In-situ, cost-effective, observation in practice: an introduction

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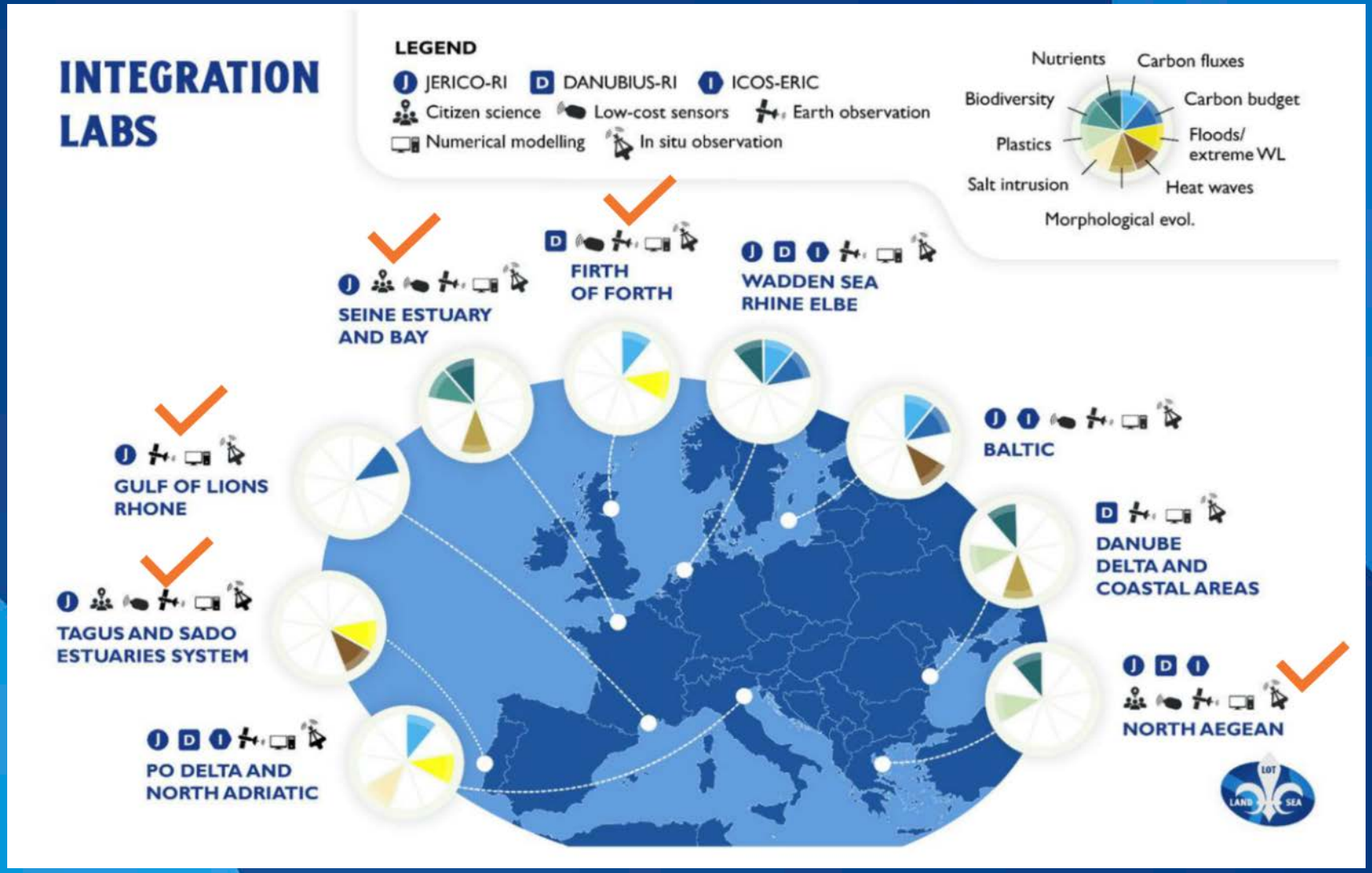
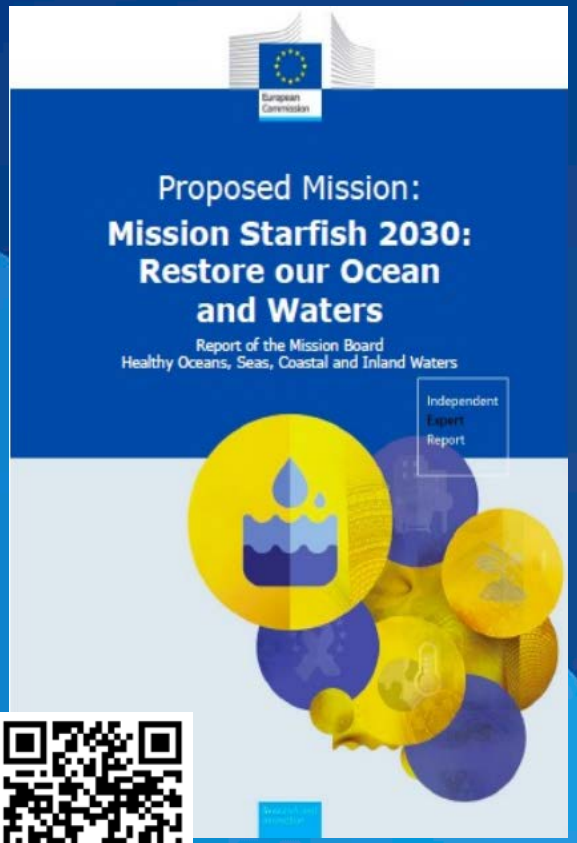
Increasing the observation capacity

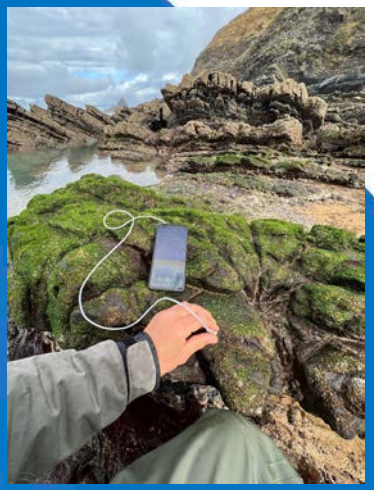


Collection of marine data

In Europe we spend ca. 1.4 billion Euro annually for collecting marine data (1.0 billion Euro *in-situ*; 0.4 billion Euro remote sensing) according to a EMODnet study



EU requires 20% of the marine data to come from citizen science by 2025



Filling key gaps in capabilities of other platforms

Satellites

Weather

Sofar/drifter

Fishing Vessel
$50/day

Saildrone
$2500/day

EnvLogger
$60

Sea-Surface

Probe fishing
$100

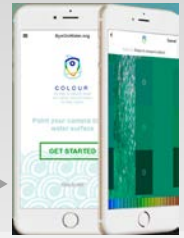
Glider
$500k/year

Sub-Surface

Water Level
Ultra
$1000+380

Argo float
$200/profile

OpenCTD
$400



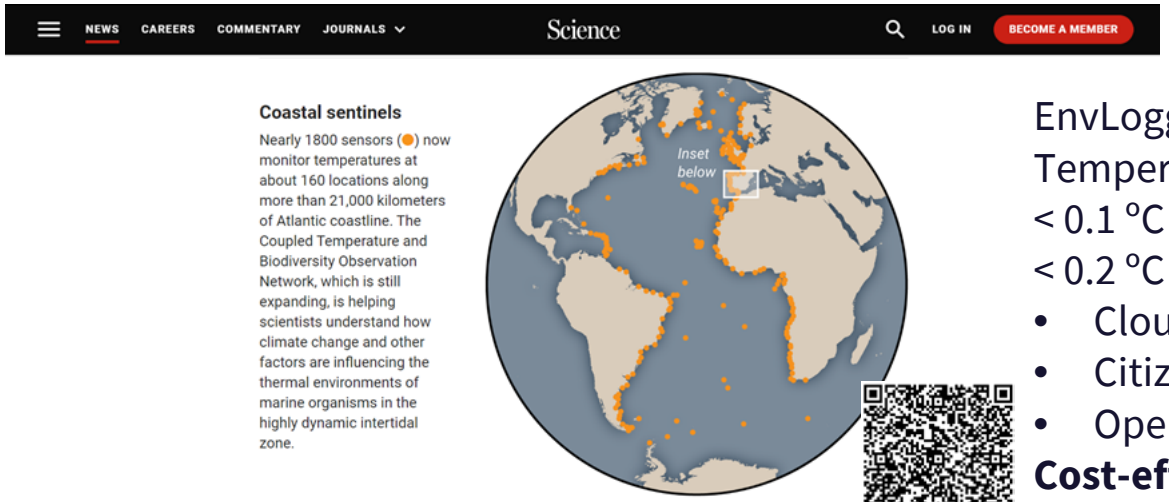
Open Ocean

Shelf and Coastal Seas

Where other ocean observation tech is lacking, in shelf and coastal seas

The most important places where maritime stakeholders need accurate forecasts

Cost-effective since platforms (fishing vessels) already exist

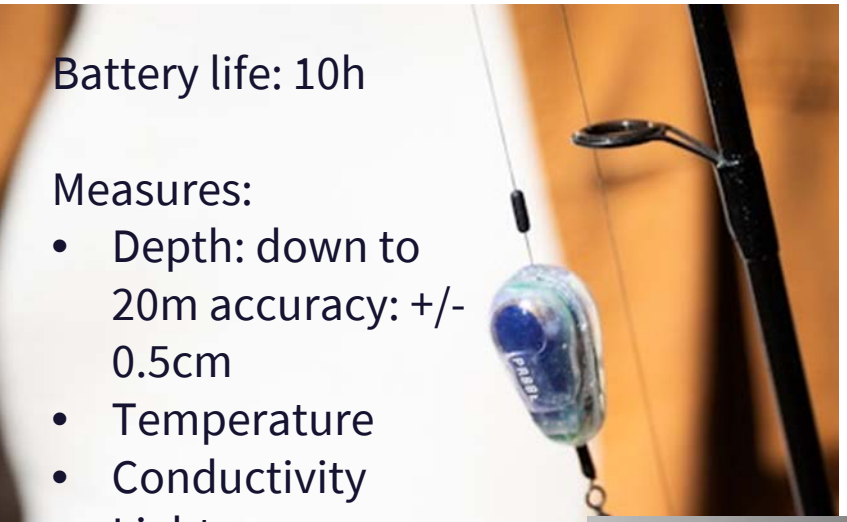


EnvLoggers:
Temperature
< 0.1 °C precision
< 0.2 °C accuracy

- Cloud processing
- Citizen Science
- Open, FAIR, data

Cost-effectivenss: 50 to 75€

https://electricblue.eu/envloggers



Battery life: 10h

Measures:

- Depth: down to 20m accuracy: +/- 0.5cm
- Temperature
- Conductivity
- Light

Cost-effectivness: €100

https://www.probefishing.com/

High-frequency water level sensor for continuous full ocean wave spectrum monitoring. Monitors tides, floods, rivers,….

Features:

- Measurement every 2 minutes
- **Real-time data** every 12 minutes
- Range 28 cm - 750 cm
- Accuracy: ± 1cm
- Temperature compensated ultrassonic
- IP67 Waterproof Enclosure
- **Cost effectiveness: 950 + 350€ (sensor + installation)**

https://coastal-e.pt/

List of developers

	A	B	C	D	E	F	G	H	I	J	K
1	**List of developers information**										
2	Created 26 Feb 2024 by Emilie Breviere										
3											
4											
5	**Developer name**	**Email address**	**Company name**	**Name of the person providing the info**	**Comment**						
6	Rui Seabra	mail@electricblue.eu	Electric Blue	francisco.campuzano@colabatlantic.com	Low cost temperature sensors						
7	Theo Moura	contact@coastal-e.pt	Coastal-e solutions	francisco.campuzano@colabatlantic.com	Water level, temperature and minibuoys						
8		https://www.hikvision.com/en/all-forms/technical-support/	HIKVISION	elias@hcmr.gr	cameras for monitoring plastics on rivers						
9	Michele Grassi	michele@elementsworks.com	https://www.elements.community/pages/neth2o	cfrangoulis@hcmr.gr	small buoys with various sensors (T,S, O2, Chla, etc) and data transmission						
10	Norbert Schmidt (distributor)	norbert@ddq.nl	DDQ Pocket Science	Stefan Simis	iSPEX 2 spectropolarimeter						
11	Tom Brewin / Bob Brewin	brewtek.online@gmail.com	Brewtek Ltd	Stefan Simis	mini Secchi disk						
12	Earthwatch	water@earthwatch.org.uk	Earthwatch Europe	Stefan Simis	Freshwater watch: nutrients, turbidity, etc	kits	James				
13	Aida Alvera Azcárate & students	a.alvera@uliege.be	GHER, University of Liège (not a company but a researc	Charles Troupin	Low-cost surface drifters using a Raspberry as software						
14	Alexandre Sousa	alex@oceanscan-mst.com	https://www.ec-meloa.eu/pages/wavy-drifters	francisco.campuzano@colabatlantic.com	Low cost drifters with temperature, wave spectrum and communications (coastal and ocean versions)						
15	HOBO sensors (Temp - also CTD?)		ONSET HOBO	romaric.verney@ifremer.fr	Low cost temperature (and also CTD?) sensors	~70$ ... but is it low cost? Francisco's sensor can certainly be cheaper?					
16	Ifremer + Neotek	cyril.giry@neotek-web.com	NEOTEK	romaric.verney@ifremer.fr	Low cost seabed lander + on time recovery. Spec. sheet in f	https://neotek-web.com/wp-content/uploads/2021/03/210315_NEO_FT_MASTODON_v1.pdf					
17	Fredrik Gustavsson	fredrik.gustavsson@deepod.se	Sensoid	patrick.gorringe@smhi.se	temperature, depth, and light.	https://www.deepod.se/					
18	Several	cchytraeus@gmail.com, carl.wixe@manniskamaskin.com	Probe fishing	patrick.gorringe@smhi.se	Temperature, Conductivity, Light	https://www.probefishing.com/					
19	Anahita Laverack	anahita.laverack@oshensail.com	OSHEN	patrick.gorringe@smhi.se	Various	https://www.oshensail.com/					
20	Andrew Thaler	andrew.david.thaler@gmail.com	OpenCTD	patrick.gorringe@smhi.se	salinity, temperature, and depth	https://oceanographyforeveryone.com/project/openctd/					
21	To be added		Juice Robotics	patrick.gorringe@smhi.se	Light wieght CTD	Products — Juice Robotics					
22	To be added		Hohonu	patrick.gorringe@smhi.se	Tide monitoring	https://www.hohonu.io/					
23			Maka Niu	patrick.gorringe@smhi.se							
24	MASTODON	ivane.pairaud@ifremer.fr	Brest, IFREMER (tbc)	ivane.pairaud@ifremer.fr	low cost shallow mooring						
25	YUCO	oceane@seaber.fr	SEABER (Lorient, France)	ivane.pairaud@ifremer.fr	micro-AUV (Seaber)	https://seaber.fr/					
26	Fabrizio Grosso	wbsadmin@idromarambiente.it	IROMARAMBIENTE	giulia.dapueto@grupposcai.it / antonio.nove	Multiparametric probe, wavemeter, biological samplers, mor	http://www.idromarambiente.it/					
27	Flavio Grazziotin	idronaut@idronaut.it	IDONAUT S.R.L.	giulia.dapueto@grupposcai.it / antonio.nove	Multiparametric CTD, Sensors, monitoring system, water sa	https://www.idronaut.it/					
28	Antonio Incas	inches@idatagroup.com	OceanHis	giulia.dapueto@grupposcai.it / antonio.nove	Portable miniaturized plug&play laboratory (Temperature, Salinity, Chlorophyll, Blue algae, Oxygen, Ops Ph and Redox, Conductivity, Turbidity)	https://oceanhis.com/					
29	Marnix Laanen	laanen@waterinsight.nl	Water Insight	Sampsa.Koponen@syke.fi	Not sure if "low-cost" enough, but the company provides e.g	https://www.waterinsight.nl/info/wisp-3					
30											
31											
32											

Sensors for demos/video

Name	Sensor name	Measured parameters	Will the sensor be on display at the Kick-off? (Y/N)
Andrew Thaler	OpenCTD	Salinity, Temperature, Depth	Video
Lucie Cocquempot	OSO CTD	Salinity, Temperature, Depth	Yes
Lucie Cocquempot	OSO CTD	Chlorophile A	Yes
Lucie Cocquempot	PHENOMER app	Phytoplankton bloom	Yes
Stephan Simis	iSPEX	Radiometry	Yes
Stephan Simis	Secchi disks	Turbidity	Yes
Peter Thijsse/Tjerk Krijger	Eye-on-Water	Water color	Yes
Francisco Campuzano	EnvLogger	Water Temperature	Yes
Julia Dorigo	Aquality App		Yes
Christer Chytraéus/Carl Wixe	Probe	Temperature, Conductivity, Light	Video
Theo Moura	Coastal e-solution	Various	Video

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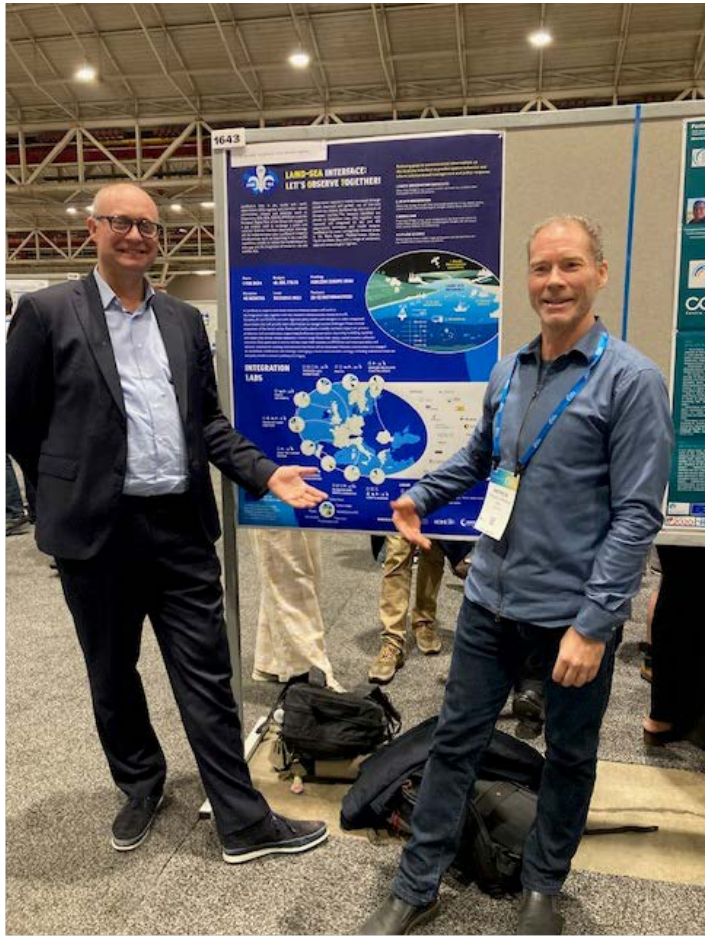

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Be part of the conversation

Coastal e-solution, Theo Moura:
https://www.youtube.com/watch?v=OEPpD2lwzeI

Probe, Christer Chytraéus/Carl Wixe :
https://www.kickstarter.com/projects/probe/probe-track-lure-swimming-depth-when-casting-or-trolling

OpenCTD, Andrew Thaler:
https://www.youtube.com/watch?v=Gn1iGRChi5U

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