Leiðandi
vettvangur í tíu ár

Global overview of electronic monitoring in fisheries

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SJÁVARÚTVEGS
RÁÐSTEFNAN

Content of presentation

- Why are we here?
- MCS
- Discards and IUU
- What is EM?
- Ongoing EM initiatives
- Effectiveness of EM
- Cost of EM
- Pros & cones of EM

Why are we here?

Shout out to our sponsors ☺

AG-fisk (Nordic counsel of ministers working group for fisheries)

Why are we here?

Efficient fisheries management depends, among other things, on:

- Reliable data on catches and effort
- Transparency
- Respect for the management measures

- **Failure to do so can result in flawed stock assessment and subsequent overfishing.**
- **Full catch accountability, or lack thereof, affects "level playing field" among fishermen.**

- **Monitoring, Control and Surveillance (MCS) is therefore a necessary evil to facilitate efficient fisheries management.**

Monitoring, control and surveillance (MCS)

MCS is to monitor e.g.:

- Catches (catch composition and size distribution)
- Discards
- Effort
- Gear
- Geographic area

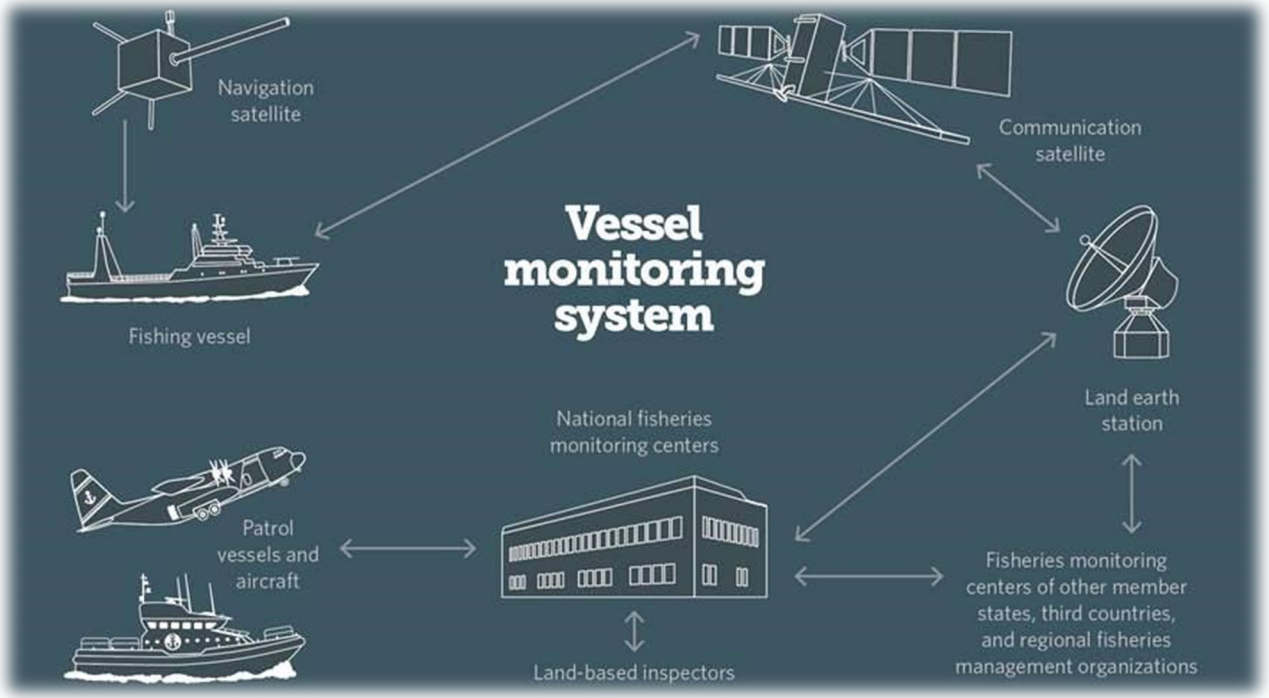


Figure: pew

Most common MCS tools in use:

- ➢ Onboard inspectors / observers
- ➢ Areal & patrol vessel surveillance
- ➢ VMS / satellite surveillance
- ➢ Self-sampling and logbooks
- ➢ Dockside monitoring
- ➢ Electronic monitoring / camera surveillance

Discards and IUU landings

Probably the biggest challenge in global fisheries are discards and IUU fisheries

- Illegal, ***unreported*** and unregulated catches estimated to be as much as 26 million tones globally (that is 30% of total catches)
- 500.000 tones of IUU fish believed to be entering EU markets
- Global discards estimated at 9,1 million tones (10,8% of total catches)
- EU discard rates prior to the implementation of the landing obligation as much as 1.7 million tons (23%)

- High level of uncertainty is unavoidable when estimating global discards.
- What is reliable data?
- FAO mentions in its report that 45% of global landings are from fisheries with few or no data on discards - "*No estimation at a fisheries level was therefore made for fisheries in these specific countries*"
- These include Iceland and Norway, as they have few data on discards.
- EU will probably be in the same category post-Landing Obligation

Discards and IUU landings

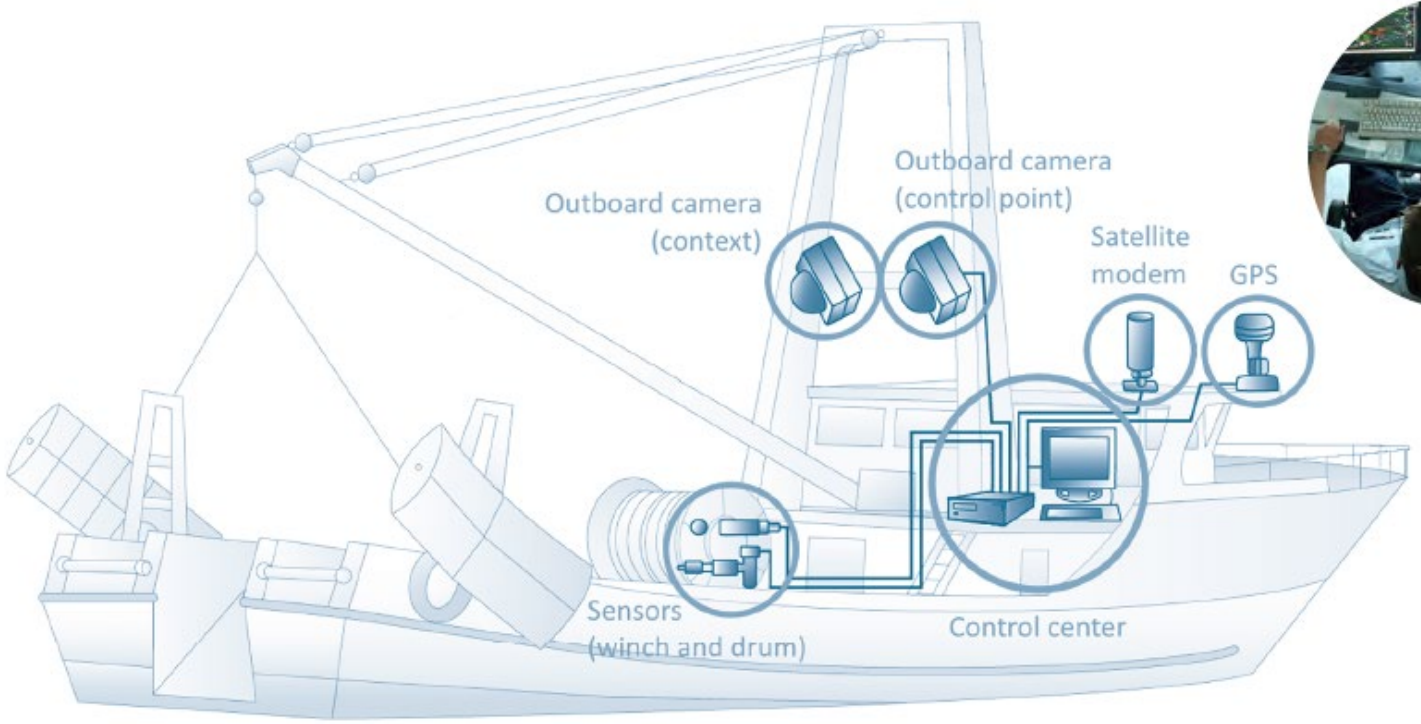
- **Unreported catches are suspected to be a problem in many Nordic and European fisheries.**
- **Level of discards in Nordic and European fisheries relatively uncertain.**

Implementation of the CFP Landing Obligation is highlighting the challenge

- When discarding was legal/obligatory the reported average discard rates were 23%
- After the implementation of the Landing Obligation there are very little unwanted catches being landed
- Landing obligation states that catches below MCRS (Minimum Conservation Reference Size) are to be landed but cannot be used for human consumption. The results are that almost no MCRS catches are being landed.
- Current MCS tools seem to be ineffective to prevent or even identify discards

What is (Remote) Electronic Monitoring?

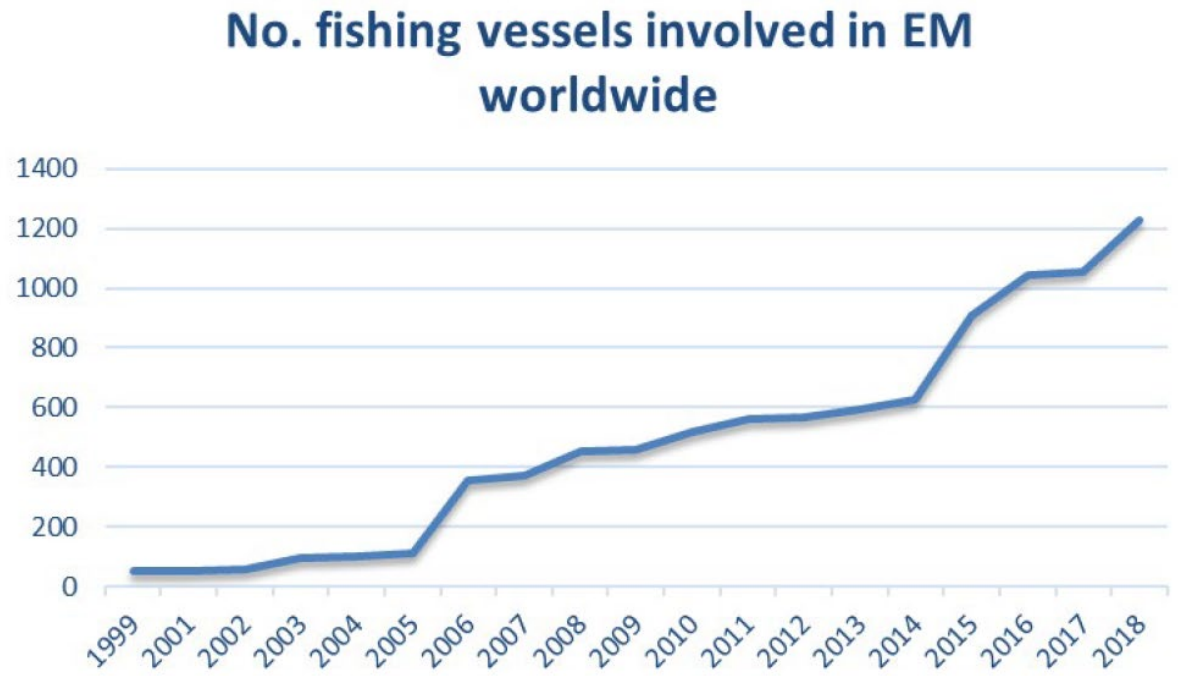
Generally speaking, electronic monitoring includes integrated on-board systems of cameras, gear sensors, video storage, and Global Positioning System (GPS) units, which capture comprehensive video of fishing activity with associated sensor and positional information.



Source: Mark Michelin et al. 2019

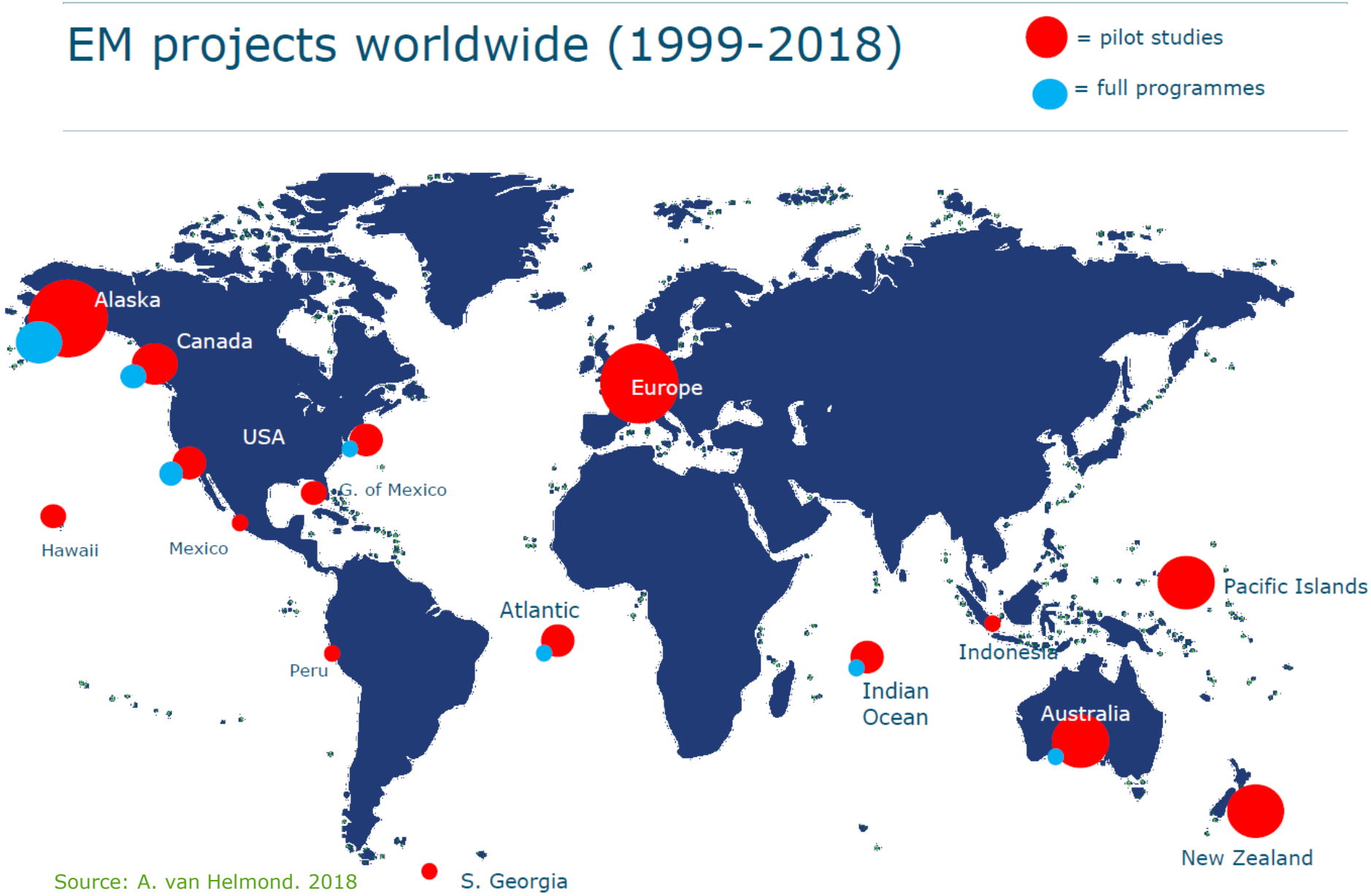
Electronic Monitoring and Camera surveillance

- 20 years since first trials of EM in fisheries (British Columbia)
- Over 1,200 systems installed today worldwide in a combination of pilots and full-fledged programs



Source: A. van Helmond. 2018

Electronic Monitoring and Camera surveillance



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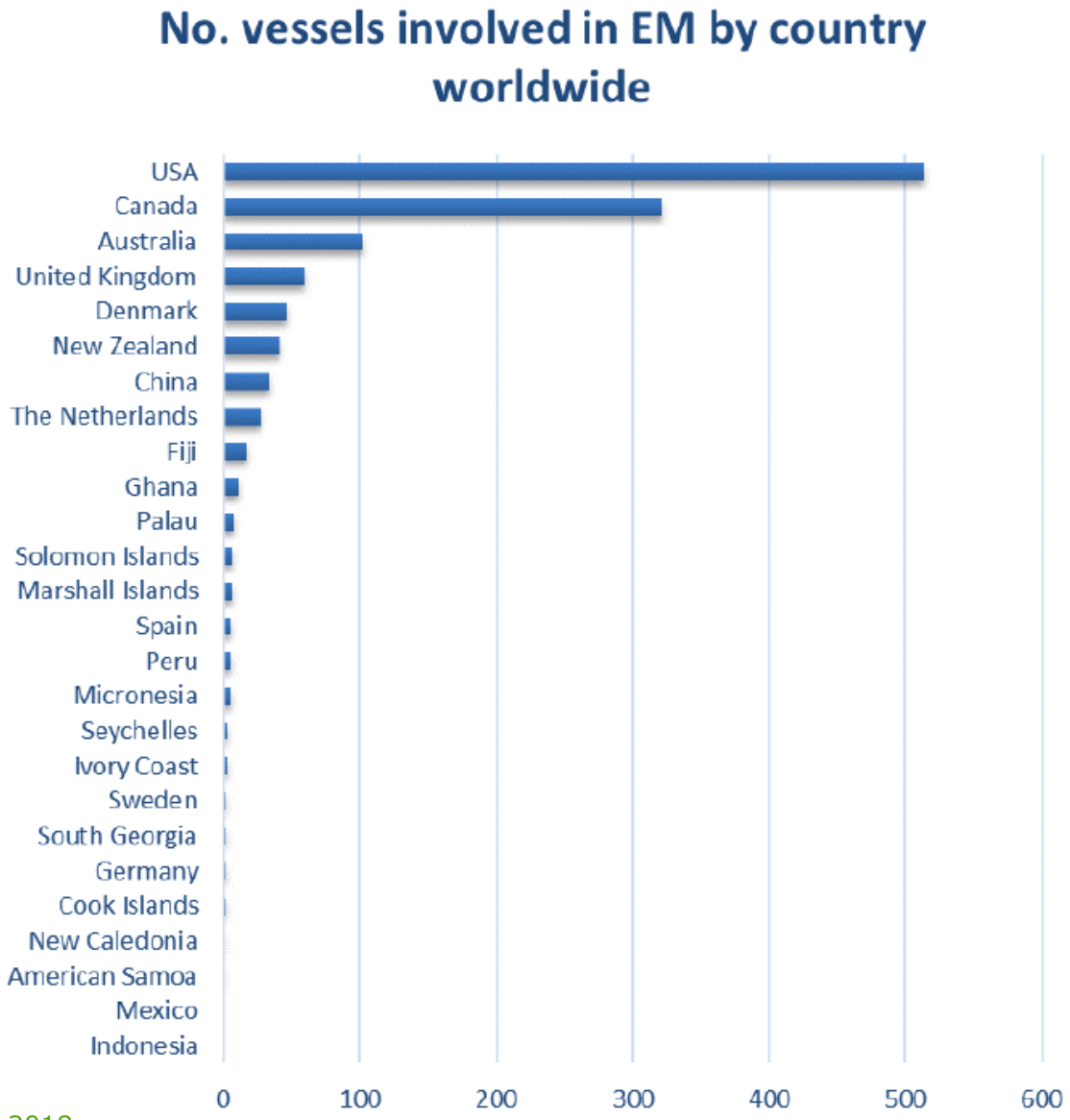
Electronic Monitoring and Camera surveillance



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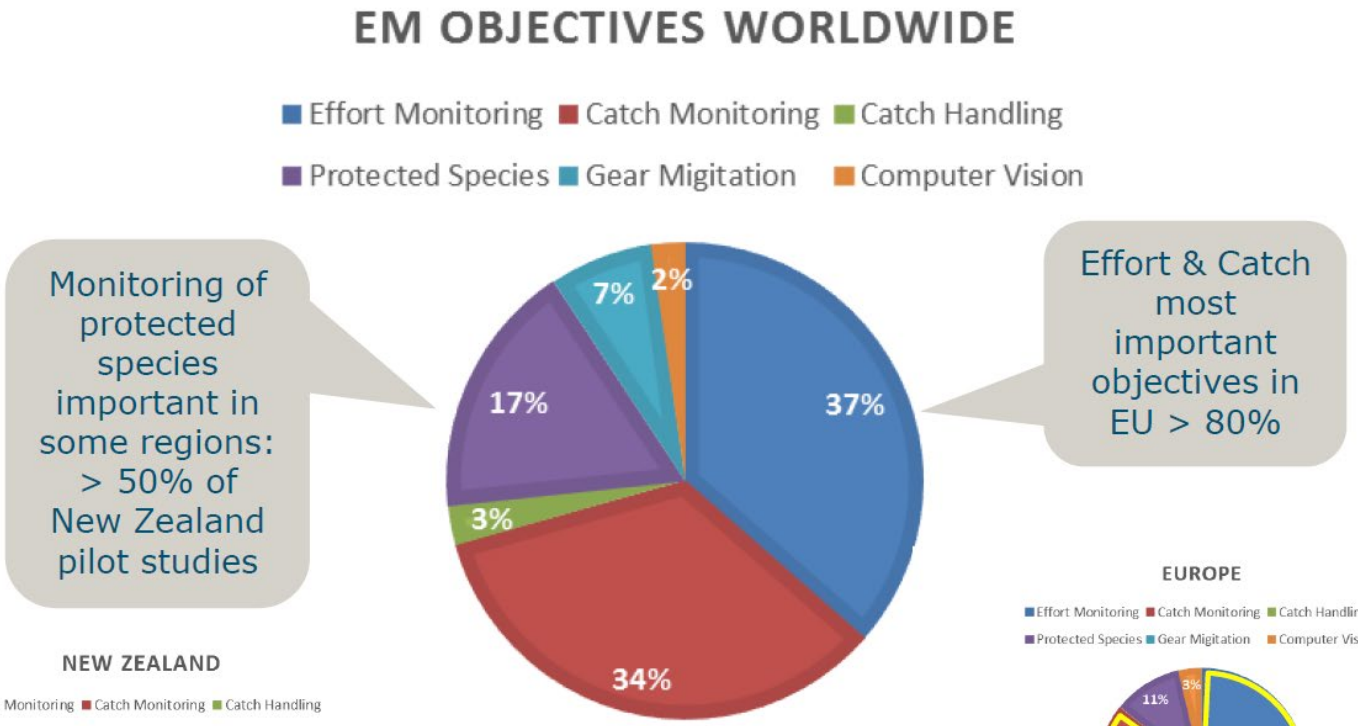
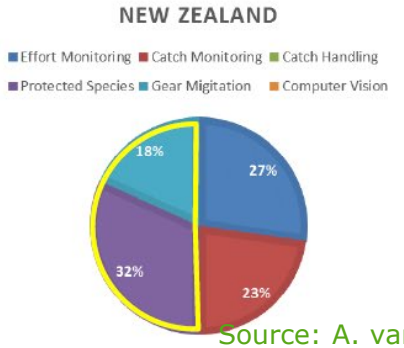
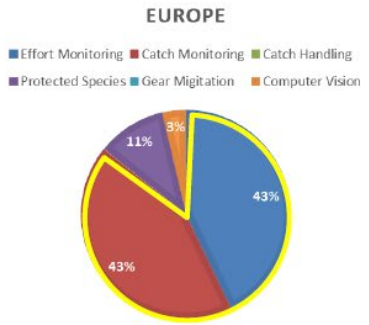
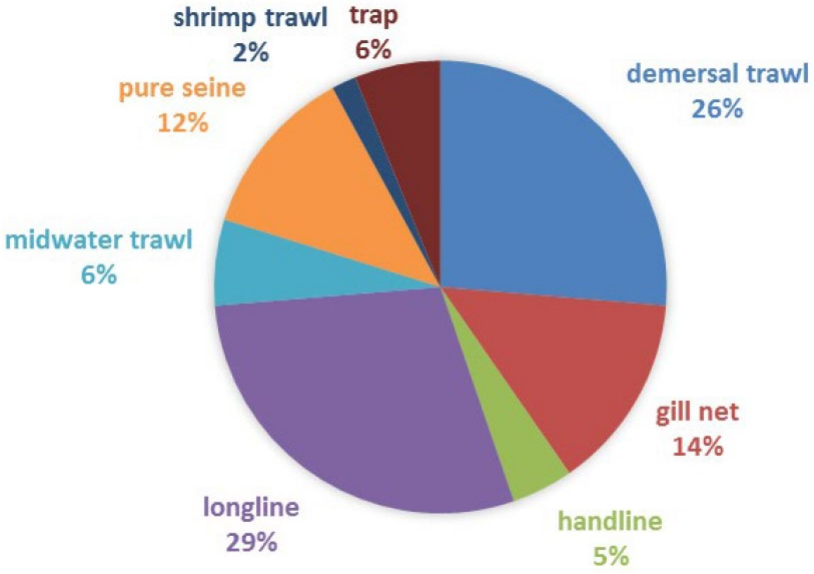
Electronic Monitoring and Camera surveillance

Effort and catch monitoring are the main objectives overall









Source: A. van Helmond. 2018

Electronic Monitoring and Camera surveillance

Wide range of different fisheries

Source: A. van Helmond. 2018

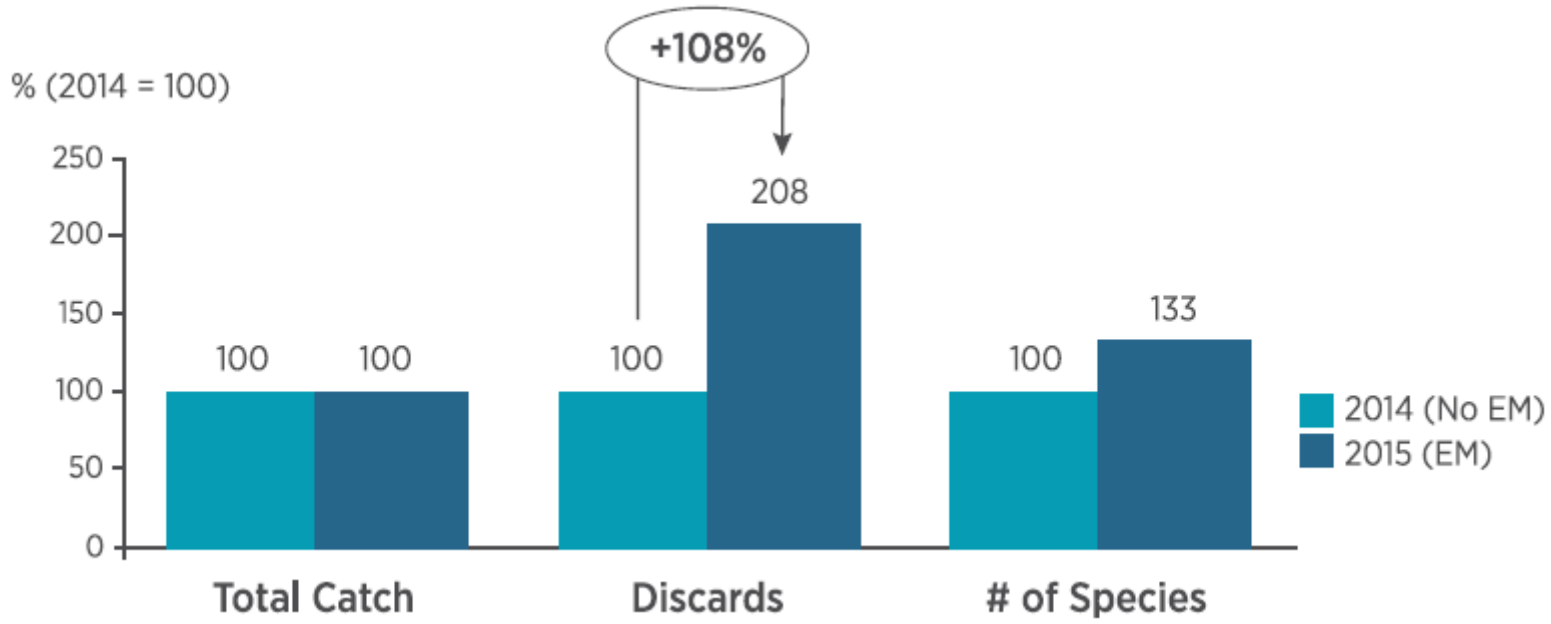
Electronic Monitoring and Camera surveillance

Wide range of different objectives

Source: A. van Helmond. 2018

Electronic Monitoring and Camera surveillance

Example from Australia: Comparison of reported landings, discards, and number of different species caught pre- and post-EM in Australia

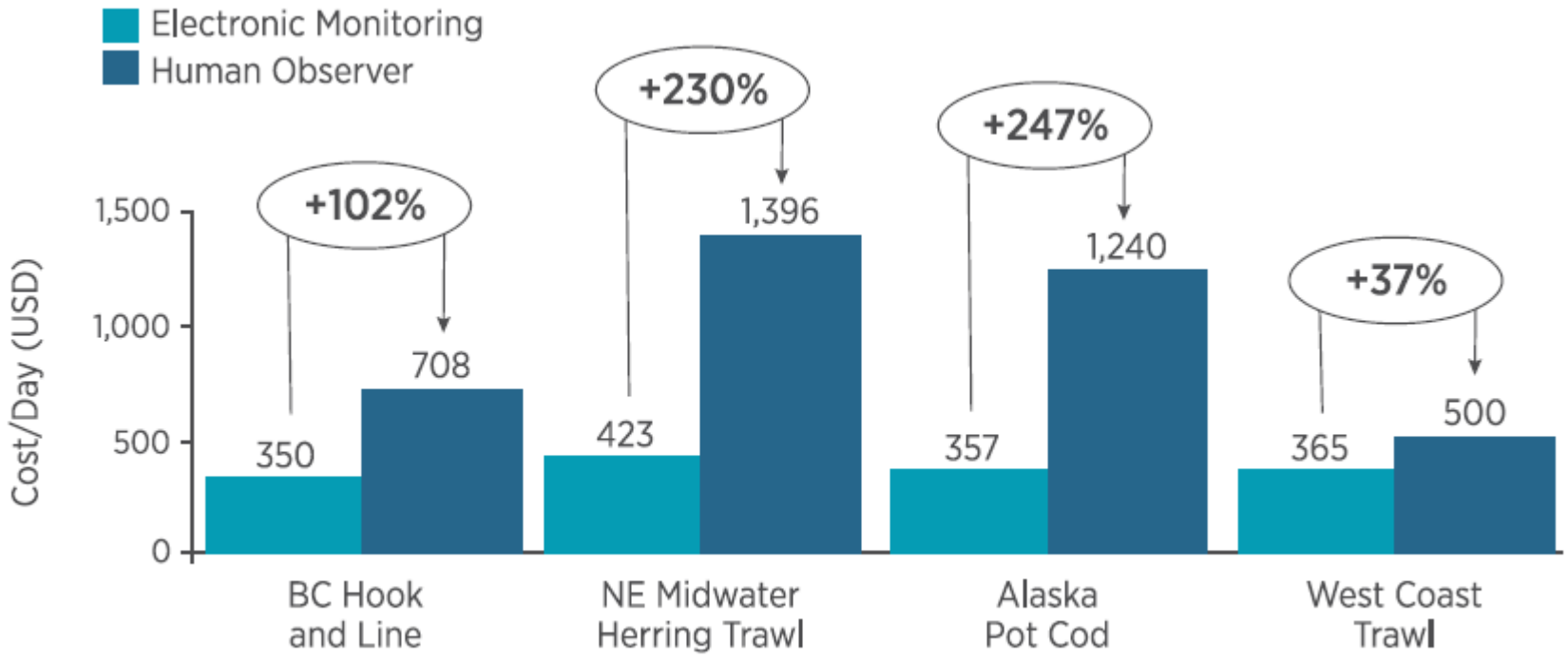


Source: Mark Michelin et al. 2019

Electronic Monitoring and Camera surveillance

What does it cost?

Cost of monitoring with EM versus 100 percent at-sea observers

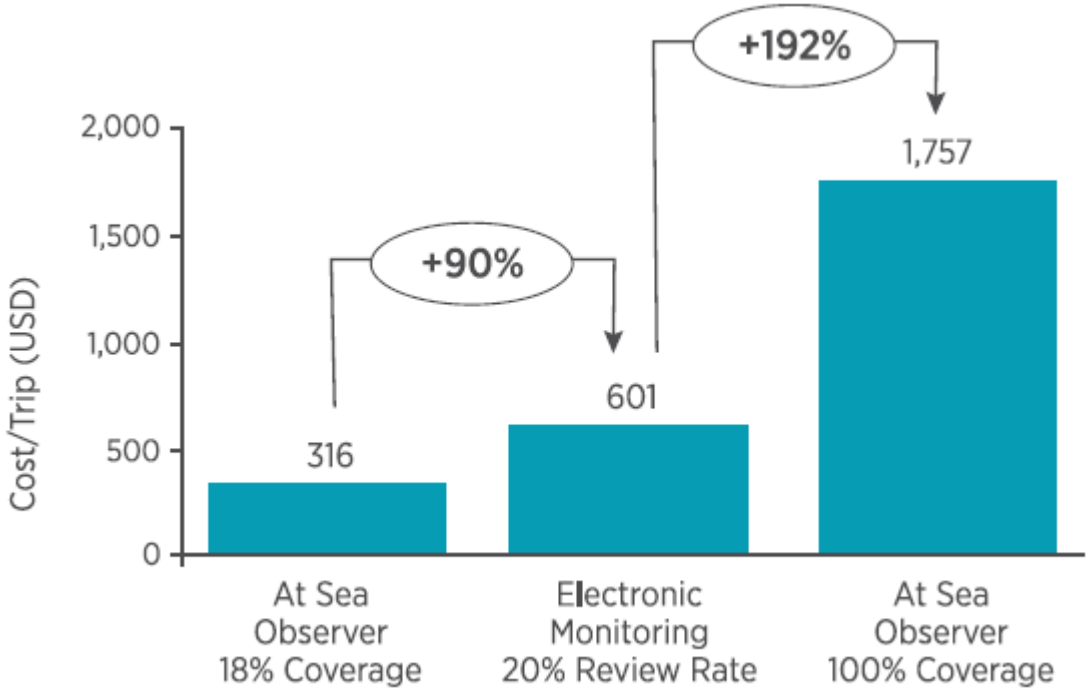


Source: Mark Michelin et al. 2019

Electronic Monitoring and Camera surveillance

What does it cost?

Cost of monitoring in the New England Groundfish fishery with at-sea observers and electronic monitoring.



Source: Mark Michelin et al. 2019

Electronic Monitoring and Camera surveillance

What does it cost?

Examples from the New England groundfish fishery, New Zealand mixed fisheries, Marshall Islands tuna longline fishery, US west coast groundfish fishery and Danish bottom trawl fishery suggest that initial investment is about 10.000 EUR on average per vessel and that annual running cost is around 5.000 EUR

	Average cost pr. Vessel	
Equipment + installation	8.000 EUR	1.104.000 ISK
Common cost + training	2.000 EUR	276.000 ISK
Running cost - video audit	2.000 EUR	276.000 ISK
IT support	2.000 EUR	276.000 ISK
Other	1.000 EUR	138.000 ISK
	15.000 EUR	**2.070.000 ISK**

Source: Mark Michelin et al. 2019

Pros and cons of EM

- In theory 100% coverage
- Species identification and length distribution can be done by onshore based analysis
- GPS signals included
- No self-interest in data (no bias in data)
- Relatively inexpensive in comparison with other alternatives and coverage

- Only allows for visual analysis (e.g. biological data such as stomach content, otoliths, fin clippings etc. not an option)
- Considerable initial cost (who to pay for that?)
- Significant IT maintenance and support needed
- Still a need to watch the footage (computer vision?)
- Privacy issues

Thanks – any questions?