Integrating Electronic Monitoring into U.S. Fisheries
Data Collection and Management

What is Electronic Monitoring?

Electronic Monitoring or EM systems as they are commonly called are in use or development to meet fishery monitoring and data collection needs in a number of U.S. Canadian, European, Australian and New Zealand fisheries. An EM system can be deployed on fishing vessels to monitor a range of fisheries issues including fishing location, catch, catch handling, fishing methods, protected species interactions, and mitigation measures. A system typically consists of up to four closed circuit television cameras which are installed on a fishing vessel and trained on areas of fishing activity. A GPS receiver collects location data, a hydraulic pressure sensor and a winch sensor monitor when fishing activity is taking place (e.g., when a net or a line is being hauled in to the vessel), and a system control box records all data which can be downloaded at the end of a fishing trip. In the United States, EM is fully operational in the shore-based Pacific whiting fishery and pilot projects have taken place in Alaska, the west coast, New England and Gulf of Mexico.

What are the benefits of Electronic Monitoring to fisheries scientists and managers?

Congress has mandated that federal fishery managers end or prevent overfishing. To meet this requirement, fishery managers need the best possible information about fishing activity, including how many fish are harvested, how many are discarded, and how much fishing effort is being deployed on the water. This information is used by fishery managers to set biologically safe catch limits.

Fishery managers need to find ways to collect this data in a fair, unbiased, and scientifically valid. For many fisheries, EM provides an independent and timely estimate of all catch, including discards, and reliably captures fishing effort data by recording all gear sets and haulbacks. In many U.S. fisheries, current data collection systems still rely on paper reporting and it may be weeks or even months before fishery managers receive catch data, a lag time preventing effective in-season monitoring of catch limits. Catch data reported in a more time-sensitive manner will enable fishery managers to monitor catch Annual Catch Limits with a greater degree of precision and responsiveness, alerting individual fishermen when quotas are nearly filled so that harvest overages and payback measures can be avoided. Finally, EM is capable of documenting protected species interactions, a function supporting ESA compliance.
What are the benefits of Electronic Monitoring to fishery conservation and fishermen?

Accurate accounting of catch and bycatch for all fisheries across user groups, gear types, vessel classes and fishers builds support for fishery conservation and management programs by giving fishery participants confidence in the quality of data used to implement these programs. EM will help level the playing field for commercial fishermen by providing accurate catch monitoring for all fishery participants. For instance, EM would bring increased accountability to catch share programs under which individual fishermen receive a portion of shares out of the overall quota for a species. EM will give each shareholder added assurance that at-sea discards and landings are accounted for and counted against individual quotas.

Can Electronic Monitoring be integrated into existing observer programs?

U.S. fisheries are highly varied and diverse, targeting hundreds of different species, with a variety of fishing gears, from different sorts of vessels. This diversity requires a variety of tools to adequately monitor. EM complements traditional fishery observer programs and should be viewed as a new tool in the observer program toolbox. EM is not necessarily a substitute for observers but may be better suited to some vessels and fisheries for at-sea data collection, allowing observers to focus on biological sampling or dockside data retrieval and analysis. For instance, captains operating smaller fishing vessels required to take observers may find that cameras and sensors are a practical alternative to observers where space is limited. Conversely, trawl fisheries bring on deck catch comprised of many species and if cameras have difficulty distinguishing species or determining the size, weight, age composition of species discarded at sea by trawlers, then observers may be more effective at recording these data.

How much does EM cost, how much is needed and how will it be used?

Costs vary depending on fishery monitoring objectives and coverage goals. However, on average, EM programs can cost up to 40 percent less than the equivalent level of coverage by an observer program. Upfront capital costs of EM are high but when distributed over a fishing season or a few years the savings can add up. EM equipment should be viewed as an investment in fishery infrastructure and management.

Fishing industry and conservation interests are asking Congress to appropriate $3,000,000 for electronic monitoring in NMFS’ FY10 budget, with funding to be equally distributed to all regions (alternate language - with funding to be distributed to each region based on regionally determined needs). With any new data collection or validation system, consistent funding for several years is needed to ensure continuity in time series data for year to year comparisons.

Federal and state fishery managers will work with the fishing industry to identify fishery data collection and monitoring priorities for applying EM funding. In general, funding may be needed for any one of the following: 1) developing a standards framework for the use of EM technology in fisheries; 2) training NMFS staff, fishery observers and fishermen on EM use; 3) refining the
technology for improved functionality; 4) reimbursing fishermen for equipment purchases; 5) contracting service providers to retrieve and analyze data and perform maintenance; and 6) field testing EM systems to determine their effectiveness.

**How can fishery managers ensure that electronic monitoring is meeting its full monitoring and management potential?**

The following performance principles for EM can be incorporated into fisheries monitoring and management plans to ensure improvements in data collection, management objectives and cost-effectiveness are achieved with taxpayer dollars.

- Improved accounting of at-sea fish discards and interactions with protected species
- Increased use of EM imagery data for verifying and auditing fisher logbook data