

FISMIS

Data processing

Data storage and

► data dissemination

IOTC Species identification workshop

Kochi, India - September 29th to October 4th 2025



Outline

- ▶ Objectives of the session
- 1. What is a FISMIS
- 2. Data base and Data storage
- 3. Reference data
- 4. FISMIS implemented by FAO
 - ▶ OpenArtfish
 - ▶ Calipseo

Objectives of the session

- ▶ Understand what are the best option to store data
- ▶ What is a database
- ▶ Understand why standardisation is important
- ▶ What are the open sources options implemented by FOA

1. FISMIS definition

- ▶ FISMIS = Fisheries Statistics and Management Information System
- ▶ Same approach as enterprise management solution = **sharing** same reference data across a system / having access to different stream of data and information for **cross checking, validation and time saving**
- ▶ FISMIS is a Statistical Working system
 - ▶ All data are usually **stored in one database**, including processed data

1. FISMIS Principles

- ▶ Centralized: web based. Has technological constraints. But more and more mitigated by deployment of internet mobile and governmental intranet/network/data centers
- ▶ Standardized: same definition applied for the same concepts
- ▶ Harmonized: same reference data shared across all domains
- ▶ Connected: some workflow could be managed outside of Fisheries (Vessel seaworthiness certificates) with data already available electronically. Connectable to mobile applications

1. FISMIS Component

1. Storage
2. User management
3. Reference data management
4. Administrative data management
5. Fisheries landing data management
6. Other flow of data management
7. Processing
8. Dissemination and Exchange

Registries:
- Vessels
- Fishers
- Licences

With history of changes

Logbook
Sample-based data

Market
Export

Data quality control
Statistics production

Automatized report
Data export

2. Data storage and database

- ▶ The primary function is to provide a way to store, retrieve, update, and manage data
- ▶ Centralized storage: all data in one repository: reference data, registries, data, statistics = **One source of truth**
- ▶ Central database: Backup and restoration are simplified
- ▶ One standard data model:
 - ▶ Fisheries data are highly organized.
 - ▶ Need to ensure integrity and consistency of data



3. Reference data

Objective = Standardisation

- ▶ Data used to classify or categorized other data
- ▶ Reference data are essential to enable harmonization and standardization of collected data, processed data, storage and dissemination.
- ▶ It define all drop down list and avoid typo, misspelling... 3 types
 - ▶ Internal system settings: type of entities (fishermen, companies), vessel status
 - ▶ Fisheries settings: type of hull, type of energy (for the landing form entries) etc
 - ▶ Code lists (actual reference data): list of species, list of vessel type, list of landing sites etc -> these code lists must be defined for each national FISMIS

3. Reference data

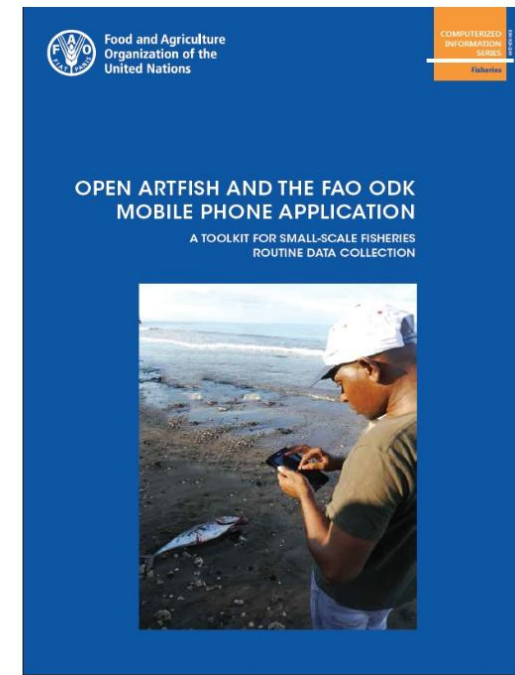
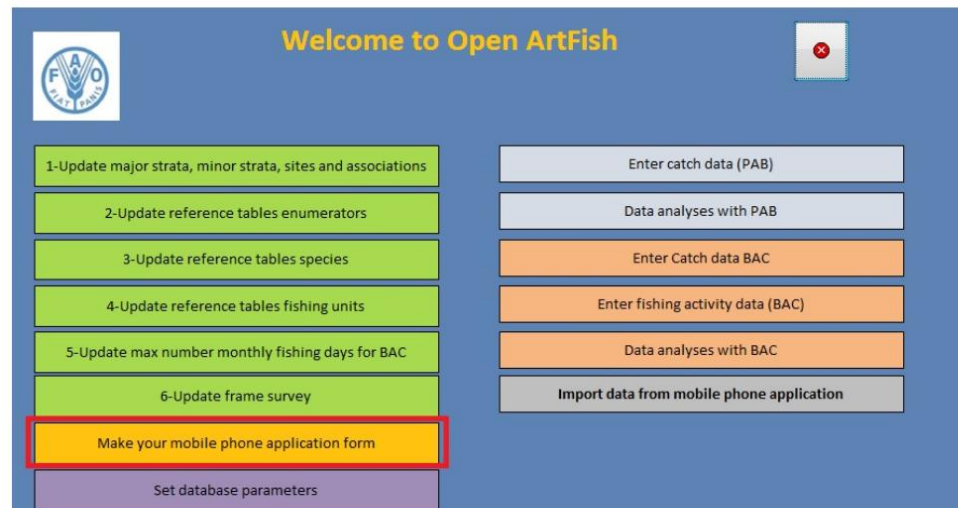
- ▶ Management of mapping in the reference data = **correspondence** between national, regional and international classification
- ▶ To enable reporting according to regional and international data calls: **aggregation** according to species groups, geartype etc.....



Food and Agriculture Organization
of the United Nations

4. FISMIS implemented by FAO: Open ArtFish

- ▶ Local instance developed on Microsoft Access
- ▶ Designed for sampled based survey

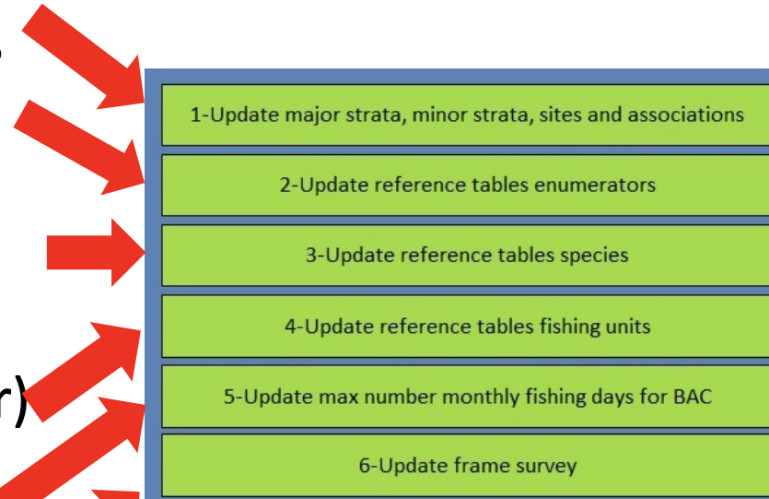


Open ArtFish - Settings

Setting up Open ArtFish

Define:

- Major strata, minor strata and landing sites
- Name of the enumerators
- Major fish species with the FAO 3 alpha code
- Fishing units (boat gear)
- Maximum number of monthly fishing days
- Updated frame survey data



Open ArtFish - Interface to enter data

Enter catch data

THE FISHING UNIT DATA

Date (dd/mm/yyyy) 08-Feb-17

Major strata CENTRAL REGION

Minor strata ABURA-ASEBU-KWAMANKESE DISTRICT

Landing site ABOKUM ANO

Name Enumerator JOSEPH ESHUN

Fishing unit APW

Trip duration (days) 1

Validated ☐

Catch and value by species

THE SPECIES DATA

Species GARFISH

Catch (Kg) 1.00

Value (Cedis) 1

Validated ☐

Record: 1 of 1 No Filter Search

Open ArtFish - Analysis Interface

Data analyses and Estimation with BAC

SELECT OPTIONS TO BE ANALYSED

Year: 2017 Major strata: Species: DEA

Month: * Minor strata: *

Fishing unit: * Landing site: *

CHECK YOUR SAMPLE SIZE

Check sample numbers CPUE

Check sample numbers BAC

Check mobile phone samples taken by enumerator

SELECT ANALYSES

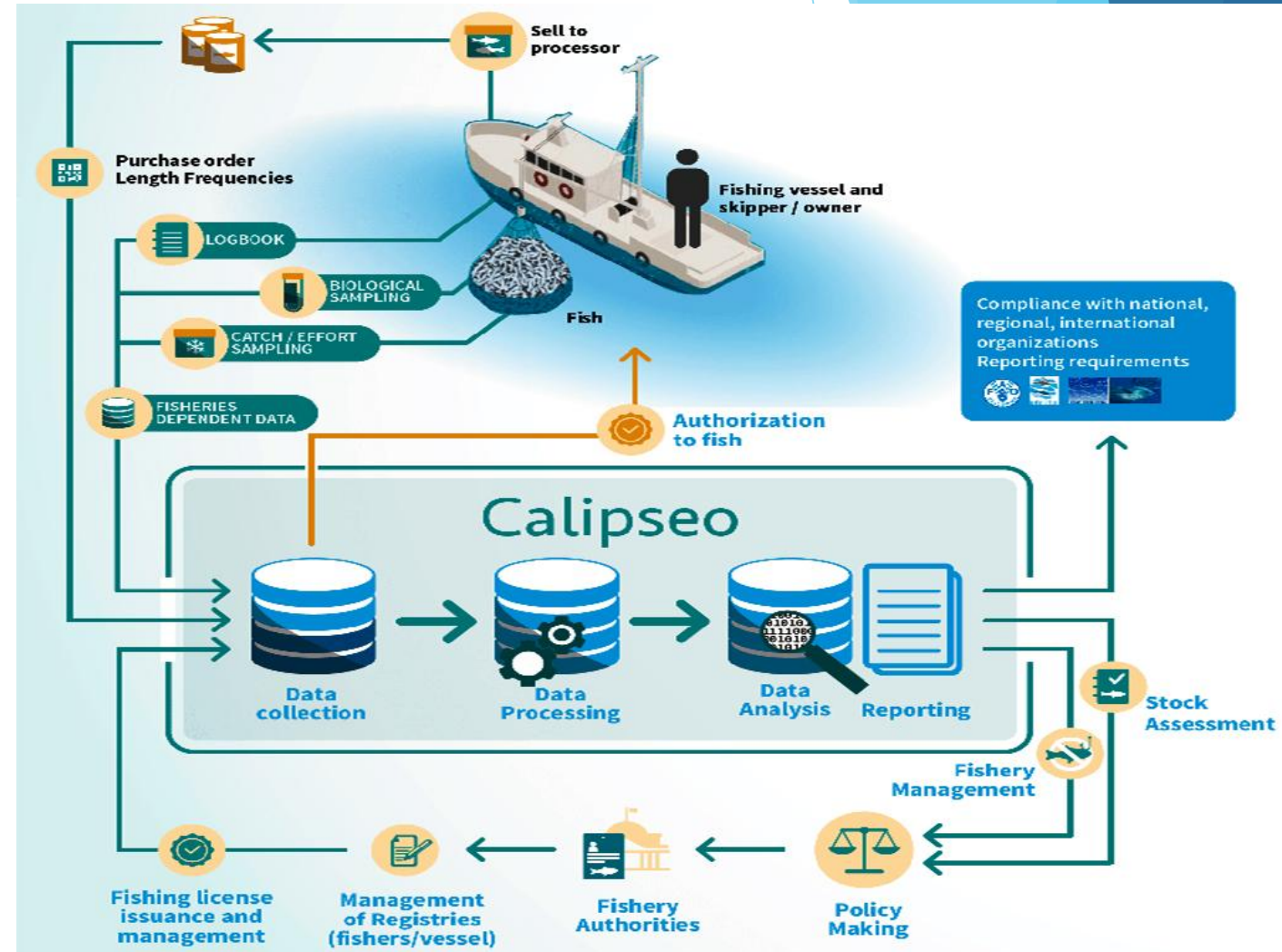
L 1.1 Year Major strata Catch Value	<input checked="" type="checkbox"/>	L 3.1 Year Major strata Species Catch Value	<input checked="" type="checkbox"/>
L 1.2 Year Minor strata Catch Value	<input checked="" type="checkbox"/>	L 3.2 Year Minor strata Species Catch Value	<input checked="" type="checkbox"/>
L 1.3 Year Major strata Fishing unit Catch Value	<input checked="" type="checkbox"/>	L 3.3 Year Major strata Fishing unit Species Catch Value	<input checked="" type="checkbox"/>
L 1.4 Year Minor strata Fishing unit Catch Value	<input checked="" type="checkbox"/>	L 3.4 Year Minor strata Fishing unit Species Catch Value	<input checked="" type="checkbox"/>
L 1.5 Year Site Fishing unit Catch Value	<input checked="" type="checkbox"/>	L 3.5 Year Site Fishing unit Species Catch Value	<input checked="" type="checkbox"/>
L 1.6 Year Fishing unit Catch Value	<input checked="" type="checkbox"/>	L 3.6 Year Fishing unit Species Fishing Effort and CPUE	<input checked="" type="checkbox"/>
L 2.1 Year Month Major strata Catch Value	<input checked="" type="checkbox"/>	L 4.1 Year Month Major strata Species Catch Value	<input checked="" type="checkbox"/>
L 2.2 Year Month Minor strata Catch Value	<input checked="" type="checkbox"/>	L 4.2 Year Month Minor strata Species Catch Value	<input checked="" type="checkbox"/>
L 2.3 Year Month Major strata Fishing Unit Catch Value	<input checked="" type="checkbox"/>	L 4.3 Year Month Major strata Fishing unit Species Catch Value	<input checked="" type="checkbox"/>
L 2.4 Year Month Minor strata Fishing unit Catch Value	<input checked="" type="checkbox"/>	L 4.4 Year Month Minor strata Fishing Unit Species Catch Value	<input checked="" type="checkbox"/>
L 2.5 Year Month Site Fishing unit Catch Value	<input checked="" type="checkbox"/>	L 4.5 Year Month Site Fishing unit Species Catch Value	<input checked="" type="checkbox"/>

4. FISMIS implemented by FAO: Calipseo

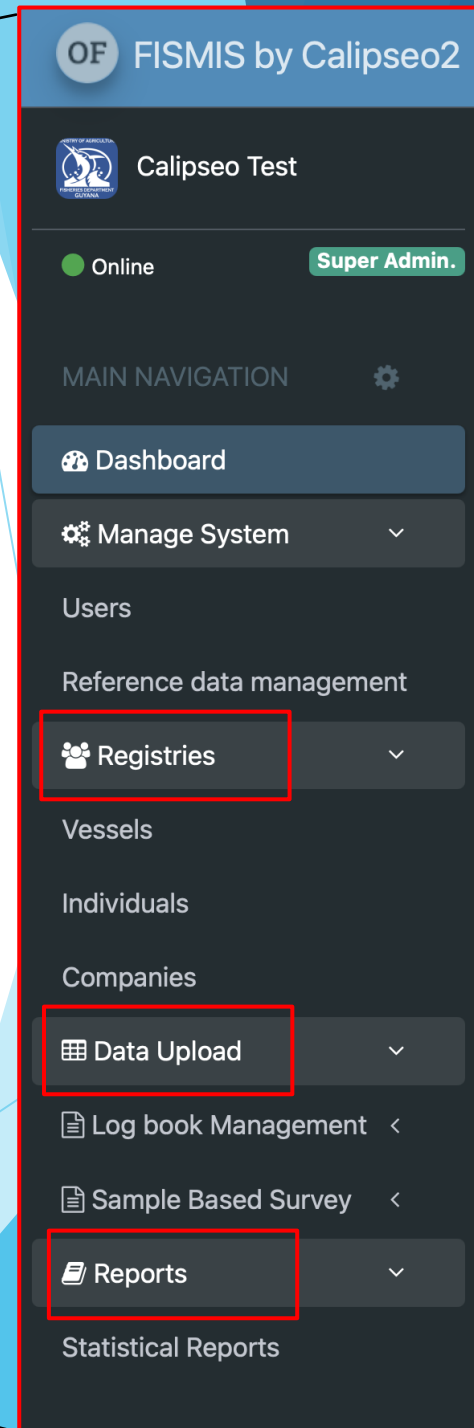
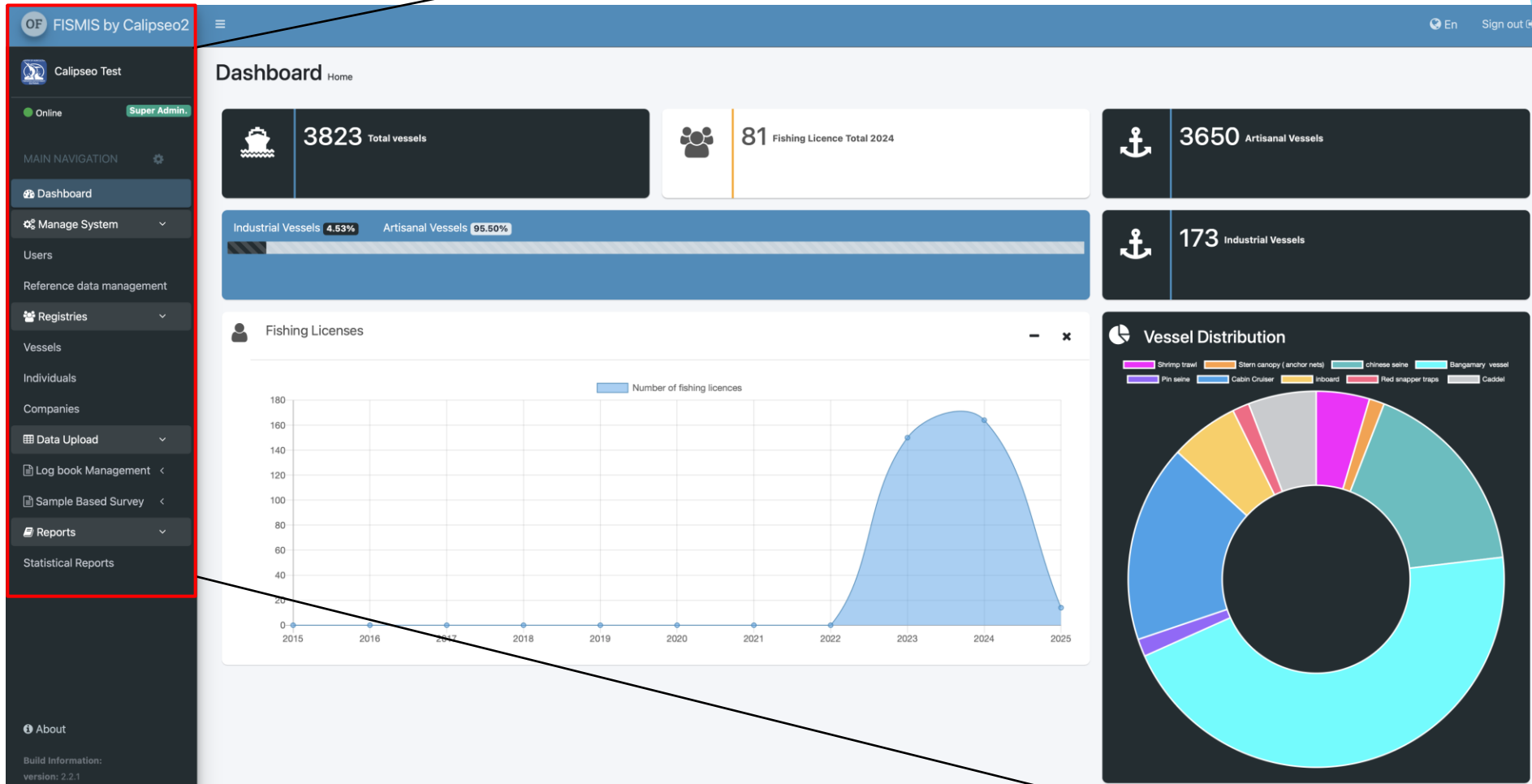
- ▶ Calipseo is a complete information system
- ▶ Web based application accessible from any computer with internet connection
- ▶ It includes:
 - ▶ **Registries** for: vessels, fishers, companies, licenses
 - ▶ **Fisheries data:**
 - ▶ Logbook of industrial fisheries
 - ▶ Sample-based data: frame survey, effort survey, landings survey, biological sampling, market
 - ▶ **Data analysis** module and visualisation (automated reports, graph and tables)

4. FISMIS implemented by FAO: Calipseo

- ▶ Based on opensource resources: Java, SQL, Springboot
- ▶ Installation on a server (preferably on local server in countries)
- ▶ With different user roles that have different access rights
- ▶ Customisation of the system with reference tables adaptations

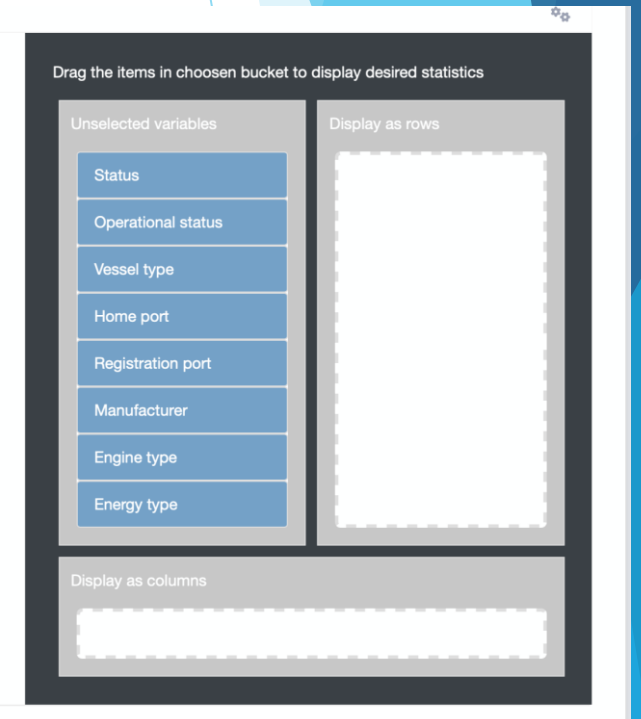
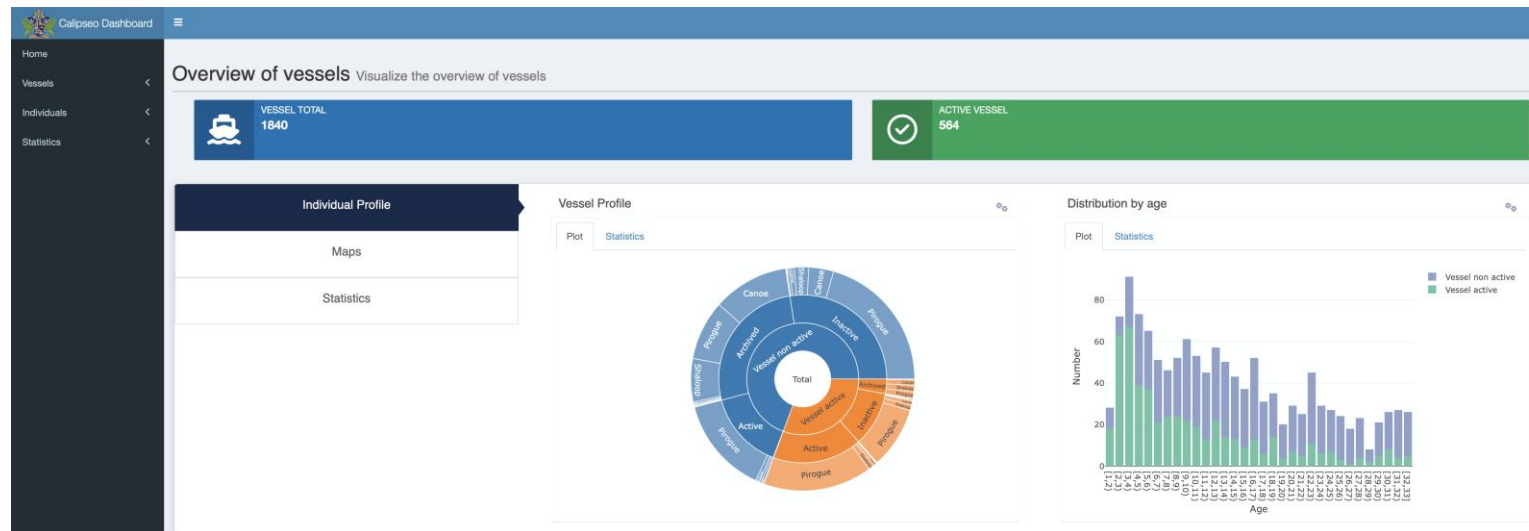


Calipseo - User interface



Calipseo - Data analysis component

- ▶ Instant overview of the database
- ▶ Statistics production
- ▶ Visualisation module with customisation options





Home

Vessels

Overview

Vessels list

Vessels quality assessment

Individuals

Logbooks

Statistics

Artfish

Overview of vessels Visualize the overview of vessels



Total number of vessels

3823



Active Vessels

0

Individual Profile

Maps

Statistics

Number of vessels

Show 27 entries

Copy

CSV

Excel

PDF

VESSEL_TYPE

HOME_PORT_LANDING_SITE

All

All

Bangamary vessel

Anna Regina

Bangamary vessel

Charity (Big Bird Wharf)

Bangamary vessel

Hague

Bangamary vessel

Kumaka, Moruca

Bangamary vessel

Lima

Bangamary vessel

Supenaam

Bangamary vessel

Unknown

Cabin Cruiser

Anna Regina

Cabin Cruiser

Parika

Drag the items in chosen bucket to display desired statistics

Unselected variables

Operational status

Registration port

Manufacturer

Engine type

Energy type

Display as rows

Vessel type

Home port

Display as columns



Home

Vessels

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Vessels quality assessment

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Total number of vessels

3823



Active Vessels

0

Individual Profile

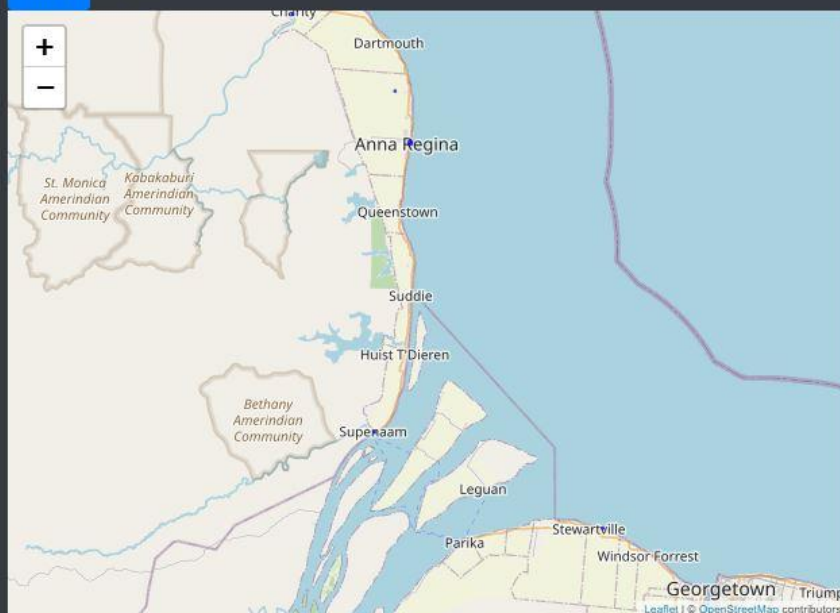
Maps

Statistics

Breakdown of vessels in Guyana per home port

Map

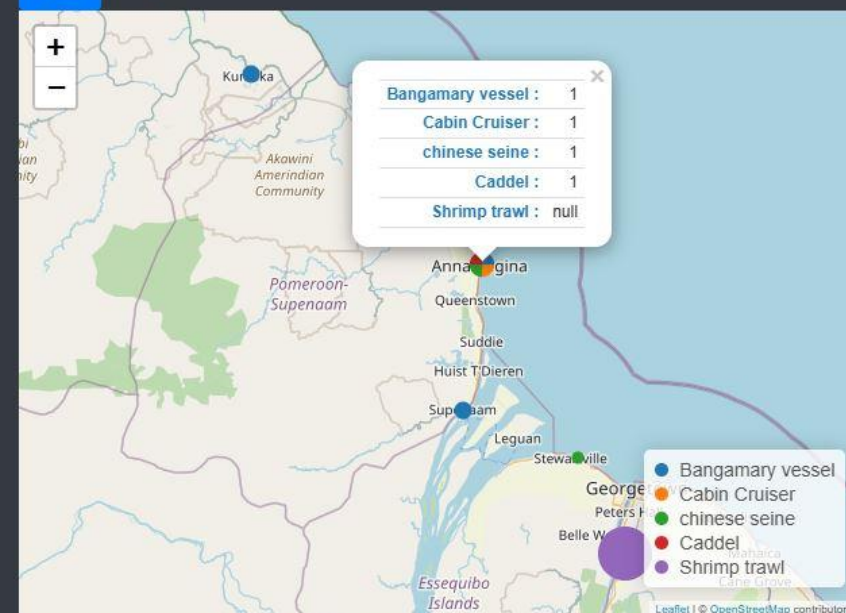
Data



Breakdown of vessel type in Guyana per Landing sites

Map

Data





Home

Vessels

Overview

Vessels list

Vessels quality assessment

Individuals

Logbooks

Statistics

Artfish

<< Back to list of vessels

Vessel information - Richard



Info Registration Characteristics

- Vessel name: **Richard**
- Vessel type: **Bangamary vessel**
- Vessel stat type: **Artisanal Vessel (Sampling)**
- Home port: : **Supenaam**
- IRCS:
- IMO:

Vessel Operational Status
IN SERVICE / COMMISSION

license status
NO LICENSE

Owners
0

Licenses
0

Mean fishing trips/year
NA

Mean days at sea / fishing trip
NaN

Landing sites
0

Fishing gears
0

Species caught
0

History

Copy CSV Excel PDF

Ownership

Search:

Licenses

Fishing Trips

Catches

Type	Description	Old Value	New Value	Change Date
All	All	All	All	All
Other	Changed Vessel Build/Construction Year but System could not parse Build year:	NULL	NULL	2025-05-15 03:35:47

Showing 1 to 1 of 1 entries



Home

Vessels

Individuals

Overview

Individual list

Individuals checks

Logbooks

Statistics

Artfish

Overview of individuals Visualize the overview of individuals



Individuals Total

3393



Non Fisher

0



Fisher

0



Active Fisher

0

Individual Profile

Statistics

Distribution by category

Plot

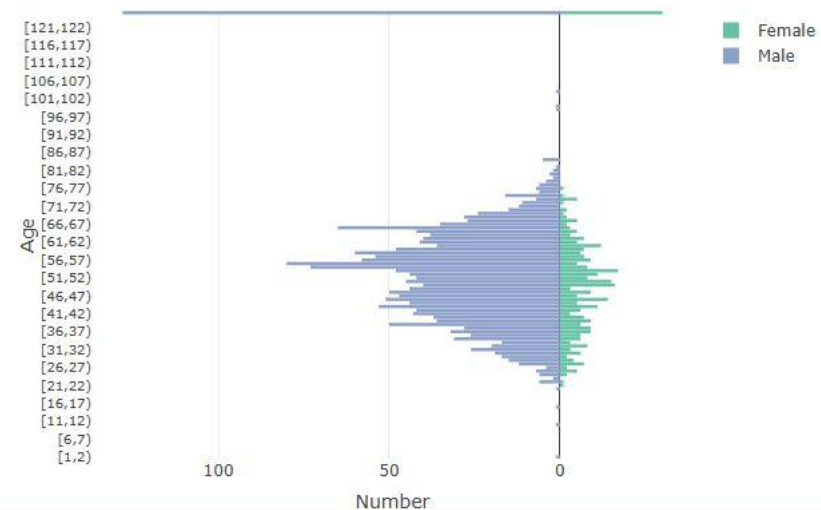
Statistics



Distribution by age

Plot

Statistics





- Home
- Vessels
- Individuals
- Logbooks**
- Overview
- Logbooks details
- Logbooks trips
- Statistics
- Artfish

Overview of industrial fishing activities – Based on logbooks monitoring

2024



Total quantity
47.02 tons



Total participating vessels
2

2025



Total quantity
0 tons



Total participating vessels
0

Total quantity

Total participating vessels

Breakdown by vessel types

Breakdown by gear types

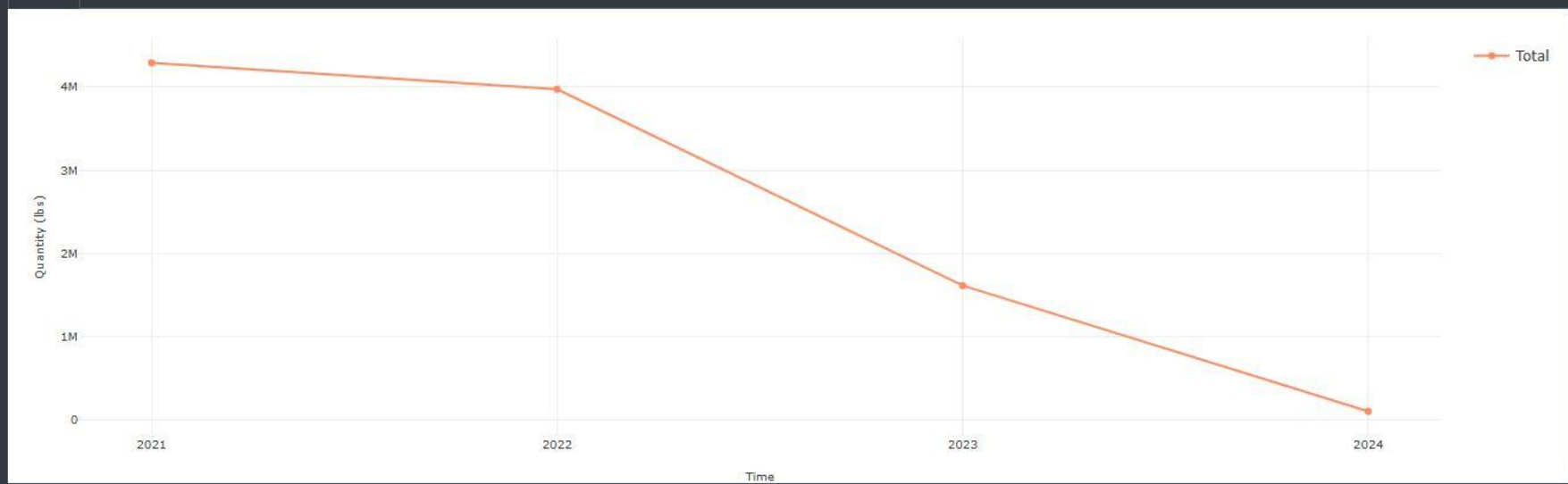
Breakdown by species

Breakdown by landing sites

Breakdown by fishing zones

Plot

Statistics





- Home
- Vessels
- Individuals
- Logbooks
- Statistics
- Compute indicators
- Artfish

Select an indicator

Statistical indicator

Artfish estimates

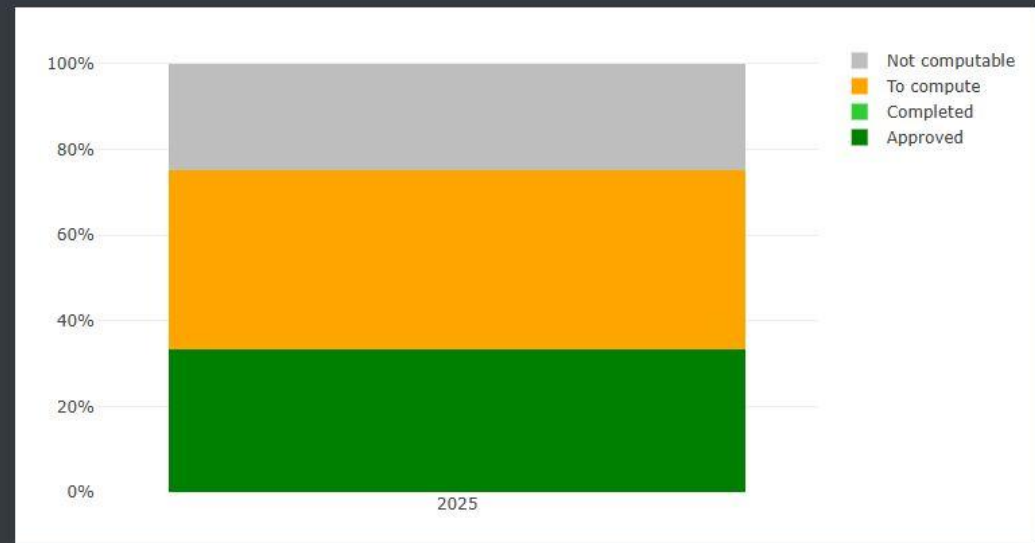
This is a short paragraph to describe the 'Artfish estimates' computation.

Show notice

Show hierarchy

Select this indicator

Indicator's status



Artfish estimates

2025 M1 M2 M3 M4 M5 M6 M7 M8 M9 M10 M11 M12

2025-M1 Status: approved (last update: 2025-09-23 21:46:194876)



2025-M2 Status: approved (last update: 2025-09-23 21:46:194876)



2025-M3 Status: approved (last update: 2025-09-23 13:06:25403976)





Home

Vessels

Individuals

Logbooks

Statistics

Artfish

Overview

By Fishing Unit

By Species

Monthly Reports

Toolbox

Overview

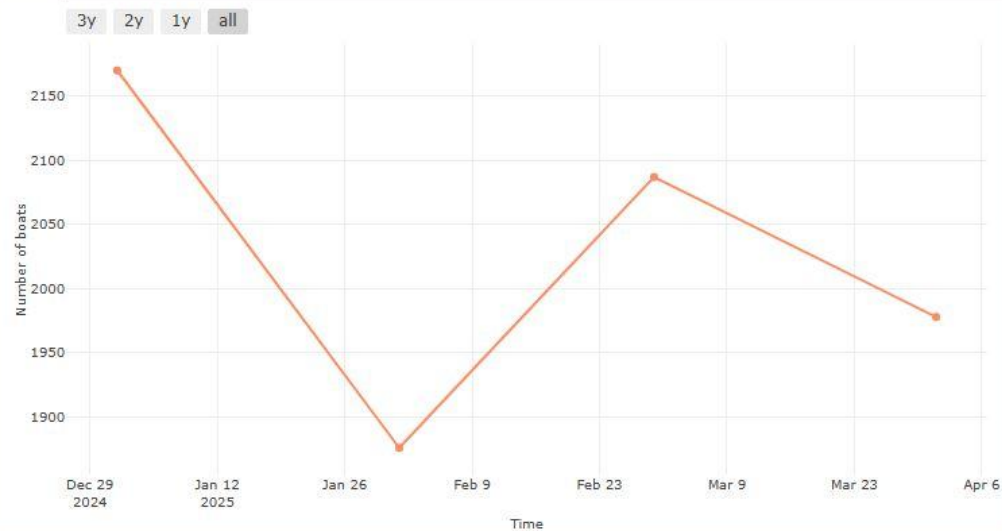
Fishing Unit :

All fishing units

Cumulate Number of Boats

Plot

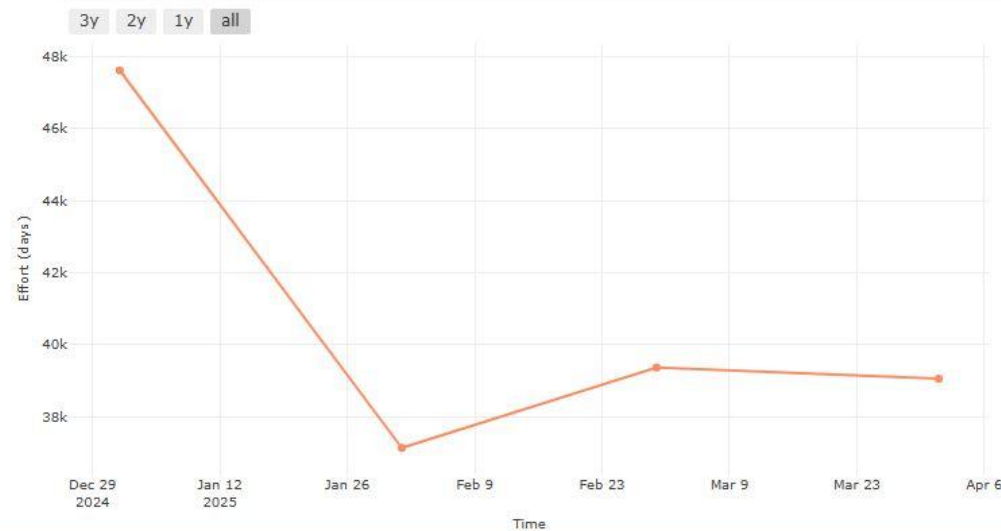
Statistics



Cumulate Effort

Plot

Statistics



Cumulate Catch

Plot

Statistics



Cumulate Value

Plot

Statistics





Annual Statistics by Fishing Unit

Year :

2025

Indicator :

Effort

Fishing unit :

All fishing units

Unit :

Days

168842.1

Total Effort (Days)

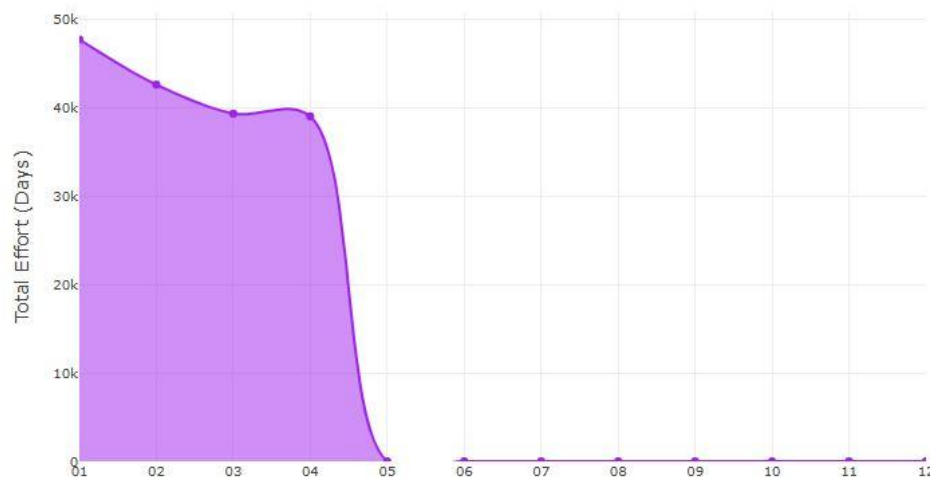
Accuracy (%)



Monthly Repartition By Fishing Units

Plot

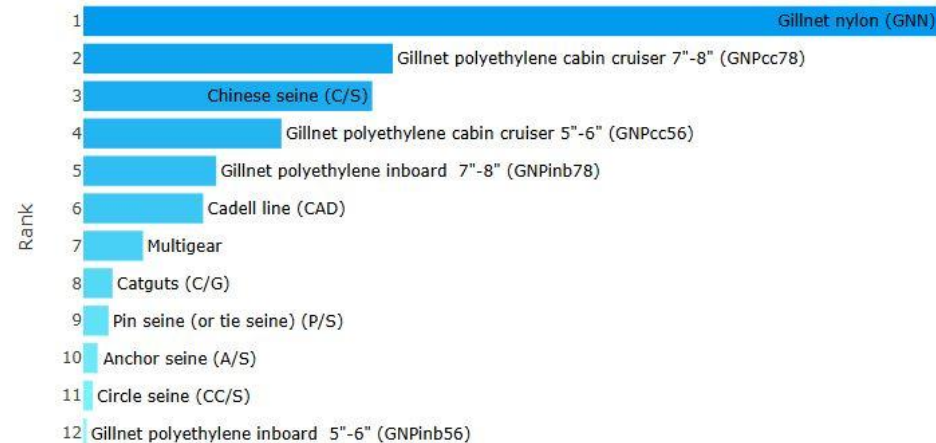
Table



Top Ranking Fishing Units

Plot

Table





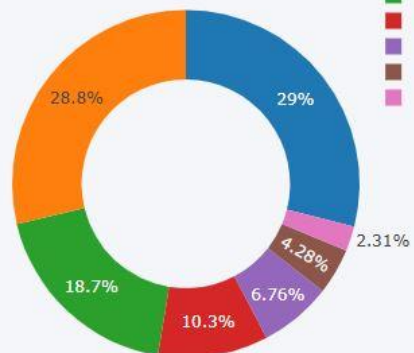
Detail by Species

Species :

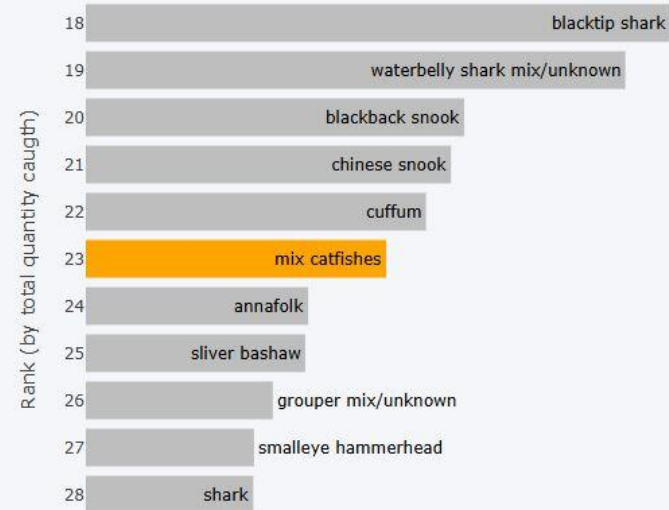
mix catfishes [Ariidae]

Fishing unit :

All fishing units



- Catguts (C/G)
- Gillnet nylon (GNN)
- Gillnet polyethylene inboard 7"-8" (GNPinb78)
- Cadell line (CAD)
- Pin seine (or tie seine) (P/S)
- Multigear
- Chinese seine (C/S)



12496372.17
Total value (\$)

71780.49
Total catch (kg)

114.44
Average price (\$/kg)

5.98584
Averge CPUE (kg/day)

31109
Total effort (days)

3y 2y 1y all

10M Value (\$)

150k Catch (kg)



- Home
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- Statistics

Artfish

- Overview
- By Fishing Unit
- By Species
- Monthly Reports
- Toolbox

Monthly Reports

Details on estimations and statistical diagnostics

Data status :

release

Year :

2025

Month :

1

Fishing unit :

Chinese seine (C/S)

Submit

Effort

(E)	Estimated Effort = (PBA)x(NB)x(FDM)	5,142
(NB)	Number of boats-gears	286
(FDM)	Fishing days in month	31
(PBA)	Probability Boat Active = (NAD)/(NDE)	0.580
(NAD)	Number of days declared active	58
(NDE)	Total number of days examined	5
(CV)	Coefficient of variation	10.0 %
(SAE)	Spacial Accuracy (effort)	89.8 %
(TAE)	Temporal Accuracy (effort)	100.0 %
(SUI)	Sampling Uniformity index (0 - 1)	0.6

Landings

	Estimated catch = Estimated Effort x CPUE	5,389,168
	CPUE = (SMC)/(SME)	950.712
(SMC)	Sample catch	10,985
(SME)	Sample Effort	60

References

- ▶ <https://www.fao.org/fishery/en/statistics/software/calipseo>
- ▶ <https://www.fao.org/fishery/en/statistics/software/open-artfish>
- ▶ <https://www.tutorchase.com/answers/a-level/computer-science/what-are-the-primary-functions-of-a-database-management-system--dbms->



Thank you for your attention

Questions ?