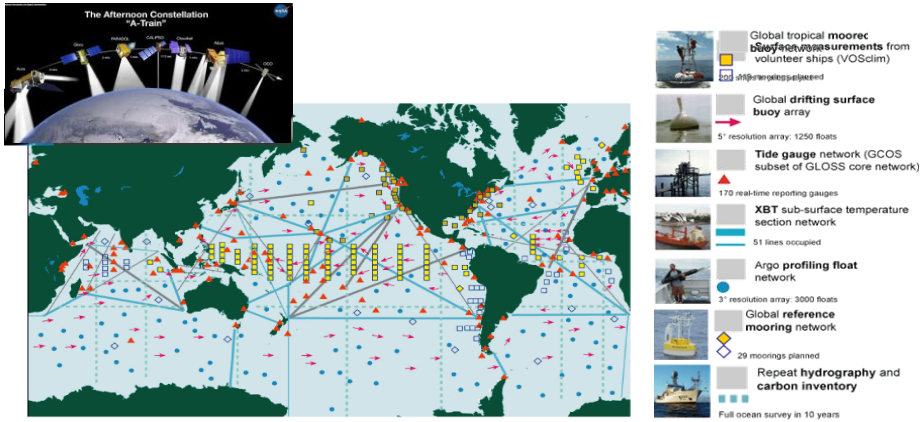
5th EGO "meeting"

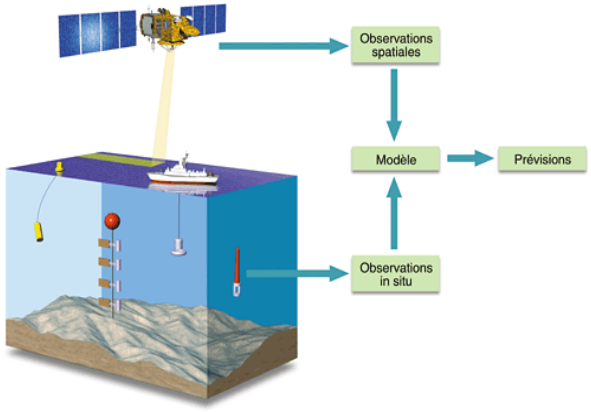
Everyone's Gliding Observatories

Organizational and Scientific Committee

Pierre Testor (LOCEAN), Carlos Barrera (PLOCAN),
Laurent Mortier (ENSTA), Dan Hayes (Univ. of Cyprus), Johannes Karstensen (IFM-GEOMAR), David Smeed (NOCS), Simon Ruiz (CSIC-UIB), Alberto Alvarez , Michel Rixen (NURC), Clayton Jones (Teledyne Webb Research), Rosario Robert (i-Robot), Deanna Abraham (Bluefin Robotics), Justin Manley (Liquid Robotics), Fritz Stahr (Univ. of Washington),
Mónica Ramírez, Darío Sosa, María José Rueda, Josefina Loustau (PLOCAN)

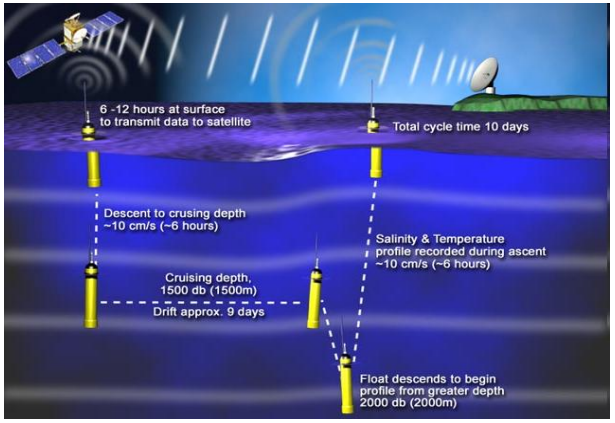
Global ocean observing system: societal needs, climate-oriented (today)





- in-situ system today : profiles T & S [~0-2000m]
- automatic measurements, transmitted in real-time
- « 300km x 300km – 10 days » Argo scale

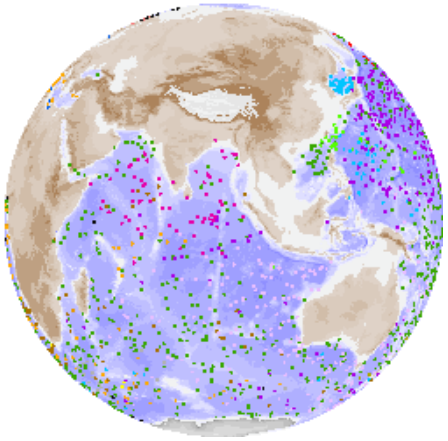
Global numerical models (~6 km res.)
Mercator, MyOcean,…



http://www.argo.net

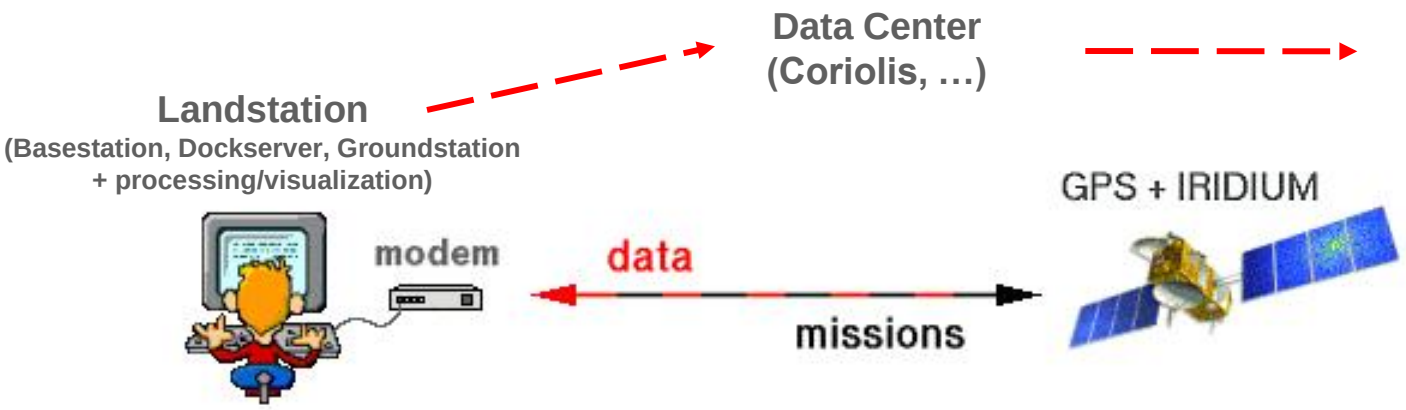
Operational/Academic

Products!

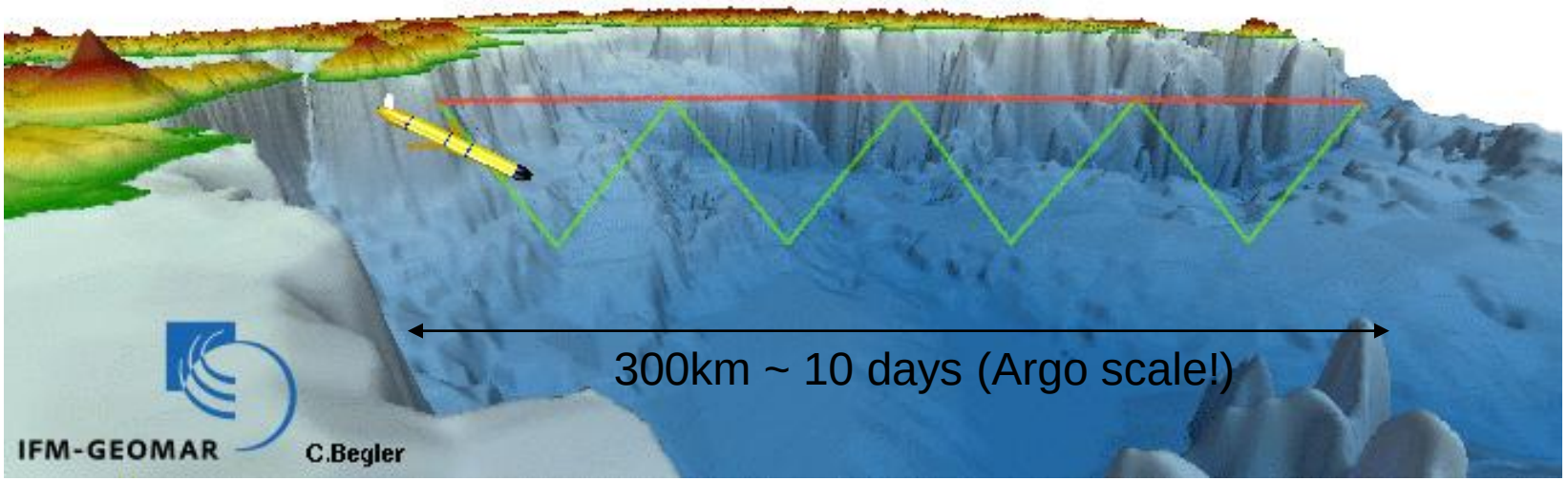


Courtesy of H. Freeland,

Gliders – Autonomous Gliding Underwater Vehicles



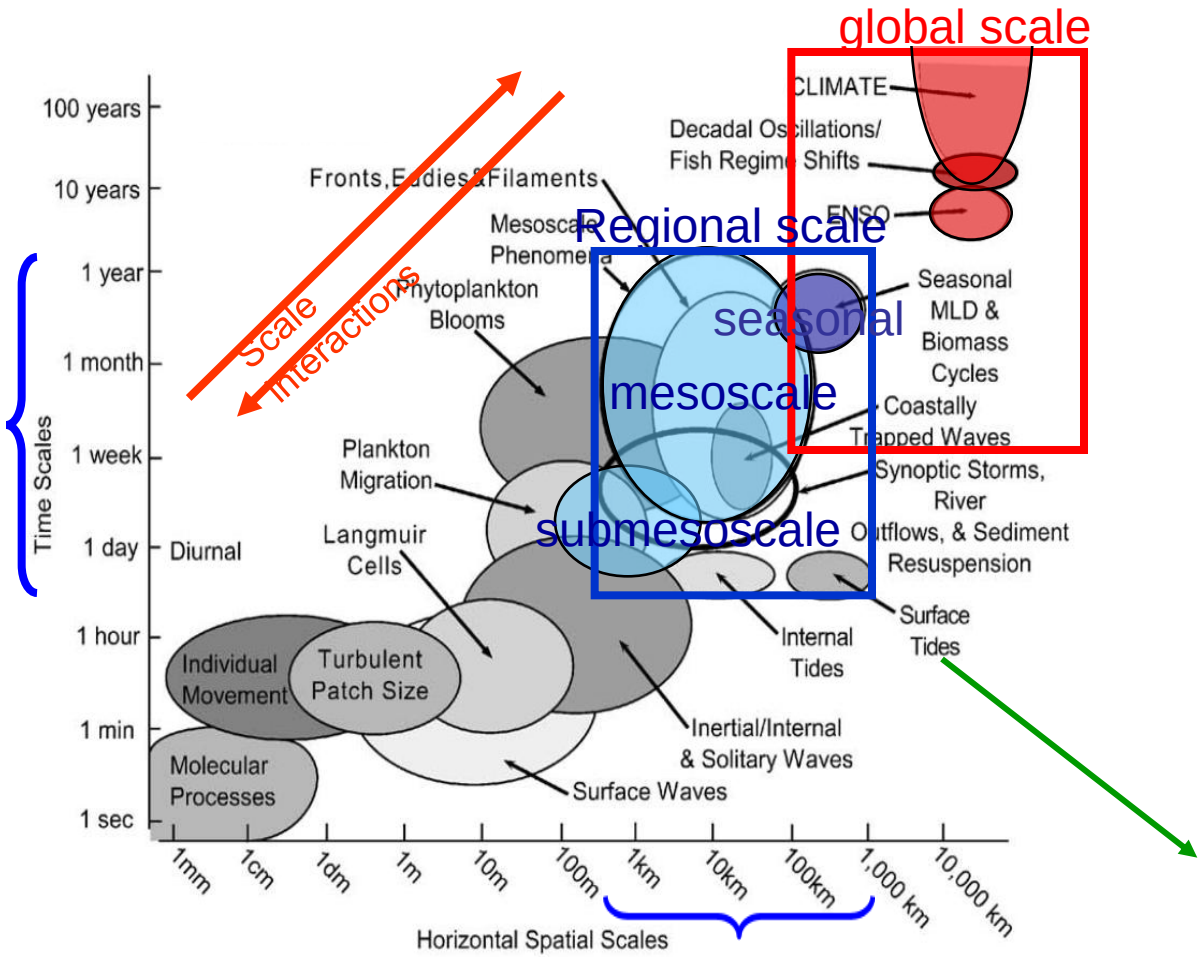
U ~ 20-40 cm/s
W ~ 10-20cm/s



~2-5 km between surfacings

sampling capabilities!!!

A « network » of observation (all plateforms) and new sensors



Processes/Platforms

- physical and biogeochemical variability of the ocean

- Extension of the global system to the regional seas and coastal area

- **Regional and coastal models**

- **Green objectives**

- **End-users (GEO, GMES, MSFD…)**

"Everyone's Gliding Observatories" (USA, Canada, Australia, EU,…)
Glider community: scientific/technical, academics + manufacturers

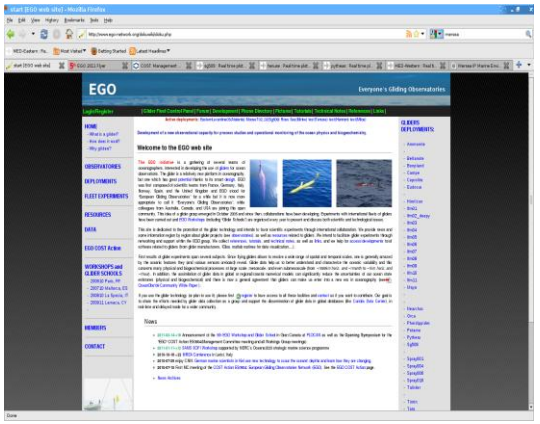
EGO > Development of a new observational capacity for process studies and operational monitoring of the ocean physics and biogeochemistry. :

- **Collection of (a lot of) physical and biogeochemical data for oceanographic research**
- **Share efforts (software/hardware dev., formats/protocols,…) and avoid duplicates**
- **Provide support to all people operating gliders**
- **Coordinate glider (fleet) deployments**
- **Provide glider RT data flow/dissemination and define quality control**
- **Develop glider data analysis and data assimilation procedures/tools (research & operational)**

"Everyone's Gliding Observatories" (USA, Canada, Australia, EU,…)
Glider community: scientific/technical, academics + manufacturers

- **EGO meetings and Glider Schools (~yearly since 2005)**

- **Showcase WWW site** →



http://www.ego-network.org/

Links (!)

News, Forum, References,

Technical notes, Tutorials, Web tools,…

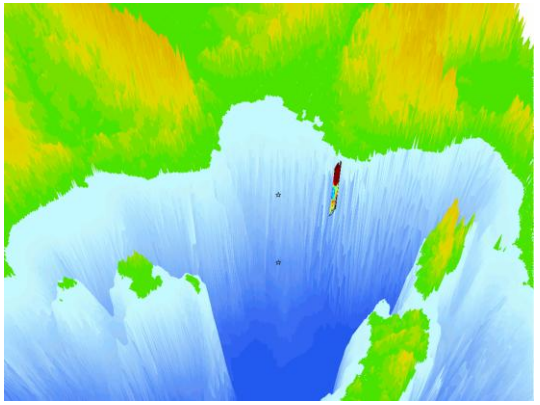
Register!!!

Contribute!!!

Single portal?

- **Coordination of some international experiments with fleets of gliders**

Ex: ego2008



- **OceanObs'09 Community White Paper**

Global Ocean Observing System (next decade)

Testor P. and 43 co-authors, (2010): gliders as a component of future observing systems consensus building in the context of the global ocean observation

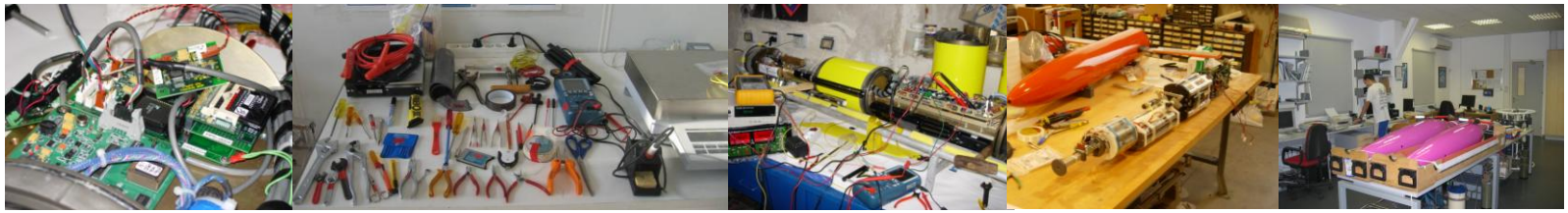
"Everyone's Gliding Observatories" (USA, Canada, Australia, EU,…)
Glider community: scientific/technical, academics + manufacturers

- **EGO workshops and Glider Schools (~yearly since 2005)**

0th EGO Workshop, *Palma de Mallorca, Spain*, **Oct 2005**, ~12 pers
1st EGO Workshop, *Paris, France,* **Oct 2006**. ~20 pers
2nd EGO Workshop and Glider School, *Palma de Mallorca, Spain,* **Oct 2007**. ~40 pers
3rd EGO Workshop and Glider School, *La Spezia, Italy,* **Oct 2008**. ~90 pers
4th EGO Workshop and Glider School, *Larnaca, Cyprus,* **Nov 2009**. ~80 pers
5th EGO Workshop and Glider School, *Telde, Gran Canaria, Spain,* **Mar 2011**. ~100 pers
6th how? where? when?
(…)

Glider school : 'ONLY' an overview of the glider technology,
aims to favour exchanges between glider manufacturers and users

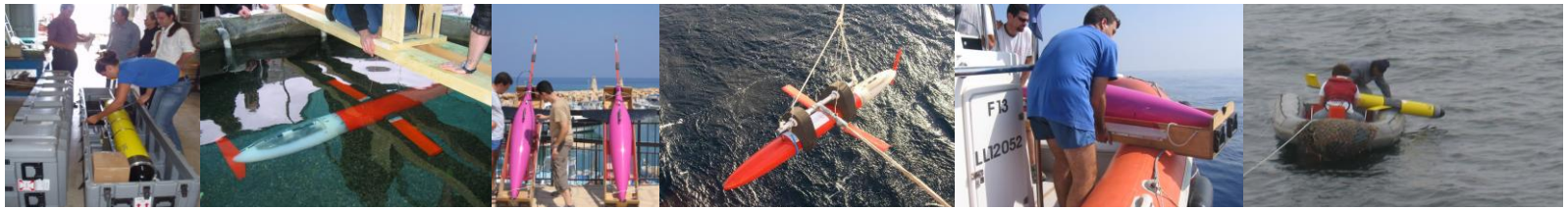
Workshop : meeting to favour scientific interactions
and organize/coordinate the glider community



- **5th EGO meeting**

5 sessions:

- **TOPIC1: Support for glider deployments and data dissemination**
- **TOPIC2: Glider vehicle, sensors, and "gliderports" infrastructures**
- **TOPIC3: Piloting gliders and artificial intelligence**
- **TOPIC4: Networks, links with the other observing systems and OSSEs**
- **TOPIC5: High resolution 4D oceanic measurements by gliders and process studies**



- **COST (COordination S/T) Action ES0904 “gliders”**

started in July 2010 and supports this symposium as a coordination/networking activity for developing the glider system

- **WG1: Support for glider deployments and data dissemination** The definition of operating data flow system (agreed protocols), to deliver all of the glider network's data in NRT and delayed mode (ARGO Data Management Systems?). The definition of an international infrastructure (steering team, technical coordinators, data managers, etc) to develop the community consensus, to oversee the planning and implementation of the network and its data system

- **WG2: Glider vehicle, sensors, and “gliderports” infrastructures** Investigations on the technical developments possible for the existing platforms as well as fully new gliding vehicles. Be active as available scientific and technical expertise and in assessing the usefulness and implementation of new developments. Recommendations for “gliderports” where the technical skills are available – to conduct specific actions. Survey concerning existing oceanographic sensors applicable for gliders will also be performed.

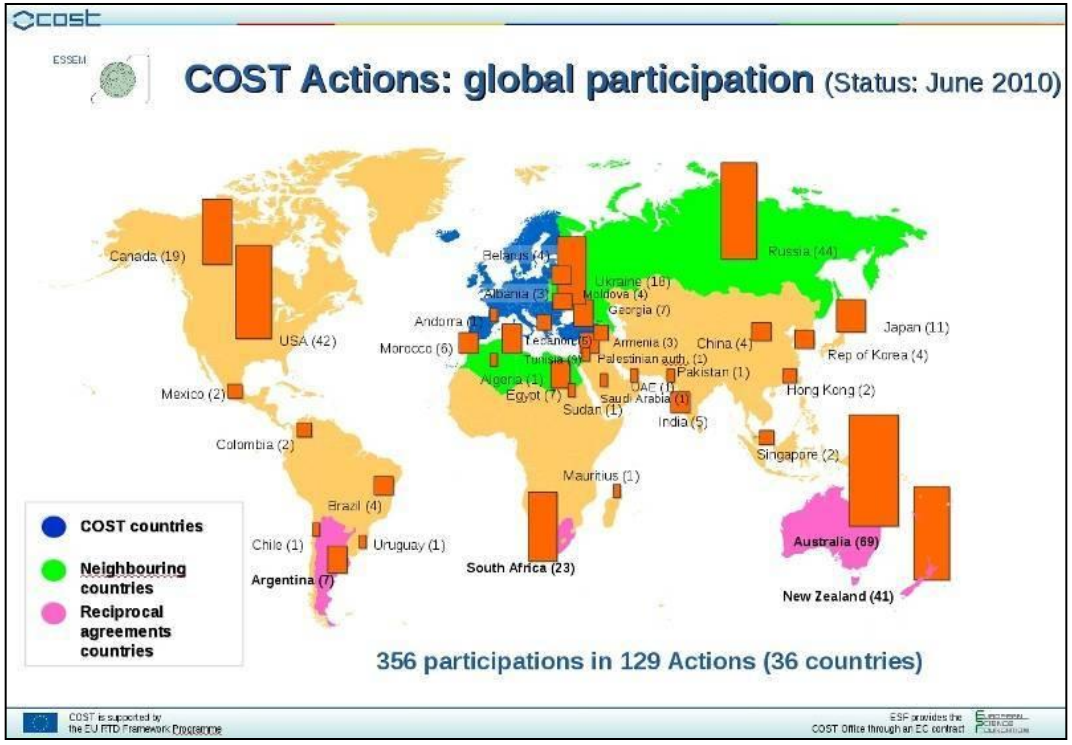
- **WG3: Piloting gliders and artificial intelligence** control of the gliders via the Internet from all over the world through the main “gliderport” piloting infrastructure is essential. This will be feasible only with easy and ergonomic access to piloting facilities, auto-pilot systems, flight control systems, automated fault diagnosis and environment information systems. Automation to ease the final decision-making by the human pilots is central.

- **WG4: Networks, links with the other observing systems and OSSEs** “how gliders can be optimally combined with other observing systems ?” answer needs to be provided by a global community consensus. OSSEs and “network design” methodologies will assess the feasibility and optimality of the possible configurations.

- **WG5: High resolution 4D oceanic measurements by gliders and process studies** how to conduct fields operations with (fleets of) gliders to gather detailed and accurate 4D oceanic data sets related to different specific research requirements. Of particular interest here are the large trans-oceanic sections or boundary current sections for large scale or regional budgets as well as the investigation of mesoscale and submesoscale phenomena in specific areas. Link to WG3, includes adaptive sampling techniques together with associated data analysis tools. Link to WG4 operational modelling.

- **COST is good!**
  - **- funded by ESF**
  - **- aims to build international programs**
  - **- good visibility for policy makers**
  - **- scientific/legal framework for international S/T coordination (COST rules)**

Aims to grow !
coordination effort



Members:

1) COST countries

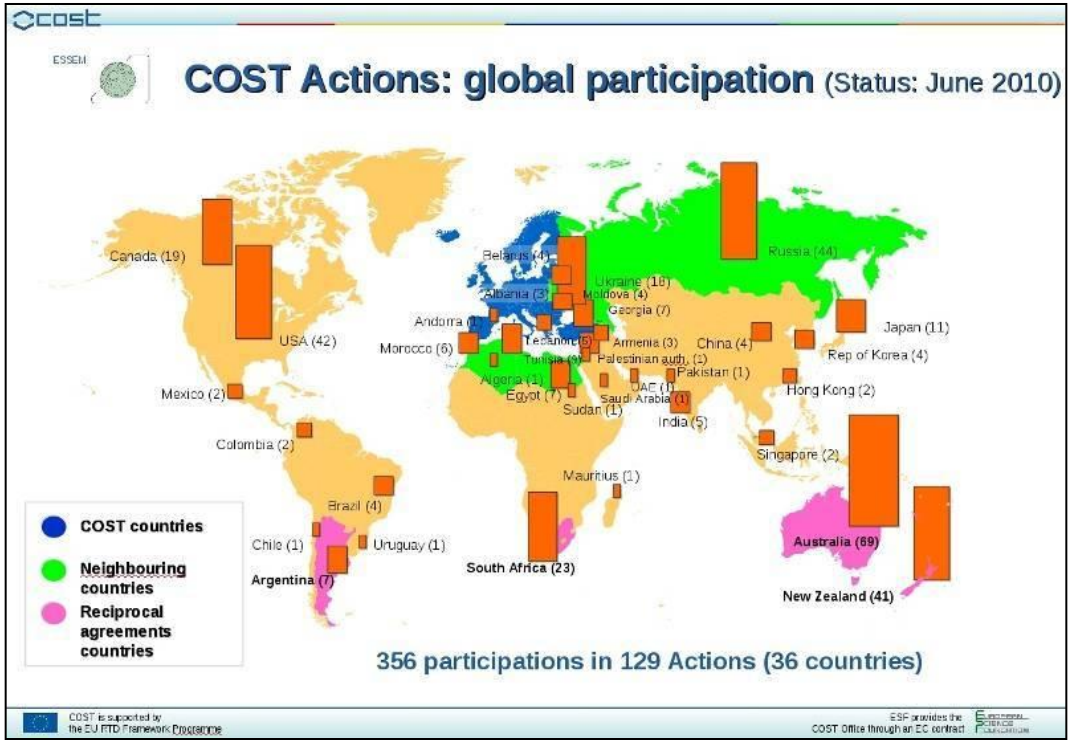
2) non-COST countries

- **Neighbouring countries**
- **Reciprocal agreement countries**
- **Other countries**
  (institutional level)

Budget varies according to the number of participants ~ 50-100 KE/year, 3 years

Representatives in the Management Committee (MC)

- **COST Action Tools:**
  - **organize meetings for MC and WGs**
  - **STSMs (Short Term Scientific Missions) : 5 days -> 6 months**
  - **training**
  - **publications**



ES0904 Action started in July 2010
Already 15 countries (Belgium, Cyprus, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Norway, Portugal, Spain, Sweden, United Kingdom) + South Africa, Egypt, Chile, Australia, Saudi, …

In order to join:

1) **letter of intent to join the Action or contact your COST contact to the Chair of the Action**

2) **Acceptance by the MC, and COST Senior Scientist Committee, etc …**

3) **Signature of the MoU (at the country/institutional level)**

See http://www.ego-network.org

- **COST (COordination S/T) Action ES0904 “gliders”**

  avoid fragmentation

  - **WG1: Support for glider deployments and data dissemination**
  - **WG2: Glider vehicle, sensors, and “gliderports” infrastructures**
  - **WG3: Piloting gliders and artificial intelligence**
  - **WG4: Networks, links with the other observing systems and OSSEs**
  - **WG5: High resolution 4D oceanic measurements by gliders and process studies**

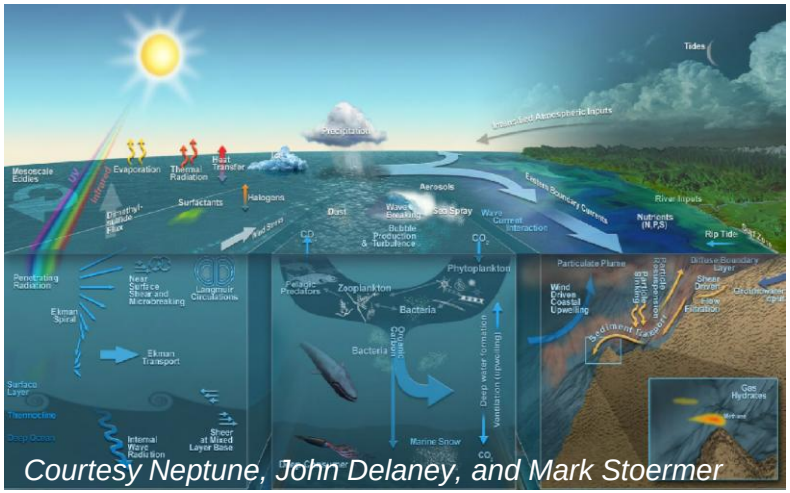
- **EU-FP7 design study GROOM (?)**

  International Research Infrastructure ???

  Useful ? How ? (scientific/technical/organizational**)**

- **5th EGO Workshop and Glider School**

  a unique opportunity
  to make real progress on all these topics
  with benefits for the whole glider community



Courtesy Neptune, John Delaney, and Mark Stoermer

The ocean: how does it work ?

physical, biogeochemical, and biological aspects

Are “gliders” the right tools/platforms to address that?

Yes (not the only ones), if deployed in sufficient numbers,
synergy with the other components of the global observing system

There is a big potential but we have to expand our EGOs ;-)

convince the (extended) oceanographic community and beyond
not miss the GMES/GEO opportunity (2014)

1) **Scientific publications (!)**

growing number, need for more and more

2) **Coordination of scientific and technological efforts,**

definition of common scientific objectives, projects, implementation plans

3) **Harmonized data flow to data centers for wide dissemination and valorization**

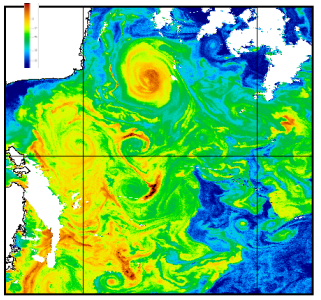
the global picture, glider data used by the modeling community, operational context

4) **Sustained observations: a network of ~20(?) endurance lines (useful/visible at global scale)**

where? how? …
transoceanic transects, coastal/regional oceanography,
local/national/regional/international infrastructures

5) **Demonstrations: multi-institute (heterogeneous) fleet experiments**

research (ex: what about 100 gliders sampling an eddy and its submesoscale structure?),
contingency plans (deepwater horizon), yearly exercices (?)



PLEASE FEEL/GET INVOLVED

&

ENJOY THE MEETING