

SOCIB-GLIDER-FACILITY

an Introductory Overview

EMRA workshop 2017
(UdG, Girona)

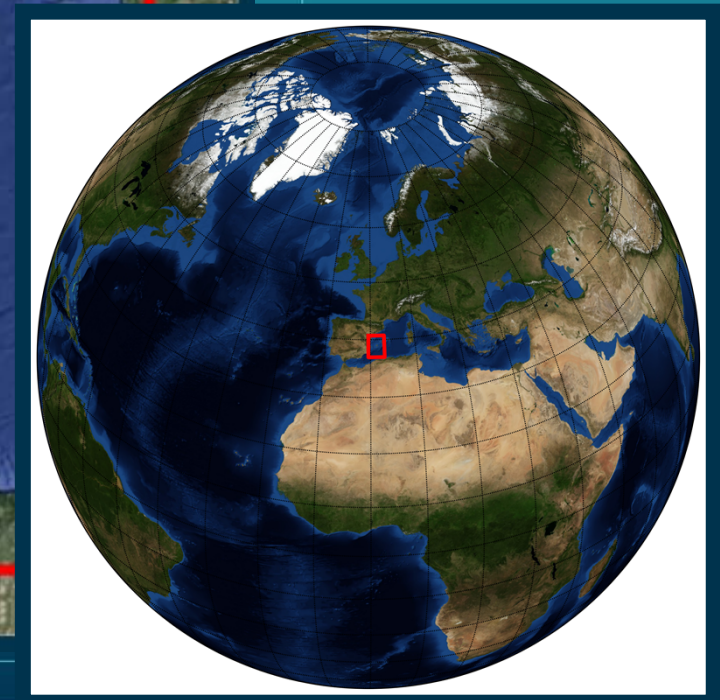
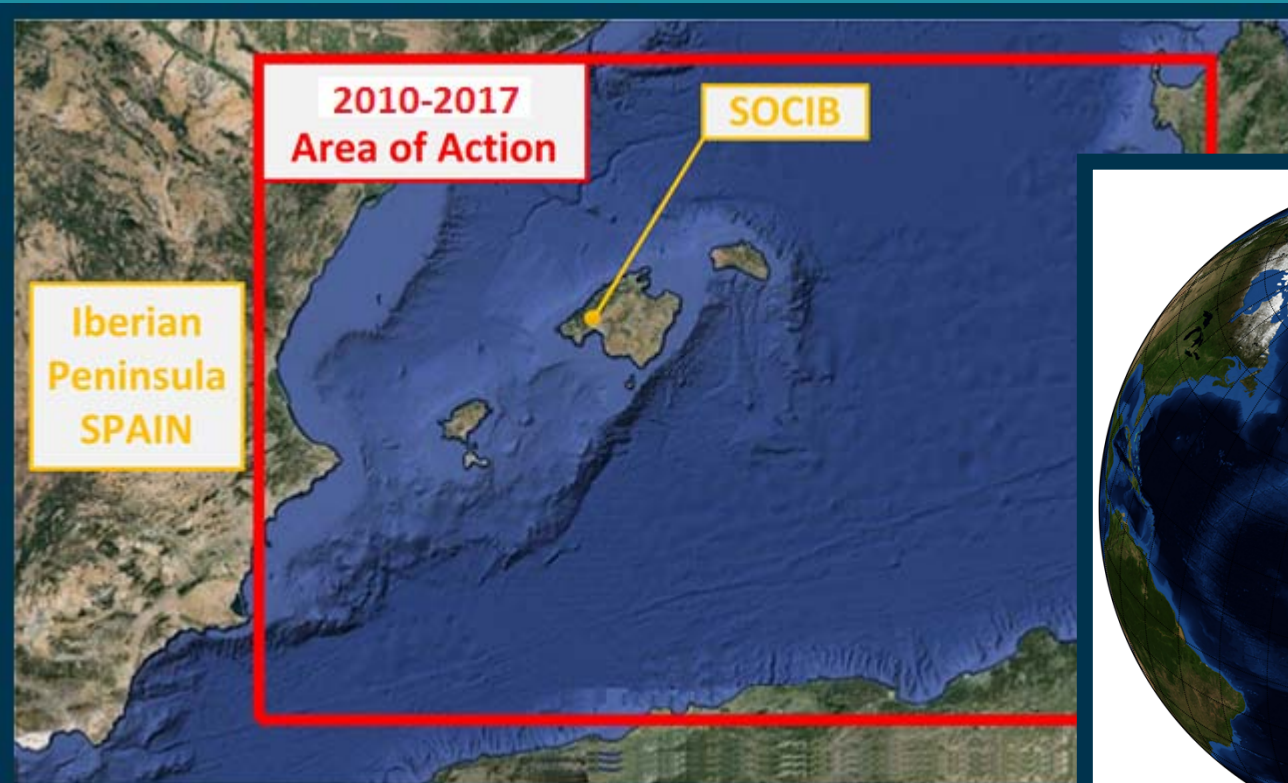
MAY2017

Speaker:

MARCtorner | mtorner@socib.es | GLIDER ENGINEER

Introducing SOCIB

- SOCIB
 - Coastal Observing & Forecasting System of the Balearic Islands
 - Public Consortium (50% Spanish Ministry, 50% Local Gov.)



Introducing SOCIB

- FACILITY of facilities



- OPEN to collaborative access

LOCAL > NATIONAL > INTERNATIONAL

- PARADIGM change in observation

- PUNCTUAL MISSIONS
- BIG RESEARCH VESSELS
- DELAYED DATA PUBLICATION



- CONTINUOUS MONITORING
- SHIP, GLIDERS, BUOYS, RADAR, MODELS...
- NRT & QC ON-LINE DATA

- Key-Driver respond

**SCIENCE
PRIORITIES**

**TECHNOLOGY
DEVELOPMENT**

**SOCIETY
NEEDS**

Introducing GLIDER-FACILITY

- Origins
 - Foundation: Sept-2010
 - Operational: Jan-2011
- Performance (per Year)
 - 10 to 12 Missions (Single or Multi Vehicle Deployments)
 - 250-380 Days-in-Water
 - 2600-3800 Nm
 - 10k-16k CTD profiles
 - (mission endurance: 10-60 Days-in-Water)

Introducing GLIDER-FACILITY

- Workforce
 - Exclusive [100%]
 - (2 x Msc. Engineers) + (1/2 x Lab. Technician)
 - Cross-facility [10-30%]
 - Field-Techs, Computer-Eng, Scientists...
- Tasks (Glider-Specific)
 - Integral Mission Management: Preparation + Survey + Conclusion
 - Workshop: Maintenance + Testing + Repair (diagnosis, execution)
 - Lab: SW-configuration, Piloting, Telemetry Analysis,...
 - Extensive Documentation: Reports, Intervention-Sheets, Protocols, ...
 - 24/7 Out-of-Work Monitoring
 - Outreach & Divulcation

GLIDER FLEET



Name	Model	(m)Depth Range	Science Sensors	(days)Max. Autonomy	Property Of	ByManaged	YearPurchase
sdeep00	Slocum G2	0-1000	CTD, Oxygen, FLNTU	60	SOCIB	SOCIB	2011
sdeep01	Slocum G2	0-1000	CTD, Oxygen, FLNTU	60	SOCIB	SOCIB	2011
sdeep04	Slocum G2	0-1000	CTD, Oxygen, FLNTU	60	SOCIB	SOCIB	2015
sdeep05	Slocum G2	0-1000	CTD, Oxygen, FLNTU	60	SOCIB	SOCIB	2015
sdeep02	Sea Glider	0-1000	CTD, Oxygen, FLNTU	60	SOCIB	SOCIB	2012
sdeep03	Sea Glider	0-1000	CTD, Oxygen, FLNTU	60	SOCIB	SOCIB	2012

GLIDER FLEET



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sdeep03	Glider	0-1000	CTD, Oxygen, FLNTU		SOCIB	SOCIB	2012
sdeep05	Glider	0-1000	CTD, Oxygen, FLNTU		SOCIB	SOCIB	2012

SCIENTIFIC SENSORS

**CTD,
Oxygen,
FLNTU**

CONDUCTIVITY

**OXYGEN
CONCENTRATION**

TEMPERATURE

CHLOROPHYL

PRESSURE

TURBIDITY

VEHICLES



(specific) INFRASTRUCTURES

- Glider-LAB

- Location:



- Work-shop

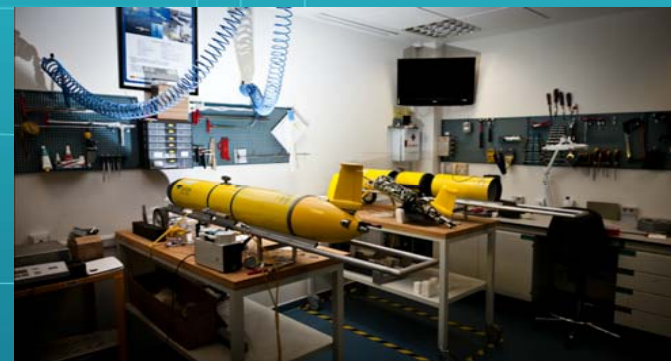
- 3 work-benches

- Ballasting Tank

- 4000L (sea-water)

- Pressure Chamber

- Fitting whole Glider
 - 150bar max.



(partial) INFRASTRUCTURES

- Data-Center

- Location:



- RACK-room

- Data Acquisition
 - Data Processing
 - github.com/socib/gliders_toolbox
 - On-line Data-Repository
 - thredds.socib.es
 - Deployment Tracking Portal
 - apps.socib.es/dapp



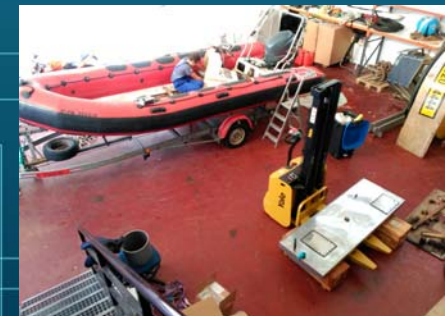
- Instrumentation Division

- Location:



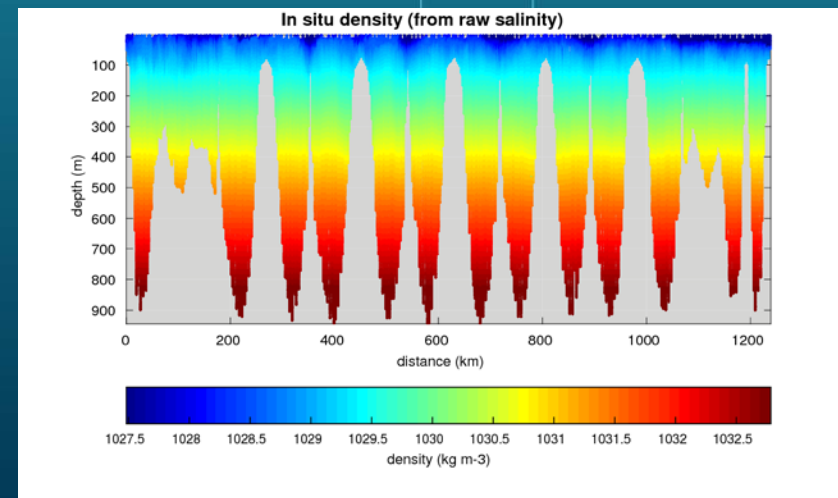
- Field Support

- Operations (Launch & Recovery)
 - Instruments (CTD, ADCP,...)
 - Logistics



GLIDER MISSIONS

- Endurance Lines
 - Balearic Channels: since 2011
 - Repeated Route (STATIC Piloting)
 - Inter-annual Variability
 - Water Mass Exchange
 - Main Difficulty
 - Long 24/7 Piloting Periods
 - Synchronizing 3 Glider units
 - 1 Glider Refurbishing (Factory)
 - 1 Glider Preparing (Lab)
 - 1 Glider Surveying (Sea)



GLIDER MISSIONS

- Specific-Process Study

- Examples

- Chasing Fronts in Alboran Sea (ALBOREX 2014, 2017)
 - Eddies in South Balearic Sea
 - Chasing Tagged Sea-Turtles

- Very Dynamic (ADAPTIVE Piloting)

- Target Waypoints
 - Sampling Strategy
 - ...




- Main Difficulty

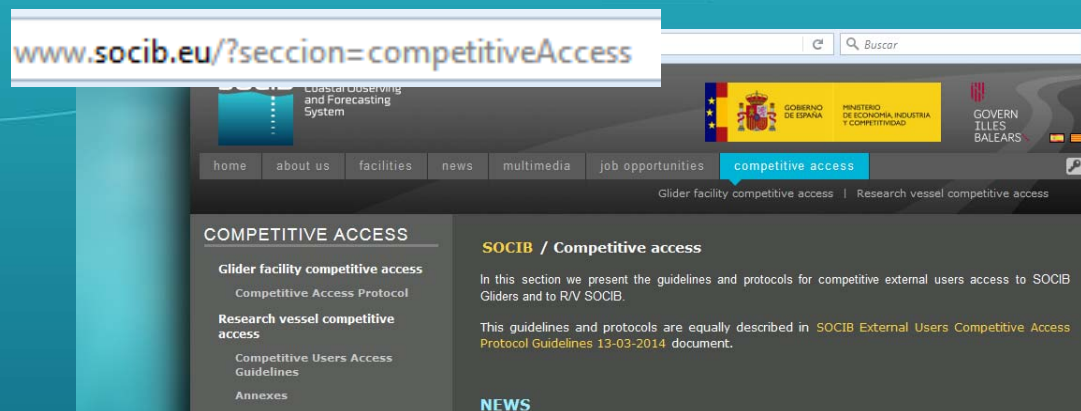
- Intense 24/7 Piloting Periods
 - Tied Schedules
 - Smaller Security Margins for Unforeseen Inconvenient

EXTERNAL COLLABORATION

- Open Access Program

EUROPEAN PROJECTS:

- GROOM
- JERICO
- JERICO-NEXT...
- ...
- AUTENTIC (SUDOE) 



— GLIDER-FACILITY



www.socib.es

— SOCIB-R/V (CATAMARAN)



<https://www.youtube.com/watch?v=Fo8TTSQWz1o>

(in-house) DEVELOPMENT

- Custom PICK-POINT



- Glider-2-Rosette Bracket



- GO-PRO Holder

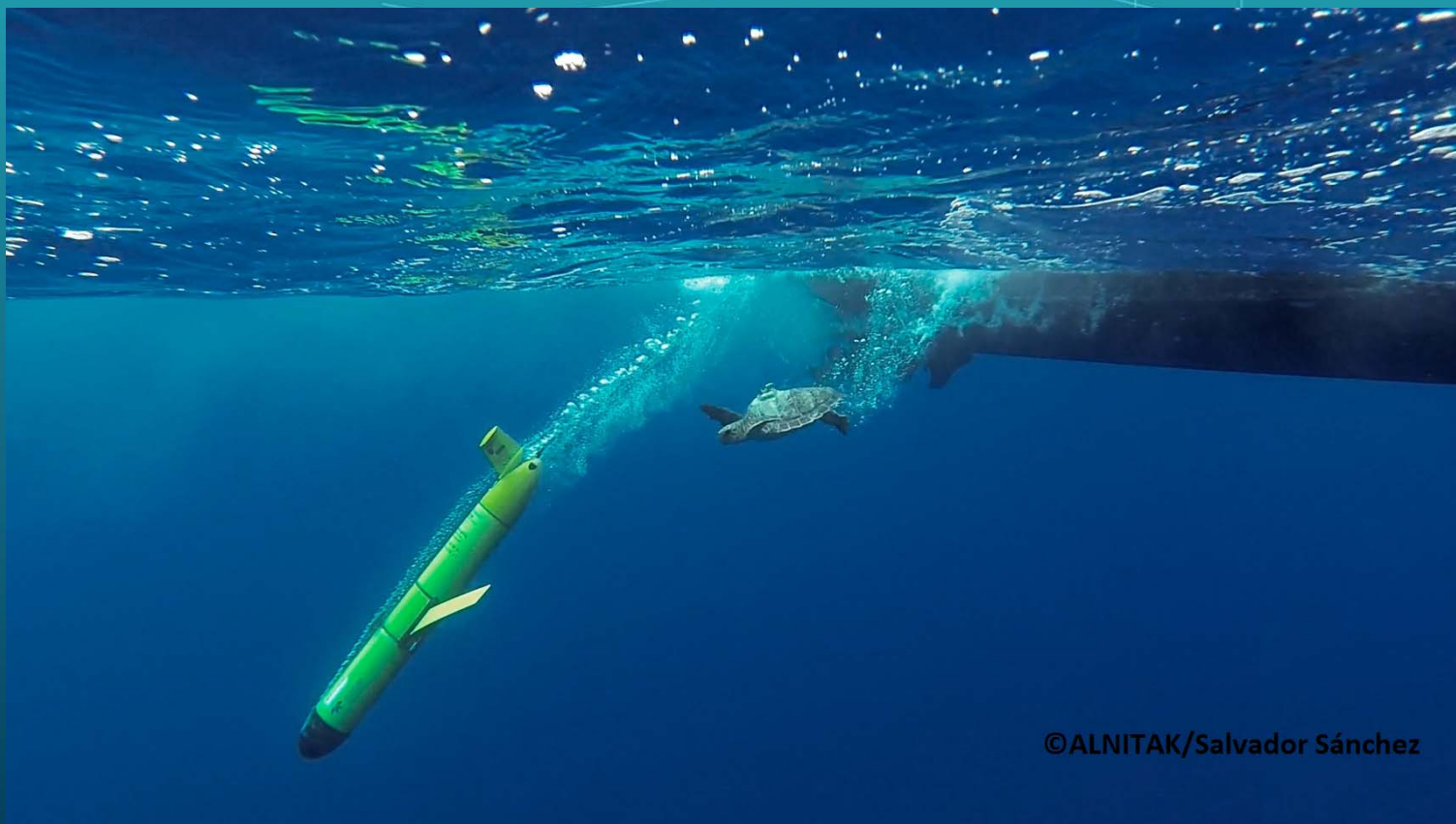


- Compass Calibration STAND



THE END

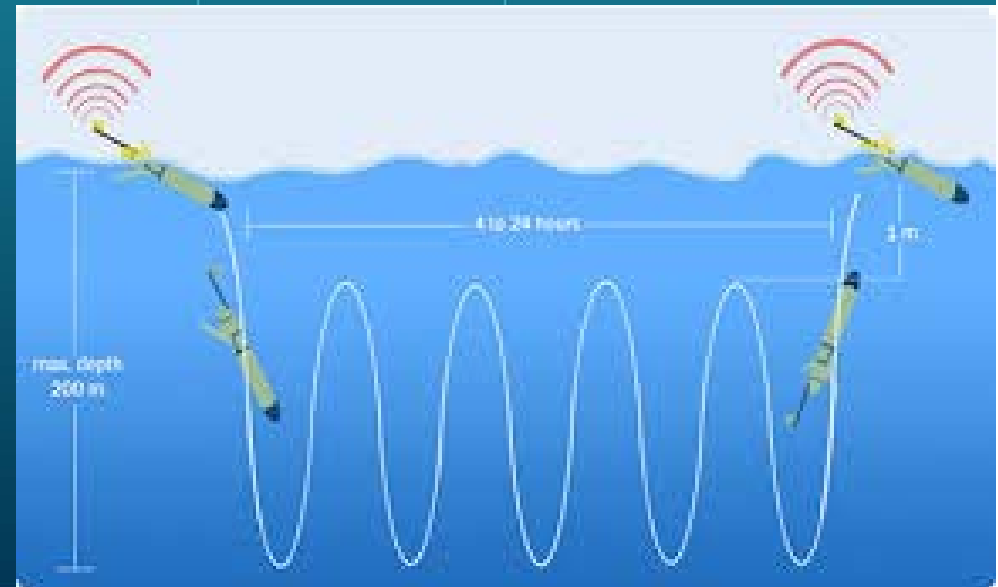
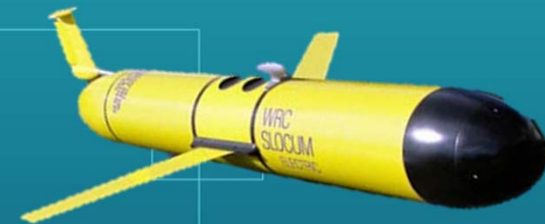
Thank you very much for you attention !



©ALNITAK/Salvador Sánchez

(bonus slide) THE SLOCUM GLIDER

- Manufacturer: TELEDYNE WEBB RESEARCH®
- Long Range AUV (1200Km@60days)
- No Propeller → Buoyancy Engine
- 1,7m (long) • 0,3m (diam) • 60Kg (weight)
- Electric (Alkalie or Lithium)
- Modular Hull (80% dry + 20% flooded)
- 3 Fairings: 2 wings + 1 fin
- Comms: Satellite, GPS, Radio, Argos
- Mechanical Actuators
 - Piston(thrust) – Fin (heading)
 - Mass shifter (pitch)
- Configurable Sensor Payload
 - Over 20 different sensors available



(bonus slide) THE SLOCUM GLIDER

