



HARNESSING TECHNOLOGY FOR FISHERIES MANAGEMENT

A Side Event

On the occasion of the
20th Meeting of the Indian Ocean Tuna
Commission (IOTC20)

HARNESSING TECHNOLOGY FOR FISHERIES MANAGEMENT

This Side Event will showcase technological advances and how they may be applied to support fisheries management. The Side Event will introduce **Electronic Monitoring (EM)** and **Electronic Reporting (ER)** technologies, provide example(s) of national application of these technologies, share the regional activities being undertaken in the Western and Central Pacific and Atlantic Oceans and highlight the work that the IOTC Secretariat has embarked upon for the IOTC.

What are we speaking to?

- Electronic reporting (ER): e.g. use of electronic logbooks to replace paper forms. Potentially time-saving (menu-driven and can derive data automatically from sensors, automatic measuring equipment as well as GIS / map plotters) and can transmit information in an agreed format to fisheries management authorities reducing lags in reporting and improving data quality.
- Electronic monitoring (EM): e.g. can provide views of key vessel areas to monitor: gear deployment / retrieval, catch aboard, sorting, processing, storage, transshipment, compliance and can potentially be used to replace or complement the use of human observers.

Adapted from: ANALYSIS OF THE COSTS AND BENEFITS OF ELECTRONIC FISHERIES INFORMATION SYSTEMS APPLIED IN FFA COUNTRIES AND IDENTIFICATION OF THE LEGISLATIVE, REGULATORY AND POLICY SUPPORTING REQUIREMENTS, Study for WWF by POSEIDON Aquatic Resource Management Ltd, February 2016

Today's Menu

- *Electronic Reporting and Electronic Monitoring: an introduction and experiences from Ghana and Fiji* – Dr Jerry Scott and Mr Julien Million
- *National Implementation: trials to implementation* – Mr Trent Timmiss, Australian Fisheries Management Authority
- *Regional Implementation: experiences from the Pacific Ocean* – Dr Graham Pilling, Oceanic Fisheries Programme of the Secretariat of the Pacific Community
- *Trials and Options for the IOTC* – Mr James Geehan, IOTC Secretariat

Output 2.2.2 EMS Ghana

- Activity under Component 2 of the Common Oceans ABNJ Tuna Project: Combatting Illegal Fishing
- Partnership with:



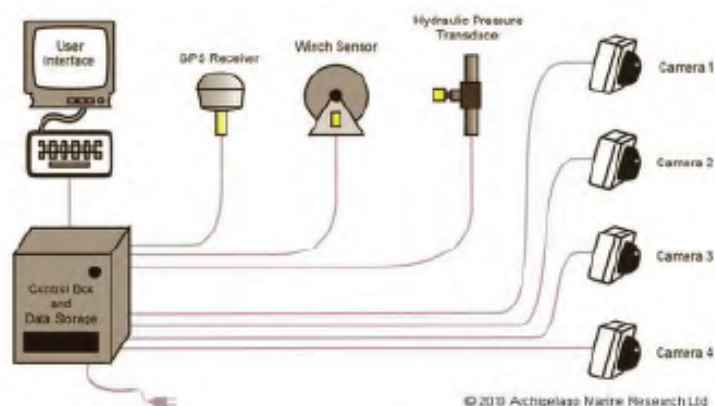
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Output 2.2.2 Electronic Surveillance

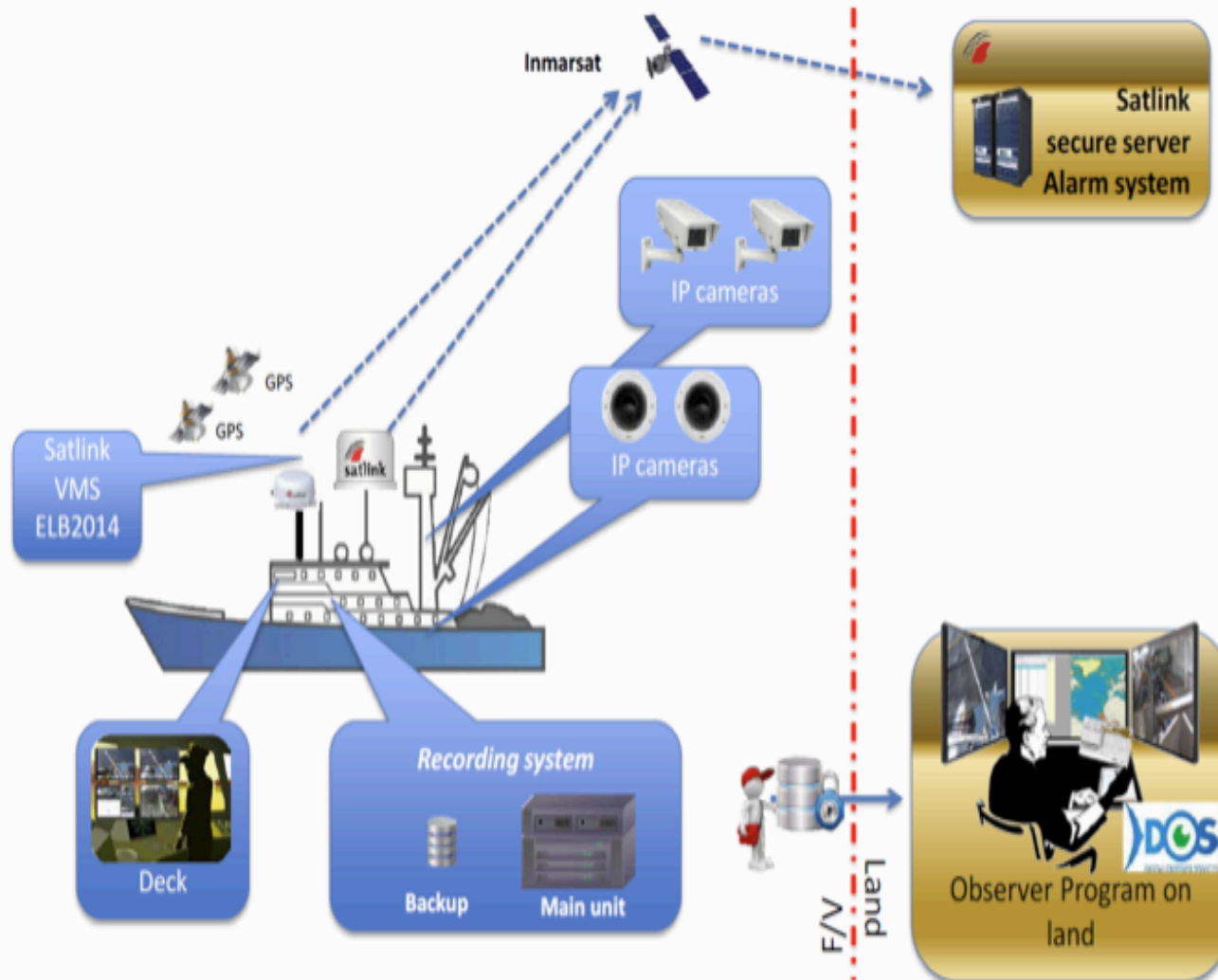


- **Electronic monitoring trials** taking place onboard working tuna **purse seine** vessels in the Pacific and Atlantic Oceans, monitors fishing effort and records fishing activity
- Partnering with FAO/GEF/WWF ABNJ Tuna Project on implementing EMS on board Ghanaian purse seine fleet
- Enabling meeting data reporting obligations and compliance with ISSF commitments
- Both direct funding and co-finance through industry and ISSF involvement

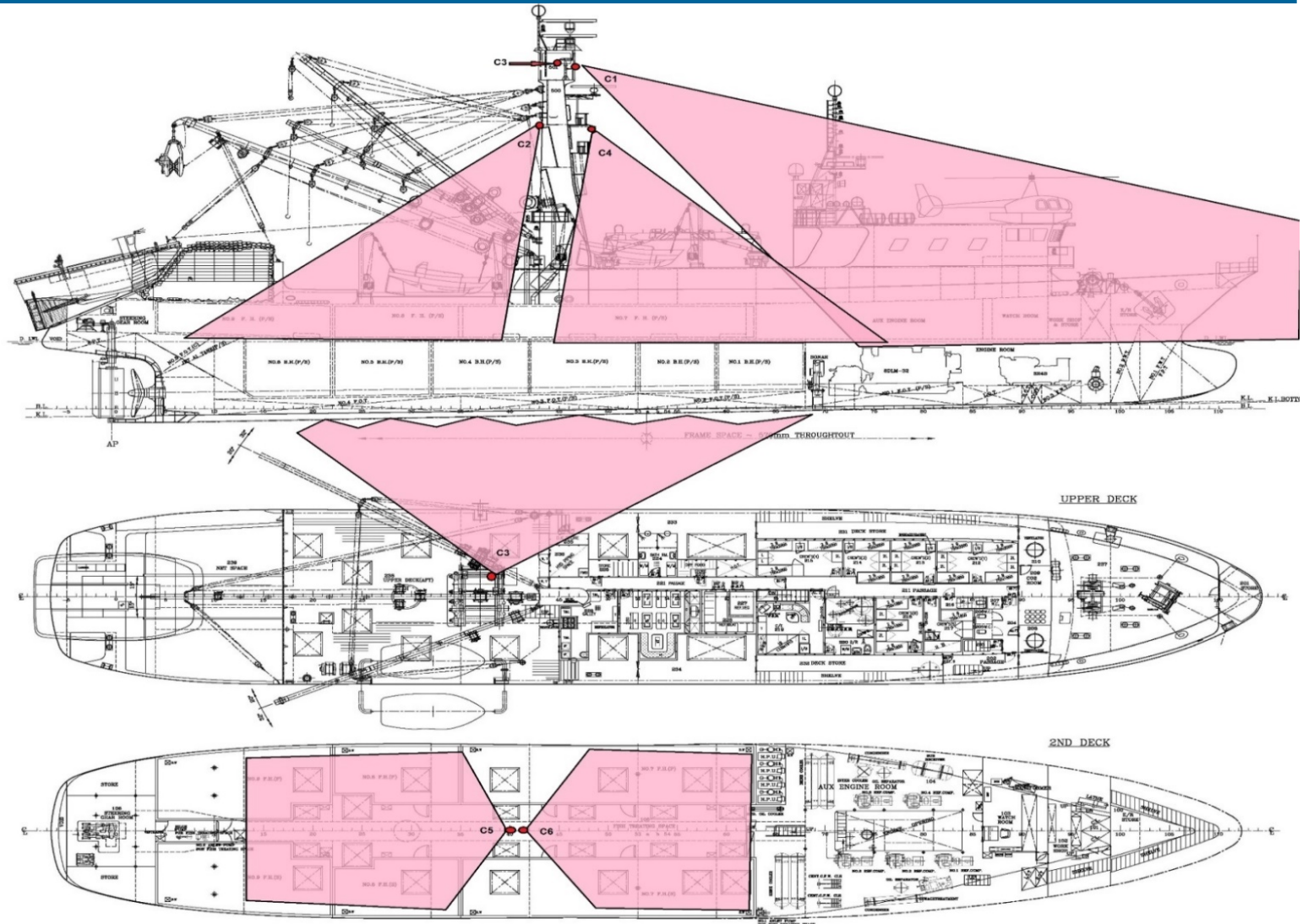




SeaTube, Electronic Observer System Operating diagram



Position of the cameras on the vessels and range of vision



Land and sea observer training in 2015



Participants of land-based observer training in Ghana (© Papa Kebe)

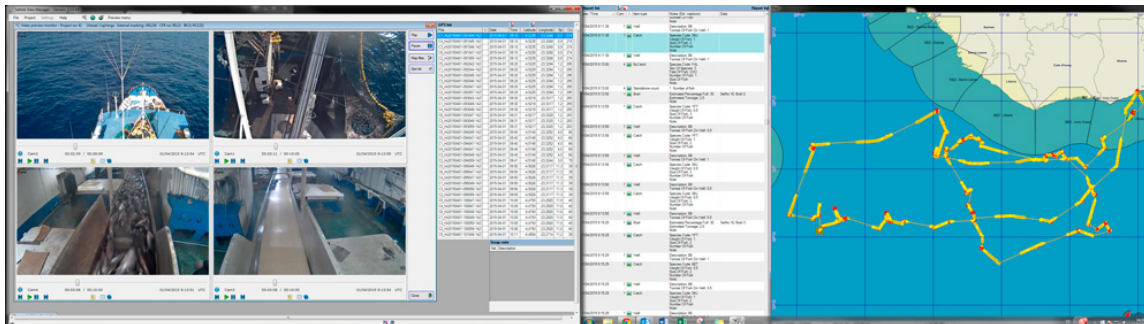


EMS Camera on board a Ghanaian purse seiner (© J. Million)



Ghanaian Assistant Fisheries Officer Cynthia Addo reviewing EMS data (© J. Million)

Collection of imagery and image analysis late 2015, phase 1:5 vessels; phase 2 (now) 11 vessels



Verification of image analysis

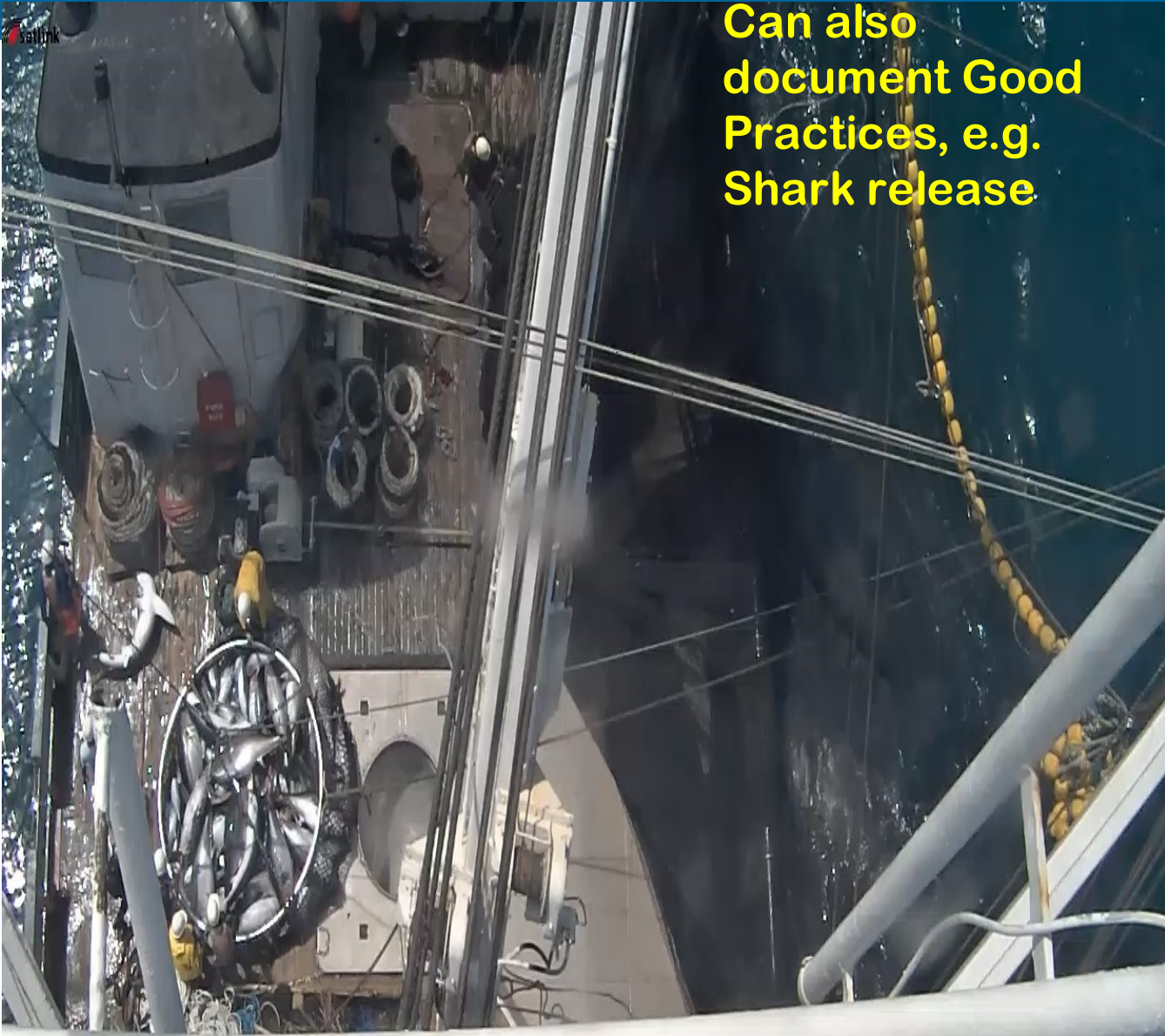


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Type of information collected from image analysis

- Near-real-time information (system health statements)
- Location and time of a set
- Type of set (free school or associated school, FADs, logs)
- Information on Fish Aggregating Devices (FADs): deployment, collection, visit, *etc.*
- Estimates of total catch, including species and size composition
- Estimation of bycatch of large and small individuals and their fate.
- Estimation of discards of target tunas
- Compliance with national, regional and international requirements

Can also document Good Practices, e.g. Shark release



Estimation of total catch and the type of purse seine fishing (FAD or Free School)



Can collect size measurements of fish

Opportunities for Ghana

- To **verify compliance** of fishing vessels with national, regional and international requirements
- To **improve estimates** of catch composition (target and bycatch) and the fishing effort to attain the catches.
- To **complement and improve** its human observer program system with the EMS systems
- To **develop human observer capacity** through training, provision of equipment and software.
- To **develop good practices** in their tuna fisheries

Lack of data and concern about lack of compliance has long been an issue off the Atlantic Coast of Africa, and this information will allow the Ghanaian government to improve data reporting and **meet** regional (ICCAT) **obligations**.

Ghana EMS So Far

Summary trips received on March 01, 2016 from Mr Yeboah

VESSEL	TRIP NUM.	FROM	TO	DAYS	SWAP DATE	LANDING PORT	DATE START ANALYSIS	DATE END ANALYSIS	ANALIST	STATUS OF ANALYSIS	PROCESS TIME IN DAYS
AGNES 1	1	05-Oct-2015	11-Nov-2015	36	11-Nov-2015	TEMA PORT	11/30/15	12/18/15	RENOLDS OBENG	COMPLETE	18
AGNES 1	2	11/11/15	12/16/15	35	16-Dec-2015	TEMA PORT	1/15/16	2/1/16	RENOLDS OBENG	COMPLETE	16
AGNES 1	3	12/16/15	1/27/16	41	27-Jan-2016	TEMA PORT			RENOLDS OBENG	IN PROGRESS	
CAP DE AMBRE	1	10/1/15	11/20/15	49	20-Nov-2015	TEMA PORT	11/23/15	11/30/15	CHARLSE DARKO	COMPLETE	7
CAP DE AMBRE	2	11/20/15	12/31/15	41	31-Dec-2015	TEMA PORT	1/13/16		JONES TETTEH	IN PROGRESS	
CAP LOPEZ	1	7-Oct-15	11/9/15	32	9-Nov-15	TEMA PORT	12/1/15	12/7/15	CHARLSE DARKO	COMPLETE	6
CAP LOPEZ	2	11/9/15	12/9/15	30	09-Dec-2015	TEMA PORT	12/27/15	1/6/16	CHARLSE DARKO	COMPLETE	9
CAP LOPEZ	3	12/26/15	1/8/16	12	08-Jan-2016	TEMA PORT	1/13/16	1/27/16	CHARLES DARKO	COMPLETE	14
PANOFI DISCOVERER	1	14-Oct-15	11/10/15	26	10-Nov-2015	TAKORADI PORT	12/1/15	12/17/15	CYNTHIA ADDO	COMPLETE	16
PANOFI DISCOVERER	2	11/10/15	12/1/15	21	01-Dec-2015	TAKORADI PORT	1/1/16	??????	CYNTHIA ADDO	COMPLETE	??
PANOFI DISCOVERER	3	12/1/15	1/9/16	38	09-Jan-2016	TAKORADI PORT	1/13/16	1/29/16	SHAMIRA ABDULAI	COMPLETE	16
PANOFI PATHFINDER	1	10/12/15	11/18/15	36	18-Nov-2015	TAKORADI PORT	12/7/15	1/4/16	SHAMIRA ABDULAI	COMPLETE	28
PANOFI PATHFINDER	2	11/18/15	1/4/16	46	11-Feb-2016	TEMA PORT			CHARLES DARKO	IN PROGRESS	

Trips 13 EMS Days 443

Land observers	trips analysed	trip in progress
RENOLDS OBENG	2	1
CHARLSE DARKO	4	1
JONES TETTEH		1
CYNTHIA ADDO	2	
SHAMIRA ABDULAI	2	
	10	3

As of early March, 2016
Phase 2 started: all Ghanaian PS (11)
are equipped

Ghana EMS: Several Challenges Ahead

- Until now, good industry cooperation .
- Yellow card revoked, lessening incentive to participate - industry cooperation could be lessened, at least in the near future.
- Moving toward using EMS data to support Ghanaian reporting obligations.
- A number of other (larger scale) fisheries projects could be considered in competition in certain ways rather than complementary– some recent initiatives have been undertaken to provide better cooperation/collaboration

Conclusions (so far :3 years to go)

EM is a Valuable Monitoring Tool for Tuna Purse Seine Fisheries

Strengths: Fishing Location and Effort
Target Species and Total Catch
Large Bycatch Species

More Work Needed: Tuna Catch Composition Methods
Small Bycatch Composition Methods
On Board Catch Handling Protocols
Improved CCTV Image Quality

Adoption of EM requires operational design and planning
Methods developed can be transferred & adopted globally

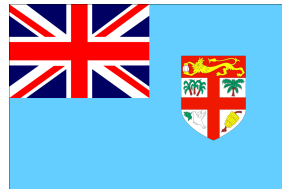
Output 2.2.1

Fiji EMS

- Activity under Component 2 of the Common Oceans ABNJ Tuna Project: Combatting Illegal Fishing
- Partnership with:



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Output 2.2.1

Fiji EMS

- Fijian longline fleet composed of 95 vessels
- Offshore Fisheries Management Decree allows for the use of electronic data on Fiji fishing vessels
- Industry support and willingness to use EMS
- Government support (partner of ABNJ Tuna Project)



Output 2.2.1

Fiji EMS

- Deployment of Electronic Monitoring Systems (EMS) onboard 50 Fijian longliners
- Review of EMS data by land-based observers at the Fisheries Department of Fiji
- EMS to be used as a new tool in the MCS toolbox and to assist for data collection

Output 2.2.1

Fiji EMS

COMPLIANCE TOOL

- Monitoring of approved transhipments and ensure that non-authorized transhipments are taking place
- Monitoring of WCFPC and Fiji compliance requirements
- Ensure that no waste or gear are dumped at sea

DATA COLLECTION

- Minimization of errors in Observer reports and improved data collection
- Improve reporting of effort, catch, bycatch and discards

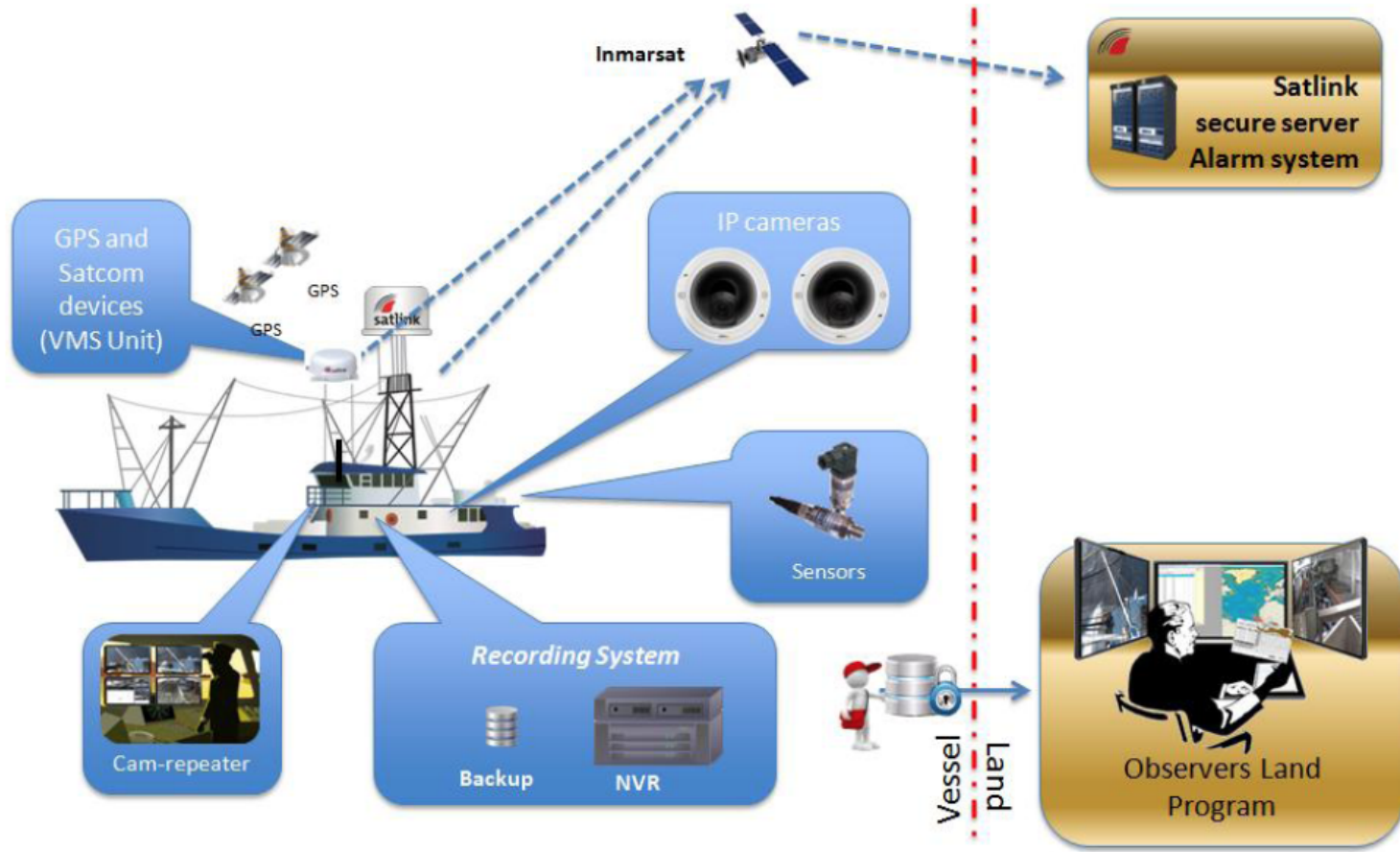
INDUSTRY

- Monitoring of handling practices and other company procedures
- Assist with certification process and audits
- Minimizes the risk of “missing” or stolen catch



Output 2.2.1 Fiji EMS

Satlink SeaTube Lite

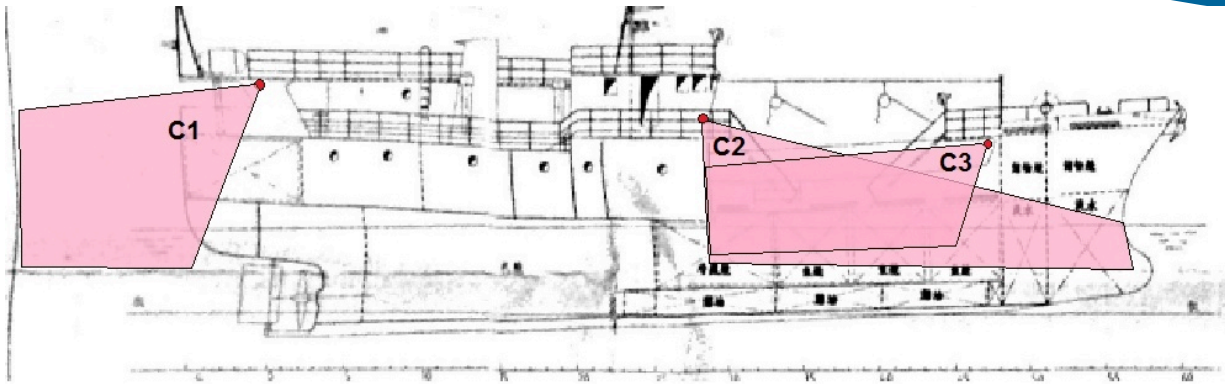


Output 2.2.1

Fiji EMS



Output 2.2.1 Fiji EMS



Position of the cameras is adapted to each vessel

Output 2.2.1

Fiji EMS

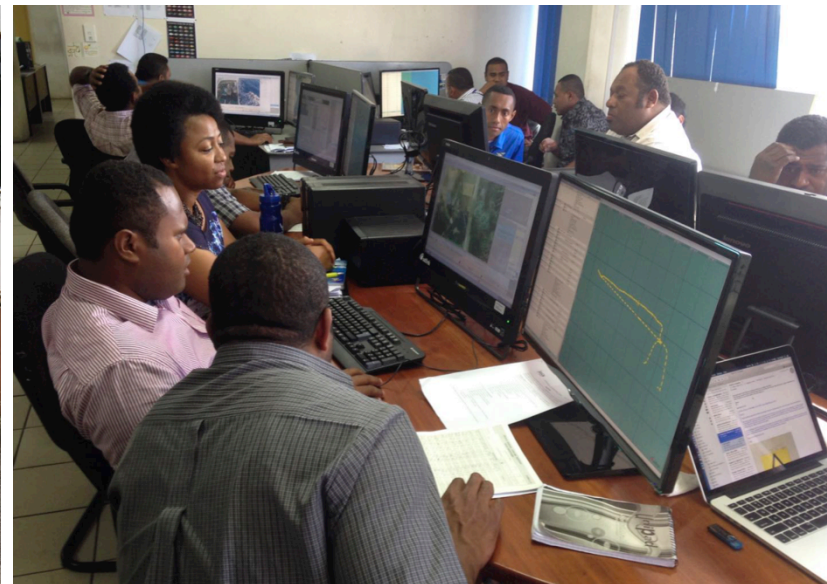


Example on Solander XI

Output 2.2.1

Fiji EMS

- Training conducted in November 2015
- 17 staff from the Fisheries Department trained
- 6 review units (SVM) are in place in Fiji



Output 2.2.1

Fiji EMS

STATUS

- Reviews have been started, although with the some delays due to administrative constraints in Fiji and at FAO: 6 trips have been completed
- Reviews should take around 1/3 of the trip time
- New version of SVM deployed
- Next deployment phase in August with 10 vessels
- Business case to study the full integration and sustainability of EMS in Fiji



Output 2.2.1

Fiji EMS

Trips	Trip start	Trip end	Fishing days	Analysis start	Analysis end	Analysis days	Sets	Hooks
1	22/10/15	02/11/15	11	24/11/15	10/12/15	16	10	23430
2	04/11/15	16/11/15	12	13/12/15	03/01/16	21	10	19590
3	18/11/15	04/12/15	16	05/01/16	27/01/16	22	11	35530
4	05/12/15	21/12/15	16	29/01/16	17/02/16	19	12	33600
5	05/10/15	17/11/15	43	07/03/16	17/04/16	41	36	117000
6	16/11/15	26/11/15	10	03/12/15	14/12/15	11	5	6235
7	03/10/15	01/12/15	59	15/12/15	27/03/16	103	45	135540

One compliance issue has been identified and is under investigation



Output 2.2.1

Fiji EMS

Challenges



Output 1.1.2

Seychelles EMS

- Activity under Component 2 of the Common Oceans ABNJ Tuna Project: Combatting Illegal Fishing
- Partnership with:



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Output 1.1.2

Seychelles EMS

- Deployment of Electronic Monitoring Systems (EMS) onboard 2 Seychelles purse seiners
- Review of EMS data by land-based observers at the Seychelles Fisheries Authority
- EMS to be used as a new tool in the MCS toolbox and to assist for data collection
- Data to be analyzed together with observer data and logbook data

Output 1.1.2 Seychelles EMS



Output 1.1.2

Seychelles EMS

STATUS

- First installation completed and second will be finalized before end of May
- 8 land-based observers trained at SFA
- First trip to be reviewed in 4 to 5 weeks



24 HOUR CCTV
RECORDING IN OPERATION

THE VIDEO RECORDING SYSTEM IS OPERATED FOR
PURPOSES OF SECURITY AND SAFETY MANAGEMENT

THE ORGANISATION RESPONSIBLE FOR THE SYSTEM IS

FAO / FUI FISHERIES

WHO CAN BE CONTACTED AT

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Thank you

ISSF