Trans-National Access

Expanding glider monitoring and facilitating external access to glider platforms

1. JERICO-NEXT and the TNA Program

The objective of the European project JERICO-NEXT, continuing the work of JERICO (FP7), is to strengthen and enlarge a solid and transparent European coastal ocean observing network, providing operational services for a timely, continuous and sustainable delivery of high quality marine data in European coastal seas. The JERICO-NEXT consortium concentrates efforts in **3 coordinated activities: Networking Activities (NA), Joint Research Activities (JRA) and Trans National Access (TNA)**.

The TNA Program offers coordinated 'free of charge' access to original coastal ocean observing infrastructure not available in the applicants country. As part of this program, gliders operated by both **SOCIB** and **CNRS** are made available for external researchers to operate glider missions in Europe. The service includes the gliders preparation, piloting, field operations and communications, as well as data processing and delivery. Application is via calls, and proposals are competitively assessed on their feasibility and merit. It is open to EU and other countries with a common regional interest (South Mediterranean, Black Sea, Baltic Sea).

TNA access contributes to (1) building a long-term collaboration between users and JERICO partners, facilitating staff exchange and scientific cooperation; (2) building a European capacity for science dedicated to innovation (new sensors, new automated platforms), and (3) promoting the infrastructure by transferring know-how from the partners to users, with a view to future expansion that will include new partners (possibly also from non-European countries).

2. SOCIB and CNRS-DT INSU glider facilities involved in TNA

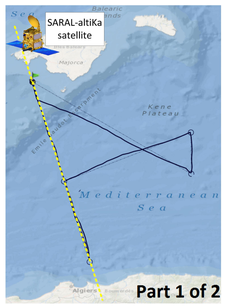
	SOCIB	CNRS – DT INSU
Founded	2011	2008
Location	Mallorca - Spain	La Seyne sur mer - France
Team	2 full-time engineers 1 full-time technician 1 part-time scientist	3 full-time engineers 1 full-time technician 1 part-time technician (IFREMER)
Fleet	3 SLOCUM G1 (1000m & 200m) 4 SLOCUM G2 (1000m) 2 iRobot SEA-GLIDERS (1000m)	4 SLOCUM G1 (1000m) 2 SLOCUM G2 (200m) 1 SPRAY (1000 m) 1 iRobot SEA-GLIDER (1000 m)
Operational Statistics	1161 days in water – 57 missions	4314 days in water – 134 missions
Specific Facilities	▪ 3-workbench (15m2) Glider Laboratory ▪ 4000L seawater ballasting tank ▪ 120-bar pressure testing facility (fits a fully assembled glider and allows glider-ON inside) ▪ 9-m professional workboat (max. distance to shore 60Nm; optimized for Glider operation) ▪ Professional tubular-heavy-load shelf for storage ▪ Dedicated capacity at SOCIB's Data-Center ▪ Access to SOCIB's R/V Catamaran	▪ 2-workbench (18m2) Glider Laboratory ▪ 3m x 3m x 2 m freshwater ballasting tank ▪ 5m-depth seawater pool for pre-mission testing ▪ Salt water bath and bench for CTD control ▪ Access to CNRS and IFREMER coastal vessels ▪ Specialized CNRS shipping service for worldwide operations
Sensors	Sensor 1: CTD — Variables: temperature, conductivity & pressure Sensor 2: FLNTU — Variables: fluorescence & turbidity Sensor 3: OPTODE — Variable: dissolved oxygen	

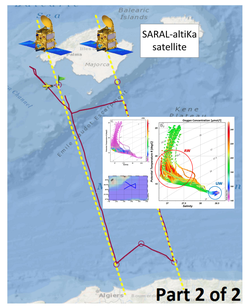
SOCIB specific facilities: a) SLOCUM glider b) Seaglider, c) glider laboratory, d) ballasting tank, e) pressure testing facility, f) workboat, g) compass calibration frame

CNRS specific facilities: a) glider laboratory, b+d) salt water bath for CTD control, c) compass calibration frame, d) ballasting tank, f) seawater pool g) « Pelagia » workboat

3. Previous JERICO TNA deployments

➢ **ABACUS: TNA SOCIB & IMEDEA PI: Dr. Yuri Cotroneo & Dr. Giuseppe Aulicino / Parthenope (Naples, Italy)**

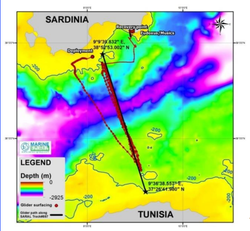


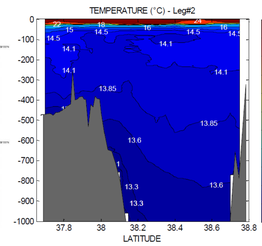


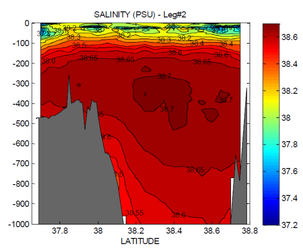
The ABACUS mission was implemented by 2 independent deployments of a SOCIB deep water SLOCUM G2 glider in 2014: Part 1 (15/09-20/10 2014) & Part 2 (18/11-19/12 2014). The mission objectives were were: (a) Undertake 1 glider transect coincident with the SARAL-altiKa satellite-swath #773 and (b) Sample Algerian eddies, the glider flight path was adjusted in real-time to achieve this and a "butterfly" shaped eddy-sampling route undertaken for Part 1, and (c) Undertake 2 glider transects over SARAL-altiKa swaths #773 and #32 for Part 2.

Y. Cotroneo & G. Aulicino: "*In situ data collection was supported by continuous monitoring of remotely sensed data from different platforms (AVISO, SST, Chl-a). Combining the use of AUV observations and remote sensing data, the structure of a mesoscale eddy in the Algerian Basin has been analyzed. Multi-platform data allowed to describe the eddy track from its origin to its last recorded position and highlighted the effect of the associated dynamics on biochemistry and chlorophyll concentration patterns. Thermohaline characteristics of water masses trapped in the eddy coincide with temperature and salinity data observed in the southern part of the Algerian Basin, thus confirming the origin of the eddy from the AC. The surface layer of the eddy is occupied by AW, while intermediate layers are characterized by the presence of LIW (Cotroneo et al., 2015).*"

➢ **MUSICS: TNA CNRS-DT_INSU PI: Dr Slim Gana / SAROST S.A. (Tunisia). Partners: SZN Napoli (Italy), IAMC-CNR (Italy), LOCEAN (France)**

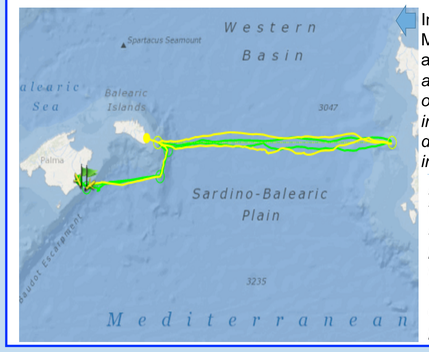






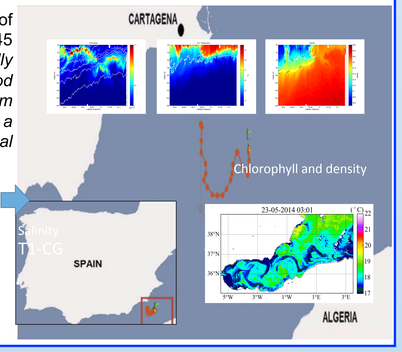
A CNRS DT-INSU deep water SLOCUM G1 glider was deployed from R/V Tethys in the Sardinia Channel during the SOMBA campaign. It carried out 3 return trips from August 15, 2014 to September 19, 201, following a path close to SARAL satellite track #887. *"The comparison of the 6 T/S hydrological sections gave an indication on the intensity of the temporal variability and on the mixing occurring within and between water masses. Near the surface, lenses of fresher water were observed at about 50m depth, all along the section, due to meandering of AW, which is advected from West to East by the Algerian current. The core of LIW is clearly observed with S>38.7 at depths between 250m and 450m" (from PERSEUS glider data analysis report - Deliverable D3.6 _WP3)*

➢ **GABS & FRIPP TNA SOCIB & IMEDEA PI: Dr Alberto Ribotti & Dr Antonio Olita / CNR-IAMC (Italy).**



In 2013 SOCIB iRobot SEA-GLIDERS were deployed from the east coast of Menorca and sampled across the Sardinia Channel in 2 separate deployments of 45 and 46 days respectively in February and October. A. Olita: "*Samplings, initially addressed to the study of the deep water masses, were performed during the period of the spring bloom initiation in western Mediterranean. In particular the bloom initiation was observed (Olita et al. 2014, Ocean Science) to be triggered by a dynamical stratification occurring along the Balearic front just after the seasonal inversion of the surface heat fluxes (negative to positive).*" (GABS)

A SOCIB shallow water SLOCUM G1 glider was deployed in the Alboran Sea from SOCIB-R/V in the frame of the multi-platform experiment ALBOREX 2014. A. Olita: "*This was a short 6-day mission to investigate the distribution and productivity of subsurface chlorophyll maxima and how much this particular feature of temperate regions is influenced by (sub-)mesoscale dynamics. Through the bio-physical glider measurements and other ancillary data we found exceptional values of primary production and biomass in coincidence with the presence of a strong density front in the Eastern Alboran sea.*" (FRIPP)



4. JERICO-NEXT calls and application rules

• Access Provision: free-of-charge access to glider platforms after passing evaluation and competitive selection phases.

• Application: made via three JERICO-NEXT TNA calls, in 2016 (May-June), 2017 (May-June) and 2018 (April-May)

• Eligibility: (a) Access must be transnational: user and platform must be from different countries; (b) Users must disseminate their results; (c) Non-EU users have limited access.

• Support to user groups: the users will receive logistical, technical and scientific support by the access provider and any special training if required

! All details on access rules: http://www.jerico-ri.eu/tna/access-rules/

5. Conclusions

The JERICO TNA program was a success on several fronts:

- The TNA calls received 8 proposals for glider access, of which 6 were approved.
- New glider transects (sampling T, S, O2, Chla, DO) filled important gaps in traditionally under-sampled areas of the Western Mediterranean
- New scientific results were published, in particular linking physical and biogeochemical processes, and satellite altimetry was validated.
- The TNA missions were operationally stimulating, involving multi-platform strategies in regions of strong mesoscale activity and real-time navigation to sample intense frontal currents and eddies.
- Last, but not least, the program enabled outside access to key infrastructure, supporting cross-country cooperation within Europe and extending to north Africa (Algeria and Tunisia).

With the JERICO-NEXT TNA now in progress the benefits of TNA access can continue to develop.
! Visit the JERICO-NEXT web site for information on upcoming TNA calls: www.jerico-ri.eu/tna /

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