ENVOL Prospective Study Programme

Meteorological web service implementation feedback

(Benjamin Chartier)

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INTRODUCTION

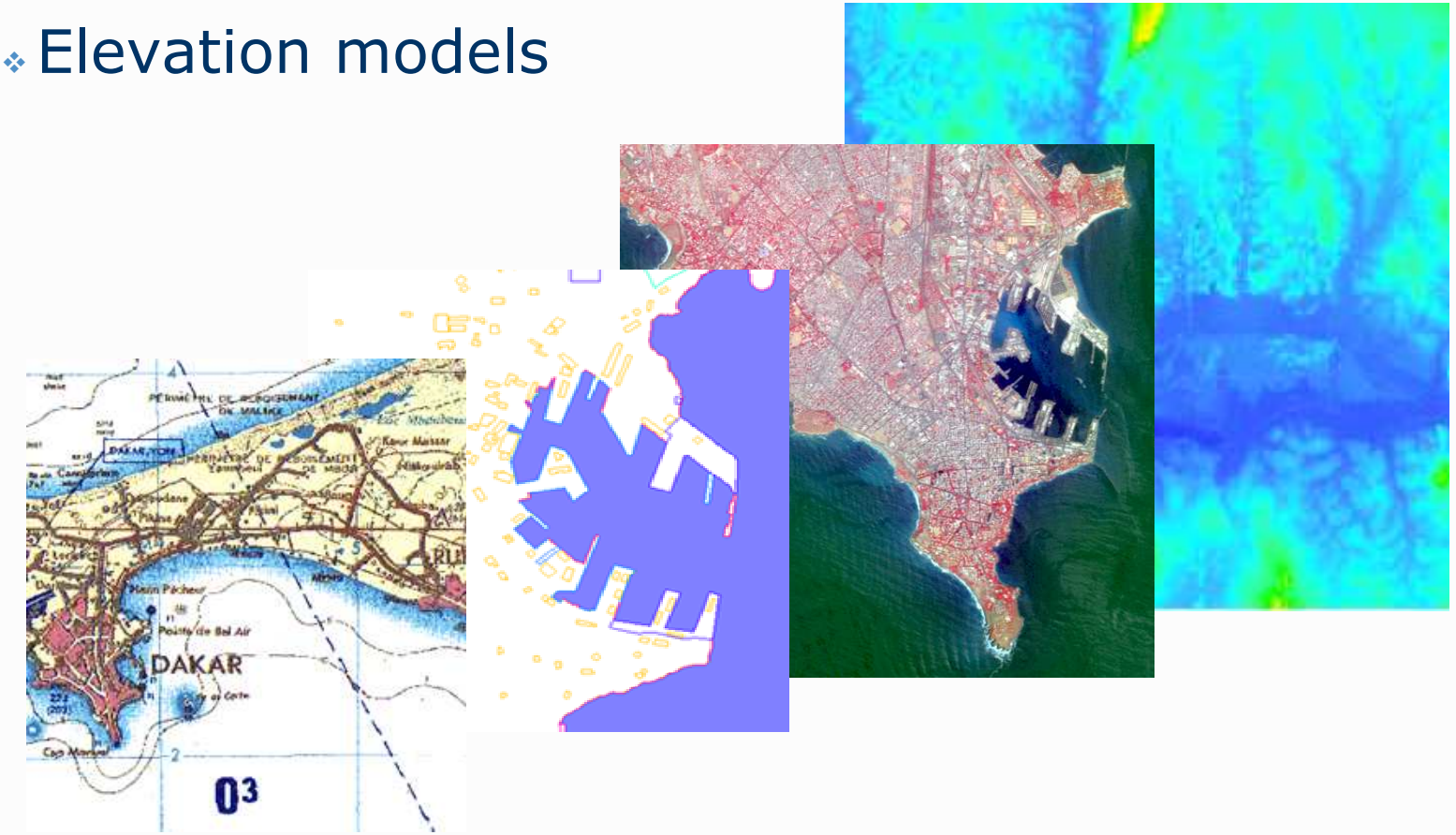
Objectives

- ENVOL : **ENV**ironment **O**n-**L**ine

- Goals:
  - Study and prototype a **web infrastructure**
  - Focused on **environmental data**
  - For **military users**
  - Strong emphasis on **OGC and ISO standards**

Topographical data

- Scanned maps
- Vector data
- Satellite images
- Elevation models



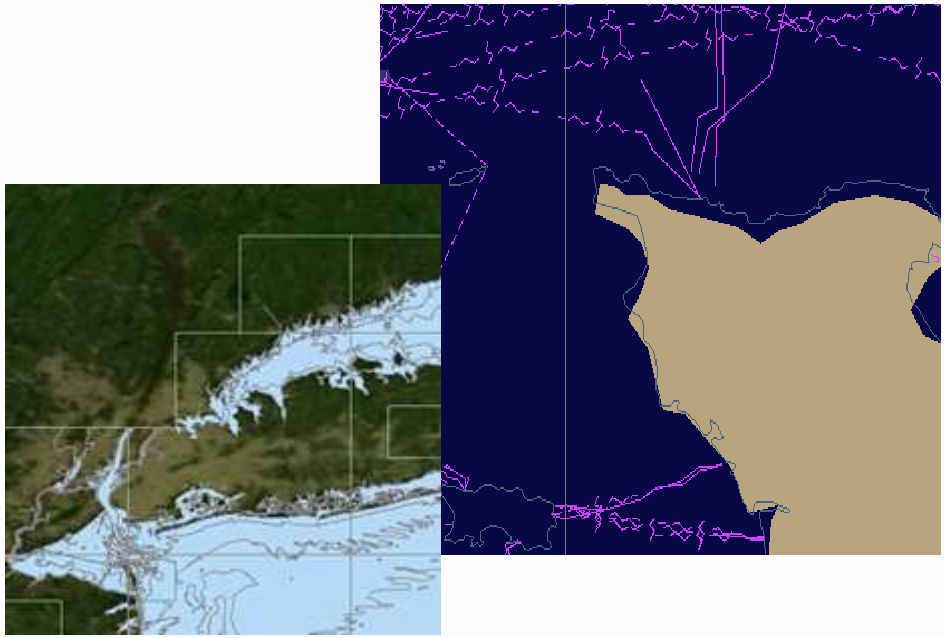
Hydrographical data

- Vector data

  ENC, DNC and AML (encoded in VPF and S57)

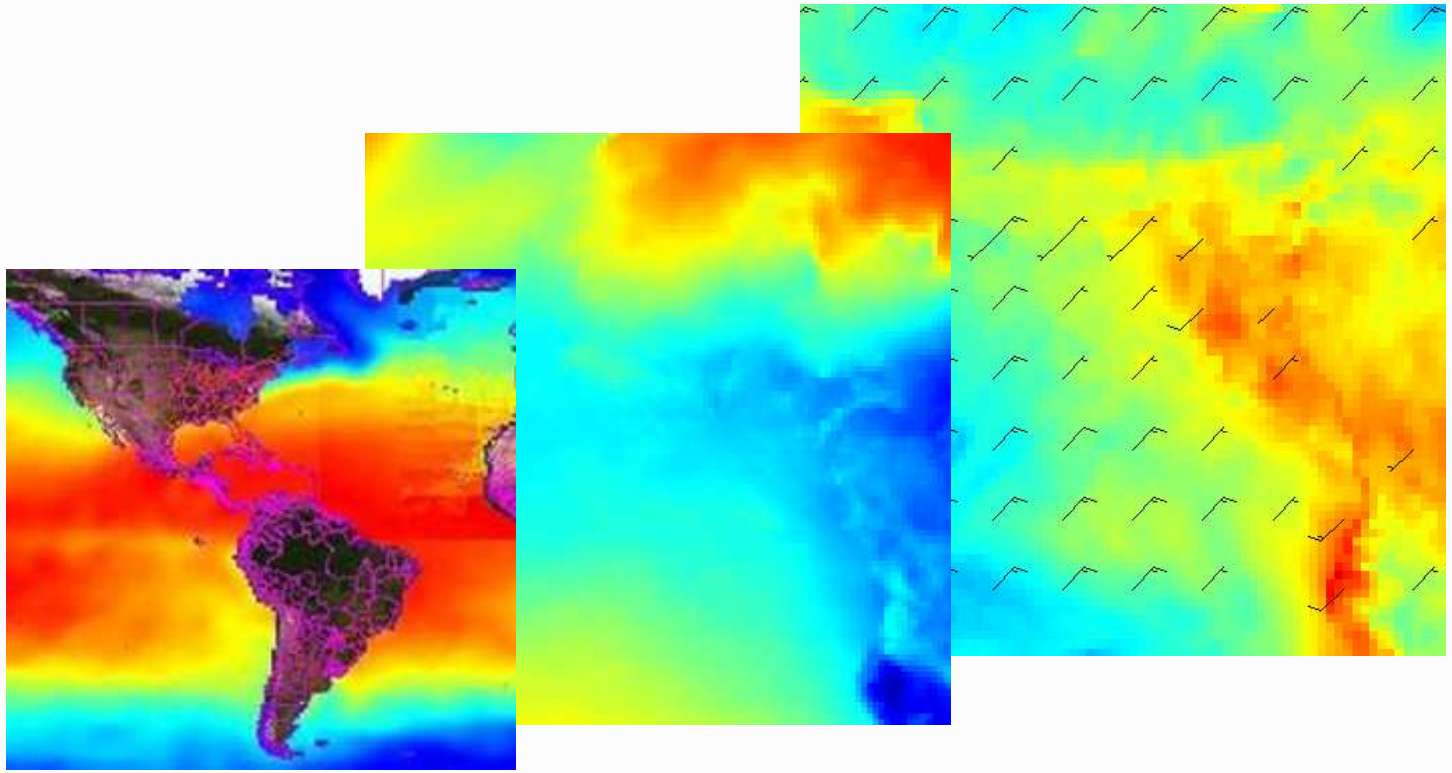
- Raster data

  ARCS maps (raster maps from UKHO)



Oceanographical and Meteorological data

- GRIB
- netCDF:
  - Encoding: RISOME convention ≠ CF convention
  - Model : AML (Additional Military Layer)



Stakeholders

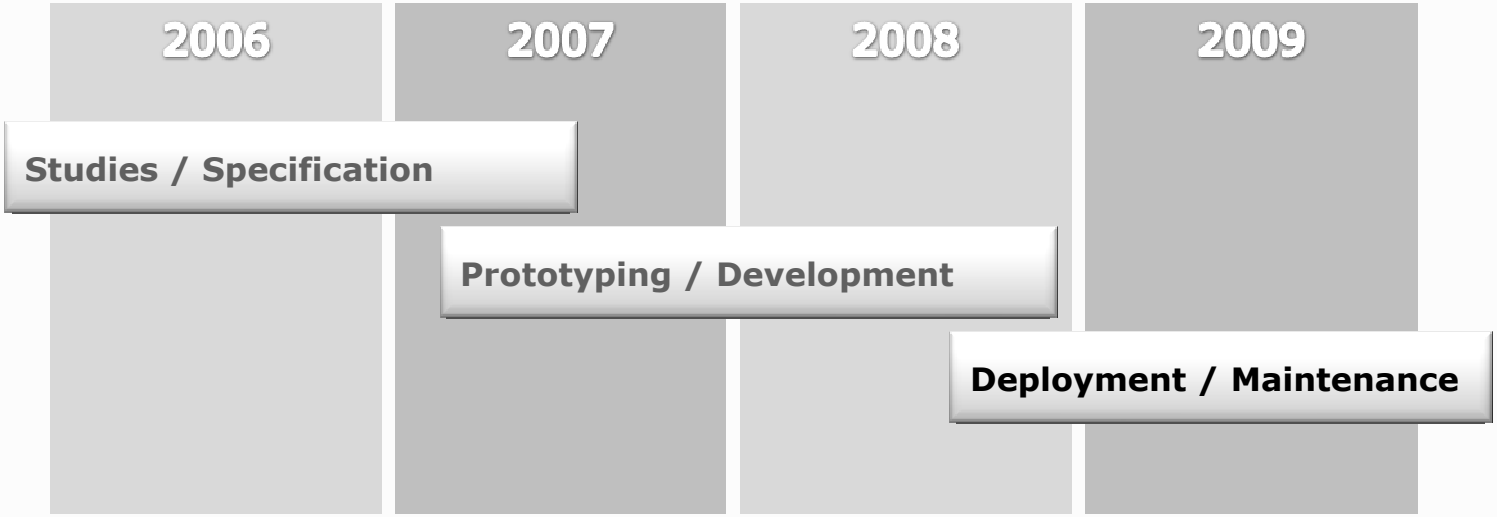
Government:

French Defence Procurement Agency
(Project Management)

French Hydrographic Agency
(Oceano/Hydro/Climate Requirements)

Industry Consortium:

Timeline


2006
2007
2008
2009
Studies / Specification
Prototyping / Development
Deployment / Maintenance

REALISATION

Standards stack (extract)

- Rendering: WMS, SLD, WMC
- Vector data access: WFS
- Annotation: WFS-T
- Processing: WPS, BPEL
- Cataloguing: CS-W (ebRIM and ISO profiles)
- Metadata: ISO 19115/19139
  (profile based on French DoD standards)

Software stack (extract)

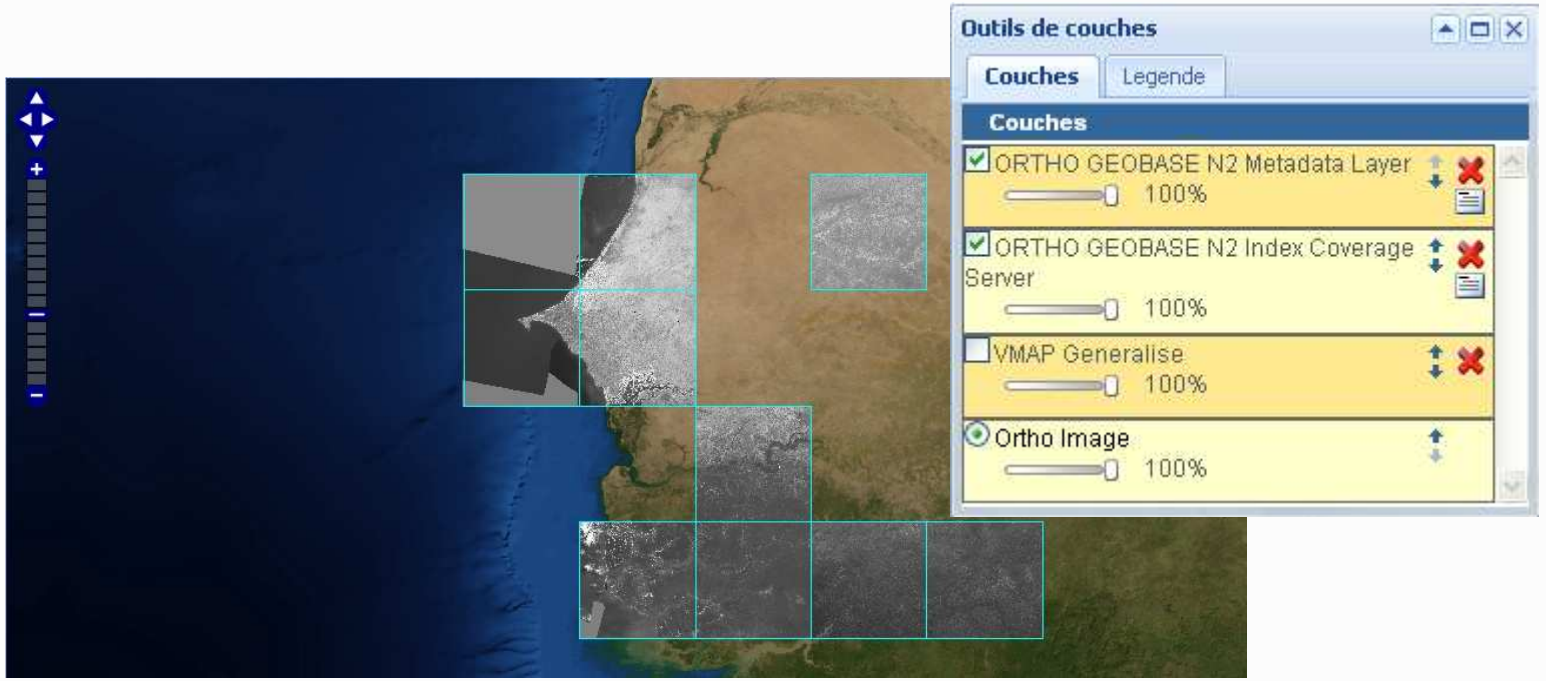
Server side

- ncWMS (netCDF)
- new connectors for ncWMS (GRIB, netCDF RISOME)
- WMS with specific renderings (GeoSym, S-52 and wind barbs)
- WMS, WFS, WFS-T, WCS
- TileCache

Client side

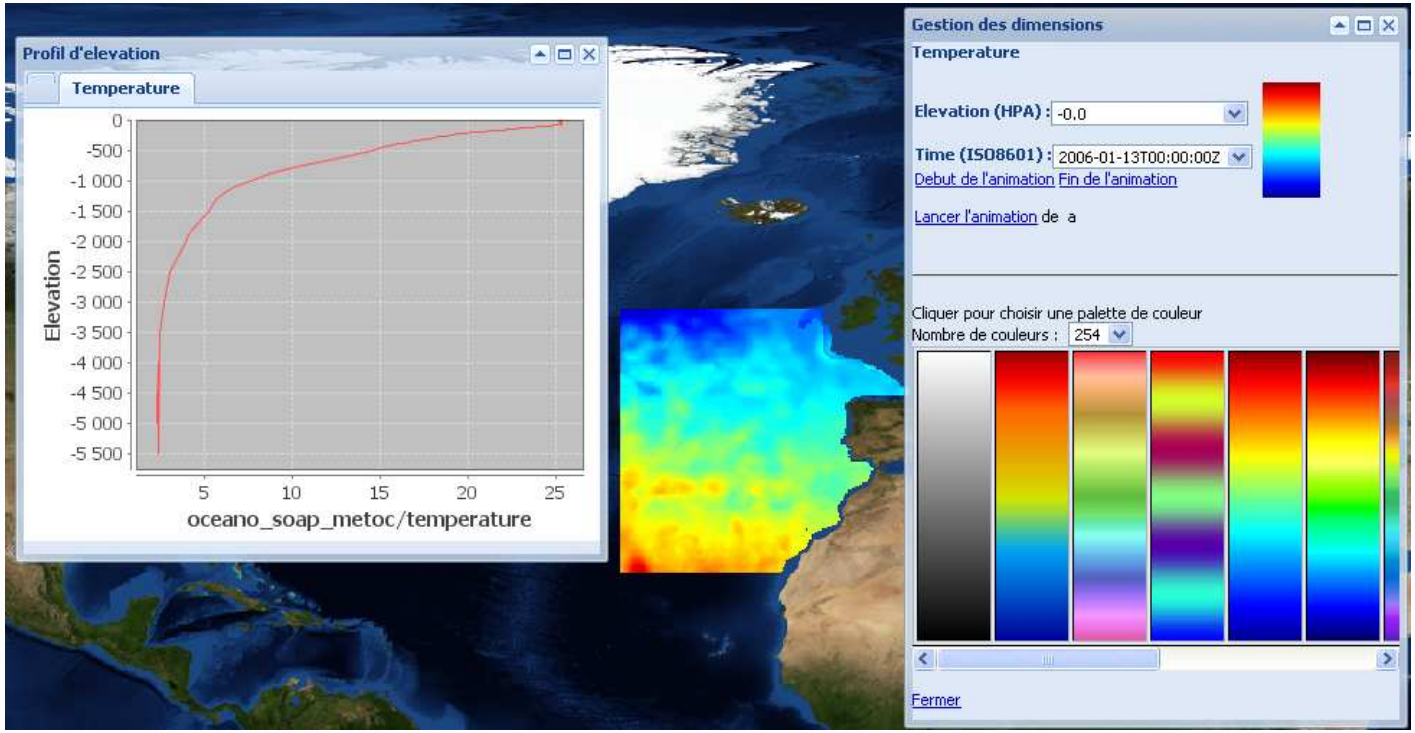
- OpenLayers

Web mapping client application



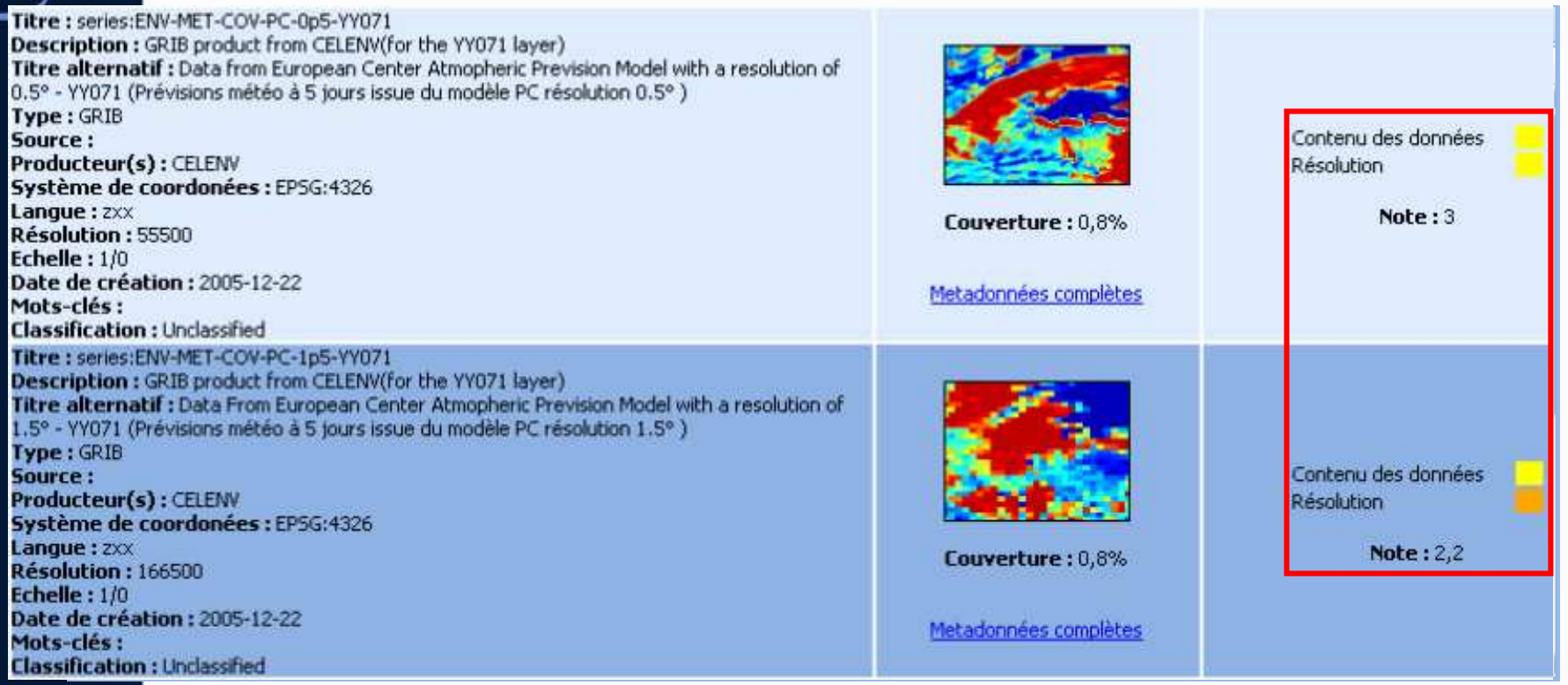
- OpenLayers
- Metadata layers
- Tools for managing the stack of layers

Meteo and oceanographical mapping



- ncWMS for met. and ocean. data
- Support of TIME and ELEVATION dimensions
- Use of the TIME dimension for animations
- Creation of charts through GetFeatureInfo

Search engine



- Evaluation of relevance based on
  - Metadata,
  - Search criteria associated with operational requirements
  - User comments

LESSONS LEARNED

WMS layer organisation

- Simple hierarchical layer structure
  - first level: datasets
  - second level: measurements/observations
- Only one type of measurement/observation per layer
  - not suitable for renderings combining more than one physical quantity

Time handling

- Weather forecast
  - Use of TIME dimension for validity date
  - No other time-related dimension

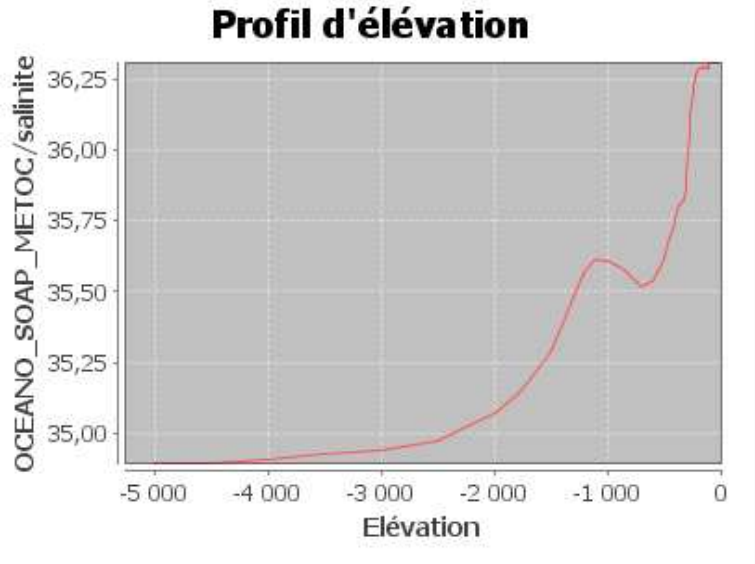
    For the date at which the model was run for example

- Climatology statistics
  - Didn’t use the TIME dimension

    ISO 8601 does not allow Truncated Representation (in the form of -–MM-DD) **unless mutual agreement**

GetFeatureInfo

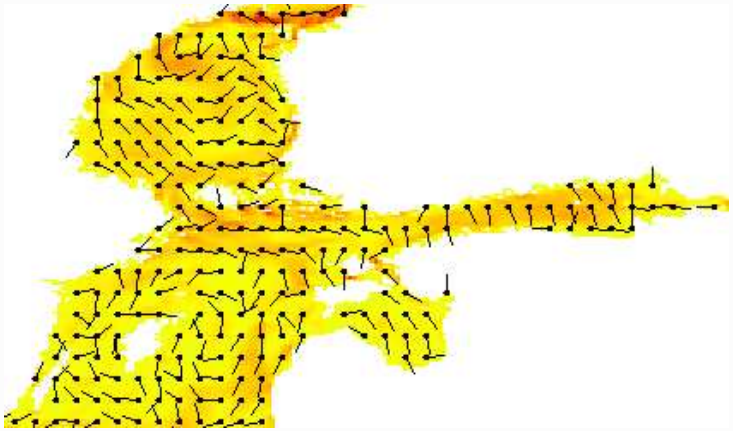
- Charts:
  - Using ELEVATION and TIME dimensions
  - Created through the GetFeatureInfo request



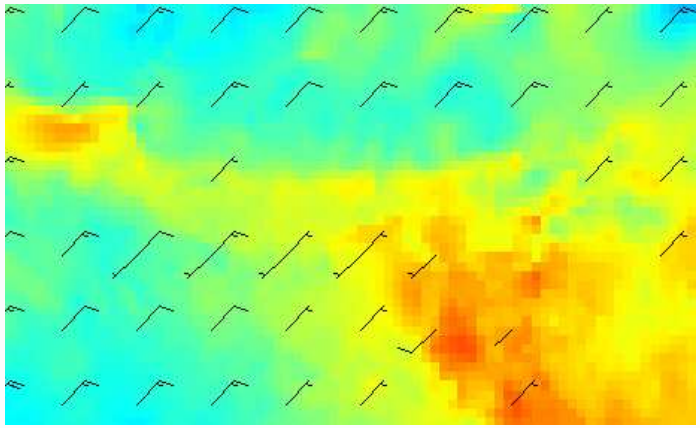
- Metadata layer (in the DGIWG WMS profile way) allowing a client application to access the metadata through a GetFeatureInfo request

Styling

- Not easy to find WMS servers implementing standards portrayal rules (wind barbs for example)



with ncWMS (from the JGrass wiki)



with Luciad Map

- SE (Symbology Encoding) does not seem to be able to produce wind barbs

- Need for well-known styles corresponding to standard portrayal rules

  (similar to the "shaded" and "hypsometric" styles defined by the DGIWG WMS profile)

WMS and WCS interop

- We intended to use WCS as a data source for our WMS
  - Need for a mechanism to define a mapping between the WCS data model and the TIME/ELEVATION WMS dimensions
  - Use of SLD for styles and requesting the WCS through the WMS

- Main issue:
  - **Lack of support for mapping TIME & ELEVATION** between WCS and WMS (shortcoming of the implementations we used)

-> We didn't use WCS as a MetOc data source

Metadata, cataloguing - 1

- Keywords: controlled vocabulary based on DFDD (DGIWG dictionary) and GRIB specification
  - describing the content of each layer
  - allowing the discovery of layers
- Cross referencing between catalogue and layer metatada
  - The metadata stored in the catalogue refer to the WMS layer
  - The WMS layer metadata refer to the metadata record stored in the catalogue

    (ISO 19139 document)

Metadata, cataloguing - 2

- Ocean/Met metadata required specific needs:
  - Time:
    - validity/analysis time is not just a date
    - validity time of a dataset may be a series of date/times
    - Validity time may not a be an ISO 8601 valid time (for climatological stats)
  - Elevation:
    - Need to describe the series of elevations (not necessarily expressed in the same units)

-> need for best practices doc or ISO 19139 profile for these metadata

Issues summary

- WMS layers structure
- Time & elevation handling
- Use of GetFeatureInfo
- Styling
- WMS / WCS interoperability
- Metadata:
  - Data metadata
  - Layer metadata
  - Metadata layer

magellium

QUESTIONS?

THANK YOU