Global Fishing Watch

API USE CASES

Global Fishing Watch

Ref:

API User Workflow: Analyzing apparent Fishing Efforts in a Region and Retrieving Vessel Details

Introduction

This workflow guides users on how to query fishing effort data using the **4Wings Report API** and retrieve vessel information using the **Vessel Search API**.

3 API user flows:

1. **Analyze apparent fishing efforts in a region and get vessel details**
   a. 4wings API report group by vessel ID
   b. Vessel API gets details by vessel ID
2. **Analyze Fishing Effort for Trawlers in Senegal's EEZ**
   a. 4wings API report group by gear type
   b. 4wings API report group by vessel ID filtered by trawlers
   c. Vessel API gets details by vessel ID
   d. Events API gets events by each vessel ID
3. **Analyze a fleet (a group of vessels)**

API user flow 1 - Analyze apparent fishing effort in a region and get vessel details

👤 **Use Case: A Port Inspector Monitoring Vessel Activity**

Mamadou, a port inspector in **Dakar, Senegal**, monitors vessel activity within Senegal's **Exclusive Economic Zone (EEZ)**. His role includes:

✅ **Analyzing apparent fishing effort, specifically for trawlers in Senegal's EEZ.**

✅ **Identifying vessels involved in apparent trawling activity and determining their reported flag states.**

✅ **Checking vessel history, including prior encounters (or potential transshipment) or port visits.**

✅ **Generating reports for enforcement authorities to assess risks.**

To do this, Mamadou will use **two Global Fishing Watch APIs**:

● **4Wings API** – To retrieve **apparent** fishing effort data for trawlers operating in Senegal's EEZ over the past 3 months.
● **Vessels API** – To retrieve **detailed vessel information**, including flag, ownership history, and authorizations.

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◆ Step 0: Identify the Region of Interest (ROI) - Senegal EEZ

Before making API requests, **Mamadou** must specify the geographic area for analysis using a Region ID:

📌 **Options to Define the Region:**

- `Using Region ID` → Each EEZ has a unique ID in the public-eez-areas dataset.
- `Custom Geometries` → Users can define a custom area using GeoJSON.
- **Find EEZ Region IDs Here: Regions API Documentation**
- For Senegal's EEZ, the region ID is **8371** (public-eez-areas dataset).

◆ Step 1: Retrieve Apparent Fishing Effort in Senegal's EEZ

📌 **API Used:** 4Wings API – /v3/4wings/report

📌 **Filters Applied:**

- Region ID = Senegal EEZ (8371)
- Gear Type = Trawlers
- Date Range = Last 3 Months

📌 **Explanation of Parameters & Considerations**

How is the Gear Type Retrieved?

- Gear types, such as **trawlers**, are inferred based on **Global Fishing Watch's vessel classification system**, which relies on **AIS data and vessel public registries** The **gear type associated with each vessel is not always 100% accurate**, as it may be derived from historical sources or inferred from movement patterns. For more details on supported **gear types**, refer to Gear Types Documentation**.**

- Also, please see caveats regarding **vessel types** and their classification: 🔗 Vessel Types & Considerations**.**

How is the Region ID Retrieved?

- The **Region ID** corresponds to Senegal's **Exclusive Economic Zone (EEZ)**. Each **region** has a unique identifier within the **public-eez-areas** dataset. Users can retrieve **Region IDs** from GFW's API by querying the **Regions API** to find the corresponding ID for a given EEZ, RFMO, or other geographic area. For more details on **retrieving Region IDs**, refer to Regions API Documentation**.**

⚠️ **IMPORTANT**: To avoid any misinterpretation of Global Fishing Watch data, please refer to our data caveats:

- Apparent Fishing Effort:
- Region source
- Vessel ID
- Vessel identity data

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🛠️ **API Request: POST**

```
curl --location --globoff
'https://gateway.api.globalfishingwatch.org/v3/4wings/report?spatial-resolution=HIGH&temporal-resol
ution=MONTHLY&group-by=VESSEL_ID&datasets[0]=public-global-fishing-effort%3Alatest&date-range=2024-
11-01%2C2025-01-31&format=JSON&filters[0]=geartype%20in%20(%27trawlers%27)' \

--header 'Content-Type: application/json' \

--header 'Authorization: Bearer TOKEN' \

--data '{

    "region": {

        "dataset": "public-eez-areas",

        "id": 8371

    }

}'
```

📌 **Why Use group-by=VESSEL_ID?**

- Grouping by VESSEL_ID allows **individual vessel identification** in the response. This is crucial for **tracking vessel activity** and, more importantly, linking each detected vessel to the **Vessel API** in the next step. By structuring the query this way, we can fetch vessel details such as **flag, name, and ownership records** in Step 2 below.

📌 **API Parameters**

- spatial-resolution (e.g., **HIGH**, **LOW**)
- temporal-resolution (e.g., **DAILY**, **MONTHLY**, **YEARLY**)
- For additional parameters, please refer to the API document

📌 **4Wings API Response**:

```
{
    "total": 1,
    "entries": [
        {
            "public-global-fishing-effort:v3.0": [
                {
                    "callsign": "DAK1142",
                    "dataset": "public-global-vessel-identity:v3.0",
                    "date": "2025-01",
                    "entryTimestamp": "2024-11-01T11:00:00Z",
                    "exitTimestamp": "2025-01-30T23:00:00Z",
                    "firstTransmissionDate": "2022-08-19T15:17:37Z",
                    "flag": "SEN",
                    "geartype": "TRAWLERS",
                    "hours": 1.8858333333333333,
                    "imo": "",
                    "lastTransmissionDate": "2025-02-17T23:59:25Z",
                    "lat": 15.68,
                    "lon": -17.059999465942383,
                    "mmsi": "663103000",
                    "shipName": "RIA  DE  DAKAR",
                    "vesselId": "90ab31dfb-bcab-a05f-d12f-2544e1869205",
                    "vesselType": "FISHING"
                },
                {
                    "callsign": "6WFI",
                    "dataset": "public-global-vessel-identity:v3.0",
                    "date": "2025-01",
                    "entryTimestamp": "2024-11-12T03:00:00Z",
                    "exitTimestamp": "2025-01-30T23:00:00Z",
                    "firstTransmissionDate": "2021-05-01T11:49:43Z",
                    "flag": "SEN",
                    "geartype": "TRAWLERS",
                    "hours": 1.0191666666666663,
                    "imo": "",
                    "lastTransmissionDate": "2025-02-17T23:59:49Z",
                    "lat": 14.19,
                    "lon": -17.559999465942383,
                    "mmsi": "663131000",
```

```
                    "shipName": "KANBAL II",

                    "vesselId": "6eb0b555f-fa62-7cb1-4135-2d0eeb6b4baa",

                    "vesselType": "FISHING"

                }

            ]

        }

    ]

}
```

✅ **What We've Learned from Step 1**

- Two vessels appear to have been engaged in potential trawling activity in Senegal's EEZ over the past 3 months:
    - KANBAL II (MMSI: 663131000, Flag: Senegal)
    - RIA DE DAKAR (MMSI: 663103000, Flag: Senegal)

We will retrieve these vessels' ownership, flag history, and authorizations in **Step 2 to validate them**.

📌**Data Source & Considerations**

The values returned in this response are primarily derived from **Automatic Identification System (AIS) self-reported data**. You can find more information about AIS here.

- **Self-Reported Information**: The vessel name, MMSI, and flag are broadcast by the vessel's AIS transponder and may not always reflect official registry data. Some vessels **may *report incorrect or outdated information, either mistakenly or deliberately.***

- **Gear Type Classification Caveats**:
    - Gear type (e.g., Trawlers) is often inferred based on vessel behavior, registries, and historical data rather than explicitly transmitted via AIS. Some vessels may switch gear types or misreport their actual fishing methods. For more details, refer to **Gear Type Classification** and **Vessel Type Considerations.**

🔹 Step 2: Retrieve Vessel Details Using the Vessels API

📌 **API Used: Vessels API** – /v3/vessels/{vessel_id}

📌 **Filters Applied:**

- **vessel id** = Retrieved from Step 1
- **includes: POTENTIAL_RELATED_SELF_REPORTED_INFO**: Vessels may change identifiers over time, such as their Maritime Mobile Service Identity (MMSI), International Maritime Organization (IMO) number), call sign, or even their name. These changes can occur due to re-registration, changes in ownership, or other operational reasons within the AIS transponder. This parameter helps users group all vessel ids that are potentially related as part of the same physical vessel based on publicly available registry information.. *for more details, visit documentation*

⚠️ **IMPORTANT**: To avoid any misinterpretation of Global Fishing Watch data, please refer to our data caveats:

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- [Vessel identity data](#) - Global Fishing Watch's authorization data relies on publicly available information. The absence of an authorization record in our data does not necessarily indicate a vessel is operating without authorization. We recommend consulting additional sources, such as national registries, to verify authorization status.

🛠️ API Request: GET

```
curl --location --globoff
'https://gateway.api.globalfishingwatch.org//v3/vessels?datasets[0]=public-global-vessel-identity%3
Alatest&ids[0]=90ab31dfb-bcab-a05f-d12f-2544e1869205&ids[1]=6eb0b555f-fa62-7cb1-4135-2d0eeb6b4baa&i
ncludes[0]=POTENTIAL_RELATED_SELF_REPORTED_INFO' \

--header 'Authorization: Bearer TOKEN'
```

📌 Example API Response:

```
    "entries": [

        {

            "registryInfoTotalRecords": 1,

            "registryInfo": [

                {

                    "id": "a07fa455e1d1d5c2da2a09320ef17f3f",

                    "sourceCode": [

                        "IMO"

                    ],

                    "ssvid": "663103000",

                    "flag": "SEN",

                    "shipname": "RIA DE DAKAR",

                    "nShipname": "RIADEDAKAR",

                    "callsign": "DAK1142",

                    "imo": "9003342",

                    "latestVesselInfo": true,

                    "transmissionDateFrom": "2020-03-16T18:40:10Z",

                    "transmissionDateTo": "2022-08-20T11:00:16Z",

                    "geartypes": [
```

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```
                "FISHING"

            ],

            "lengthM": null,

            "tonnageGt": 173,

            "vesselInfoReference": "1e76d3c121ec222a32aed42622129adc",

            "extraFields": []

        }

    ]

            "transmissionDateFrom": "2017-04-18T10:55:35Z",

            "transmissionDateTo": "2025-01-31T23:46:05Z",

            "geartypes": [

                "FISHING"

            ],

            "lengthM": null,

            "tonnageGt": 365,

            "vesselInfoReference": "8a34839eab6dee3c8ccad1c871039244",
```

✅ **What We've Learned from Step 2**

Vessel Identity: KANBAL II (MMSI: 663131000, IMO: 8708464) appears to be registered under Senegal (SEN).

Ownership & Historical Changes: "SOPERKA" appears to be listed as the registered owner.

📌 **Next Steps:**

- Further, **validate ownership history** using official registry sources.
- Assess whether any historical changes in flag, name, or ownership are relevant for enforcement.
- Generate an apparent activity report with all available details.

📌 **Understanding the Response Objects**

- **registryInfoTotalRecords –** This represents the number of registry records found for the vessels.
- **registryInfo –** Contains public registry data, including. This data is sourced from official vessel registries.
- **registryOwners –** Lists the registered owners of the vessel based on public sources.

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- **registryPublicAuthorizations** – Represents known fishing authorizations from public sources. Users should verify against national registries and RFMO records for additional context.
- **combinedSourcesInfo** – Provides Vessel Type and Gear Type inferred data from multiple sources. It is calculated from our neural network model, which uses registry, AIS information, and track behavior to estimate these identity values
- **selfReportedInfo** – Contains AIS self-reported data, including MMSI, ship name, and flag as broadcast by the vessel itself. Self-reported data may not always align with registry data and should be cross-checked.

◆ Summary of the API Flow

- **4Wings API** → Retrieve apparent fishing effort for trawlers within Senegal's EEZ.
- **Vessels API** → Fetch detailed vessel identity, ownership history, and public authorizations for vessels detected in Step 1.
- **Analyze vessel history** → Compare registry records, AIS self-reported data, and inferred information to identify potential flag-hopping or historical changes in vessel identity.
- **Assess authorizations** → Cross-check whether vessels have publicly available fishing authorizations and consider external official sources for further verification.
- **Generate an analysis report** → Provide enforcement authorities with a structured report highlighting vessel activity, identity records, and any notable discrepancies for further investigation.

API user flow 2 - Analyze Apparent Fishing Effort for Trawlers in Argentina's EEZ

👤 **Use Case: A Fisheries Enforcement Officer Monitoring Industrial Trawlers**

Maria, a fisheries enforcement officer in Argentina, monitors industrial trawlers operating within Argentina's Exclusive Economic Zone (EEZ). Her role includes**:**

    ✅ **Analyzing apparent fishing effort for trawlers operating in Argentina's EEZ.**

    ✅ **Identifying vessels involved in apparent trawling activity and determining their reported flag states.**

    ✅ **Checking vessel history, including potential transshipment and port visits.**

    ✅ **Generating reports to support fisheries enforcement decisions.**

To achieve this, Maria will use **four Global Fishing Watch APIs**:

- **4Wings API** – Retrieve apparent fishing effort for trawlers.
- **4Wings API** – Group vessels by ID that are involved in trawling activity.
- **Vessels API** – Retrieve vessel identity & ownership details.
- **Events API** – Fetch port visits & potential transshipment history.

◆ Step 0: Identify the Region of Interest (ROI) - Argentina EEZ

Before making API requests, Maria must specify the geographic area for analysis using a Region ID:

📌 **Options to Define the Region:**

- `Using Region ID` → Each EEZ has a unique ID in the public-eez-areas dataset.
- `Custom Geometries` → Users can define a custom area using GeoJSON**.**
- **Find EEZ Region IDs Here: Regions API Documentation**
- For Argentina EEZ, the region ID is **8466** (public-eez-areas dataset).

The **4Wings Report API** provides flexible output formats, including **TIFF (GeoTIFF)** for geospatial mapping, **JSON** for raw data analysis, and CSV.

⚠️ **Important Caveats**

    🚨 The 4wings API **only supports one active report per user at a time**.

    🔴 **Sending multiple requests simultaneously** results in a **429 Too Many Requests** error.

- **Report Generation Time & Timeout Risks:**

    ↪️ If a report takes over **100 seconds** to generate, it may return a **524 Gateway Timeout** error.

    🔄 To retrieve a previously requested report, use the **last-report endpoint** instead. For details, see

    4Wings API documentation

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◆ **Step 1: Retrieve Apparent Fishing Effort in Argentina's EEZ**

📌 **API Used:** 4Wings API – /v3/4wings/report

📌 **Filters Applied:**

- Region ID = Argentina EEZ
- Date Range = Last 6 Months
- Grouped by Gear Type

📌 **Why This Step?**

✅ Identifies which gear types (e.g., trawlers, squid jiggers) are most active in the EEZ.

✅ Establishes baseline fishing activity trends before narrowing the search to specific vessels.

🛠️ **API Request:** POST

```
curl --location --globoff
'https://gateway.api.globalfishingwatch.org/v3/4wings/report?spatial-resolution=HIGH&temp
oral-resolution=MONTHLY&group-by=GEARTYPE&datasets[0]=public-global-fishing-effort%3Alate
st&date-range=2024-08-01%2C2025-01-31&format=JSON' \

--header 'Content-Type: application/json' \

--header 'Authorization: Bearer TOKEN' \

--data '{

    "region": {

        "dataset": "public-eez-areas",

        "id": 8466

    }

}'
```

✅ **What We've Learned from Step 1**

- Multiple gear types were potentially detected in Argentina's EEZ.
- Trawlers appear to be operating, but further vessel-level investigation is needed.

📌 **Example API Response**

```
"entries": [

    {

        "public-global-fishing-effort:v3.0": [

            {
```

```
        "date": "2024-09",

        "geartype": "trawlers",

        "hours": 1.1805555555555551,

        "lat": -46.14,

        "lon": -63.09,

        "vesselIDs": 1

    },

    {

        "date": "2025-01",

        "geartype": "squid_jigger",

        "hours": 1.978333333333333,

        "lat": -46.69,

        "lon": -62.83,

        "vesselIDs": 1

    }
```

◆ Step 2: Get Vessel IDs for Trawlers

Maria refines her **4Wings API** request to **group by VESSEL_ID**, filtering specifically for **trawlers**.

📌 **Why This Step?**

- Links apparent fishing activity to specific vessels.
- Allows further verification using vessel identity records in Step 3.

📌 **Endpoint: /v3/4wings/report**

    📌 **Filters Used:**

- Region ID = Argentina EEZ
- Gear Type = Trawlers
- Grouped by Vessel ID

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```
curl --location --globoff
'https://gateway.api.globalfishingwatch.org/v3/4wings/report?spatial-resolution=LOW&temporal-resolu
tion=ENTIRE&group-by=VESSEL_ID&datasets[0]=public-global-fishing-effort%3Alatest&date-range=2024-08
-01%2C2025-01-31&format=JSON&filters[0]=geartype%20in%20(%27trawlers%27)' \

--header 'Content-Type: application/json' \

--header 'Authorization: Bearer TOKEN' \

--data '{

    "region": {

        "dataset": "public-eez-areas",

        "id": 8466

    }

}'
```

📌 **Example API Response**

```
entries": [
        {
            "public-global-fishing-effort:v3.0": [
                {
                    "callsign": "LW 2962",
                    "dataset": "public-global-vessel-identity:v3.0",
                    "date": "2024-08-01,2025-01-31",
                    "entryTimestamp": "2024-08-01T03:00:00Z",
                    "exitTimestamp": "2024-09-29T10:00:00Z",
                    "firstTransmissionDate": "2017-04-10T15:34:43Z",
                    "flag": "ARG",
                    "geartype": "TRAWLERS",
                    "hours": 5.009722222222223,
                    "imo": "7728572",
                    "lastTransmissionDate": "2025-02-10T23:55:58Z",
                    "lat": -43.4,
                    "lon": -62,
                    "mmsi": "701000619",
                    "shipName": "MEVIMAR",
                    "vesselId": "f38fb1980-0be3-d9d5-b166-877d9e9f3dc6",
                    "vesselType": "FISHING"
                },
```

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![Global Fishing Watch logo] **Global Fishing Watch**

✅Maria now has a vessel ID for further investigation. The 4Wings API provides AIS self-reported data, while the Vessels API combines information from public registries, AIS, and GFW's combined sources, offering a more complete view of vessel identity and ownership**.**

Explanation of Parameters:

- temporal-resolution=**ENTIRE** → Aggregates data by the full period selected.
- group-by=**GEARTYPE** → groups data by fishing gear type, for more information about our vessel types and gear types, check [here](#).

📌**Data Source & Considerations**

The values returned in this response are primarily derived from **Automatic Identification System (AIS) self-reported data**. You can find more information about [AIS here](#).

- **Self-Reported Information**: The vessel name, MMSI, and flag are broadcast by the vessel's AIS transponder and may not always reflect official registry data. Some vessels **may** *report incorrect or outdated information, either mistakenly or deliberately.*

- **Gear Type Classification Caveats**:
  - Gear type (e.g., Trawlers) is often inferred based on vessel behavior, registries, and historical data rather than explicitly transmitted via AIS. Some vessels may switch gear types or misreport their actual fishing methods. For more details, refer to **[Gear Type Classification](#)** and **[Vessel Type Considerations](#)**

This workflow demonstrates how to analyze apparent fishing effort using **4Wings API** with flexible formats (TIFF, PNG, JSON, CSV). Get more details of the parameters from our API documentation [here](#)**.**

🔹 **Step 3: Retrieve Vessel Details**

Maria queries the Vessel API to get identity & ownership details.

📌 **Endpoint: /v3/vessels/{vessel_id}**

📌 **Filters Used:**

- Vessel ID from 4Wings API
- Dataset = public-global-vessel-identity:latest
- **Includes =** POTENTIAL_RELATED_SELF_REPORTED_INFO: Vessels may change identifiers over time, such as their Maritime Mobile Service Identity (MMSI), International Maritime Organization (IMO) number), call sign, or even their name. These changes can occur due to re-registration, changes in ownership, or other operational reasons within the AIS transponder. This parameter helps users group all vessel ids that are potentially related as part of the same physical vessel based on publicly available registry information.. *for more details, [visit documentation](#).*

⚠️ **IMPORTANT**: To avoid any misinterpretation of Global Fishing Watch data, please refer to our data caveats:

- [Apparent Fishing Effort:](#)
- [Region source](#)
- [Vessel ID](#)
- [Vessel identity data](#)

🛠️ **API Request:** GET

```
curl --location --globoff
'https://gateway.api.globalfishingwatch.org//v3/vessels?datasets[0]=public-global-vessel-identity%3
```

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```
Alatest&ids[0]=f38fb1980-0be3-d9d5-b166-877d9e9f3dc6&includes[0]=POTENTIAL_RELATED_SELF_REPORTED_IN
FO' \

--header 'Authorization: Bearer TOKEN'
```

📌 **Example API Response**

```
"entries": [
    {
        "registryInfoTotalRecords": 1,
        "registryInfo": [
            {
                "id": "c6b11037f6fa71be1862907471021d01",
                "sourceCode": [
                    "IMO"
                ],
                "ssvid": "701000619",
                "flag": "ARG",
                "shipname": "MEVIMAR",
                "nShipname": "MEVIMAR",
                "callsign": "LW2962",
                "imo": "7728572",
                "latestVesselInfo": true,
                "transmissionDateFrom": "2013-03-08T22:19:15Z",
                "transmissionDateTo": "2025-01-31T23:45:06Z",
                "geartypes": [
                    "FISHING"
                ],
                "lengthM": 37.5,
                "tonnageGt": 221,
                "vesselInfoReference": "3a6e31ef3bbf3036720b796c614d7c15",
                "extraFields": []
            }
        ],
        "registryOwners": [
            {
                "name": "RIMINIMARR",
                "flag": "ARG",
                "ssvid": "701000619",
                "sourceCode": [
                    "IMO"
                ],
                "dateFrom": "2013-03-08T22:19:15Z",
                "dateTo": "2025-01-31T23:45:06Z"
            }
        ],
        "registryPublicAuthorizations": [],
        "combinedSourcesInfo": [
            {
                "vesselId": "f38fb1980-0be3-d9d5-b166-877d9e9f3dc6"
```

✅ **Maria now has official records to cross-check against self-reported AIS data**

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📌 **Understanding the Response Objects**

- **registryInfoTotalRecords** – This represents the number of registry records found for the vessels.
- **registryInfo** – Contains public registry data, including. This data is sourced from official vessel registries.
- **registryOwners** – Lists the registered owners of the vessel based on public sources.
- **registryPublicAuthorizations** – Represents known fishing authorizations from public sources. Users should verify against national registries and RFMO records for additional context.
- **combinedSourcesInfo** – Provides inferred data from multiple sources, including. This is not explicitly reported by vessels but determined through GFW's classification methods.
- **selfReportedInfo** – Contains AIS self-reported data, including MMSI, ship name, and flag as broadcast by the vessel itself. Self-reported data may not always align with registry data and should be cross-checked.

For additional parameters and its usage, please refer **to [Vessel API documentation](#)**

◆ **Step 4: Detect Potential Port Visits, Encounters, or Fishing Events**

Maria checks port visits, encounters, and fishing events using the Events API, which allows monitoring of vessel activities such as potential transshipments, unauthorized port entries, or fishing activity patterns.

📌 **Endpoint:** /v3/events

📌 **Filters Used:**

- **Vessel ID** from 4Wings API
- **Event Types** = PORT_VISIT, ENCOUNTER, FISHING. To obtain other event types, please visit our **[Events API Documentation](#)**
- **Datasets(**for more details, check [here](#):
  - `public-global-port-visits-events:latest` (Port Visits)
  - public-global-encounters-events:`latest` (Encounters between vessels)
  - public-global-fishing-events:`latest` (Fishing activity)
-

🛠️ **API Request:** GET

```
curl --location --globoff
'https://gateway.api.globalfishingwatch.org//v3/events?vessels[0]=f38fb1980-0be3-d9d5-b166-877d9e9f
3dc6&encounter-types[0]=CARRIER-FISHING&sort=-start&start-date=2024-08-01&end-date=2025-01-31&limit
=200&offset=0&datasets[0]=public-global-encounters-events%3Alatest&datasets[1]=public-global-fishin
g-events%3Alatest&datasets[2]=public-global-port-visits-events%3Alatest&include-regions=false&types
[0]=ENCOUNTER&types[1]=FISHING&types[2]=PORT_VISIT' \

--header 'Authorization: Bearer TOKEN'
```

📌 **Example API Response**

```
{
    "metadata": {
        "datasets": [
            "public-global-encounters-events:v3.0",
            "public-global-fishing-events:v3.0",
            "public-global-port-visits-events:v3.1"
```

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```
        ],
        "vessels": [
            "f38fb1980-0be3-d9d5-b166-877d9e9f3dc6"
        ],
        "dateRange": {
            "from": "2024-08-01",
            "to": "2025-01-31"
        },
        "encounterTypes": [
            "CARRIER-FISHING"
        ]
    },
    "limit": 200,
    "offset": 0,
    "nextOffset": null,
    "total": 94,
    "entries": [
        {
            "start": "2024-08-22T10:31:36.000Z",
            "end": "2024-08-22T14:15:01.000Z",
            "id": "aae842479c882c3122ad3655c790ad0d",
            "type": "fishing",
            "position": {
                "lat": -43.216,
                "lon": -62.3137
            },
            "boundingBox": [
                -62.27678833333334,
                -43.258505,
                -62.3508866666667,
                -43.18715666666667
            ],
            "distances": {
                "startDistanceFromShoreKm": 124,
                "endDistanceFromShoreKm": 115,
                "startDistanceFromPortKm": 225.135859,
                "endDistanceFromPortKm": 220.055141
            },
            "vessel": {
```

```
            "id": "f38fb1980-0be3-d9d5-b166-877d9e9f3dc6",
            "name": "MEVIMAR",
            "ssvid": "701000619",
            "flag": "ARG",
            "type": "fishing",
            "publicAuthorizations": [
                {
                    "hasPubliclyListedAuthorization": "false",
                    "rfmo": "ICCAT"
                },
                {
                    "hasPubliclyListedAuthorization": "false",
                    "rfmo": "CCSBT"
                }
            ]
        },
        "fishing": {
            "totalDistanceKm": 24.478457436190546,
            "averageSpeedKnots": 3.721428578453404,
            "averageDurationHours": null,
            "potentialRisk": false,
            "vesselPublicAuthorizationStatus":
            "not_matching_relevant_public_authorization"
        }
    },
    {
        "start": "2024-08-26T06:09:51.000Z",
        "end": "2024-08-26T11:50:04.000Z",
        "id": "92d530d7637aa2bbeff14852528d2e72",
        "type": "fishing",
        "position": {
            "lat": -42.8803,
            "lon": -64.0146
        },
        "boundingBox": [
            -64.03539833333333,
            -42.893166666666666,
            -63.998918333333336,
            -42.872285
```

```
            ],
            "distances": {
                "startDistanceFromShoreKm": 3,
                "endDistanceFromShoreKm": 2,
                "startDistanceFromPortKm": 79.030523,
                "endDistanceFromPortKm": 81.852523
            },
            "vessel": {
                "id": "f38fb1980-0be3-d9d5-b166-877d9e9f3dc6",
                "name": "MEVIMAR",
                "ssvid": "701000619",
                "flag": "ARG",
                "type": "fishing",
                "publicAuthorizations": [
                    {
                        "hasPubliclyListedAuthorization": "false",
                        "rfmo": "CCSBT"
                    },
                    {
                        "hasPubliclyListedAuthorization": "false",
                        "rfmo": "ICCAT"
                    }
                ]
            }
```

Response Objects:

The API response includes multiple objects that provide key insights into vessel activity:

- **metadata –** contains the datasets, vessel(s) queried, analysis period, and encounterTypes (e.g., CARRIER-FISHING)**.**
- **publicAuthorizations:** showing whether the vessel has publicly listed authorizations**.**
- **Activity-Specific Data:** fishing, port visit, and encounter events (if present)

What we've learned from step 4:

✅ **Apparent Fishing Events:**

- The vessel "MEVIMAR" has been detected in multiple apparent fishing events during the analyzed timeframe (August 2024 – January 2025).

✅ **Port Visit Events:**

- The vessel potentially made multiple port visits, including stops at Puerto Madryn, Buenos Aires, and Zarate.

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- The confidence level for these visits is 4 (which may indicate high certainty but will need verification). Ports are based on the Global Fishing Watch anchorages dataset, a global database of anchorage locations where vessels congregate. More information on anchorages can be found here.

✅No explicit ENCOUNTER events were returned in the response dataset. Check more details here. You can read more about transshipment behavior from our report or scientific publication.

⚠️ **IMPORTANT: Data Interpretation Caveats**

- High confidence (level = 4) indicates that the vessel was identified using AIS with an entry, stop or gap, and exit within a port. A port visit with lower confidence may sometimes be a false port visit caused by noisy AIS transmission and requires a further inspection of the vessel tracks. For more information, please refer to our events caveat.

✅ **Potential Considerations:**

- The vessel's fishing activities appear near the EEZ boundary, requiring further assessment of compliance with national or RFMO regulations.
- The absence of matching public authorizations in the RFMO registry does not necessarily indicate illegality, but it suggests that authorities may need to verify through national databases or official sources.

For comprehensive information on our events API, please refer to: **Events API documentation**

◆ **Summary of the API Flow**

1️⃣**4Wings API** → Retrieve apparent fishing effort for trawlers within Argentina's EEZ.

2️⃣**Vessels API** → Fetch vessel identity, ownership history, and public authorizations.

3️⃣**Events API** → Detect potential port visits, encounters, and apparent fishing events to analyze operational patterns.

4️⃣**Assess potential risks** → Compare registry records, AIS data, and inferred vessel activity for enforcement follow-ups.

5️⃣**Generate a report** → Provide a structured analysis for relevant authorities.

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API user flow 3 - Analyze a fleet (a group of vessels)

👤**Use Case Example: Monitoring a Fleet of Tuna Longliners for Compliance**

Kwame is a fisheries compliance officer in Ghana, responsible for monitoring a fleet of tuna longliners operating within Ghana's Exclusive Economic Zone (EEZ). His goal is to:

✅ **Track apparent fishing effort for longliners over the last 12 months.**

✅ **Identify potential vessels in this fleet, their operational patterns, and their activity levels.**

✅ **Retrieve vessel details, including flag state, ownership history, and authorizations.**

✅ **Analyze events such as port visits and encounters (potential transshipment) activities.**

📌 **APIs Used**

1️⃣ **4Wings API** – Retrieve apparent fishing effort grouped by vessel ID in Ghana's EEZ.

2️⃣ **Vessels API** – Get vessel identity, ownership, and compliance details.

3️⃣ **Events API** – Identify port visits and potential transshipment activities for vessels in the fleet.

◆ Step 0: Identify the Region of Interest (ROI) - Argentina EEZ

Before making API requests, Maria must specify the geographic area for analysis using a Region ID:

📌 **Options to Define the Region:**

- `Using Region ID →` Each EEZ has a unique ID in the public-eez-areas dataset.
- `Custom Geometries →` Users can define a custom area using GeoJSON.
- **Find EEZ Region IDs Here: [Regions API Documentation](#)**
- For Ghanaian EEZ, the region ID is **[8400](#)** (public-eez-areas dataset).

The **4Wings Report API** provides flexible output formats, including **TIFF (GeoTIFF)** for geospatial mapping, **JSON** for raw data analysis, and CSV.

⚠️ **Important Caveats**

🚨 The 4wings API **only supports one active report per user at a time**.

🔴 **Sending multiple requests simultaneously** results in a **429 Too Many Requests** error.

- **Report Generation Time & Timeout Risks:**

🔄 If a report takes over **100 seconds** to generate, it may return a **524 Gateway Timeout** error.

↩️ To retrieve a previously requested report, use the **last-report endpoint** instead. For details, see

[4Wings API documentation](#)

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◆ Step 1: Retrieve Fishing Effort in Ghana's EEZ

Kwame first queries the 4Wings API to get fishing effort for all vessels, grouping them by gear type.

📌 **Endpoint: /v3/4wings/report**

   📌 **Filters Used:**

- Region ID = 8400 Ghana EEZ

- Date Range = Last 12 Months

- Grouped by Gear Type

You can use the following list to filter fishing effort or other data by gear type. For more details, check our data caveats here. For more information on the supported gear types, please refer to the API documentation.

🛠️ **API Request:** POST

```
curl --location --globoff
'https://gateway.api.globalfishingwatch.org//v3/4wings/report?format=JSON&datasets[0]=public-global
-fishing-effort%3Alatest&temporal-resolution=ENTIRE&spatial-resolution=LOW&spatial-aggregation=true
&group-by=VESSEL_ID&date-range=2024-01-01%2C2025-01-01' \

--header 'Content-Type: application/json' \

--header 'Authorization: Bearer TOKEN' \

--data '{

    "region": {

        "dataset": "public-eez-areas",

        "id": 8400

    }

}'
```

📌 **Example API Response**

```
{

                "callsign": "JRWC",

                "dataset": "public-global-vessel-identity:v3.0",
```

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```
            "date": "2024-01-01,2025-01-01",

            "entryTimestamp": "2024-08-08T01:00:00Z",

            "exitTimestamp": "2024-10-15T22:00:00Z",

            "firstTransmissionDate": "2016-04-20T21:36:13Z",

            "flag": "JPN",

            "geartype": "DRIFTING_LONGLINES",

            "hours": 588.8797222222233,

            "imo": "",

            "lastTransmissionDate": "2025-01-20T10:17:21Z",

            "mmsi": "431100690",

            "shipName": "SENSHU MARU NO.3",

            "vesselId": "b1dad8628-8c9c-2ee7-258b-3d8fb747f1c8",

            "vesselType": "FISHING"

        }
```

✅ **Kwame now has apparent fishing effort data, with a potential vessel operating as a longliner in Ghana's EEZ.**

◆ Step 2: Retrieve Vessel ID for Longliner

Kwame refines his **4Wings API** request to **group by vessel ID**, filtering only for **longliners**.

📌 **Endpoint:** /v3/4wings/report

📌 **Filters Used:**

- **Region ID** = Ghana EEZ
- **Gear Type** =Drifting Longliner
- **Group by =** Vessel ID
- **Date Range** = Last 12 Months

📌 **Why Use group-by=VESSEL_ID?**

- Grouping by VESSEL_ID allows **individual vessel identification** in the response. This is crucial for **tracking vessel activity** and, more importantly, linking each detected vessel to the **Vessel API** in the next step. By structuring the query this way, we can fetch vessel details such as **flag, name, and ownership records** in Step 3 below.

📌 **API Parameters**

- spatial-resolution (e.g., **HIGH**, **LOW**)
- temporal-resolution (e.g., **ENTIRE**, **MONTHLY**, **YEARLY**)
- For additional parameters, please refer to the [API document](#)

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```
curl --location --globoff
'https://gateway.api.globalfishingwatch.org//v3/4wings/report?format=JSON&datasets[0]=public-global
-fishing-effort%3Alatest&temporal-resolution=ENTIRE&spatial-resolution=LOW&spatial-aggregation=true
&group-by=VESSEL_ID&date-range=2024-01-01%2C2025-01-01&filters[0]=geartype%20in%20(%27drifting_long
lines%27)' \

--header 'Content-Type: application/json' \

--header 'Authorization: Bearer TOKEN' \

--data '{

    "region": {

        "dataset": "public-eez-areas",

        "id": 8400

    }

}'
```

📌 **Example API Response**

```
entries": [

        {

            "public-global-fishing-effort:v3.0": [

                {

                    "callsign": "",

                    "dataset": "public-global-vessel-identity:v3.0",

                    "date": "2024-01-01,2025-01-01",

                    "entryTimestamp": "2024-04-12T08:00:00Z",

                    "exitTimestamp": "2024-04-17T05:00:00Z",

                    "firstTransmissionDate": "2014-02-21T02:59:18Z",

                    "flag": "CHN",

                    "geartype": "DRIFTING_LONGLINES",
```

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```
            "hours": 2.750555555555555,

            "imo": "",

            "lastTransmissionDate": "2025-02-18T23:32:07Z",

            "mmsi": "412331032",

            "shipName": "",

            "vesselId": "f37ebdc1b-be44-0740-7904-49397360e29d",

            "vesselType": "FISHING"

        }
```

✅ **What We've Learned from Step 2**

- Kwame identifies two vessels operating as longliners within Ghana's EEZ.
- The vessel SENSHU MARU NO.3 shows significant activity with 588.88 hours logged.
- Another vessel potentially (MMSI: 412331032) shows apparent fishing effort over a short duration.
- This response is based on AIS self-reported data and should be further validated

◆ Step 3: Retrieve Vessel Details

Kwame queries **the Vessels API** to get **detailed vessel identity and ownership records**.

📌 **Endpoint:** /v3/vessels/{vessel_id}

    📌 **Filters Used:**

- **vessel id** from 4Wings API
- **dataset** = public-global-vessel-identity:latest
- **includes** = `POTENTIAL_RELATED_SELF_REPORTED_INFO`: Vessels may change identifiers over time, such as their Maritime Mobile Service Identity (MMSI), International Maritime Organization (IMO) number), call sign, or even their name. These changes can occur due to re-registration, changes in ownership, or other operational reasons within the AIS transponder. This parameter helps users group all vessel ids that are potentially related as part of the same physical vessel based on publicly available registry information.. for more details *for more details, visit* **Vessel Identity API Documentation**

⚠️ **IMPORTANT**: In order to avoid any misinterpretation of Global Fishing Watch data, please refer to our data caveats:

- Apparent Fishing Effort:
- Region source
- Vessel ID
- Vessel identity data

🛠️ **API Request:** GET

```
curl --location --globoff
'https://gateway.api.globalfishingwatch.org//v3/vessels?datasets[0]=public-global-vessel-identity%3
Alatest&ids[0]=f37ebdc1b-be44-0740-7904-49397360e29d&includes[0]=POTENTIAL_RELATED_SELF_REPORTED_IN
FO' \

--header 'Authorization: Bearer TOKEN'
```

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📌 **Example API Response**

```
entries": [

    {

        "registryInfoTotalRecords": 0,

        "registryInfo": [],

        "registryOwners": [],

        "registryPublicAuthorizations": [],

        "combinedSourcesInfo": [

            {

                "vesselId": "f37ebdc1b-be44-0740-7904-49397360e29d",

                "geartypes": [

                    {

                        "name": "DRIFTING_LONGLINES",

                        "source": "COMBINATION_OF_REGISTRY_AND_AIS_INFERRED_NN_INFO",

                        "yearFrom": 2014,

                        "yearTo": 2025

                    }

                ],

                "shiptypes": [

                    {

                        "name": "FISHING",

                        "source": "COMBINATION_OF_REGISTRY_AND_AIS_INFERRED_NN_INFO",

                        "yearFrom": 2014,

                        "yearTo": 2025

                    }

                ]

            }

        ],
```

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```
            "selfReportedInfo": [

                {

                    "id": "f37ebdc1b-be44-0740-7904-49397360e29d",

                    "ssvid": "412331032",

                    "shipname": null,

                    "nShipname": null,

                    "flag": "CHN",

                    "callsign": null,

                    "imo": null,

                    "messagesCounter": 27862,

                    "positionsCounter": 27859,

                    "sourceCode": [

                        "AIS"

                    ],

                    "matchFields": "NO_MATCH",

                    "transmissionDateFrom": "2014-02-21T02:59:18Z",

                    "transmissionDateTo": "2025-02-18T23:32:07Z"

                }

            ],

            "dataset": "public-global-vessel-identity:v3.0"

        }

    ]
```

✅ **What We've Learned from Step 3**

- The vessel MMSI: 412331032 appears to be a drifting longliner flagged under China.
- No public registry data is found for this vessel.
- The vessel's identity information is based on AIS self-reported data, which may not always align with official registries.
- The vessel appears to have been active since 2014, based on self-reported AIS records.
- This vessel's data needs further validation against official public sources

📌 **Understanding the Response Objects**

- `registryInfoTotalRecords` – No official registry records were found for this vessel.
- `registryInfo` – Empty, potentially indicating no data from public registries.

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- registryOwners → No known ownership records found in public datasets.
- registryPublicAuthorizations → No known authorizations were found.
- combinedSourcesInfo → Provides inferred data based on AIS and other data sources.
- selfReportedInfo → The vessel's self-reported flag, identity, and activity timestamps.

For additional parameters and its usage, please refer to **Vessel API documentation**

◆ **Step 4: Detect Fleet Activity (Port Visits)**

Now that Kwame has identified vessels in the fleet, he examines their activity further by querying the Events API. This allows him to detect port visits, encounters (Potential Transshipment) and apparent fishing activity based on vessel movement patterns.

📌 **Endpoint:** /v3/events

📌 **Filters Used:**

- **Vessel ID** from 4Wings API
- Event Types – Port visits, encounters (potential transshipment), and fishing events.
- Time Range – Last 6 months.
- **Event Types** = PORT_VISIT, ENCOUNTER, FISHING. To obtain other event types, please visit our **Events API Documentation**
- **Datasets**(for more details, check here**:**
  - public-global-port-visits-events::latest (Port Visits)
  - public-global-encounters-events:latest (Encounters between vessels)
  - public-global-fishing-events:latest (Fishing activity)
- **encounter-types** = FISHING-FISHING (for more details on its use and data caveat, see here.

🛠️ **API Request**

```
curl --location --globoff
'https://gateway.api.globalfishingwatch.org//v3/events?vessels[0]%3Df37ebdc1b-be44-0740-7904-493973
60e29d=&vessels[1]%3Db1dad8628-8c9c-2ee7-258b-3d8fb747f1c8=&vessels[2]%3D60f7bb972-2c90-4553-650b-2
3c38f9521bf=&encounter-types[0]=FISHING-FISHING&sort=-start&start-date=2024-08-01&end-date=2025-01-
31&limit=200&offset=0&datasets[0]=public-global-encounters-events%3Alatest&datasets[1]=public-globa
l-fishing-events%3Alatest&datasets[2]=public-global-port-visits-events%3Alatest&include-regions=fal
se&types[0]=ENCOUNTER&types[1]=FISHING&types[2]=PORT_VISIT' \

--header 'Authorization: BearerTOKEN'
```

📌 **Example API Response**

```
{

    "metadata": {

        "datasets": [
```

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```
        "public-global-encounters-events:v3.0",

        "public-global-fishing-events:v3.0",

        "public-global-port-visits-events:v3.1"

    ],

    "vessels": [

        "f37ebdc1b-be44-0740-7904-49397360e29d",

        "b1dad8628-8c9c-2ee7-258b-3d8fb747f1c8",

        "60f7bb972-2c90-4553-650b-23c38f9521bf"

    ],

    "dateRange": {

        "from": "2024-08-01",

        "to": "2025-01-31"

    },

    "encounterTypes": [

        "FISHING-FISHING"

    ]

},

"limit": 200,

"offset": 0,

"nextOffset": null,

"total": 0,

"entries": []

}
```

📌 **Response Objects**

The Events API response includes multiple objects:

- **metadata** – Specifies the datasets queried, vessel IDs, date range, and event types.

- **limit** – Maximum number of results returned per request.

- **total** – Number of events found matching the criteria.

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◆ **entries** – List of detected events (empty in this case, meaning no matching encounters, port visits, or fishing events were found).

✅ **What We've Learned from Step 4**

🚢 **No recorded port visits, encounters, or fishing events** were found for the queried vessels in the given date range. This could mean:

- The vessels have not been engaged in these activities recently.
- Some events were missed due to **AIS data coverage gaps**.
- Different filters may need to be applied to refine results.

⚠️ **Caveats & Considerations (Check more detail about data caveats [here](#).**

🚨 **A lack of recorded encounters or port visits does not confirm the absence of such activities**—AIS coverage, reporting behavior, and dataset updates can impact results.

🚨 **Further investigation may be required**, including manual validation using historical data or consulting additional sources.

◆ **Summary of API Flow**

1️⃣ **4Wings API** → Identify fishing effort by gear type in Ghana's EEZ.

2️⃣ **4Wings API** → Retrieve vessel IDs for potential longliners.

3️⃣ **Vessels API** → Fetch detailed vessel identity & ownership.

4️⃣ **Events API** → Attempt to detect fleet activity (port visits, encounters, and apparent fishing events)

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