Satellite Remote Sensing – Lucinda Jetty WORKFLOW

Version 1.0

6th November 2025

Data Workflows

The AODN, in managing the data for IMOS, has developed workflows for each IMOS facility to describe the flow of data from planning through data collection to data delivery and public data access.

The primary goals of these workflows are to:

- Improve data flow and data handoff, making tracking of data status easy and preventing data loss.

- Identify and delimit precisely the responsibilities of each person involved.

- Improve communication at the interface between IMOS facilities and the AODN.

- Improve transparency for end users by providing more details to populate metadata records (*i.e.* limitations and processing methods applied to datasets).

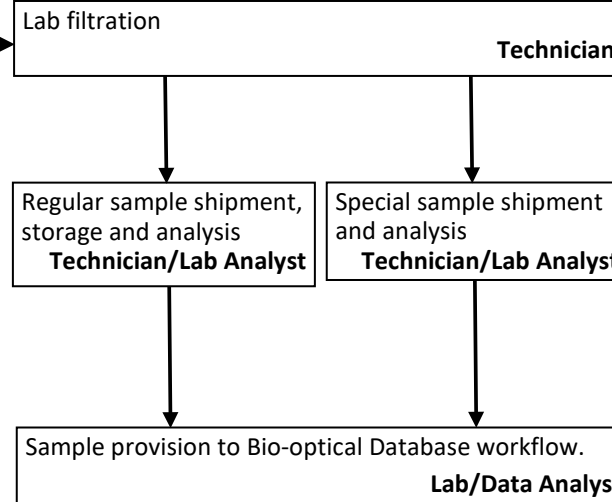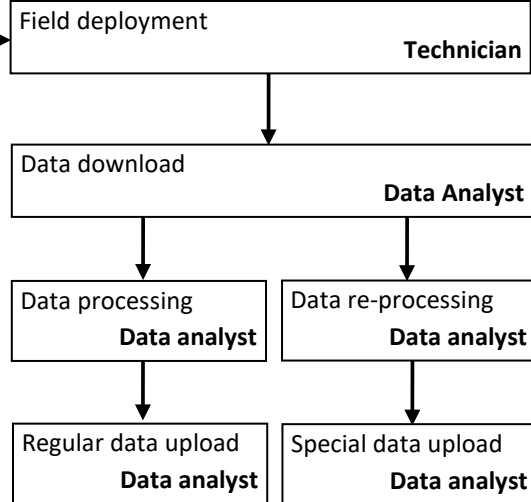- Assist in reporting planned deployments against actual deployments and data delivery.
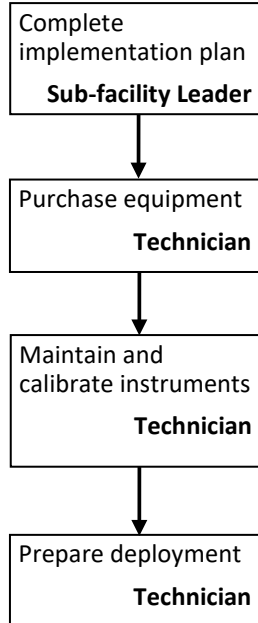
The workflow is available on the next page of this document. Additional information (*i.e.* timeline, input, output, step description) for each operation step is available in the 'Supporting Information' section. The role and contact details of people involved in the workflow are summarised in a table and suggested potential improvements are listed at the end of the document.

Satellite Remote Sensing - Lucinda Jetty Coastal Observatory

Planning:

Complete implementation plan
Sub-facility Leader

↓

Purchase equipment
Technician

↓

Maintain and calibrate instruments
Technician

↓

Prepare deployment
Technician

Data collection and data processing:

Field deployment
Technician

↓

Data download
Data Analyst

↓

Data processing
Data analyst

Data re-processing
Data analyst

↓

Regular data upload
Data analyst

Special data upload
Data analyst

Lab filtration
Technician

↓

Regular sample shipment, storage and analysis
Technician/Lab Analyst

Special sample shipment and analysis
Technician/Lab Analyst

↓

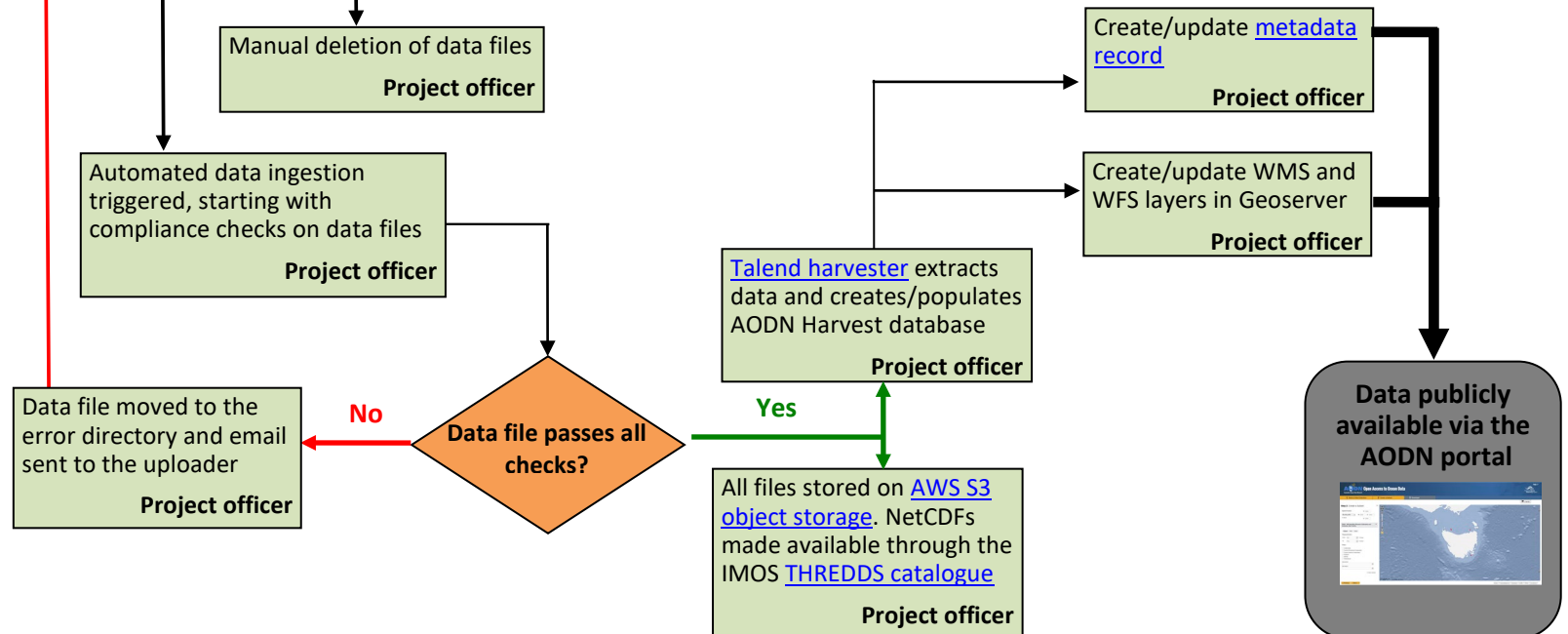Sample provision to Bio-optical Database workflow.
Lab/Data Analyst

List of acronyms:
- AODN: Australian Ocean Data Network
- LJCO: Lucinda Jetty Coastal Observatory
- AWS: Amazon Web Services
- QA/QC: Quality Assurance/Quality Control
- THREDDS: Thematic Real-time Environmental Distributed Data Services
- WFS: Web Feature Service
- WMS: Web Map Service

Green boxes indicate processes and infrastructures monitored in Nagios

AODN:

Manual deletion of data files
Project officer

Automated data ingestion triggered, starting with compliance checks on data files
Project officer

Data file moved to the error directory and email sent to the uploader
Project officer

No ←

Data file passes all checks?

Yes →

Talend harvester extracts data and creates/populates AODN Harvest database
Project officer

All files stored on AWS S3 object storage. NetCDFs made available through the IMOS THREDDS catalogue
Project officer

Create/update metadata record
Project officer

Create/update WMS and WFS layers in Geoserver
Project officer

Data publicly available via the AODN portal

All data management processes at AODN are tested on a release candidate environment prior to being deployed to the AODN portal.

Supporting information

Phase	Operation step	Timeline	Input	Output	Step description	Step operator
Planning	**Complete implementation plan**		IMOS funding Node Science plans	Implementation plan		**Satellite Remote Sensing Sub-facility Leader**
Planning	**Purchase equipment**		Implementation plan	Sensors available	Purchase instruments and other necessary equipment.	**Technician**
Planning	**Maintain and calibrate instruments**		Sensors available	Instruments operational	Maintain overview of deployment schedule and instrument calibration status. Liaise with instrument manufacturers, to organize shipments for repair and calibration, or perform in-house calibrations.	**Technician**
Planning	**Prepare deployment**		Implementation plan Instruments	Deployment plan		**Technician**
Data collection and processing	**Field deployment**	**Fortnightly**	Calibrated instruments	Operational data collection	Deploy clean and calibrated instruments. Collect water sample. Take photos and fill-in log-sheets.	**Technician**
Data collection and processing	**Data download**	**Daily**	Successful data acquisitions	Raw data	Remotely maintain server and cronjobs for automated data download. Transfer data to CSIRO compute infrastructure and archive.	**Data Analyst**
Data collection and processing	**Data processing**	**Weekly**	Raw data	IMOS-compliant NetCDF files	QA/QC raw data. Create IMOS-compliant FV01 and FV02 NetCDF data. Visualize data and report any anomalies to guide next instrument deployment.	**Data Analyst**
Data collection and processing	**Data re-processing**	**Approx. once every two years**	Raw data	IMOS-compliant NetCDF files	Reprocess entire archive if major improvements to QC or meta data become available	**Data Analyst**
Data collection and processing	**Regular data upload**	**Quarterly**	IMOS-compliant NetCDF files	NetCDF files uploaded to the AODN incoming directory	Upload files to the AODN incoming directory. Inform AODN officer by email.	**Data Analyst**

	Special data upload	**Approx. once every two years**	IMOS-compliant NetCDF files	NetCDF files uploaded to the AODN incoming directory	Data analyst sends list of files that should be replaced to AODN Officer. After files have been deleted by AODN Officer, Data Analyst sends new version of files.	**Data Analyst**
	Lab filtration	**Fortnightly**	Water sample	Filtrate and filter pads	Return water sample to Townsville lab and perform filtration for total suspended solids (TSS), pigments, particulate absorption and coloured dissolved organic matter (CDOM).	**Technician**
	Regular sample shipment, storage and analysis	**Fortnightly**	TSS, CDOM samples	TSS, CDOM samples shipped	Ship TSS and CDOM samples overnight to Hobart bio-optics lab for further analysis. Store pigment and particulate absorption samples at -80 degC for bi-annual shipment.	**Technician Lab Analyst**
	Special sample shipment and analysis	**Every six months**	Pigment and particulate absorption filter pads	Pigment and particulate absorption filter pads shipped	Transfer pigment and particulate absorption samples to liquid nitrogen filled transport device and ship to Hobart bio-optics lab for further analysis.	**Technician Lab Analyst**
	Sample provision to Bio-optical Database workflow	**Every six months**	All water samples	All water samples transferred	Provide all water samples to IMOS Bio-Optical Database (see separate workflow)	**Lab Analyst Data Analyst**
	Automated data ingestion triggered, starting with compliance checks on data files	**Automatic**	Individual NetCDF files on the AODN incoming directory	Checks performed on content of the NetCDF files.	The generic incoming handler is automatically triggered once a new NetCDF file is uploaded to the AODN SRS/OC/LJCO incoming directory. The following checks are performed: • Check if the NetCDF file is a valid LJCO file • Check if the NetCDF file is CF (Climate and Forecast) and IMOS compliant. If any of the above checks fail, the NetCDF file is moved to the error directory and an email is sent to the uploader. If it passes all checks, the tasks below are performed.	**AODN Project officer**
Data collection and processing	**All files stored on AWS S3 object storage. NetCDFs made available through the IMOS THREDDS catalogue**	**Automatic**	FV01 NetCDF file having passed all checks.	NetCDF files stored on AWS S3 object storage and publicly available. NetCDFs also made available through the IMOS THREDDS catalogue	If the NetCDF file is valid, all data files are then copied to the AWS S3 object storage. All files are then publicly available. NetCDFs are also made available on the IMOS THREDDS catalogue. Raw data files are copied to the TPAC/Nectar archive storage.	**AODN Project officer**

	Talend harvester extracts data and creates/populates AODN Harvest database		NetCDF file stored on AWS S3 object storage	All data is harvested in a AODN Harvest database	If the file passes all the checks, a Talend harvester is then triggered. It extracts metadata and data contained in NetCDF files and store the information in a AODN Harvest database.	**AODN Project officer**
Data Re-processing	**Manual deletion of data files**	**Manual**	Sub-facility communicates need for reprocessing of files	Batch deletion of files	• Sub-facility sends a list of products and years they plan to re-process. • Identify files via PostgreSQL • Batch unharvest of files • Batch deletion of files from S3	**AODN Project officer**
Data delivery on the AODN portal	**Create/update WMS and WFS layers in Geoserver**	**Automatic update**	Populated AODN Harvest database tables	WMS and WFS layers created in Geoserver	• Database tables and/or views are used to create a WMS and WFS layer in Geoserver. • Configure the pop-up window (content.ftl) and filters. • Create style for WMS visualisation.	**AODN Project officer**
	Create/update metadata record	**Automatic update**	Populated AODN Harvest database tables	GeoNetwork record created and configured to support data discovery, visualisation and download via the AODN portal	• Create a metadata record with a new UUID. • Configure the newly created record (*e.g.* abstract, point of contact, parameters, timeframe). • Fill out the distribution section with links to the corresponding Geoserver WMS and WFS layers and other AODN's download services. • Talend harvester automatically updates bounding box.	**AODN Project officer**

Contact details (as at November 2024)

	Role	Name	Email address	Phone
Satellite Remote Sensing - LJCO	**Facility leader**	Edward King	edward.king@csiro.au	(03) 6232 5334
	Sub-facility leader	Thomas Schroeder	Thomas.Schroeder@csiro.au	(07) 3833 5581
	Data analyst	Yi Qin	Yi.Qin@csiro.au	
		Jenny Lovell	Jenny.Lovell@csiro.au	
AODN	**Project officer**	Laurent Besnard	Laurent.Besnard@utas.edu.au	(03) 6226 8570
	Data services team leader	Benedicte Pasquer	Benedicte.Pasquer@utas.edu.au	(03) 6226 1927

Supporting links

AODN portal: http://portal.aodn.org.au

AODN portal help page: https://help.aodn.org.au/
Data upload instructions: https://help.aodn.org.au/aodn-ftp-upload/ (contact AODN for access)

Satellite Remote Sensing Lucinda Jetty layer on AODN portal: https://portal.aodn.org.au/search?uuid=4ac6bf81-cd37-4611-8da8-4d5ae5e2bda3
Satellite Remote Sensing Lucinda Jetty data on S3 server: https://data.aodn.org.au/?prefix=IMOS/SRS/OC/LJCO/

Satellite Remote Sensing Lucinda Jetty THREDDS server: https://thredds.aodn.org.au/thredds/catalog/IMOS/SRS/OC/LJCO/catalog.html
Satellite Remote Sensing Lucinda Jetty metadata record: https://catalogue-imos.aodn.org.au/geonetwork/srv/eng/metadata.show?uuid=4ac6bf81-cd37-4611-8da8-4d5ae5e2bda3

IMOS user code library: https://github.com/aodn/imos-user-code-library
Satellite Remote Sensing Lucinda Jetty pipeline scripts on GitHub: https://github.com/aodn/python-aodndata/blob/master/aodndata/srs/srs_oc_ljco.py

IMOS website: http://www.imos.org.au/

Satellite Remote Sensing Ocean Colour sub-facility: https://imos.org.au/facility/satellite-remote-sensing/ocean-colour