

FishSOOP

Fishing Vessels Ships of Opportunity Ocean Observing Program.

Crowd sourcing ocean data through collaboration between the University of New South Wales and the commercial fishing industry as part of Australia's Integrated Marine Observing System (IMOS).

Our oceans are changing, and we need measurements to model the future

Recently, marine heatwaves have hit Australian waters leading to temperatures well above normal. These higher temperatures may impact fish populations, and currently we do not know how deep they extend or how they affect fished species.

We are working with fishers to collect real-time ocean observations where it matters most. Just like weather stations help increase the accuracy of atmospheric weather forecasting, getting more ocean observations helps us improve ocean models, and help the fishing industry optimise its resources by gaining a better understanding of the relationship between catches and sea temperature.

Sensor attaches to fishing gear

Our technology partner, Zebra-Tech, has developed a compact, low-cost temperature sensor (the Moana sensor) that can be attached to many types of commercial or recreational fishing gear. It operates with minimal human intervention and communicates directly to a solar powered deck box.

Fishers collect ocean temperatures

Fishers have always been ocean experts. The Moana sensor puts ocean data collection back into the hands of those who work on, and depend upon, the sea.

We need subsurface marine measurements to understand how the ocean is changing below the surface. International ocean observing programmes such as Argo (www.argo.net) provide some deepwater data offshore but our subsurface coastal waters are not well monitored. Fishing vessels operate in areas where we have few subsurface ocean measurements, and where environmental change is having a huge impact.

There are thousands of vessels operating around Australia and across the South Pacific. This network of fishing vessels can collectively provide cost-effective, real-time subsurface data in our vast EEZ and beyond.

What are we asking fishers to do?

Participating fishers deploy small self-contained temperature sensors on their fishing gear, and a standalone, solar-powered deck unit on the vessel.



Small and lightweight: the sensor measures 14.5 cm by 4 cm.





The sensor collects data every time the gear is deployed. After the installation, the system needs little to no intervention.

What do fishers get in return?

You will be able to access your individual vessel temperature data (with pressure and time). Sensor measurements will be made available online as downloadable files and sent to you via email within 1 hour of data reception.

You can compare sensor data with your personal catch information and understand relationships between catch and temperature.

The data will benefit fisheries & fishers

We are working to further the understanding of the link between water temperature at depth and fish distribution and abundance. The fishing industry can provide very valuable ocean observations on an unprecedented scale, which can be used to answer a range of questions. We can use the data in near real time to improve our ocean forecast models.

In the longer term, we hope the data will assist in standardising catch rates in our fisheries stock assessment models. Furthermore, better ocean data will improve our understanding of general ocean warming, marine heatwave events, temperature impacts on the relative or total abundance of species, species range shift, and the impact of this on fisheries productivity.

Frequently Asked Questions

Can I attach the sensor to any type of fishing gear?

We can attach the sensors to longlines, netting, pots, trawling equipment, and more. We have a range of protective housings and brackets to simplify sensor mounting.

What data are collected?

The only information collected and shared will be temperature, depth, time and position at regular intervals during your fishing operations. Detailed vertical temperature profile measuring every 2m depth between the surface and 200m, every 4m between 200m and 1000m on the way up and down, and data every 5 mins while at a constant depth (such as on a pot, or on a line).

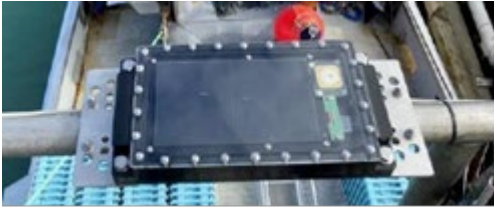
What about catch information?

No catch information is collected or shared. This is your private information, and we do not have access to it.

How are the data offloaded?

When the Moana sensor comes out of the water, it automatically offloads its data via Bluetooth to a small, standalone, weather-proof, deck unit. You do not need to do anything during this process. Data are then automatically transferred to our secure, cloud-based servers.





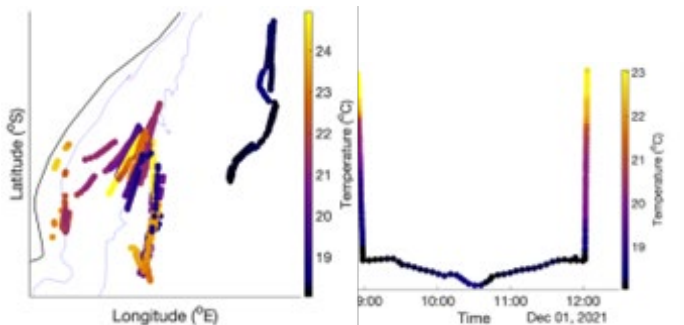
The deck unit.

Where are the measurements stored?

Data are anonymised and then sent to directly to the global telecommunications system where they can be accessed only by authorised national weather services (e.g. BoM). They use the data in their ocean models to improve tomorrow's ocean and atmospheric forecasts.

For example, knowing the temperature of the upper ocean can help us predict cyclone tracks more accurately. Additionally, the temperature data are stored on our UNSW database for processing before being publicly shared anonymously, under the Creative Commons License 4.0 through IMOS on the Australian Ocean Data Network (AODN; <https://portal.aodn.org.au/>)

Measurements collected by the sensor are emailed back to the vessel that collected them within 1 hour of reception as a plot and in spreadsheet format.



Will you send details of my fishing to others?

We will share the temperature, depth, time and position data collected publicly on the AODN under the Creative Commons License 4.0. **If you are concerned about your fishing location being shared, please speak with us before installing the sensor and deck unit.**

How long will the sensor be on my vessel?

We will establish this upfront. The sensor's battery lasts for two years, after which you will need to send it back to us for battery change and recalibration.

What does it cost?

The data pathway is funded by IMOS, but we require industry co-investment to cover equipment purchase and operating costs. Factors such as the number of sensors affect the degree of co-investment required. If you'd like to discuss entry to the project, email fishsoop@unsw.edu.au or fill out our expression of interest form via this QR code (or by clicking this [link](#)).



Professor Moninya Roughan
Lead Investigator



Partners

IMOS Fisheries Ships of Opportunity sub-Facility is operated through the University of New South Wales and the Sydney Institute of Marine Science (SIMS) an IMOS partner.

Operating Institution

University of New South Wales as a partner in the Sydney Institute of Marine Science

Delivery Partners

Australian Fisheries Management Authority (AFMA)
Charles Darwin University (CDU)
Fisheries Research and Development Corporation (FRDC)
Fishing Vessel Observing Network (FVON) – International
Fishwell Consulting
Northern Territory Fisheries
University of the Sunshine Coast (USC)
University of New South Wales (UNSW)

For information, please email FishSOOP@unsw.edu.au

About IMOS

The [Integrated Marine Observing System \(IMOS\)](#) operates a wide range of observing equipment throughout Australia's vast and valuable coastal and open ocean estate.

IMOS makes all of its data openly and freely accessible to the marine and climate science community, other stakeholders and users, and international collaborators.

IMOS is enabled by the [National Collaborative Research Infrastructure Strategy \(NCRIS\)](#). It is operated by a consortium of institutions as an unincorporated joint venture, with the [University of Tasmania](#) as Lead Agent.

Why collaborate with IMOS FishSOOP?



Direct benefits

Access to temperature-depth data in near real time to inform operational decision making

Simple installation, autonomous operation

Low cost, high impact data gathering

Access to Research quality, robust data at subsidised rates (e.g. data QC and processing funded by IMOS)



Wider impact

Oceanography, meteorology, climatology

Contribute to data gathering efforts which will enrich the blue economy through improved weather forecasts, better ocean monitoring, and an enhanced understanding of climate change

Contributing to sustainable fisheries management



Why FishSOOP in particular?

Track record of delivering open access data since 2006

Work with not-for-profit organisations devoted to the public good (e.g. NCRIS, IMOS, AODN, SIMS, & UNSW) as part of a collaborative enterprise

Connections across academia and industry in Australia and worldwide (e.g. FVON steering committee)

Full credit given for industry participation