 and GeoJSON over the web. The software consists of a server-side C++ application and a client-side JavaScript application. ADAGUC uses OGC Web Mapping and Web Coverage standards for data dissemination and OGC Web Processing for data analytics. Web clients like GoogleMaps, OpenLayers and Leaflet are supported and can directly use the exposed webservices. ADAGUC supports any number of dimensions (e.g. time, elevation, ensemble member, threshold, reference times) and can update and aggregate data on an operational webservice. ADAGUC is used in numerous projects like KNMI GeoWeb, KNMI Data Centre, IS-ENES Climate4impact, CLIPC and C3S-34a lot 2 Magic.

ADAGUC-server can visualize data from other webservices offered via OPeNDAP. This enables direct and interactive visualization of an enormous number of datasets over the web, including climate and observation data offered in the distributed Earth System Grid Federation (ESGF). Graphical styling of data is done by utilizing the Climate and Forecast' s standard_name and units. OGC Web Coverage Services (WCS) are available and can be used for data re-projection, spatial sub setting and conversion to other formats. Querying of OPeNDAP services is done efficiently; multiple requests are aggregated into one and only the domain of interest is requested. This allows for easy, quick and interactive visualization of OPeNDAP enabled datasets. ADAGUC has a number of data converters and data post processors to support various data conventions. Supported file formats are "true color netCDF" for satellite imagery, structured grids, curvilinear grids, satellite swaths, point observations, point timeseries and polygons stored in GeoJSON. Datasets consisting of several netCDF files can be aggregated into a single dataset and are offered over WMS, WCS and OPeNDAP. ADAGUC can be used as a component for Web Processing Services to subset data and convert GeoJSON to grids. Latest developments include tiling of huge satellite imagery like HIMAWARI and NOAA GOES-16 to provide interactive zooming and panning while running an animation loop.

In the KNMI GeoWeb project we are building a new and open web based meteorological working station to support operational weather forecasting. ADAGUC is used to provide real-time visualization and animation loops of satellite imagery in combination with observations from automated weather stations and predictions from weather models. Areas of interest can be indicated by drawing polygons on a map. Throughs and ridges can be indicated by drawing a line. The frontend is built using ReactJS, a JavaScript library for building user interfaces and integrates ADAGUC-viewer as a component. The GeoWeb project is hosted on GitHub and includes unit tests, continuous integration and docker containers to ensure high code quality which can run anywhere. Development is done using Agile methodology and deployment of the system is done frequently in an operational environment using Docker. GeoWeb supports meteorological product generation like TAF and SIGMET and supports IWXXM. We are open for collaboration to use, extend or join our project.

Results and lessons learned will be presented at the conference.