European Gliding Observatories Network (EGO)

Action ES0904

WG2
Glider vehicle, sensors, and “gliderports” infrastructures

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COST is supported
by the EU Framework Programme

ESF provides the COST Office
through a European Commission contract

Sensors

Parameters:

- Hydrographic (temperature, salinity and density)
- Optical (suspended matter, chlorophyll a, turbidity, oxygene, nutrients, hydrocarbon, CDOM, ...)
- Acoustic (currents, noise from physical processes or biology)
- Physical (turbulence, waves)
- ...

Sensor Suites

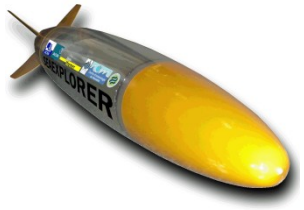
Sensors

The CTD is the most used sensor on gliders, but still plagued with unsorted issues:

Workshop October 2013 to gather experts within the community

- **Pumped CTD vs. free-flush CTD**
- **Thermal lag**
- **Sensor mismatch**
- **Sensor timings**

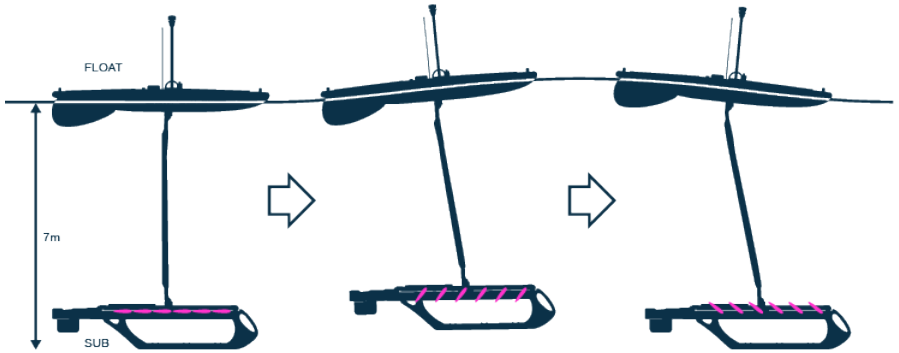
Glider technology

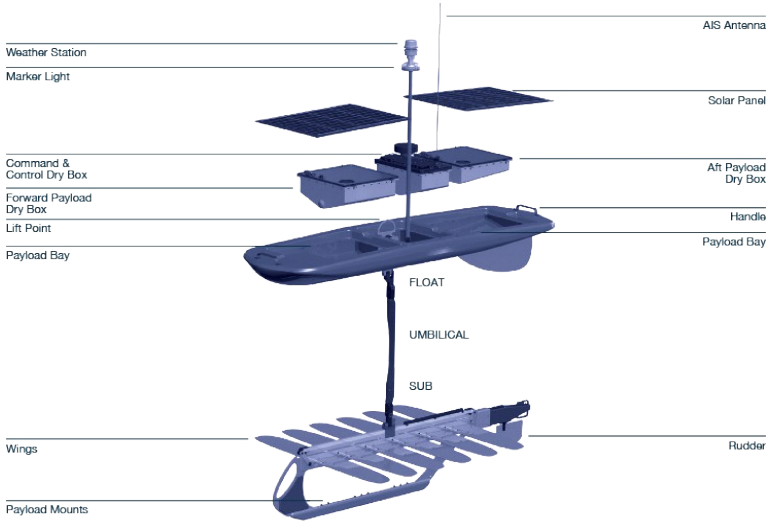


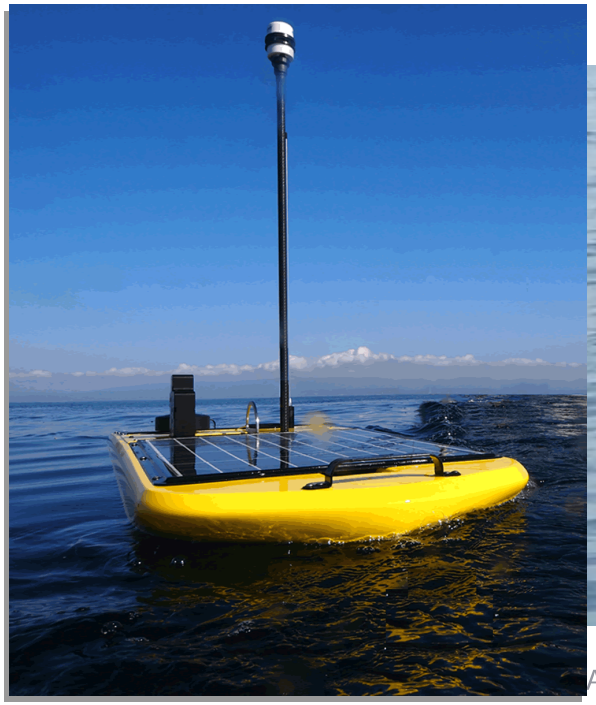


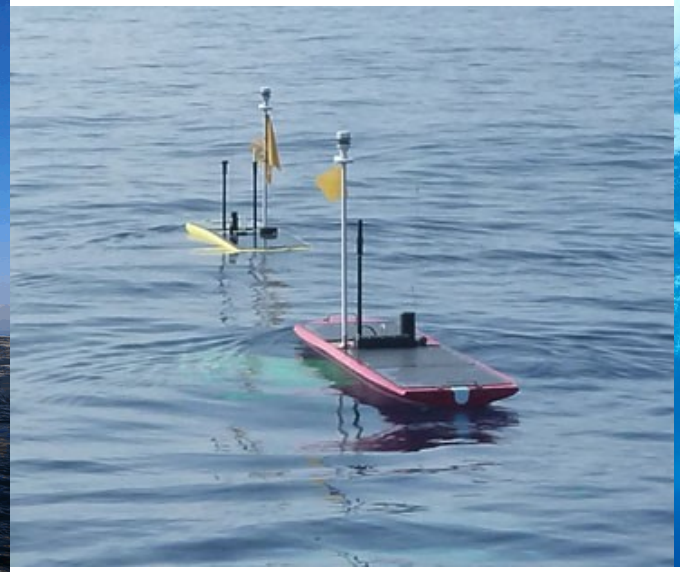
	SeaExplorer	Seaglider	Spray	Slocum
Wingspan	56,5 cm	100cm	110cm	120cm
Volume change	1.0L	0.84L	0.9L	0.45L
Nominal Speed	0.5 m/s	0.25 m/s	0.25 to 0.35 m/sec	0.3 to 0.4 m/sec
Dimensions	L=290cm Diam=24cm	L=330cm Diam=30cm	L=200cm Diam=20cm	L=215cm Diam=21cm
	Mass=59 kg	Mass=52 kg	Mass=51 kg	Mass=52 kg
Ballast Efficiency	60 (25)% efficient @ 700 (100) dbar	40 (8)% efficient @ 1000 (100) dbar	50 (20)% efficient @ 1000 (100) dbar	50% efficient @ 200 dbar
Payload capacity	Dry section: 5.5Kg + Wet section: Up to 3Kg	4Kg	3.5kg	3 to 4 kg
Puck ports	4	0	0	4
Operating	700m	1000m	200-1500m	200m or 1000m
Batteries	8.6MJ, Rechargeable	10MJ, Primary Lithium	13MJ, Primary lithium	8MJ Primary alkaline Or Lithium
Refueling cost	Free	1375$	2850$	~1000$ (Alkaline) ~10000$ (Lithium)
Origin	Europe (France)	US	US	US

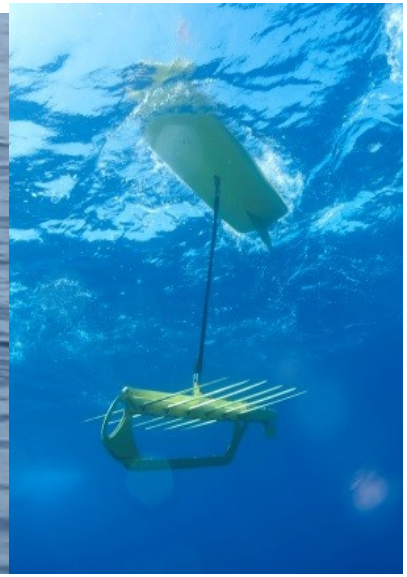
Wave glider


FLOAT
7m
SUB


AIS Antenna
Weather Station
Marker Light
Solar Panel
Command &
Control Dry Box
Aft Payload
Dry Box
Forward Payload
Dry Box
Handle
Lift Point
Payload Bay
Payload Bay
FLOAT
UMBILICAL
SUB
Wings
Rudder
Payload Mounts

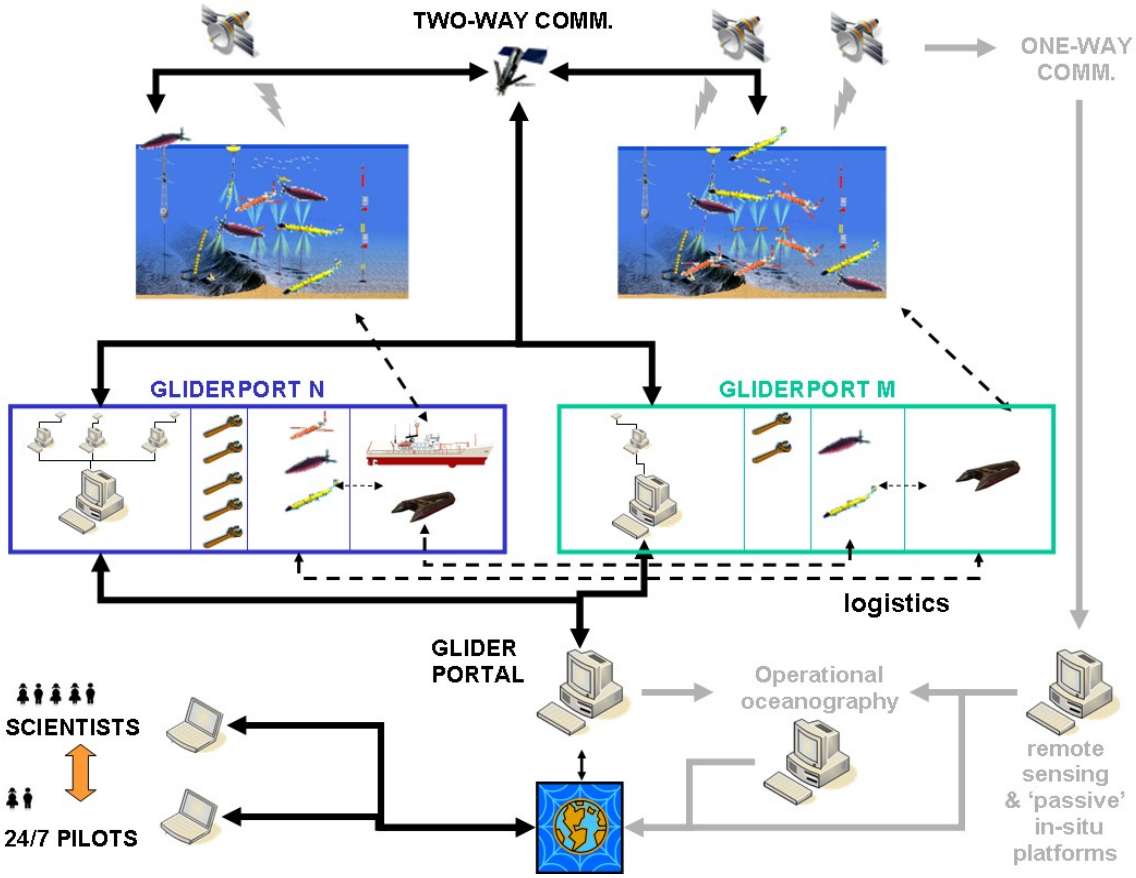






Sail buoy (PLOCAN)

Concept of glider ports



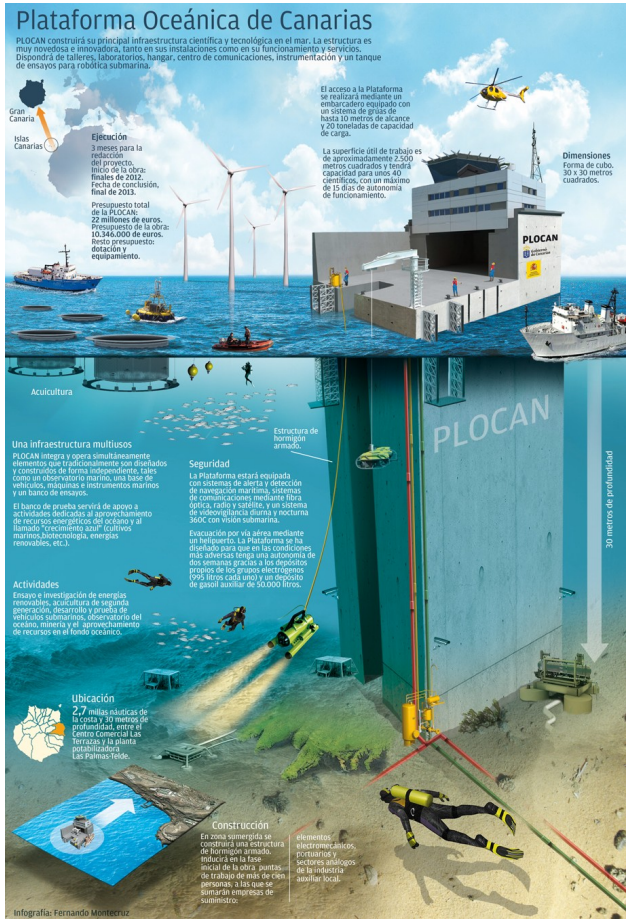
Glider ports

Description:

Glider ports are facilities that

- Provide a means for glider preparation
- Provide a means for glider piloting
- Handle data (near-real time and post-mission)
- Provide a means deployment and recovery
- Play a role in sensor or vehicle development
- Provide access to sensor calibration setups

… or a subset of these attributes.



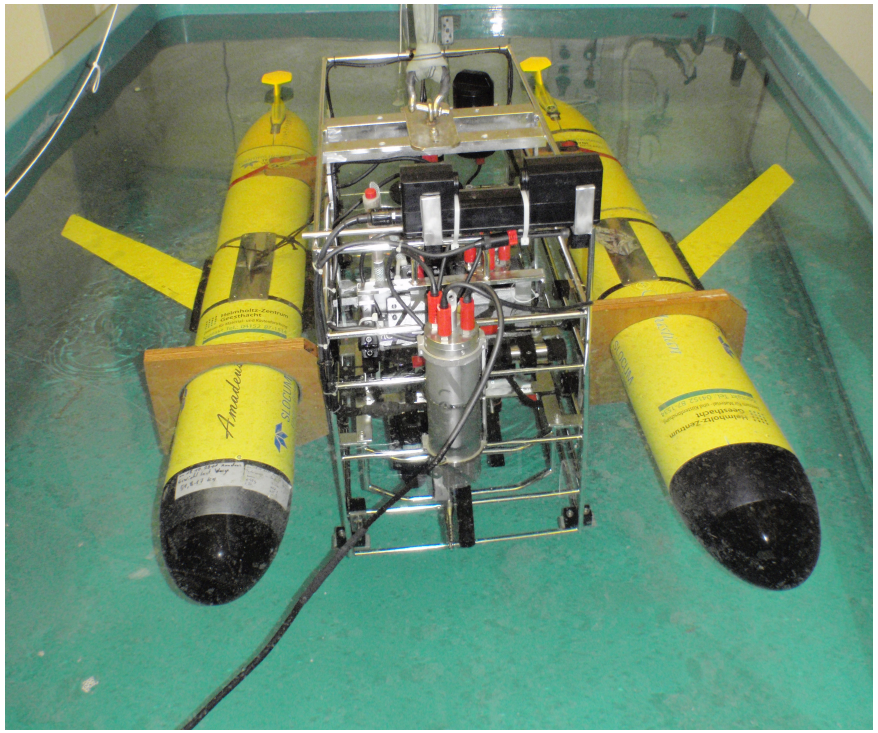
Glider lab at HZG

- Ballast tank
- Workbench
- Crane
- Storage

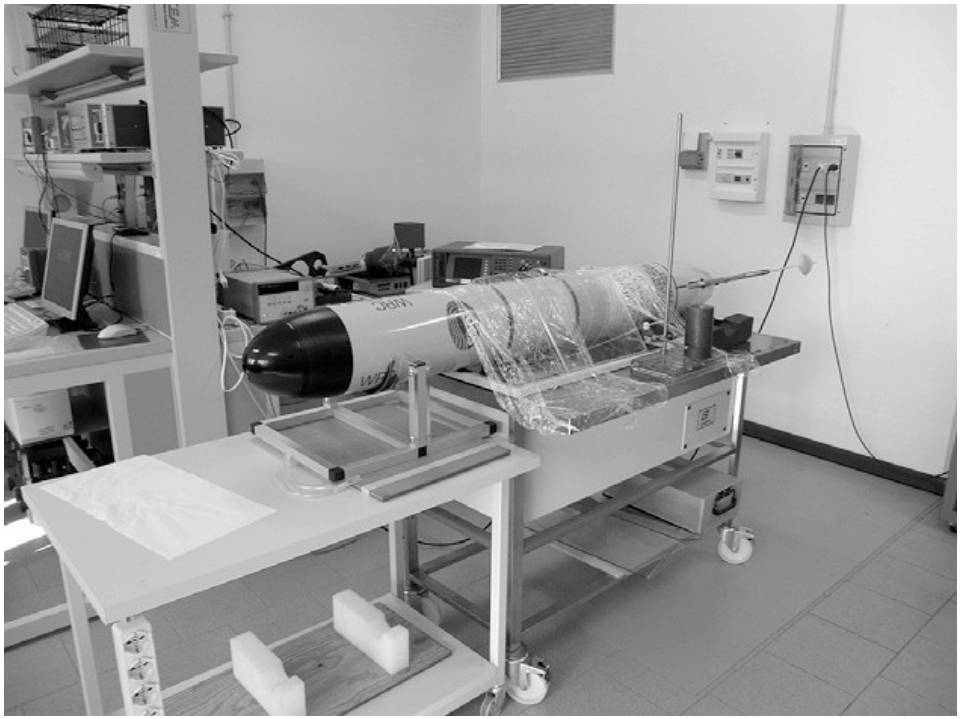
Special facilities: a pressure chamber at SOCIB

Special facilities: sensor calibration facilities

(in-situ) sensor calibration Frame (HZG)



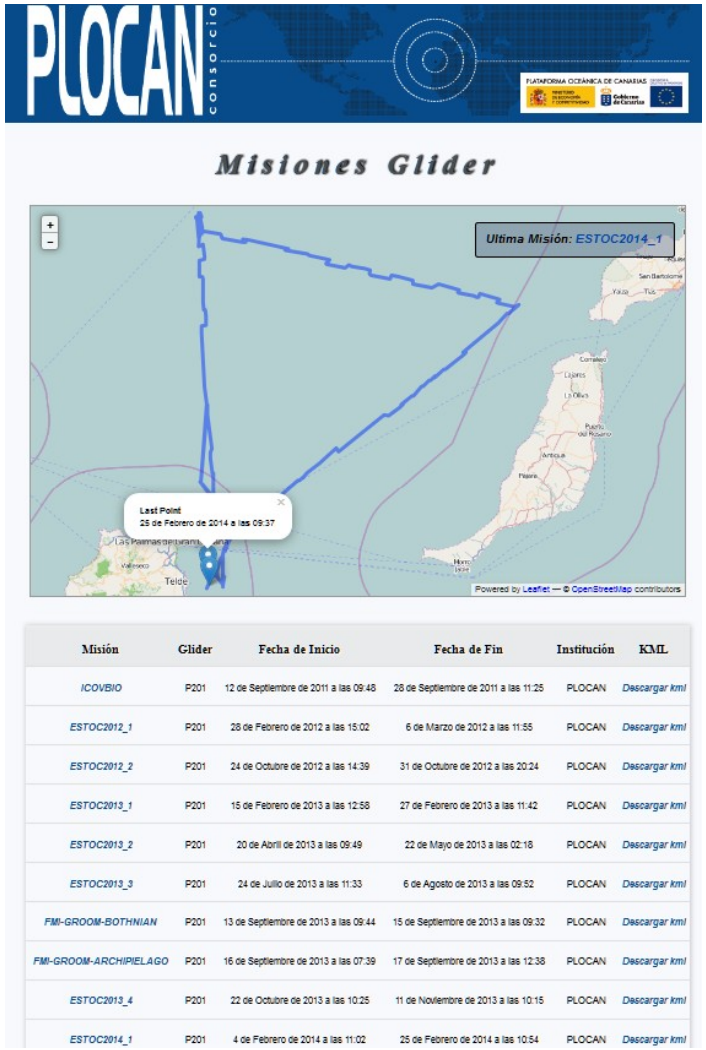
laboratory CTD calibration setup (OGS)



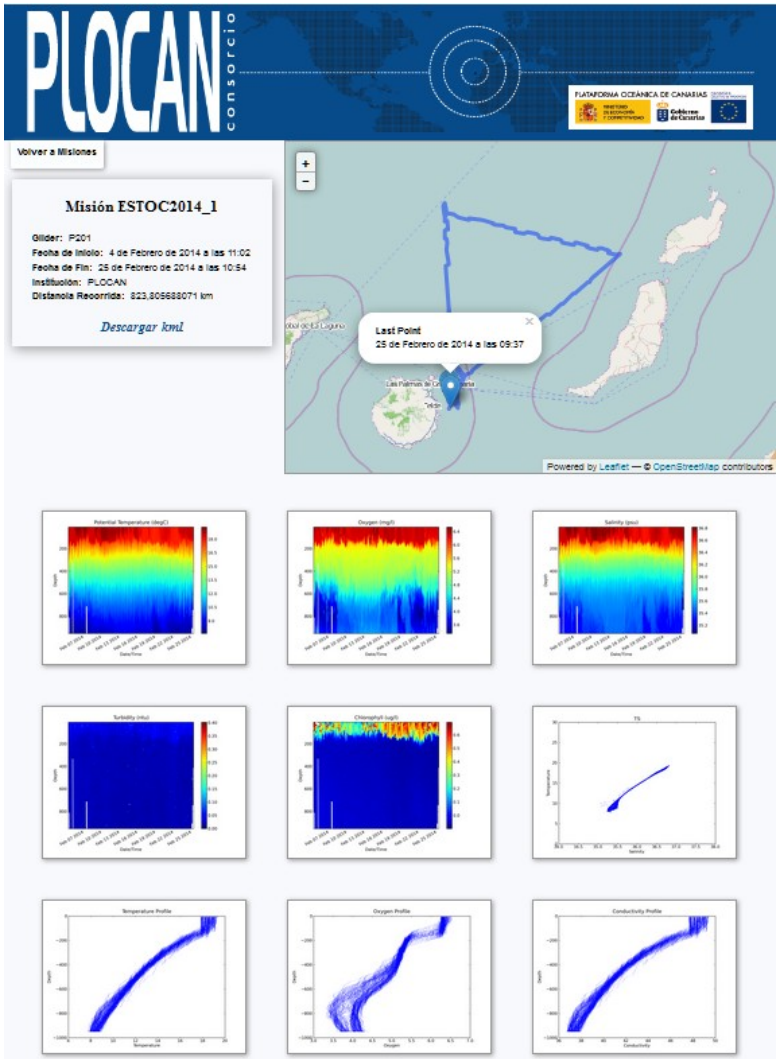
Support for deployment and recovery

Research vessels (PLOCAN)

Data visualisation (example from PLOCAN)



Misión	Glider	Fecha de Inicio	Fecha de Fin	Institución	KML
ICOVBIO	P201	12 de Septiembre de 2011 a las 09:48	28 de Septiembre de 2011 a las 11:25	PLOCAN	Descargar kml
ESTOC2012_1	P201	28 de Febrero de 2012 a las 15:02	6 de Marzo de 2012 a las 11:55	PLOCAN	Descargar kml
ESTOC2012_2	P201	24 de Octubre de 2012 a las 14:39	31 de Octubre de 2012 a las 20:24	PLOCAN	Descargar kml
ESTOC2013_1	P201	15 de Febrero de 2013 a las 12:58	27 de Febrero de 2013 a las 11:42	PLOCAN	Descargar kml
ESTOC2013_2	P201	20 de Abril de 2013 a las 09:49	22 de Mayo de 2013 a las 02:18	PLOCAN	Descargar kml
ESTOC2013_3	P201	24 de Julio de 2013 a las 11:33	6 de Agosto de 2013 a las 09:52	PLOCAN	Descargar kml
FMI-GROOM-BOTHNIAN	P201	13 de Septiembre de 2013 a las 09:44	15 de Septiembre de 2013 a las 09:32	PLOCAN	Descargar kml
FMI-GROOM-ARCHIPIELAGO	P201	16 de Septiembre de 2013 a las 07:39	17 de Septiembre de 2013 a las 12:38	PLOCAN	Descargar kml
ESTOC2013_4	P201	22 de Octubre de 2013 a las 10:25	11 de Noviembre de 2013 a las 10:15	PLOCAN	Descargar kml
ESTOC2014_1	P201	4 de Febrero de 2014 a las 11:02	25 de Febrero de 2014 a las 10:54	PLOCAN	Descargar kml



Training facilities

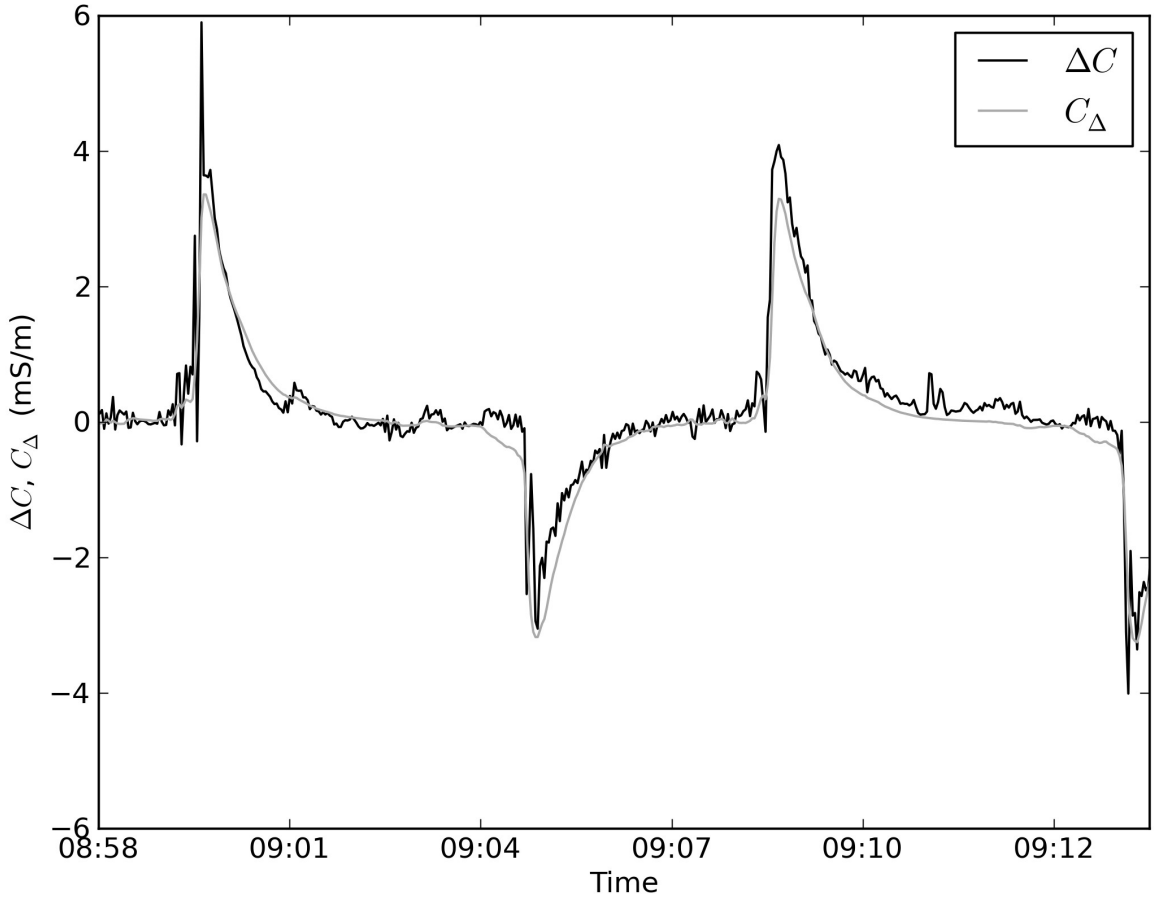
Where do we find gliderports in Europe?

Not shown are facilities in:

- Cape Verde
- Chile
- Australia
- USA

Sensors (CTD)

Example of where it works for a pumped CTD:



Thanks to totally mixed salinity

Sensors (CTD)

- Pumped CTD suffers from smaller thermal lag effects.
- Strong/sharp thermoclines (like in North Sea) pose new issues due to timing mismatches between sensors.
- Only to some extent correctable.
- Database with a wide range of different C-T profiles.