Concerns to be Addressed Regarding Use of EM in West Coast Fisheries as a Cost Saving Strategy

Cost

- Depending on the fishery and the monitoring goals, cost savings may not be realized.
- The largest ongoing cost of EM is the review of the collected video images. Given the rarity and extremely low limits of many catch share species, sampling less than 100% may not be acceptable to fishery managers/Council. Cost savings likely not to be realized unless sub-sampling of data occurs.
- All **implementation** costs must be analyzed examined to determine total costs.
    - Initial costs such as EM equipment and installation
    - Cost to resolve enforcement/legal and tampering concerns.
    - Data transfer issues and database change costs.
    - Costs to change West Coast fish ticket and logbook programs
- All **ongoing costs** must be objectively estimated and funding sources identified
    - Data management and analysis costs
    - Quality assurance/quality control costs.
    - Costs of support staffing or contracting can be significant
- Analysis of cost/benefits of the PFMC/ Archipelago Pacific hake EM trial and NRDC longline EFP is needed. Investment in this analysis is a key first step to informed decision-making on the West Coast.

Data collection

- EM is susceptible to failure issues, cannot distinguish many rockfish species, estimate a volume of catch (trawl), weigh individual fish or collect biological samples from discarded catch.
- EM would only be able to collect catch data on numbers of individual fish, not weight. Therefore, to compare this catch data with landings, **the entire West Coast fish ticket system would have to change**. Significant cost to implement and intergovernmental coordination (including state expenditures) will be required
- EM cannot provide the needed level of detail for bottom trawl and pot fisheries.
- While observers can distribute or gather direct feedback, EM offers little in the way of direct communication with the fleet after its deployment
- The British Columbia fishery has been in catch shares for years and do not use cameras/EM for bottom trawlers. BC long line fishery uses cameras but only 3% of the fishery is being monitored. For our West Coast overfished species/ACL's, we can't afford to reduce observation to this level

Evidentiary issues

- EM data ownership and chain of custody issues would have to be clearly outlined and resolved.
- EM systems are susceptible to tampering which must be addressed before they are implemented.
- Other Enforcement Consultant (PFMC) concerns would need to be resolved

Pros and Cons of Electronic Monitoring vs. Human Observers

Briefing Points for John Ferguson, NWFSC

Electronic monitoring (EM) consists of data collection devices such as a video camera, GPS, and various sensors to determine fishing events. EM systems could be applicable for specific fisheries where monitoring goals are clearly outlined and achievable through electronic means.

Cost

The most common incentive to use EM is the expected lower cost vs. human observers. Depending on the fishery and the monitoring goals, cost savings may not be realized. Besides the initial equipment and installation costs, the largest cost of EM is the review of the collected video images. Cost savings are realized by sub-sampling the video. Given the rarity and extremely low limits of many catch share species, sampling less than 100% may not be acceptable to fishery managers/Council. Cost savings likely not to be realized unless sub-sampling of data occurs.

- All costs must be analyzed examined to determine total costs.
    - Initial costs such as EM equipment and installation
    - Data management and analysis costs.
    - Data transfer issues and database change costs.
    - Costs to change fish ticket and logbook programs(to measure numbers vs. pounds and electronic logbooks- see below)
    - Quality assurance/quality control costs.
    - Costs of support staffing or contracting

- Analysis of cost/benefits of the PFMC/ Archipelago Pacific hake EM trial and NRDC longline EFP is needed

Data collection

In studies comparing EM and human observer data, EM and human observers offer various pros and cons in data collection aboard a vessel. EM data can be reviewed multiple times, provides accurate accounting of catch enumeration (aboard longliners), and can be collected 24 hours/day. However, EM is susceptible to failure issues, cannot distinguish many rockfish species, estimate a volume of catch (trawl), weigh individual fish or collect biological samples from discarded catch. Human observers can do everything an EM system can with the exception of staying awake 24 hours/day and having a video image that can be reviewed ashore. One of the more likely applications of EM in West Coast groundfish is in longline fisheries. EM would only be able to collect catch data on numbers of individual fish, not weight. Therefore, to compare this catch data with landings, the entire West Coast fish ticket system would have to change.

- EM cannot provide the needed level of detail for bottom trawl and pot fisheries.
- EM may be able to provide confirmation of full retention of hake mid-water trawl vessels. NOAA Enforcement would need to clearly outline conditions and requirements for this to be successful. For example, provide rules for what a vessel must do if their EM system fails,

- EM could be deployed aboard long line vessels (as each fish comes up individually). Conditions for its use would have to be given such as full retention for certain species (to confirm rockfish species ID by catch monitor), etc.
- Fish ticket and logbook systems would have to be updated to record individual number of fish to be comparable with EM data. Significant cost to implement and intergovernmental coordination will be required.

Data privacy issues

While the EM and observer data is considered confidential and protected from public distribution, use of EM must outline what exactly is being collected and how it will be used. Human observers have been deployed for years and data collected and recorded is well understood by all parties.

Evidentiary issues

It should be expected that EM data could be used as evidence to prosecute fishery violations. As this is a newer application of this technology, the requirements needed to protect and use this data evidence are not well understood. EM data ownership and chain of custody issues would have to be clearly outlined and resolved. The use of human observer data by NOAA Enforcement and General Counsel is well established and been used in countless fishery violation cases.

Scalability

EM could be helpful in complex deployment situations wherein observers are difficult to accommodate aboard. Also, while human observers stay on a vessel for an entire trip, EM can be scaled by sub-sampling a given portion of that trip.

Industry support

Successful deployment of EM and human observers need the support and input from industry members. EM systems are susceptible to tampering which must be addressed before they are implemented. While observers can distribute or gather direct feedback, EM offers little in the way of direct communication with the fleet after its deployment.

Where has it been implemented (not just tested) for monitoring?

Canada: BC fisheries such as hook and line and Dungeness crab

- BC fishery has been in catch shares for years and do not use cameras/EM for trawlers. BC long line fishery uses cameras but only 3% of the fishery is being monitored. For our West Coast overfished species/ACL's, we can't afford to reduce observation to this level.

Where has it been tested?

US: West Coast Pacific hake trawl, Alaska halibut longline, Alaska trawl (seabird interactions), Southeast reef fish longline, Alaska rockfish trawl (selective discard of Pacific halibut bycatch), Southwest drift gillnet (seabird, MM and pinger deployment) and in some Northeast gillent /hook and line fisheries.

New Zealand: Various pelagic/demersal longline, set net and trawl fisheries (seabird and MM bycatch),

Australia: Antarctic longline (catch), trawl (MM bycatch) and gillnet fisheries (catch).

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The National Observer Program (NOPAT) is currently drafting a document to outline the pros and cons of EM to allow for a full analysis of the tool.