Electronic Monitoring (EM)

Evidence of Compliance

marine scotland

Norman Fletcher EM coordinator

EM trials

Cod CQ 2011 – 2016
- All cod retained/landed/recorded
- LO (2016 Haddock/Plaice)

Pelagic 2013 -2015
- FDF fishery
- LO (2015)

Evidence - EM / Non EM

Landed catch composition
- size grades of cod landed
- BMS (LO)

Behavioural change

Pelagic – Fully documenting Fishery
        Force majeure events
        Survivability exemption

Discards - Low compliance levels

- High Grading
- Discards – not documented since day 1
- Landing obligation – discarding/slipping continues - Business as usual
                                    Pelagic/demersal

Reason – poor control

- Control tools. Difficult to detect.

  They do not change behaviour

  Temporary change

EM

Continuous monitoring

Changes Behaviour

Evidence of Compliance

Level playing field

Cod CQ trial 2011 -2016 (LO)

- Up to 27 vessels annually

- Knowledge of vessel (VMP)

- Risk areas

- Sensor – GPS/winch

- CCTV (7) – all fish handling areas

- 10% of annual hauls - Verified cod removals

- Cod measured in video -WT conversion - compared with elog (haul by haul)

- 3 continuous hauls (part box effect)

- Elog documentation - main source data
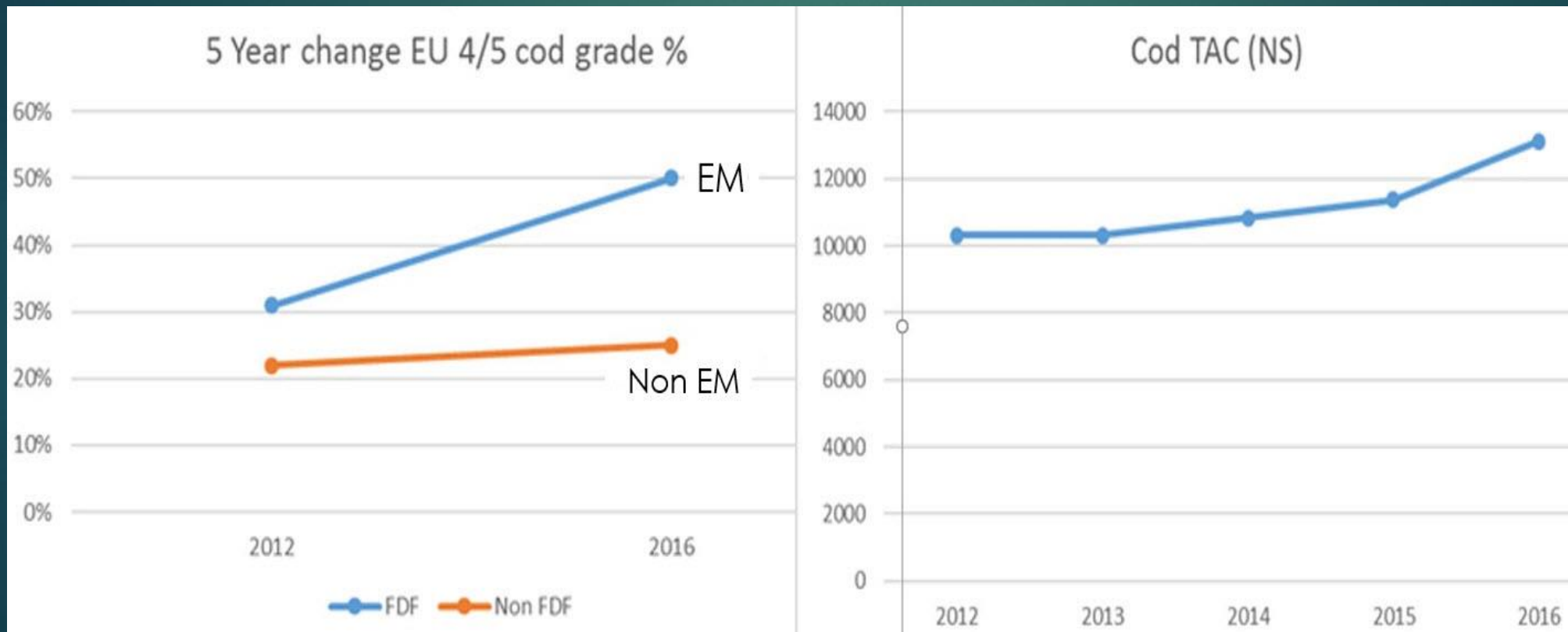
- Use EM to audit Elog documentation

Catch composition (cod)

Evidence of compliance with EM

EU fish size grades landed (5 grades – 4 & 5 smallest)

High grading – discarding of lowest value part of catch

Similar results DK/Eng

2016 - LO - Below Minimum Size – BMS
Requirement to land and fully document

EM fleet 2016 – 14 vessels

- BMS Haddock/plaice documented – 115 tonnes = 700kg per trip
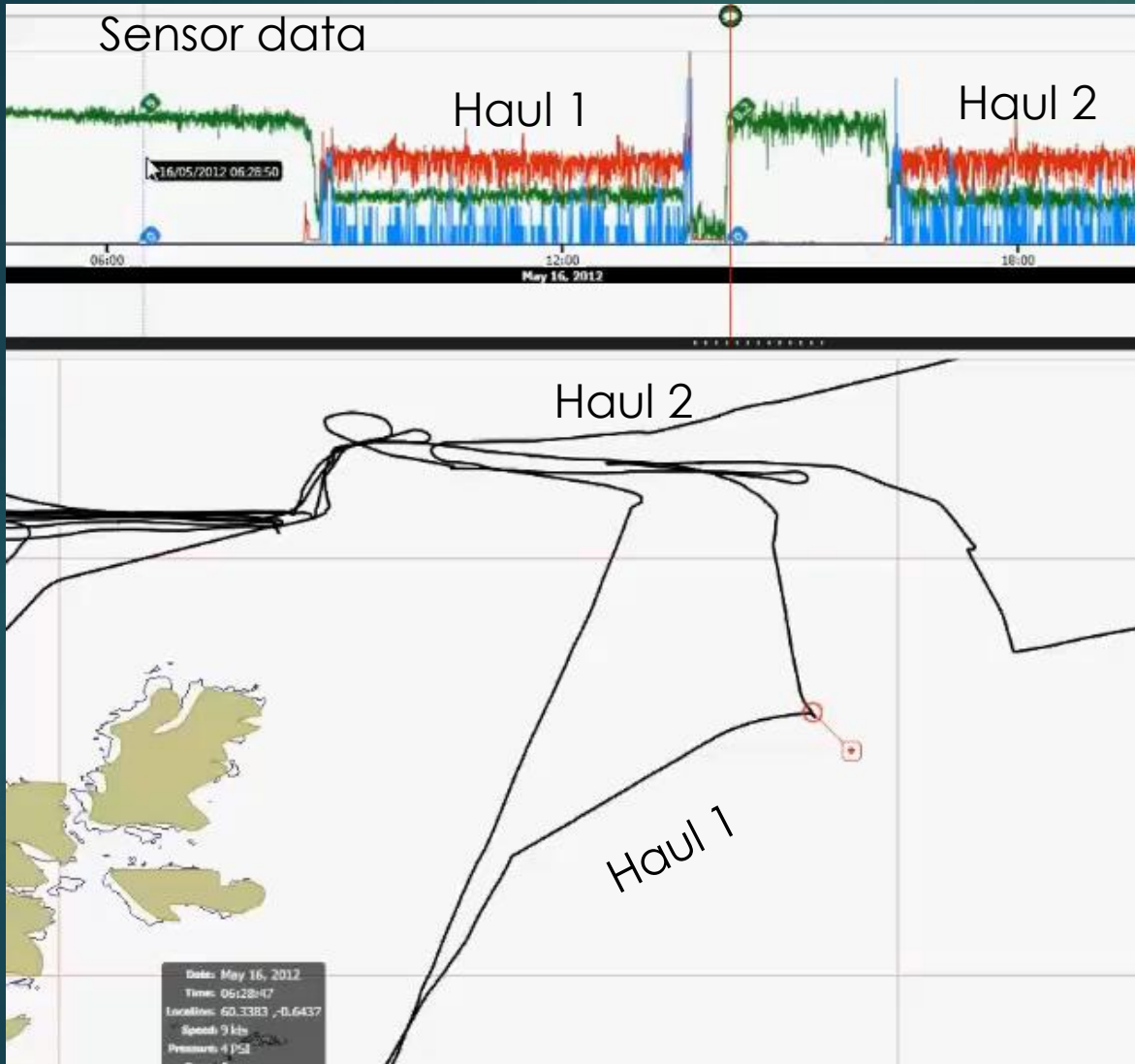
Non EM - Token gesture.
Even when plenty quota i.e. no choke

£2000 FPN for discarding Haddock/plaice using REM data

Without EM no detection

Behavioural change

Sensor data

Haul 1

Haul 2

Haul 2

Haul 1

Haul 1
Cod	1919	kg
Saithe	857	
Ling	91	
Pollock	47	

Haul 2
Cod	164	KG
Monk	165	
Ling	1368	
Haddock	47	
Hake	33	

Cod CQ – LO for cod

Evidence of compliance

Reversal of behaviour

% EU Grade 4/5

Vessel	2016 Q1	CCTV removed	LO cod 2017 Q1
1	53%	→	28%
2	63%	→	38%
3	51%	→	30%
4	50%	→	31%
5	40%	→	31%
6	53%	→	25%
7	31%	→	28%
8	67%	→	44%
9	70%	→	39%
10	51%	→	28%
11	30%	→	12%
12	49%	→	38%
Tonnes cod	413 t		480 t
			16% increase

Evidence of Compliance with EM
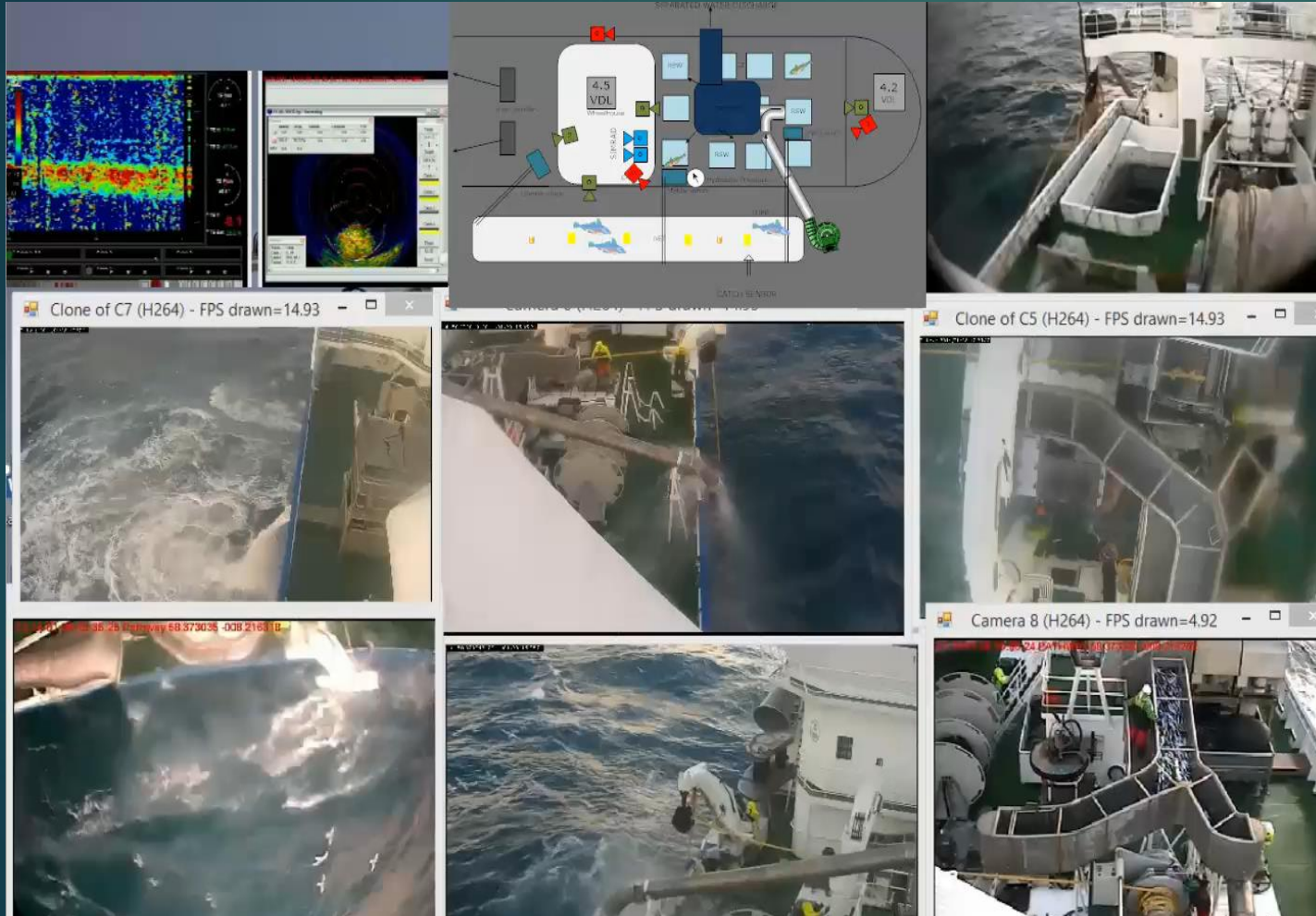
Aerial surveillance – evidence of substantial slipping/discarding

2 ½ year trial – Pathway PD 165

- EM - 7 cameras + net catch sensors

- High risk areas

- Catch sensor data

- Pump rates

- Flow rates to RSW tanks

- Verification of haul by haul Documentation – Declared by RSW tank

- Gramme size data

Pelagic trial results – Mackerel (similar Herring)

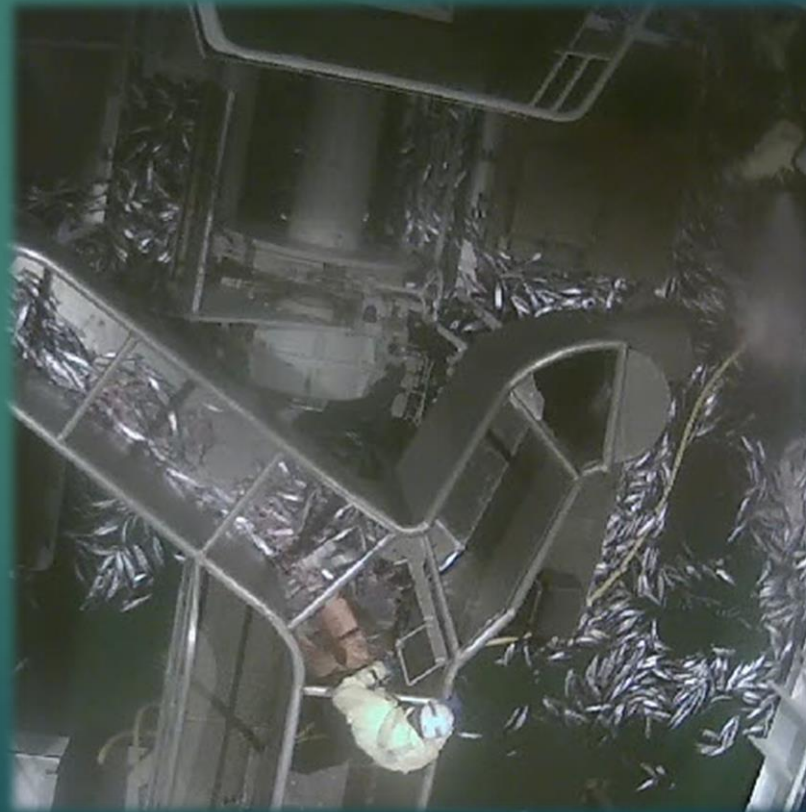| 2014(Q1) & 2015 (Q4)	Hauls Analysed	Elog (t)	Landed (t)	EM Analysis (t)
	65%	7073	7099	7347

EM verification of removals

Within 4% of landed weight

Certified weigh scales

3 major Force majeure events

- EM helped verify skippers claims

- Avoid false accusation

Pelagic EM trial

Purse seine – using EM to verify survivability exemption of Mackerel & Herring

EM

- verifies Point of no Return

- verifies catch taken on board

- enforces LO

Without EM/Observer - impossible
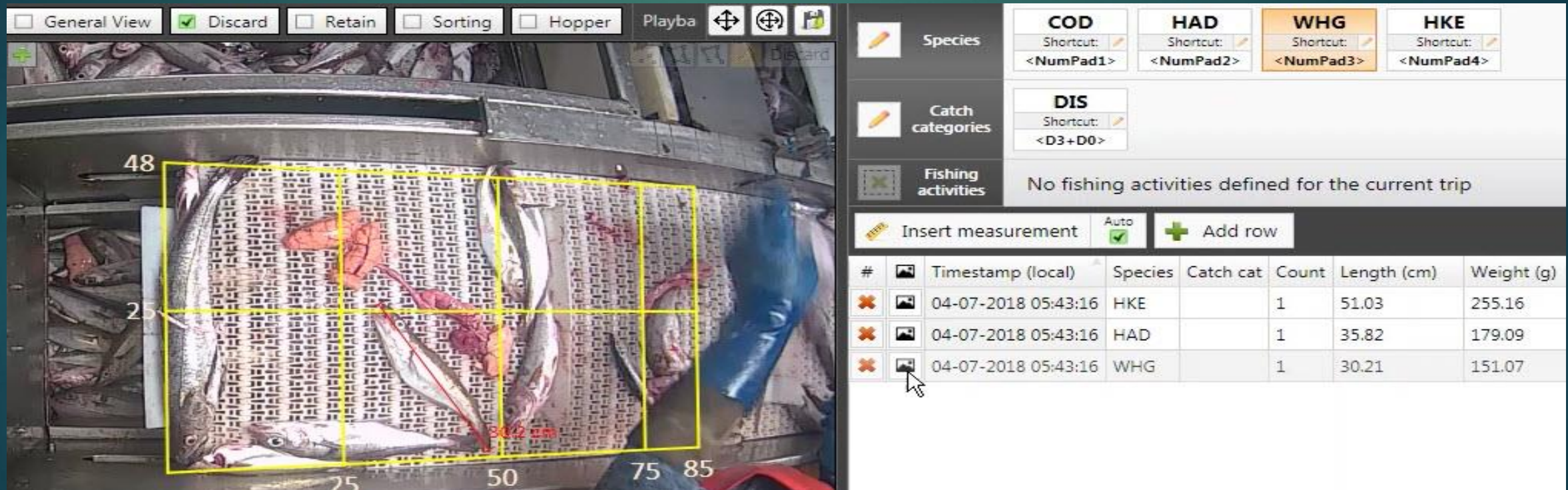
EM – Current & Future developments

Data transmission – 4/5 G & Satellite
- Remote monitoring from a desktop (scot 43 vessels – scallop & Razor)

Measuring tool – quantify retained/discard +Annotation

Machine learning – reduced analysis/increased verification

13

Reducing cost

£3k for CCTV system

Proportionate / appropriate inshore fisheries

Summarise

Landing obligation/discard ban

EM - Strong evidence delivers compliance

EM brings about Behavioural change – better decisions

- Where, when to fish
- Net construction. Selectivity
- Time of day, month, year
- Light or dark
- Hard or soft
- Quota availability
- Price

This is where decisions are made

Trials LO – Scot 2016 and England 2016 -2018 – High level compliance

What's ahead?

EFCA REM TWG

Document defining technical requirements /procedures (LO objective)

EFCA board ➡ RWG's ➡ Control Reg. Several years away.
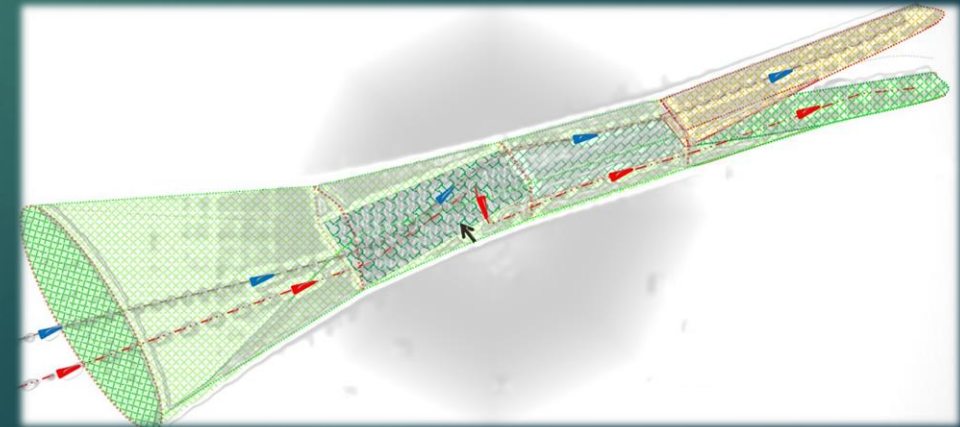
Chance for industry to shape REM

Fisherman not policy

Develop our own rules and standards
  e.g. Flexibility BMS discards. Accountability.

Ensure deliver compliance + Level playing field

Science (data collection tool)

REM to prove results in selectivity trials…can these nets deliver

Questions?