Ocean best practices

Task Team 22-01

Coastal Observations in Under-Resourced Countries

Lucie Cocquempot (IFREMER, France) and **Jethan d'Hotman** (SAEON, South Africa), and multiple co-investigators

"Affordable and standardised practices that can be broadly used for observations of physical, biological and biogeochemical parameters of the coastal ocean"
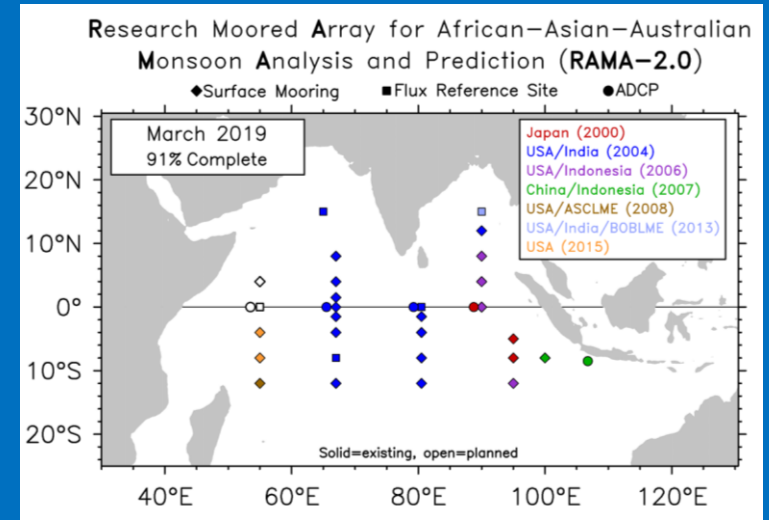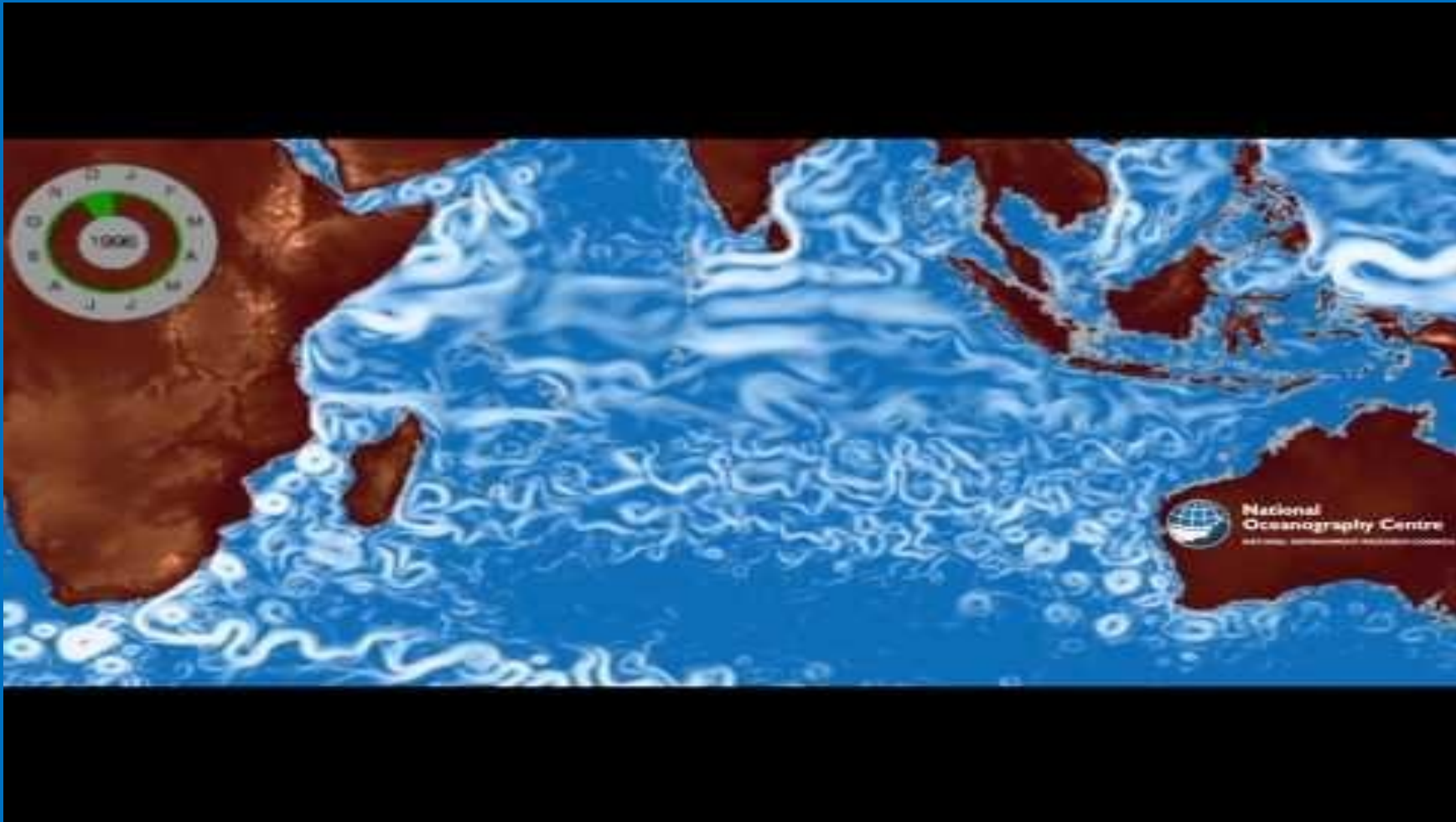
COLaB: "Coastal Observation Lab in a Box"

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Plus a growing cast of Co-Is, including ECS

Research Moored Array for African–Asian–Australian Monsoon Analysis and Prediction (RAMA-2.0)

COLaB: "Coastal Observation 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

- Diverse applications (wetlands to shelf edge)

- Complementary to moored systems and remote sensing

- Protocols

- Data management and modelling tools packages

- Regional hubs for instrument/sensor cross calibration
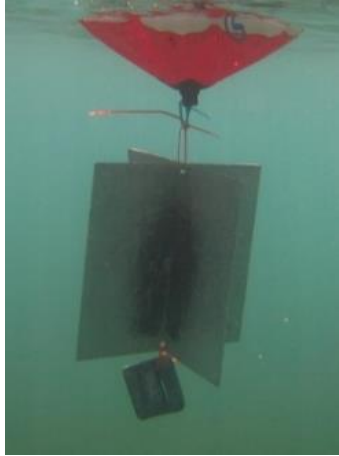
- Training – in-person and online support
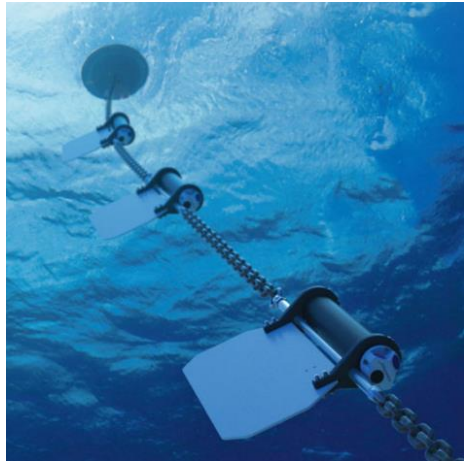
Basic hydrographic instrumentation

CTD   Currents   CTD + Currents

Biogeochemical analyses

Sondes

Lab-based methods

- Nutrients (full suite)
- Chlorophyll, phycocyanin/erythrin
- Dissolved oxygen
- Alkalinity
- pH
- SPM
- Sulfide
- CDOM and FDOM
- Turbidity

Simple analytical instrumentation

- UV-vis spectrophotometer
- Fluorimeter

Water sampling and profiling

Shallow water

Niskin bottles, rope, and messenger

Deep water

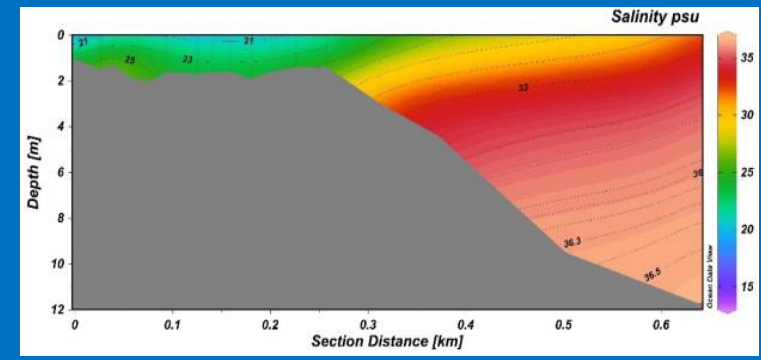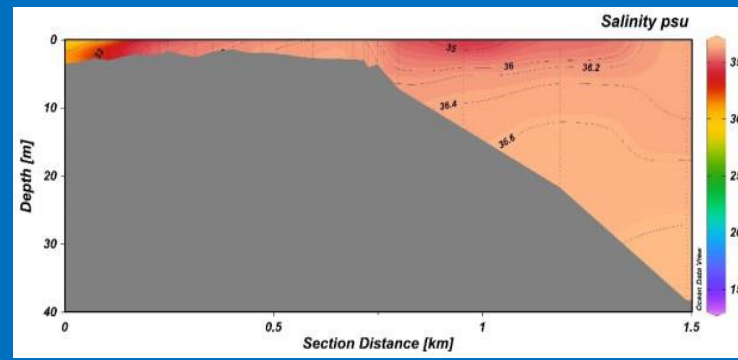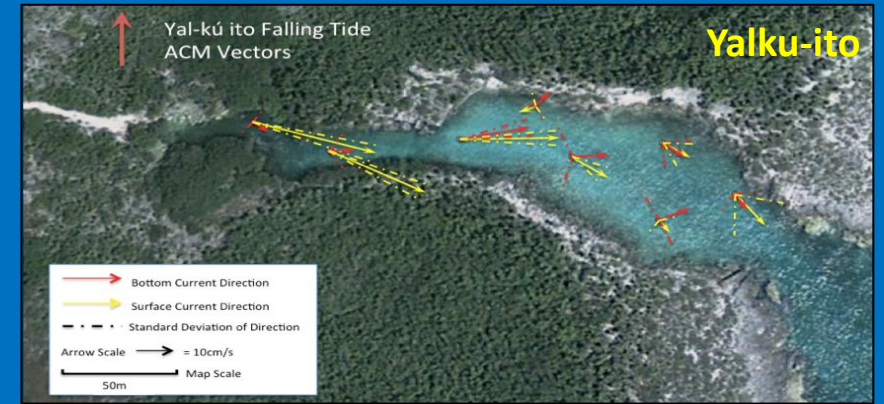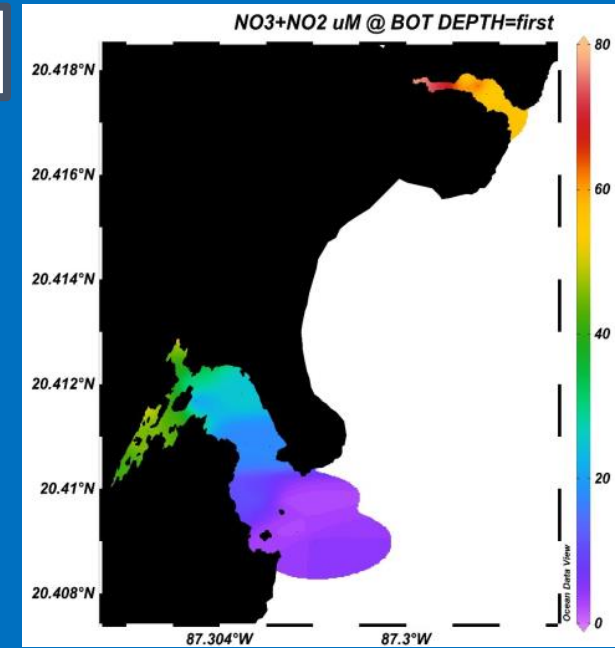12V line hauler or winch

Portability

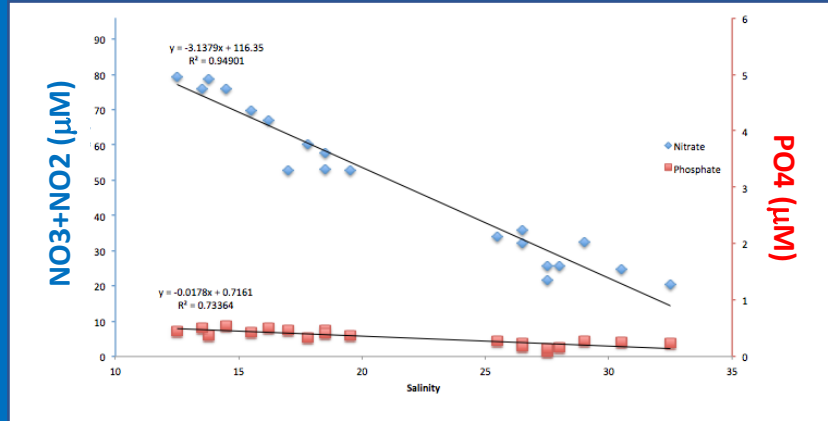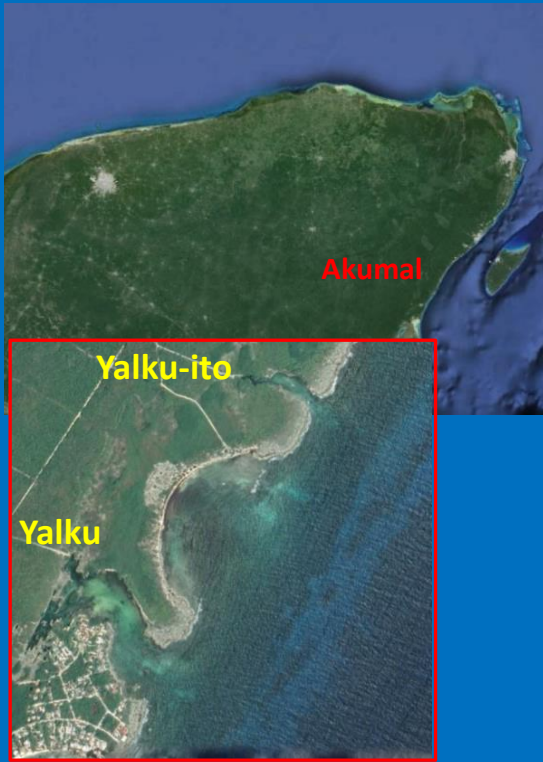2-4 23-kg crates

No formal lab required

- Sink
- Power
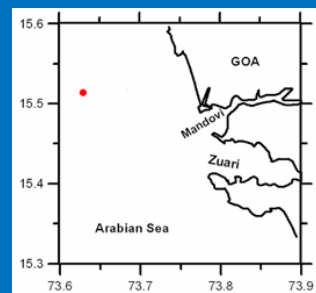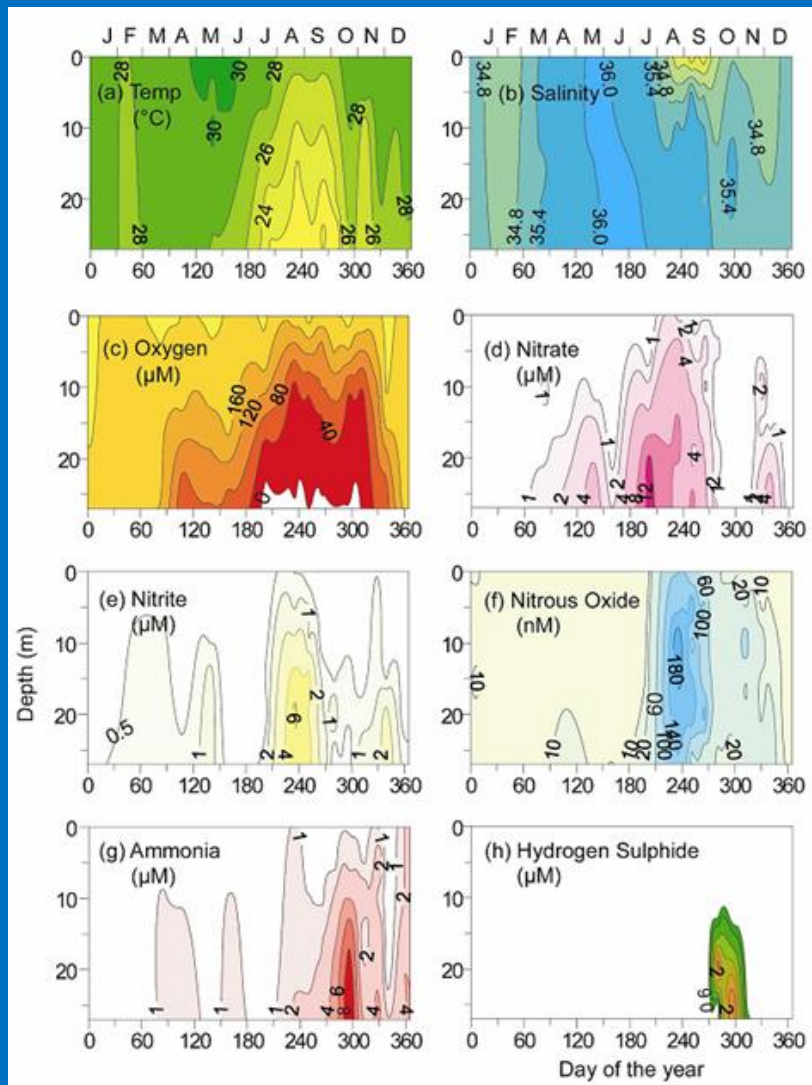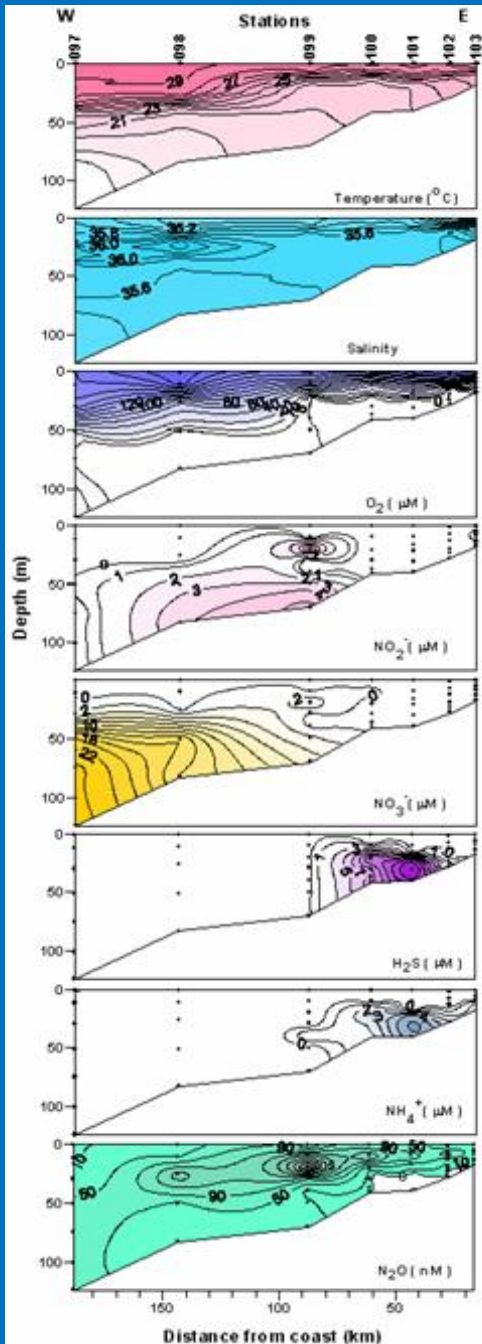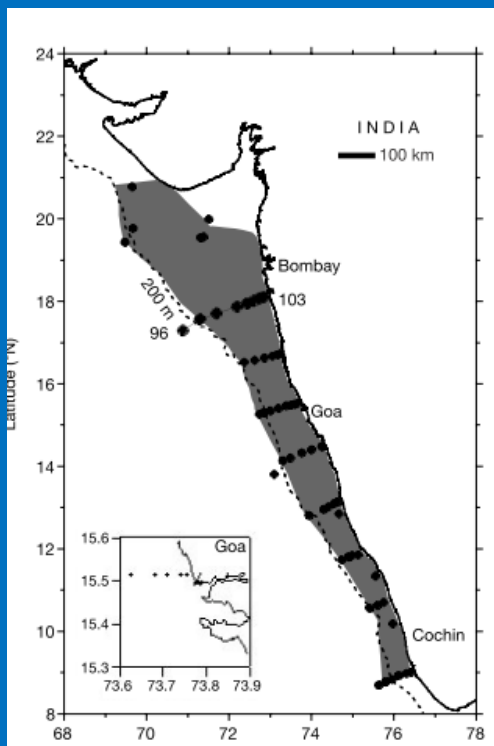- Bench space

Throughput

30 - 40 samples/day
(e.g. 1 staff + 3 students)

Mexico: Contaminated groundwaters and reef health

Western Indian margin: Observing system and cross-shelf transects

MOSAIC programme (INCOIS)
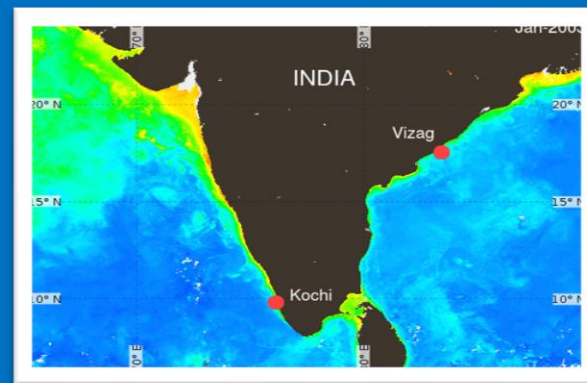
CONTACT: Dr. Aneesh Lotliker
aneesh@incois.gov.in

Naqvi et al 2006, 2009

Dr. Andrew Thaler

(Blackbeard Biologic
Southern Fried Science)

- Marine scientist
- Blogger, and…
- Open-source instrument developer

Meet the OpenCTD

?
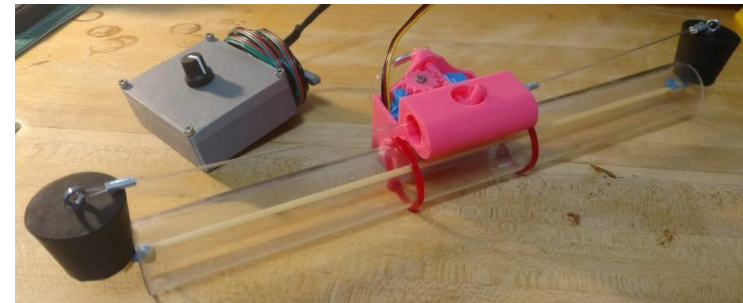
Professor Lon Porter

Wabash College Indiana, USA

Analytical chemist
Instrument developer
Director of a 3D printing facility

Open and affordable modular imaging platform for citizen oceanography

https://www.planktoscope.org

COLaB: Integration of Ocean Models

Ocean models optimized for key coastal regions, downscaled from global models
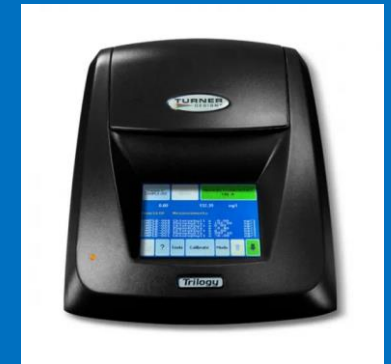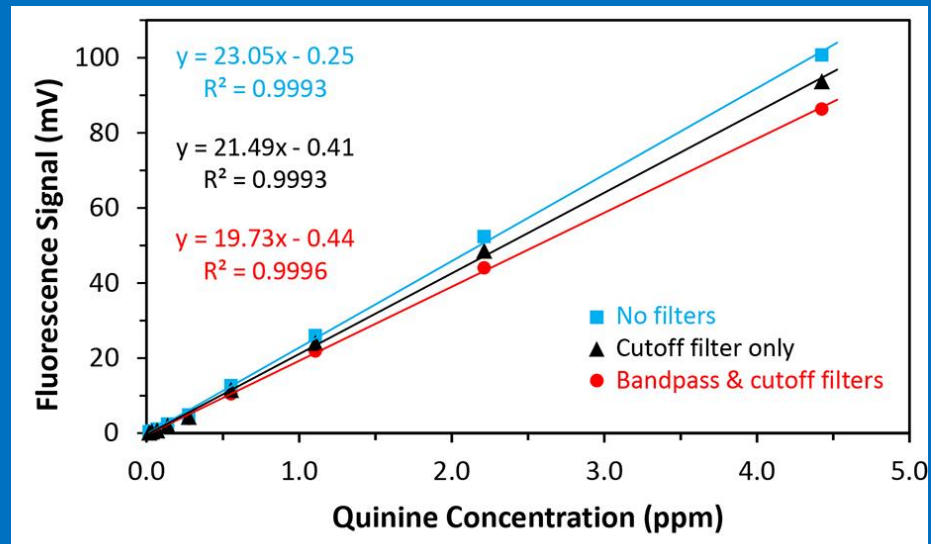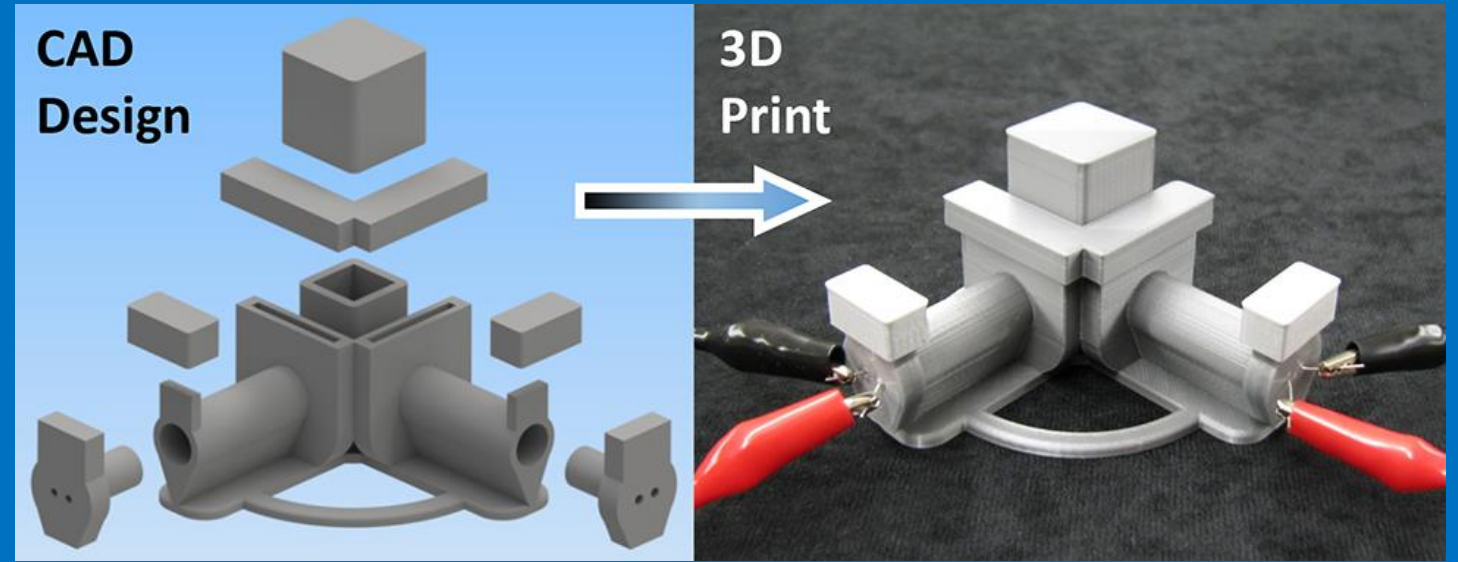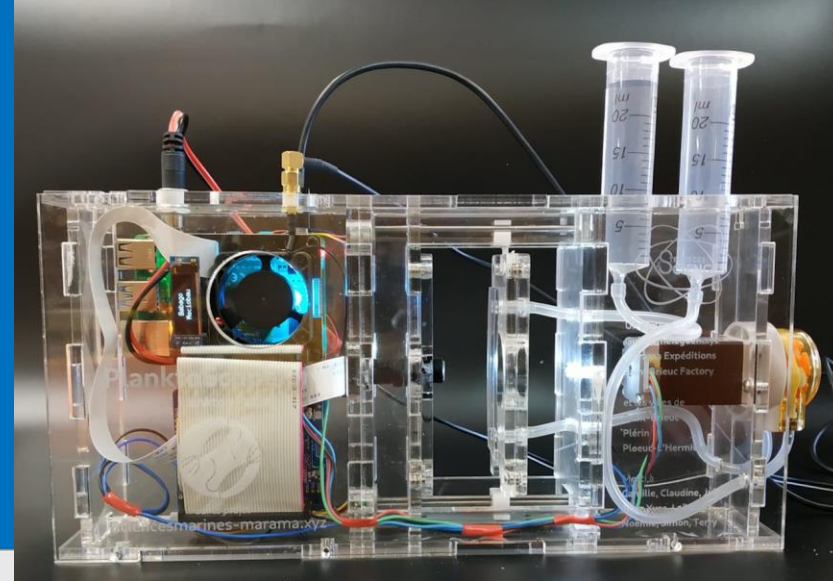
Limited-domain operational ocean forecast system (OOFS):

Example: Algoa Bay, South Africa

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"Easy to implement and relocate ocean models, integrated into the COLaB concept will 'fill the gaps' and provide a spatially and temporally cohesive dataset. This will be done by using the in situ observations to constrain (assimilation) and evaluate the models".
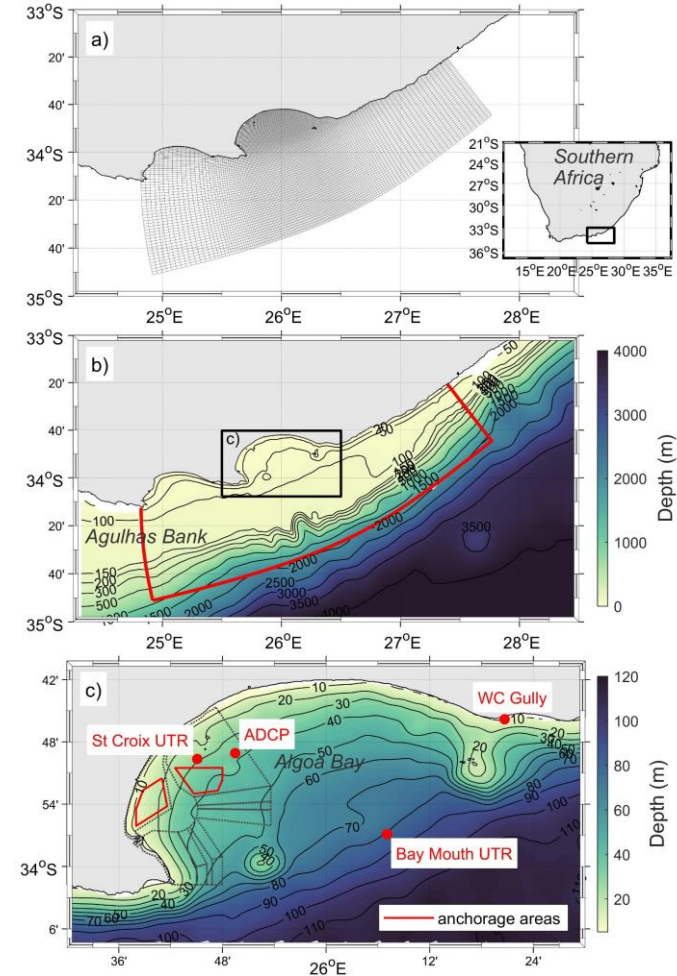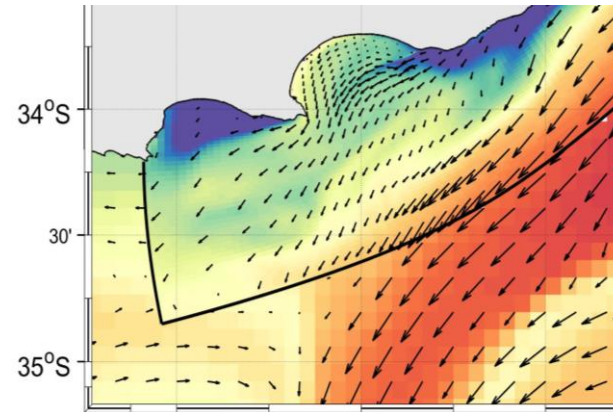
science & innovation
Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

NRF | SAEON
National Research Foundation | South African Environmental Observation Network

COLaB Data management: Integration of ERDDAP Services

CONTACT: Dr. Kevin O'Brien
kevin.m.o'brien@noaa.gov

data payload

1. Data payload is extracted from sensor and pushed directly into an ERDDAP service using the HTTP Rest API
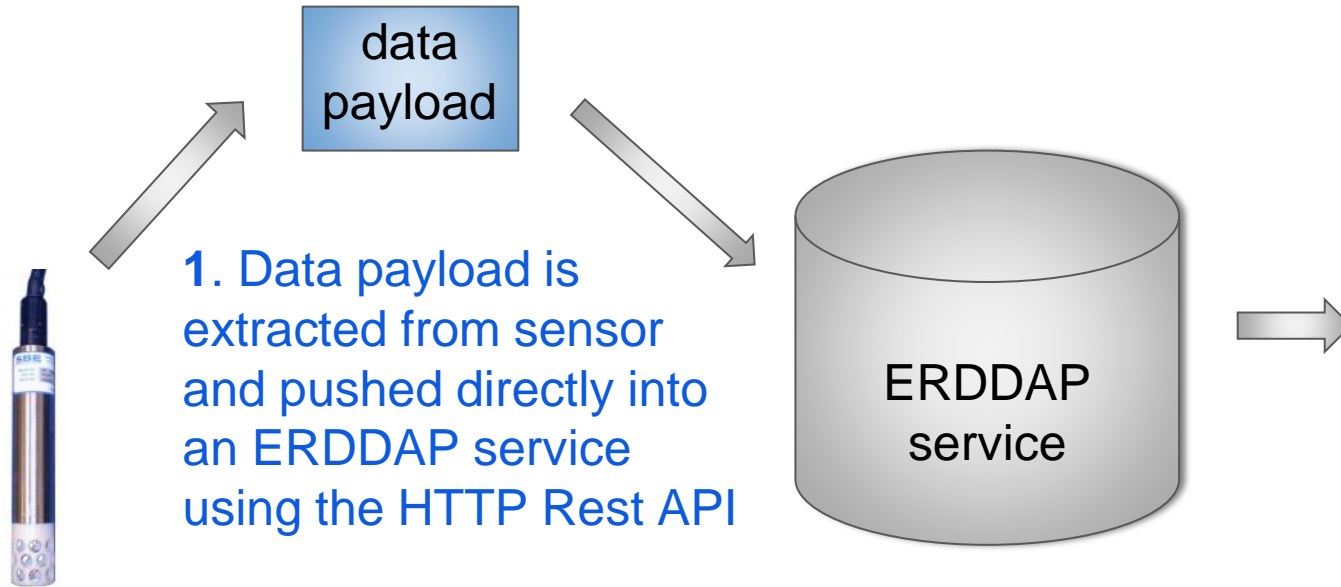
ERDDAP service

Time	Airp
UTC	Pa
2022-03-14T16:18:00Z	1016
2022-03-15T18:52:00Z	1021
2022-03-16T03:54:00Z	1019

ERDDAP also provides extensive capabilities for:

- Data access through interoperable and machine-to-machine services
- Improving metadata and documentation of datasets
- Federation of distributed data services
- Integration into cloud environments
- Potential connection to WMO WIS 2.0 data exchange services

2. Data are then available to be accessed immediately and used in one of the many data formats ERDDAP supports

EXAMPLE URL: http://localhost:8080/erddap/data.insert?date="2022-03-16T03:54:00Z"&airp="1019"

Current status

Following multiple 2022 workshops (virtual and in-person) that served to present the COLaB concept and explore potential end-user needs:

- Proposals submitted for in-person COLaB workshop (June 2023?)
    Finalise: EOVs and instrument packages
        Data management and modelling tools
        Training plans and teams
        Business model
    Prepare follow-up proposals to fund
        Training teams and materials
        Pilot regional training camps (Mozambique, Ghana, Caribbean)
- *Longer-term*: Seek funds for broader roll-out, regional calibration hubs, etc (COLaB concept included in *CoastPredict* Decade of the Ocean project)