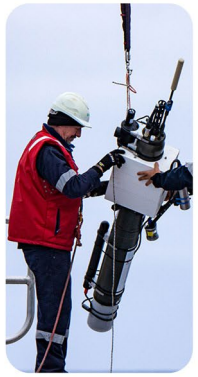
IMOS Integrated Marine Observing System

IMOS Best Practice

Rebecca Zitoun

Science Engagement Officer Coastal Observing, IMOS

Co-Chair, Ocean Best Practice System (OBPS)



26th February 2025, IMOS AM, Adelaide

IMOS acknowledges the Traditional Custodians and Elders of the land and sea on which we work and observe, and recognise them as Australia's first marine scientists and carers of Sea Country. We pay our respects to Aboriginal and Torres Strait Islander peoples past and present.

Why develop, use, and adopt “best practices”?

- Efficient use of time
- Collaborative opportunities
- **Improved systems interoperability**
- **Data comparability and collectability**
- **Greater trust in data = greater data uptake = greater impact**
- Streamlined regulatory approval
- Higher funding success
- **Improved quality and consistency of observations**
- **Better transparency, traceability and reproducibility**
- **Stronger connections between data, models, & applications.**

The development and implementation of **Best Practices** are now standard **expectations in most project proposals** and are **integral to numerous national and international white papers, policy frameworks, and reports**.

Althou capacity of First Nations communities vary across Australia, First Nations people pressed interest in leading ambitious initiatives and working collaboratively with ocean stakeholders on a broad range of sea Country matters, including research, on-ground management, business and climate action. Drawing on examples of best practice from across Australia, it will be essential to have the right tools and frameworks in place to uplift capability, bridge communication gaps and strive for best-practice First Nations-led and co-designed engagement principles. These include requiring proponents to engage early with those with authority to speak on behalf of sea Country in support of the principles of free, prior and informed consent to the extent possible under current laws, and upholding the principles of Indigenous Cultural and Intellectual Property.

- Enhancing best practices in sensor development, data curation, and delivery.
- Strengthening capacity building and knowledge integration across the ocean observing value chain.

(see the anagement with Traditional Custodians section in the Coasts chapter). However, more work is required to ensure that best-practice methods are known and used across the nation. Reviews of Indigenous engagement in the National Environmental Science Program identified that progress is being made with Indigenous engagement and inclusivity, but that there is still a long way to go (Wensing & Callinan 2020). Indigenous people’s connections and obligations to Country are often ignored, and Indigenous engagement is often retrofitted into projects, initiatives and programs.

IMOS Integrated **Marine Observing** System

What is considered a “Best Practice”:

“A best practice is a methodology that has **repeatedly produced superior results relative to other methodologies with the same objective**; to be fully elevated to a best practice, a promising method will have been adopted and employed by multiple organizations." (Simpson et al., 2019; Pearlman et al., 2019).

Evolution of Practices – maturity levels.

Mantovani et al., 2024

Formation of a practice
- Ad hoc
- Little documentation

Emerging Practice
- Documented practice
- Enable replication

Good Practice
- Formally documented
- Openly available
- Replicated by experts
- Standardized formats

Better Practice
- Used by multiple institutions
- Means to verify implementation
- Enable replication
- Guidelines for evolution
- Standardized formats
- Machine-readable

Best Practice
- Endorsed by expert panel
- Adopted at least regionally
- Protocols for improvement
- Process for quality assessment
- Provision for training
- Tool to verify implementation

Making Practices discoverable and accessible:

IMOS actively contributes to OBPS, via the IMOS Community Repository on the OBPS Repository. contributing to the requirement for collaborative ocean observing to follow well-defined and reproducible methods.

Ocean Best Practices System:

- **International project supported by IOC**, and co-sponsored by IODE and GOOS
- **Mission:** To develop and sustain an evolving system which fosters collaboration, consensus building, and innovation by providing coordinated and global access to best practices across ocean sciences and applications.
- **Repository:** Online, open access repository, designed to provide a discovery point for the ocean community to search, find, and permanently archive ocean practices.

The OBPS-IMOS community repository - TODAY

62 Submissions: 55 reports and manuals, 7 videos

Videos (2016-2018)

Protocol for TSS Blank Collection. [Training video]

Integrated Marine Observing System (IMOS) (CSIRO/Integrated Marine Observing System (IMOS), Canberra, Australia, 2018)

Instructional video for Integrated Marine Observing System (IMOS) TSS Blank Collection – Protocol for IMOS TSS blank collection (2.08 mins) .....

Protocol for IMOS zooplankton sample collection. [Training video]

Integrated Marine Observing System (IMOS) (CSIRO/Integrated Marine Observing System (IMOS), Canberra, Australia, 2016)

Instructional video for Integrated Marine Observing System (IMOS) biogeochemical water sampling procedures – Protocol for IMOS zooplankton sample collection

Protocol for IMOS TSS sample collection. [Training video]

Integrated Marine Observing System (IMOS) (CSIRO/Integrated Marine Observing System (IMOS), Canberra, Australia, 2018)

Instructional video for Integrated Marine Observing System (IMOS) biogeochemical water sampling procedures – Protocol for IMOS TSS sample collection (4.29 mins) .....

Protocol for IMOS flow cytometry sample collection. [Training video]

Integrated Marine Observing System (IMOS) (CSIRO/Integrated Marine Observing System (IMOS), Canberra, Australia, 2018)

Instructional video for Integrated Marine Observing System (IMOS) biogeochemical water sampling procedures – Protocol for IMOS flow cytometry sample collection (2.24 mins) ...

Protocol for IMOS microscopic phytoplankton sample collection. [Training video]

Integrated Marine Observing System (IMOS) (CSIRO/Integrated Marine Observing System (IMOS), Canberra, Australia, 2018)

Instructional video for Integrated Marine Observing System (IMOS) biogeochemical water sampling procedures – Protocol for IMOS microscopic phytoplankton sample collection. (1.20 mins) ...

Protocol for IMOS HPLC pigment sample collection. [Training video]

Integrated Marine Observing System (IMOS) (CSIRO/Integrated Marine Observing System (IMOS), 2018)

Instructional video for Integrated Marine Observing System (IMOS) biogeochemical water sampling procedures - Protocol for IMOS HPLC pigment sample collection on YouTube (2.24 mins) ...

Protocol for IMOS microbial sample collection. [Training video]

Integrated Marine Observing System (IMOS) (CSIRO/Integrated Marine Observing System (IMOS), Hobart, Tasmania, 2016)

Instructional video for Integrated Marine Observing System (IMOS) biogeochemical water sampling procedures – Protocol for IMOS microbial sample collection. (2.54 mins)

Inclusion of a record in the repository does not indicate that it is a best practice.

Documents (2002-2024)

Recent Submissions

Surface water CO2 measurements from ships of opportunity, A report for Australia's Integrated Marine Observing System.

Tilbrook, Bronte; Neill, Craig; Akl Uhri, John (CSIRO, Hobart, Australia, 2024)

Underway measurements of the fugacity of carbon dioxide (fCO2) in surface waters and the atmosphere are made using General Oceanics Incorporated Model 8050 or 8060 systems (GO) equipped with LI-COR gas analysers.

System Description and Procedures for Moored Biogeochemical Measurements Manual. Version 1.0.

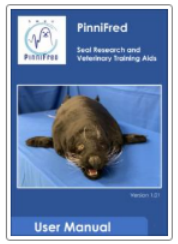
Tilbrook, Bronte; van Ooijen, Erik (2023)

This document serves as the description and quality-control manual for the IMOS Acidification Moorings Sub-Facility, a component of IMOS's National Mooring Network. It includes details on mooring locations, mooring design, ...

Best Practice Manual for SMRU CTD Satellite Relay Data Loggers: Instrument Calibration, Near Real-Time and Delayed Mode Data QA/QC. Version 1.0.

Jonsen, Ian; McMahon, Clive; Harcourt, Rob (Integrated Marine Observing System (IMOS), Hobart, Australia, 2024)

This document is the IMOS Animal Tracking Facility's Best Practice manual for near real-time and delayed-mode processing of physical and behavioural observations collected using Sea Mammal Research Unit CTD Satellite Relay ...



PinniFred: Seal Research and Veterinary Training Aids - User Manual. Version 1.01.

Sea Mammal Research Unit (Sea Mammal Research Unit, University of St Andrews, St Andrews, Scotland, 2023)

PinniFred is a unique training tool designed for seal veterinary, conservation and research staff. We believe that by learning with PinniFred you will quickly improve the knowledge, skills and competency of staff, as ...

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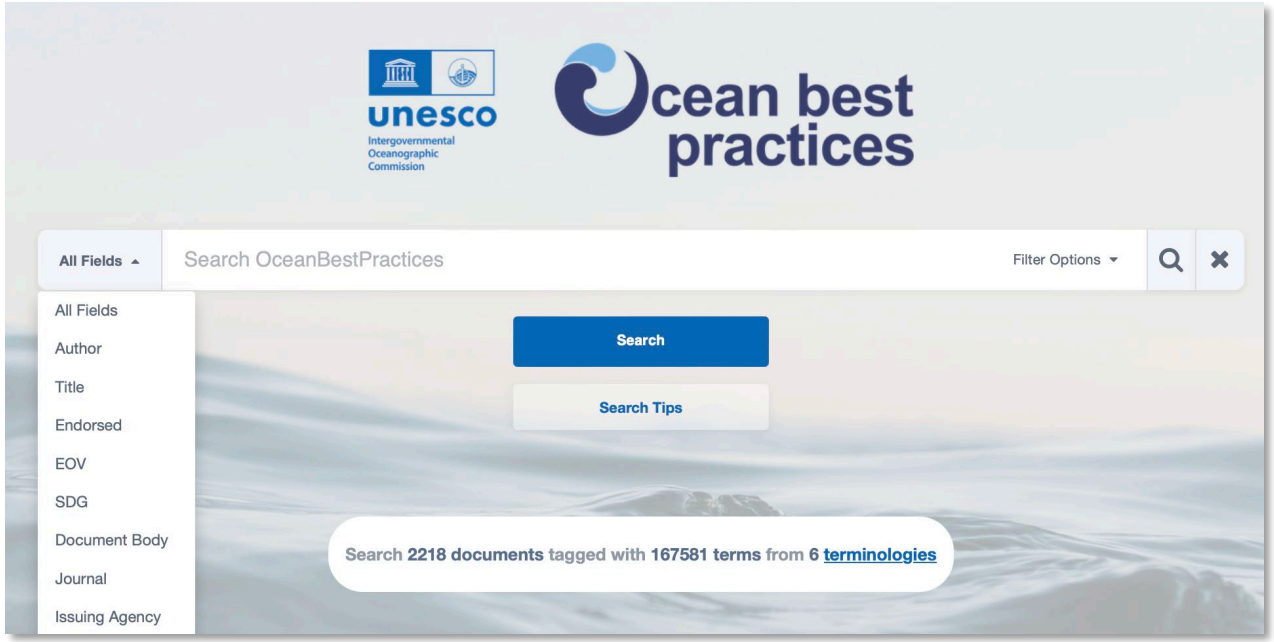
The OBPS-IMOS community repository - Benefits

- **DOI and Metadata Generation**: Ensures citability and discoverability.
- **Wide Reach**: Broad audience with usage insights
- **Structured Categorization**: By maturity level, EOVs, endorsement etc. helping users find/apply the most relevant and well-developed practices.
- **Collaboration & Improvement**: Facilitates sharing, feedback, and continuous improvement/refinement - progressing from good-better-best.



Best Practice Manual for SMRU CTD Satellite Relay Data Loggers: Instrument Calibration, Near Real-Time and Delayed Mode Data QA/QC. Version 1.0.

This document is the IMOS Animal Tracking Facility's Best Practice manual for near real-time and delayed-mode processing of physical and behavioural observations collected using Sea Mammal Research Unit CTD Satellite Relay Data loggers (SMRU CTD-SRDL). The Animal Tracking Facility deploys SMRU CTD-SRDL's on southern elephant seals (Mirounga leonina) and Weddell seals (Leptonychotes weddellii) in the Southern Ocean and on olive ridley sea turtles (Lepidochelys olivacea) and flatback sea turtles (Natator depressus) in the Timor and Arafura Seas. The data transmitted by these instrumented animals contributes to the study of ocean structure and dynamics by supplying temperature and salinity observations within the upper ocean in high latitude, shallow coastal and tropical regions that are historically under-sampled by traditional observing platforms. This document describes the calibration methods used by the Animal Tracking Facility prior to instrument deployment and the quality analys.....

View/Open
PDF (2.033Mb)

Resource URL
https://catalogue-imos.aodn.org.au/geonetwork/srv/eng/catalog.search#/metadata/3e0148c8-295d-4804-94c3-4a80314ad746

Date
2024

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Integrated Marine Observing System (IMOS)
Hobart, Australia

Author
Jonsen, Ian
McMahon, Clive
Harcourt, Rob

Document Language
en

Status
Published

Sustainable Development Goals (SDG)
14.a

Pages
24pp.

Essential Ocean Variables (EOV)
Subsurface temperature
Sea surface temperature
Sea surface salinity
Subsurface salinity
Ocean bottom pressure
Marine turtles, birds, mammals abundance and distribution

Metadata
Show full item record

Maturity Level
Mature

Spatial Coverage
Southern Ocean
Timor Sea
Arafura Sea

DOI Original
https:doi.org/10.26198/ev75-0j83

Citation
Jonsen, I., McMahon, C. and Harcourt, R. (2024) Best Practice Manual for SMRU CTD Satellite Relay Data Loggers: Instrument Calibration, Near Real-Time and Delayed Mode Data QA/QC. Version 1.0. Hobart, Australia, Integrated Marine Observing System, 24pp. DOI: https:doi.org/10.26198/ev75-0j83).

URI
https://repository.oceanbestpractices.org/handle/11329/2571

Collections
IMOS Community Practices [55]

IMOS Integrated Marine Observing System

IMOS Endorsement for practices

Endorsement: process where coordination groups/communities **approve documents as the current standard for their operations.**

- Initially only GOOS Panels endorsed practices
- New OBPS process allows other entities to endorse practices that they consider fit for purpose.

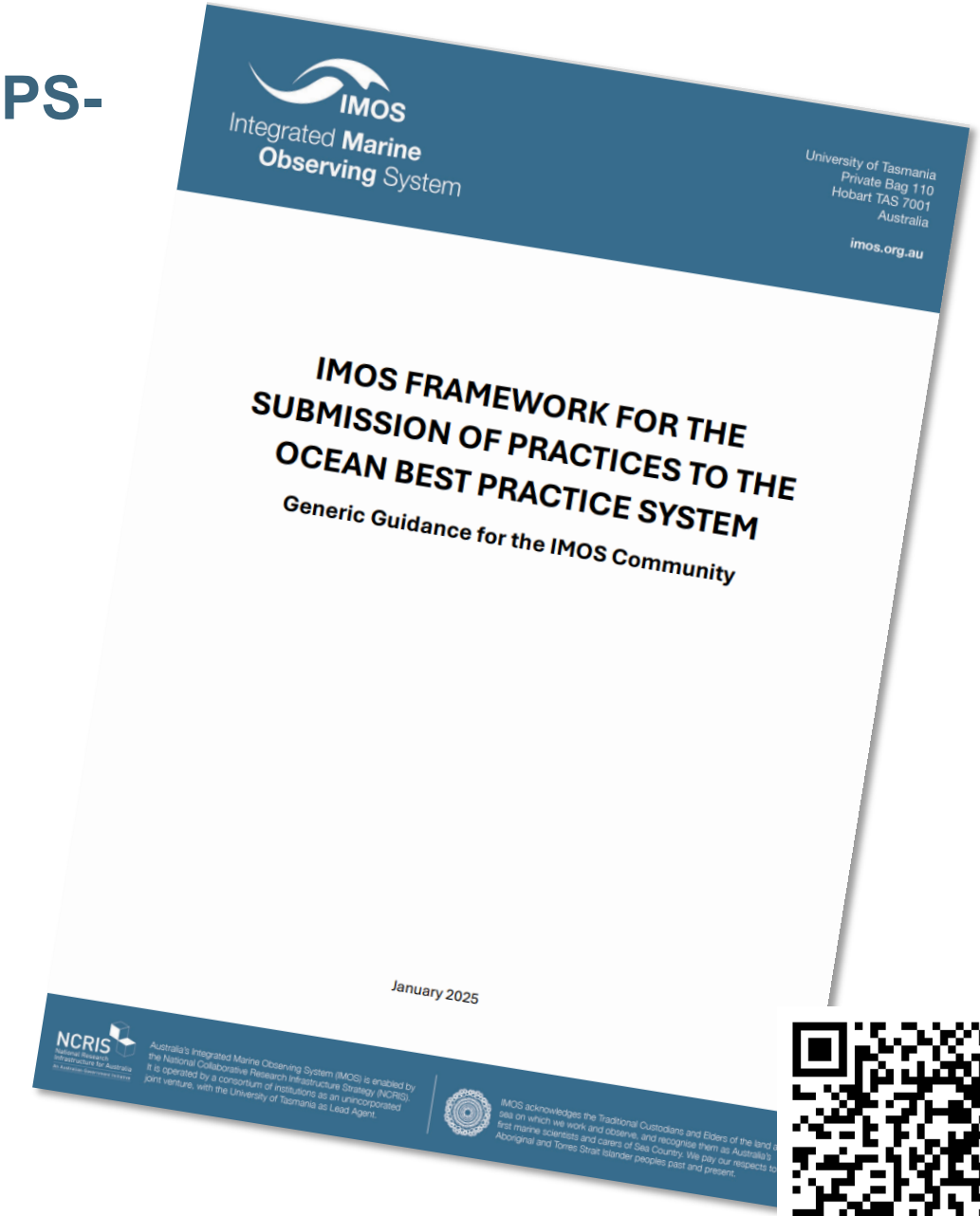
IMOS can now recommend practices that fulfill the endorsement criteria for endorsement.

Submission of IMOS Facility practices to OBPS-IMOS community repository

IMOS has developed a framework to guide the community in developing practices that align with the OBPS requirements.

This framework outlines:

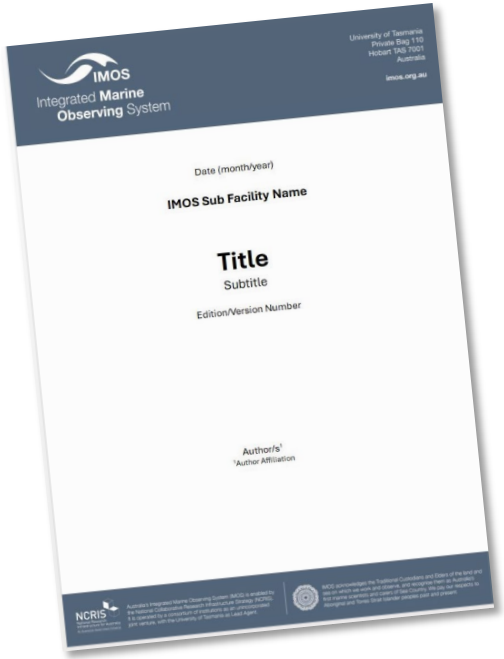
- The submission process to the OBPS Repository
- The maturity model for classifying practices (good, better, or best practice)
- IMOS criteria for endorsing practices
- Roles and responsibilities of the IMOS Office and Facilities

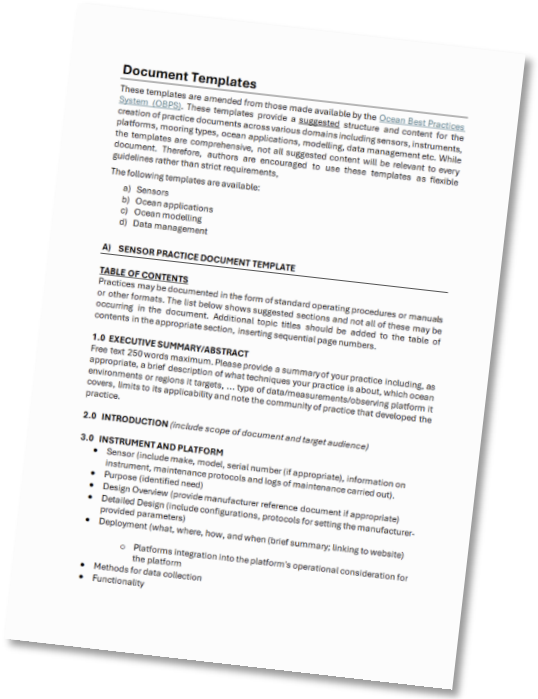


Submission of IMOS Facility practices to OBPS-IMOS community repository

To facilitate and streamline document submissions (new documents or updated versions) to IMOS, the IMOS Office has developed:

Title Page Template





Documentation Template

Document Templates

These templates are amended from those made available by the Ocean Best Practices System (OBPS). These templates provide a suggested structure and content for the creation of practice documents across various domains including sensors, instruments, platforms, mooring types, ocean applications, modelling, data management etc. While the templates are comprehensive, not all suggested content will be relevant to every document. Therefore, authors are encouraged to use these templates as flexible guidelines rather than strict requirements.

The following templates are available:

a) Sensors
b) Ocean applications
c) Ocean modelling
d) Data management

A) SENSOR PRACTICE DOCUMENT TEMPLATE

TABLE OF CONTENTS

Practices may be documented in the form of standard operating procedures or manuals or other formats. The list below shows suggested sections and not all of these may be occurring in the document. Additional topic titles should be added to the table of contents in the appropriate section, inserting sequential page numbers.

1.0 EXECUTIVE SUMMARY/ABSTRACT

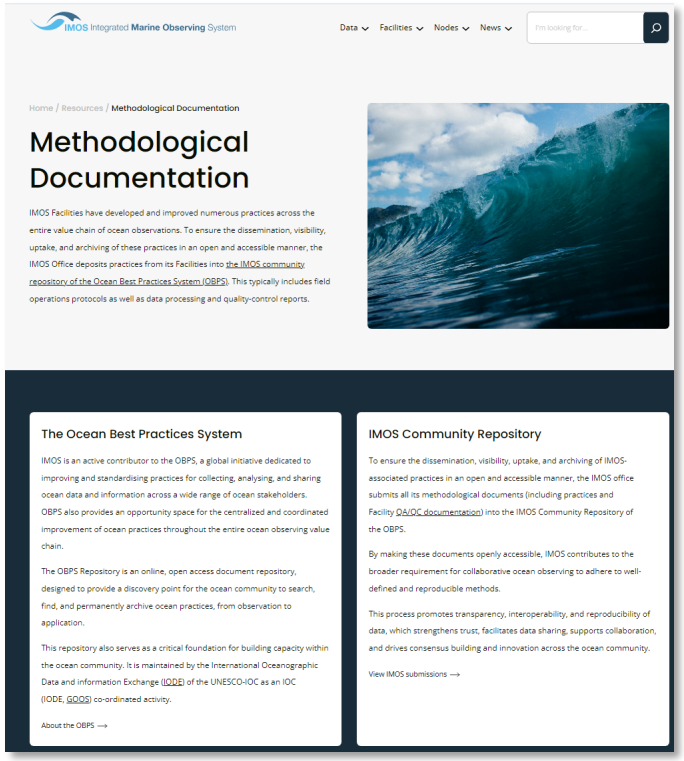
Free text 250 words maximum. Please provide a summary of your practice including, as appropriate, a brief description of what techniques your practice is about, which ocean environments or regions it targets, ... type of data/measurements/observing platform it covers, limits to its applicability and note the community of practice that developed the practice.

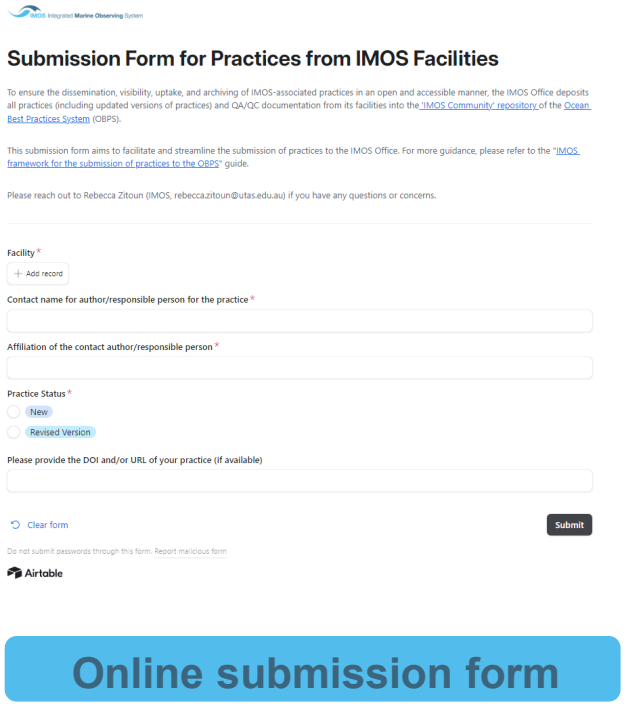
2.0 INTRODUCTION *(include scope of document and target audience)*

3.0 INSTRUMENT AND PLATFORM

- Sensor (include make, model, serial number (if appropriate), information on instrument, maintenance protocols and logs of maintenance carried out).
- Purpose (identified need)
- Design Overview (provide manufacturer reference document if appropriate)
- Detailed Design (include configurations, protocols for setting the manufacturer-provided parameters)
- Deployment (what, where, how, and when (brief summary; linking to website)
  - Platforms integration into the platform's operational consideration for the platforms
- Methods for data collection
- Functionality

Dedicated page on the IMOS website





Online submission form

IMOS Integrated Marine Observing System

NCRIS
National Research Infrastructure for Australia
An Australian Government Initiative

Australia's Integrated Marine Observing System 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.

PRINCIPAL PARTICIPANTS

University of Tasmania (Lead Agent)

Australian Government

Australian Institute of Marine Science

Australian Government Bureau of Meteorology

CSIRO

Government of South Australia

SARDI South Australian Research and Development Institute

The University of Western Australia

sims sydney institute of marine science

UTS

The University of Sydney

Macquarie University

UNSW Sydney

SIMS is a partnership invoving four universities

ASSOCIATE PARTICIPANTS

Curtin University

Australian Government
Department of Climate Change, Energy, the Environment and Water
Australian Antarctic Division

Australian Antarctic Program

Deakin University

The University of Melbourne

IMOS thanks the many other organisations who partner with IMOS, providing co-investment, funding and operational support, including investment from the Tasmanian and Western Australian Governments.