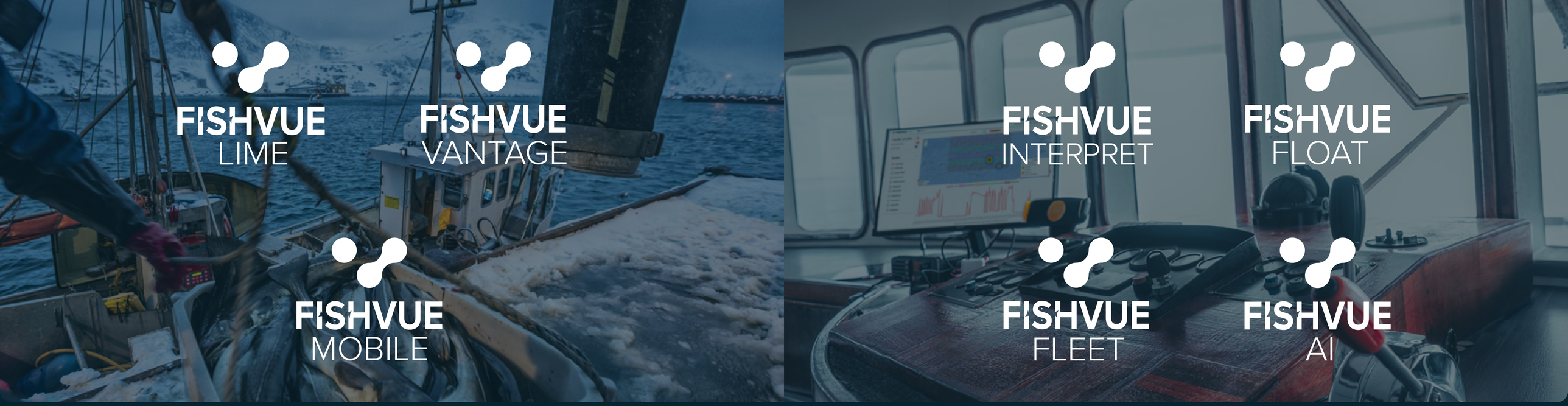
archipelago

Electronic Monitoring for Modern Fisheries



Our EM Story

Archipelago is the industry leader in Electronic Monitoring (EM) products and services.

With over 30 years' experience across more than 40 Electronic Monitoring commercial fisheries worldwide, our mission is to collect and deliver data that informs sound decision making for the health of our natural resources. We strive to contribute to improving the sustainability of our natural resources for generations to come.

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Chapter 01

End-to-End Electronic Monitoring

Meet FishVue: connected monitoring from sea to shore

Our FishVue Electronic Monitoring family provides commercial fisheries and regulators worldwide with onboard monitoring and a shore-based review system that ensures sustainability of the commercial fishing industry. It does this by autonomously capturing key data.

Key data captured automatically:

GPS location of fishing activity ensuring accurate recording of time and location.

Manage, log, and view fishing activity data seamlessly across multiple sources.

High-resolution timeseries measurements enable forensic verification of fishing activity.

EM helps fishers and regulators improve:

Catch Accounting

Bycatch Reduction

Gear Usage and Legality

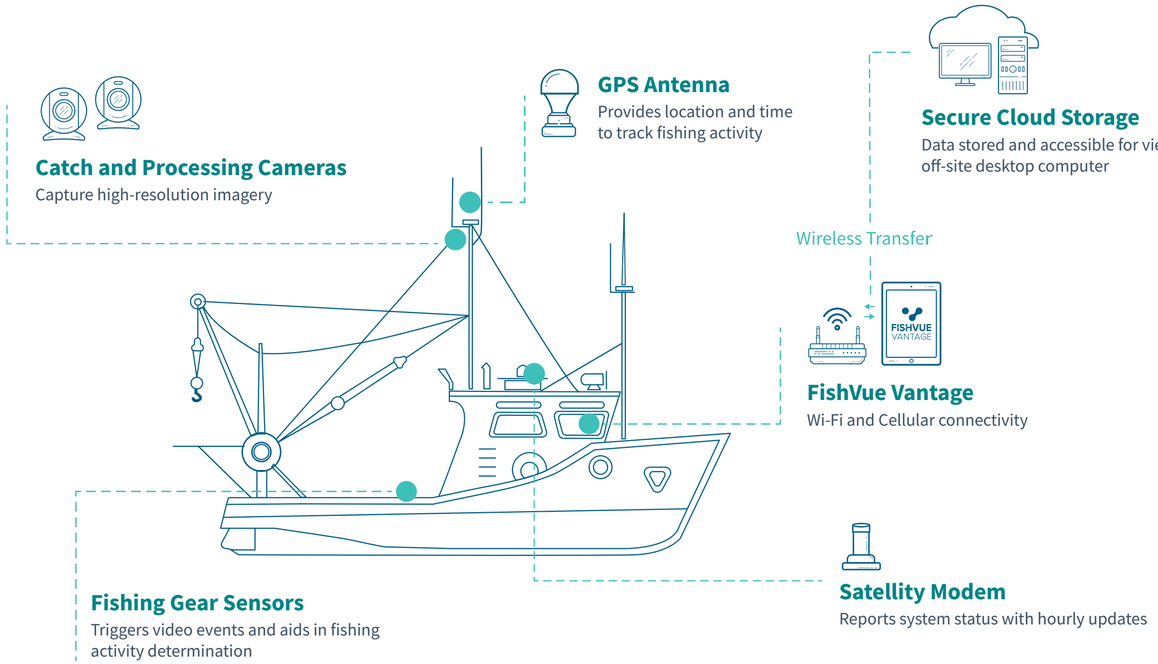
Program design, deployment, and ongoing Support

Archipelago Fisheries Monitoring Services Division understands the challenges facing today's fishing industry and can design and deliver a solution that's right for fisheries and regulators alike. This can include:

Solutions tailored to your fishery

- Solutions to suit your fisheries' needs from small inshore fishing boats to large pelagic vessels.
- A complete hardware and software solution onboard your fishing fleet and supporting your shore-based fleet management team.
- Full turnkey design and management of your electronic monitoring programs.
- Comprehensive in-depth certified training, support and installation solutions with local partners.

Whether you're monitoring a single boat or an entire fleet, Archipelago is your comprehensive provider of products and services to help you plan, deploy, manage, review and analyze your electronic monitoring (EM) program.



Chapter 02

Onboard Equipment

The onboard foundation of every EM program

The basis of an effective Electronic Monitoring system is the onboard equipment used to monitor the fishing activity. Archipelago offers a range of options to address all fisheries and vessel types.

For each vessel an Electronic Monitoring computer is installed onboard the vessel to record all relevant data associated with the fishing trip, time-stamped for a synchronized view of all events. Elements of the system as shown above include:

Core onboard components

- GPS Antenna to record the vessel's location at all times with a timestamp.
- Vessels can be equipped with a satellite modem, cellular modem or both to transmit location and other key data in real time to the shore-based monitoring systems (e.g. **Fishvue Fleet**).
- Hydraulic Pressure or Rotational Sensors can be installed to record fishing gear deployment and retrieval indicating when fishing is actually occurring.
- Finally, cameras can be installed to record actual fishing imagery including species caught, bycatch and catch lost before being brought on board.

Chapter 03

Mobile: Tablet-Based Electronic Monitoring

Pilot video EM with a lightweight tablet solution

FishVue Mobile is designed as a low-cost way to explore video-based EM through short-term deployments, giving users a simple, accessible method to test how EM can support their needs. It supports EM demonstration, experimentation, and early-stage evaluation, which helps teams build confidence and insight before scaling to longer-term operational use.

Designed for fast deployment on the water

Mobile is a lightweight, tablet-based electronic monitoring (EM) app that captures video and position data. It runs on Android devices, making video-based EM more accessible with flexible hardware options and simple installation. For at-sea deployments, we recommend using a rugged Android tablet with a single-camera setup and a compact, mount-friendly form factor. Devices with an IP68 water-ingress rating and MIL-STD-810H certification, such as an 8-inch display unit rated for up to 1.2 m drops, can provide added durability and reliable performance on the water.

What Mobile captures

Mobile gathers data related to fishing effort, including date, time, and location. High-quality imagery provides essential information on retained and discarded catch, as well as catch handling.

Mobile integrates with the FishVue ecosystem, helping programs get familiar with Fleet and Interpret workflows. This integration also introduces the potential offered by FishVue AI. You can upload data directly from the app using either Wi-Fi or cellular data.

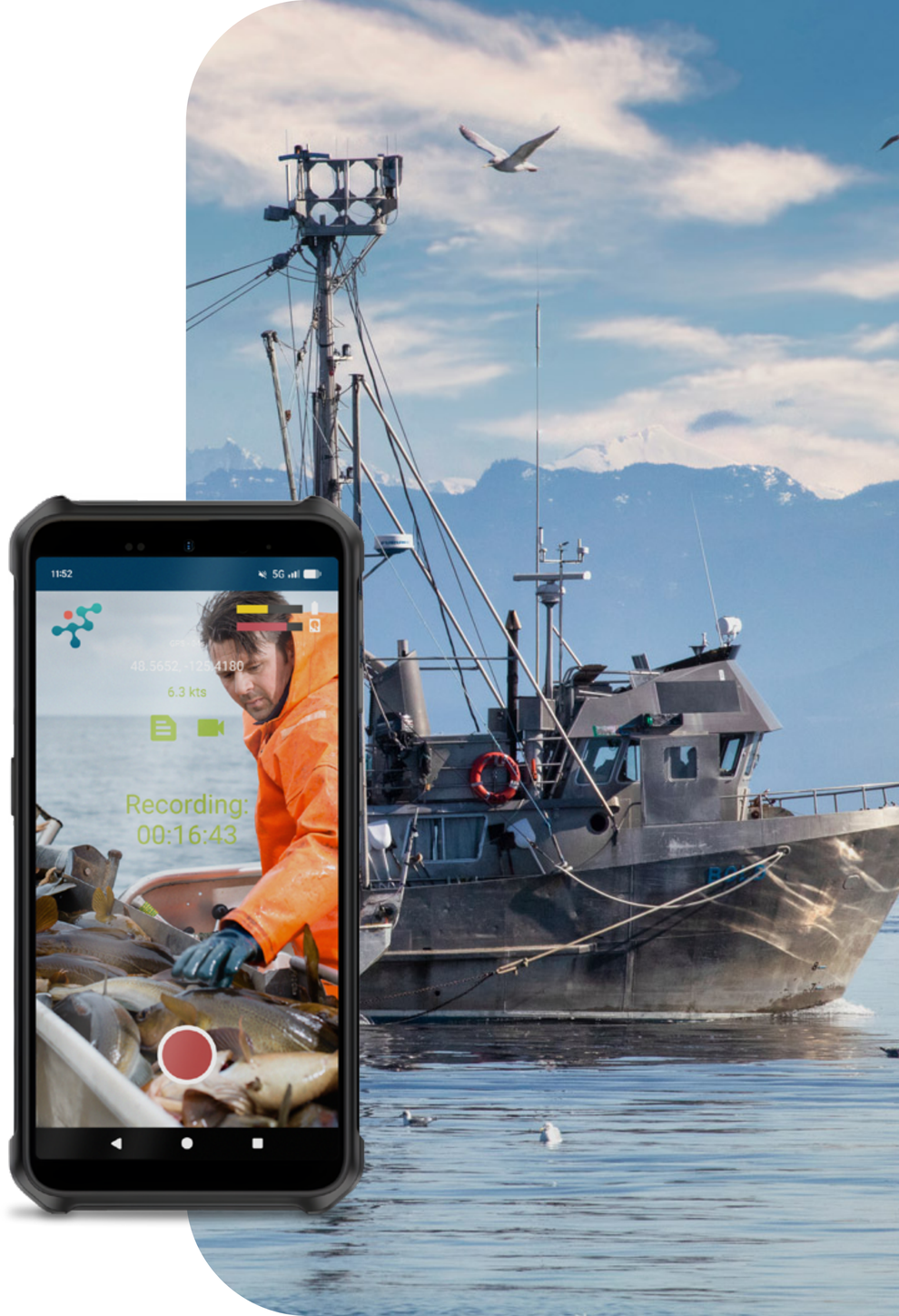
Ideal for pilots, feasibility studies, and early adoption

Scientists and NGOs running one-off pilots or early-stage research.

Fisheries managers or compliance leads exploring EM feasibility.

Community groups or individuals seeking to validate EM value before seeking funding.

Institutions considering broader EM adoption using LIME or Vantage.



Chapter 04

LIME: Lite Integrated Monitoring Equipment

Real-time monitoring built for inshore fleets

FishVue LIME (Lite Integrated Monitoring Equipment) is an entry-level, real-time fisheries data collection platform designed for coastal and inshore fisheries. Its minimal footprint makes it well suited to smaller vessels that benefit from a streamlined installation, or to fisheries where trip frequency or fishing intensity makes a lighter-touch approach more cost-effective. (e.g. few fishing trips per vessel, low catch rates etc.)

LIME captures sensor-based data on fishing effort and vessel location through integrated GPS, giving fisheries and enforcement managers real-time visibility into key activity. It uses cellular connectivity, making it a strong fit for nearshore operations with reliable mobile coverage.

Key features

- Small footprint for restricted installation environments.
- Collects high resolution data on vessel location, fishing effort, and environmental conditions without requiring imagery-based surveillance.
- Supports Positive Gear ID and tracking. Allows for automated tracking and soak time detection.
- Flexible sensor inputs (analog and digital) for a range of gear measurements.
- Can be upgraded with Rockblock satellite connectivity.

CASE STUDY: LIME

LIME in Dungeness Crab Fisheries (WA and CA)

In 2021, Archipelago, partnered with the Washington Department of Fish and Wildlife (WDFW), to improve the accuracy and consistency of data collection, leading to the modernization of the management of the coastal WA Commercial Dungeness crab fishery. The LIME system proved its mettle by accurately recording fishing locations and tracking the number of pots fished under mandatory trap limits. The LIME EM also enabled WDFW to evaluate spatial fishery data, leading to strategies to minimize interactions with marine mammals.

These key achievements were instrumental in WDFW's decision to consider the pilot projects successful. Subsequently, WDFW implemented EM regulations for the coastal WA commercial Dungeness crab fishery, and California also implemented monitoring of their Dungeness crab fleet using LIME. Today, Archipelago LIME systems provide real-time monitoring on 226 active vessels in Washington and 360 vessels in California.

Chapter 05

Vantage: Premium EM

Premium EM designed for reliability, scale, and real-time data

FishVue Vantage is Archipelago's latest generation premium Electronic Monitoring system. It is designed for a wide range of vessel sizes, gear types and operating modes. Vantage is engineered to deliver precise and efficient data collection across diverse fisheries.

Vantage offers vessel operators an EM solution capable of supporting multiple high definition cameras and industrial gear sensors for real-time data transmission via cellular or satellite. This data integrates seamlessly with Archipelago's family of software products enabling:

Integrated with Fleet, Interpret, and AI

Real-time system checks and remote monitoring via **Fleet**.

Data review and analysis via **Interpret**.

Tools for accurate data collection and advanced analysis for all gear types via **AI**.

Vantage is designed for reliability and scalability, integrating seamlessly into global EM programs, ensuring compliance while optimizing operational efficiency. Vantage empowers fisheries to enhance monitoring capabilities and streamline data analysis.

Product features

- Supports multiple (6+) high-definition IP cameras
- 2-Way Connectivity for remote updates and data transmission
- Analog, Digital and RFID sensor inputs
- Removable Hard Drive (up to 4TB) with 1TB internal backup
- Temperature rated from -10°C to 60°C
- 12-36v DC power 110/220v AC power
- Supports a wide range of gear sensing technologies.
- Cellular and Satellite connectivity.
- Integral Wi-Fi.
- Remote configuration and updating support.
- Seamless integration with Fleet, Interpret and AI.

Vantage video:

Vantage Features Demo

CASE STUDY: VANTAGE

Alaska Pollock Trawl EM program

The Alaska Pollock Trawl EM program allows the use of EM as a substitute for human at-sea observers on 50 midwater trawl vessels fishing in the Bering Sea and the Gulf of Alaska pollock fisheries. This project was initially intended to evaluate the feasibility and cost-efficiency of using EM systems to monitor compliance with retention (salmon bycatch) and discard (groundfish) regulations, while improving data quality and timeliness in these fisheries. It is now a regulated EM program.

Archipelago provides equipment and field support services to this fishing industry. EM services to industry comprise providing equipment, installation, technical support and implementing changes and improvements geared towards increasing data quality. The EM data is processed by Pacific States Marine Fisheries Commission (PSMFC).

US Alaska Cooperative Research EM program (Fixed Gear)

US Alaska Cooperative Research (Fixed Gear) EM Program started in 2014 and is an ongoing program. It is primarily directed at groundfish hook and line (as well as trap) vessels targeting halibut, sablefish, and Pacific cod. The existing EM pool consists of 140 vessels that carry EM for all fishing operations.

The program allows participating vessels to use EM for at-sea catch and discard monitoring as well as mitigation device deployment instead of At-Sea Observers.

Chapter 06

LIME vs Vantage: Hardware Comparison

Key specifications side-by-side

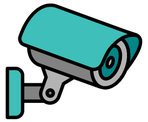
The following table compares the 2 main Archipelago EM systems:

Specification	LIME	Vantage
Accelerometer	3-axis accelerometer or detect movement, high G-force events, etc	2g to 16g FSR
Analog Sensors	1 x 0V – 30 V	Up to 4 x 0V – 30 V
Antenna (internal)	GPS, Cellular, Bluetooth (all internal)	Vantage Cellular, Wifi GPS (External)
Backup Power	LIME 7+ Days (Depending on configuration)	Intentional Shutdown 10 secs Unintentional Shutdown 1.5 Min
Camera Support	No	6+ ONVIF, Profiles S & T
Cellular Connectivity	LTE Cat 1bis, 3G, 2G fallback	Vantage LTE, 3G, 2G Fallback
Digital Sensors	2 x	Up to 4
Dimensions (inches)	4.5” x 6”	11.6” x 8.5” x 3.5”
Dimensions (mm)	153mm x 118 mm x 39 mm	295 x 215 x 85
Enclosure tampering	Optional internal tampering sensing and power loss alerting	Tamper evident
GPS	~1m CEP, GPS, -130dBm concurrent GPS/QZSS, GLONASS, Galileo, Beidou	Internal or External GPS Galileo, GLONASS, Beidou QZSS, 2.0m accuracy, L1/E1/B1 support SBAS, WAAS, EGNOS, MSAS, GAGAN
Mobile Interface	See: **FishVue Fleet**	Browser UI (Chrome, Safari, FireFox)
Operating Temperature	-30C to +60C	-20C to +60C
Power Consumption	<2uA standby, ~25 mA active	30W, Camera – 4.2W
Power Outputs	N/A	12V output / 48V output
Power Source / Battery	3500 mAh (internal), Optional external battery	11 – 36V DC, 10 - 240 VAC
Remote configuration / Device Update	FOTA (Cellular)	FOTA (Cellular, Satellite)
Satellite Upgrade	Available	Yes
Serial communications	RS232, UART TTL Canbus, Weigand, 1-wire	Ethernet GigE, RS232, NMEA2000
Storage	72,000 logs, ~25 days @ 30 secs	1TB NVME, Removable 2.5” SATA drive <4TB, Removable USB Storage <4TB
Supported Wireless	BLE, Bluetooth 5.2	Wifi, Cellular
Waterproof Housing	IP68, IK08	IP65
Weight	1lb (0.45kg)	2kg / 4.4 lb
CE, UKCA, RCM, FCC compliant	Yes	Yes, Plus WEEE, RoHS

Chapter 07

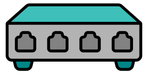
Accessories

The following accessories are available for use with the Archipelago EM systems.



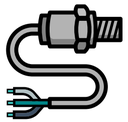
Cameras

Archipelago, offers both panoramic and fixed focal IP cameras for use with the Vantage EM system. The cameras offer 5 Mega pixel resolution and are rated for IP67 marine environments. They offer precise object tracking for integration with our AI Software. All cameras feature Wide Dynamic Range (WDR) and excellent low-light performance down to 0.03 Lux, ensuring reliable imagery in challenging lighting conditions typical of fishing operations.



PoE 1 GB Ethernet Switch

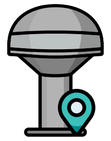
For the Vantage we provide a 1 GB Power over Ethernet (PoE) Ethernet switch to connect the cameras to the Vantage system.



Sensors (Analog and Digital)

Archipelago, offers a range of sensors, these include environmental sensors, 5000 psi pressure sensors for hydraulic or pneumatic lines, laser rotation sensors and Hall Effect transducers for auto baiters, DC Current sensors for electrical winches and engine oil pressure sensors.

- Analog sensors measure and report continuously changing conditions, such as pressure, temperature, or tension
- Digital sensors detect binary on/off states, making them ideal for monitoring discrete events such as door openings or gear activation.
- Digital counter inputs are used to measure and count repetitive events or motions, such as gear rotations or hook passages.
- Pressure transducers are installed directly into the hydraulic or pneumatic systems of the vessel. The sensors measure pressure changes that correspond to gear actuation and produce a voltage output that can be monitored by the FishVue system.
- PNP/NPN type sensors detect gear rotation and provide digital ‘pulses’ to the FishVue Vantage system, which are counted to determine rate.
- PIR sensors detect motion and heat changes, monitoring crew presence near fishing gear or in defined work areas. They trigger signals to the FishVue Vantage system when motion is detected.



GPS

Both the LIME and Vantage are equipped with GPS receivers integral to the system.

Satellite Connectivity

Archipelago systems, support satellite connectivity. For the Lime system, the Rockblock short burst modem can be used for connectivity. The Vantage expands this offering with either the Certus 100 Midband satellite modem or the Starlink Maritime broadband satellite modem.

Cellular Connectivity

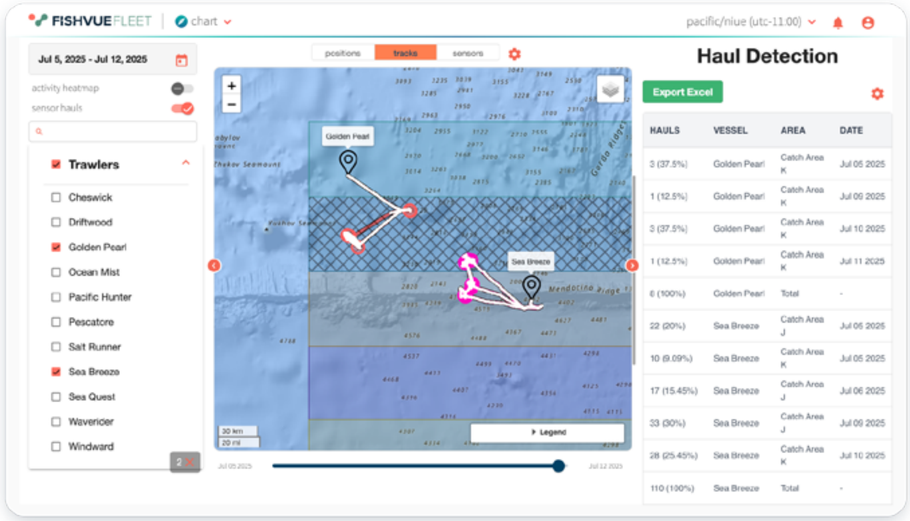
Both the LIME and Vantage systems support cellular connectivity.

Chapter 08

FishVue Fleet Software

Real-time visibility for compliance and performance

The Fishvue Fleet software provides real-time data and notifications to monitor, regulate and practice sustainable and profitable fishing. Fleet allows skippers and fleet managers to view current and historical fishing vessel activity updated in real-time so that they can make decisions and take action faster than ever before.



Make decisions faster with live and historical activity

Fleet enables managers to quickly locate vessel positions and determine whether they have entered a closed fishing area. Managers can instantly locate vessels across the fleet and view both current location and historical movement through intuitive vessel trail views. Fleet can also send notifications when a vessel fishes in a biologically or legally closed zone, supporting proactive compliance and oversight.

Vessels can be organized by region, owner, or fishery to speed up access and improve program insights. Each vessel's current location, historical track, and operating area are displayed in real time within the map view.

Operational monitoring and technical support

Fleet provides real time data on vessel activity as well as EM system performance. Advanced algorithms which continuously process EM data enable fishing hauls and locations to be tracked and analyzed from real time and historical perspectives. From a technical support perspective, the status of the EM system can be determined in real time, including connectivity, performance, and subscription status enabling remote configuration or troubleshooting (**Vantage**).

Fleet features at a glance

As shown in the detailed view to the right of a specific vessel's track and activity, Fleet offers the following features:

- Quickly locate the latest positions of your vessels by fleet or by individual vessel.
- Determine if they have entered or passed through a closed fishing zone.
- View vessel track data to get more information about locations of fishing activity.
- See fishing activity by sensor type to determine when fishing gear is deployed and retrieved. The graph below illustrates fishing gear hauls based on a pressure sensor.
- Determine if the EM system is performing well or in need or remote diagnostics or configuration updating. (Archipelago offers this monitoring service as part of an annual service subscription.)

Fleet videos:

Fleet for vessels

Fleet for managers

Chapter 09

Interpret: Review and Analysis

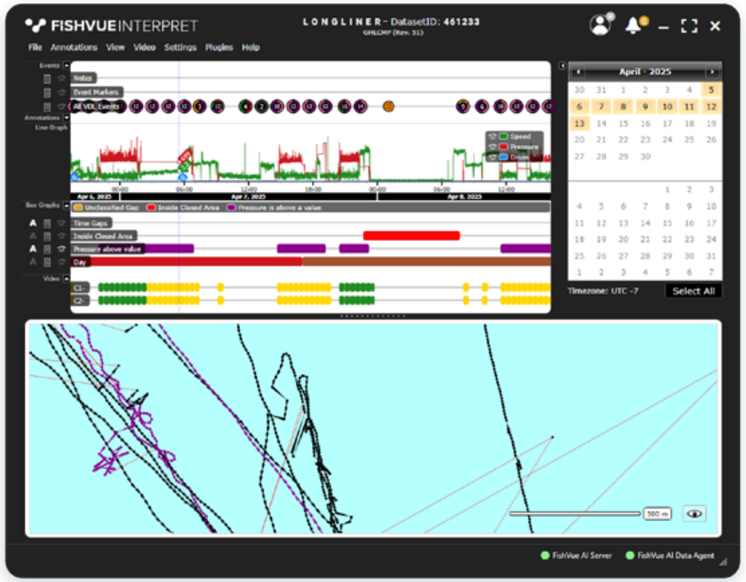
Turn complex EM data into clear, review-ready insights

FishVue Interpret is a comprehensive analysis tool for reviewing EM data collected by the onboard systems described above. A typical fishing trip may generate hundreds of hours of data. With Interpret, reviewers can easily navigate large data sets, quickly follow vessel cruise tracks, verify gear deployment times and locations, confirm “kept and discarded” catch records and summarize their observations in a fraction of the real time.

A synchronized timeline and map view

Shown to the right on the main screen of Interpret is an overview of fishing activity plotted on a timeline versus a map of activity. The image to the right provides the following details on a fishing trip:

- The calendar in the upper right allows you to select the dates of the fishing trip for review.
- The top timeline shows activity by sets and hauls, catches and any annotations.
- The smaller lower timeline indicates any warnings during the trip including power failures, and time spent inside of designated closed fishing areas.
- This data correlates with the vessel track shown on the map at the bottom as a green line. Closed areas have been shaded (red).
- All data is timestamped and synced, enabling the reviewer to scroll across the timeline to points of interest.



Video review and annotation

Interpret can also display video recordings taken with the Vantage cameras. Again the cameras are timestamped and synced with all the other fishing trip data. In reviewing the video data, annotations can be made on the species detected and the status of the catch (caught, discarded, bycatch). These are indicated in the bottom timeline by colour.

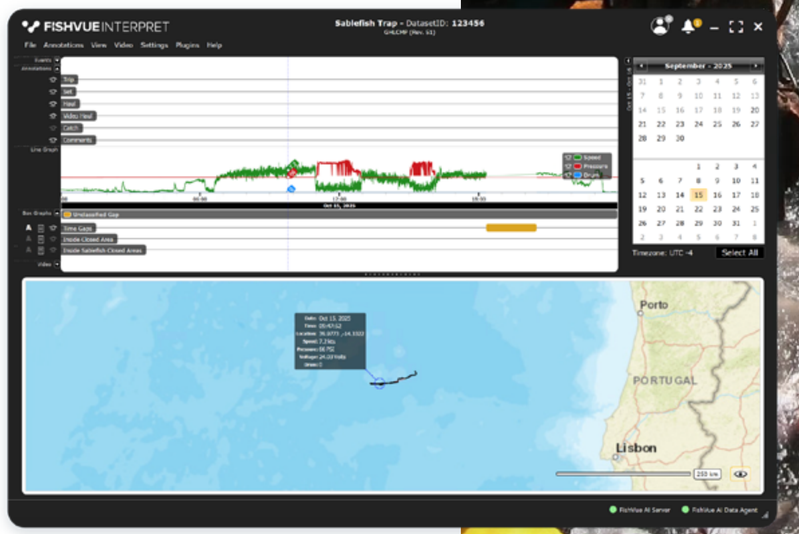
Length detection and measurement

Interpret also has a length detection tool for recording the species and size.

Scale and track record

Interpret is utilized to review more EM fishing days per year than any other data review application in the world. In the last decade, Interpret has been utilized to review more than 50,000 fishing trips across dozens of fisheries and multiple gear types.

To learn more watch this video: [Interpret features demo]



Interpret Lite vs Pro

Interpret Pro

To better suit the needs of EM reviewers, Archipelago has created two versions of Interpret – Lite and Pro. Interpret Pro streamlines the review process, transforming months of sensor and video data into a clear and accurate assessment of fishing activity at sea. Click between GPS, video, and sensor data at any point; Interpret Pro synchronizes all data along a single timeline for easy reference. Efficiently navigate weeks of fishing records to quickly spot relevant activities, add annotations, save video excerpts, and generate trip summaries for further analysis, reporting, or integration into a sustainable fisheries management program.

Interpret Lite

Interpret Lite™ is intended for those who need fast access to EM data, but don't need to save or view annotations.

Features	Interpret Lite	Interpret Pro
View fishing activity with video footage	✓	✓
View equipment activity with sensor data	✓	✓
View vessel cruise track with GPS mapping	✓	✓
View skipper notes, and create viewer notes	✓	✓
View high-res footage from digital cameras	✓	✓
Clip and save data sets for further review	✓	✓
Evaluate EM system with technician mode	✓	✓
Create annotations to identify key events		✓
View annotations to review key events		✓
Edit, group, and sort annotations		✓

CASE STUDY: INTERPRET

Bycatch Monitoring in the Bay of Biscay

Project overview

Following reports of dolphin bycatch in gillnet fisheries in the Bay of Biscay, the French government commissioned a demonstration EM project to assess the data collection capabilities on these small vessels.

How it was implemented

An EM system capable of transmitting live video and sensor data over 4G from the vessel was installed on four gillnet vessels, with the associated cameras and sensors. No changes were required to either fishing activities or catch handling and the privacy of the fishermen involved was maintained in the video collected. All data analysis is done locally in France using Archipelago's Interpret analysis software and training. The initial project ran for 5 months and based on the successful data collection to meet monitoring goals the program was continued.

Chapter 10

FishVue AI

AI-assisted review that fast-forwards analysis

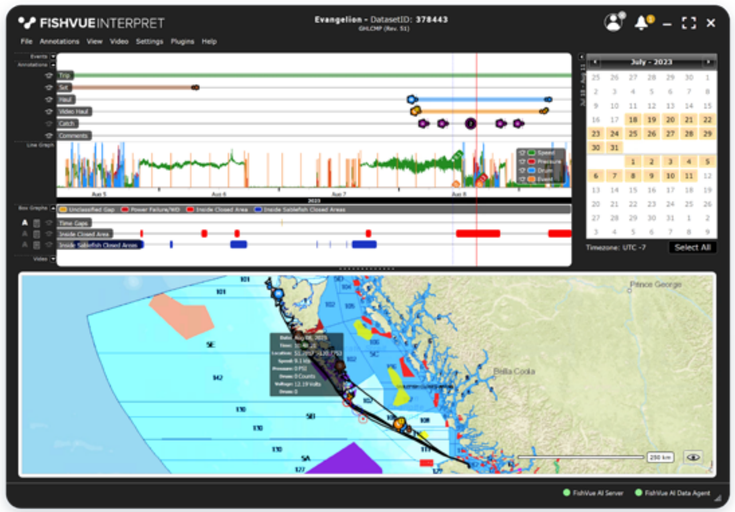
FishVue AI (Artificial Intelligence) expands the capabilities of Interpret by providing an AI based multi-step analysis model that sees fisheries data pass through numerous AI tools and then ingests these outputs into Archipelago's Interpret data analysis application.

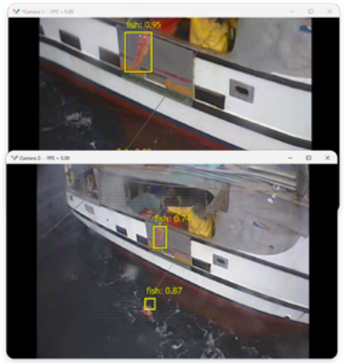
Human-validated results, delivered faster

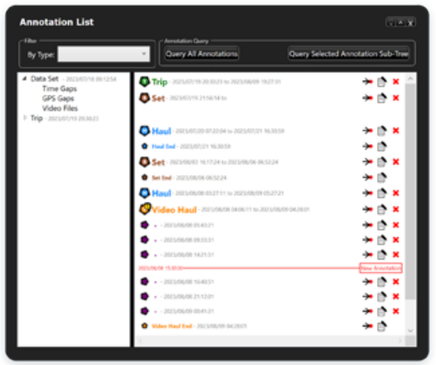
Analysis is then completed and validated by a human data analyst, and the results are reported to the client. FishVue AI does more than detect fish across up to ten simultaneous camera feeds. It fast-forwards human reviewers through hours of footage with pinpoint object-detection models, slashing review time.

FishVue AI can be trained to recognize a fish being caught in the video imagery and then automatically annotating that in Interpret as shown on the right in the enhanced Interpret / AI screen.

In the middle timeline AI is identifying all fish caught as pink on the timeline, these are then annotated in the bottom notes window. A detection rate box is open in the middle allowing the reviewer to set the detection rate and jump rate for no detection to speed up the review process dramatically.

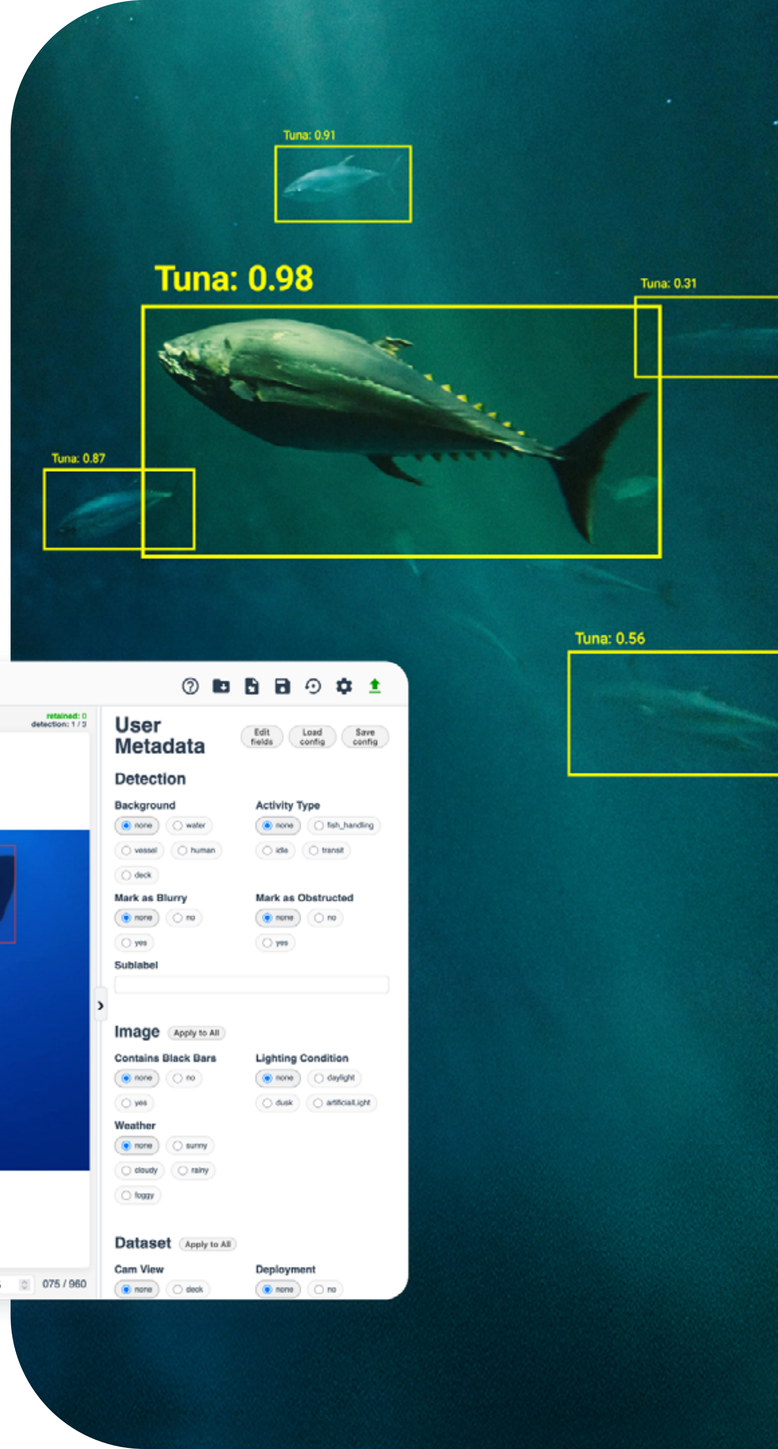


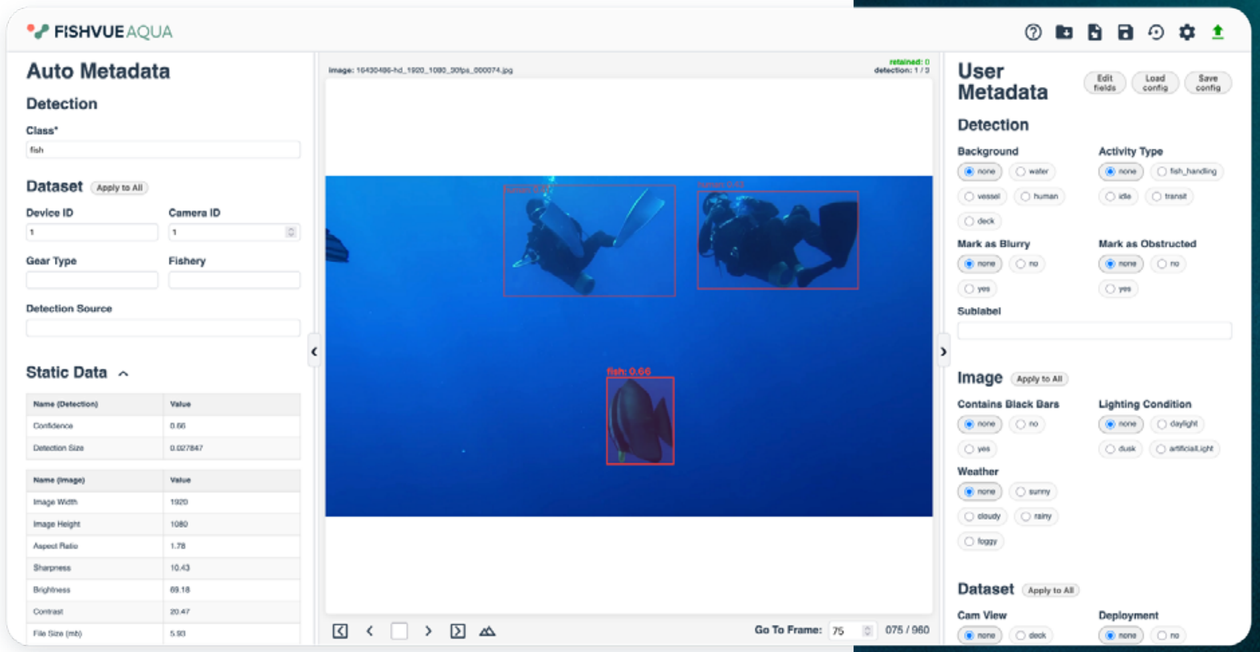




A continuous improvement pipeline

Underpinning this capability is our AI self-sustaining pipeline that auto-annotates and statistically profiles incoming image datasets. It feeds human-in-the-loop insights back into the model for retraining using our AQUA AI training tool. The result is an ever-sharpening cycle of improvement, delivering smarter inference in the cloud and more intuitive, time-saving review in the desktop app. This helps regulatory bodies and fleet managers access faster, more reliable analytics while keeping the human expert at the helm.





Chapter 11

FLOAT / ELOG

Electronic fishing logs, simplified for crews at sea

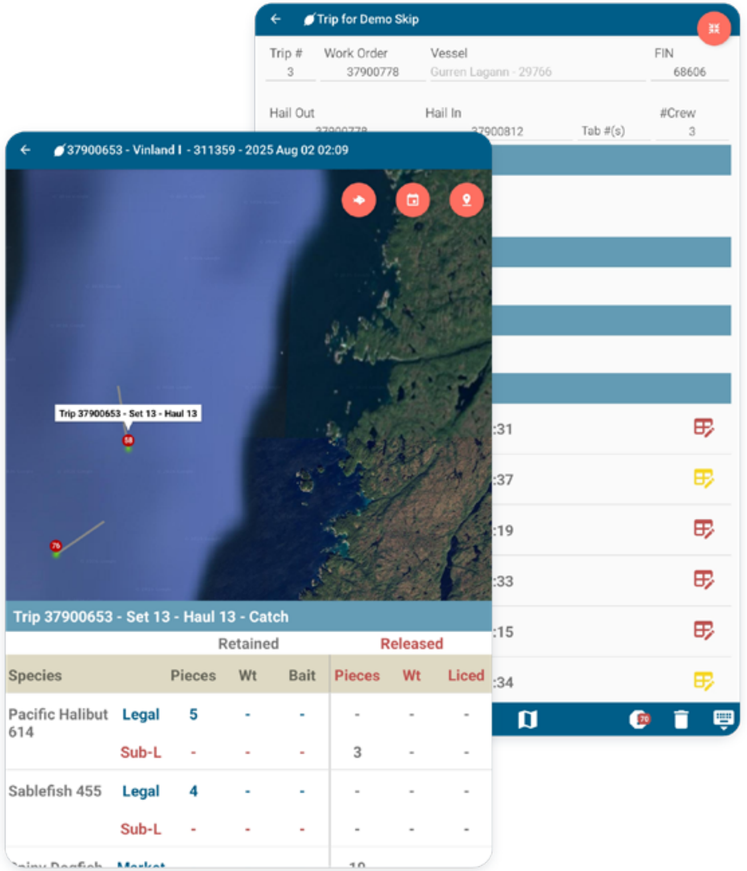
Fishing Log on a Tablet (FLOAT) is Archipelago's custom electronic fishing log application. Float allows vessel operators to enter and submit their fishing log information electronically. The application gives access to audits, species identification materials, and retains log data from previous trips for future reference. Float is designed for the Android tablet platform and has been successfully used in the Canadian Pacific Halibut, Sablefish, Lingcod, and Rockfish fisheries since 2017.

Automated reports can be viewed in real-time while at sea, providing a warning of any likely mistakes in the log. Catch summaries can be viewed and emailed directly to buyers or quota managers, and fishing activity can be viewed on a map and filtered by month and species to easily see what areas have been the most successful over time, or to avoid bycatch hot spots. FLOAT also holds reference documents such as local species identification and quota status reports which can be received through the app whenever the tablet is connected to the internet.

Using FLOAT E-Logs takes advantage of technology to record some information with just one tap, making filling out the logs much faster, easier, and more accurate.

Product features:

- Record and submit e-logs
- View Audits and Quota Reports
- Map your catch
- Catch summaries
- Email catch summaries to buyers
- Species identification guide



Chapter 12

About Archipelago

A global partner for sustainable marine resource management

Archipelago Marine Research is a global provider of sustainable marine resource management products and services. From its headquarters in Victoria, British Columbia, Canada, the company's team of 80+ industry professionals help fisheries, coastal communities, NGOs and government organizations around the world to implement sustainable practices through at–sea and dockside observer services, electronic monitoring programs, and environmental services.

Proven experience across fisheries, gears, and geographies

Over the past 5 decades, Archipelago has addressed a wide range of environmental and fisheries management challenges, working with a wide range of fishery types, target species, gear types, geographic locations, technological complexities, and organizations.

Through an ongoing commitment to our shared ocean resources and to the businesses, communities and individuals that rely upon them, Archipelago is helping to drive positive change on a global scale. We support sustainable practices for marine resource management by providing an objective, third-party approach that meets the needs of all stakeholders.

Established in 1978 and headquartered in Victoria, BC, Archipelago has regional office in Canada, the United States, and Asia Pacific.

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