



**NURC** - Partnering for Maritime Innovation



# *Glider Command and Control Centre*

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# Introduction

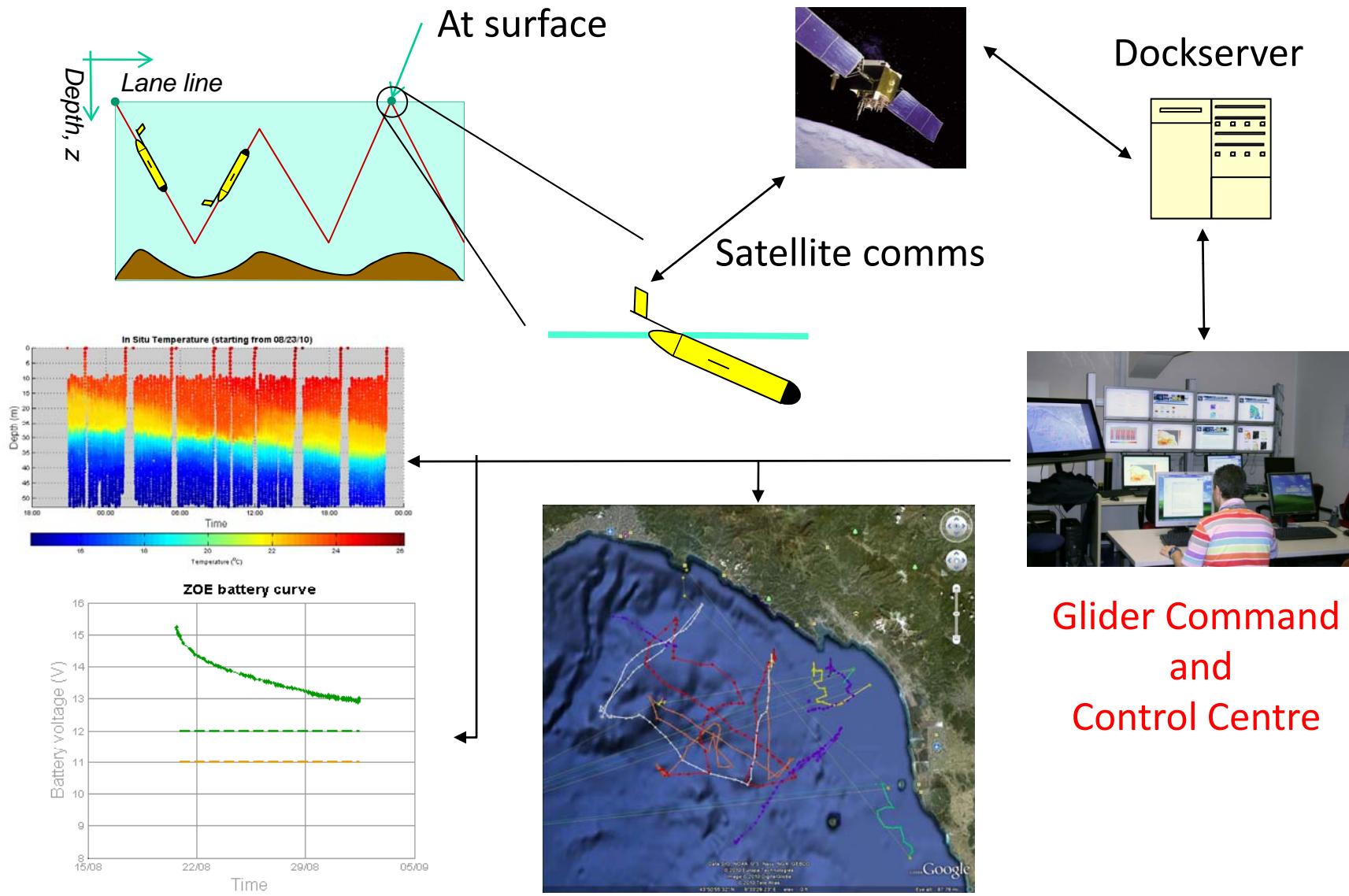


- Autonomous underwater gliders are ready for extensive oceanographic data collection
- A control centre is crucial to operate a fleet of vehicles
- Information centralization
- Near real time data processing
- Results distribution
- Provide aiding tools to pilots and decision makers





# Workflow

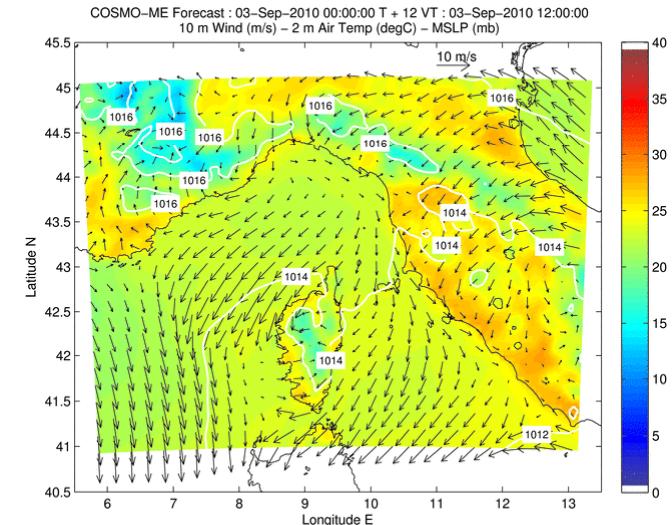
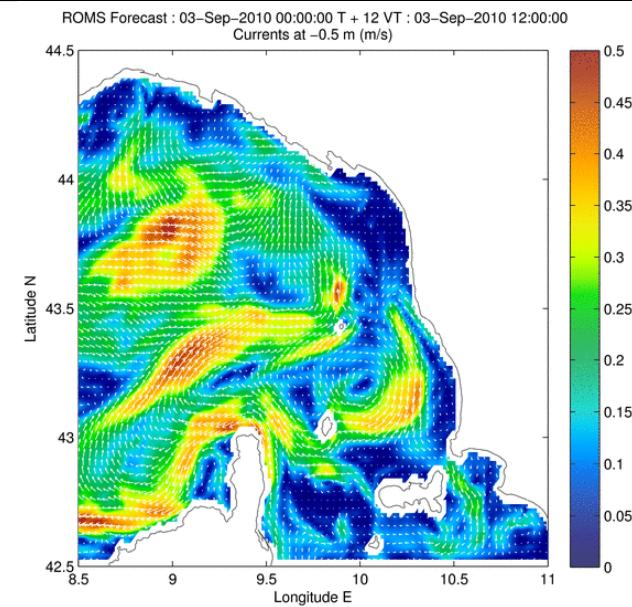
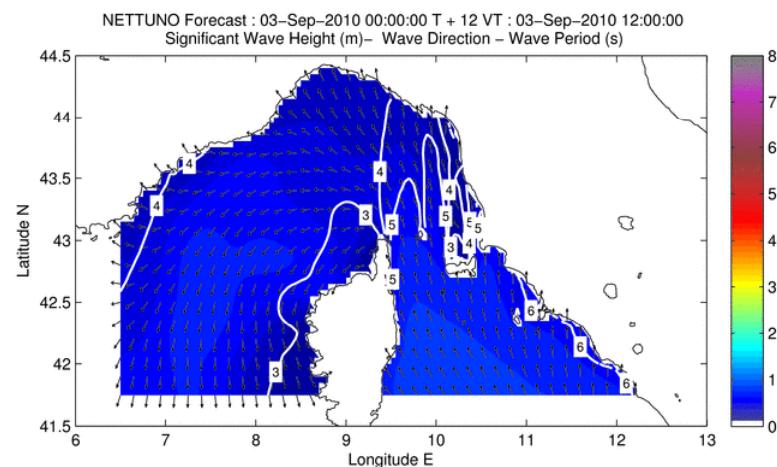
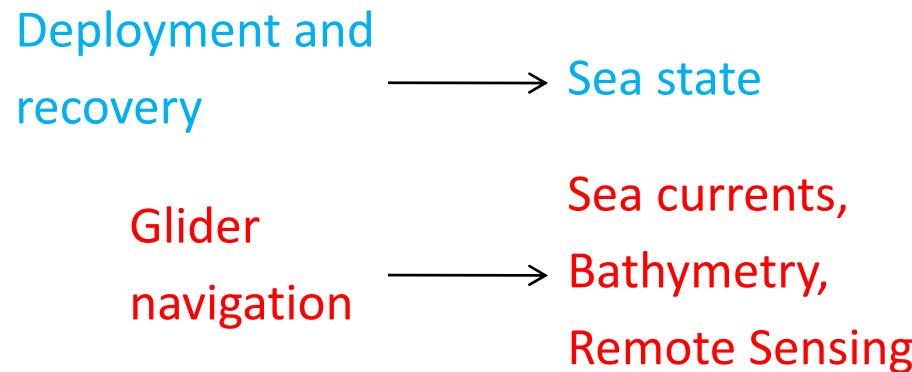




# Environment and forecasts



Glider operations are heavily affected by environmental conditions

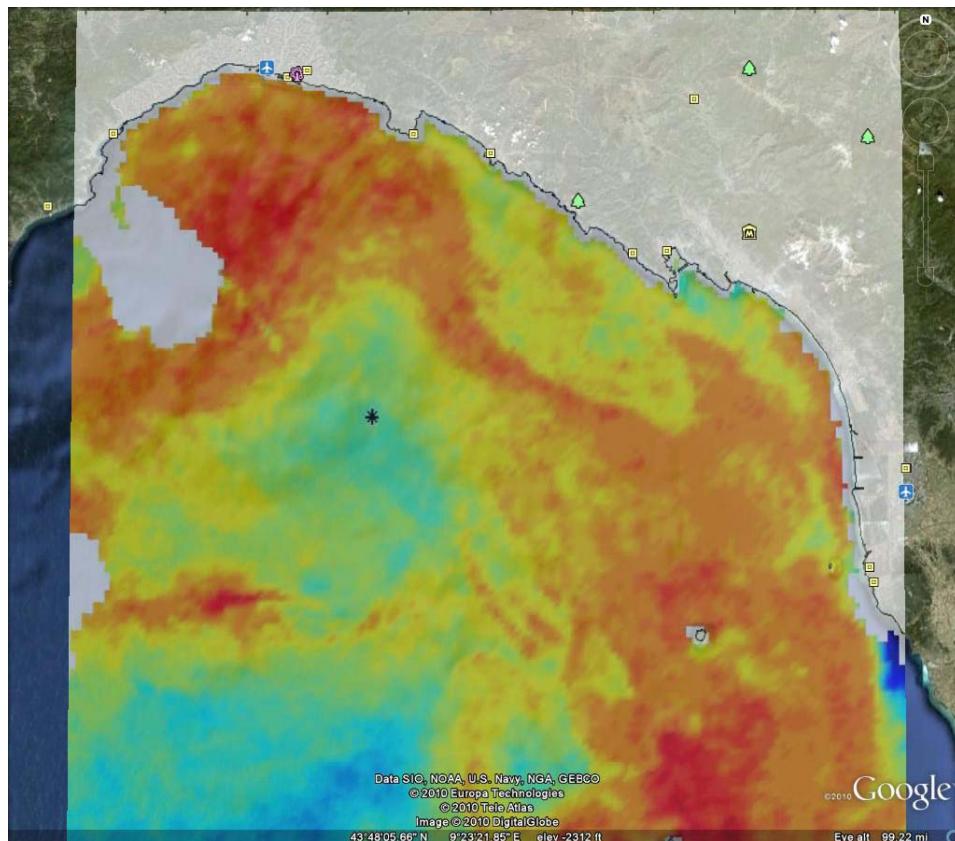




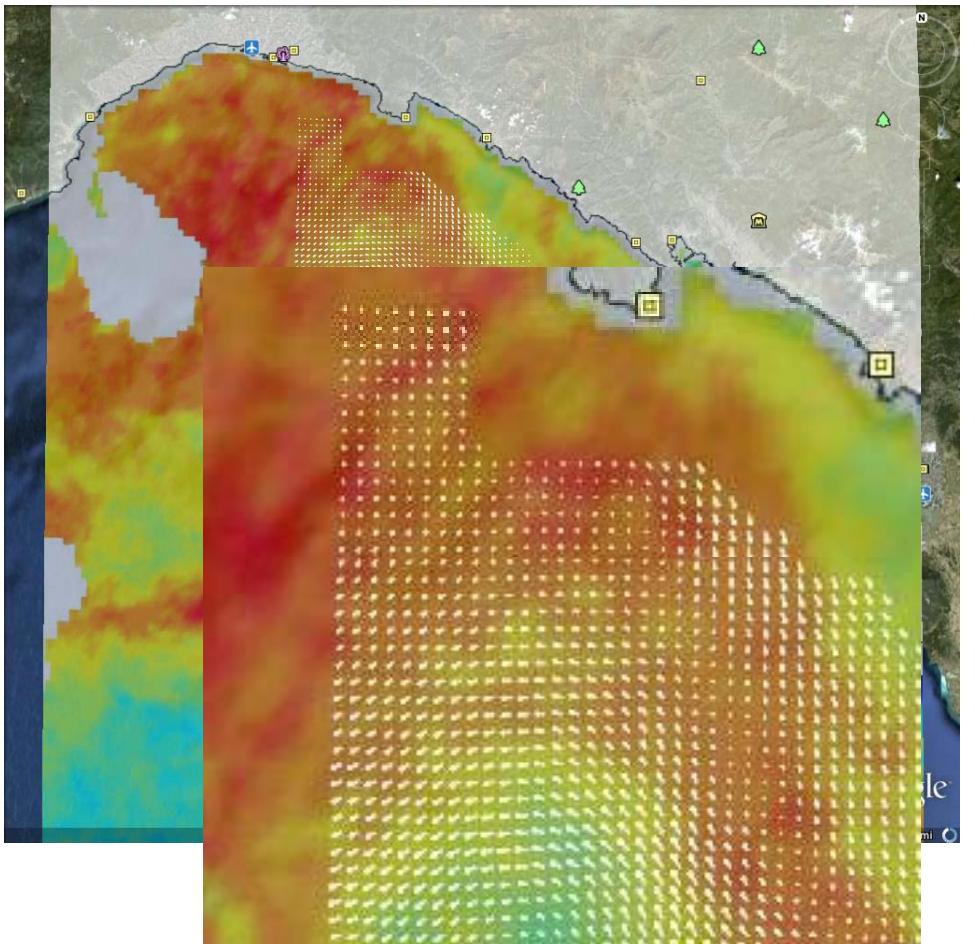
# Remote sensing



Sea Surface Temperature (SST)



Gradient of SST

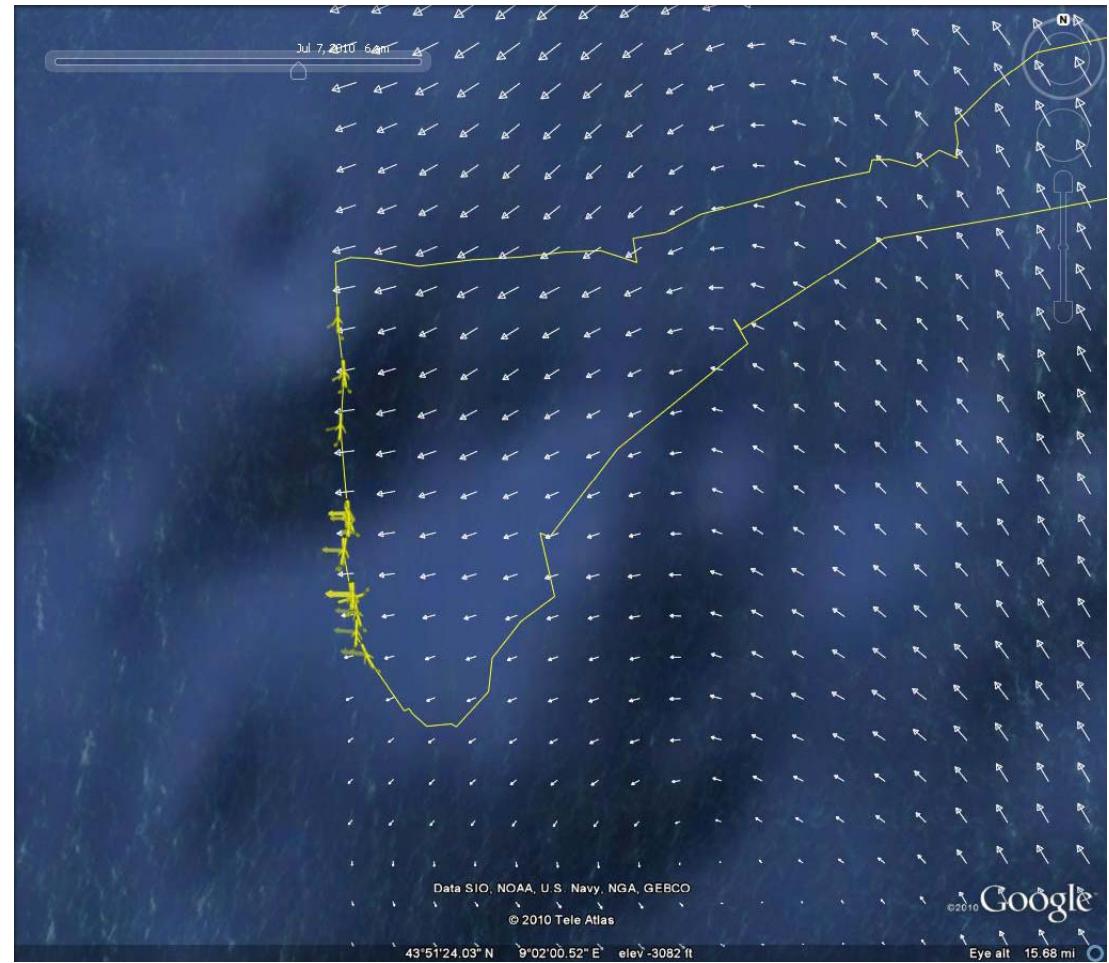




# Operational use



During our main engineering test in 2010, sea current estimation from SST has been used to pilot a glider inside an adverse current field

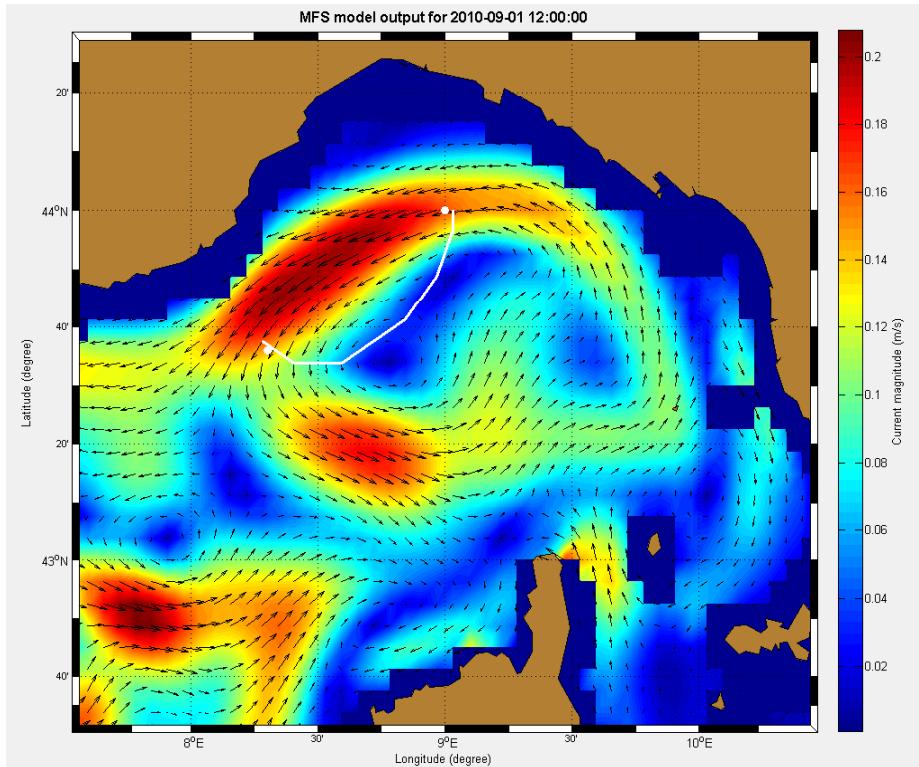
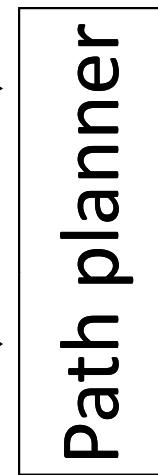




# Path planning



Current field  
Desired destination



Should the glider find itself in a strong current field, the planner helps find a trajectory that avoids fighting directly against the current

Waypoint list

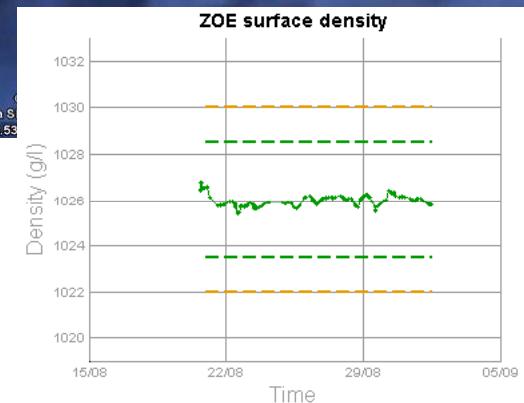
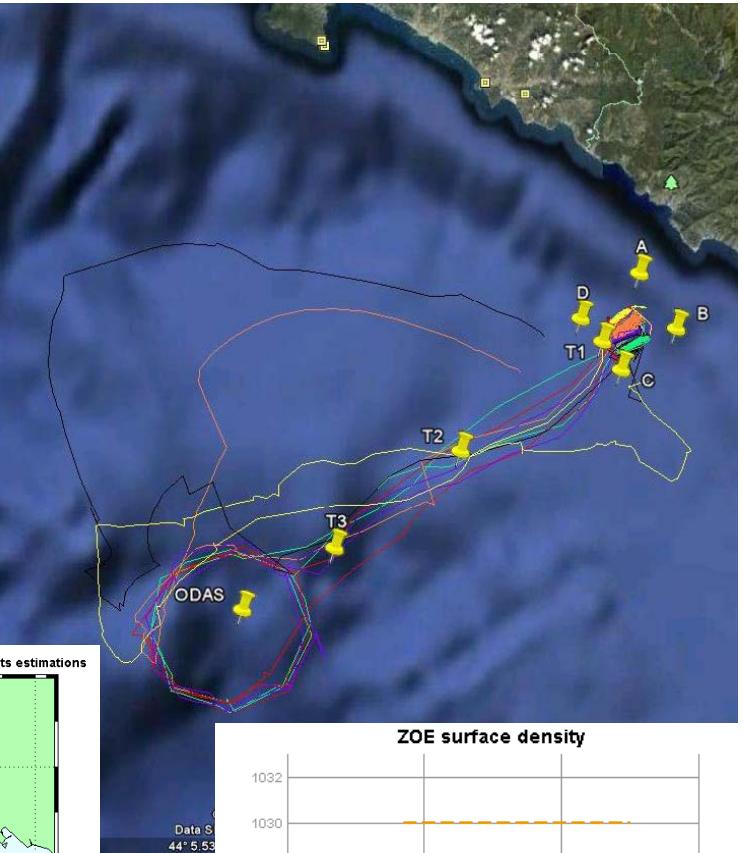
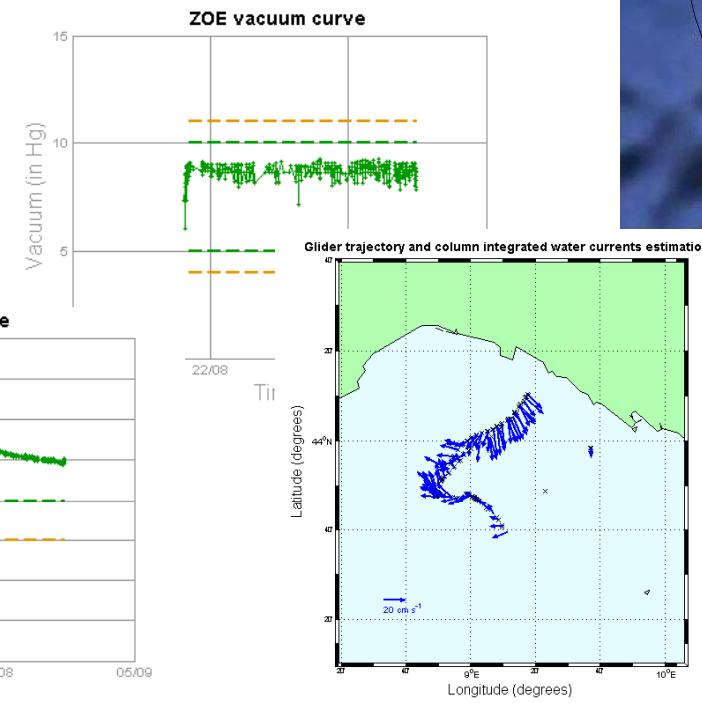
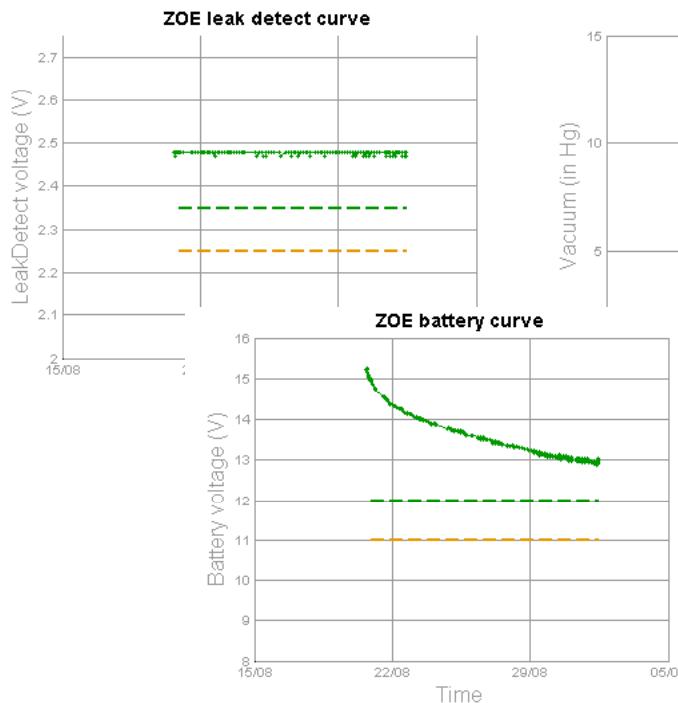


# Glider monitoring



Every time a glider surfaces:

- glider positions and estimated sea current are updated
- glider status plots are generated
- if requested, scientific and engineering data files are downloaded

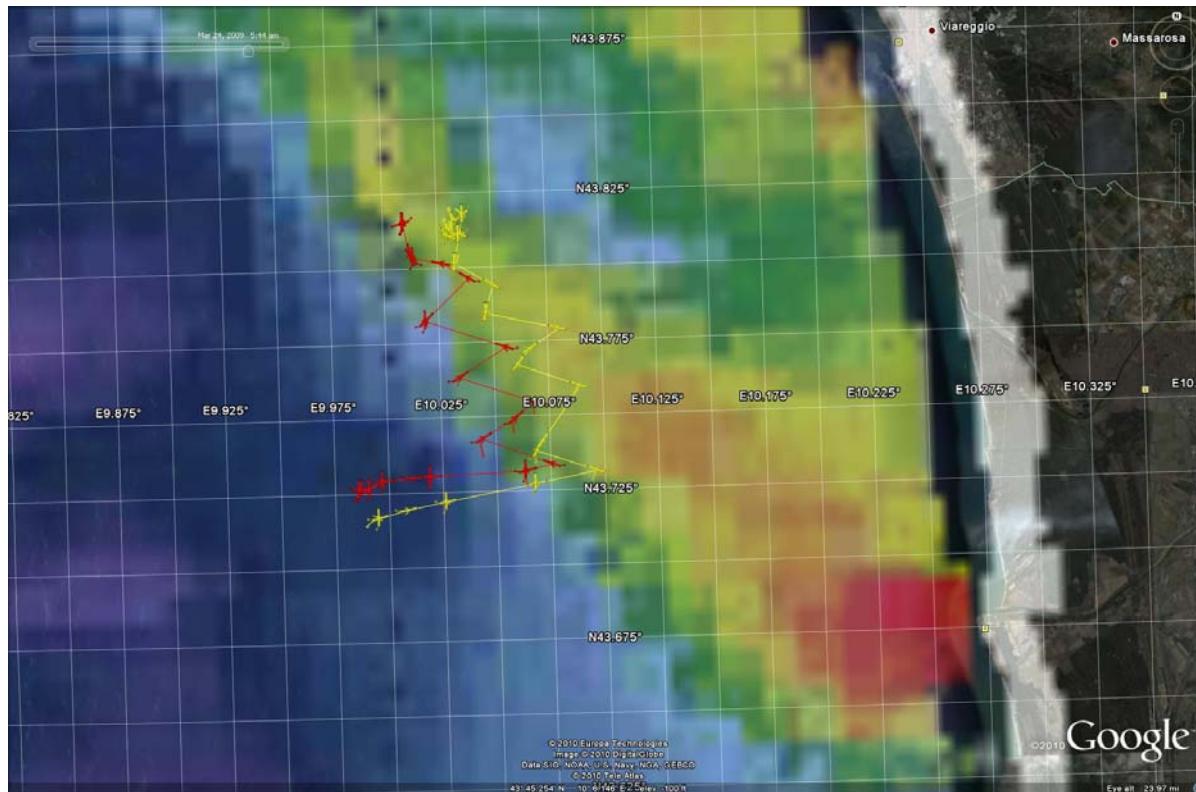




# Support for mission design



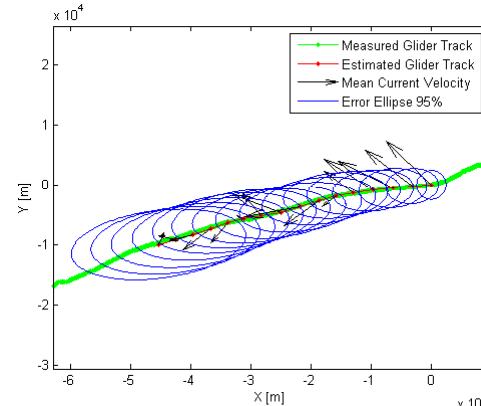
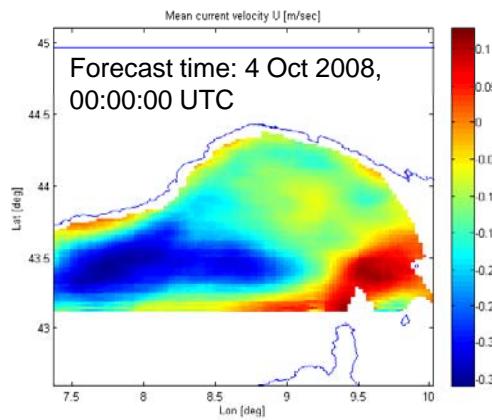
Every time a glider surfaces the mission parameters may be updated due to scientific or engineering needs



- Waypoints list
- Longitudinal behavior
- Data download
- Surfacing interval



# Support for piloting



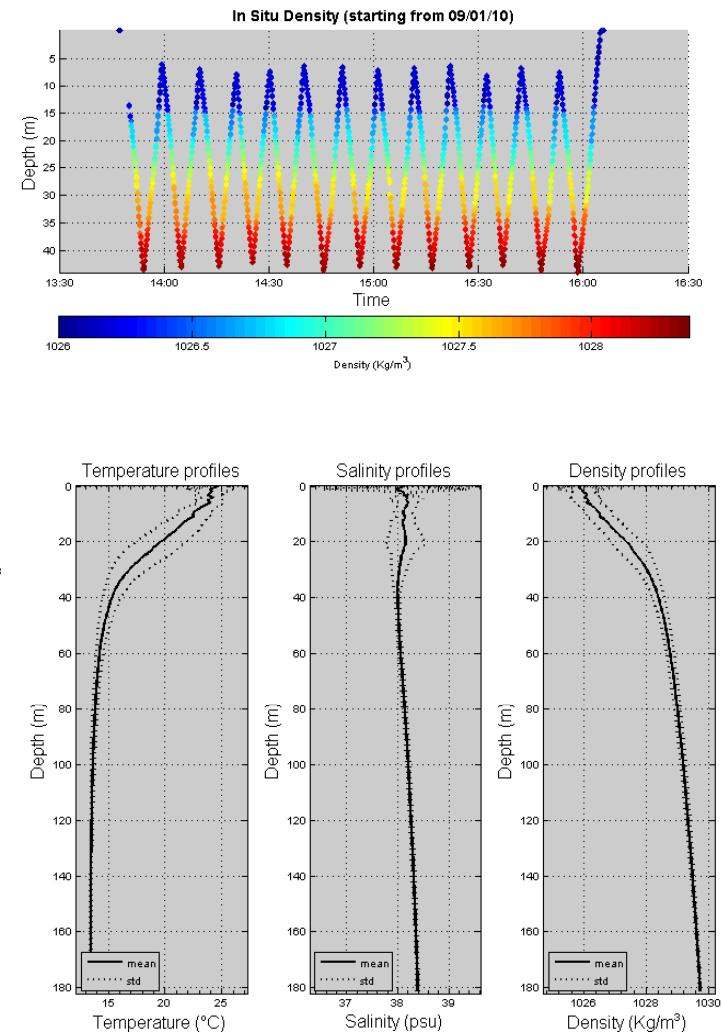
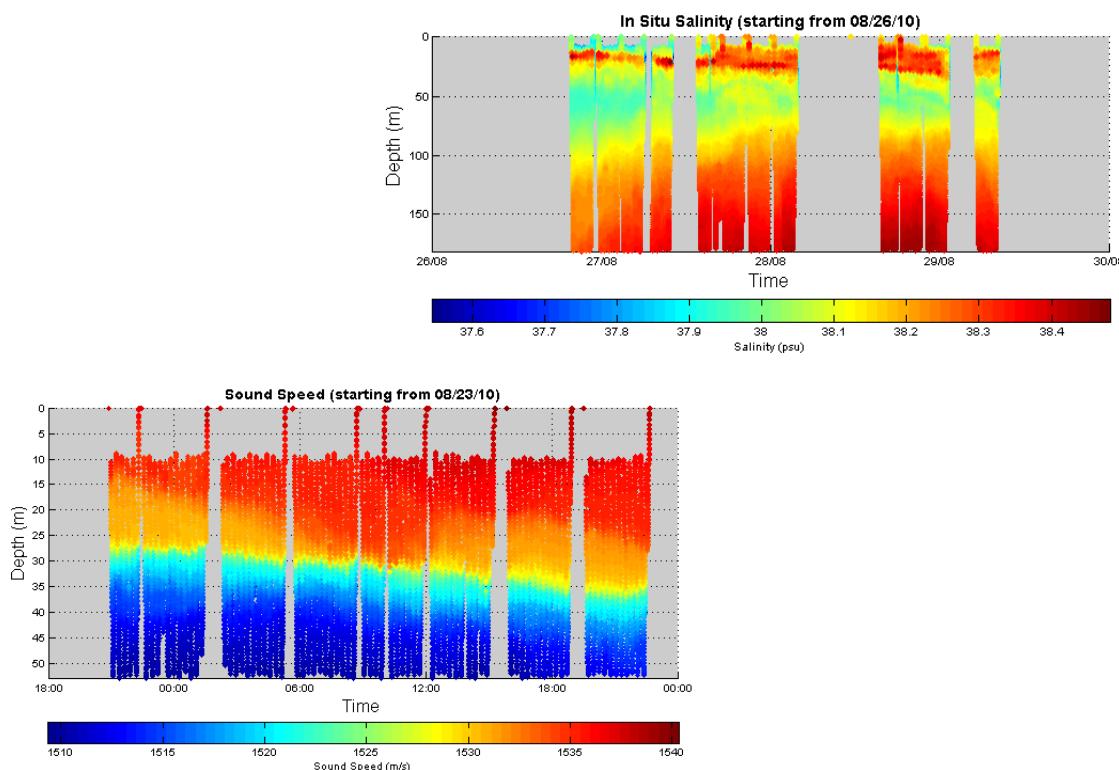
- Decision Support System: glider track prediction based on environmental models
- Glider Simulator: to test new missions and correctness of modifications
- Automated generation of vehicles' logs and email with last Known fleet status



# Scientific data preview



- Scientific data downloaded during the mission are processed in near real-time and displayed for quick visual inspection





## *Future developments*



- Improve automated data processing delivering more products (plots, processed data)
- Improve pilot's aiding tools (Decision support)
- Introduce an automated system for data quality control:
  - mark data that do not satisfy requested criteria producing a referenced list
  - exclude that data from real time visualization

