At-Sea Observing Using Video-Based Electronic Monitoring Technology

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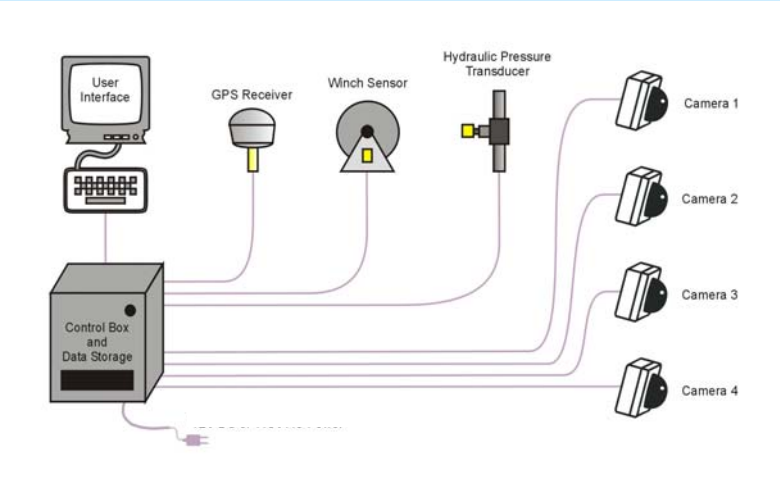
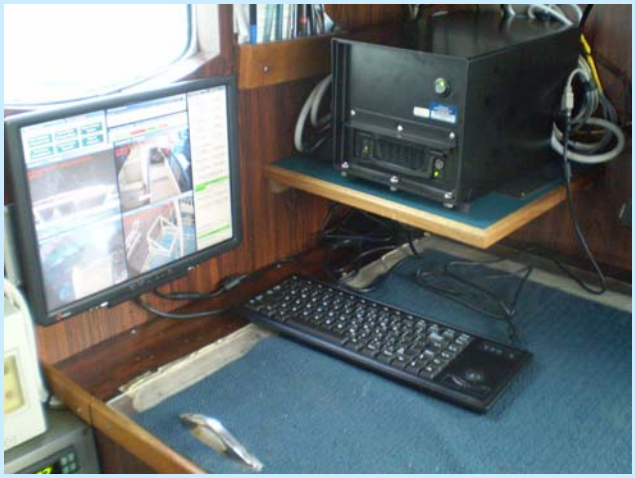
Fishery Information Toolbox

- Self Reported Data
  - Hails,
  - Logbooks,
  - Dealer reports, etc.
- Independent Monitoring
  - Landings verification - Dockside monitoring programs (DMP)
  - At-Sea Monitoring
    - Observers
    - Electronic Monitoring (EM, CCTV, eMonitoring)

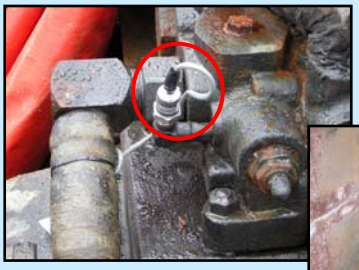
What is EM?



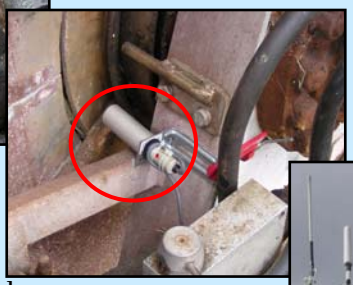
Control Box



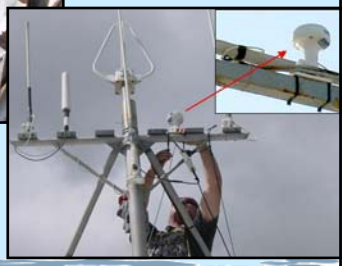
Sensors



Hydraulic
Pressure

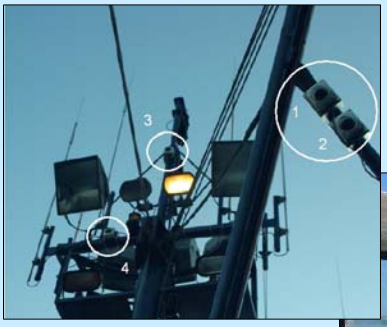


Winch
Rotation

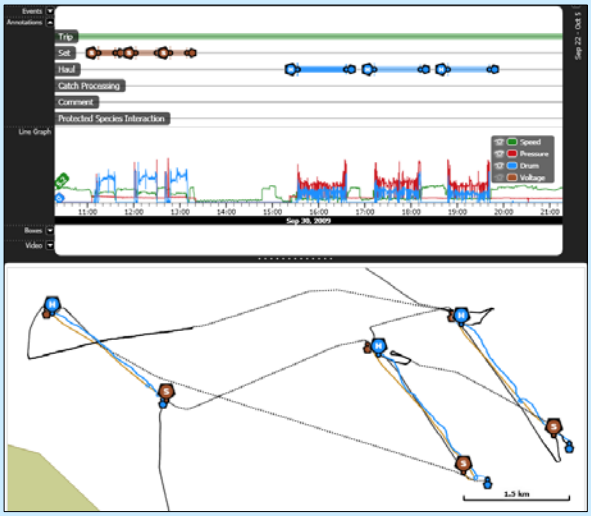


GPS

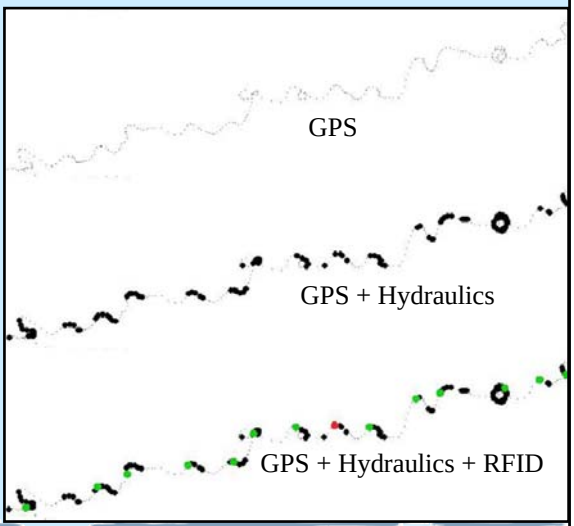
CCTV Cameras



EM Sensor Data - 1



EM Sensor Data - Crab Trap



CCTV Imagery - 1

CCTV Imagery - 2

CCTV Imagery - 3

EM System Reliability
BC Groundfish Fishery

Parameter	2006/2007	2007/2008	2008/2009	2009/2010
Number of vessels	230	230	220	202
Number of trips	1 476	1 519	1 399	1 323
Testable trips (%)				
Dockside vs. logbooks	95%	98%	98%	99%
EM sensor vs. logbooks	97%	97%	97%	100%
EM imagery vs. logbooks	88%	93%	94%	99%
Number of tests performed				
Dockside vs. logbooks	n/a	n/a	3 268	3 364
EM sensor vs. logbooks	n/a	28 457	26 176	23 423
EM imagery vs. logbooks	n/a	5 412	13 172	12 030
Total	n/a	n/a	42 616	38 817

(Source: Stanley et al., 2011)

Key Challenges with EM

- EM is not tamperproof
- Technology can fail
- Requires industry engagement
- Requires incentive framework
- Complex infrastructure requirements
- 2-3 year implementation timeline

Key Advantages of EM

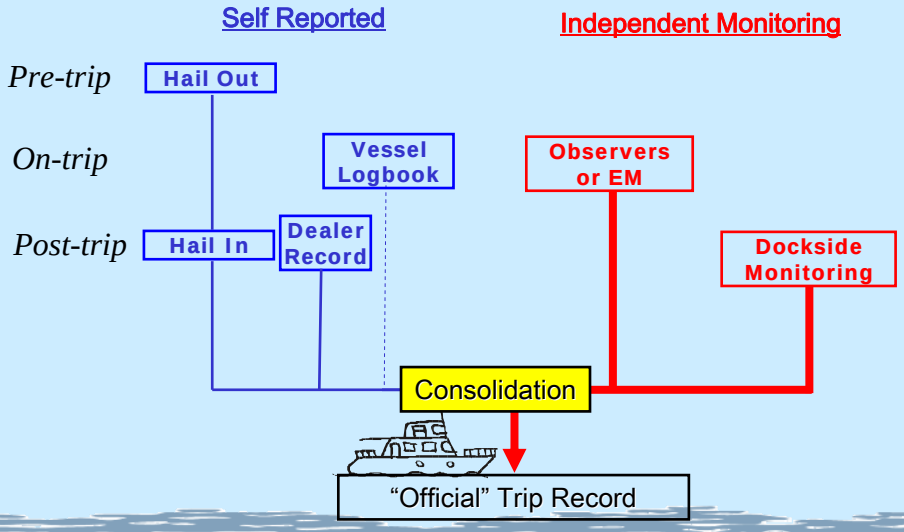
- Not limited by vessel size
- Less impacted by irregular fishing schedules
- 24/7 data collection
- Less intrusive than observers
- Less costly than observer programs
- Labor input is adjustable



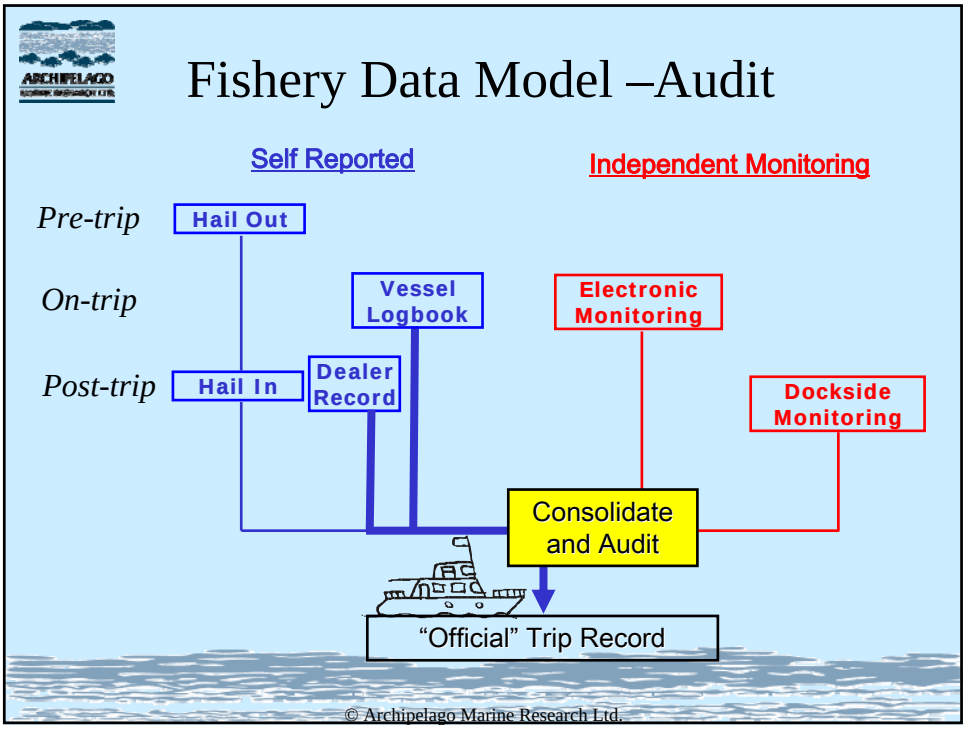
Where is EM Used?

- Pilot Studies
  - 11 years, 25 studies, 20 fisheries, 10 gears, 10 countries
- Fully Implemented EM Programs
  - Area A Crab Fishery (since 1999)
    - 50 vessels, ~1,500 days/annum
  - WC Shore Side Whiting Fishery (2004-2010)
    - 30 vessels, ~1,000 days/annum
  - BC Groundfish Hook and Line Fishery (since 2006)
    - 200 vessels, 14,000 days/annum
  - North/Baltic Sea Groundfish CQM Fishery (since 2009)
    - 140 vessels, ~15,000 days/annum

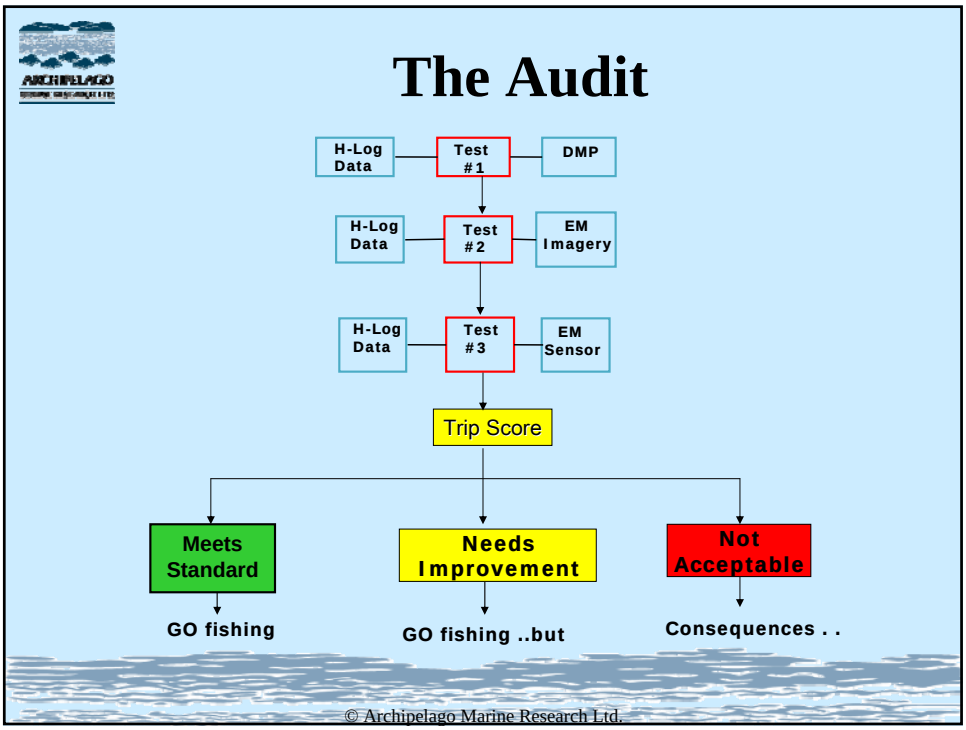
Fishery Data Model – Census



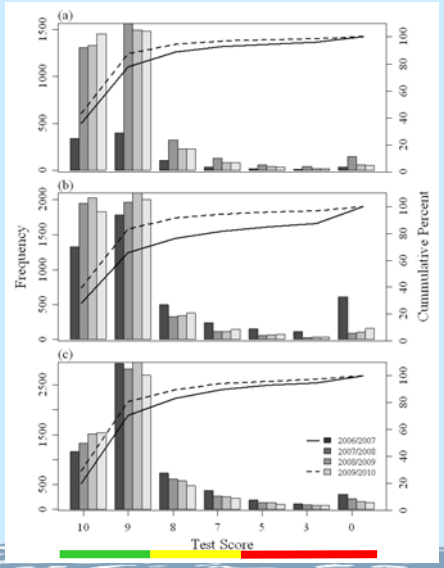
Fishery Data Model –Audit



The Audit



Audit Scores 2006 - 2009



Logbook vs DMP

Logbook vs EM (retained)

Logbook vs EM (discarded)

(Source: Stanley et al., 2011)

Conclusions

- EM is a proven, reliable technology that will more widely used
- EM and audit approach is only way to develop cost effective fishery monitoring
- Incentive systems are key to successful use of EM
- Cost of EM will decline
- EM technology will become more complex and more integrated (e.g., *e*logs, VMS, vessel data)


Thanks!