

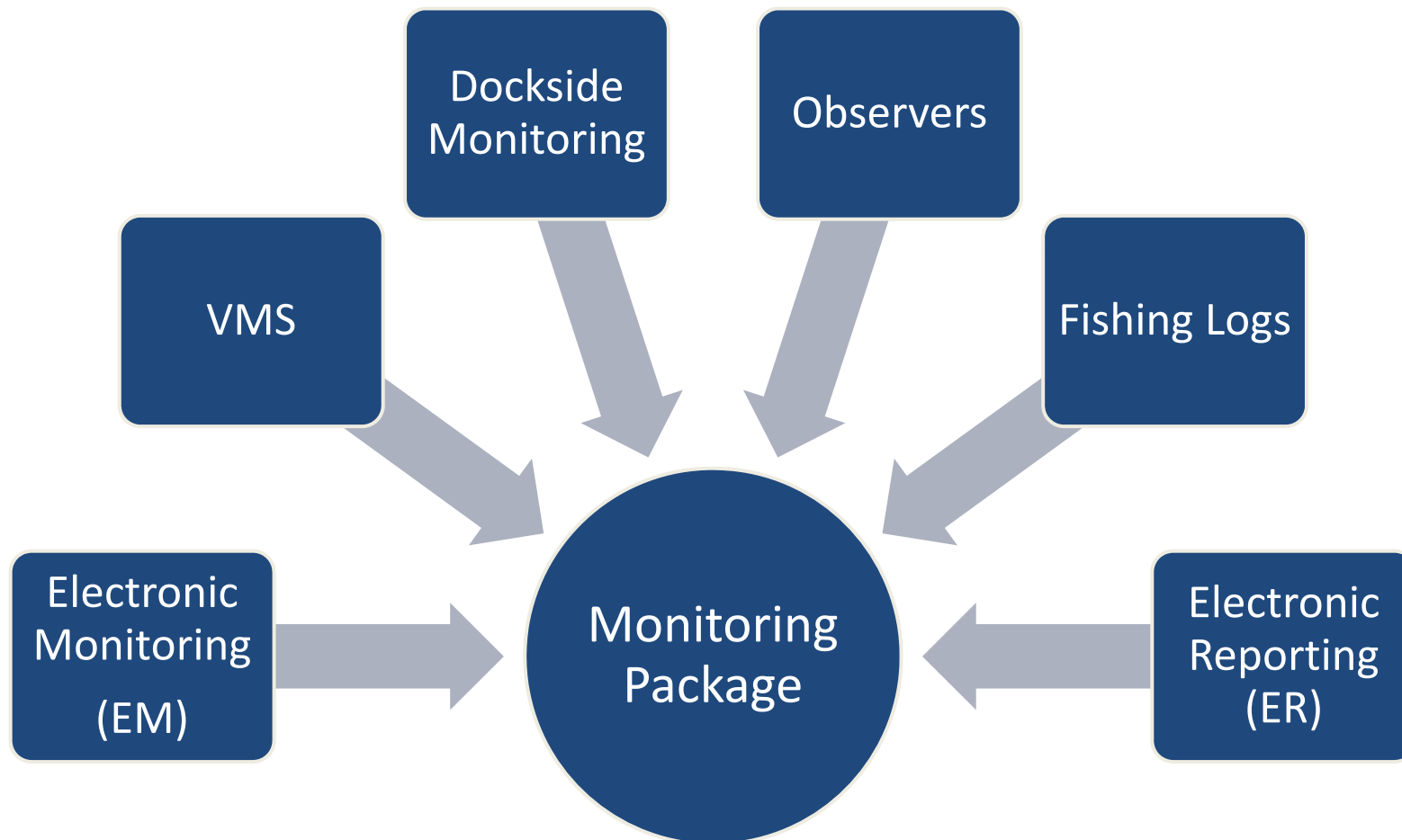


Opportunities for Bycatch Assessment Using Electronic Monitoring

McElderry¹, H., Pria¹, M. J., Stanley², R. D.

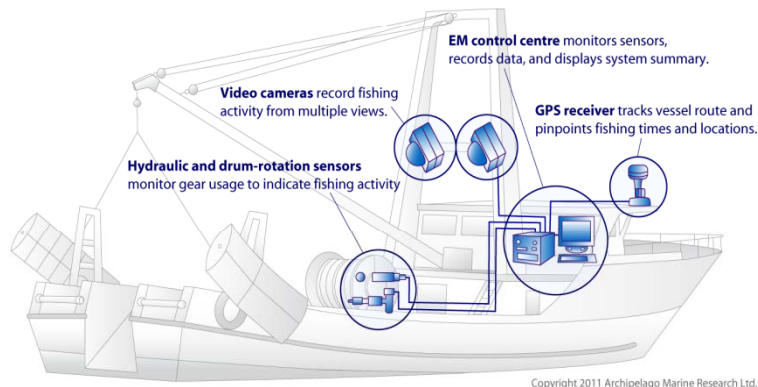
¹ Archipelago Marine Research Ltd.

² Fisheries and Oceans Canada (retired)



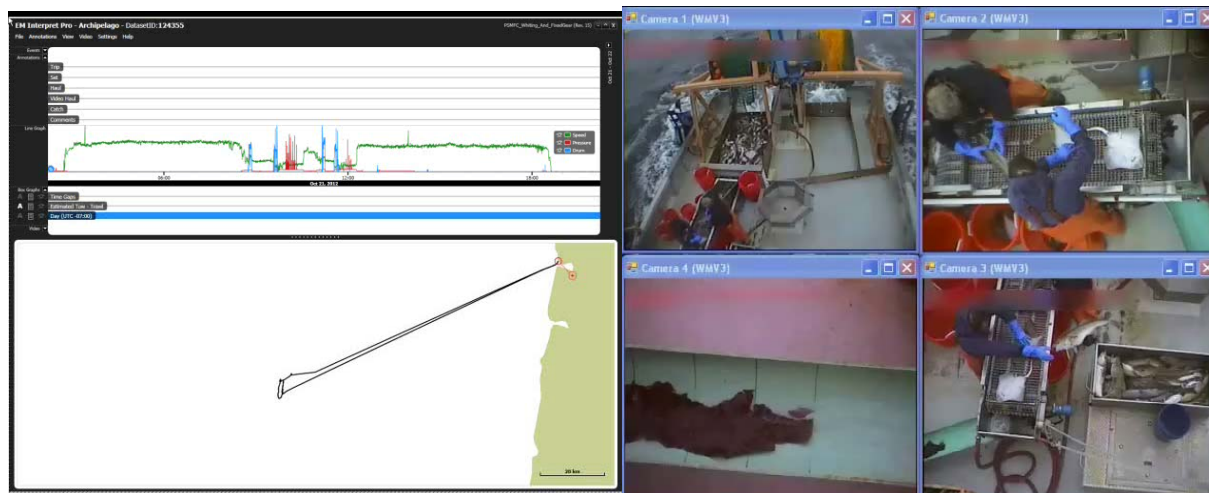


EM Technology



At Sea Data Recording System

Land-based Data Analysis System





EM Program Components

Outreach and Management

Data Analysis
Services



Field Services

Technology



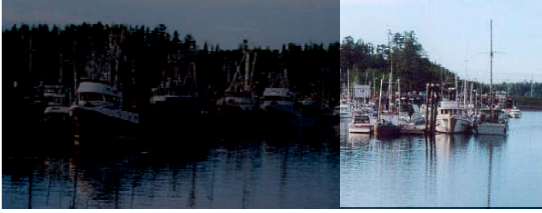



EM Applications Since 1999

- Pilot Studies (data not used to manage fishery)
 - 33 fisheries
 - 140 vessels
 - 7,000 vessel days
 - Multiple gears
 - Europe, Canada, Australia, New Zealand, Africa, US
- Operational EM Programs (data used to manage fishery)
 - 8 fisheries
 - 450 vessels
 - >30,000 vessel days/annum
 - Multiple gears
 - Europe, Canada, Australia



Sampling Method

		Relative Cost
Self-Reported		0.001
Census		1.0
Sample		0.3
Audited Self-Reporting		0.3



Monitoring Options –

Monitoring Objective- What EM data will be used for	EM Analysis Effort	Vessel Crew Effort
Vessel Location (VMS data)	Nil	Nil
Vessel Activity (including fishing effort)	Very Low	Nil
Mitigation Compliance	Low	Nil
Catch Handling Protocols	Low	Low
Full Retention Compliance	Low	Low-Medium
Limited Discarding	Low-Medium	Low-Medium
Unlimited Discarding	Medium	Low-Medium
Limited Catch Accounting	Medium-High	Low-Medium
Full Catch Accounting	High	High

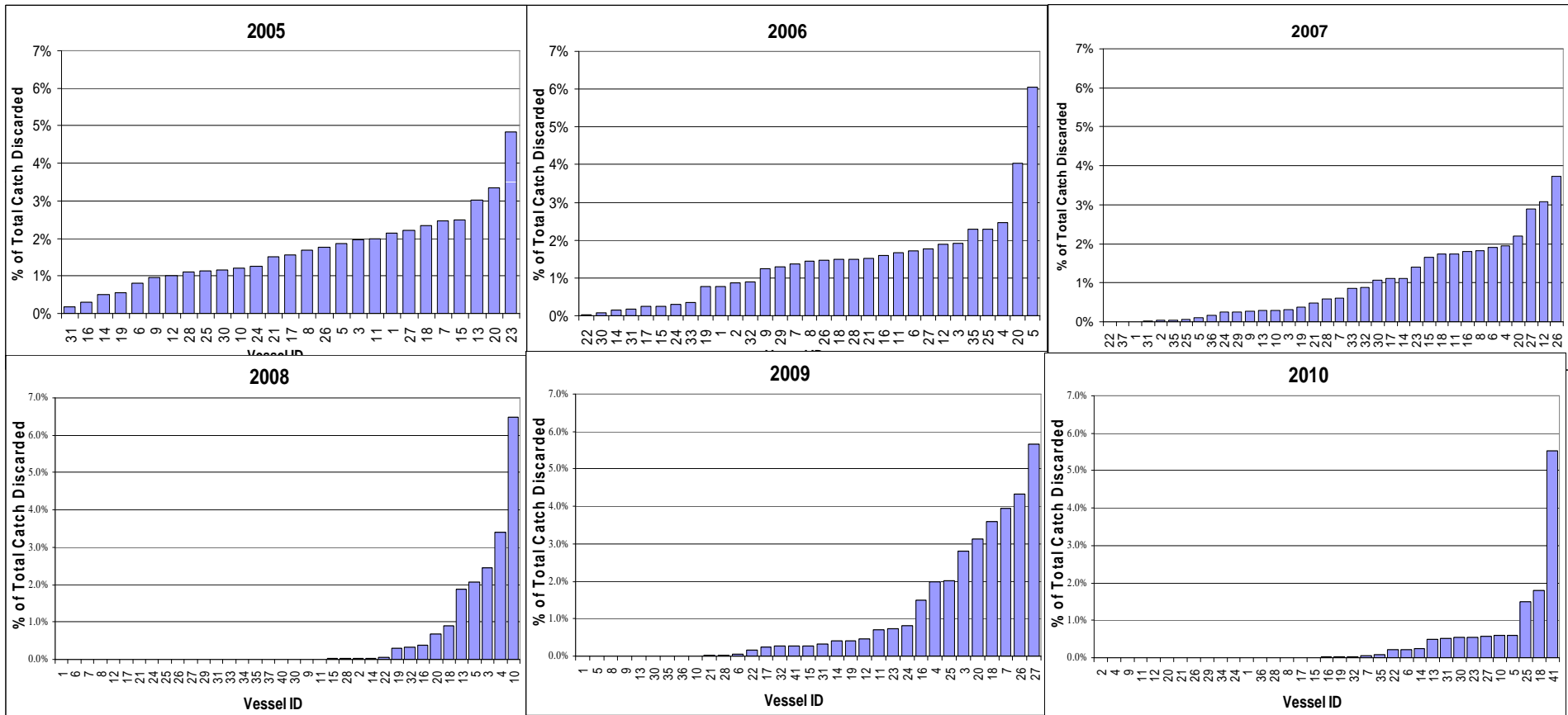


US Shore-based Whiting

- Objective
 - Maximize retention compliance
- Monitoring Approach
 - Full retention compliance
 - Census review



Discards by Vessel 2005-2010





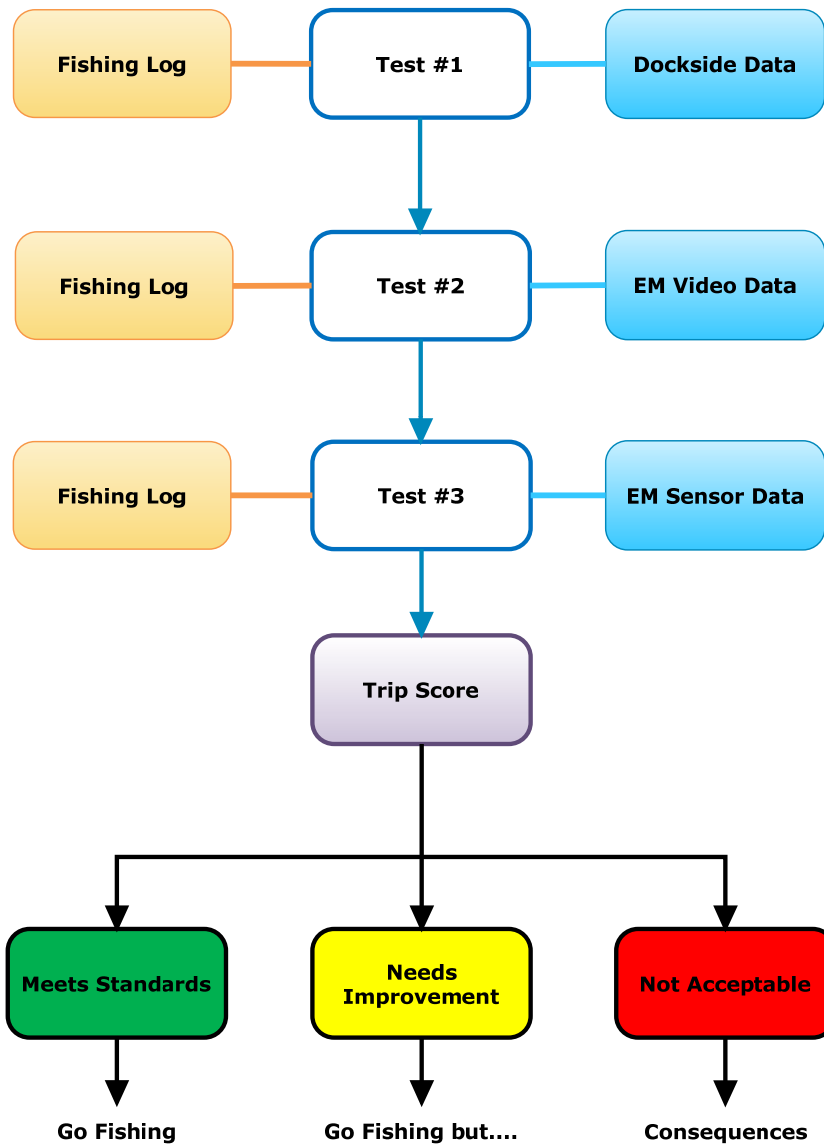
Groundfish Hook and Line, British Columbia - Rockfish

- Objective
 - Full catch accounting- Conservation concern
- Monitoring Approach
 - Full retention
 - Random sample review
 - Catch accounting of retained rockfish
 - Actual weights and piece counts at the dock



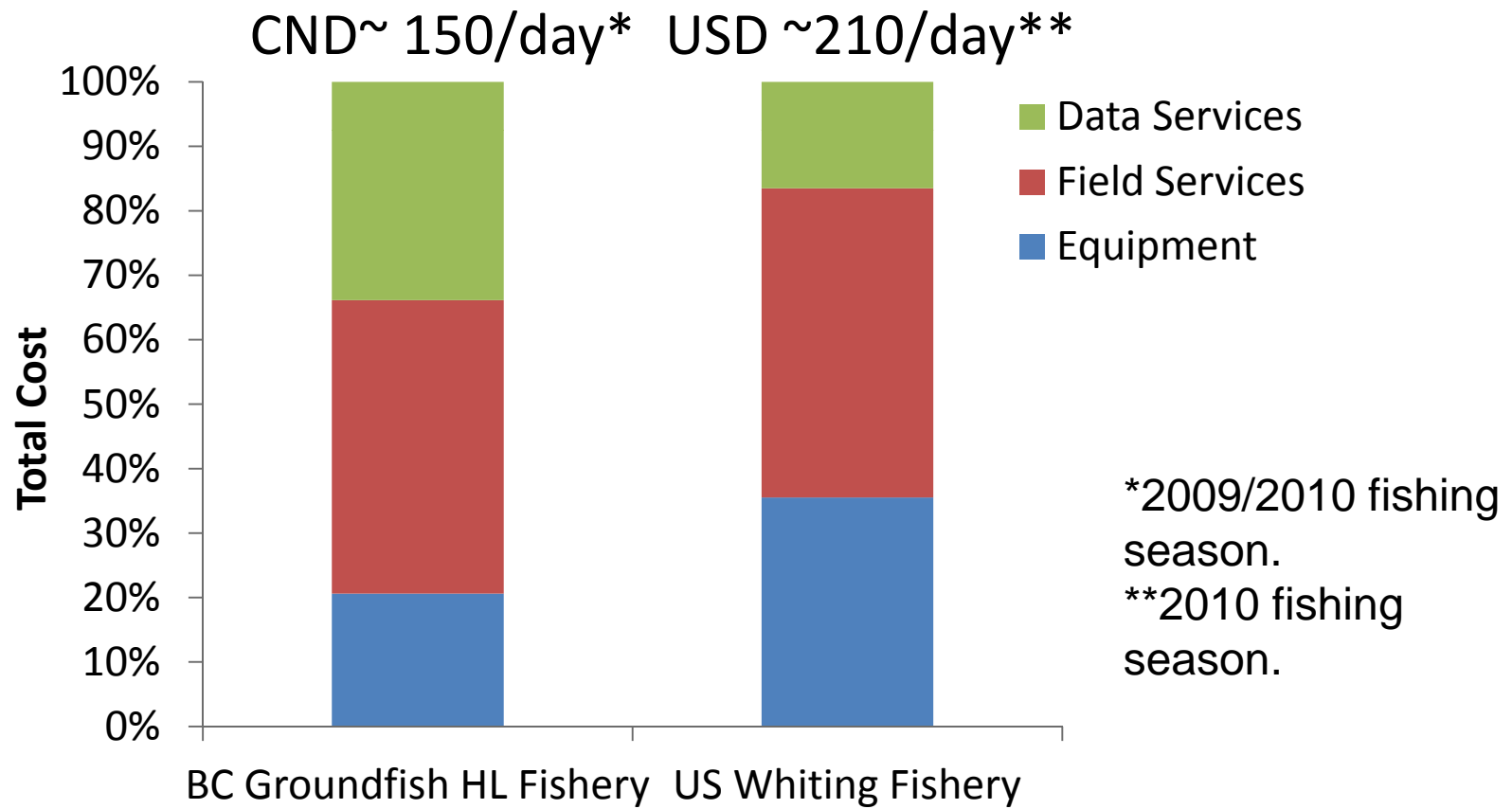
Groundfish Hook and Line, British Columbia – Quota Species (non-rockfish)

- Objective
 - Full catch accounting
- Monitoring Approach
 - Discarding allowed (some spp. with MSL)
 - Random sample review
 - Catch accounting and compared to fishing log
 - Discards from fishing log
 - Retained from dockside monitoring



		Annual Score									
		0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10
Trip Score	0-1										
	1-2										
	2-3										
	3-4				Category 3						
	4-5										
	5-6										
	6-7										
	7-8						Category 2				
	8-9										
	9-10									Category 1	

How much does it cost? – It depends





Field Services

Fishery Characteristics

- Number of Vessels
- Spatial and Temporal Fleet Distribution
- Fleet Coverage Levels

Service Requirements

- Service Locations
- Number of Technicians
- Response Requirements

Data Services

Fishery Characteristics

- Data Volume
- Number of Data Units

Service Requirements

- Analysis Requirements
- Response Timelines
- Number of Data Users



Summary

- EM can be an effective tool for bycatch assessment
- EM is not a 'Plug and Play' solution
- Successful implementation of EM requires a comprehensive planning approach
- EM can provide cost effective monitoring, but only by design!



Thanks!