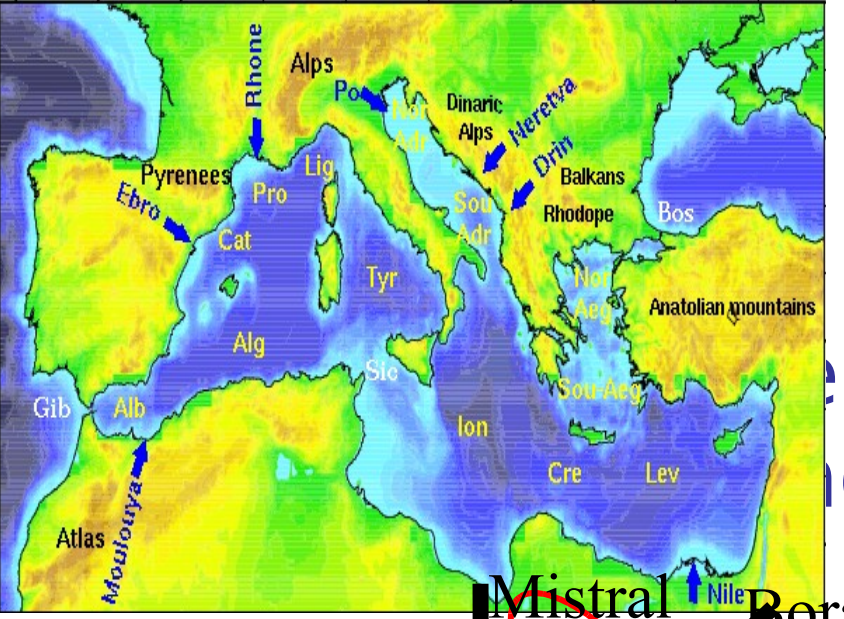
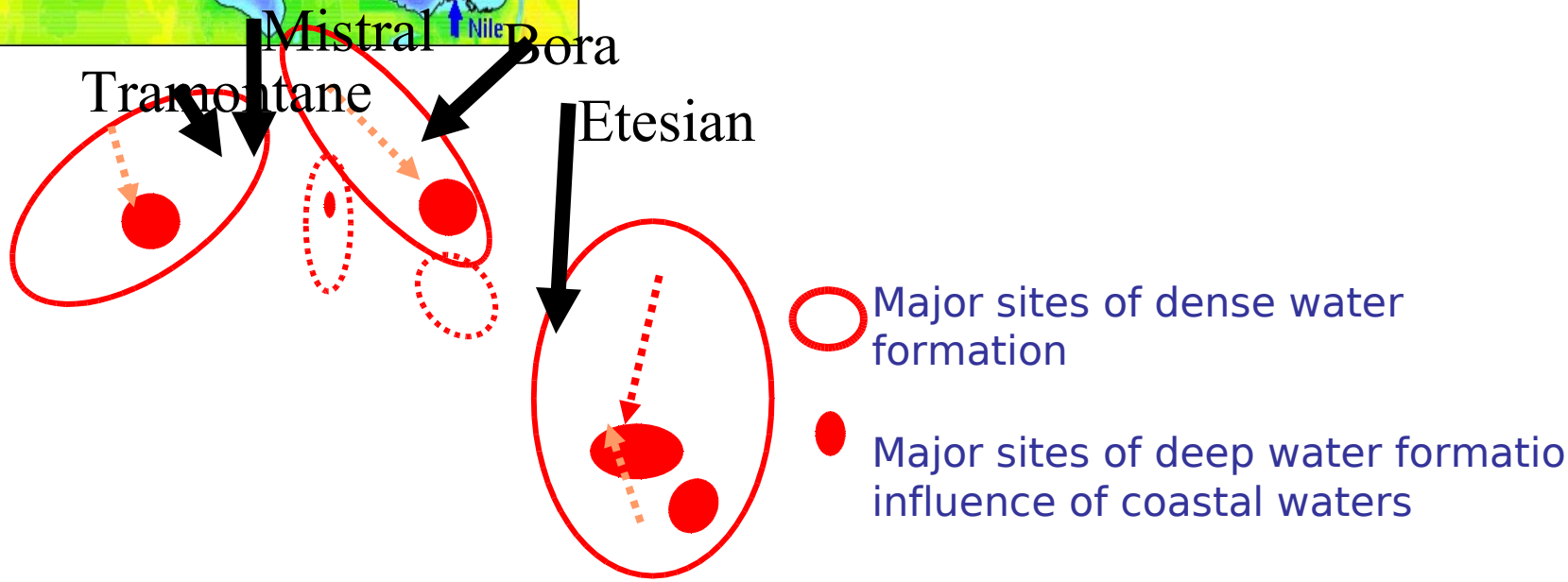
e modelling platforms
ng SOP/EOP





Chairs: G. Boni, B. Ivancan Picek, J.M. Lellouche

general comments

- define standards for data and visualization (list of parameters, how to store data, how to produce charts..). Add some web page like the map D-Phase

- where and how to store model outputs?

- general task of real time experiments: to drive data collection during extreme events in order to have some lead time

- letter of invitation to operational meteorological-oceanographic and hydrological services in order to involve them officially

1) Real-time modelling platforms during SOP/EOP - Atmosphere

General needs

Coupled and non-coupled models of high resolution need to be developed in order:

- to study the cyclogenetic processes in the Mediterranean

- to study heavy precipitation and strong local winds, influenced by topography

- to ameliorate the parameterization of the air-sea interactions

- to make sensitivity experiments

- to evaluate forecasts

- to make scenarios

- to make high-resolution reanalyzes

Real-time modelling platforms during SOP/EOP

Numerical mesoscale models (operational - research)

Adriatic Sea area

- ALADIN/HR mesoscale model – 8 km horizontal resolution; DADA dynamical adaptation of surface wind field at 2 km 10-year (1991 – 2000) dynamical downscaling the global data (ERA-40) with ALADIN/HR/DADA are available
- WRF model – 1 km horizontal resolution
- COAMPS model (Coupled Ocean – Atmosphere Mesoscale Prediction System) – multiple nested grid domains, the finest grid having 333-m horizontal spacing.

Aegean Sea and Crete area

- BOLAM mesoscale model operating at 15-km resolution over S. Europe and 7 km over Greece. Seven year BOLAM winds at 7 km resolution over Greece are stored in database.
- WRF model – 1 km horizontal resolution. WRF is already operational and it will be used as the primary tool for very-high resolution modelling over the Aegean Sea and especially Crete.

Northwestern Mediterranean

- WRF mesoscale model operating at 21-km resolution over the Mediterranean area and 7 km over the Gulf of Lions, not in operational mode.
- AROME 2km Météo-France, forecast.
- ARPEGE
- MOLOCH

2) Current or future oceanic operational systems (oceanic models and assimilation algorithms)

- Mercator (France): (NEMO + SEEK)

=> ATL12: Atlantic + Mediterranean 6-7km - already operational

=> NEATL36 (include West Med 2-3km) : will be operational at the end 2010 ...

- MFS (Italy): (NEMO + 3DVar)

=> MFS: Mediterranean 6-7km - already operational

- FOAM (UK): (NEMO + OI)

=> FOAM: Atlantic + Mediterranean 12km (NEMO + OI) - already operational

- Poseidon II : (POM + SEEK)

=> POSEIDON II: Mediterranean 5km

- Others ???

Observations

Observations that could be assimilated in real time:

=> Already used:

- Satellite altimetry (SLA)
- Temperature and salinity profiles (Argo, CTD, XBT, ...)
- Satellite SST
- Gliders (T/S)

® In the future ?

- tides gauge
- Satellite SSS (may have serious limitations for the Med Sea)
- Drifters and profilers velocity (lagrangian information)
- New high resolution altimetry missions : the shelves will be better observed
- Radar HF

In terms of Resolution, frequency, accuracy, ...

We need :

- Times series (how long?) to tune properly assimilation systems
- Accuracy of observations error.
- Different sources of observations at the same position at the same time.
- More T/S profiles ...

Modelling/ Assimilation periods

Strong link with modelling strategy : To “build” the background errors covariances, we need a “free” simulation (without assimilation) ~ 10 years => Need of “GOOD” free simulation …

What could be done for Hymex?

- Oceanic Reanalysis for the altimetric period (~ 10-20 years) ? (=> LOP ?)

® Contribute to the understanding of the long-term water cycle over the Med basin in terms of variability and trend.

- Assimilative systems can be a provider of boundary and initial conditions for embedded and/or coastal models with higher resolution (downscaling): real time daily forecast during SOP and EOP periods

3) operational hydrologic models

- hydrological forecast has high uncertainty, mainly due to uncertainty in forecast of rainfall quantities and position.
- For small scale catchments (100-1000 km^2) it is quite impossible to identify in advance (several hours) the location where a flood will occur
- difficult to use hydrological forecast to drive data colection during events. Need to use operational “nowcasting” models (<3 hrs lead time)
- interesting research activities
  - evaluate the performance of operational hyd-models coupled with different operational meteorological models
  - investigate the role of ensemble forecast and downscaling of

- List of models currently available
  - Italy: several different regional (in political sense) models, with different characteristics
    - Upper Po river: lumped hydrological model coupled with detailed hydrodynamic model (based on DHI-MIKE suite)
    - Liguria region: semi-distributed - event scale - hydrological model, modelling infiltration, runoff and routing but not evapotranspiration (DRiFt)
    - Arno river: complete distributed model, simulating infiltration and soil atmosphere exchanges (MOBIDIC)
    - North East: topkapi - Emilia Romagna Region, Reno River
    - .... many others.....
  - Other mediterranean countries....
    - TBD