



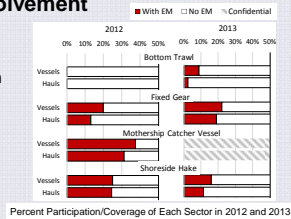
Electronic Monitoring Program

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Objective

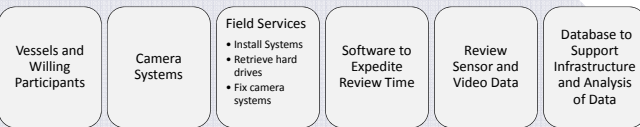
To test the viability of Electronic Monitoring (EM) as a source of data to achieve effective individual accountability of catch and bycatch in the Pacific Trawl Rationalization Program.

PSMFC Involvement



PSMFC began testing EM systems on three sectors of the west coast groundfish Individual Fishing Quota (IFQ) fishery in the summer of 2012. The project expanded to include bottom trawl vessels in 2013.

Moving parts of an EM Program



Discard Chute Study

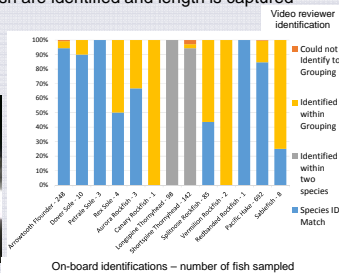
Problem:

In order for EM to work if discards are allowed, IFQ fish discards must be identified and quantified by weight.

Method to test a discard chute:

- On-board – individual fish are identified to species, and length and weight are captured before sending down chute
- Using footage – individual fish are identified and length is captured

Length captured from video will be converted to weight



Preliminary identification results:

Reviewers are successful at identifying fish into their relative groupings (Rockfish, Roundfish, Flatfish). Some species seem impossible to identify to species despite this closer and clearer view (e.g. Longspine Thornyhead consistently identified as Longspine/Shortspine).

Night lighting seems to be the main reason for problematic identification due to fish appearing blurred for species that are more successfully identified.

2013 Results

Changes between 2012 and 2013 patterns

Fixed Gear

- Improved species identification
- Improved individual fish count accuracy
- Hake**
- Improved estimation of catch (lbs)



Within 2013 data

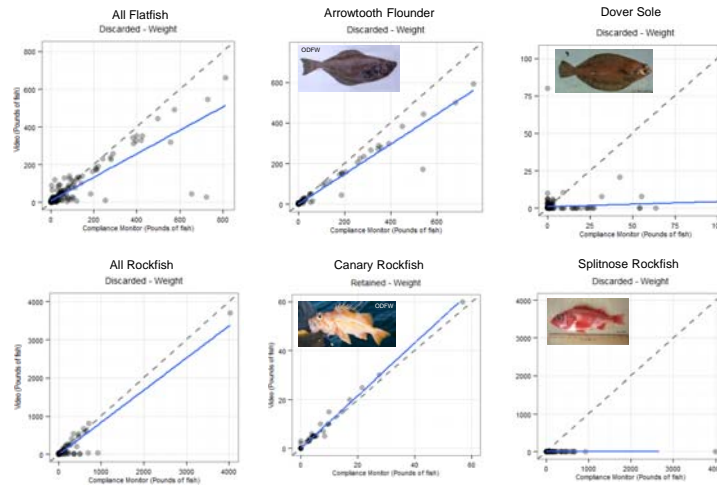
- Count data more accurate than weights
- Retained catch more accurately speciated and quantified than discarded catch
- For **Multispecies Bottom Trawl** fishery – Retained and discarded catch more successfully identified and quantified when full on-deck sorting occurs

Bottom Trawl

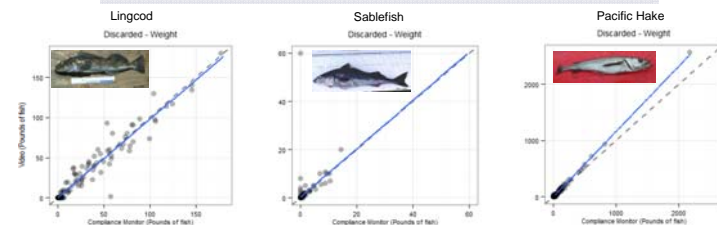
Successful identification at the grouping level when sorted

Some species possible to identify when sorted

Some species not possible to identify



Roundfish are consistently successfully identified and quantified



Acknowledgements

We would like to thank the owners, skippers, and crew of the participating fishing vessels for volunteering and helping this project move forward. We would like to thank the West Coast Groundfish Observer Program for providing at-sea compliance monitor data.

Costs of Review of At-Sea Sorting

Costs are based on Archipelago Marine Research System

Hake fishery: Maximized retention

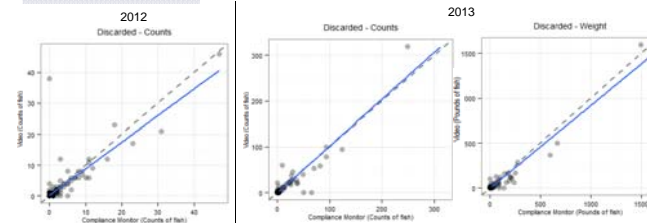
Fixed gear and Bottom Trawl: Can discard freely

Fishery	Bottom Trawl	Longline	Pot	MS Catcher Vessel	Shoreside Hake
Average Sea Days per Trip*	3.55	3.59	3.88	13.57	2.17
Average Hauls per Trip*	8.37	7.41	11.67	27.65	1.86
Average Sort Minutes per Haul	133.92	66.46	37.7	40.28	60.57
Average Review Minutes per Haul	159.25	67.5	21.47	15.04	17.53
Average Review Minutes per Sort Minute	1.19	1.02	0.57	0.37	0.29
100% Review (Review Hours per Trip)	22.22	8.34	4.17	6.93	0.54
Cost per trip for review time only (100%)	\$ 1,136.00	\$ 442.00	\$ 233.50	\$ 371.50	\$ 52.00
Cost per sea day for review time only (100%)	\$ 320.00	\$ 123.12	\$ 60.18	\$ 27.38	\$ 23.96
20% Review - Number of hauls reviewed	2	2	3	6	1
20% Review (Review Hours per Trip)	5.31	2.25	1.07	1.5	0.29
Cost per average trip for review time only (20%)	\$ 290.42	\$ 137.50	\$ 78.68	\$ 100.20	\$ 39.61
Cost per average sea day for review time only (20%)	\$ 81.81	\$ 38.30	\$ 20.28	\$ 7.38	\$ 18.25
Fraction of 100% review cost per sea day	26%	31%	34%	27%	76%

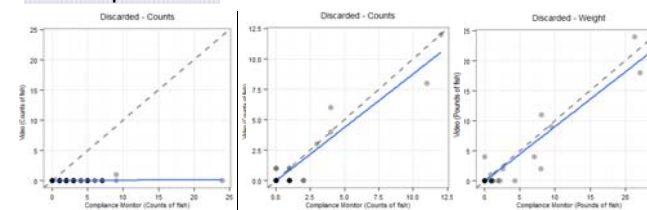
* Source 2013 WCGOP dataset

Fixed Gear

Sablefish



Minor Slope Rockfish



Update

Four EFPs recommended by PFMC for approval by NMFS beginning January 2015

- Bottom trawl, pot, longline and mid-water whiting trawl
- 100% video review by PSMFC or NMFS
- Two year minimum duration on all approved EFPs