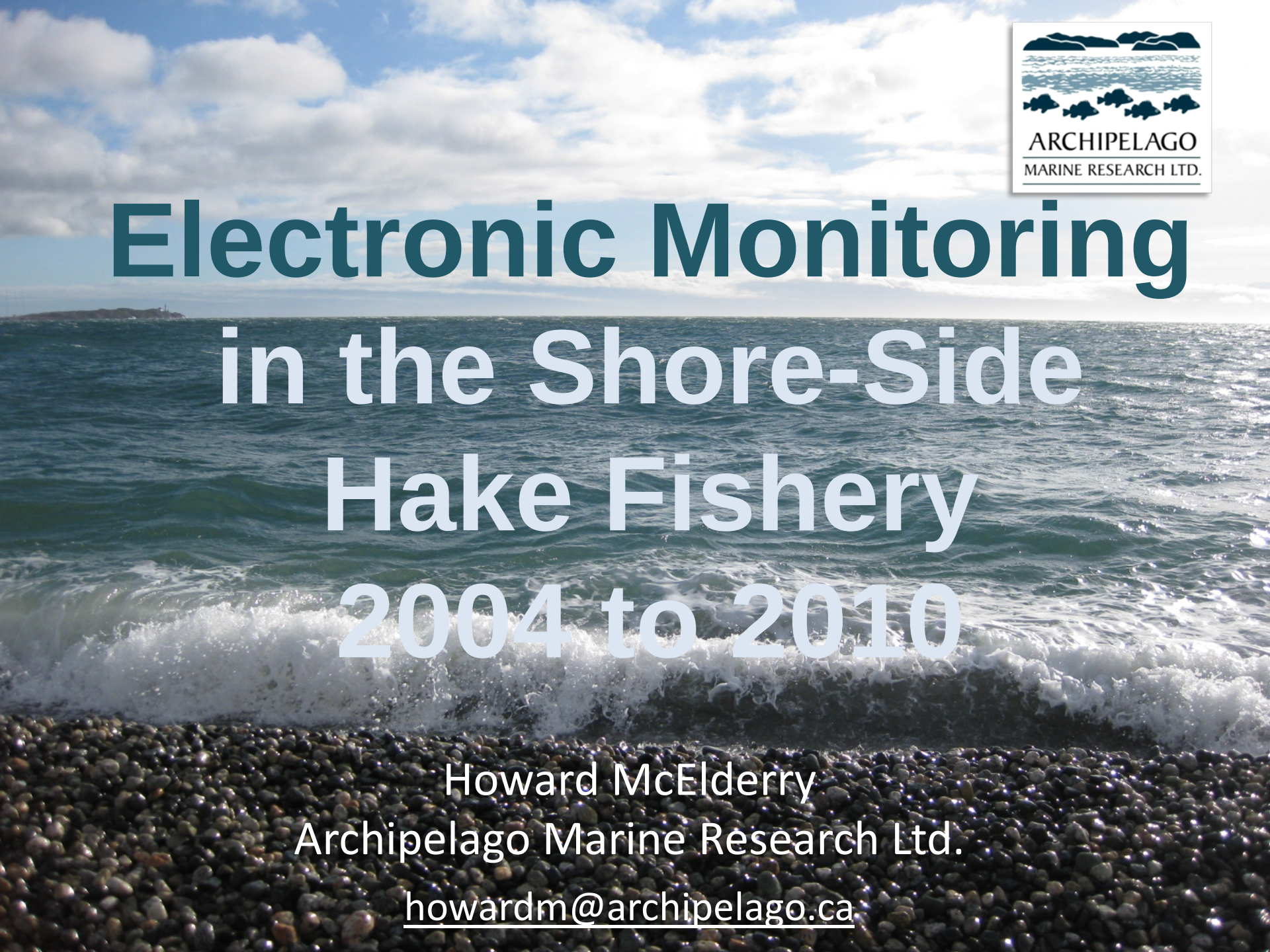

Electronic Monitoring in the Shore-Side Hake Fishery 2004 to 2010

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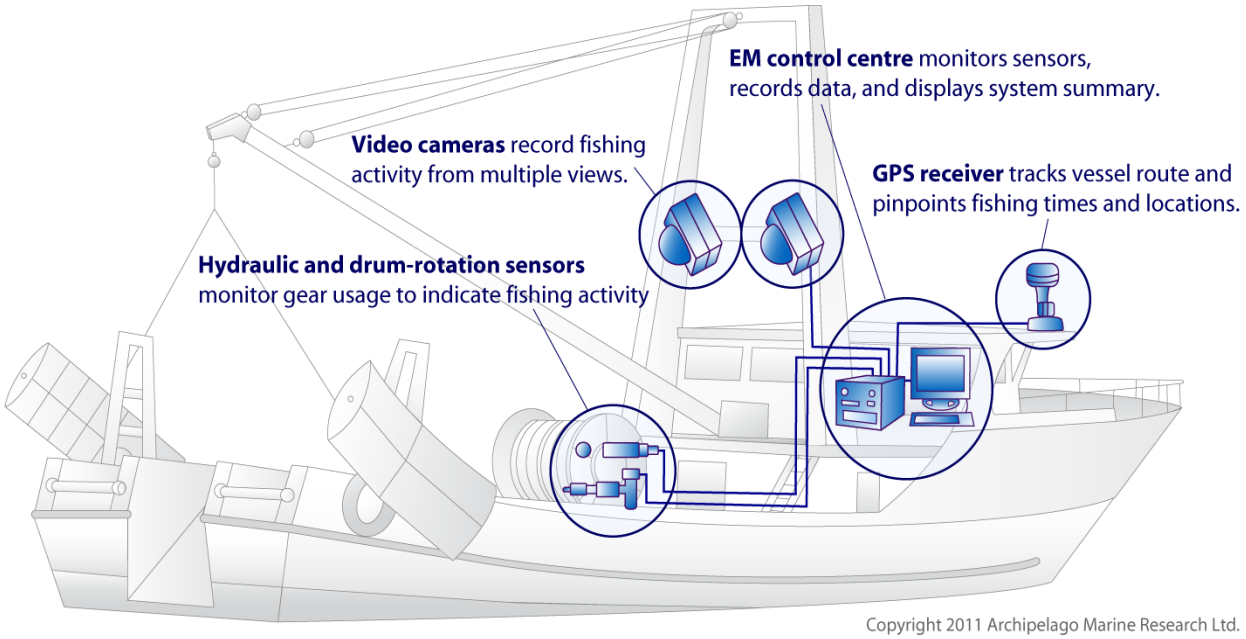
Fishery Profile

	2004	2005	2006	2007	2008	2009	2010
Vessels	24	28	35	36	36	33	35
Season Length	~60	~60	~50	~40	~150	~70	180
Catch (000's mt)			100	92	64	42	66
Fishing Trips	1,003	1,105	1,113	820	609	478	750
Fishing Events	1,762	2,013	2,197	1,796	1,248	940	1,843
Total Seadays	823	982	1,043	875	745	475	1,268
Total Hours	19,755	23,575	25,030	20,980	17,900	11,665	30,518

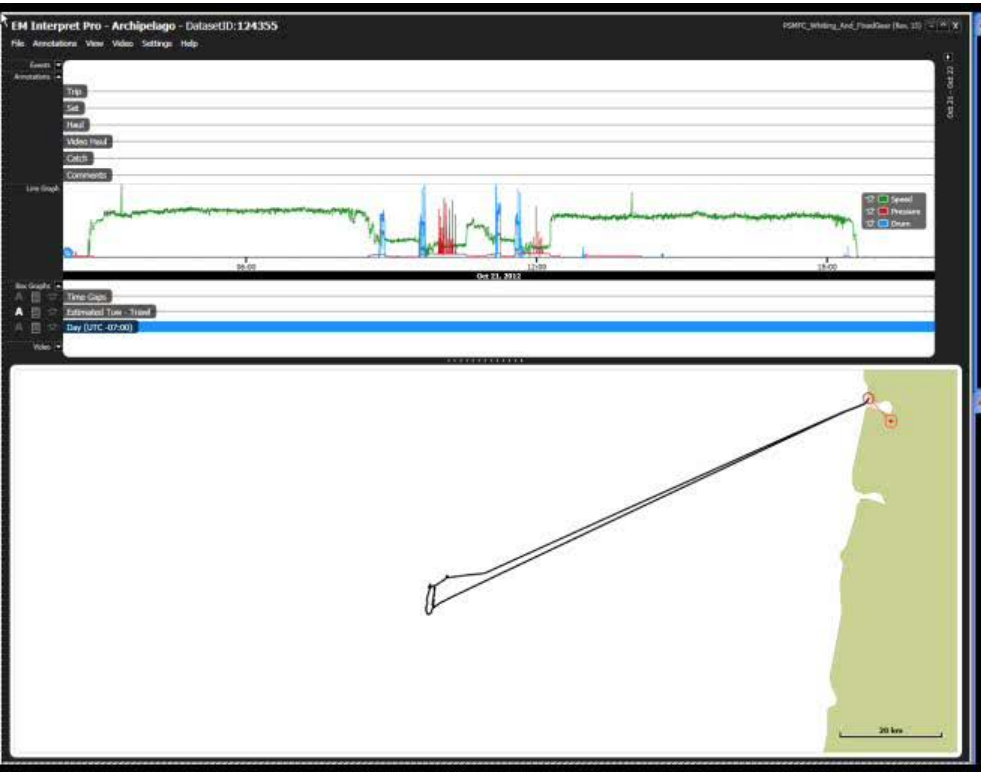
EM Program 2004-2010

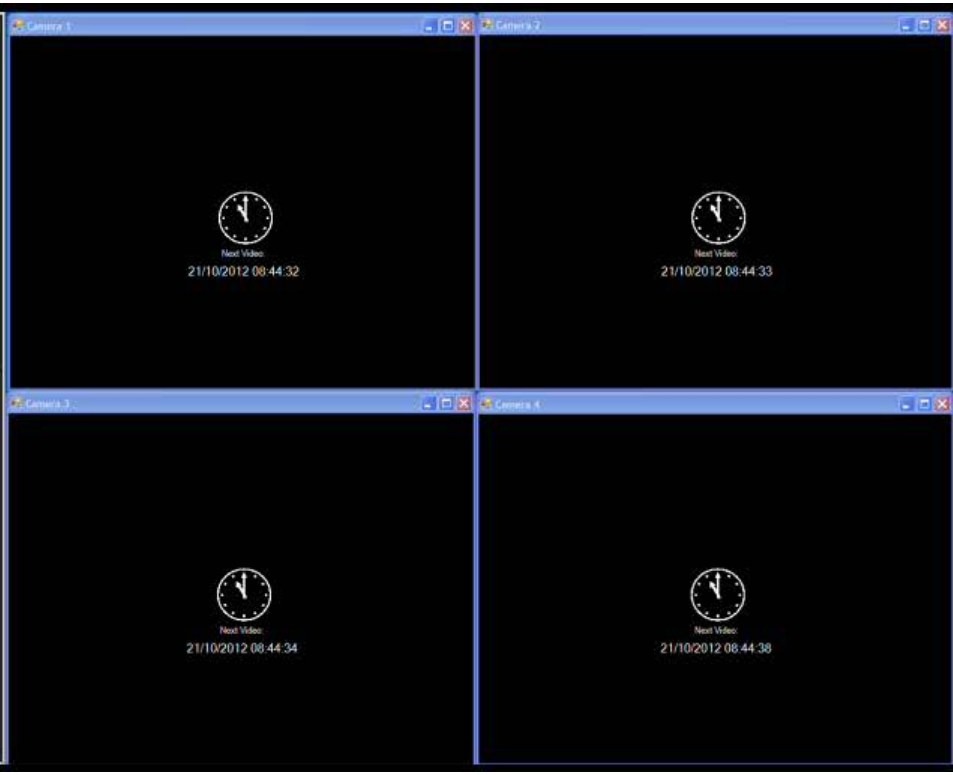
- Monitoring Objectives
  - Maximize Retention
  - Fishing Location
- Operational Components:
  - EM Systems on All Vessels Operating 24/7
  - Imagery Recorded While Fish Onboard
  - Monthly Analysis of EM Data
  - Compliance Reports to NMFS
  - Season Performance Feedback to NMFS and Fisher
- Governance
  - Regulated thru EFP
  - Funded 25:75, NOAA:Industry

At Sea EM System



Land Based Analysis Software





EM Program Deployment Operational Model

ARCHIPELAGO MARINE RESEARCH LTD.

	Design	Implementation	Operational EM Program						
Fisheries Authority	Scoping & Design	Pre-Production Program Management	Infra-structure	Outreach	Operational Program Management			Data Integration & Reporting	Project Assessment
Local Services	Support Scoping & Design	Infra-structure	Fleet Install	EM System Maintenance	Logistics	Sensor & Image Data Analysis			Support Project Assessment
Technology Provider	Scoping & Design	Program Advice & Mentoring	Operational Systems & Processes	Training & Certification	Technical Support & Upgrades	Hardware & Software			Project Assessment

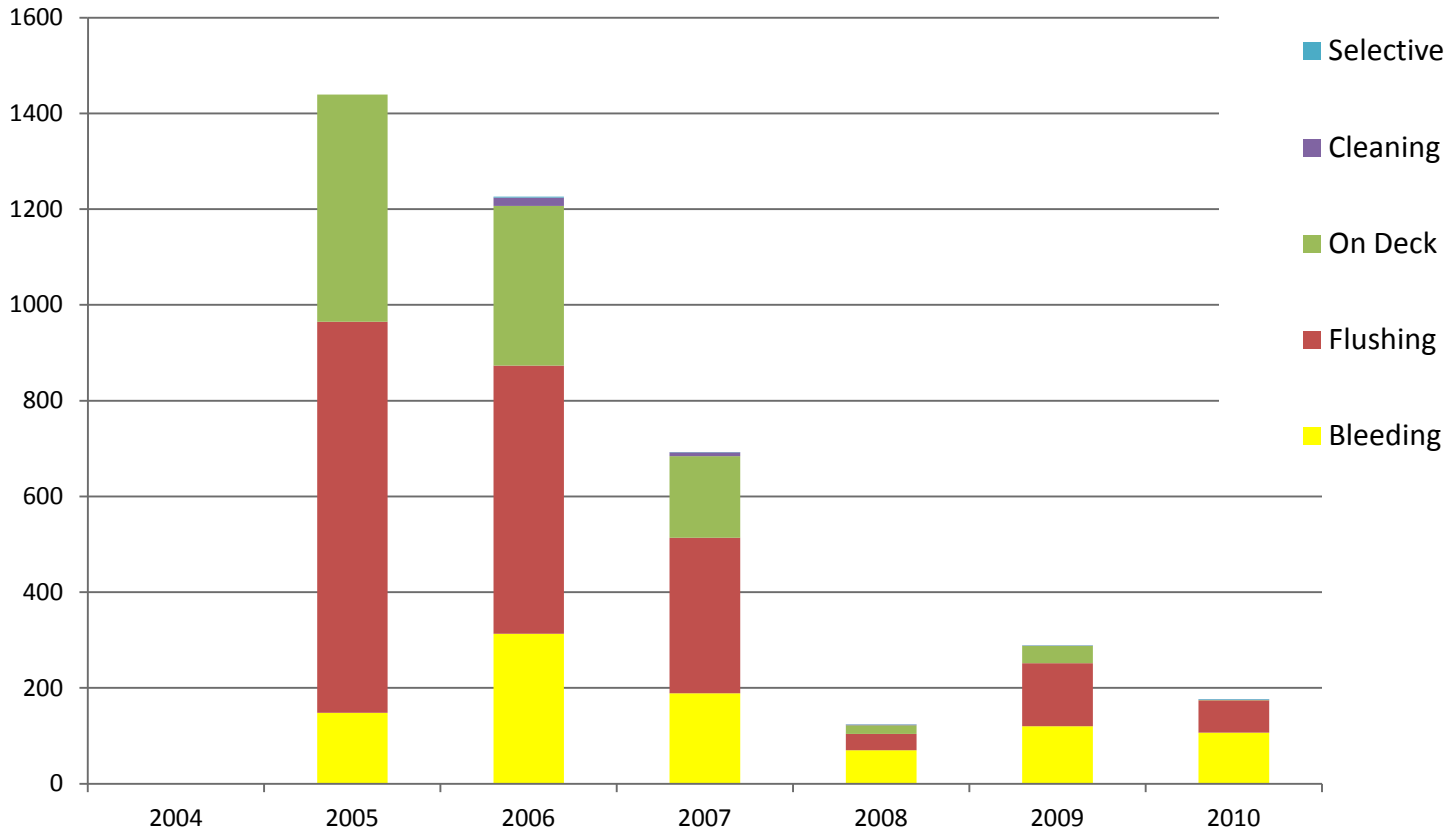
Results Summary

	2004	2005	2006	2007	2008	2009	2010
Vessels	24	28	35	36	36	33	35
Catch (000's mt)			100	92	64	42	66
Fishing Trips	1003	1105	1113	820	609	478	750
Fishing Events	1762	2013	2197	1796	1248	940	1843
EM Success	96%	98%	87%	89%	97%	99%	99%
Discard Events	327	238	367	243	52	129	76
Total Discarded	~1500	1440	1228	694	125	288	177
Avg. Discard amt		6.0	3.0	2.9	2.4	3.0	2.3

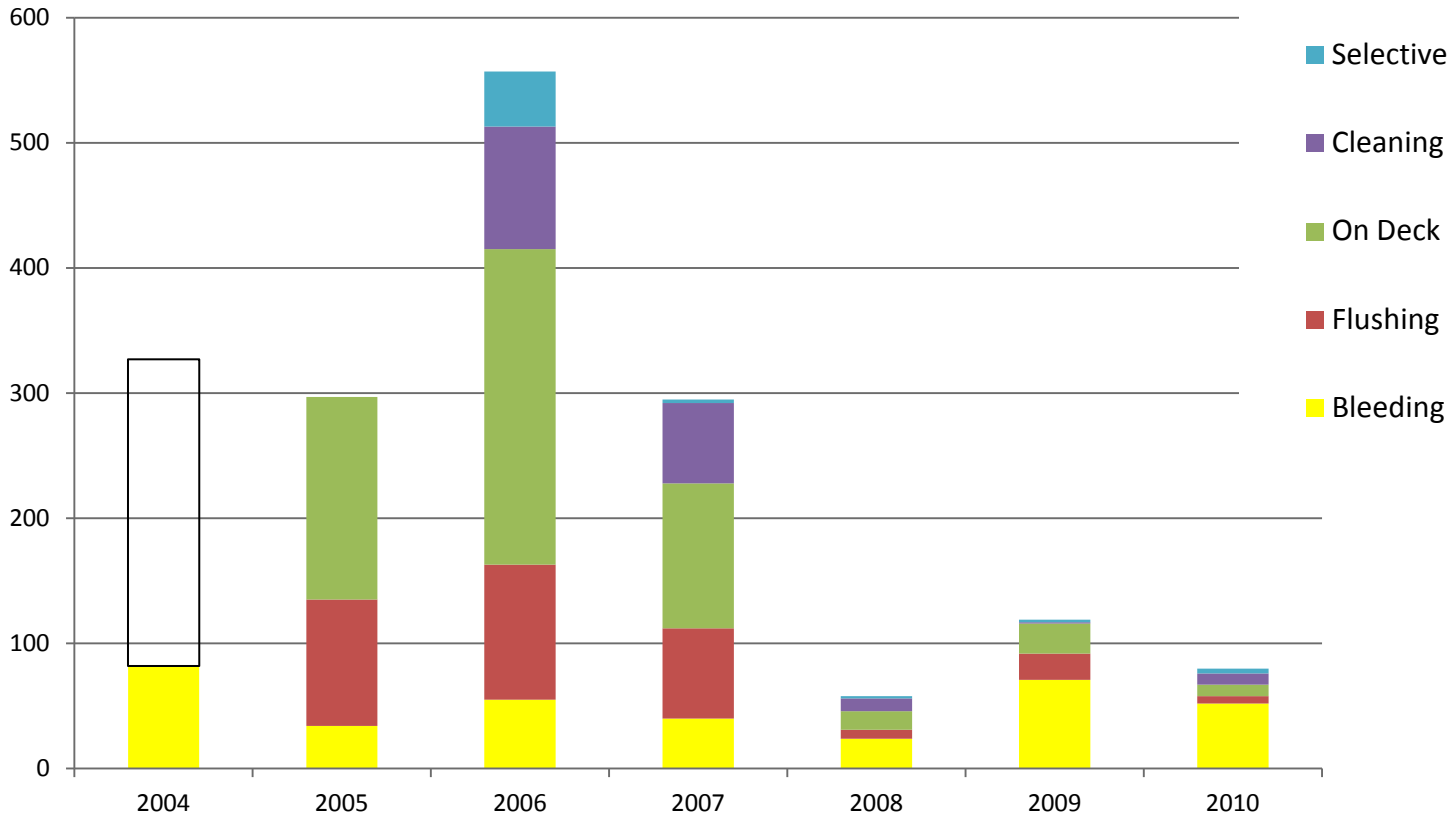
Discard Event Classification

- Selective – Selective removal of catch from deck
- Net Cleaning – Towing empty net
- On Deck – Discharging fish from deck
- Net Flushing – Discharging fish after net on board
- Net Bleeding – Discharging fish before net on board

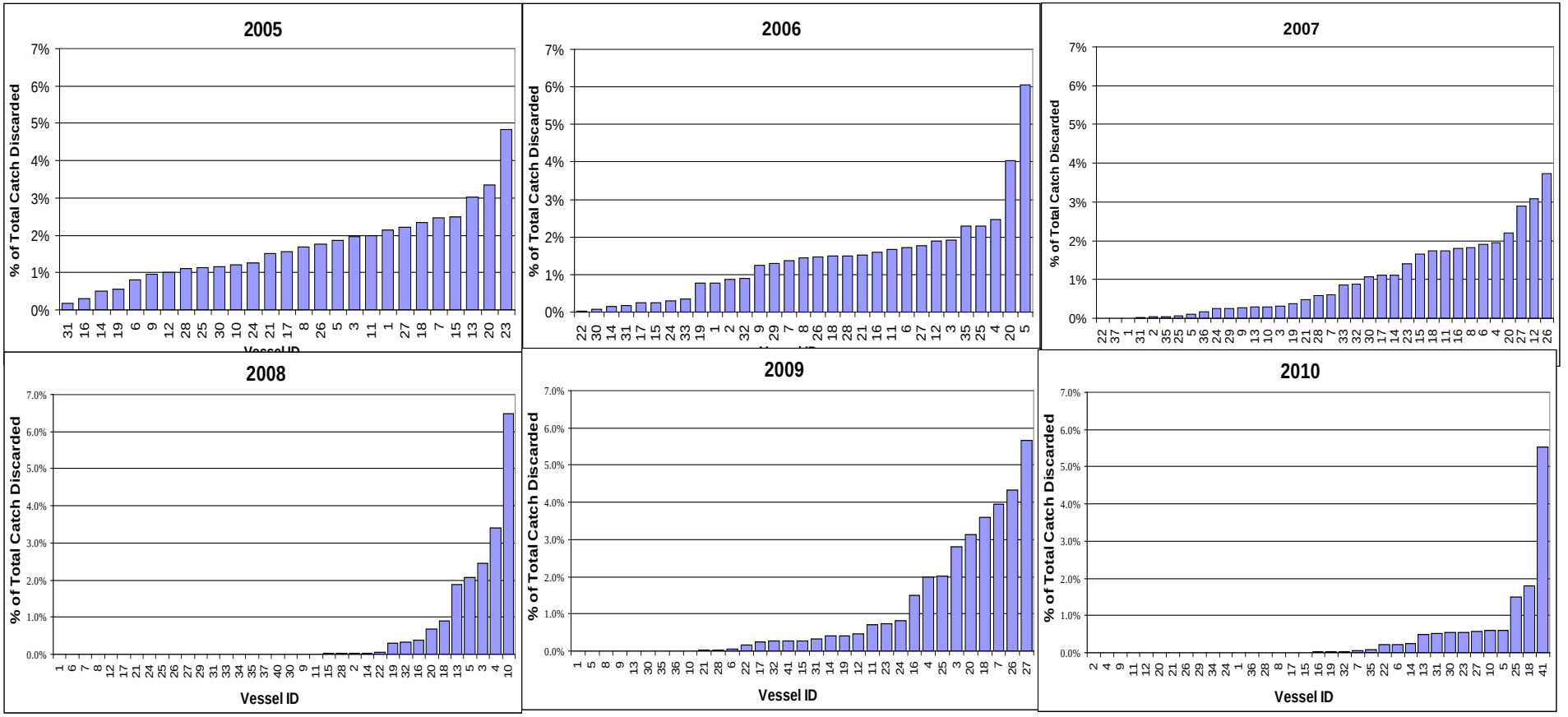
Discard Types (MT)



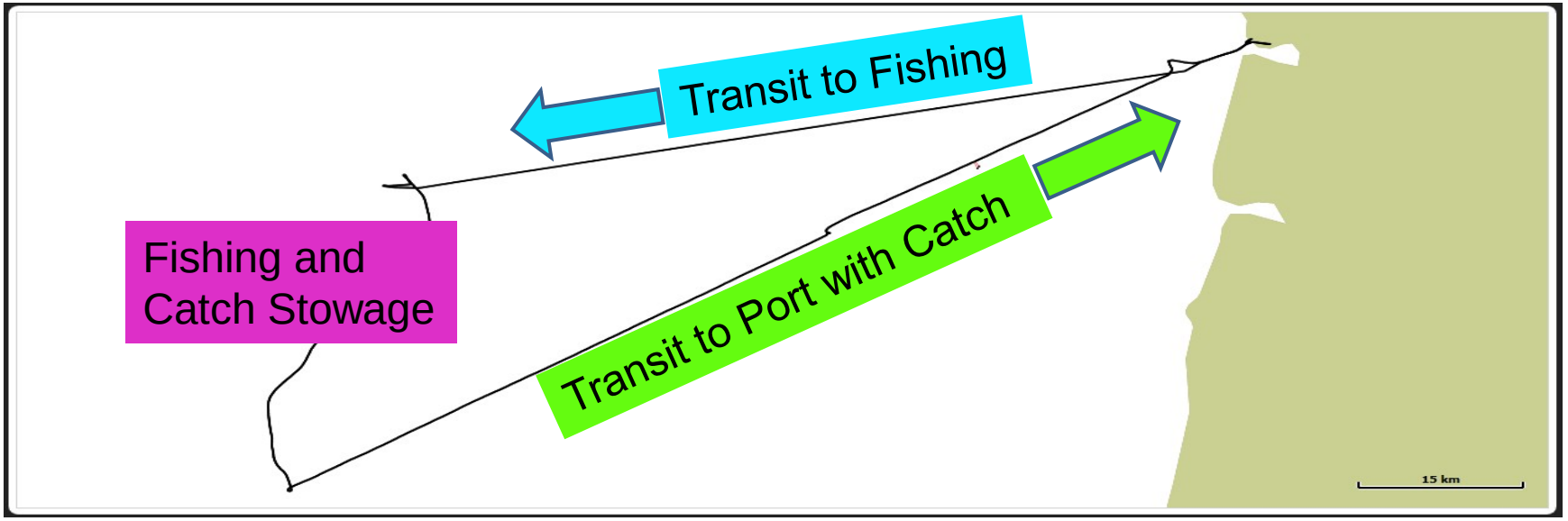
Discard Types (# Events)



Discards by Vessel 2005-2010



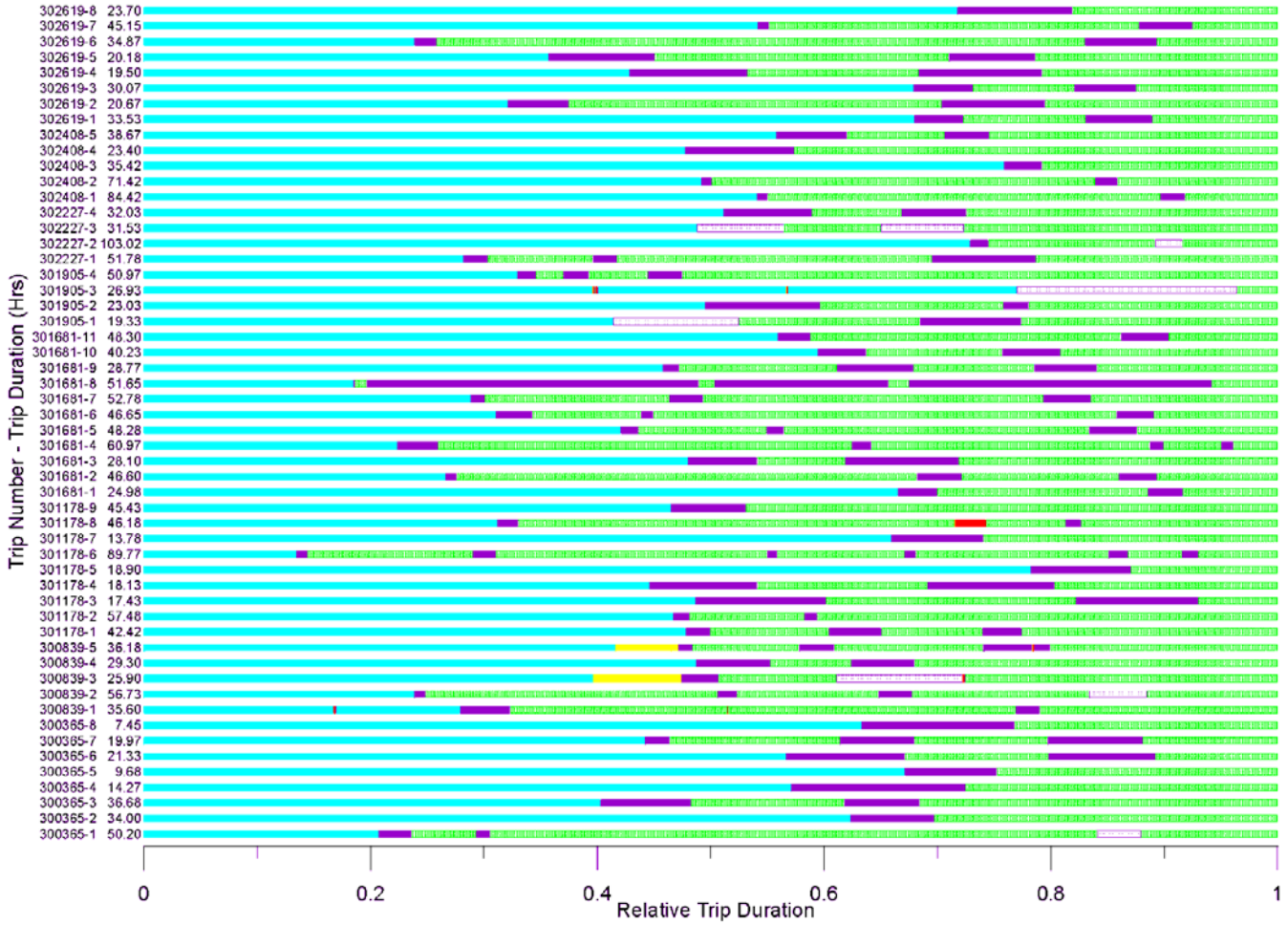
Fishing Trip Timelines



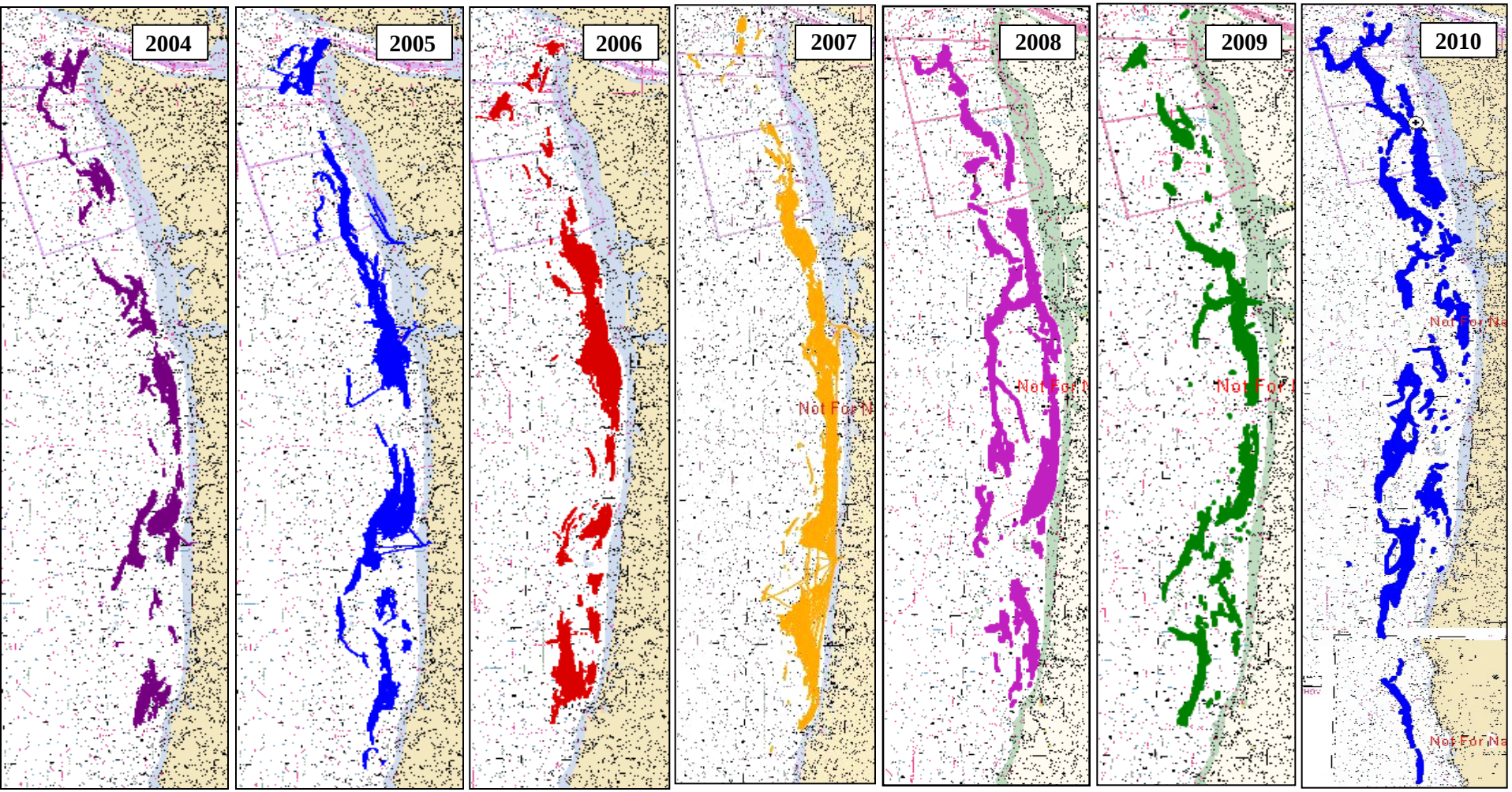
Start end

Risk Low High Moderate

Vessel Trip Timelines – Full Season



Spatial Distribution 2004-2010



Key EFP Milestones

- 2004 – ‘Full Retention’
- 2005 – ‘Maximized Retention’
- 2008 – ‘Unavoidable Discards’ – return to port.
- General trends:
  - Expanding EM ‘duty of care’ requirements
  - Expanding vessel log data quality

Key Operational Elements

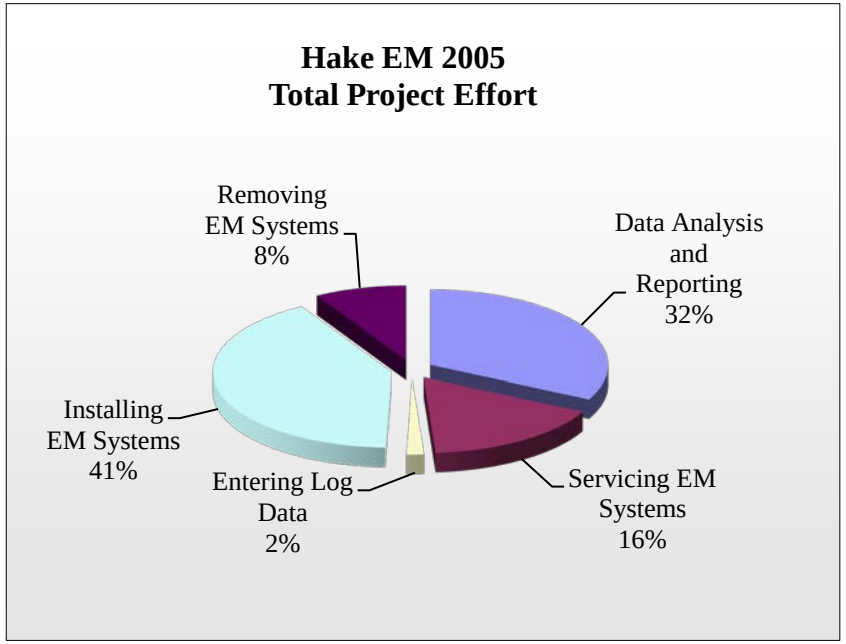
- 2004 – 2006 – Annual technical reports
- 2007 – 2010:
  - Project operations centralized
  - Compliance issues defined
  - OLE more aligned with program
  - Structured data reports
  - 100% data archiving
  - Intensified emphasis on EM Log comparison
- Regular feedback to skippers

EM Technology Developments

- Platform Transition
  - Integrated sensor and video data
  - Improved reliability
- EM Analysis Software
- Other
  - Data encryption
  - IP cameras
  - Up to 8 cameras
  - Improved sensors
  - Real time ‘Health Statement’ via satellite

Program Cost Issues

- Average cost per Seaday – $225-300
- Key Issue – No Tenure
  - Large mob/demob effort
  - Annual EM lease cost
  - Limited infrastructure
- Cost could be 30-50% lower



Summary

- EM program provided fine scale data to effectively monitor full retention compliance,
- Data set also better characterizes fishery, individualize accountability and improve rule design,
- EFP was effective for setting regulations,
- EFP and EM program together drove significant change in the fishery.


Thanks!