

DIVA and OceanBrowser

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Data-Interpolating Variational Analysis

- Diva: generate **climatologies** from in situ observations
- Diva releases: 4.6.7 (October 2014), 4.6.8 (December 2014), 4.6.9 (March 2015), **4.6.10** (June 2015)
- Improve interoperability with **NetCDF**
- Possibility of using different **reference field** for each season
- Data binning much faster
- **Time series** and weighting option

Near future...

- ✓ Creation of very **large** 4D **NetCDF** files ($> 2\text{Go}$)
- ✓ DivacutNCDF : a tool to **cut the domain** of your final NetCDF
- ✓ Available in **October 2015**
- ✓ DIVA Workshop next month



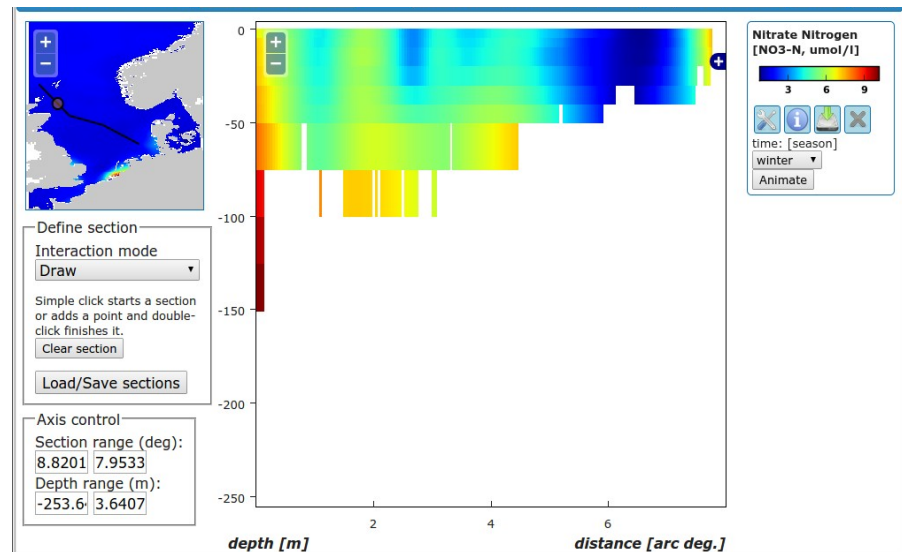
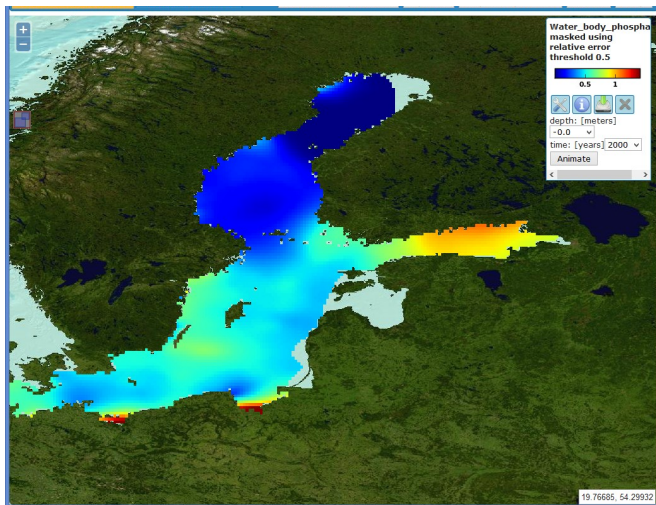
... and more distant future

- Extraction of data from the sea bottom
- Correlated observational errors
- Better file structures (input and driver better separated from command) in 4D loops
- Automatic selection of solver (parallel, serial, iterative) depending on the problem type and size

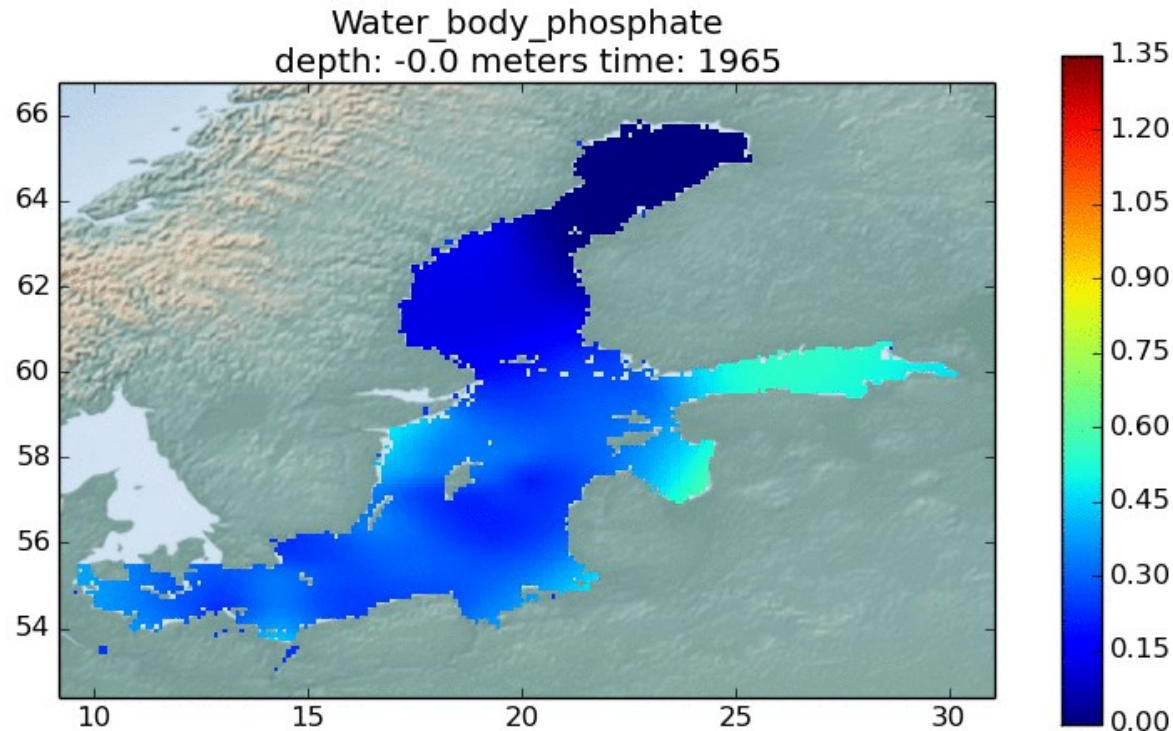
OceanBrowser

- Web-interface to **visualize gridded data** sets in NetCDF
 - Horizontal and vertical sections
 - Scalar and vector fields

<http://oceanbrowser.net/web-vis/>



Export animations

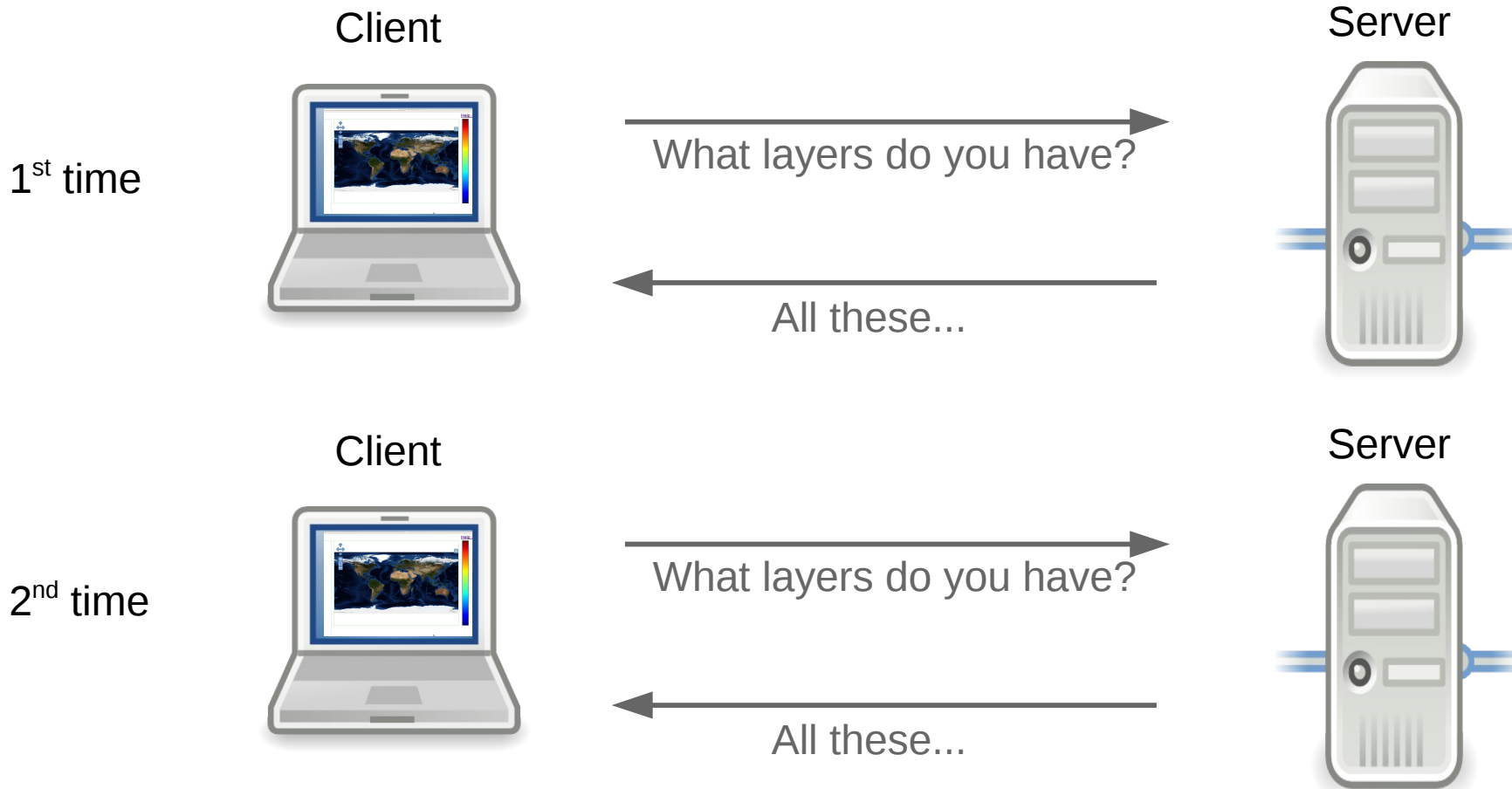


- Winter distribution of phosphate (produced by SMHI)
- Centred 10-year average of all winter months
- OceanBrowser: export of animation by choosing MP4 or WebM animation.

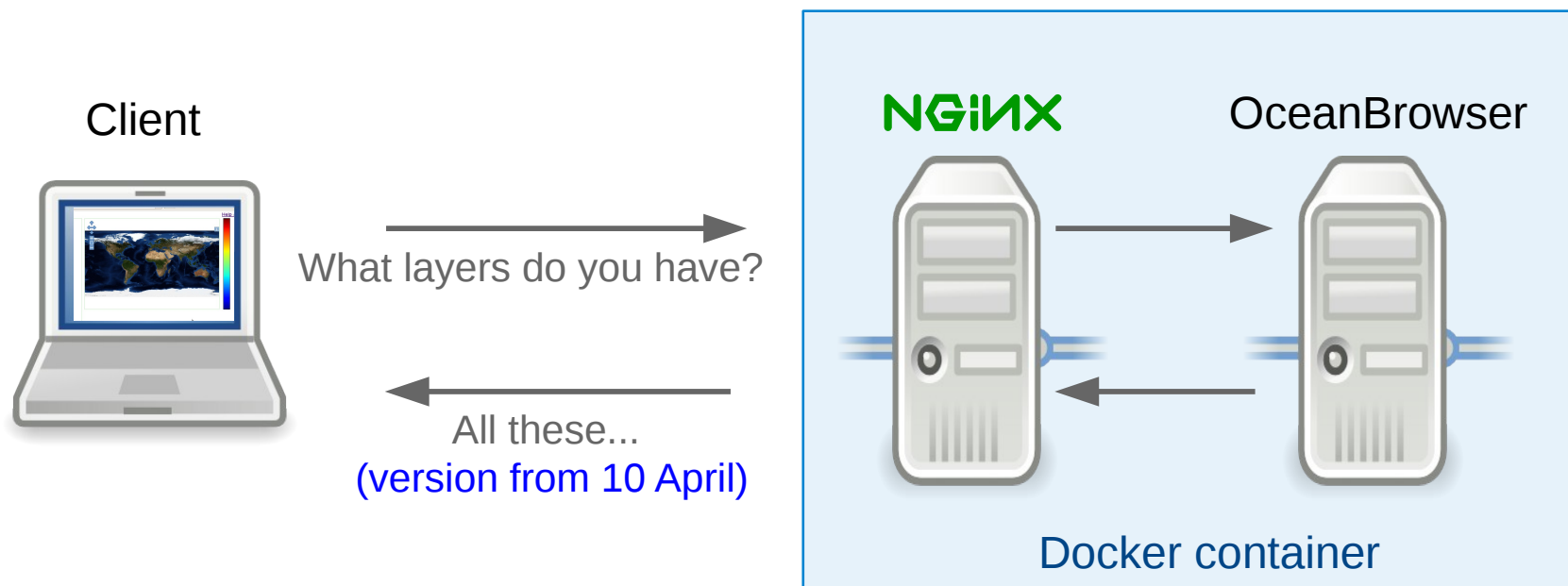
Optimization

- The web-browser request first the list of layers
- This XML file tends to be quite large (even compressed)
- This list changes only infrequently
- But when it does, the users should see the updated list of layers
- Using cache control header to improve speed

Without caching

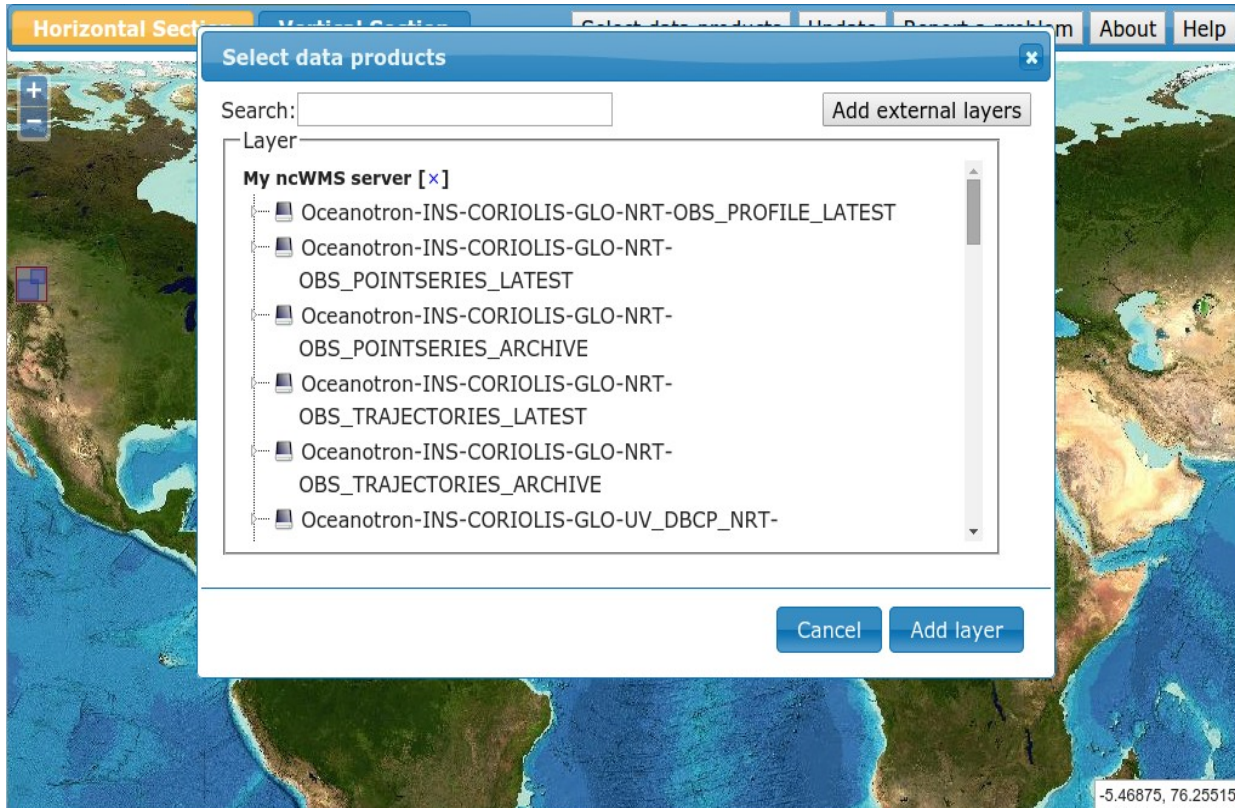


With caching



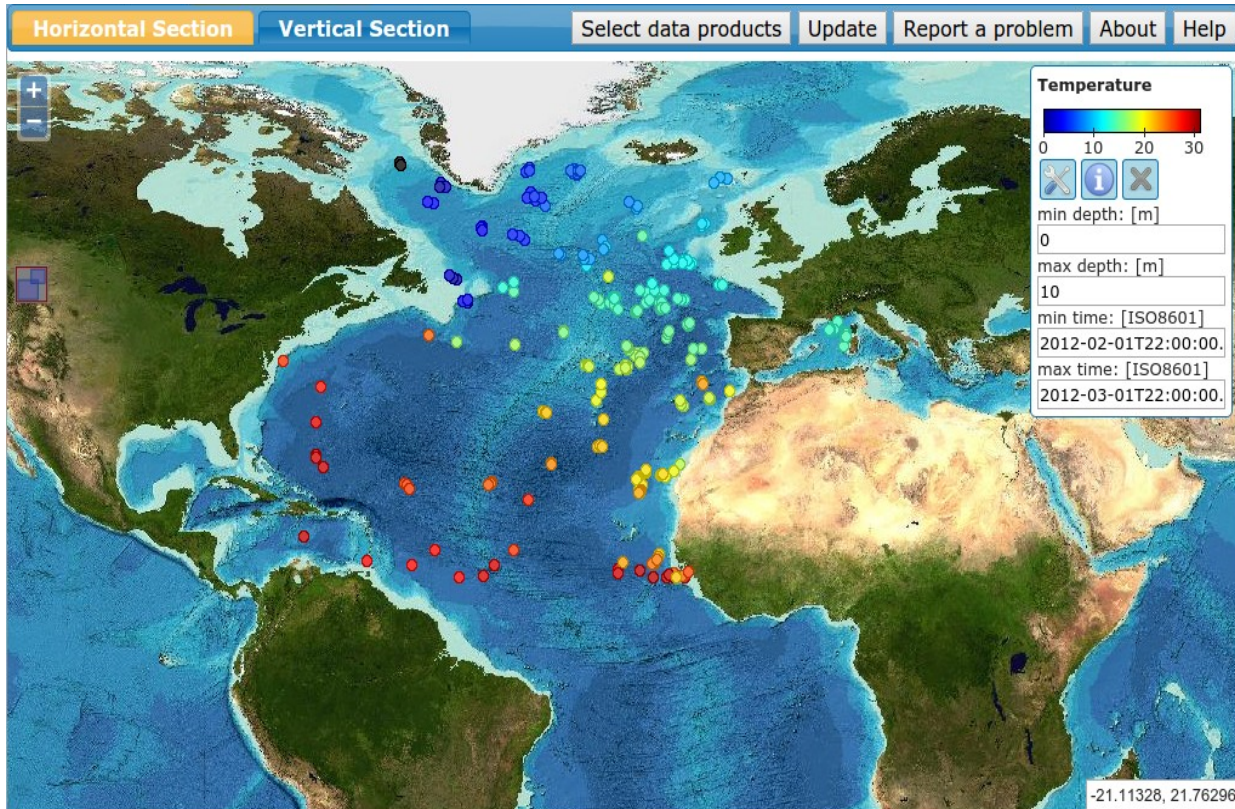
- Two levels of caches:
 - At the web-browser
 - Cachine server (NGINX)
- Cache revalidated based on time-stamp
- Revaliation at every request (unless validation was 5 seconds ago)
- Risk of using outdated information is minimized

Connecting OceanBrowser and Oceanotron



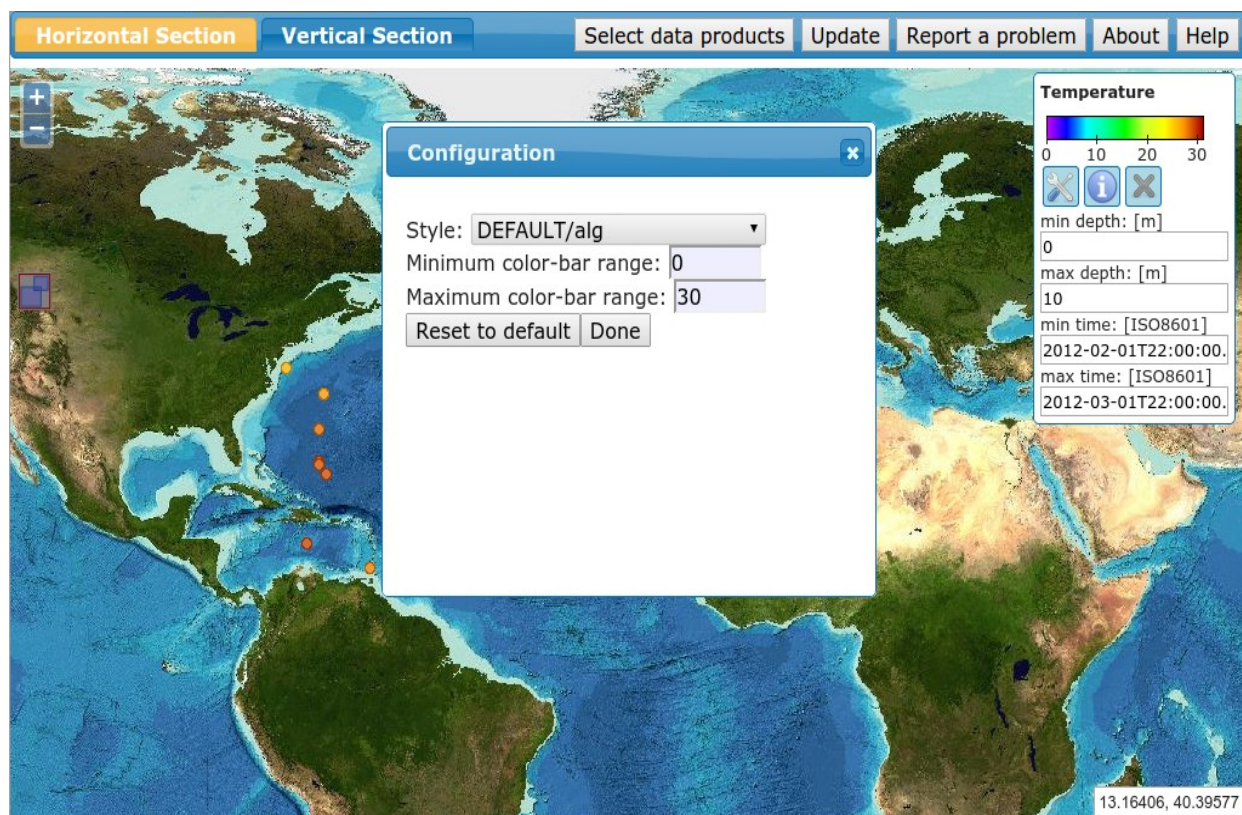
- Add external layers and choose Oceanotron
- WMS request:
 - GetCapabilities
 - Inventory of available layers on Oceanotron
- SeaDataNet layers, example:
 - Oceanotron-SDN_2014-03_TS_Atlantic_QC_done_v1.1

Location of observations



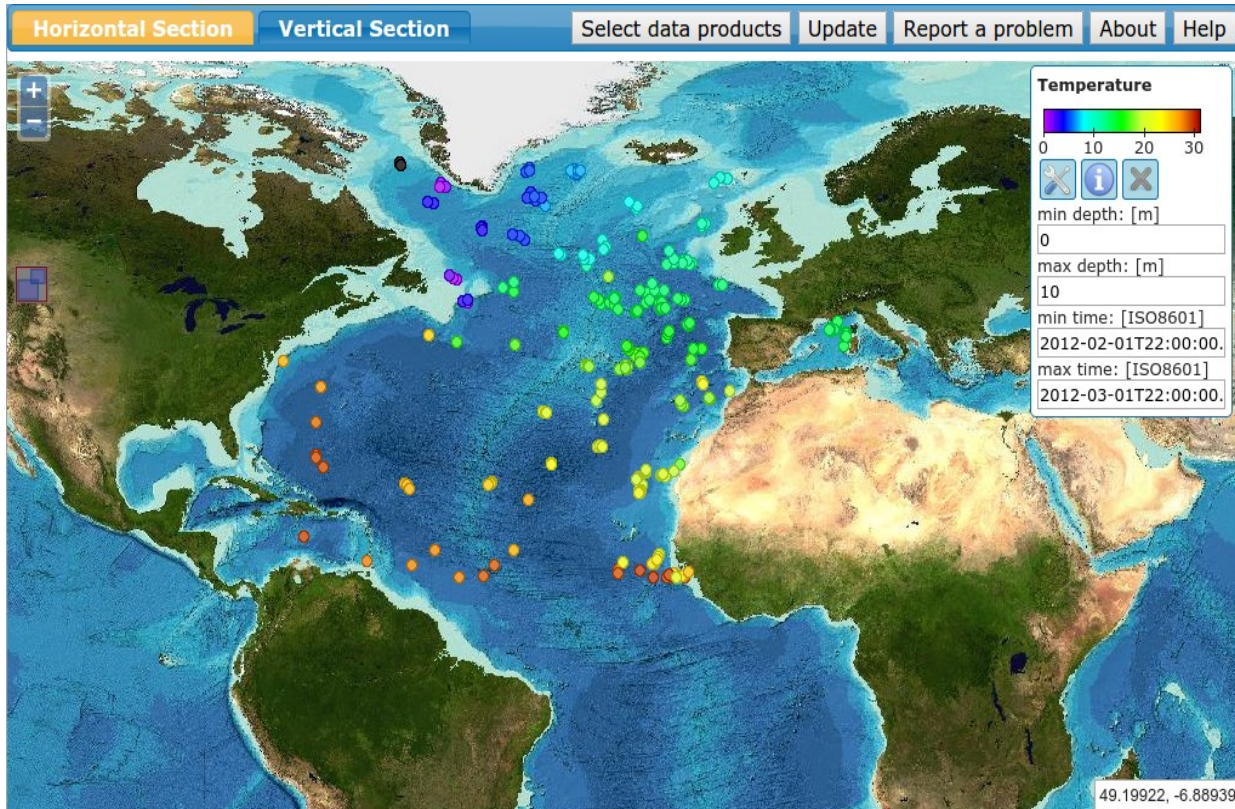
- GetMap request
- Color represent the value

Change style of layer



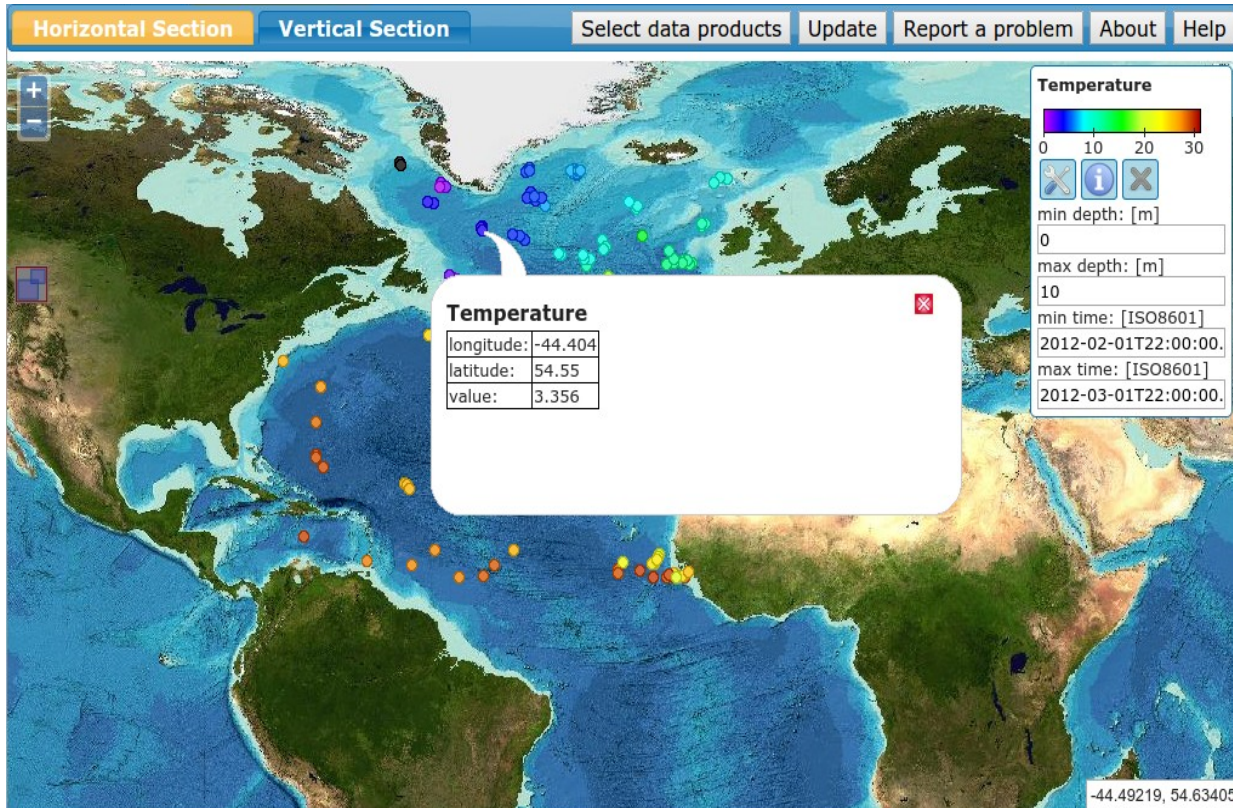
- Not completely defined in OGS WMS standard
- Different extensions in OceanBrowser and ncWMS (basis of Oceanotron)
- Implement ncWMS extensions to:
 - change colorbar
 - change colorbar range

Change style of layer



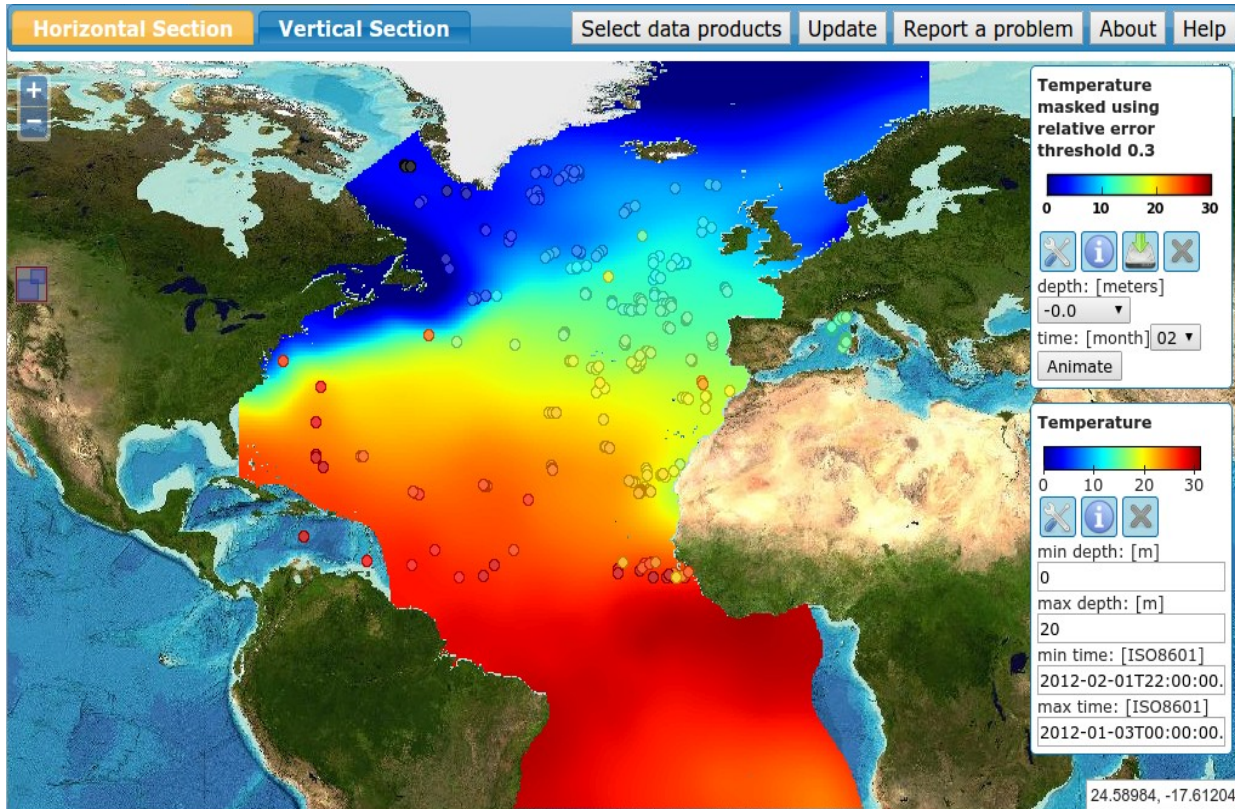
- Example with a different colormap

Extract value at a location



- WMS request: GetFeatureInfo
- Location and value of the selected layer

DIVA products and insitu observations



- Allow to compare DIVA products and insitu observation

Conclusions

- New DIVA releases with new features (reference field per season, time series, data binning...)
- New release planned in October
- OceanBrowser allows the visualization of gridded data sets:
 - along a **horizontal section** (at given time and depth)
 - along a **vertical section** (e.g. at a fixed distance from coast)
- Recent improvements:
 - **Better caching**
 - **Connection to Oceanotron**
- DIVA and OceanBrowser are freely available as open source

Installation

- The hard way: install 13 packages, configure Apache and OceanBrowser and set file permissions
- The easy way:

```
# docker run -p 8080:80 --name my-oceanbrowser-container \                -v  
/some/netcdf/files/:/var/www/data:ro abarth/oceanbrowser
```

- Docker automatically downloads and runs OceanBrowser
 - OceanBrowser is available at port 8080 on localhost and servers files in the directory `/some/netcdf/files/`
 - Configuration using environment variables (public URL, name,...)
- More info at the docker **hub.docker.com** and search for **OceanBrowser**

<https://hub.docker.com/r/abarth/oceanbrowser/>

More info about DIVA

→ How to get DIVA ?

http://modb.oce.ulg.ac.be/mediawiki/index.php/DIVA#How_to_get_the_code.3F

→ History of DIVA new features and bug fixes

http://modb.oce.ulg.ac.be/mediawiki/index.php/New_Diva_Features

→ DIVA documents (installation & use)

http://modb.oce.ulg.ac.be/mediawiki/index.php/Diva_documents