HiSea

High resolution merged satellite sea surface temperature fields

BELSPO project SR/12/140

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Motivation for this work

- High quality SST data sets needed for various applications, including numerical weather prediction, ocean forecasting and climate research.

- Coverage, resolution and precision of individual SST observations not sufficient

- Merging these data sets is needed to increase the coverage and to reduce the final data set error.

- Satellite data from various sensors and in situ data: different technical characteristics, depth of measurement, spatial and temporal resolution...

Objectives of HiSea

- Develop a technology to merge data sets with different space/time resolution

- To provide improved, merged analyses of SST and chlorophyll.

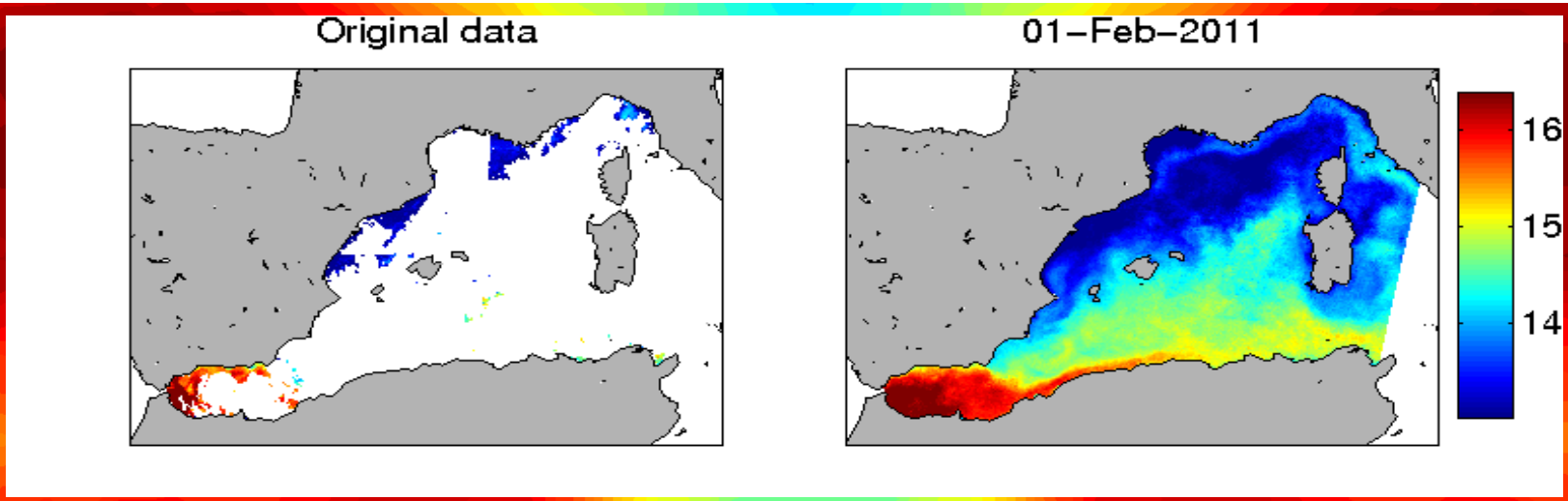
- Obtain a better understanding of the diurnal cycle of the studied variables.

- To better understand the relation between variables

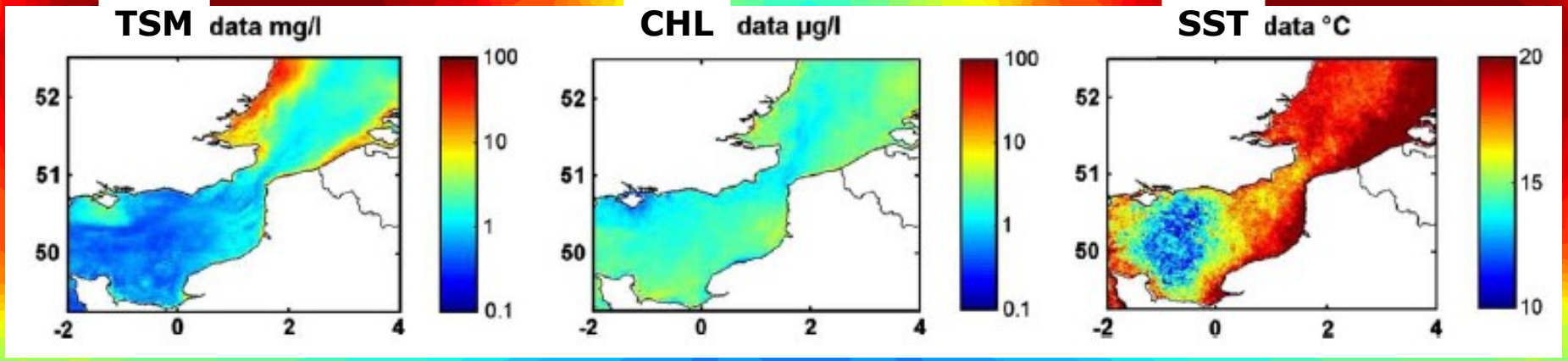
- Explore the capability of DINEOF to produce SST forecasts based on multi-variate EOFs and model forecasts.

DINEOF (Data Interpolation Empirical Orthogonal Functions)

- Reconstruction method for gappy data based on an EOF decomposition
- Parameter-free, no need of *a priori* information
- Truncated EOF basis: determines optimal number of EOFs by cross-validation. Reduced noise in reconstruction



BELSPO project Recolour (a Belcolour spin-off) used DINEOF in the North Sea and Mediterranean Sea

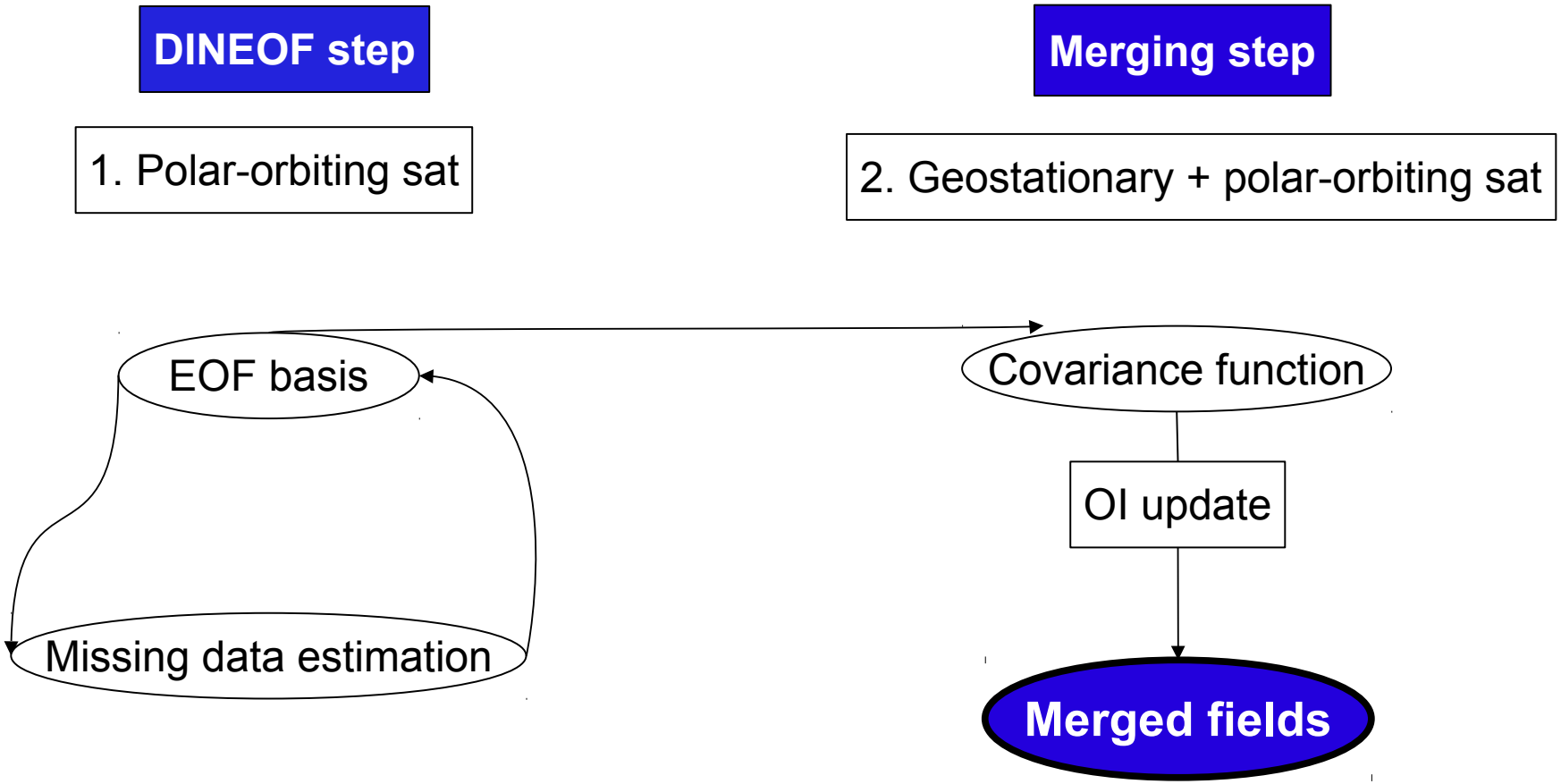


HiSea: merging capabilities for DINEOF

DINEOF does not merge different data sets into unique fields

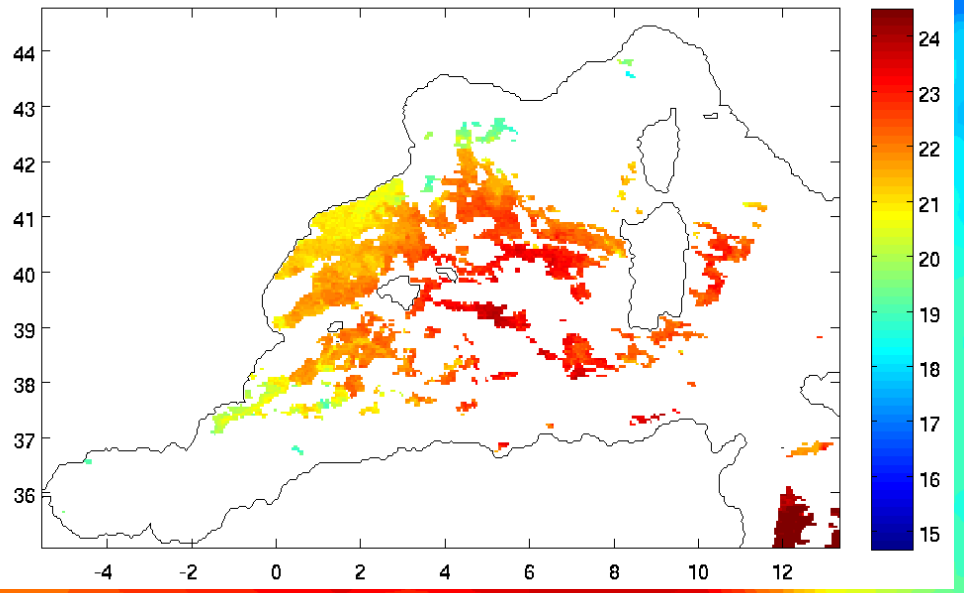
We are developing a **merging capability** within DINEOF
Data from different satellites, in situ, models, etc...

Proposed scheme:

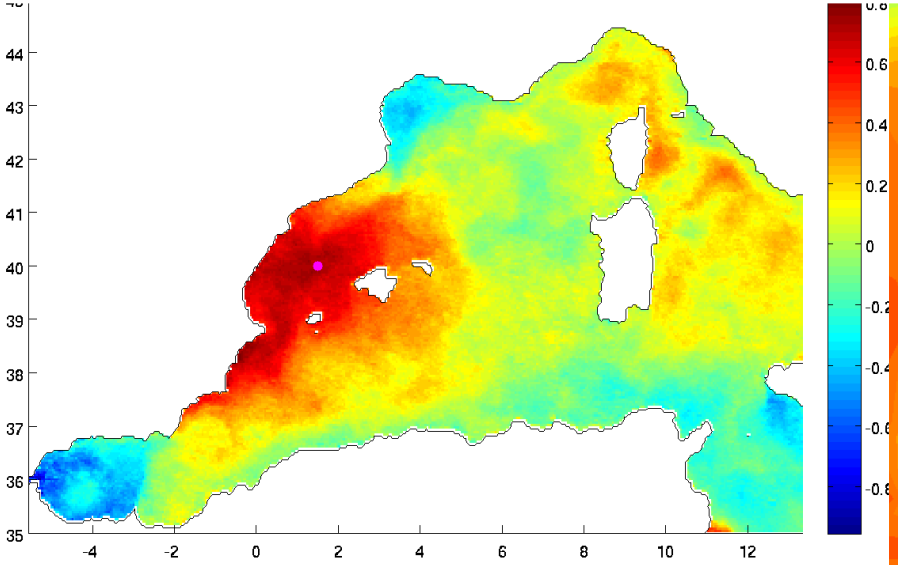


Preliminary results: AVHRR + in situ data

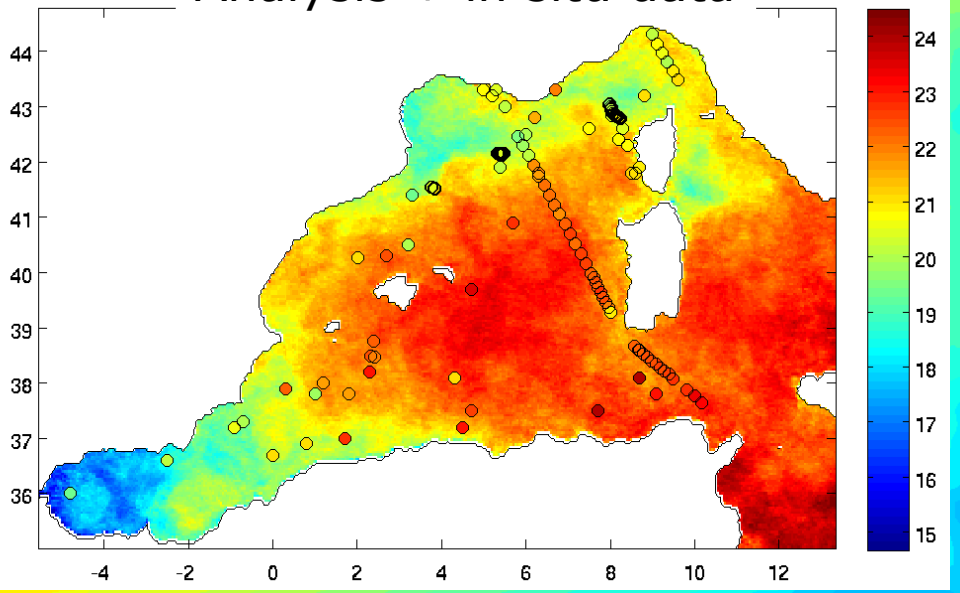
Initial satellite data



Non-parametric covariance (from DINEOF)



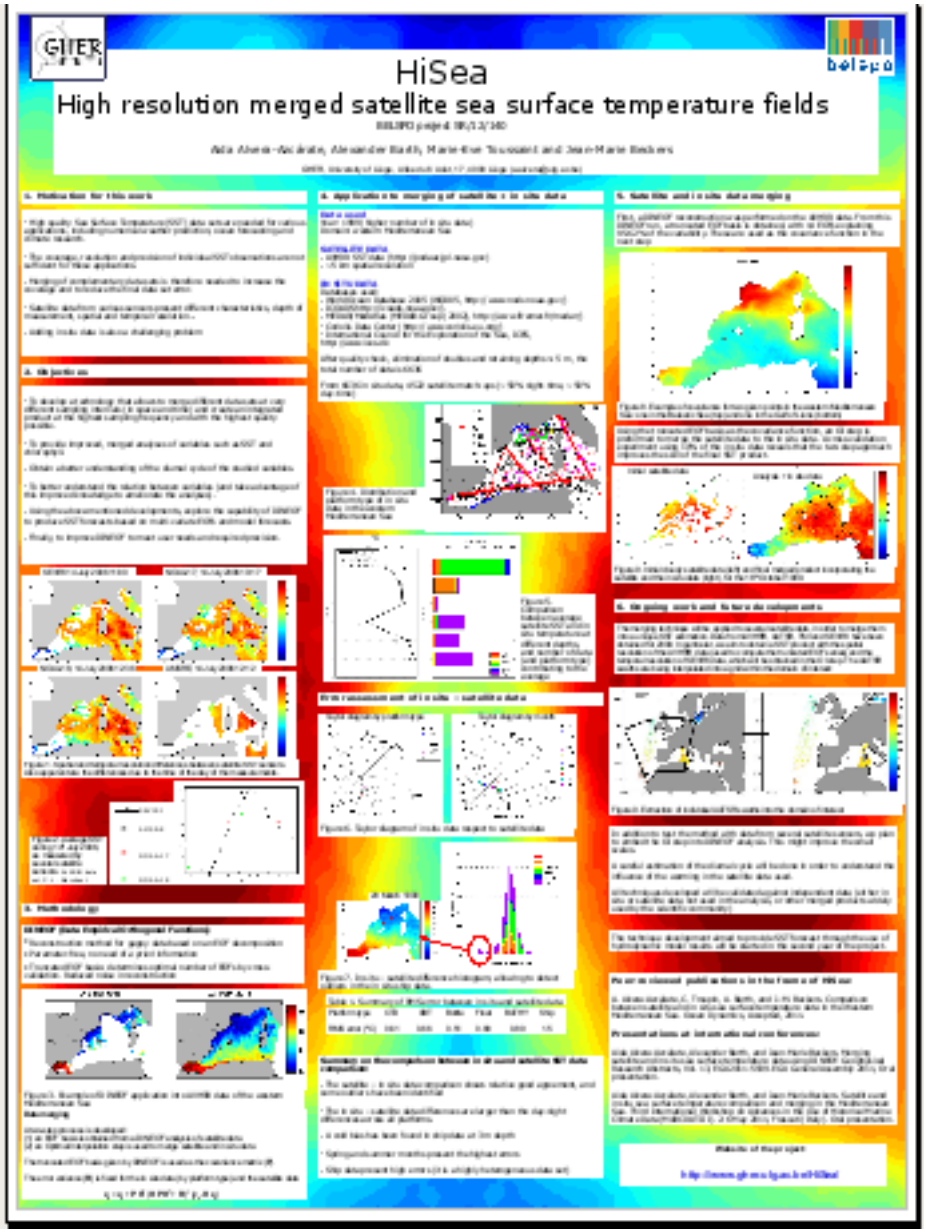
Analysis + in situ data



Cross-validation RMS (°C)

	all	CV data
DINEOF	1.12	1.07
DINEOF-OI with all insitu data	1.08	1.04
DINEOF-OI without CV insitu data	1.08	1.06

More information at our poster...



...and in the website of the project:
http://www.gher.ulg.ac.be/HiSea/