JOINT ANALYTICAL CELL

IMCS NETWORK

Global Fishing Watch

TMT

C4ADS

SKYLIGHT

Fisheries Data Analysis Training Package Implementation Guide

11 February 2025

A compendium of monitoring, control, surveillance and enforcement learning modules that supports the creation of skill sets and training programmes.

Contents

Fisheries Data Analysis

The fisheries sector produces a wide range of data in relation particular fisheries, operations and marine ecosystems. Fisheries data can be quantitative or qualitative and are essential in order to effectively monitor and manage national and/or international fisheries.

Fisheries data analysis refers to the process of deriving conclusions from fisheries data. Fisheries data analysis is a critical process to assist fisheries officers understand a situation and to inform decision making.

The availability of fisheries data differs widely between jurisdictions, entities and fisheries. Therefore, fisheries data analysis requires sound data management and analytical procedures that use different levels, types and combinations of fisheries datasets. It also relies upon data management tools, technologies and platforms that facilitate timely data access and use.

Through targeted and strategic fisheries data analysis, fisheries officers can effectively detect potential IUU fishing and inform appropriate and timely decision making.

The Joint Analytical Cell (JAC)

The JAC is a collaboration between the IMCS Network, TMT, Global Fishing Watch, Skylight and C4ADS. The JAC brings together the unique and complementary capabilities of its member organisations.

The JAC demonstrates how organisations can work together to provide national fisheries agencies and regional fisheries organisations with access to data and technology, data analysis and intelligence, MCS capacity development and collaborative MCS activities.

The JAC develops effective partnerships and understands partner needs and priorities making JAC activities efficient, effective and scalable. The JAC seeks to grow into a larger coalition of like-minded organisations and a home for data and technology, data analysis and intelligence and MCS capacity development.

IMCS Network

The IMCS Network is a global informal, voluntary organisation that promotes and facilitates communication, cooperation, coordination, and capacity development across the fisheries monitoring, control, surveillance (MCS), compliance and enforcement community.

The IMCS Network supports members from national fisheries agencies and regional fisheries organisations. The Network also includes observers from IGOs, NGOs and academic institutions that support the objectives of the Network.

The Vision of the IMCS Network is to create a globally connected and capable fisheries MCS, compliance and enforcement community. A community that works collectively to achieve and maintain optimal levels of compliance that effectively support marine conservation and fisheries management objectives.

The IMCS Network provides the JAC with fisheries MCS, compliance and enforcement expertise and links the JAC with national and regional MCS practitioners. The IMCS Network provides the cooperative and collaborative mechanisms to deliver JAC outputs and leads JAC's MCS capacity development work.

The IMCS Network website consolidates a range of fisheries MCS related tools, including those of other JAC member organisations. These tools can be used by national fisheries agencies, regional fisheries organisations and the members of the JAC partners to support their work. - https://imcsnet.org/external-resources

The IMCS Network Combined Regional Authorised Vessels Tool (CRAVT) combines vessel-related data and information from several RFMOs and RFBs. The CRAVT can be used to search for specific vessels or browse groups of vessels including by flag, vessel type or RFMO or RFB. The CRAVT identifies where differences exist between RFMO or RFB records for a specific vessel. Users may also search Vessel Contacts (vessel companies and vessel masters) for a specific vessel - https://cravt.imcsnet.org/

Global Fishing Watch

Global Fishing Watch (GFW) is an international nonprofit organization dedicated to advancing ocean governance through increased transparency of human activity at sea. By creating and publicly sharing map visualizations, data and analysis tools, we aim to enable scientific research and transform the way our ocean is managed. We believe human activity at sea should be public knowledge in order to safeguard the global ocean for the common good of all.

The JAC utilises GFWs historical database of vessel activity, vessel identity data and remote sensing data to create bespoke analytical products and intelligence reports. GFW also provides technical support and training on the use of GFW tools specifically the GFW Map, Vessel Viewer (co-developed with TMT) and the Carrier Vessel Portal and more generally supporting JAC capacity development initiatives on data analysis to support MCS.

The GFW Map

The GFW fishing map is a freely available online platform for visualization and analysis of human activity at sea. Users can search for vessels, filter activities by flag State or time period, identify port visits and view encounters between vessels in near real-time. Users can access the map here

Marine Manager

The marine manager portal is a freely available interactive platform that provides near real-time, dynamic data on ocean conditions, biology, and human-use activity to support marine spatial planning, enable scientific research, and inform the design and management of marine protected areas. Users can access Marine Manager Portal here

Vessel Viewer

Vessel Viewer is a vessel history and insights tool developed in partnership with TMT. Vessel Viewer combines satellite data and publicly accessible vessel registry data allowing users to identify and cross check information about a given vessel, its fishing related activities, relevant compliance history and authorisations

Vessel Viewer is arming decision makers with the information needed to enhance fisheries controls, strengthen risk assessments and bolster the due diligence process. Users can access Vessel Viewer here

Carrier vessel portal

The carrier vessel portal is a comprehensive transshipment monitoring tool that pinpoints encounters between vessels, synthesizes fishing authorizations and filters publicly available data to create a picture of vessel risk for management authorities.

TMT

TMT is a non-profit organisation that provides national fisheries authorities and international organisations with fisheries intelligence, analysis, and capacity building, targeting a reduction of illegal fishing and broader improvements in ocean governance.

TMT brings to the Joint Analytical Cell a reputation for analytical expertise and extensive capacity building experience focused on the application of tools and data. With a history of trusted operational cooperation with State partners, TMT is well placed to coordinate JAC analytical work, leveraging a wide range of data sources, including from JAC members, to produce high quality fisheries intelligence in support of country partners. TMT also works alongside other JAC members to deliver training, capacity development and communications services.

TMT Resources

The Combined IUU Vessel List provides the best available, up-to-date information on all fishing and related vessels that appear on the illegal, unregulated, and unreported (IUU) fishing vessel lists published by Regional Fisheries Management Organisations (RFMOs) and related organisations. The aim of the site is to improve the effectiveness of the original IUU lists as a tool for a wide variety of stakeholders to better understand and combat illegal fishing and broader fisheries crime.

Skylight

Skylight is a maritime monitoring and analysis platform providing analysts and protected area managers with a real-time tool to identify suspicious vessel behaviour and take action. Applying state-of-the-art artificial intelligence (AI) such as computer vision and machine learning to a combination of data sources, Skylight visualizes what's happening at sea to enhance decision-making and accelerate how we protect our ocean. Available at no-cost to government, regional, and nongovernmental organizations, Skylight is based at the Allen Institute for AI (Ai2), a non-profit organization dedicated to building breakthrough AI to solve the world's biggest problems.

Role in JAC

Skylight plays a pivotal role in the JAC, offering State partners and NGO colleagues real-time insights into vessel activities, a necessary capability crucial for active enforcement and compliance work. By leveraging advanced AI-driven data insights, Skylight identifies fishing and vessel rendezvous activities from AIS data, alongside detections of vessels at sea that appear in multiple types of publicly available satellite imagery, including optical imagery, night lights, and satellite radar. Skylight's ability to display recent data complements the other technologies in the JAC toolkit, enriching the collaborative effort with actionable intelligence.

Skylight also supports patrols and operations against IUU fishing directly by tasking high-resolution satellite imagery. This boosts intelligence gathering and ensures more targeted responses to maritime threats. Through the collective effort of all of its partners, the JAC provides capabilities essential for advancing fisheries management and bolstering maritime security endeavors.

Resources

- Monthly Live Training in English, Spanish, and French can be found here.
- Connect to Skylight: API documentation to view Skylight's AI insights on your preferred platform.
- EarthRanger: A sister product of Skylight at Ai2, EarthRanger is a data visualization and analysis platform that gives protected areas and conservationists the real-time information they require to keep wildlife, habitats, and communities safe.
- Easy to use and free for conversation missions, the platform collects, integrates, and displays all historical and available data and combines it with reports from the field to provide one unified view of tagged animals, marine patrols, and potential illegal fishing behaviour. With EarthRanger, see the big picture, react immediately, and make better-informed conservation decisions.

C4ADS

C4ADS is a nonprofit organization dedicated to combatting the illicit networks that threaten global peace and security. Through cutting-edge data science, innovative technology applications, and evidence-driven analysis, it works to coordinate effective global responses to drivers of conflict, instability, environmental crime, and human rights abuses worldwide. C4ADS' IUU fishing team aims to expose the on and offshore networks that enable IUU fishing. Their investigations, structured data products, and capacity building support MCS practitioners, journalists, and NGOs to strengthen targeting efforts and close enforcement gaps.

Role in JAC

As part of the JAC, C4ADS conducts in-depth analysis to reveal the networks of enablers and support systems that facilitate offshore vessel activities, with a particular focus on beneficial ownership and corporate networks. C4ADS draws on its extensive data holdings across multiple issue areas and jurisdictions to reveal connections between industrial fishing and illicit activity globally. The organization also supports the JACs' capacity building efforts by providing training on how to effectively use publicly available information to enhance stakeholders' investigations and enforcement efforts.

Resources:

Triton is a freely available digital platform that maps the ownership structures behind the world's industrial fishing fleet. It fuses data sources from around the world, including vessel registration records, RFMO listings, IUU blacklists, sanctions, and corporate registries from different jurisdictions. Triton allows users to search for specific vessel names, companies, or individuals to uncover their connections within the fishing industry. This includes links to IUU blacklists and sanctioned entities, promoting better tracking and accountability for IUU fishing.

Overview Information

Version control and modification history of the Fisheries Data Analysis Training Package Implementation Guide

Release No (Version)	Release Date	Comments
1.0	December 2024	First release of **Modules** JAC M01 MCS definitions JAC M02 MCS data analysis JAC M03 Comparing fishing vessel operations JAC M04 Using vessel tracking tools JAC M05 Data Analysis using satellite remote sensing data JAC M06 Introduction to MDA tools JAC M07 Use the GFW Map JAC M08 Use the Skylight online platform JAC M09 Use the Triton tool for fisheries analysis JAC M10 Integrate MDA data with other MCS data JAC M11 Integrate vessel tracking and satellite remote sensing data **Learning Courses** JAC C01-24 MCS Fundamentals JAC C02-24 Analysis of Fishing Vessel Tracking & Remote Sensing Tools Data JAC C03-24 Using Open-Source MDA Tools to Support MCS Data Analysis. **Qualification Programmes** Nil

Purpose of this guide

This Guide supports trainers, assessors and presenters in the delivery of the Fisheries Data Analysis Training Package. The Guide outlines the structure of each skill set and training programme.

About the Fisheries Data Analysis Training Package

This training package give fisheries officers a clear understanding of the topics of study they must learn in order to achieve a skill and competently perform in the workplace.

The Fisheries Data Analysis Training Package specifies the learning programmes that are available to fisheries and enforcement officers, and those working in similar fields. This package consists of modules, when combined create learning courses which can also be combined to create qualification level training programmes. Each module of learning describes the learning outcomes and performance criteria participants are expected to display upon successful completion of the module.

The training package does not specify how an individual should be trained. Trainers, assessors or presenters are required to develop learning strategies, matching the needs of the participants, to ensure the successful achievement of the learning outcomes as detailed in each unit.

List of modules, learning courses and training programmes

Summary of Fisheries Data Analysis Training Package

The training package comprises:

- 11 Modules
- 3 Learning courses

Codes are allocated to each qualification and unit of competency. These codes have been developed by the JAC with the creation of this training package.

Codes:

The code is made of FIVE parts and each part is used as necessary. These parts include: *Creator*, learning *unit type*, the *level* of learning, the *order* of development and the *year*.

Module Codes *e.g. JAC M10*

Creator was the Joint Analytical Cell (**JAC**),
The learning *unit type* M=Module, C=Course, P=Training Programme; this is a ***Module***
The *order* it was developed (01, 02 etc).This was the tenth (#**10**) module created

Learning Course *e.g. JAC C01-24*

Creator was the **JAC**,
The learning *unit type* M=Module, C=Course, P=Training Programme; this is a ***Course***.
The *order* it was developed (01, 02 etc). This was first (**#1**) course created.
The *year* it was made was **2024**

Training Programme e.g.: *JAC P0304-24*

Creator was the **JAC**,
The learning *unit type* M=Module, C=Course, P=Training Programme; this is a ***Training Programme***.
The *level* of learning is equal to a level **3**
The *order* it was developed (01, 02 etc). This was fourth (**#4**) course created.
The *year* it was made was **2024**

Codes may change as more modules and programmes are created and there becomes a need to refine these codes.

Module

A module describes the skills and knowledge that a participant must learn in order to competently perform a task in the workplace.

Every module has associated activity requirements that describe the knowledge and performance a participant must achieve.

The following is a list of modules available at the time of this version.

Code	Module Title
JAC M01	MCS definitions
JAC M02	MCS data analysis
JAC M03	Comparing fishing vessel operations
JAC M04	Using vessel tracking tools
JAC M05	Data analysis using satellite remote sensing data
JAC M06	Introduction to MDA tools
JAC M07	Use the GFW Map
JAC M08	Use the Skylight online platform
JAC M09	Use the Triton tool for fisheries analysis
JAC M10	Integrate MDA data with other MCS data
JAC M11	Integrate vessel tracking and satellite remote sensing data

Learning Courses

Learning courses are a combination of modules. When particular modules are packaged together, they support the learning of a broad skill.

Code	Learning Course Title

JAC C01-24	MCS Fundamentals
JAC C02-24	Analysis of Fishing Vessel Tracking and Remote Sensing Tools and Data
JAC C03-24	Using Open-Source MDA Tools to Support MCS Data Analysis

Training Programmes

Training programmes are a combination of learning courses. When a number of learning courses are packaged together, they create a programme of learning in a range of skills which provide a whole of job approach.

Code	Training Programme Title
NIL	NIL

Mapping Information

The mapping table below details the changes in the Fisheries Data Analysis Training Package with comments about their relationship to previously released versions of the Training Package

Modules

Primary Release			
Code and Title (current release)	**Code and Title (previous release)**	**Comments, summary of changes**	**Equivalence (E=Equivalent / N=Not)**
JAC M01 MCS Definition		New Unit	
JAC M02 MCS data analysis		New Unit	
JAC M03 Comparing fishing vessel operations		New Unit	
JAC M04 Using vessel tracking tools		New Unit	
JAC M05 Data analysis using satellite remote sensing data		New Unit	
JAC M06 Introduction to MDA tools		New Unit	

JAC M07 Use the GFW Map		New Unit	
JAC M08 Use the Skylight online platform		New Unit	
JAC M09 Use the Triton tool for fisheries analysis		New Unit	
JAC M10 Integrate MDA data with other MCS data		New Unit	
JAC M11 Integrate vessel tracking and satellite remote sensing data		New Unit	

Learning Courses

Primary Release			
Code and Title (current release)	**Code and Title (previous release)**	**Comments, summary of changes**	**Equivalence (E=Equivalent / N=Not)**
JAC C01-24 MCS Fundamentals		New Course	
JAC C02-24 Analysis of Fishing Vessel Tracking and Remote Sensing Tools and Data		New Course	
JAC C03-24 Using Open-Source MDA Tools to Support MCS Data Analysis		New Course	

Implementation Information

The following packaging rules apply to the formation of Learning Courses.

JAC C01-24 MCS Fundamentals

Code	Module Title
JAC M01	MCS definitions
JAC M02	MCS data analysis

JAC C02-24 Analysis of fishing vessel tracking and remote sensing tools and data

Code	Module Title
JAC M03	Comparing fishing vessel operations
JAC M04	Using vessel tracking tools
JAC M05	Data analysis using satellite remote sensing data

JAC C03-24 Using open-source MDA tools to support MCS data analysis

Code	Module Title
JAC M06	Introduction to MDA tools
JAC M07	Use the GFW Map
JAC M08	Use the Skylight online platform
JAC M09	Use the Triton tool for fisheries analysis
JAC M10	Integrate MDA data with other MCS data
JAC M11	Integrate vessel tracking and satellite remote sensing data

Assessment conditions

Assessment conditions may include a range of requirements for assessment, typically under the following categories:

- equipment
- materials
- specifications
- relationships with team member and supervisor
- relationship with clients.

When conducting training and assessments in a real work site, safety, workplace induction or village; cultural requirements for trainers, assessors, presenters and learners may apply. In these situations, trainers or training coordinators must ensure they meet any requirements to access and operate on the worksite. This may include securing government approval, safe handling of equipment, appropriate dress standards and observing customary protocols.

Maintaining currency in fisheries data analysis.

To effectively deliver and assess against the Fisheries Data Analysis Training Package modules, trainers and assessors will need to maintain currency of knowledge, skills and industry experience. To maintain vocational currency, trainers and assessors should undertake work experience or professional development related to the industry sector for the respective qualification within the past 12 months.

While not mandatory trainers and assessors are encouraged to undertake training, assessment or mentoring professional development.

Industry Sector

The Fisheries Data Analysis Data Analysis Training Package covers fisheries in the coast, off-shore and high-seas waters and are managed by fisheries or compliance officers.

Occupational Outcomes of Learning Courses

Learning Course	Occupational Outcome	Comments
JAC C01-24 MCS Fundamentals	This course reflects the skills required of **fisheries, compliance or enforcement officer** who is involved in the monitoring, control, surveillance, compliance and enforcement of fisheries laws and regulations.	Participants undertaking this course would not necessarily have powers of authority but seek to gain a basic understanding of the concept of MCS, compliance and enforcement.
JAC C02-24 Analysis of Fishing Vessel Tracking and Remote Sensing Tools and Data	This course reflects the skills required of **fisheries, compliance or enforcement officer** who is involved in the monitoring, control, surveillance, compliance and enforcement of fisheries laws and regulations. A participant in this course would undertake vessel risk assessments, perform vessel inspections and investigations	Participants in this course with powers of authority to inspect and take action would benefit from this course as part of their due diligence and investigation tasks.
JAC C03-24 Using Open-Source MDA Tools to Support MCS Data Analysis	This course reflects the skills required of **fisheries, compliance or enforcement officer** who is involved in the monitoring, control, surveillance, compliance and	Participants in this course with powers of authority to inspect and take action would benefit from this course as part of their due

	enforcement of fisheries laws and regulations. A participant in this course would undertake vessel risk assessments, perform vessel inspections and investigations	diligence and investigation tasks

Mandatory entry requirements

Entry requirements are the skills, knowledge and experience required to enter a learning course or training programme. These requirements may be expressed in terms of competency from a lower level module or vocational expertise (including job roles), or both. When entry requirements apply, they must be achieved prior to entering the training.

Access and equity considerations

An individual's access to learning and assessment processes should not be adversely affected by restrictions placed on the location or context of this learning and assessment beyond the requirements specified in the Fisheries Data Analysis Training Package and must be bias-free.

Training Packages must reflect and cater for the diversity of participants. The flexibility offered by Training Packages should enhance opportunities and potential outcomes for all learners so that all benefit from a wider national skills base and a shared contribution to fisheries management.

Reasonable adjustment

It is important that trainers and assessors consider and implement reasonable adjustments for learners with specific learning needs.

An adjustment is any measure or action that a learner requires because of their disability or access to learning capabilities and which has the effect of enabling the learner to participate in education and training on the same basis as those without a disability or access issue. An adjustment is reasonable if it achieves this purpose while considering factors such as the nature of the learner's disability, the views of the learner, the potential effect of the adjustment on the learner and others who might be affected, and the costs and benefits of making the adjustment.

Trainers and assessors are also entitled to maintain the academic integrity of a course or program and to consider the requirements or components that are inherent or essential to its nature when assessing whether an adjustment is reasonable.

Foundation skills

Foundation skills are the non-technical skills that support an individual's participation in the workplace, in the community and in education and training. Foundation skills refer to learner's language, literacy and numeracy skills. These skills are:

- reading skills

- writing skills
- oral communication skills
- numeracy skills
- learning skills
- problem solving skills
- initiative and enterprise skills
- teamwork skills
- planning and organising skills
- self-management skills
- technology skills.

The foundation skills listed in a module detail the necessary skills a participant must have in order to fully engage and succeed in the learning.

Advice on any health and safety implications in the industry

Training coordinators should seek further information from national administrations regarding relevant safe work practices.

Resource and equipment relevant to this training package

The resource requirements are specified within each module and facilitators guide.

Further information relevant to implementing the training package

Where imported modules are used as part of Fisheries Data Analysis Training Package trainers and assessors must consider and meet the specific training and assessment requirements of those imported units and their parent Training Package (if any).

These requirements may include specific legal, work health and safety, resourcing and equipment requirements, as well as unique trainer and assessor requirements, including industry experience.

JOINT ANALYTICAL CELL

About the Joint Analytical Cell:

The Joint Analytical Cell, or JAC, provides authorities with fisheries intelligence, data analysis and capacity building to help combat illegal, unreported and unregulated fishing. Founded by IMCS Network, Global Fishing Watch and TMT, the initiative's members also include C4ADS and Skylight. By harnessing innovative technology and the complementary expertise of its collaborating organizations, the JAC fosters cooperation among State and non-State actors to build insights and capacity to help enhance fisheries management

Contact: jac-coord@tm-tracking.org

www.imcsnet.org
www.globalfishingwatch.org
www.tm-tracking.org
www.c4ads.org
www.skylight.global