



# SeaDataNet

PAN-EUROPEAN INFRASTRUCTURE  
FOR OCEAN & MARINE DATA  
MANAGEMENT

## WP8 and WP9 developments

### Data-Interpolating Variational Analysis (Diva) developments

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2nd Plenary Meeting, 26-27 September 2013, Lucca (Italy)

## Diva related tools

**Diva:** base tool (command line), 2D analysis

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**OceanBrowser:** visualisation tool of 4D NetCDF files

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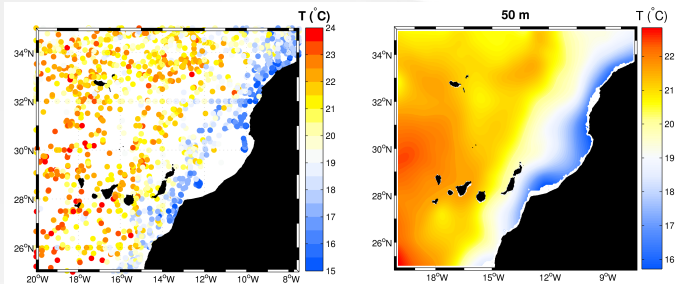
**Godiva:** automatic repetition of 2D analysis

**Diva-on-web:** 2D analysis with your data on our server

**OceanBrowser:** visualisation tool of 4D NetCDF files

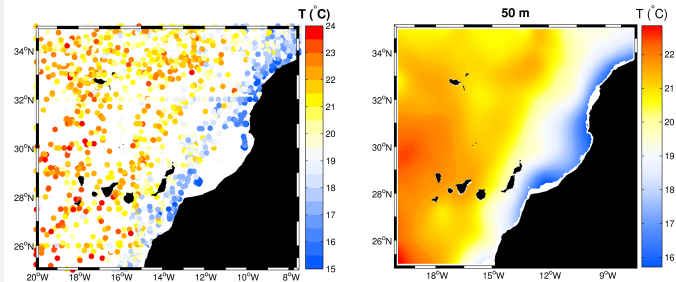
**divand:** multi-dimension analysis (lon, lat, time, depth)

## Diva: an advanced interpolation method for ocean data



**Method:** minimize cost function (observations, smoothness, physics)

## Diva: an advanced interpolation method for ocean data



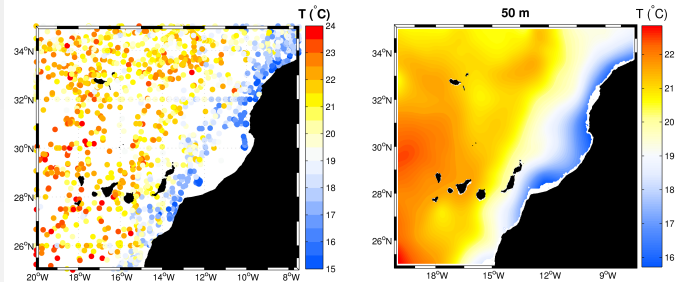
**Solver:** finite-elements

Numerical efficiency

Domain geometry taken into account



## Diva: an advanced interpolation method for ocean data



**Implementation:** Fortran + bash scripts

Easy adapted for automatic loop

Runs under Linux, Mac-OS & Windows (+ Cygwin)

## Diva developments: summary

- Modernisation of the code structure.

OK

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- Support for observations in NetCDF format

OK

In progress

Test with altimetry data (AVISO) using nco tool box  
Future test with World Ocean Database NetCDF files

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- Modernisation of the code structure. OK
- Support for observations in NetCDF format In progress
- Multivariate approach OK

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- Modernisation of the code structure. OK
- Support for observations in NetCDF format In progress
- Multivariate approach OK
- Non-Gaussian distributed variables OK
- 4-dimensional generalisation OK: divand
- Spatially correlated observations errors In progress

Preliminary results available  
on-going developments, see afternoon presentation

## Diva-on-web & OceanBrowser developments: summary

### **OceanBrowser:**

- Inclusion of external WMS layers

OK



## Diva-on-web & OceanBrowser developments: summary

### OceanBrowser:

- Inclusion of external WMS layers
- Show locations of CDIs used in an analysis

OK

In progress

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- Download animations of horizontal/vertical sections OK

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- Inclusion of external WMS layers OK
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### Diva-on-web:

- Inclusion of additional metadata in the NetCDF file produced in the analysis OK

## Diva-on-web & OceanBrowser developments: summary

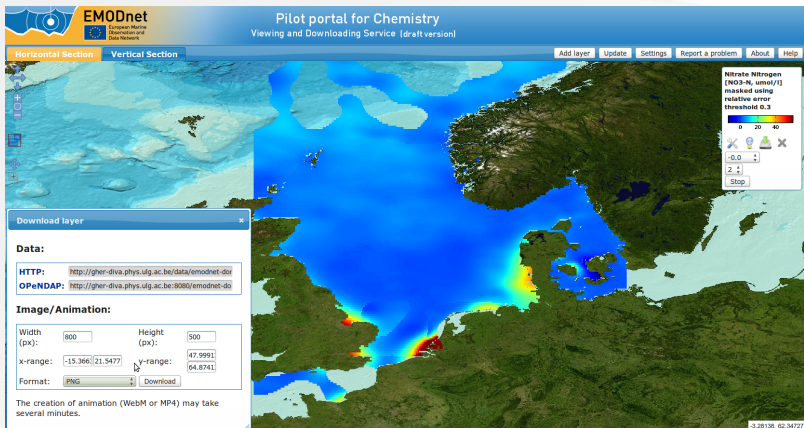
### OceanBrowser:

- Inclusion of external WMS layers OK
- Show locations of CDIs used in an analysis In progress
- Download animations of horizontal/vertical sections OK

### Diva-on-web:

- Inclusion of additional metadata in the NetCDF file produced in the analysis OK
- Advection constraint In progress

# Diva-on-web & OceanBrowser developments: Animation download (mp4 or webm format)



**EMODnet**  
European Marine Observation and Data Network

Pilot portal for Chemistry  
Viewing and Downloading Service (draft version)

Horizontal Section Vertical Section

Add layer Update Settings Report a problem About Help

**Nitrate Nitrogen**  
[NO<sub>3</sub>-N, umol/l]  
masked using  
relative error  
threshold 0.3

0 20 40

X Y Z

-0.0

2

Stop

**Download layer**

**Data:**

**HTTP:** <http://gher-diva.phys.ulg.ac.be/data/emodnet-dor>

**OPeNDAP:** <http://gher-diva.phys.ulg.ac.be:8080/emodnet-do>

**Image/Animation:**

Width (px): 800 Height (px): 500

x-range: -15.366 21.5477 y-range: 47.9991 64.8741

Format: PNG Download

The creation of animation (WebM or MP4) may take several minutes.

-3.28138, 62.34727

# Diva-on-web & OceanBrowser developments: NetCDF metadata

Upload

Grid

Analysis

Statistics

Download

Link or embed

Report a problem

Help

### Analysis with Diva

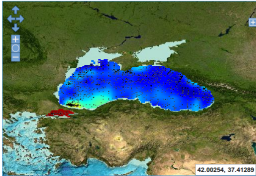
Correlation length [deg]:

Signal to noise ratio:




Quality of the fit (0: bad 1: good):  
0.871251

#### Optional parameters

Maximum rel. error (from 0 to 1):



42.90254, 37.41289

Download

Analysis:

- NetCDF file (.nc)
- Octave or Matlab (.mat)
- Google Earth (.kml)
- Image Format:

Bathymetry:

- NetCDF file (.nc)

NetCDF Metadata

Variable name:

Units:

Standard name:

Long name:

Title:

Institution:

Source:

References:

Comment:

You may leave non-applicable fields empty. Variable can only contain letters (a-z and A-Z), digits, hyphens (-) and underscores (\_). Other fields are limited to the 7-bit ASCII characters (in particular no umlaut or accents).

## Deliverables

No.	Object	Delivery date
D9.9	Updated versions and documentation	M 12, 24, 36, 44
D9.10	Report on multi-dimensional analysis and spatially correlated observations errors	M 24
D9.11	New version Diva-on-web: meta-data + <b>advection constraint</b>	M 24
D9.12	New version Diva-OceanBrowser: <b>interact with CDI records</b>	M 24

# Diva workshop

**Where?** STARESO station (ULg), Calvi, FRANCE

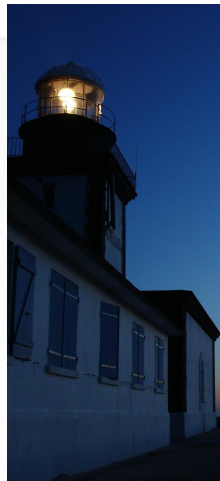
**When?** **Monday** 4 (arrival) – **Friday** 8 (departure)  
November 2013

**Who?** SeaDataNet / EMODnet partners, all levels

**What?** Installation, test cases, 2D, 3D, 4D, ...

✉ [ctroupin@ulg.ac.be](mailto:ctroupin@ulg.ac.be)

**More details:** [http://modb.oce.ulg.ac.be/mediawiki/index.php/  
Diva\\_workshop\\_2013\\_Stareso](http://modb.oce.ulg.ac.be/mediawiki/index.php/Diva_workshop_2013_Stareso)







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Thank you

More information  
this afternoon.