







Atlantic Ocean Observing

Ambitions and Opportunities feeding into the United Nations Decade of Ocean Science for Sustainable Development (2021-2030)

0.614

Atlant S



OCEAN OBS'19 -m/\$

6 CLEAN WAJER AND SANITATION

Q

9 MOUSTRY INNOVATION AND INFRASTRUCTURE

15 ON LAND

•~

SUSTAINABLE DEVELOPMENT GOALS

İ.++.

4 QUALITY EDUCATION

Q

10 REDUCED REQUALITIES

13 ACTION

16 PEACE JUSTICE

5 GENDER

q

8 DECENT WORK AND ECONOMIC GROWTH

14 LIFE BELOW WATER

10

17 PARTNERSHIPS FOR THE GGALS

æ



Improving Ocean Observations in the Macaronesia Region with Autonomous Mobile Platforms

C. Barrera for the PLOCAN Glider Team - partners & collaborators

carlos.barrera@plocan.eu



Estoril, 3rd-5th Dec. 2019











PLOCAN - ICTS































PLOCAN – ICTS





Definition:

Unique Scientific and Technology Infrastructure (ICTS) – <u>Committed and</u> <u>Addressed with/to Marine Sciences</u> <u>and Technologies</u>

□ Main goal:

Design, Construction and Operation of an offshore platform for *Research & Innovation* in the field of Marine Science and Technologies.

<u>Support service infrastructure</u> to public and private sector initiatives (BlueGrowth)

Main Working lines:

Marine Renewable Energies and Ocean Observation (not limited)

Given Strategy in key words:

Interdisciplinary, large projects, innovation oriented, testing and demonstration, clustering local R&D, international alliance, tailored infrastructures and services, leverage funds, public and political support.



PLOCAN - ICTS



PERIOD 2014-2018

- Projects: 64 (25 Nat + 39 EU)
- Overall budget granted: 203 M€ (20.6 M€ Nat + 182.4 M€ EU)
- PLOCAN budget granted: 14.1 M€ (7.2 M€ Nat + 6.9 M€ EU)
- Overall mean-grant created / year: 3.1 M€
- Avg. Requested Projects yearly: 32
- Avg. Success rate: 26%
- Total number of partners: 672 (373 Public + 299 Privated)























FLEET



- Slocum glider G3 (1000 m.)
 CTD, DO, TURB and FLU
- Slocum glider G2 (1000 m.)
 CTD, DO, TURB and FLU
- Seaglider M1 (1000 m.) CTD, DO, TURB and FLU.
- Seaglider M6 (6000 m.) CTD, DO, TURB and FLU.
- SeaExplorer (700 m.) CTD, DO, TURB, FLU and HC
- Wave Glider (SV2) CTD, DO, MET and PAM + 1 CAM
- Wave Glider (SV3) CTD, DO, MET and ADCP + 5 CAM
- Sailbuoy
 CTD, DO, MET, TUR, FLU and HC

FACILITIES



- Wet and Dry lab (200 m²)
- Dedicated benches and tooling
- Ballasting area (fresh and target water)
- Storage area
- Control room
- Teaching and meeting rooms
- Transport VAN

ACTIVITIES



- Mission planning and performance.
- Maintenance.
- Subsystem integration and testing.
- Piloting.
- Training.
- Deployment/Recovery maneuvers.

PARTNERSHIP



- Joining R&D projects with private and public entities.
- Support activities into specific programs and initiatives.
- Glider School.
- Prototype testing.



VIMAS - BASE FOR UNMANNED OCEAN SYSTEMS



OCEAN OBSERVATORY









OCEAN OBSERVATORY



















THE ATLANTIC: OUR SHARED RESOURCE MAKING THE VISION REALITY









90°E

180°W

90°W

ANIMATE - FP5 MERSEA - FP6 EuroSITES - FP7 FixO₃ -FP7 AtlantOS - H2020 EMISODEV - H2020 EMISO-ERIC

1994-2019

ME SERIES IN

ESTOC







european

seafloor observatory

multidisciplinary

- Eur**e Sea**
- Seasonal mission Endurance line since 2012
 - 200 Nm path distance
 - 3 weeks duration
 - Seawater parameters sampled: conductivity, temperature, dissolved oxygen, turbidity and chlorophyll-a
 - Partnership with IEO (RAPROCAN line support)























Unión Europea Fondo Europeo de



















© Plataforma Oceánica de Canacias









- 7 weeks duration (360 dives@1000 m. depth)
- Seawater parameters sampled: CTD, DO, TURB and CHL-A
- Partnership with OOM, IH/Marinha y Armada.









Salinity (psu)

















A





SAILOR

1











1233



15, 25 / 55,70

+178.4 km 846.2 km

> +352.0 km 1198 km

> > 1654 k

A5205



69 7 k





The Challenger One is an international program PLOCAN initiative where cooperates with Teledyne **Rutgers** Marine and University in regards a Slocum G2 glider unit, under the name of Silbo, that attempts to circumnavigate the North Atlantic basin, for scientific and technological Deployed purposes. in Ireland in May 2017, after 178 days of navigation across Macaronesia, Silbo the reached Gran Canaria on November 2017, where after a maintenance and battery replacement was redeployed in April 2018.





















Slocum glider G2 Marine Institute 2 weeks CTD, DO, Chl-a and Turbidity





Wave Glider SV2 PLOCAN 2.5 months CTD, DO, Meteo and Passive Acoustics



DATA PORTAL

🛛 🕻 🗛 🖌 🖌 🖌 Vehicles 🗸 🛪 Drifters 🗸 🚱 Educational Passages 🗸 🗰 Climatology 🗸



Oceanic Platform of the Canary Islands (PLOCAN)

Research Infrastructure (RI) labeled by the ICTS (Unique Scientific and Technological Infrastructure) Spanish National Roadmap.

PLOCAN is a multipurpose technical-scientific service infrastructure that provides support for research, technological development and innovation in the marine and maritime sectors, available to public and private users. PLOCAN offers both onshore and offshore experimental facilities and laboratories, operational throughout the whole year thanks to the Canary Islands excellent climatic conditions. PLOCAN also brings a broad experience in large national and EU marine/maritime projects.

As part ot its activitites, PLOCAN manages a variety of Observation Platforms in order to provide a continuous and real-time in-situ monitoring of the ocean. These platforms can be both fixed or mobile, providing information about the ocean surface and/or the water column. Different sensors are placed in PLOCAN Observation Platforms allowing access to physical, biochemical and climatological data.



http://obsplatforms.plocan.eu/



DATA PORTAL



🛦 Vehicles - 🛛 🛛 Drifters - 🗰 Climatology -

			Search	٩
Mission \$	Vehicle \$	Start	↓† Last comm	↓† _{State} ↓†
Lisboa_2019	P302	2019-04-02 09:00	2019-05-08 21:44	Active
MADEIRA_2018	WG PLOCAN	2018-10-16 11:40	2018-11-23 08:30	Completed
AtlantOS_TEST	WG PLOCAN	2018-09-27 06:00	2018-09-28 12:00	Completed
MARCET_GCSW	WG PLOCAN	2018-07-23 06:00	2018-07-30 07:57	Completed
ESTOC2018_1	P202	2018-05-25 09:38	2018-06-13 11:59	Completed
MARCET_2018	SB PLOCAN	2018-04-19 10:09	2018-04-21 09:45	Completed









Everyone's Gliding Observatories



EMODnet



European Marine Observation and Data Network



PLOCAN	🔒 Home	★ Vehicles- ≄Drifters-	🗰 Climatology -	📞 Contact Us
GLIDERS				
Name		Model	Manufacturer	State
P201	×-)-	Slocum Deep G2	Teledyne Webb Research	Out of service
P202	×-)-	Slocum Deep G2	Teledyne Webb Research	In lab
P203	<u> </u>	Slocum Deep G3	Teledyne Webb Research	In lab
P302	-	SeaGlider M1	Kongsberg Maritime	On mission
P401	- +	Sea Explorer -	ALSEAMAR-ALCEN	In lab
USV				
Name		Model	Manufacturer	State
SB PLOCAN		Sailbuoy Water Quality Mo	nitor (WQM) Offshore Sensing AS	In lab
WG PLOCAN	_i	WaveGlider SV2	Liquid Robotics	in lab
ROVs				
Name		Model	Manufacturer	State
BlueROV	<u>100 00</u>	BlueROV 2	BlueRobotics	In lab
ROV SB	<mark>∞∞</mark> →	Seabotix vLBV950	Teledyne Marine Seabotix	In lab

DATA PORTAL - External

Generic view for underwater vehicles

- Slocum
- > Seaglider
- > SeaExplorer





- Metadata (sensors, related projects, involved institutions,...)
 Full path
- Surfacing information
- Scatter plots (science data)
- Profile plots (science data)
- Image gallery



DATA PORTAL - External







- Full path + vehicle speed
- Path color depending on selected variable (oceanographic and meteorological data)
- Time series dynamic plot

Puertos del Estado



DATA PORTAL – Internal Piloting Tools

Information for underwater gliders:

Surface currents (Copernicus-IBI and PLOCAN HF Radar)
3D mean depth (0 – 1000 m) currents (Copernicus-IBI)
Bathymetry (EMODnet)
Vessel traffic density (EMODnet)
Surface geostrophic velocity (Copernicus – SALTO/DUACS)









DATA PORTAL – Internal Piloting Tools

Info for surface vehicles:

•Surface currents (Copernicus-IBI)

Wind (NOAA-GFS)
Wave height (Copernicus-IBI)
Vessel traffic density (EMODnet)









GLIDER SCHOOL

















National Oceanography Centre NATURAL ENVIRONMENT RESEARCH COUNCIL











A Boeing Company ROBOTICS



Offshore Sensing AS



147 Students - 29 Countries - 18 Companies & 12 Research Institutions Supporting - 10 Editions





Call: Type of action: Proposal number: Proposal acronym: Duration (months):	H2020-BG-2019-1 IA 862626 EuroSea 50
Proposal title:	Improving and Integrating European Ocean Observing and Forecasting Systems for Sustainable use of the Oceans
Activity:	BG-07-2019-2020 - B

PT

1	HELMHOLTZ ZENTRUM FUR OZEANFORSCHUNG KIEL
2	EUROGOOS
3	UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION -UNESCO
4	MERCATOR OCEAN
5	ALMA MATER STUDIORUM - UNIVERSITA DI BOLOGNA
6	MARINE INSTITUTE
7	AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS
8	ECOLE NORMALE SUPERIEURE
9	COLLECTE LOCALISATION SATELLITES SA
10	ISTITUTO NAZIONALE DI OCEANOGRAFIA E DI GEOFISICA SPERIMENTALE
11	FONDAZIONE CENTRO EURO-MEDITERRANEOSUI CAMBIAMENTI CLIMATICI
12	UNIVERSITETET I BERGEN
13	UNITED KINGDOM RESEARCH AND INNOVATION
14	SORBONNE UNIVERSITE
	SOCIB - CONSORCIO PARA EL DISENO, CONSTRUCCION,
15	EQUIPAMIENTO Y EXPLOTACION DEL SISTEMA DE
	OBSERVACION COSTERO DE LAS ILLES BALEARS
16	EUROPEAN CENTRE FOR MEDIUM-RANGE WEATHER FORECASTS
17	INSTYTUT OCEANOLOGII POLSKIEJ AKADEMII NAUK
18	INSTITUT FUER WELTWIRTSCHAFT
19	EURO-ARGO ERIC
20	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS
21	INSTITUT FRANCAIS DE RECHERCHE POUR L'EXPLOITATION DE LA MER
22	INSTITUT ROYAL DES SCIENCES NATURELLES DE BELGIQUE

DE BE

FR

FR IT

IE

ES

FR

FR

IT

IT

NO

UK FR

ES

UK

PL DE FR FR

FR BE

39

UNIVERSIDADE DO PORTO





23	Institut de Science et Etique	FR
24	ISTITUTO SUPERIORE PER LA PROTEZIONE E LA RICERCA AMBIENTALE	IT
25	IEEE FRANCE SECTION	FR
26	EUROPEAN MARINE BOARD IVZW	BE
27	INSTITUT MINES-TELECOM	FR
28	OCEAN NEXT	FR
29	FUNDACION AZTI - AZTI FUNDAZIOA	ES
30	Puertos del Estado	ES
31	ACRI-ST SAS	FR
32	OVE ARUP & PARTNERS INTERNATIONAL LIMITED	UK
33	HELLENIC CENTRE FOR MARINE RESEARCH	EL
34	NORSK INSTITUTT FOR VANNFORSKNING	NO
35	MET OFFICE	UK
	EUROPEAN MULTIDISCIPLINARY SEAFLOORAND WATER	
36	COLUMN OBSERVATORY - EUROPEAN RESEARCH	IT
	INFRASTRUCTURE CONSORTIUM (EMSO ERIC)	
	CONSORCIO PARA EL DISENO, CONSTRUCCIÓN,	
37	EQUIPAMIENTO Y EXPLOTACION DE LA PLATAFORMA	ES
	OCEANICA DE CANARIAS	
38	UNIVERSITAET BREMEN	DE

	40	STAZIONE ZOOLOGICA ANTON DOHRN
	41	ALFRED-WEGENER-INSTITUT HELMHOLTZ-ZENTRUM FUR
		FULAR- UND MEERESFURSCHUNG
	42	ETTSPA
	43	Nologin Consulting, S.L.
	44	UNIVERSITAT POLITECNICA DE CATALUNYA
	45	DANMARKS METEOROLOGISKE INSTITUT
	46	TALLINNA TEHNIKAULIKOOL
	47	CONSIGLIO NAZIONALE DELLE RICERCHE
	48	INSTITUT DE RECHERCHE POUR LE DEVELOPPEMENT
40	40	THE CHANCELLOR MASTERS AND SCHOLARS OF THE
	43	UNIVERSITY OF CAMBRIDGE
	50	Aanderaa Data Instruments AS
	51	ORGANISATION METEOROLOGIQUE MONDIALE
	52	Universidade do Estado do Rio de Janeiro
	53	UNIVERSIDADE FEDERAL DE PERNAMBUCO
	54	MEMORIAL UNIVERSITY OF NEWFOUNDLAND
	55	DAI HOUSIE LINIVERSITY
	00	

OT A ZIONE ZOOL OCICA, ANTON DOUDN









Horizon 2020 European Union funding for Research & Innovation



IT Assoc DE

IT

ES

ES

DK EE

IT

FR

UΚ

NO

CH BR BR CA CA

6

WP1 - Governance and coordination of ocean observing and forecasting systems

WP2 - Ocean Observing System Design

WP3 - Network Integration and Improvements

WP4 - Data integration, assimilation and forecasting

WP5 - Coastal resilience and operational services demonstrator

WP6 - Ocean Health Demonstrator

WP7 - Ocean climate indicators demonstrator

WP8 - Communication: Engagement, Dissemination, Exploitation, and Legacy

WP9 - Project Coordination, Management and strategic ocean observing alliance

WP3 is addressed to the increase efficiency and effectiveness of operation and use of in-situ ocean observing technology by improving and integrating observing networks and improve their coordination.

Task 3.7 Autonomous Surface Vehicles (task leader PLOCAN, partner: UBREMEN, UPORTO, UKRI, Deliverables D3.5, PM1 - PM48:

Autonomous surface vehicles (ASVs) are unmanned platforms of increasing importance for multiple observing applications that are not coordinated on a European (EuroGOOS) or a global level. EuroSea will establish an ASV network for better coordination, technological innovation and best practices. This will improve the availability of ASV technologies at operational, data management and policy level, and will enhance the use of ASV data improving ocean observing products, their implementation and dissemination through existing EU data infrastructures. The specific actions towards these objectives are: 1) ASV-Network definition and roadmap addressed to cover current and future user's needs, including access to infrastructures, community roadmap monitoring, promoting knowledge exchange, enhancement and partnership worldwide with the establishment of an ASV User Group; 2) improvements on Standard Operating Procedures (SOP) for derived BP implementation on operational protocols, data management, knowledge transfer, risk assessment, legislation, etc. in order to properly improve the ASV technology - challenges, opportunities and user engagement, and ASV technology - Best-practices implementation. The tasks will cooperate and support the EuroSea demonstrator activities, in particular WP7 that will provide important feedback on ASV usage.



EuroSea











www.plocan.eu



