

Safeguarding marine resources and optimising their economic value....the contribution of Operational Oceanography

Aldo Drago

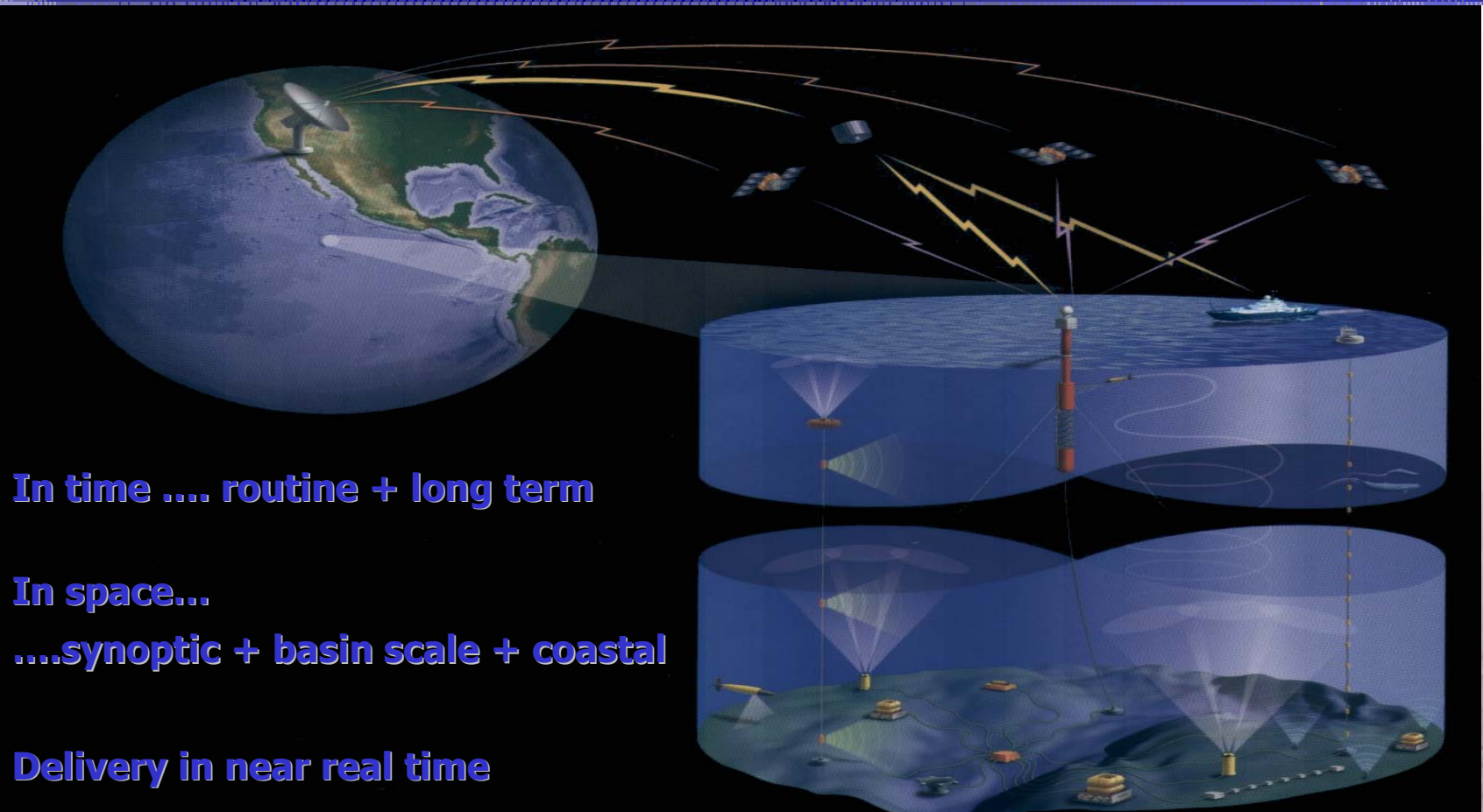
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Progress in the capacity to observe the ocean



The ocean prediction system

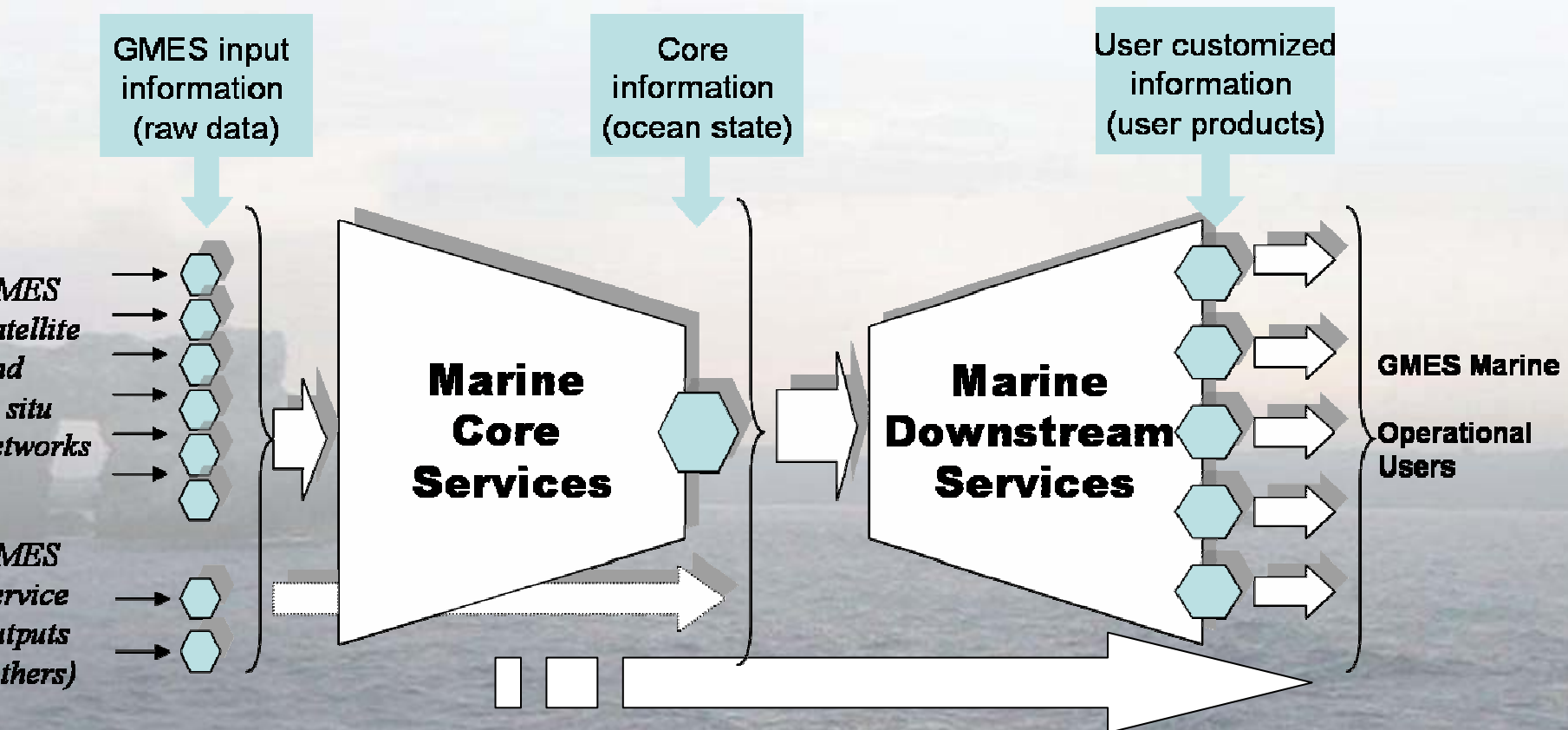
Meld observations into numerical models

**Full 3D description of the state of the ocean
(nowcasts)**

Predict the future state of the sea (forecasts)

GMES Marine Fast Track service

- CORE MARINE SERVICE (public good service)
- MARINE DOWNSTREAM SERVICE (public good and private sector)



The benefits...

- Informed decisions based on knowledge
- Effective and sustainable management of the marine environment
 1. Fisheries
 2. Safe and efficient transportation
 3. Coastal recreation
 4. Marine industries

The benefits...

- Support economies and improve standards of living
 1. Mitigating marine hazards
 2. Search & Rescue
 3. Public health
 4. Extreme events
- Detecting and forecasting oceanic components of climate variability and change
- Preserving and restoring healthy marine ecosystems

The value of routine marine observations....

Evolving role of operational oceanography

- from research mode to operational mode to service-oriented approach
 - addressing social concerns
 - targeting to support economic activities
- apply for sound ocean/coastal policy development
 - providing a tool for sound decision making

An evolving chain.....



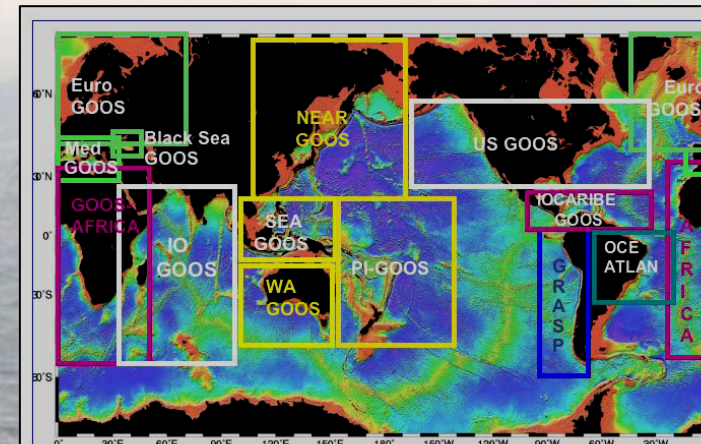
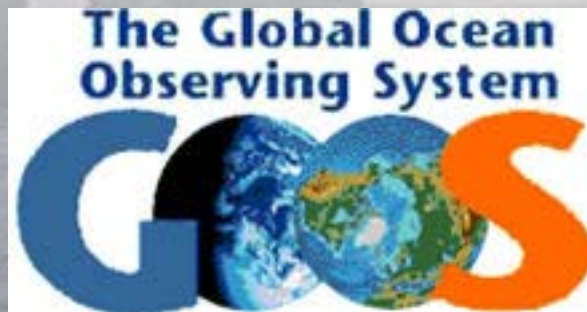
across scales: global – regional – local

across fields: climate – geophysical – fisheries - other

across sectors: environment – social - economical

Concerted action worldwide

- **GOOS – Global Ocean Observing System**
Programme led by IOC providing a global framework for operational oceanography
- **I-GOOS ...an IOC/WMO/UNEP committee**
providing an intergovernmental framework for
GOOS



MedGOOS

The Mediterranean Global Ocean Observing System



climate change

health of the ocean

services and products

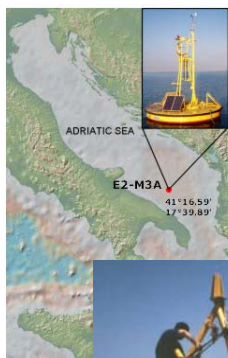
mitigating marine hazards

operational forecasting system

ringing the countries together to co-develop
and co-share observing and forecasting
systems in the regional and coastal seas.....



Basin Scale RT Observing System



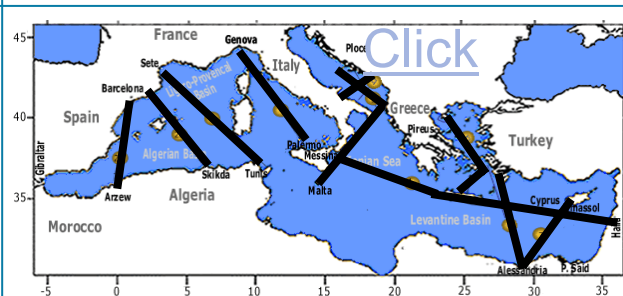
click



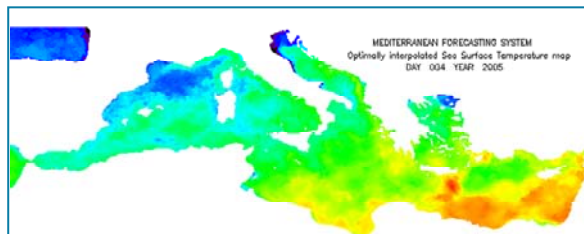
Multiparametric buoys in:
Ligurian Sea, Adriatic Sea
and Cretan Sea
(few hours delay)



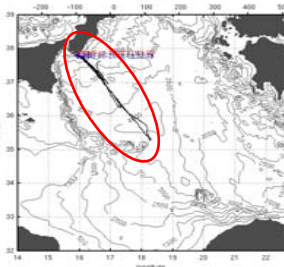
Scatterometer DAILY winds
analysis, 1/2x1/2
(one week delay)



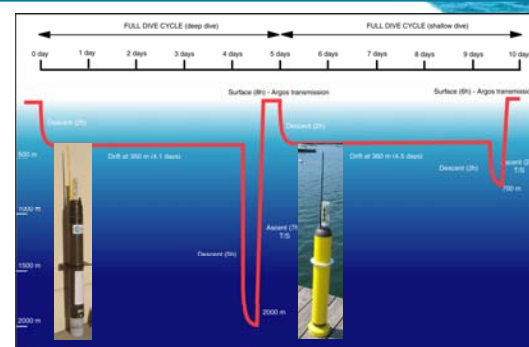
XBT VOS/SOOP high resolution
(12 nm along track and full profile
transmission, few hours delay)



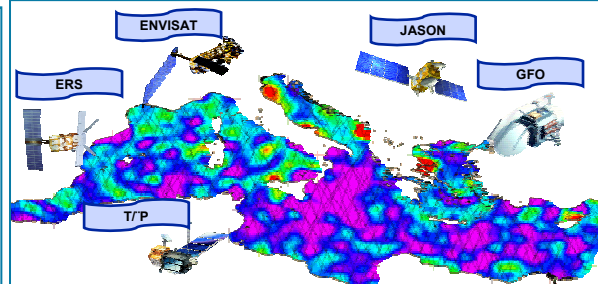
Daily satellite SST interpolated in
RT on model grid (one day delay)



Open ocean monitoring by gliders
(few hours delay)

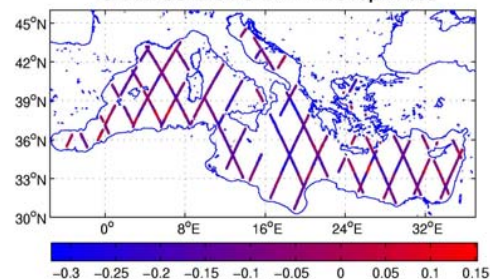


20 ARGO floats deployed from VOS
(few hours delay)

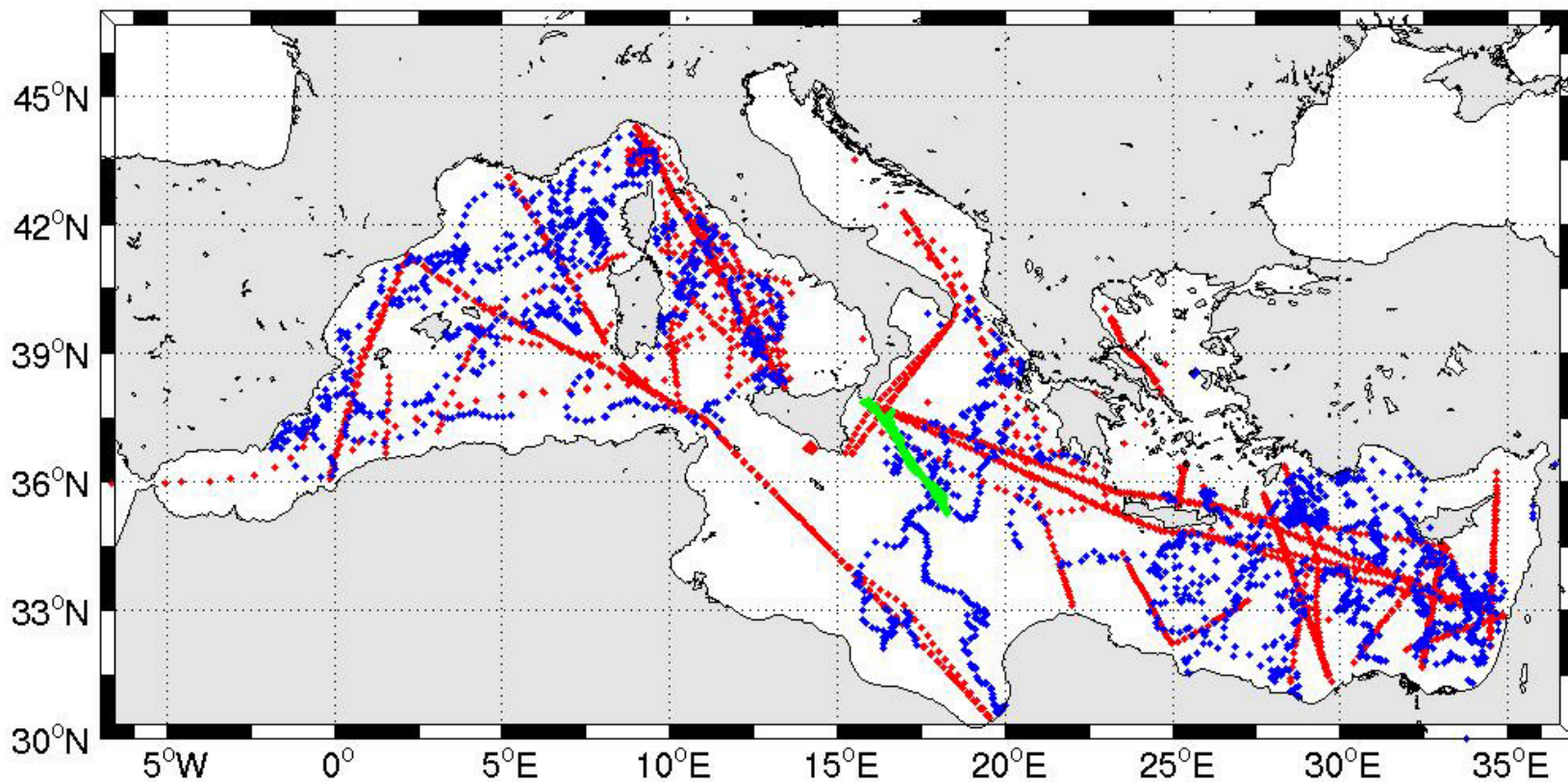


JASON-1, GFO, ENVISAT, T/P
Sea Level Anomalies
(few days delay)

TOPEX/POSEIDON SATELLITE 04 april 2000



MOON now: the collected data from 2004

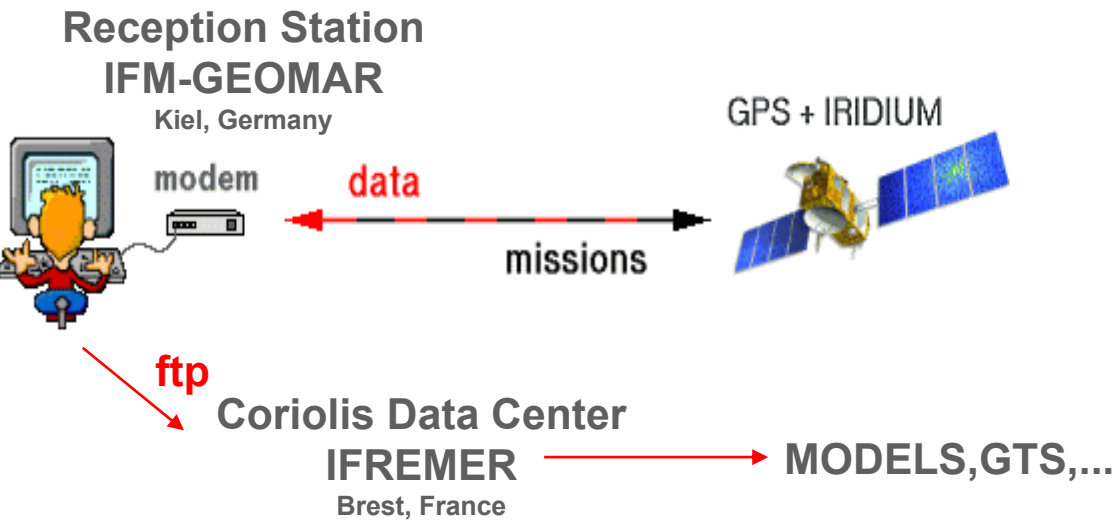


■ SOOP

■ ARGO

■ GLIDER

MOONFLOW: pre-operational GLIDER MONITORING EXPERIMENTS



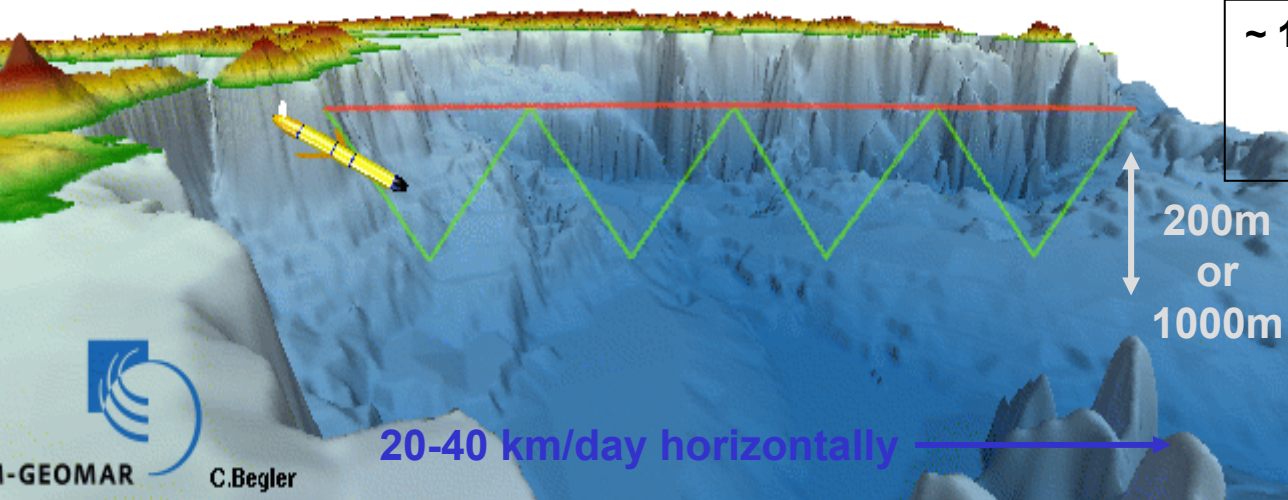
Mission parameters in MFSTEP experiment

angle of ascent/descent = 25°
(minimum energy cost)

surfacing every 4 hours:
8 yos [200m-18m]
or 2 yos [1000-20m] with the deep
prototype

CTD downcasts only
(energy cost)

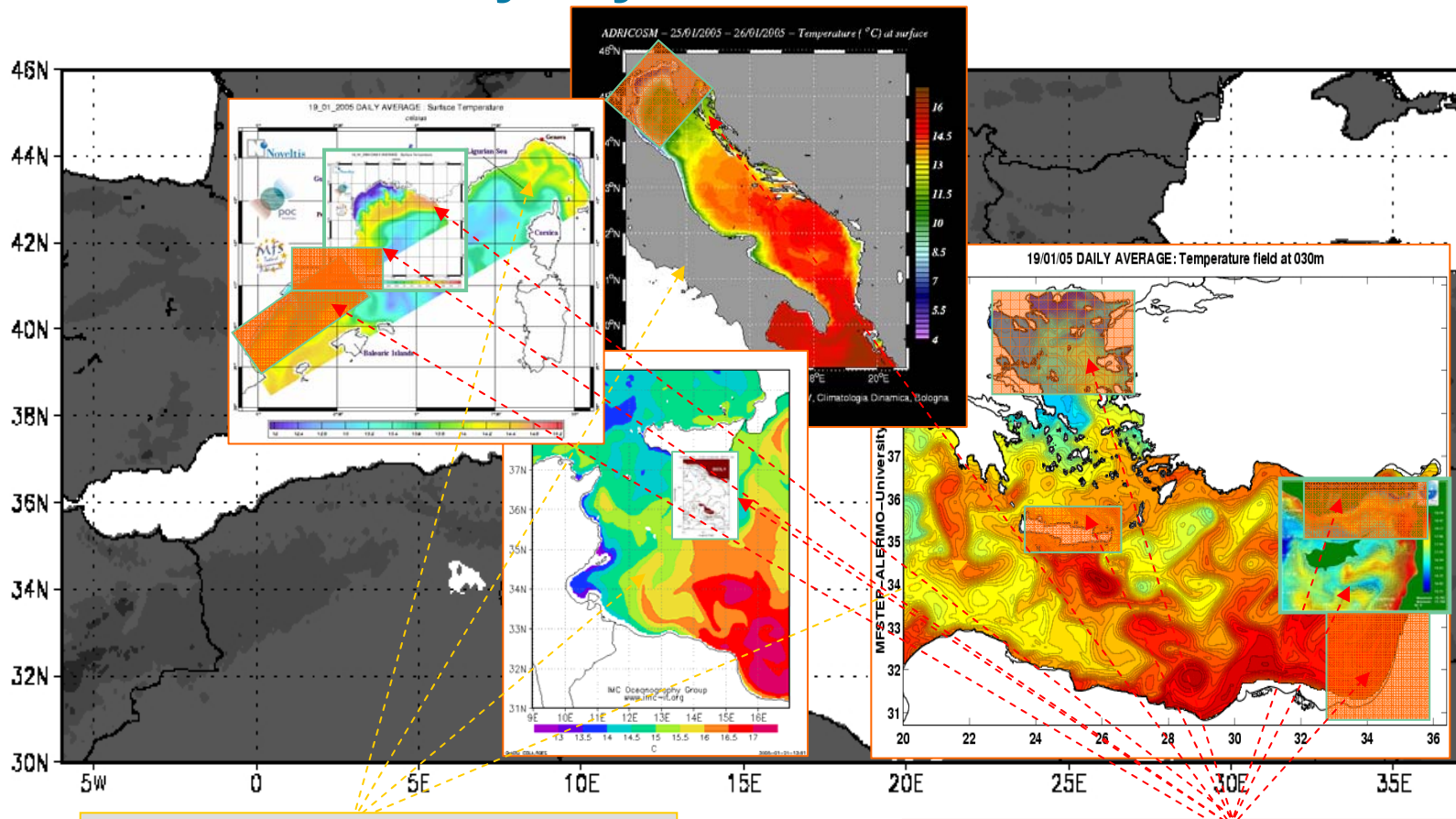
~ 11 minutes at surface
1.5 minutes GPS
8 minutes Iridium
1.5 minutes GPS



MOON now:

The nested sub-regional models

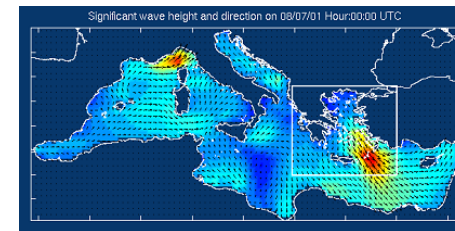
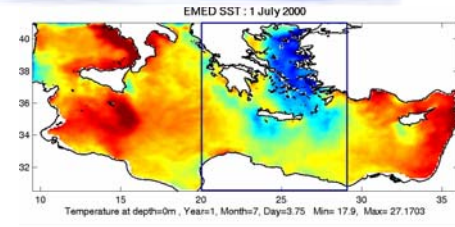
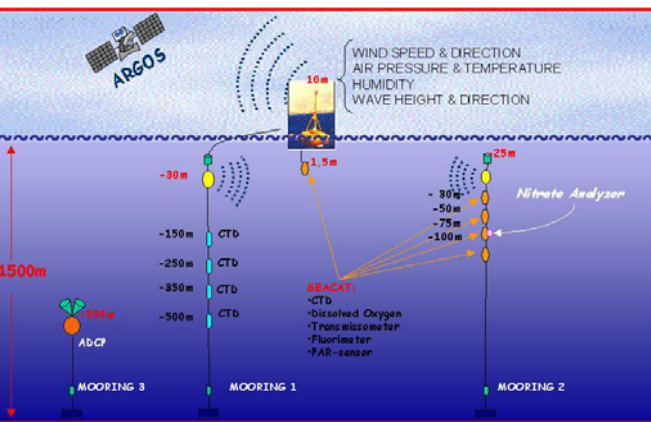
MFS disseminates the daily forecast to 9 nested models every day



Sub-regional models at 3 km

Shelf models at 1-2 km

POSEIDON - the Greek marine observing and forecasting system

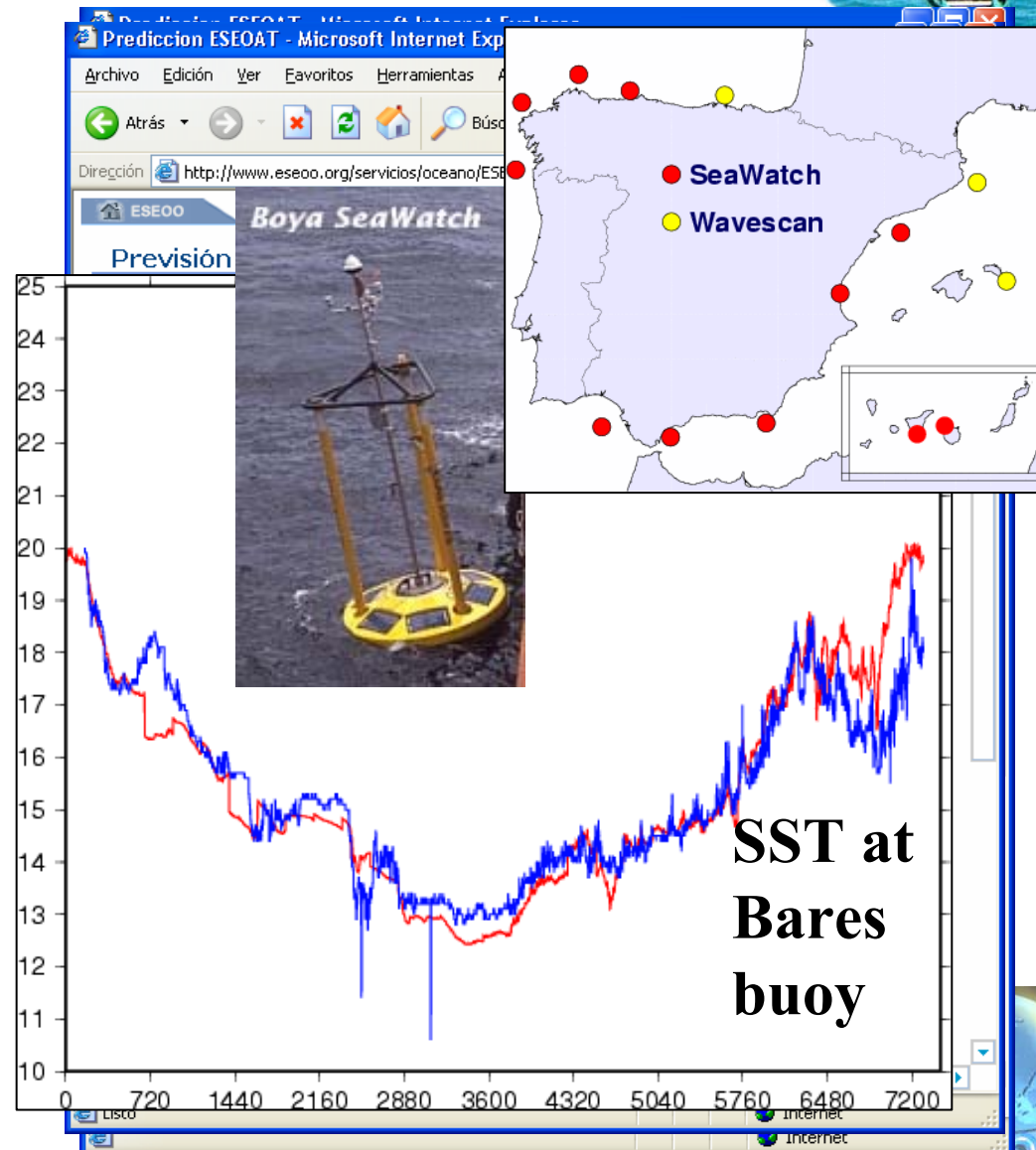


Preliminary results:
Numerical modeling (2)

Operational daily
current forecast
available on the web
<http://www.esooo.org>

Forcings:

- Tides
- Wind
- Atmospheric pressure
- Heat and fresh water fluxes
- River outflow





GOOS What is GOOS ?

Operational Oceanography

What is MedGOOS ?

The MAMA Project



MFSTEP - Ocean forecasting for the Mediterranean

MAMA-NET
Access to ocean data in the Mediterranean

PO UNIT
MFSTEP - Rosa Malta Shelf Mo

ICM - CSIO
Real Time Satellite Maps

Mediterranean WAVE FORECAST

SEA-SEARCH
Online database for oceanographic data holding

www.cape.malta.net

Pondering on the future....

The EU maritime vision is a challenge....

....we need the ink to write it into practice

**....operational oceanography is a key element
to make it a reality**