

# Workshop on electronic technologies for fisheries

## Part II: Electronic Monitoring Systems

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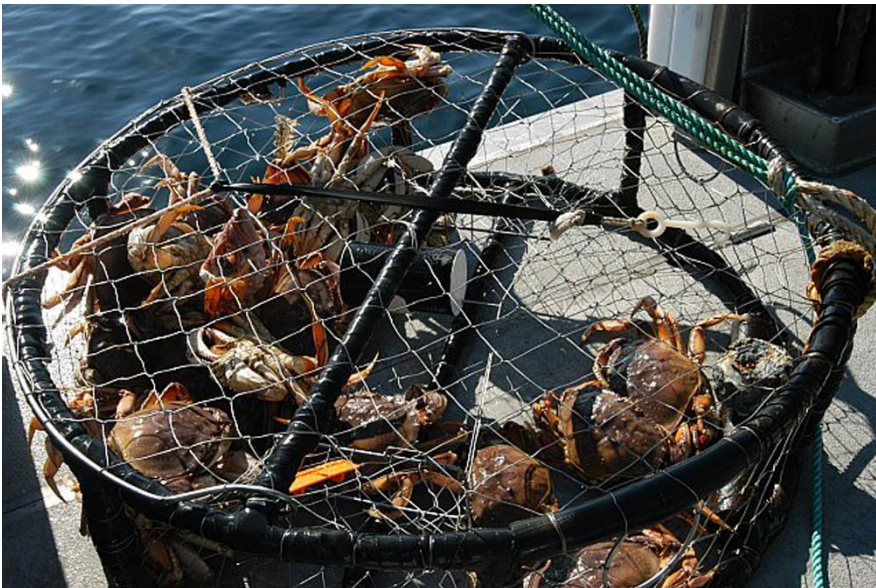
# Structure of the Presentation

- 1. History of Electronic Monitoring**
- 2. Technology of Electronic Monitoring**
- 3. State of play of Electronic Monitoring**
- 4. European Electronic Monitoring trials**
- 5. Conclusions and Recommendations**

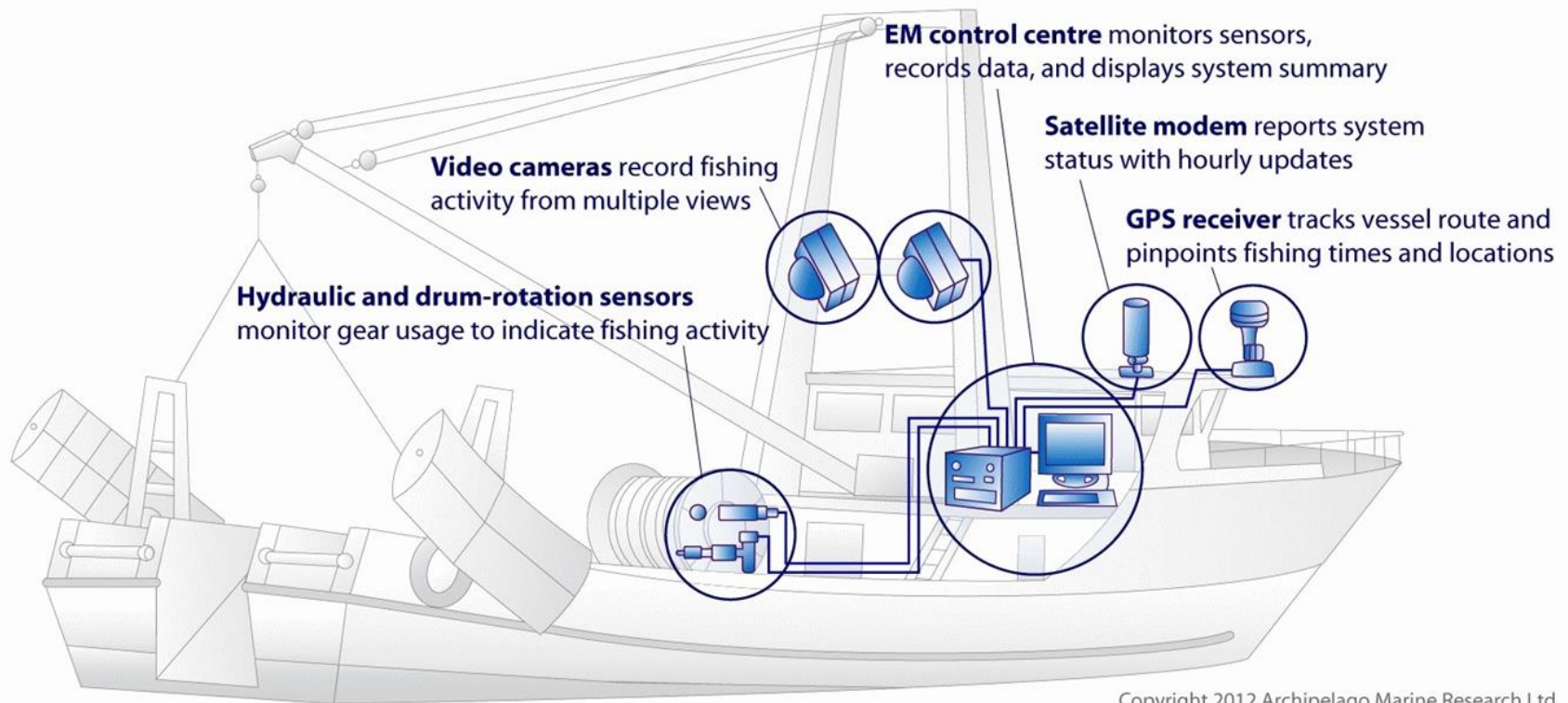
# 1. Historic background of EM

## Video recording in Fisheries

- British Columbia
  - Crab fishery in 1999: Trap limits and gear theft
  - Groundfish longline, early 2000's: **catch recording**

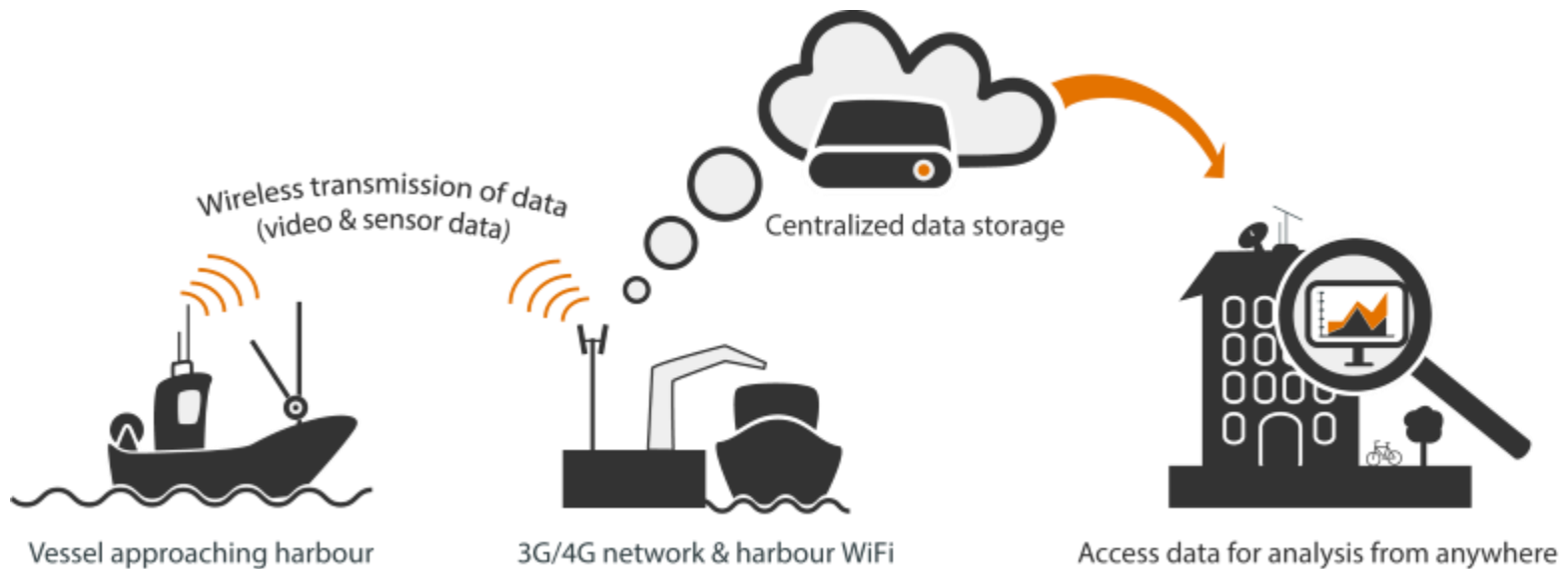


## 2. Technology of EM Systems (1)



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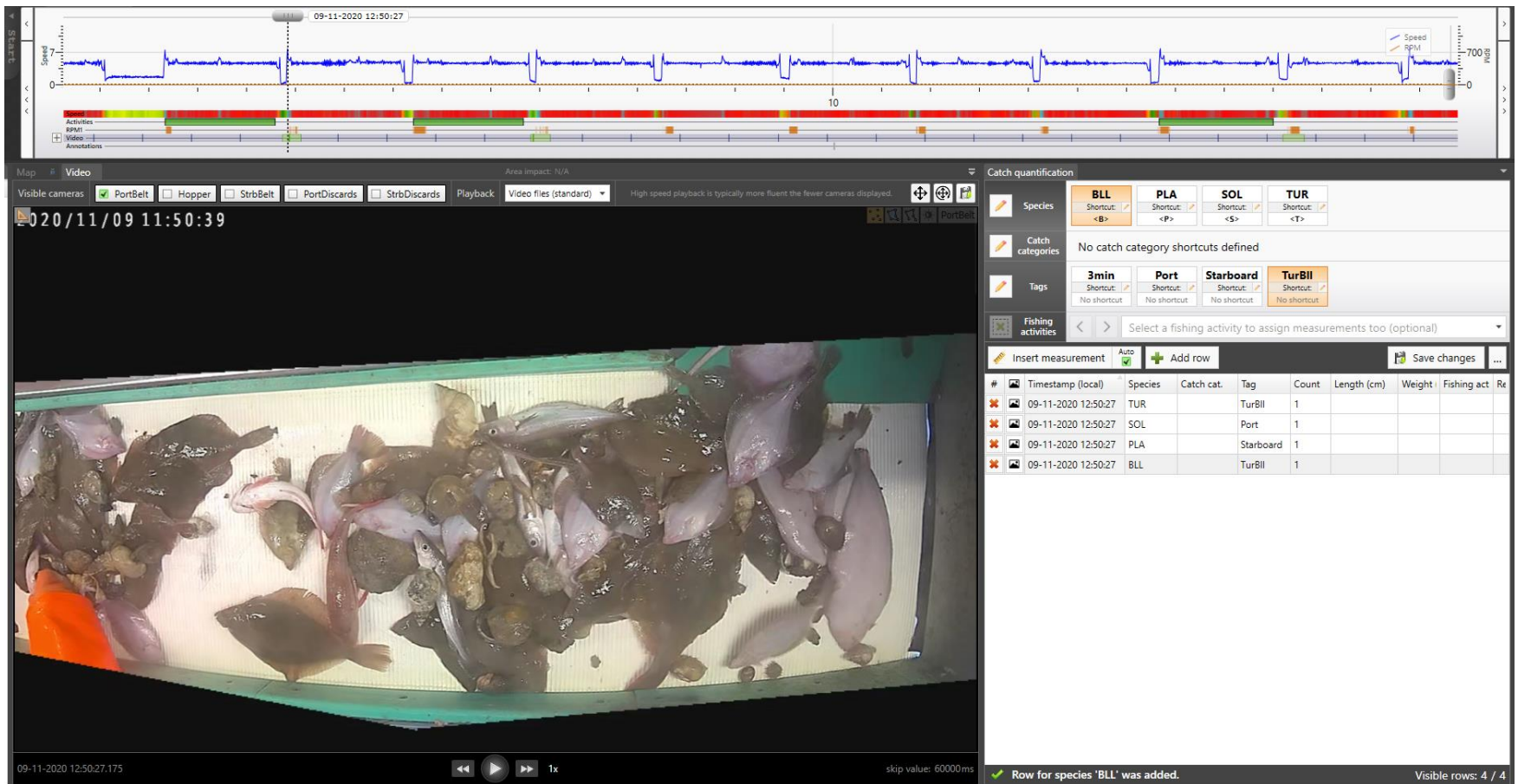
## 2. Technology of EM Systems (2)



Anchor Lab

# 2. Technology of Electronic Monitoring (3)

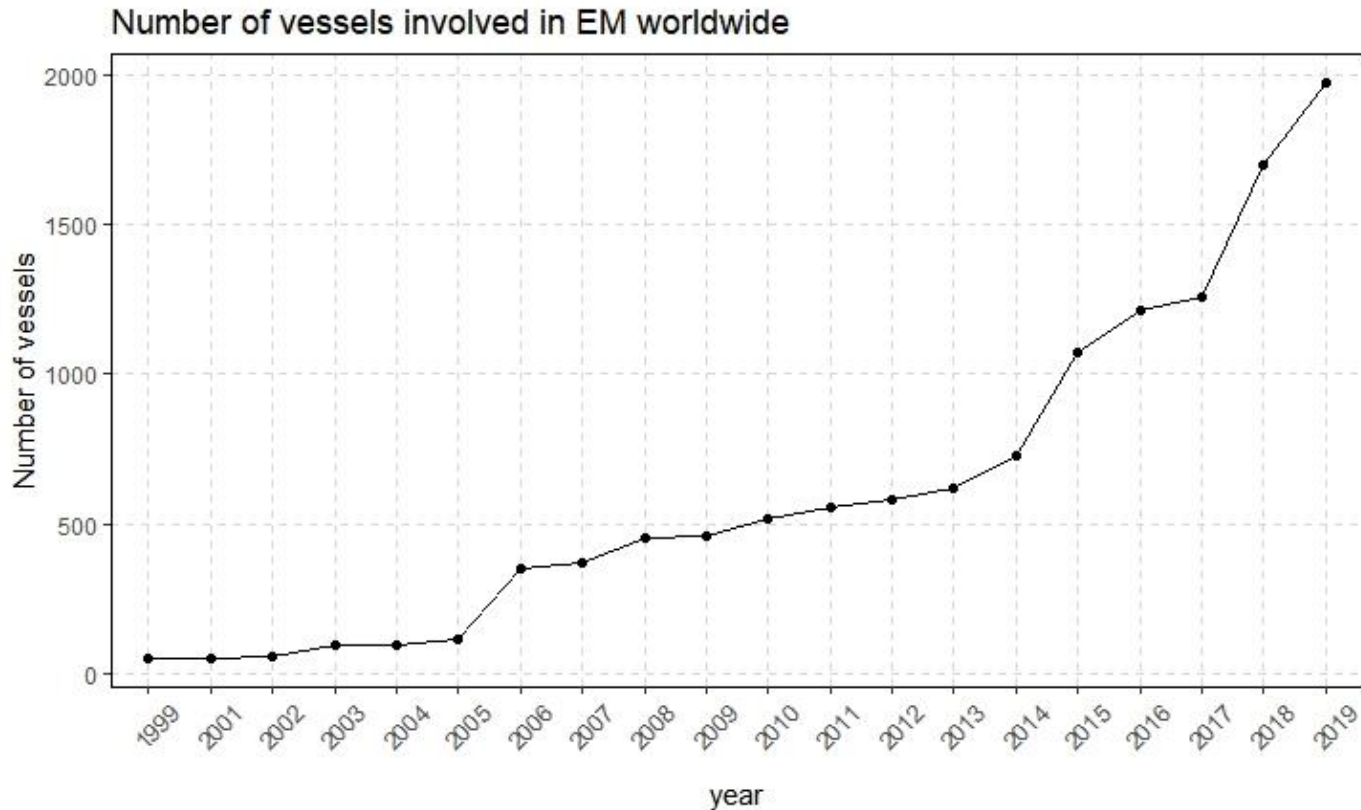
## Video review



The screenshot displays the Electronic Monitoring (EM) software interface. At the top, a speed graph shows vessel speed over time. Below it, a video player shows a live feed of fish in a hold. On the right, the 'Catch quantification' panel includes a table of species and catch data.

#	Timestamp (local)	Species	Catch cat.	Tag	Count	Length (cm)	Weight	Fishing act	Re
	09-11-2020 12:50:27	TUR		TurBll	1				
	09-11-2020 12:50:27	SOL		Port	1				
	09-11-2020 12:50:27	PLA		Starboard	1				
	09-11-2020 12:50:27	BLL		TurBll	1				

# 3. State of play of Electronic Monitoring (1)



# 3. State of play of Electronic Monitoring (2)

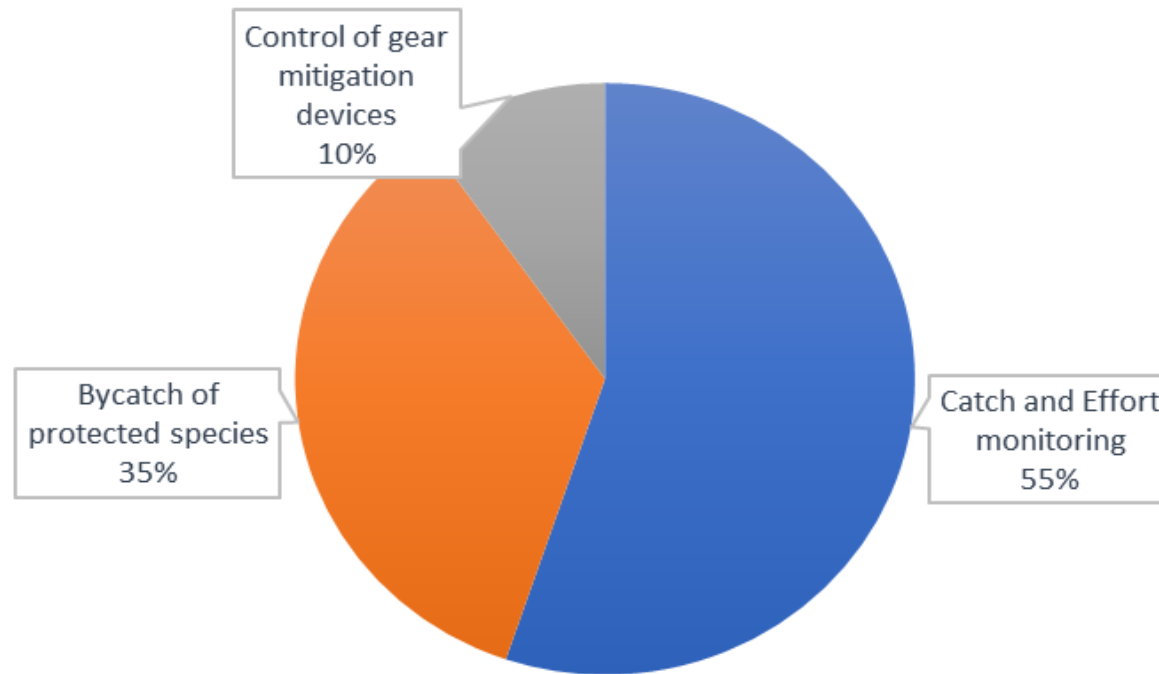


van Helmond et al. 2019



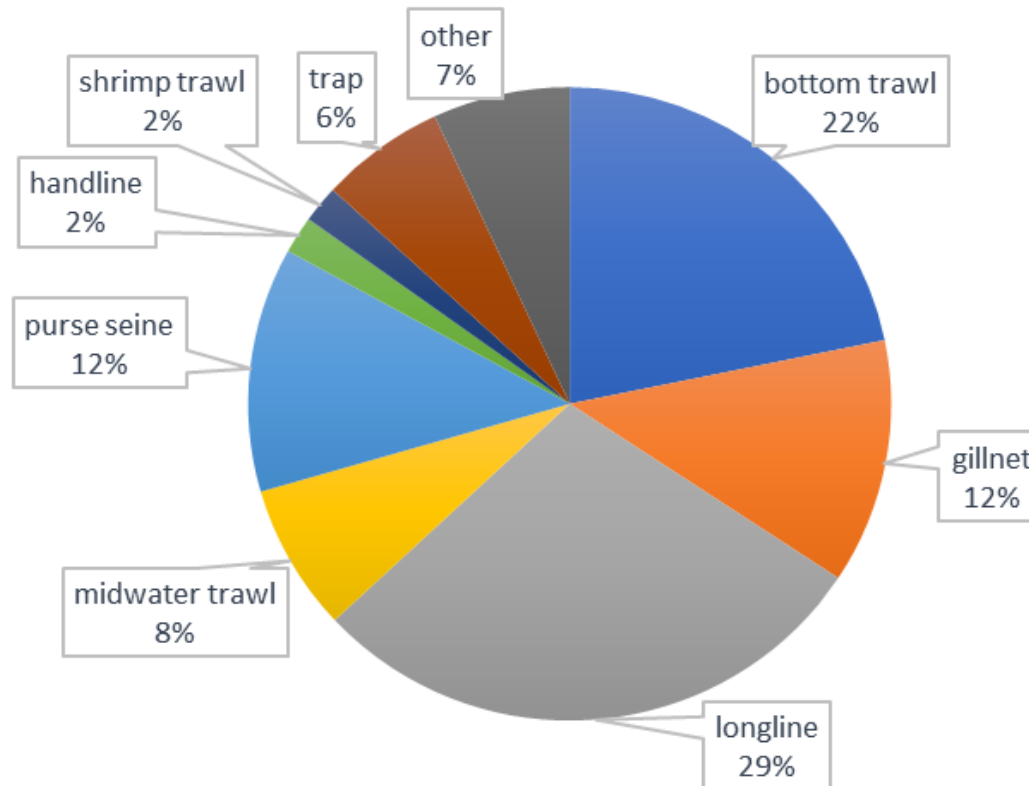
# 3. State of play of Electronic Monitoring (3)

## Objectives of EM worldwide



# 3. State of play of Electronic Monitoring (4)

## Relative proportion of gears in EM worldwide



# 3. State of play of Electronic Monitoring (5)

## Benefits of EM

- Increased sampling coverage
- Detailed information on fishing effort
- More cost-efficient
- Increased transparency



# 3. State of play of Electronic Monitoring (6)

## Risks of EM

- Level of intrusion
- Video review is labour intensive
- Deal with large amount of (video)data



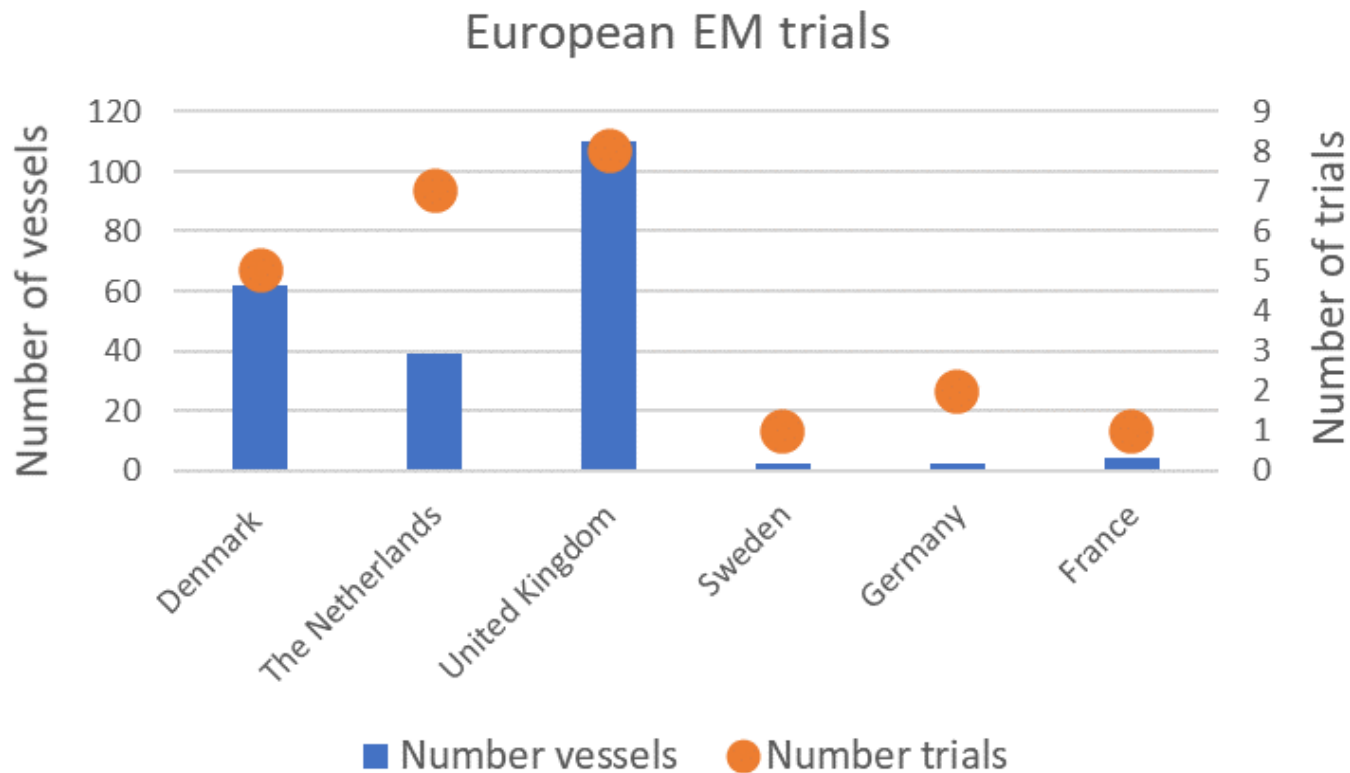
# 3. State of play of Electronic Monitoring (7)

## Computer Vision Technology



# 4. European Electronic Monitoring trials (1)

## EM in Europe



# 4. European Electronic Monitoring trials (2)

## Lessons learnt 1 and 2

- None of the trials evolved in full EM programmes
  - Integration in national sampling schemes requires specific focus.
  - Clarify the distribution of responsibilities.
- EM is not a “plug-and-play” system
  - EM set up, communication with fishers, protocols on board, coordination of EM supplies and maintenance.

## 4. European Electronic Monitoring trials (3)

### Lessons learnt 3

- Involvement of fishers is crucial for a proper EM implementation
  - Camera lenses need to be cleaned
  - Experiences EM fishers are positive and supportive, compared to “unknowing” fishers

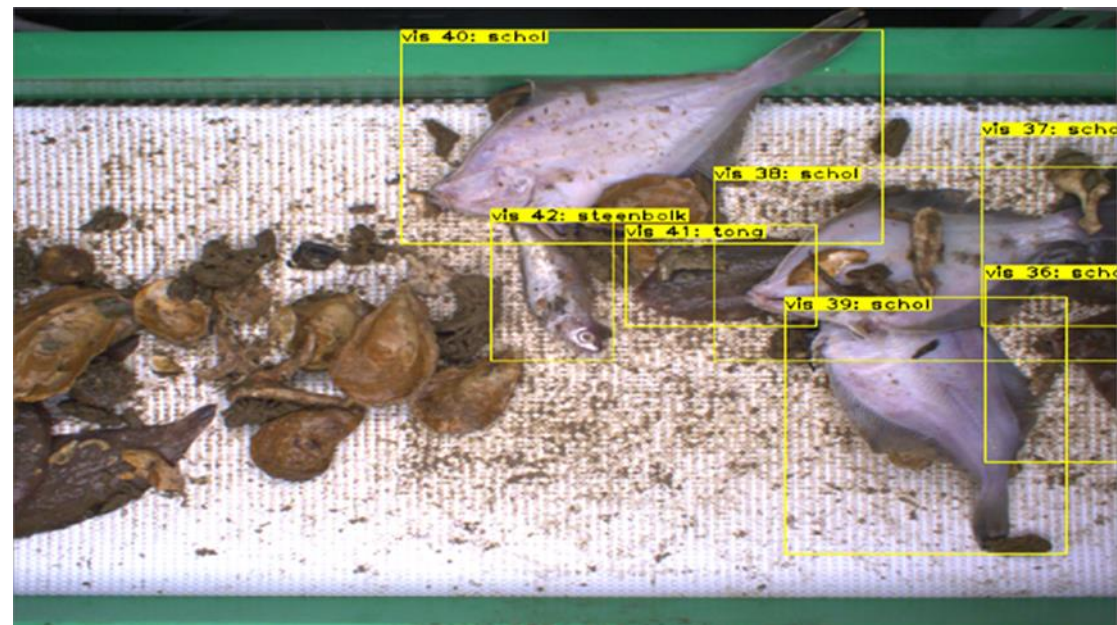
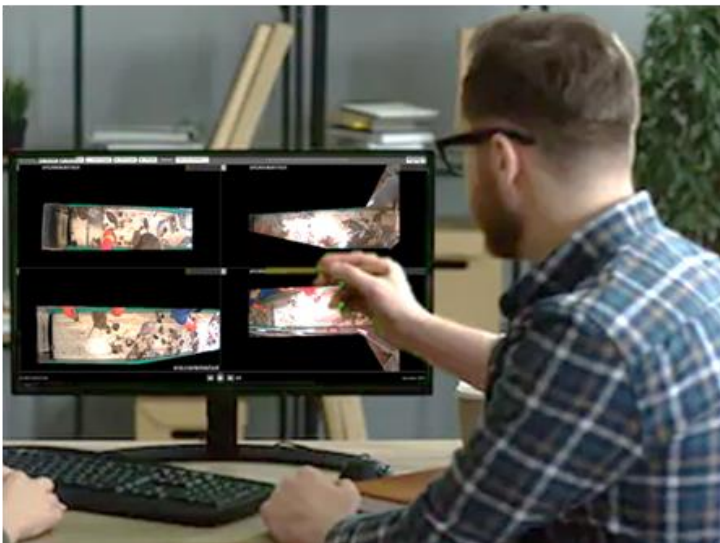




# 4. European Electronic Monitoring trials (4)

## Lessons learnt 4

- EM generate vast amounts of data
  - Video footage is (privacy) sensitive
  - Video review in labour intensive work



# 4. European Electronic Monitoring trials (5)

## Lessons learnt 5

- Difficult to see all smaller individuals



# 4. European Electronic Monitoring trials (6)

## Lessons learnt 6 and 7

- EM is the next level of fisheries monitoring
  - Behavioural studies
  - Data Limited Stocks
  - “Net-to-plate-stories”
- EM is corona-proof!



# 5. Conclusions and Recommendations

## Conclusions

- Valuable lessons learnt from European trials.
- Gained knowledge and experience should be used to implement EM.
- Computer vision technology is the logical next step.

## Policy Recommendations

- Support the development of technical innovation in EM.
- Build support from the fishing industry.
- Create an European EM infrastructure.

# Thank you for your attention

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