Global Ocean Observing System

unesco Intergovernmental Oceanographic Commission

WORLD METEOROLOGICAL ORGANIZATION

UN environment programme

International Science Council

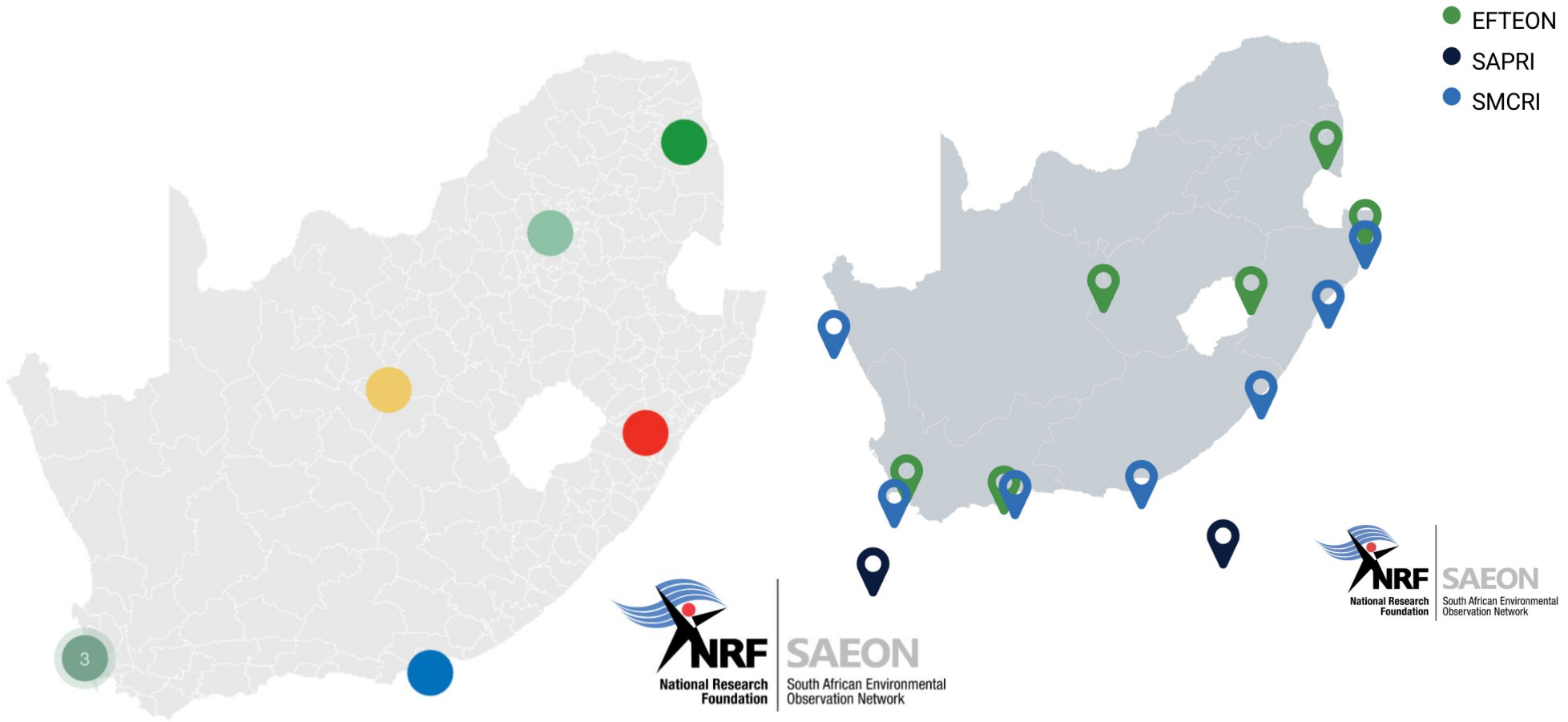
The use of accessible ocean technologies to better understand coastal environments around Southern Africa

SAEON

Tammy Morris, Jethan d'Hotman and Juliet Hermes

SAEON Research Nodes

SAEON encompasses seven Research Nodes throughout South Africa and a National Office that is located in the country's political capital of Pretoria. There are three nodes located in Cape Town. Click on the icons to expand.



Why accessibility matters

- Traditional ocean research tools are often **expensive, complex, and limited** to well-funded institutions.
- Accessible technologies bridge this gap by:
  - Reducing **costs**
  - Improving **ease of use**
  - Expanding **participation** (citizen science, small institutions, developing regions)


(Muskegon Community College, 2026)

unesco
Intergovernmental Oceanographic Commission

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

COLaB
Coastal Observation Lab in a Box

GOOS | CoastPredict
with The Global Ocean Observing System

COLaB: "Coastal Observing Lab in a Box"

OBPS 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"

NRF National Research Foundation | SAEON South African Environmental Observation Network

Ocean best practices

IIOE-2 2nd International Indian Ocean Expedition

THE UNIVERSITY of EDINBURGH

GOOS

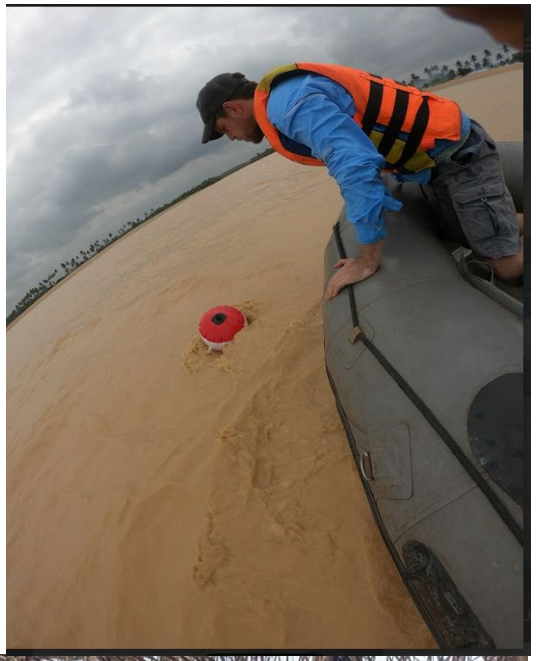
Packages of instruments and methods for physical, biological and biogeochemical observations

Objectives

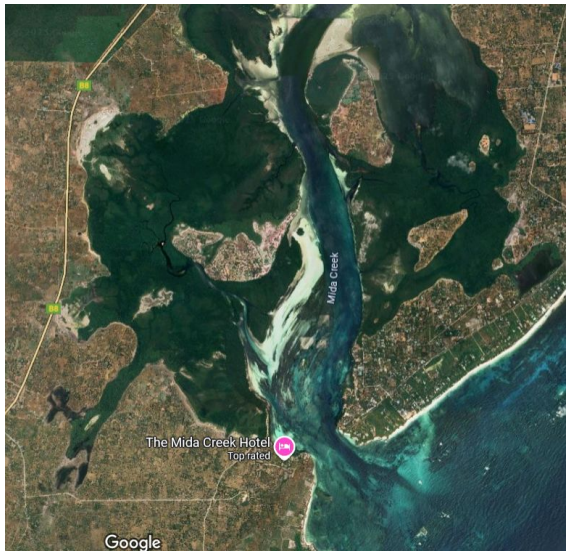
- "Old-school" – affordable, low-maintenance, proven
- Modular: Open-source and commercial sampling gear, field/lab instruments, sensors & moorings
- Minimal infrastructure (vessel, laboratory)
- Portable and easily taught, training – in person and online
- Diverse applications (wetlands to shelf edge), 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

Pilot Study, Ghana 2024 Pra river estuary

- Instrument testing & comparison
- Currents and river discharge
- CTD profiling
- Water sampling and nutrient analysis
- System modeling
- Community engagement

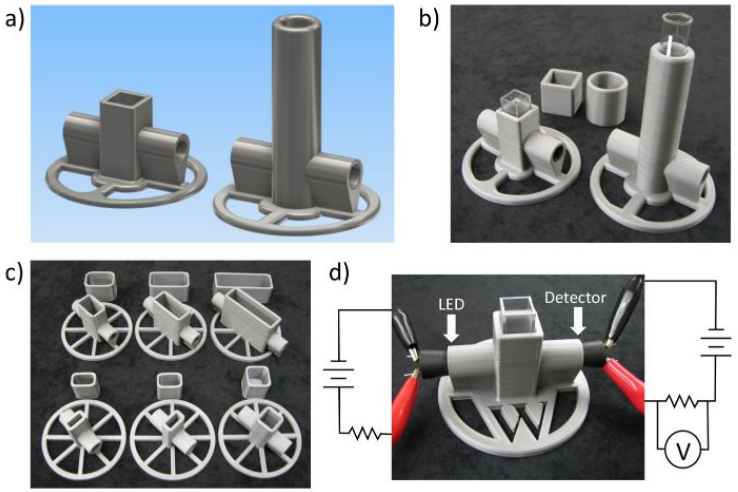


Milda Creek, Kenya 2024

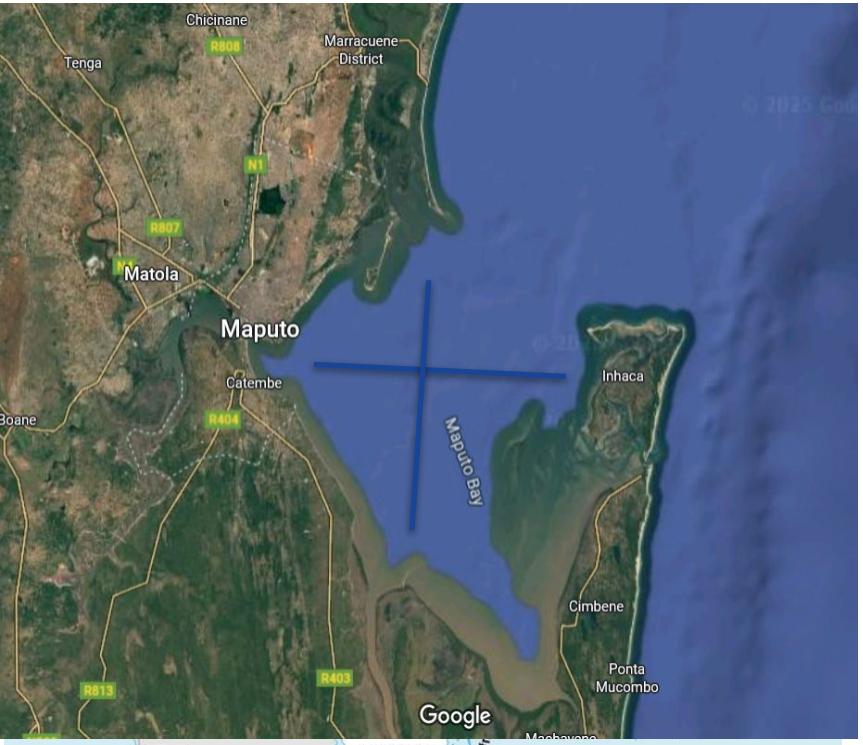


To demonstrate the potential of affordable methods for coastal observations through a study of thehydrography and nutrient dynamics of a tidal estuary

Comparison of hydrography under falling a rising tides



Mozambique Regional Training Camp



- Train 20 - 30 participants from the IORA region on data collection, processing, analysis and management
- Use COLaB to re-establish monitoring transects last visited in the early 2000s
- Objective is to study the influence of the estuaries on the Maputo Bay

COLaB and the UN Decade

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

GOOS | CoastPredict

with The Global Ocean Observing System

COLaB and IIOE-2

- Third phase 2026-2030, with amended science plan (Hood et al, 2004)
- Emphases on coastal observations and marine science capacity
- **Endorsed project under the IIOE-2 (March 2026 to December 2030)**
- Funding secured for first regional camp (SW Indian Ocean), Maputo Bay, Mozambique
- Keen interest for training camps in:
  - **Indonesia (BRIN Facility, Lombok)**
  - **Malaysia**
  - **Andaman Islands**
  - **Seychelles**
  - **Mauritius**
  - **Kenya (followup)**
  - **South Africa**
- Collaborative effort with INCOIS, Hyderabad, India (UN Decade collaborative centre)

National Research Foundation | SAEON South African Environmental Observation Network

A LIQUID FUTURE EST 2011 SURF FOR GOOD

Surfer Scientists

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

CoLAB +ATLANTIC

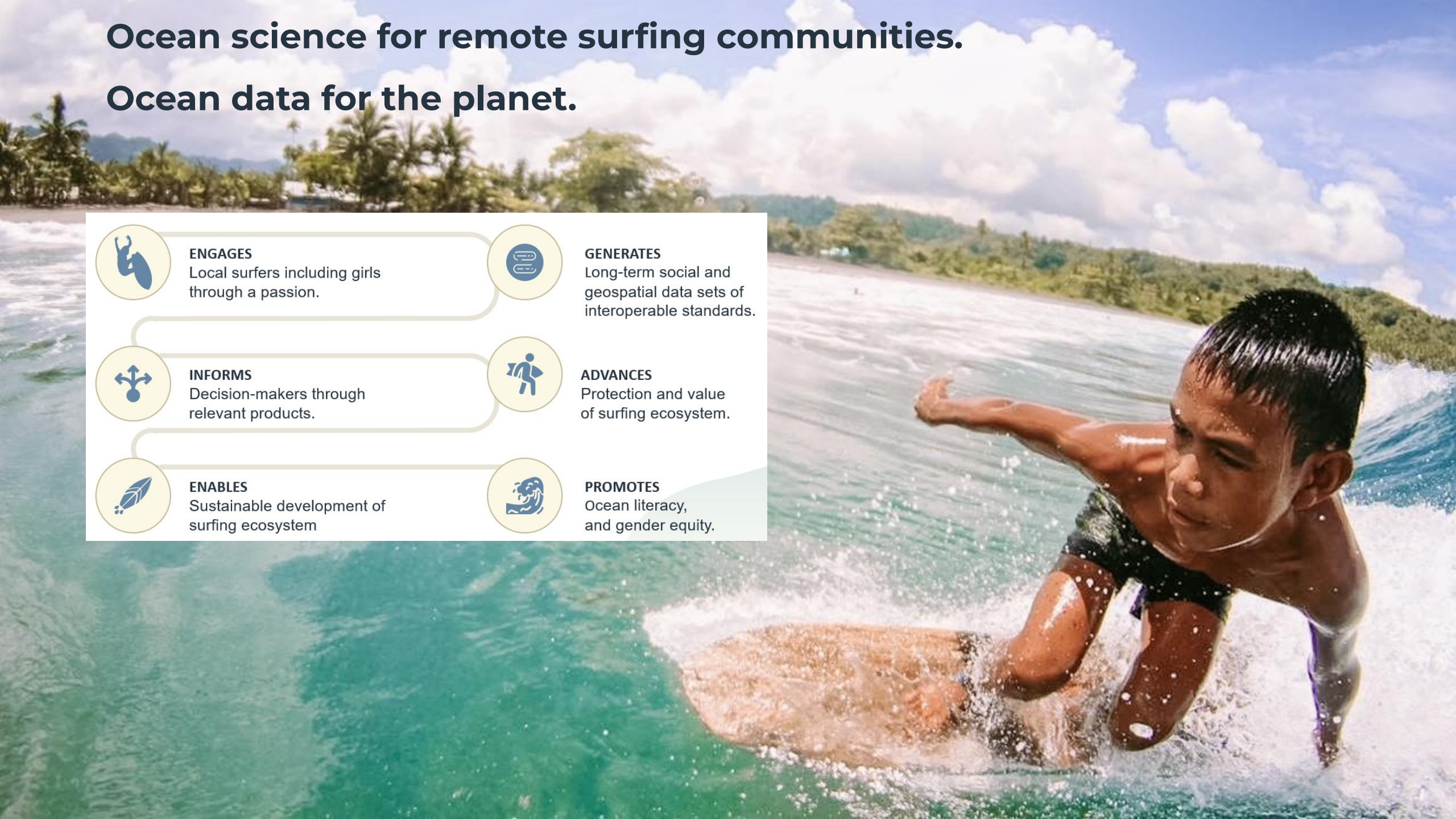
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

cmcc Centro Euro-Mediterraneo sui Cambiamenti Climatici

GOOS

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.

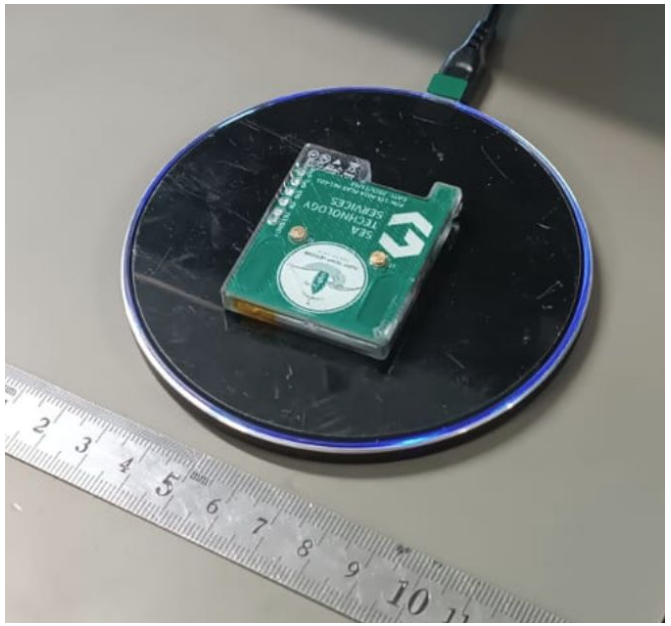
ENABLES
Sustainable development of surfing ecosystem

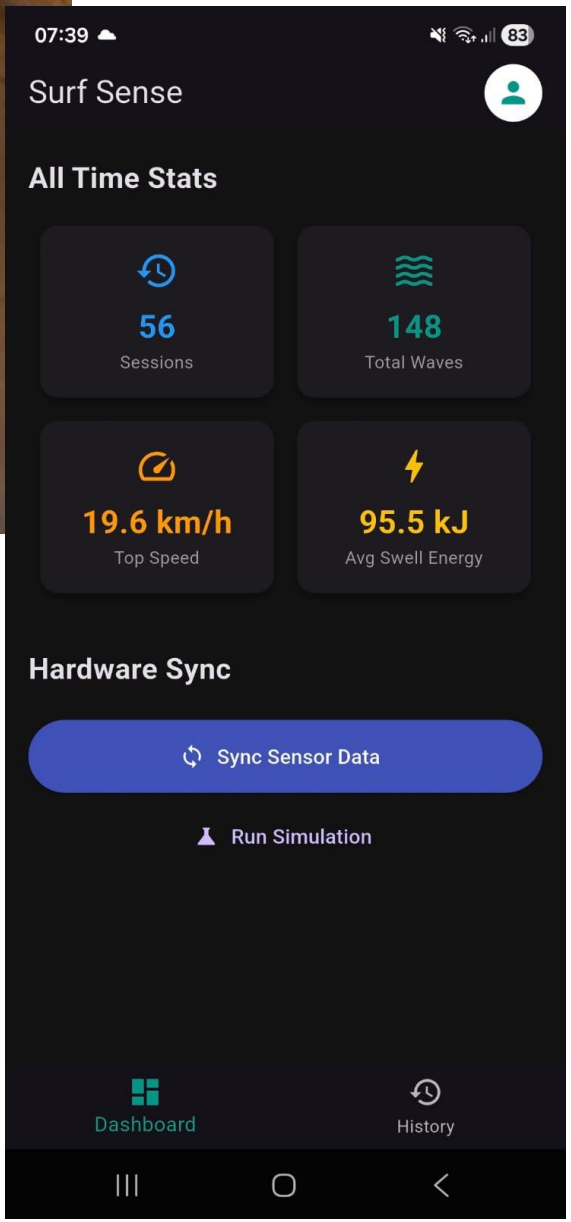
PROMOTES
Ocean literacy, and gender equity.

Surf Sense

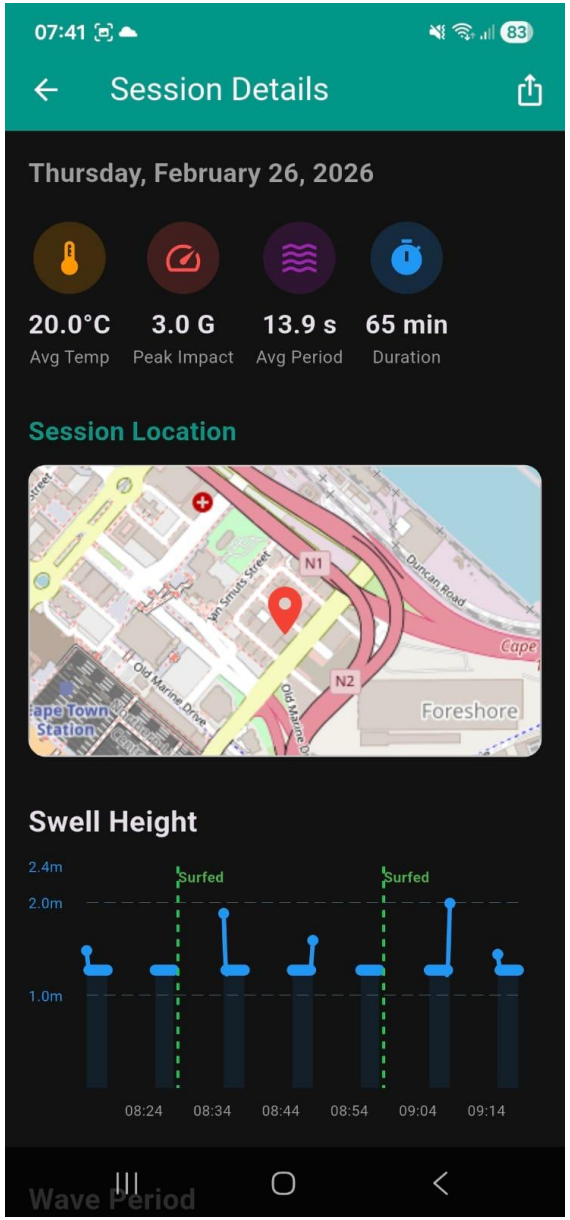
Sensor details:

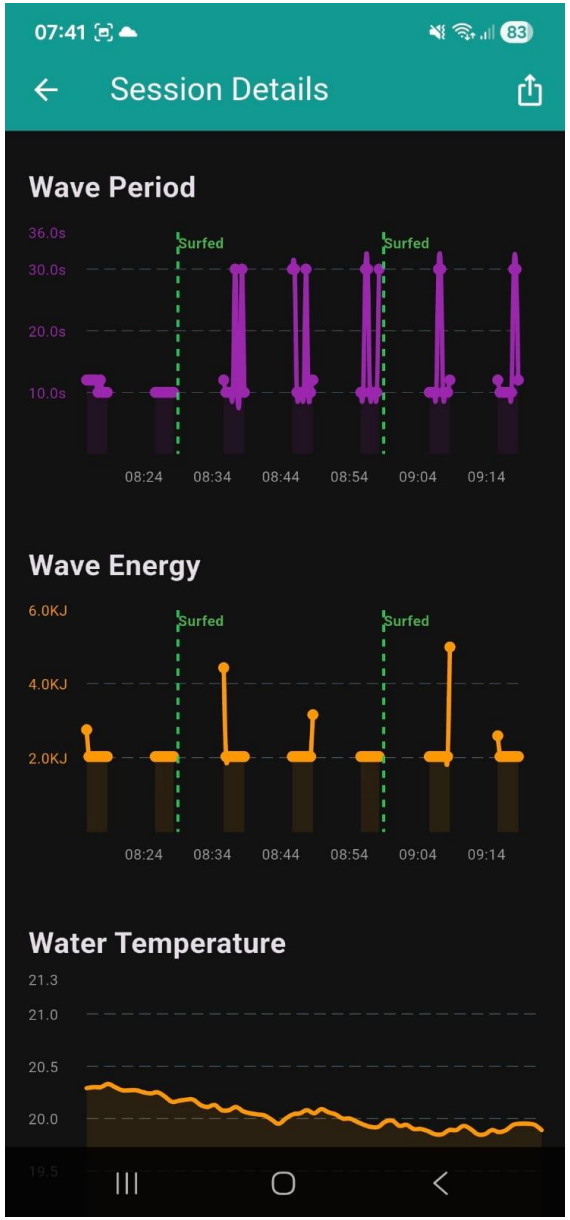
- Parameters: Temperature, Wave height, period and energy
- Off the shelf components used
- Wireless charging
- Paired with a phone app

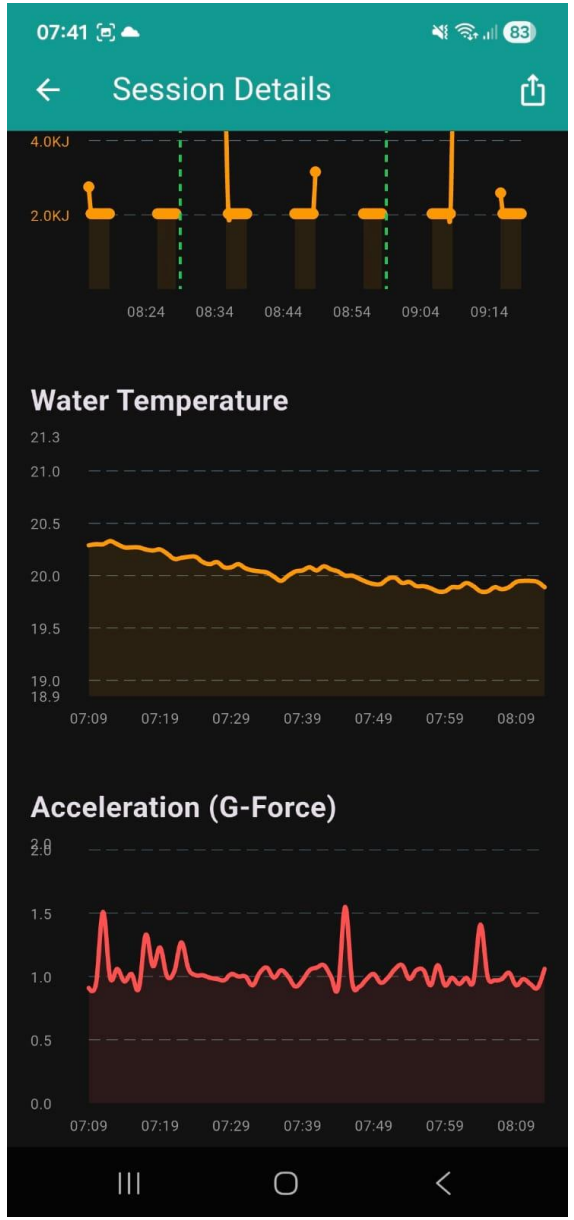


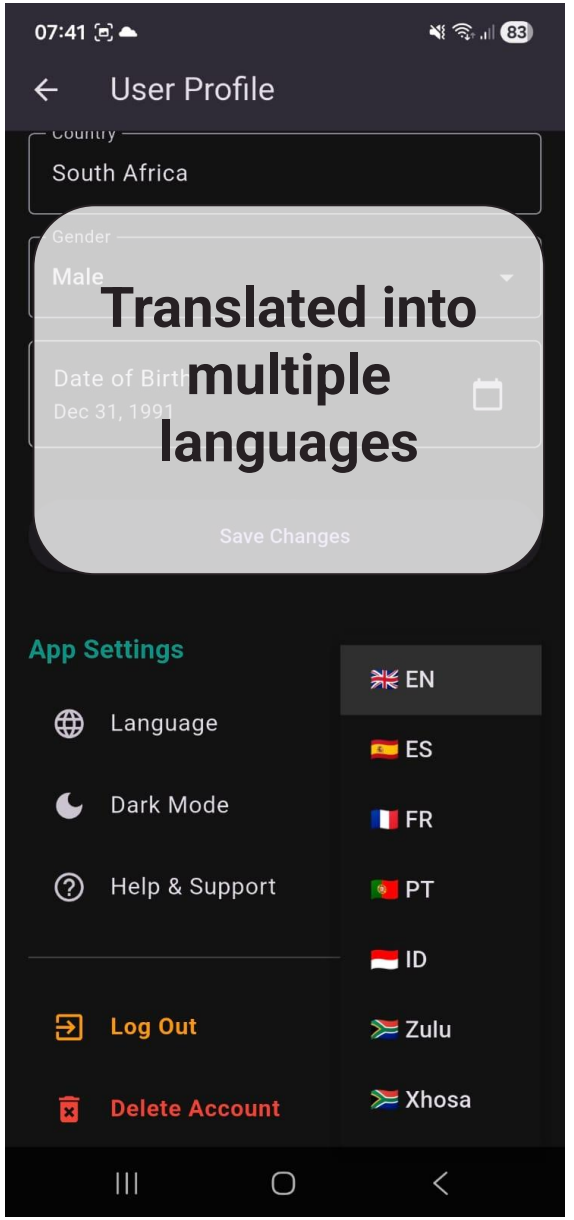


Surf Sense App









Multi-layered dashboard

Core Idea

- Landing page
- 3 layers
  - **Language needs to be translated into the local language**
  - **Policy makers**
    - Show economic value and risk profile
    - For South Africa link to SARVA (Indo link TBD)
  - **Researchers**
  - **Community**
    - Fundamentals of why these parameters are important
    - Using the data on the dashboard we can show how things are changing and the potential implications
      - This must be done with simple graphics like smiley, neutral and sad faces

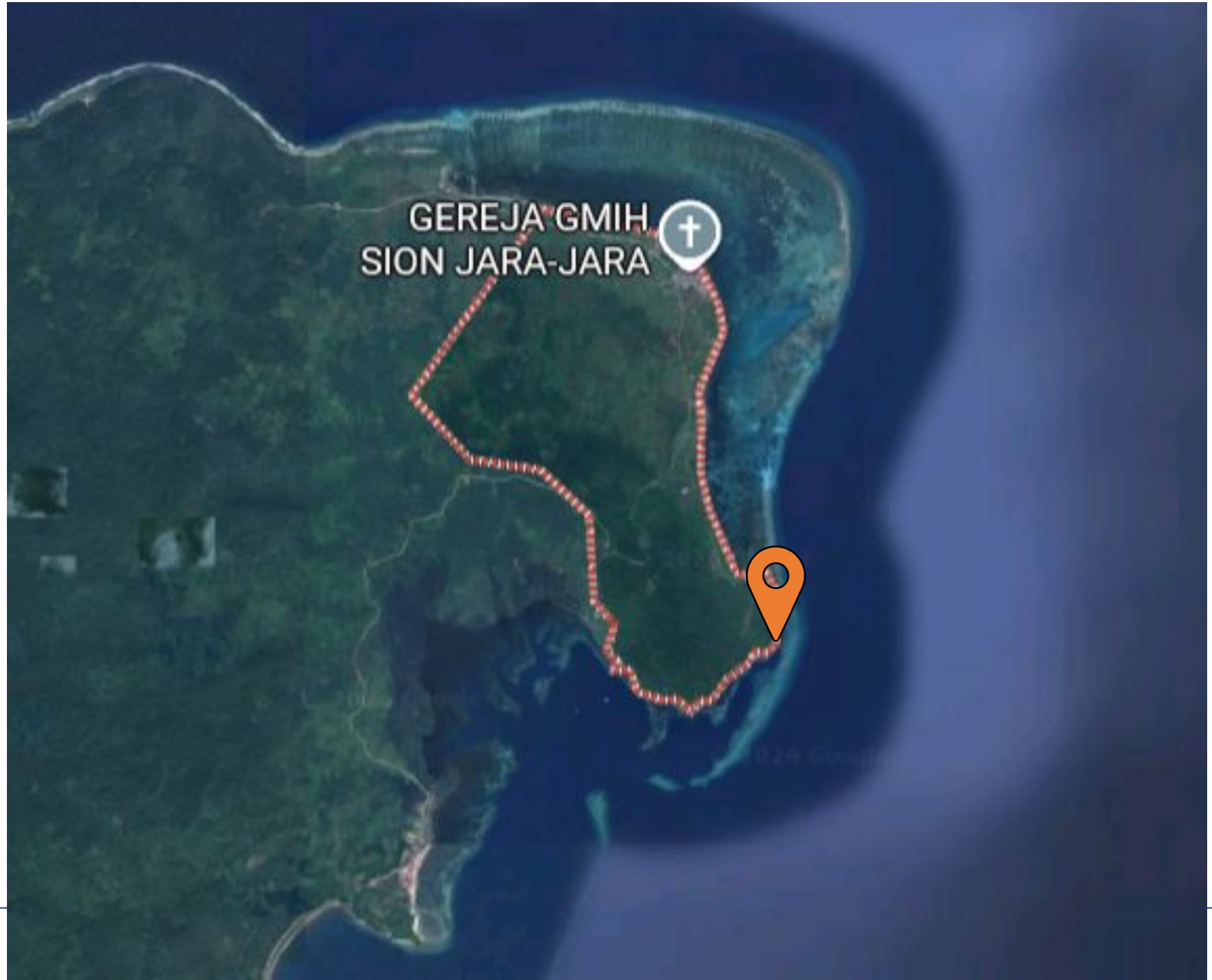
Other ideas/additions

- Social media tab
  - **Community members can upload photos and videos of themselves or friends and family surfing etc**
- Intercommunity knowledge & experience sharing tab

(News24. 2020)


Nepal
UP
BR
RJ
JH
WB
India
OD
AS
NL
ML
YUNNAN
GUANGXI
GUANGDONG
FUJIAN
Taiwan
Myanmar
(Burma)
Laos
Hanoi
HAINAN
Thailand
Bangkok
กรุงเทพมหานคร
Vietnam
Cambodia
Luzon
Manila
Philippines
Palawan
Negros
Mindanao
Basilan Island
Chennai
சென்னை
Lanka
Malaysia
Kuala Lumpur
Singapore
Kolonia
Jayapura
Indonesia
Jakarta
Surabaya
Papua New
Guinea
Solomon
Islands
Fiji
NORTHERN
TERRITORY
New
Caledonia


Likupang
Manado
NORTH SULAWESI
Molucca Sea
Luwuk
Banggai
Tikong
Taliabu Island
Sanana
Golea
NORTH MALUKU
Halmahera
Subaim
Ternate
Maba
Sagea
Halmahera Sea
Palamea
Labuha
Laiwui
Kawassi
Fluk
ARC


GEREJA GMIH
SION JARA-JARA


GEREJA GMIH
SION JARA-JARA
GEREJA GPI

Fishing Vessel Ocean Observing Network (FVON)

FVON FISHING VESSEL OCEAN OBSERVING NETWORK

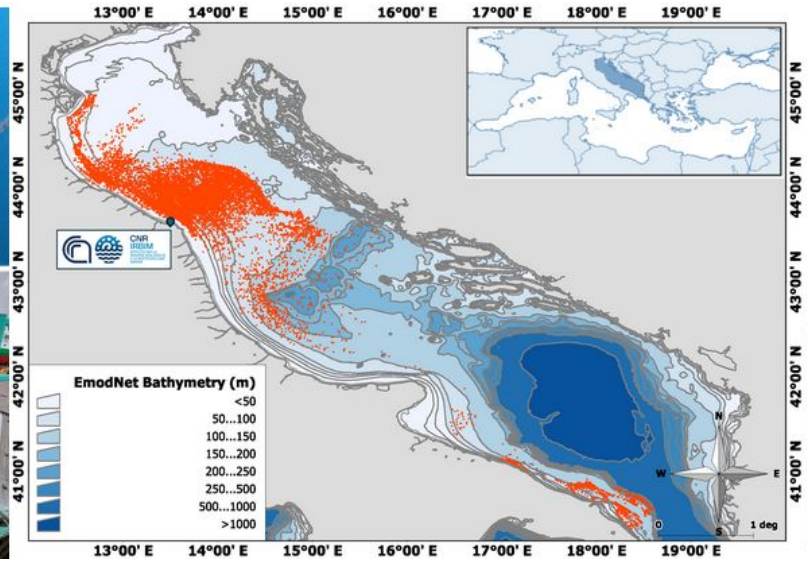
FISHING FOR DATA.

- 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








13°00' E
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43°00' N
42°00' N
41°00' N
EmodNet Bathymetry (m)
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200...250
250...500
500...1000
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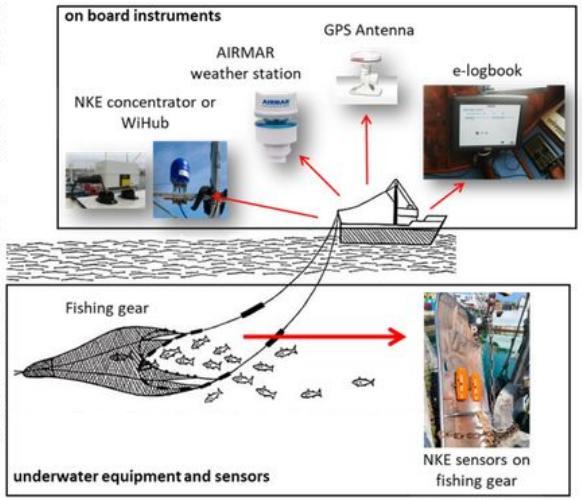
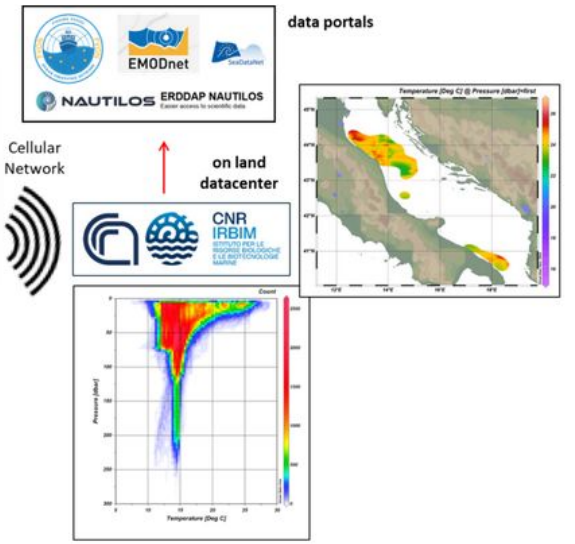

on board instruments
GPS Antenna
AIRMAR
weather station
e-logbook
NKE concentrator or
WiHub
Fishing gear
underwater equipment and sensors
NKE sensors on
fishing gear


data portals
EMODnet
NAUTILOS ERDDAP NAUTILOS
Cellular
Network
on land
datacenter
CNR
IRBIM

Thank you

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