Electronic Monitoring Video Data Management Workshop

Meeting Summary

June 26-27, 2019
Cedarbrook Lodge, SeaTac Washington
Hosted by the Net Gains Alliance

MEETING GOALS & OBJECTIVES

We started the meeting with an open discussion about what attendees wanted to do with the time we had together. The meeting objectives the organizers set out in the pre-workshop materials were to provide:

- A better understanding of the commonalities and distinctions across regions and fisheries in how EM programs handle data;
- An awareness of different EM program design choices and how they can affect cost, data availability, usability, and other factors;
- Questions to ask during EM program design discussions to help clarify how policy and technology might intersect, and what the implications could be for fishermen, vendors, scientists, enforcement, and other stakeholders.

The participants echoed these goals and added an interest in:

- Making connections across regions, departments, and sectors to learn from others taking on similar issues
- Clarifying EM program goals and how program implementation ties to those goals
- Better understanding of the different constraints around EM programs: technical, policy and negative user perceptions
- Developing a shared vocabulary

WHAT WE DID: TOPICS & ACTIVITIES

DATA FLOW MAPPING

We used sticky notes and whiteboards to create maps of the data flows in a few different EM programs, from initial data collection to submission of required data to NMFS and beyond to any broader data releases (e.g. summary reports to Fishery Management Councils). This allowed us as a group to have a shared visual reference for the different stages of EM data management and pinpoint areas for deeper discussion. We also built off the background document distributed to participants in advance.

LEGAL & POLICY DISCUSSION

We focused on three statutes that might affect access to and release of EM data - the Freedom of Information Act (FOIA), the Federal Records Act (FRA), and the Magnuson-Stevens Fishery Management and Conservation Act (MSA). An overview of these statutes and their potential applicability to EM are summarized in the workshop background document. We discussed when and how these statutes might apply to unprepared EM data and data products, and whether and when EM video and data may become an "agency record" and susceptible to FOIA production under various EM program models. We heard presentations from NMFS on the recent EM cost allocation procedural directive (available on the NMFS website), the status of the draft video retention procedural directive, and the development of a federal records retention schedule (required under the FRA).

DESIGNING FOR INDUSTRY AND AGENCY NEEDS

We heard presentations from industry and data platform providers on user-centered data projects. These projects aggregate and analyze data gathered by participating vessels to provide valuable information back to the fleet on bycatch, protected species, and habitat. We discussed how projects like these could potentially integrate EM data to add value for industry in addition to complying with monitoring requirements. This added value could help user groups balance the cost of implementing EM. We also discussed the types of organizational structures that could support these types of data sharing efforts, such as fishing co-ops that build their own data systems or a data platform with multi-party licensing to share data across the industry and the agency.

STORAGE

NMFS is in the process of drafting a procedural directive on storage, guided largely by the agency's legal mandates, management needs, and recognition of potential cost impacts. Our conversations highlighted the importance of thinking through the technical details, as well as the policy issues. For example, data storage costs are driven by file size and by how often (and how quickly) the files are accessed. If NMFS requires external partners to store all video and tabular data, rather than only a subset of EM data, that increases costs. If data need to be accessible to enforcement or management in 24 hours, versus a time frame that would let hard drives be mailed in, that requires a different data storage system that may also have higher costs.

GOALS & USES

When program goals change, data needs and system requirements may also be affected. An EM camera configuration to confirm no fish are being discarded may not capture images detailed enough to measure fish lengths, if the program later decides it wants to use video for that goal. Several current EM programs are used to verify fishermen's logbooks (both paper and electronic logs) which may not mean they're configured to record protected species interactions. We talked about the importance of having clear goals that can drive system specifications and vendor requirements; while those goals may change over time, it's valuable to try and anticipate future goals and talk about the roadmap for program expansion early on, rather than try and add new data uses on the fly. On a related note, we wondered if an EM system could be so reliable that monitoring could be completely automated and require no manual input from fishermen (e.g. eliminating logbooks), and how would you know if a system reached that threshold of trust.

FUTURE VISIONS

We closed by asking participants to envision their ideal EM programs. We heard about using the data to create value for fishing participants: fishermen-created and controlled data systems that also feed into business systems, or low-cost hardware captains can install and repair themselves. There were networked fleets that could coordinate in real-time, cameras that processed footage so video never left the boat, and fully-monitored full-retention fisheries that allowed easier fishing for multiple species, across fisheries. There was also a vision of a bigger community educated about EM program design, from fishermen and Council/NMFS staff who better understand the tradeoffs and benefits to more cross-regional communication within NMFS and with external data partners, like FINs and vendors.

ISSUES IDENTIFIED & AREAS FOR FOLLOW-UP

The issues listed below represent those where we, the meeting hosts, observed significant interest or energy and those that raised ideas for follow up. There was a robust discussion of a wide range of topics over

the two days (more than we can include here) and while we asked the group to help identify next steps, we didn't ask for any agreement on or prioritization of those ideas. The Net Gains Alliance will be reviewing these follow-ups to see where we could advance them and we encourage others interested in tackling them to contact us or start their own projects and share what they learn.

GLOSSARY

A lack of consistent language about data has implications for policy and cost. For example, the NMFS cost directive refers to "raw" and "processed" data, where "processed" means data that has been fully reviewed by an EM vendor. Technical experts often refer to decompressing and decoding camera data as "processing" the footage, thus what a reviewer watches to count fish is already "processed" and what is sent to NMFS is "summary" or "tabular" data.

> FOLLOW UP: Create a working (maybe even a wiki) glossary of key EM terms such as Raw Data, Audit, Third Party Provider, Contractor, Data bucket, EM, ER, and Retention. Reference and build on the lists of terms that already exist, including NMFS guides, EDF's EM Design Manual, the CEA/TNC EM report, and the ISSF Glossary.

DATA SHARING

Managing EM data requires a network of agreements governing data sharing across public and private parties, including agencies, vendors, data intermediaries, and fishermen. While these are primarily legal agreements, designed to enforce data sharing and confidentiality, they have technical implications for how databases are structured and data are sent or received. In order for these agreements to have their desired effect, it's valuable for both legal and data professionals to understand the meaning of the language in the documents, from both perspectives.

> FOLLOW UP: A review of past NMFS data sharing agreements (within and outside EM programs) with technical and legal advisors to explore what language is most effective. Templates for agency-friendly data sharing agreements with clear technical and legal terms based on those findings.

Based on the detailed discussion of how to manage and share data before it's submitted to NMFS, there is interest in researching the contractual agreements that specify what individuals, organizations (such as co-ops), and vendors can do with EM data. These agreements could clarify how unprepared EM data (video and sensor data) and EM data products would be accessed to meet management requirements and help reduce uncertainty or concern about how data would be used.

> FOLLOW UP: A report on contractual agreements in fisheries that could be used to also govern data sharing, as well as examples from analogous data sharing programs from outside fisheries.

QUALITY CONTROL & AUDITING THE UPSTREAM DATA

There are currently no standardized protocols for reviewing the work of EM vendors or third-party intermediaries, who take the video and data from EM systems and provide summary reports to NMFS. We described this as "auditing the vendors" or performing a "secondary review" and it could be done by the agency, by certified external auditors, by consultants using an agency-approved framework, or a combination of these entities. This review would entail not only the quality of video review, but also other quality assurance metrics such as data management and security. The lack of secondary review could reduce data quality, if not all vendors are meeting consistent standards, or diminish the perception of data quality by managers and the public. A secondary review process could also provide a way to differentiate across vendors and it impacts vendor costs, as preparing for an annual or biennial review might cause companies to prepare and store data differently than if reviews are rare or nonexistent. Another option could be creating a 'trusted' or 'verified' vendor program, where clients can pick from any firm on that list.

FOLLOW UP: Conversations with EM vendors about secondary review protocols - how they might be designed and optimised. Research into how these quality audits are done for vendors in other sectors and for analogous programs at other federal agencies.

VIDEO REVIEW AND DETERRENCE

Some EM programs record 100% of operations for the entire trip, but only review a randomly selected subsample of footage. Others only record a smaller percentage of trips but review 100% of the footage collected from those trips. This may be due to specific program goals, or it may be a hold-over from past human observer coverage rates. Video review is one of the biggest costs of an EM Program and until AI is perfected, it can also be time consuming. How could we design cost-effective review frameworks?

FOLLOW UP: Pull together and share existing information from across NMFS regions on the effectiveness and cost of different EM review rates. Additional research looking at video surveillance in other fisheries and sectors to explore what level of review provides a sufficient deterrent to cheating, and how does that review rate compare with the rates needed for scientific protocols (e.g. avoiding sampling bias).

WORKING WITH VENDORS

Requirements for EM system hardware, data processing, data storage, auditing, etc. will affect the products and services that the industry needs and that the vendors can provide. These needs and requirements need to be clarified among the industry, vendors, and NMFS.

FOLLOW UP: Consider a vendor exchange event or meeting in the future that will provide a forum for vendors, industry, and NMFS to discuss EM data requirements, system design options, and administrative processes. An EM vendor fair is currently planned for the NMFS EM Meeting in New Hampshire on November 13-14, 2019, which could be an opportunity to start this discussion.

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Participant List

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Meeting Chairs: Joe Sullivan & Dorothy Lowman

Name	Organization
Abigail Turner	North Pacific Fisheries Association
Bill Karp	University of Washington
Bill Tweit	North Pacific Fishery Management Council / Washington Dept. of Fish & Wildlife
Brett Alger	NMFS Office of Science & Technology
Brett Wiedoff	Pacific Fishery Management Council
Caitlin Imaki	NOAA Office of General Counsel Northwest Section
Chris McGuire	The Nature Conservancy

Claire Fitz-Gerald	NMFS Greater Atlantic Regional Fisheries Office
Courtney Paiva	Pacific States Marine Fisheries Commission
Dan Falvey	Alaska Longline Fishermen's Association
Dave Colpo	Pacific States Marine Fisheries Commission
Dayna Matthews	Retired NMFS Office of Law Enforcement
Dorothy Lowman	Net Gains Alliance Task Force
Elena Onaga	NOAA Office of General Counsel Pacific Islands Section
Emma Htun	NMFS Office of the Assistant Administrator
Eric Torgerson	Chordata, LLC
Jennifer Stahl	University of Hawai'i at Mānoa - NMFS
Joe Sullivan	Joe Sullivan Law Office PLLC
Johanna Thomas	Environmental Defense Fund
Julie Bonney	Alaska Groundfish Data Bank
Justin Kavanaugh	NMFS West Coast Regional Office
Karen Sender	NMFS Office of Science & Technology
Kate Kauer	The Nature Conservancy
Kate Wing	Net Gains Alliance Task Force
Keith Hagg	NOAA Office of General Counsel Fisheries and Protected Resources
Kelly Spalding	NMFS Office of Law Enforcement
Leigh Habegger	Seafood Harvesters of America
Melissa Hooper	NMFS West Coast Regional Office
Sam Rauch	NMFS Deputy Assistant Administrator for Regulatory Programs
Sheila Lynch	NOAA Office of General Counsel Northwest Section
Shems Jud	Environmental Defense Fund
Steve Martell	Sea State Inc
Tom Nies	New England Fishery Management Council
Tom Warren	NMFS Highly Migratory Species Division
Emilie Franke	Administrative Support

Agenda

All events in Cedarbrook Lodge Cedar 1 meeting room unless otherwise noted

Wed, June 26

10:00am	Start: welcome, introductions, and meeting goals
10:45	Describing the current landscape of EM programs: objectives, users, data flows, key elements
11:15	Legal & Policy issues: presentation, panel discussion, and Q&A
12:00pm	*Lunch (in workshop room)*
1:00	Legal & Policy issues continued: NOAA Fisheries directives, existing guidance, and other applicable constraints or program requirements. Short talks and full group discussion.
2:15	*Break*
2:30	Mapping legal & policy issues onto EM programs: ● What are the commonalities and distinctions across regions and fisheries in data handling and access? ● How do design choices affect cost, data availability, usability, and other factors?
5:00	End Day 1
6:00	*Hosted reception with appetizers (Reflections Gallery outside workshop room)*

Thu, June 27

9:00am	Start: check-in from Day 1, review outstanding topics
9:30	User & goal-centered design: imagining EM programs that optimize for different goals or groups of users.
10:15	*Break*
10:30	User & goal-centered design continued
12:00pm	*Lunch (downstairs in Tamarack Hall)*
1:00	Outstanding topics, synthesis, and next steps
3:00	Meeting close

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The Net Gains Alliance (NGA) is a cross-sector collaboration supporting efforts to improve U.S. fisheries data. The NGA believes electronic monitoring (EM) programs can be part of that improvement and that there are outstanding issues for discussion around EM data management. The NGA is funding and supporting this invitation-only workshop for NMFS and NOAA General Counsel (NOAA GC) staff, fishing industry representatives, and conservation organizations as a forum for exchanging perspectives. Dorothy Lowman, an NGA leadership team member and a former Chair of the Pacific Fishery Management Council, and attorney Joe Sullivan will co-chair the workshop. Funding and logistical support for the event is provided by Council Fire, the Kingfisher Foundation, and the databranch.

Discussions of laws and policies will focus on the general application of existing laws and policies to EM data management without addressing how they might apply to specific EM programs that are under development or in rulemaking. The discussion is intended to promote a common understanding of the relevant legal and policy framework for EM, and statements made will not constitute legal advice or agency opinions. Agency staff and NOAA GC attorneys will not comment on unresolved agency policy issues or issues being addressed in ongoing rulemaking but are welcome to listen and ask questions during the entire event.

The NGA will summarize and share insights from this meeting to further the broader discussion about improving fisheries data systems, but will not record or attribute statements to individual participants or their home organizations.