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Intergovernmental Oceanographic Commission

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

GOOS | CoastPredict
with The Global Ocean Observing System

Ocean best practices

Coastal observations in under resourced countries

Jethan d'Hotman, Patrick Gorringe, Gregory Cowie, Thomas Bornman, Juliet Hermes, Tamaryn Morris, and many others

NRF National Research Foundation | SAEON South African Environmental Observation Network

COLaB Coastal Observation Lab in a Box

THE UNIVERSITY of EDINBURGH

COLaB: "Coastal Observing Lab in a Box"

TT Coastal Observations in Under-Resourced Countries

"Affordable and standardised equipment, practices and training that can be broadly used for observations of physical and biogeochemical parameters of the coastal ocean, across the observing lifecycle"

If you want to go fast, go alone. If you want to go far go together

Greg Cowie (University of Edinburgh, UK)
Juliet Hermes (SAEON, South Africa)
Tommy Bornman (SAEON, South Africa)
Lucie Cocquempot (IFREMER, France)
Jethan d'Hotman (SAEON, South Africa)

Benjamin Osei Botwe (University of Ghana)
Kacie Conrad (Fisheries and Oceans Canada)
Katherine Shaw (Fisheries and Oceans Canada)
Andrew Thaler (Oceanography for everyone, US)
Kevin O'Brien (NOAA, US)
Virginie vanDongen Vogels (AIMS, Australia)

Jerome Aucan (PCCOS New Caledonia)
Lon Porter (Wabash College Indiana, USA)
Bob Brewin (Uni Exeter, UK)
Aneesh Lotliker (INCOIS, India)
Patrick Gorringe (SMHI)

Emmanuel Hanert (Belgium)
Samuel Obeng Boamah (Uni Ghana)
Bernadino Malauene (ICIMS, Mozambique)
Jennifer Veitch (SAEON, South Africa)
Shelley-Ann Cox (Caribbean)
Katy Soapi (PCCOS, Fiji)

COLaB: "Coastal Observing Lab in a Box"

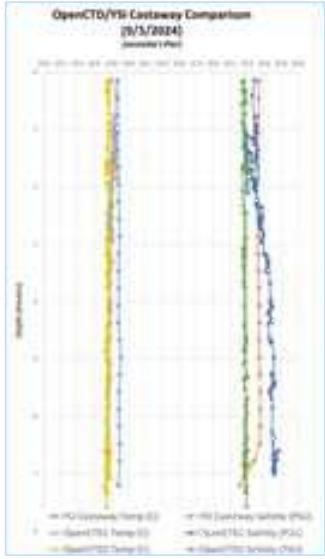
Packages of instruments and methods for physical, biological and biogeochemical observations

Objectives

- "Old-school" – affordable, low-maintenance, proven
- Modular: Open-source and commercial sampling gear, field/lab instruments, sensors & moorings
- Minimal infrastructure (vessel, laboratory)
- Portable and easily taught, training – in person and online
- Diverse applications (wetlands to shelf edge), packages co-designed with the region for the region – fit-for-purpose
- Complementary to moored systems and remote sensing
- Protocols (sampling to data management)
- Modelling and data packages with end user in mind
- Regional hubs for instrument/sensor cross calibration

COLaB pilot study, Ghana July 2024
Sediment and mercury contamination in the Pra river-estuary system

- Instrument testing and comparison
- Currents and discharge
- CTD profiling
- Water sampling and analysis
- Modelling



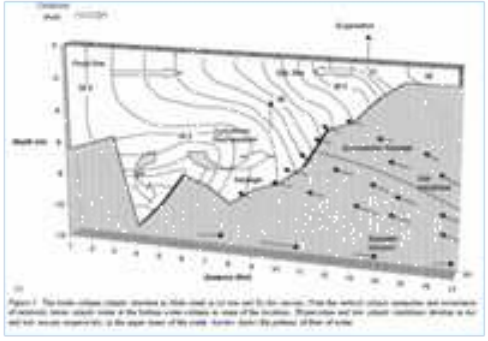
Mida Creek, Kenya – VOKCE-COLaB study site, September 9-14, 2024

To demonstrate the potential of affordable methods for coastal observation, through a study of the hydrography and nutrient dynamics in a tidal estuary

Study and training outline:

Comparison of Mida Creek hydrography and water chemistry under falling and rising tides

- CTD profiling & instrument comparison
- Current meter deployments (acoustic & drifter)
- Water sampling
- Chemical analysis & instrument comparison
  - Nitrate & phosphate
  - Chlorophyll
  - FDOM
  - PAHs & microplastics
- Physical & chemical data processing
- Data presentation



COLaB and the UN Decade

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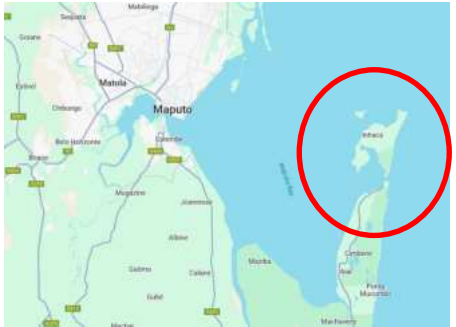
Global Coast Experiment site survey

COLaB and IIOE-2

- Third phase 2026-2030, with amended science plan (Hood et al, 2024)
- Emphases on coastal observations and marine science capacity building
- Funding secured for first regional training camp (SW Indian Ocean), Maputo Bay, Mozambique
- Indonesia: BRIN facility in Lombok
- Negotiations underway for Malaysia, Andaman islands, Seychelles- Mauritius etc
- Collaborative effort with INCOIS, Hyderabad, India (UN Decade collaborative centre)

Mozambique COLaB Camp 2025 – Inhaca Island

- Co-Hosted by Edurdo Mondlane University and InoM
- 25-30 trainees
- Focus on land-sea interface across CTD transect lines last visited in 200-2001
- Establish long-term monitoring project



Laboratory

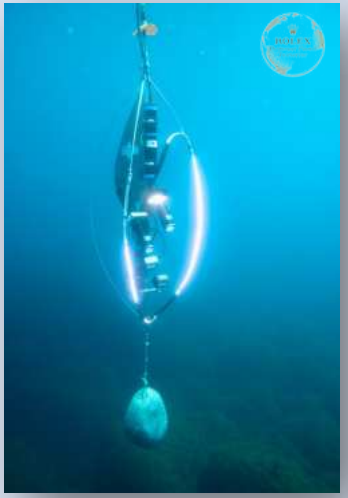
Accommodation

Participants:
WIO countries e.g.

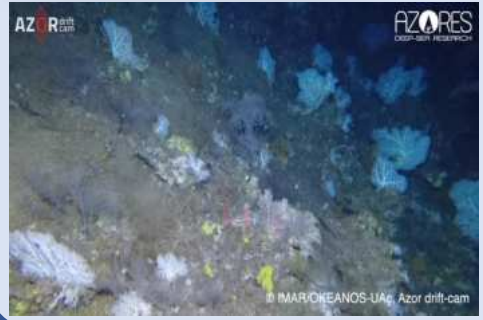
- Kenya
- Tanzania
- Mozambique
- South Africa
- Madagascar
- Comoros
- Seychelles
- Mauritius
- Reunion

Azor Drift Camera

A cost-effective video system for a rapid appraisal of deep-sea benthic habitats



- 4k High-Res Benthic Video Footage
- 1000m Depth Capability
- Live Camera Feed for Navigation
- Equipped with Mini CTD
- Scaling Laser for Size Estimates
- Non-Destructive Survey Capability
- Able To Be Used In Rocky Habitats
- Can Be Deployed By Hand Off Small Vessels
- Low Maintenance Cost
- Commercially available, Off the Shelf Components
- Able to be Built, Operated and Maintained with Limited Technical Expertise

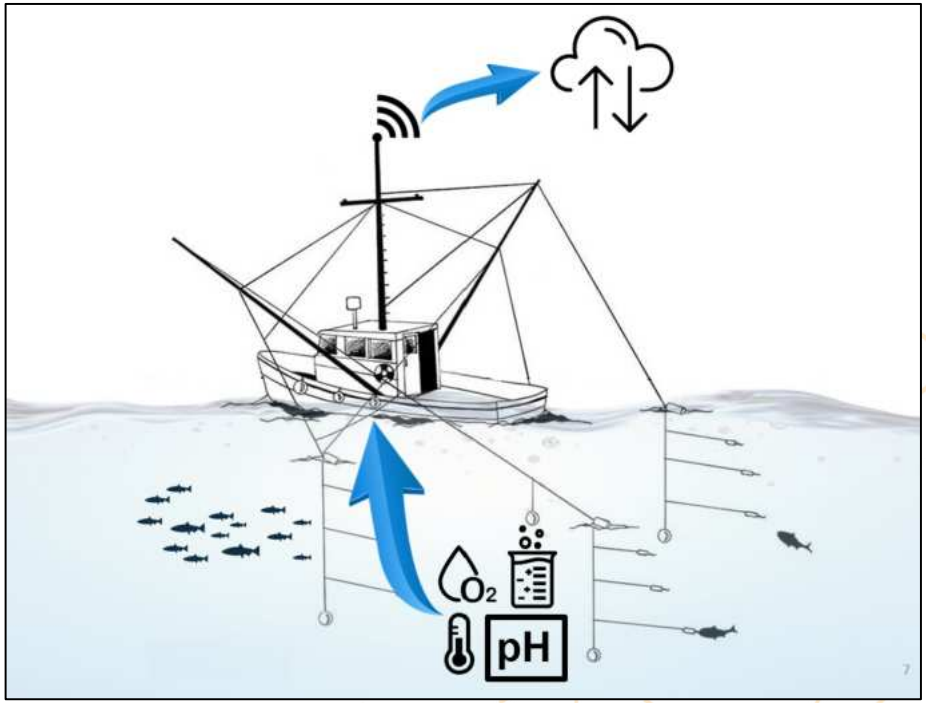


NRF National Research Foundation | SAEON South African Environmental Observation Network | SAPRI South African Polar Research Infrastructure | AZORES DEEP-SEA RESEARCH

THE FISHING VESSEL OCEAN OBSERVING NETWORK, THE FVON APPROACH

FISHING FOR DATA

- Millions of fishers already operate in shelf and coastal regions
- Sensors *go along for the ride* on nets, traps, etc., catching water column profiles
- Co-located surface met, sea surface, & subsurface data – powerful!
- Fully automatic: as soon as the sensor surfaces data is automatically transmitted



Citizen Science with scuba divers
The worlds largest Citizen science initiative

Mobilizing the global water sports community to collect and share ocean data.

Bridging the gap between citizen engagement and scientific research and advancing ocean literacy, resilience and stewardship

A Liquid Future presents **Surfer Scientists**

Ocean science for remote surfing communities. Ocean data for the planet.

ENGAGES
Local surfers including girls through a passion.

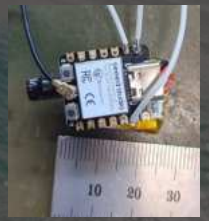
GENERATES
Long-term social and geospatial data sets of interoperable standards.

INFORMS
Decision-makers through relevant products.

ADVANCES
Protection and value of surfing ecosystem.

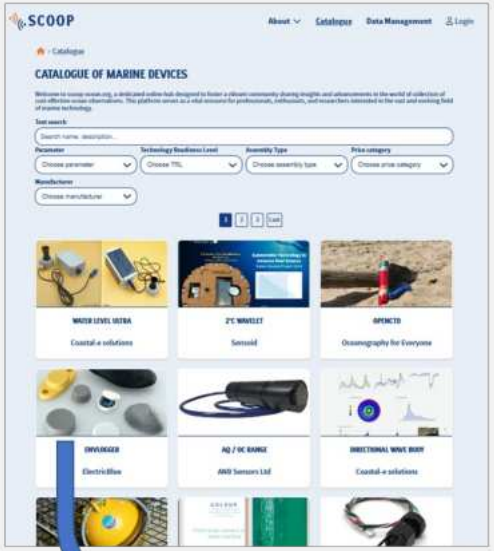
ENABLES
Sustainable development of surfing ecosystem

PROMOTES
Ocean literacy, and gender equity.



Solutions for Cost-effective Ocean Observation Platform

https://scoop-ocean.org/



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JERICO RI
SCIENCE · SERVICES · SUSTAINABILITY

EMODnet
European Marine Observation and Data Network

GOOS | CoastPredict
with The Global Ocean Observing System

Synchro

OCEAN ENTERPRISE INITIATIVE

MTS marine technology society
Opportunity runs deep™

The Global Ocean Observing System

NOAA

IOOS Integrated Ocean Observing System

Save the Date: Dialogues with Industry – Late 2025
The Ocean Enterprise Initiative is pleased to announce the return of our Dialogues with Industry series later this year, with a **focus on cost-effective and accessible technologies for ocean observation.**

oceanenterprise.com

Future Plans

- Training & Workshops
  - Low cost tech workshop @ WIOMSA 2025
  - Western Indian Ocean regional training camp in Mozambique (Maputo Bay) 2025/2026
  - North & West African regional training camp in Ghana 2025/2026
- Sensor Development
  - Low cost ADCP
  - Low cost water sampling rosette
- Establish regional calibration hubs
- Roll out an ERDDAP data management network

One Ocean One Future:

Connecting People, **Policy**, and **Science** for a Thriving Western Indian Ocean

KMFRI Kenya Marine and Fisheries Research Institute

Nairobi Convention

unesco Intergovernmental Oceanographic Commission

WIOMSA

Coasts Ocean and People

WESTERN INDIAN OCEAN MARINE SCIENCE ASSOCIATION

13TH SCIENTIFIC SYMPOSIUM

Mombasa Kenya
28th Sept - 3rd Oct 2025

Thank you!