

ELECTRONIC MONITORING

The Role of EM in improving the collection of
bycatch data and verifying best practices for safe
handling and release

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Intro to TNC

The Nature Conservancy (TNC) is a leading global conservation organization with a mission to protect the lands and waters on which all life depends.

400
scientists

4,000
conservationists

A FAR REACHING ALUMNI NETWORK
of leaders in the conservation community

72
countries

50
U.S. states

1 MILLION
dedicated members

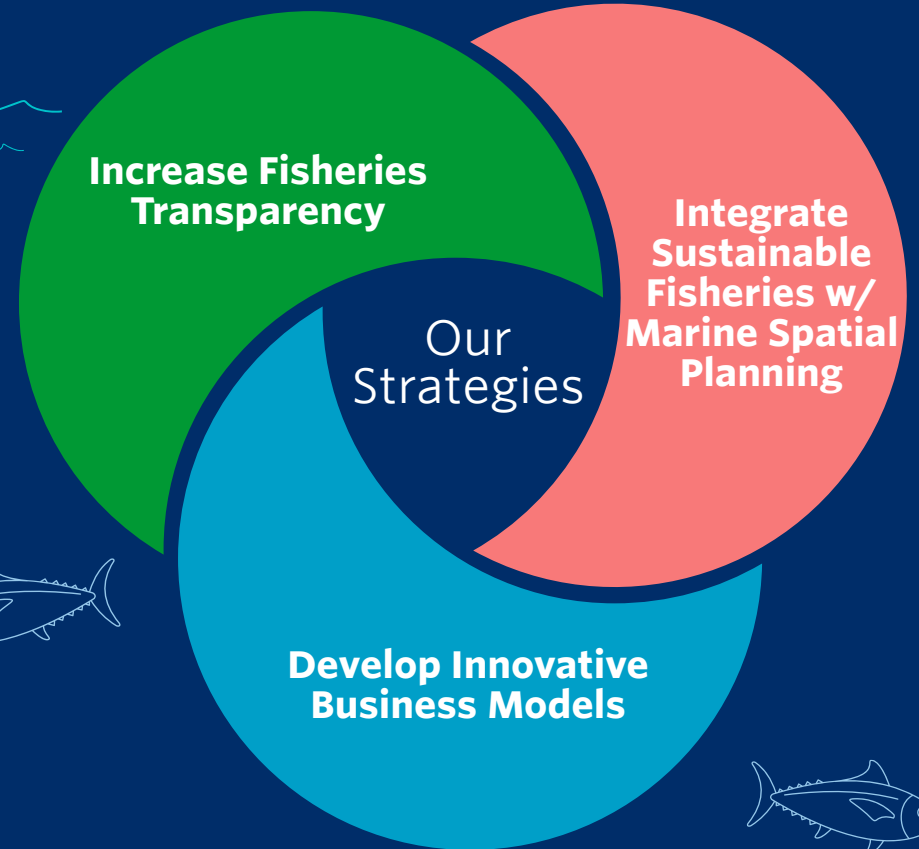
1,300 prominent
volunteer leaders

Large Scale Fisheries Program

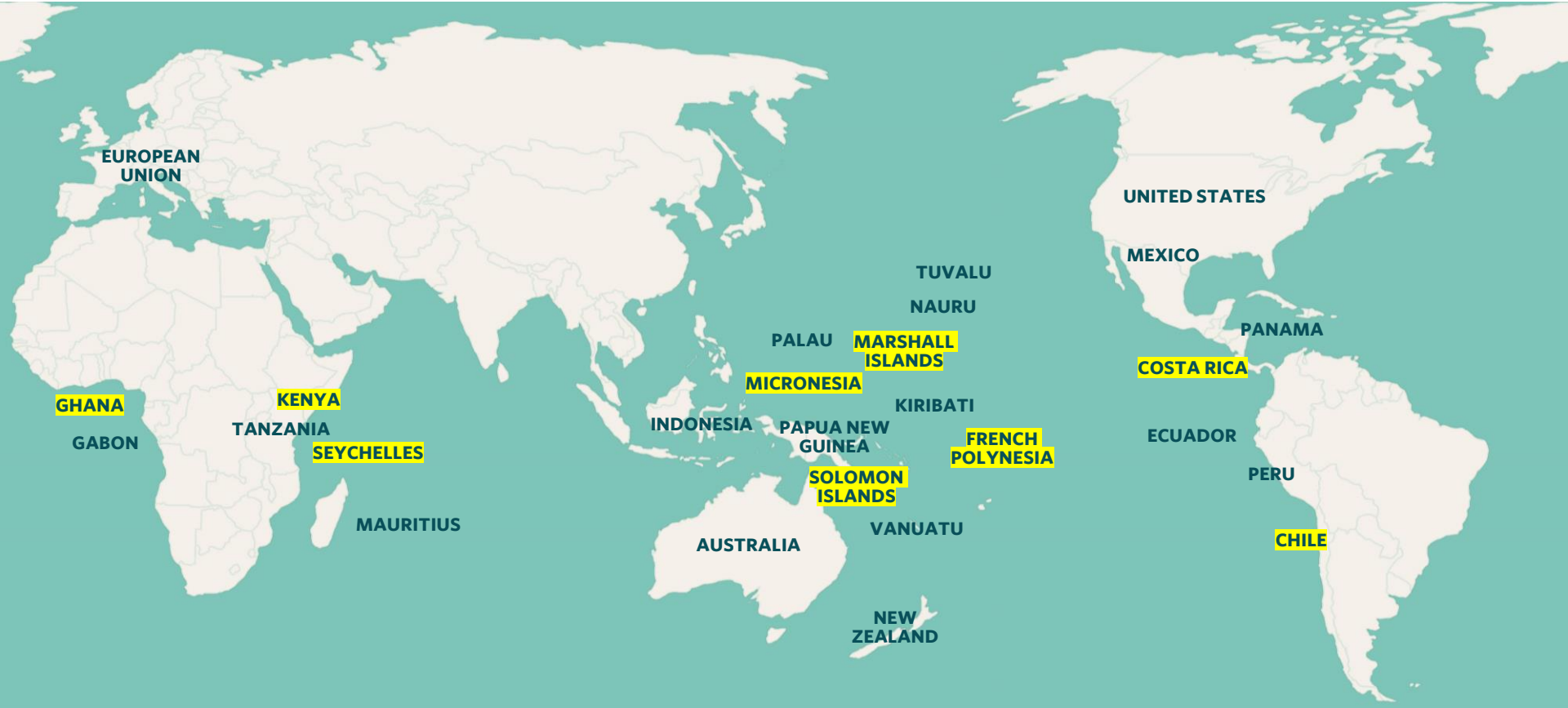


Our Goals

- Build healthy target stocks;
- Reduce bycatch of vulnerable species;
- Eliminate illegal, unreported and unregulated (IUU) fishing; and
- Improve socioeconomic resilience of resource



- ✓ TNC IS **ADVANCING EM IN OVER 18 COUNTRIES GLOBALLY** WITH FISHERIES AGENCIES, COMMUNITIES, AND FISHING INDUSTRY.
- ✓ DIRECTLY **SUPPORTING SIX COUNTRIES' PUBLIC COMMITMENTS** TO EM.





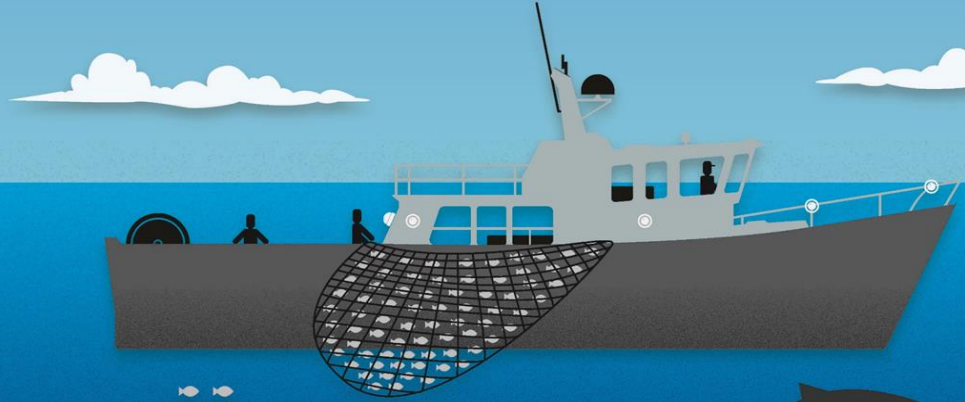
What is Electronic Monitoring?

Electronic monitoring (EM) is the use of onboard video cameras, GPS, and sensors to automatically track and verify fishing activity



How does EM work?

Electronic monitoring has a critical role to play:



1 While satellites, drones, vessels and planes can show who's on the water, EM takes our awareness a whole step further

2 EM provides detailed data on fishing effort, catch composition, and bycatch of non-target species and adherence to environmental and social commitments

3 EM drives confidence that seafood products have been harvested legally, sustainably and without labor abuses

Global Electronic Monitoring Accelerator

Our path to fisheries transparency focuses on 4 areas:

Removing barriers

Long-Term Success

TECHNOLOGY

Innovate.

**ON-THE-
WATER**

Demonstrate.

MARKETS

Motivate.

POLICY

Integrate



Overview

Project Outputs

- EM program and shared infrastructure
- Harmonized EM performance standard
- Bulk procurement (hardware and data review)

Participants

- Thai Union, StarKist, FCF, Tri Marine, Martec, Marpesca, and more
- The Nature Conservancy, ISSF, Key Traceability
- Governments, Regional Support Organizations
- Over 240+ participating vessels across the Pacific, Atlantic, and Indian Oceans



MAJOR FUNCTIONS OF ELECTRONIC MONITORING CYCLE



1

SCOPING

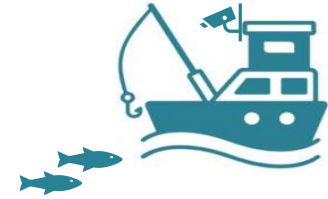
Initial kick off to clarify roles, objectives, and requirements, lock in specs and contracts



2

INSTALLATION

EM systems are installed on vessels at port and training of project partners



3

FISHING & DATA COLLECTION

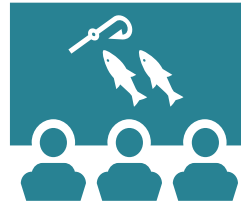
EM systems record raw video data on fishing vessels



4

DATA RETRIEVAL, INSPECTION & MAINTENANCE

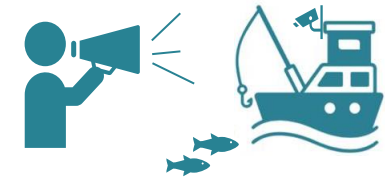
Data removed from vessel, EM systems maintained to ensure proper function



5

DATA REVIEW & ANALYSIS

Raw EM data is reviewed and analyzed



6

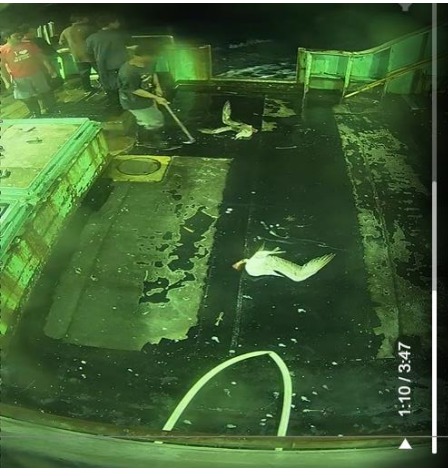
REPORTING, COMPLIANCE, MANAGEMENT

Reports generated and data used by stakeholders to drive continuous fishery improvement

Electronic Monitoring

EM footage—from boats that know they are being watched — demonstrating IUU activities and improper handling and release practices

Improper Albatross Interaction



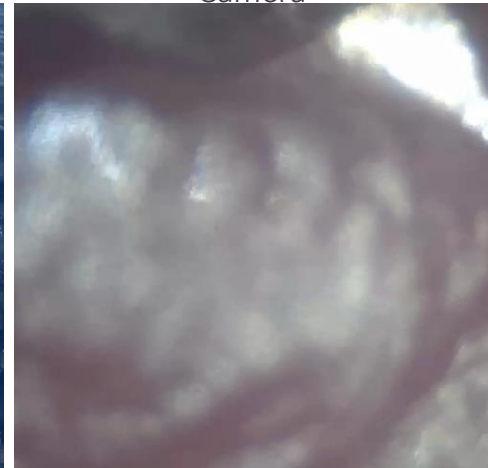
Oceanic Whitetip Shark Gaffing



Improper Oceanic Ray Interaction



Cloth Placed by Crew Member to Cover a Camera



Handling Sharks & Rays

- 🦈 When releasing a shark or ray, follow the steps shown to reduce stress and injury and minimize your safety risk. The abundance of many shark and ray species have been declining and ineffective release is seen as a contributing factor.
- 🦈 Minimize time spent handling and releasing sharks and rays. Some species and sizes of sharks and rays die if they experience too much stress when being caught and handled. Have a lifting device, bolt cutters, dehooker and line-cutter readily available on deck where crew can get it quickly.
- 🦈 If not bringing aboard, bring the shark as close to the vessel to aid in identification either by human observers or EM



Manipulation des requins



SI POSSIBLE, ÉVITE DE REMONTER LES REQUINS À BORD. RAMÈNE LES EN SURFACE ET LIBÈRE LES DANS L'EAU, MÊME SI ILS TE SEMBLENT MORTS



Si le requin est dans l'eau

Coupe l'hameçon ou à défaut la ligne aussi près que possible de la bouche du requin.

S'il s'est emmêlé, prends le temps de le libérer de sa ligne.

Utilise un dégorgoir ou une pince coupante à long manche.

Si le requin doit être monté à bord

Utilise une épuisette pour mettre à bord les petits individus.

Coupe l'hameçon avec une pince coupe-boulon, ou le fil le plus près possible de l'œillet de l'hameçon.

Soulève toujours le requin avant de le transporter. N'hésite pas à demander l'aide d'une deuxième personne !

Autant que possible, garde le requin toujours en position horizontale. Tu peux mettre tes mains au niveau des nageoires pectorales et de la base de la queue.

Fais glisser le requin à l'eau la tête la première, sans le lancer et positionne-le face au courant !

Il peut être nécessaire de maintenir le requin face au courant pendant quelques minutes pour l'aider à se réoxygéner.



Évite tout traumatisme pour le requin (choc ou amputation), d'autant que tu risques des morsures



N'utilise pas de gaffe. Attention aux coups de nageoire caudale



Ne soulève pas un requin par la queue, la tête ou les branchies

Protège-toi : n'oublies pas tes gants et tes lunettes de protection, ne mets pas tes mains près des mâchoires et reste loin de la tête du requin ! Un requin qui semble mort peut s'animer soudainement et te causer des blessures !



Ne laisse pas le requin au soleil !

RAPPELS RÉGLEMENTAIRES

Les requins sont protégés par le Code de l'environnement en Polynésie française.

Interdiction de cibler ou de nuire de manière intentionnelle aux requins. L'équipage et l'armement devront par ailleurs s'appliquer à leur évitement et à garantir leur manipulation et leur remise à l'eau, permettant les meilleures conditions de survie en cas de capture.

Détenir :

- un dégorgoir
- une pince coupante capable de couper un hameçon et un avançon
- une épuisette assez grande pour remonter

















Turtle Handling & Release

If the turtle is hooked and still in the water:

- If hooked internally do not attempt to remove the hook and do not pull on the line.
- Use a long-handed line-cutter to release the animal by cutting the line right at the mouth.
- If hooked externally or around the beak you may try removing the hook using a “pig tail” dehooker.
- If you do not succeed leave the hook in place and cut the line as short as possible.
- Bring the turtle as close to the vessel to aid in identification.

If the turtle is brought onboard:

- Always use a dip-net to bring the turtle on board.
- Never use a gaff.
- Never pull or lift by the line.
- Do not attempt to lift the turtle by its flippers





Electronic Monitoring

EXAMPLE:

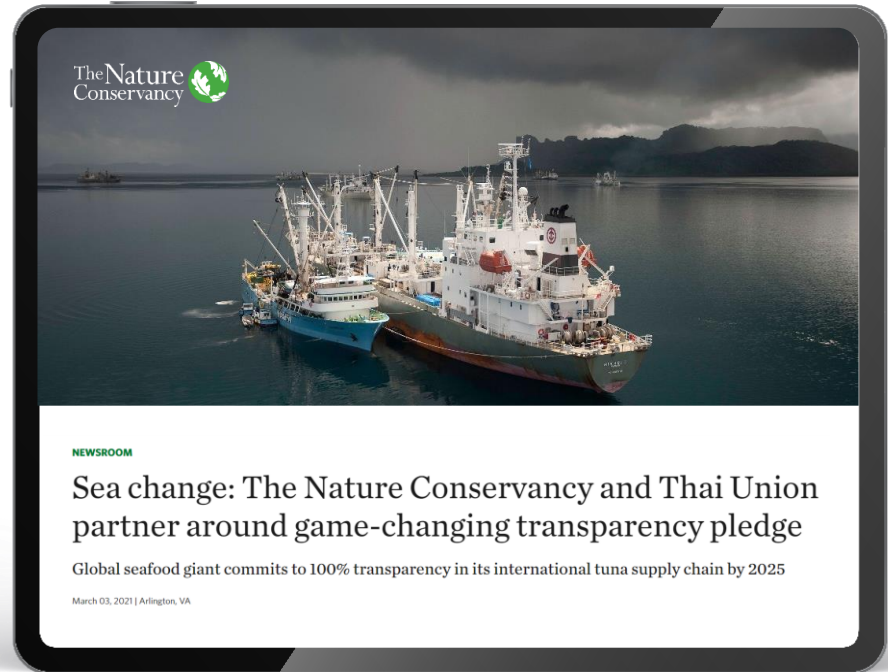
Thai Union commits to 100% transparency by 2025



I look forward to the sustainable future Thai Union and TNC can help create through increased electronic monitoring and transparency throughout the seafood industry.



Thiraphong Chansiri,
President & CEO of Thai Union





RENEW

DONATE

NEWSROOM

All Eyes on Deck: The Republic of Ghana Commits to 100% Transparency on Industrial Fishing Vessels

Taking the lead in fisheries transparency in West Africa, the Republic of Ghana is committed to ensuring 100 percent electronic monitoring.

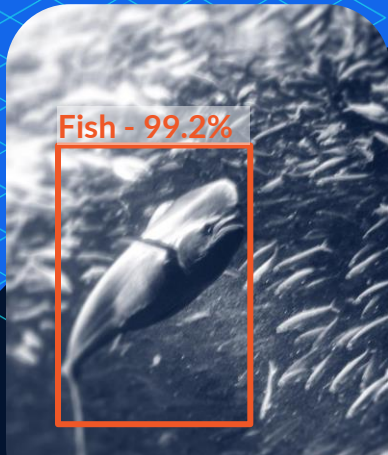
March 02, 2023 | Panama City, Panama



Thank you!

For more information contact:
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APPENDIX – BACKGROUND SLIDES



What we need is reliable species level detection in multiple vessel environments. To get there we need images - lots of labeled images.

FishNet 2.0

AI is a crucial component to help reduce time and costs of EM as well as enable new capabilities like risk assessments. In order to improve AI computer vision for EM, we need more data, specifically videos, images, and expertly labeled data sets.

Requirements

- Storage and management videos, images, and labels
- Managed registration
- User uploaded data sets (regulated) and data searching
- User added labels
- User community
- Managed content / website (CMS)
- Mask key sensitive information (TBD)

Workstreams

- 📌 **Information Architecture** - Determine data to store/organize
- 📌 **UX** - Design application based on stakeholder needs
- 📌 **Develop** - Create app that is easy to manage
- 📌 **Implement** - Migrate data from Fishnet and other sources

Participants

Funding: TNC

Project Owner: productOps

Data Providers: EM, Fisheries

Users: EM Providers, Data scientists, NGOs

Operator: TBD

Project Traits

Timeframe



Impact



Budget



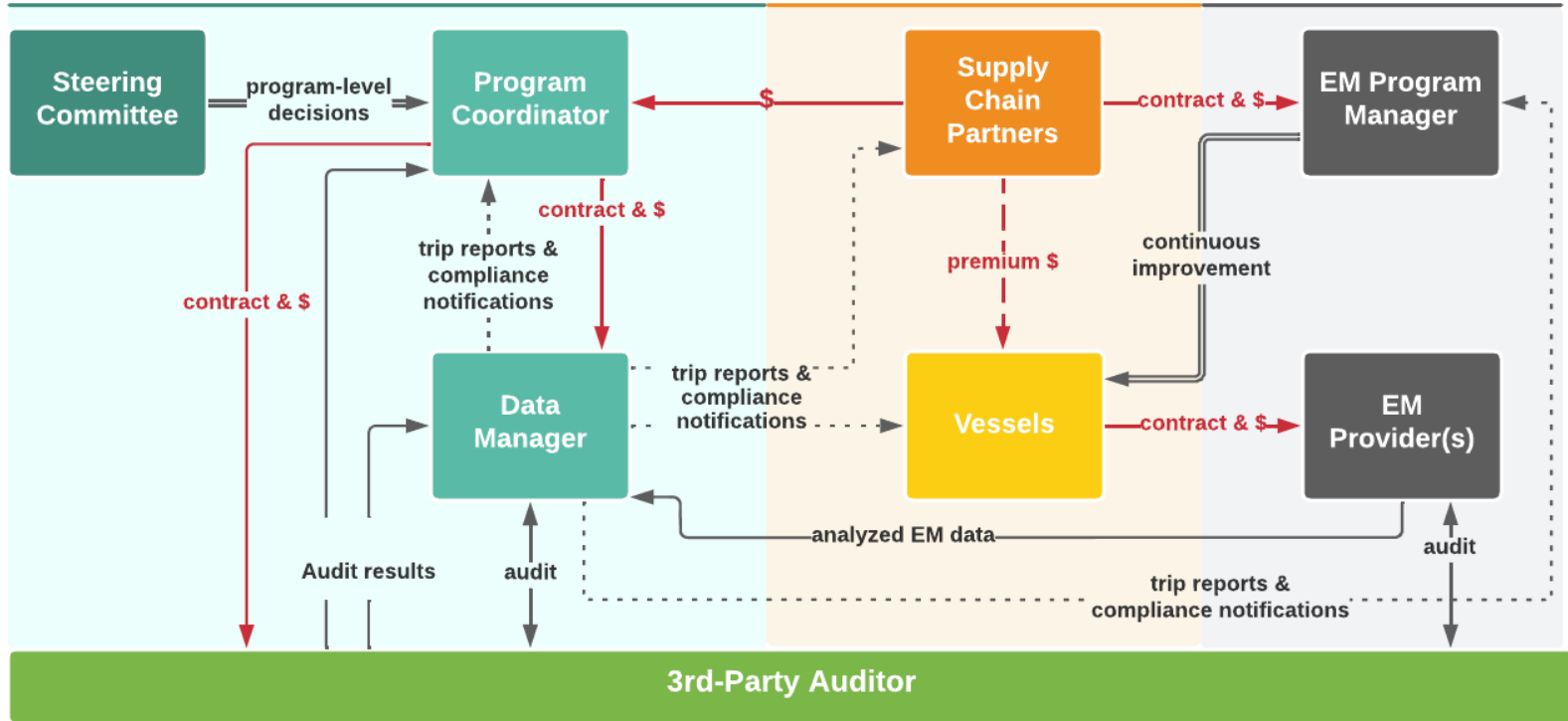
Value Propositions

- ✓ Improve product/ accuracy
- ✓ Enable ML related initiatives
- ✓ Allow other stakeholders to contribute

Components

- Data platform to organize files
- Secure data ingestion to add files
- Secure app to find and use data sets
- Comments/forum for support
- Registration and contact form
- CMS for application
- **Technology Stack:** AWS

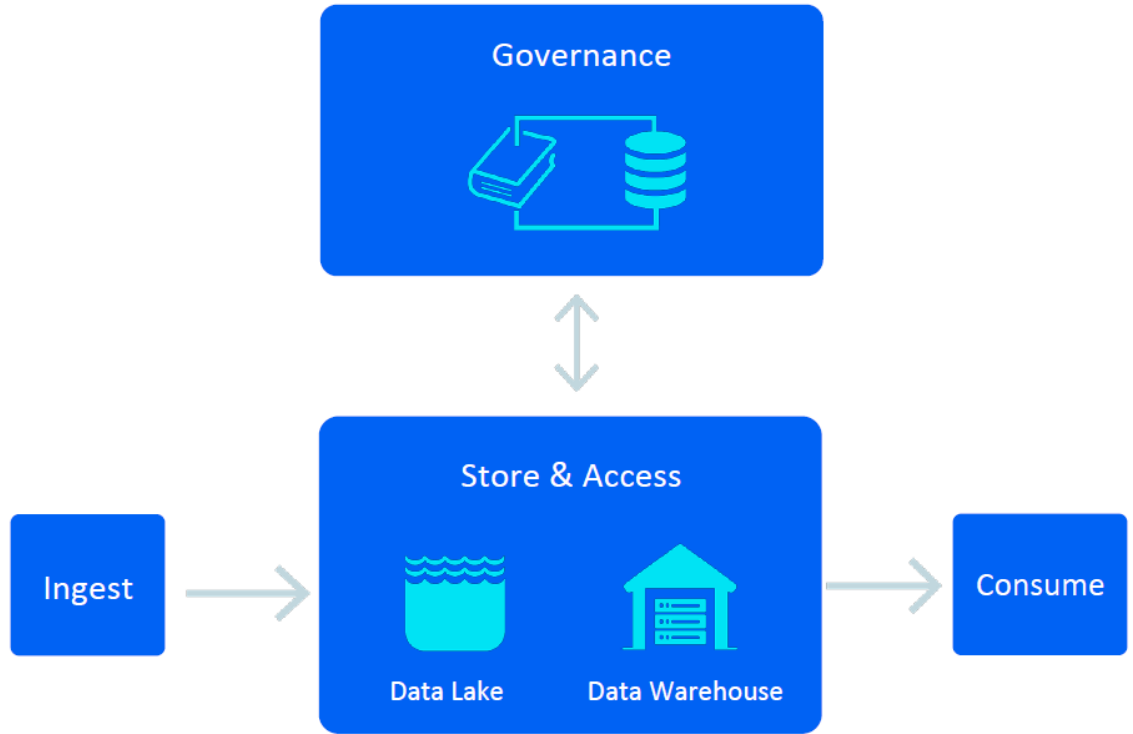
EM Program Roles and Responsibilities



DATA SOURCES

- Vessel Info
- Log Reports
- EM Reviews
- 3rd Party Data (i.e., Sat data, weather, etc.)

Data Platform Example

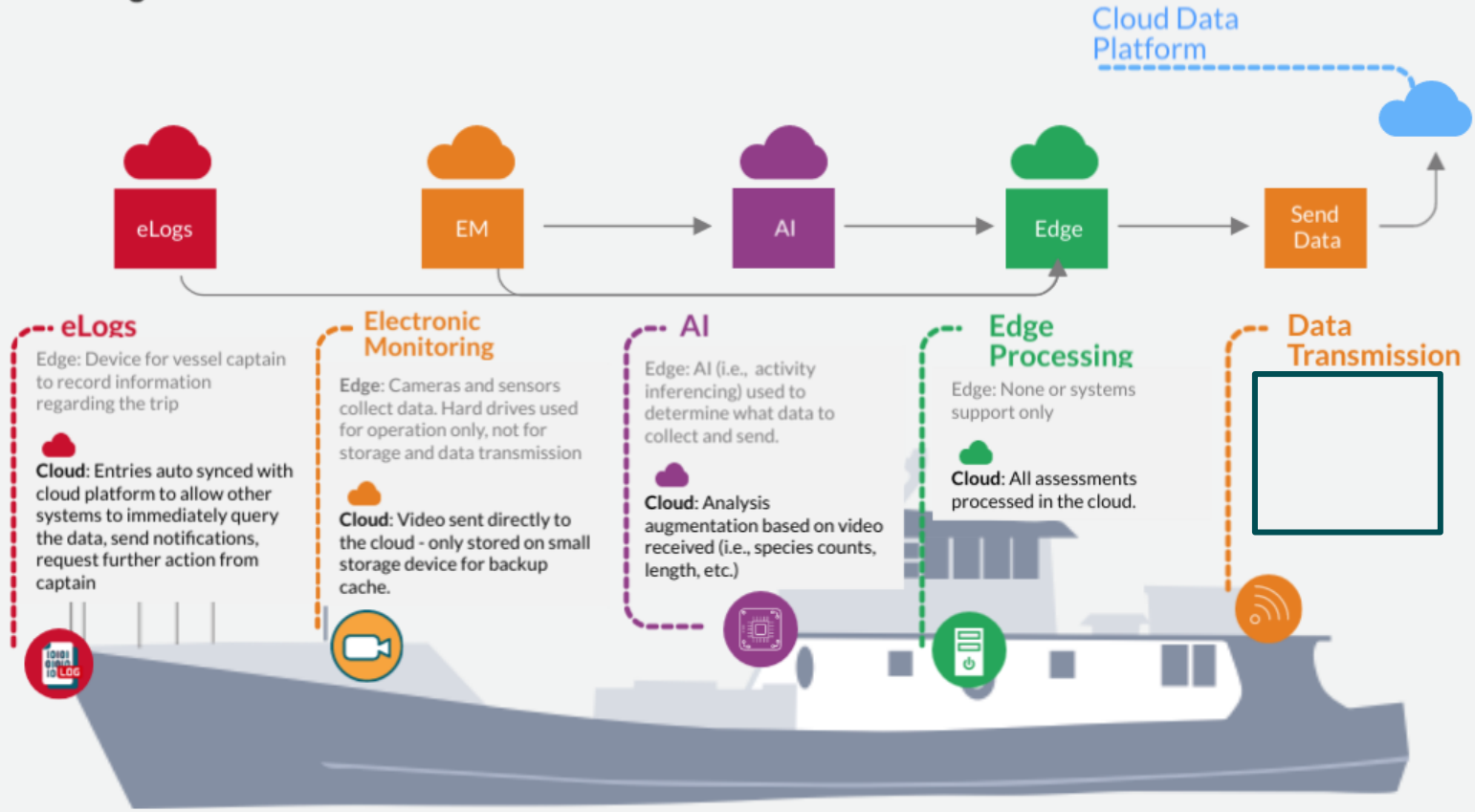


Normalize AI / ML / NLP Enrichment

DATA STORIES

- Analysis
- Reports
- Applications
- Notifications

Edge Assessment Activities & Technical Architecture



RISK BASED REVIEW



If the trip has a high risk score - send a notification to the program director and flag the vessel for review by an EM analyst.



Electronic Monitoring:

TECHNOLOGY

ON-THE-WATER

MARKETS

POLICY



Pacific Island Tuna will require 100% electronic monitoring on its partner vessels, resulting in:

- New company helping Marshall Islands move from rent-seeking to ownership stake in supply chain
- Verification that customers' environmental and social standards are met
- **First contract with Walmart to deliver canned tuna – over 15 million cans delivered so far**



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