



Fishing for Data

A 4-part podcast series from the Net Gains Alliance, Duke University and EM4Fish.

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Fishing for Data: Episode 3 Guide

Electronic Monitoring and the MSA

Episode Summary

This episode is the final part of the podcast series *fishing for data*. The term “electronic monitoring” is not defined outright in the definitions section of the MSA, 16 U.S.C. 1802 § 3. Rather, the term appears merely as a component of the statutory definition of “observer information”. Though there are clear benefits to utilizing EM technology in this context (both for fishermen and fisheries managers), the absence of a standalone definition for EM prevents the use of technological systems for a broader range of compliance and management goals. But not limited to those specific goals. Ocean expert Melissa Garren sees electronic monitoring program as a broad umbrella; meaning, that cameras can be combined with different sensors and used for a variety of purposes ranging from monitoring catch handling, catch quantity, catch composition, discards, ETP interactions, workplace safety etc. In fact, enabling a more use of technology, and moving toward a best- technology-available approach, in the fisheries world would likely enhance efficiency in fishing and fisheries management, including the rise of the smart boat.

Learning Outcomes

This episode intends to explore how EM exists in the MSA today, but also the present and future applications of EM in fisheries (beyond what is authorized in the MSA today). Speakers will comment on how we might amend the MSA to reflect the present and future capacity of EM to assist with fisheries management. Listeners should understand how the statutory construction limits the wider use of EM for compliance and management goals and presented reasons to update the statute to ensure the law can continue to function effectively as EM systems evolve.

Transcription available

Please see the full transcript at the end of this document. Transcript was provided by Rev.com.

Content

Part 1: The status of electronic technologies and the challenges to new tech adoption

00:04-21:35

Speakers:

- Chris Cusack, acting director of the Oceans Technology Solutions team at the Environmental Defense Fund

- Melissa Garren, CEO of Working Ocean Strategies

Part 2: The future of technology in the fisheries world

21:48-40:16

Speakers:

- Chris Cusack, acting director of the Oceans Technology Solutions team at the Environmental Defense Fund
- Melissa Garren, CEO of Working Ocean Strategies

Relevant Terms

- **EM/R:** Electronic Monitoring and Reporting
- **MSA/MSFCMA:** Magnuson-Stevens fishery conservation and management act
- **VMS:** Vessel Monitoring System
- **AIS:** Automatic Identification System
- **ET:** Electronic technologies
- **FAA:** Federal Aviation Administration

Applicable laws

- Magnuson-Stevens Act 16 U.S.C. 1802

Questions?

Questions, comments, and inquiries are welcome at fishingfordatapodcast@gmail.com

Future episodes will be posted at <https://law.duke.edu/dclt/em>

Transcript

Part 1: The status of electronic technologies and the challenges to new tech adoption

Libba Rollins ([00:04](#)):

Hi, I'm Libba, and welcome to the Fishing for Data podcast series. This podcast is produced by The Duke University Center on Law and Technology, in cooperation with and support of the Net Gains Alliance, a global initiative in support of sustainable management of ocean resources through data modernization, and EM4FISH. The digital hub for fisheries data in tech.

Kyle Medin ([00:25](#)):

Hi, I'm Kyle. In this episode, we will be exploring the intersection between fisheries policy and technological innovation. We will be talking with two experts about why we've failed to see greater adoption of emerging technologies in the fisheries space and what the management community can do to accommodate and support future innovations.

Ines Nnoko ([00:42](#)):

Hi, I'm Ines. This program is intended to be educational in nature. And as such, we do not intend that the information we discuss be taken as legal advice. If you would like to determine your or your fisheries liability, or plan your own response to these issues, we recommend that you seek legal representation to assist you with your specific situation. That said, we are welcoming questions on this topic until June 15, at FishingforDatapodcast@gmail.com. On Friday, June 18, we will host a live reaction and Q&A with speakers from the show. And we may answer your questions. More information about the Q&A live session will be released soon on www.netgainsalliance.org.

Libba Rollins ([01:36](#)):

I'm Libba Rollins.

Ines Nnoko ([01:38](#)):

I'm Ines Nnoko.

Kyle Medin ([01:40](#)):

And I'm Kyle Medin, and we'll be your hosts here on the Fishing for Data podcast.

Libba Rollins ([01:48](#)):

All right team, we have covered a lot of information about Electronic Technologies and fisheries over the course of our previous three podcast episodes.

Ines Nnoko ([01:56](#)):

We definitely have, our first episode looked at electronic monitoring data in relation to Federal Records and the Freedom of Information Act.

Kyle Medin ([02:06](#)):

And episode two, which looked at secondary uses of EM data, grew so big, we ended up having to split it into two separate episodes.

Ines Nnoko ([02:14](#)):

In this episode, we are going to shift our focus slightly away from the data Electronic Monitoring Systems, collect and think more about the Electronic Technologies themselves.

Libba Rollins ([02:25](#)):

Right. And we'll be looking at how Electronic Technologies in fisheries have been supported or not in the past and present but will also be looking ahead to think about how we can foster technological innovation into the future.

Ines Nnoko ([02:38](#)):

We spoke with two experts for this episode. We will hear from them throughout the conversation.

Libba Rollins ([02:45](#)):

First up we have Chris Cusack.

Chris Cusack ([02:47](#)):

Yeah, thanks for having me on. My name is Chris Cusack. And I am the acting director of the Oceans Technology Solutions team at the Environmental Defense Fund.

Libba Rollins ([02:56](#)):

And we also spoke with Melissa Garren.

Melissa Garren ([02:58](#)):

Thanks so much for the opportunity to join you today. My name is Melissa Garren, I am the CEO of Working Ocean Strategies, which is a firm dedicated to supporting financial, social, and environmental sustainability, the triple bottom line in the ocean space.

Libba Rollins ([03:16](#)):

Okay, so we are going to start with some of our conversation from Chris.

Ines Nnoko ([03:20](#)):

Yeah, and his work broadly focuses on using technology to solve the whole range of problems in the oceans.

Chris Cusack ([03:28](#)):

In a nutshell, my team tries to find ways that new and emerging technologies are and could be used to solve some of the most pressing environmental challenges facing our oceans, then we try to make them happen at scale.

Kyle Medin ([03:39](#)):

To start, we asked Chris to briefly review what the most common tech looks like on fishing vessels in the US today. Though, there are tons of technologies that have been developed to improve the fishing effort. We asked Chris to focus on tech that assists with compliance and management of fisheries specifically.

Chris Cusack ([03:55](#)):

The most common piece of tech is probably a Vessel Monitoring System. It is basically a piece of equipment that records the vessel's location every few minutes. These units let agents monitor for incursion into illegal fishing areas. And they can also be used to generate a lot of other insights. The past few decades and seeing the emergence of EM systems. And they are basically cameras on boats that monitor fishing activity. These cameras often take the place of human observers, they are generally used to ensure compliance with regulations and to provide a record for auditing fishermen's logbooks.

Chris Cusack ([04:31](#)):

Another one is electronic logbooks. And these take the place of paper forms. And they are also really important pieces of tech that can help fishermen by making reporting easier. There is lots of other examples of compliance tools in use around the world. But those are the main ones here in the US.

Kyle Medin ([04:48](#)):

But Chris also said we could be doing way more with the tech that exists today.

Chris Cusack ([04:53](#)):

Yeah, I mean, there's a lot of technologies that can benefit management if management caught up to the technologies. One good example is Dynamic Spatial Mapping. Managers set management regulations such as closed areas, and they are static, they set a closed area, it's a year-round, and it's in a fixed location. But especially with the effects of climate change, the movement of fish and the location of species that they care about, are not fixed in time. But we already have good data to tell us where those species are moving to, where they are. And so, as a result, management lags behind.

Ines Nnoko ([05:36](#)):

Chris offers this as just one of many examples of how existing technology and analysis methods could vastly improve the way we regulate fisheries.

Chris Cusack ([05:47](#)):

I think we are missing a trick really in fisheries where fishermen can provide information that can be used for management, and the timeliness with which that data could get to management could be reduced, making management adaptive, and dynamic within a season. So instead of a static measure, you can adjust management in response to what you are seeing on the water, that is generally not happening now. So, management could benefit. But they just need to kind of up their game a little bit.

Libba Rollins ([06:22](#)):

When it comes to today's EM systems. Chris said that there is no big mystery about how existing technologies could inform better management.

Chris Cusack ([06:30](#)):

Yeah, it has been around for 20 or 30 years, probably. We have good models of cost-effective EM use all over this country, and Canada and Australia, and New Zealand, and so on, and so on. We know how to get it right in terms of the technology. And so, we have the model in place. And I think the difficulty that we have come up against is building the program, the EM program. The program is the policies and the rules and the infrastructure and the processes that exist that support the use of the EM systems. And that is what we have been struggling with, for example, on the West Coast for the past few years. Even though the technology has proven to be effective, fishermen are happy, managers are happy. There is no real issue with the tech.

Ines Nnoko ([07:14](#)):

Melissa Garren, echoed the same sentiments.

Libba Rollins ([07:18](#)):

Right. Specifically with EM, she said the challenge is not so much the technology but a host of other factors around deployment.

Melissa Garren ([07:26](#)):

The uptake of EM has been slow, and it has been slower than other Electronic Technologies, generally speaking in the fisheries' management arena. And in part that has to do with EM being a really big umbrella. In terms of technology, it is a bunch of different tools that can be used in a variety of different ways. And so, this big umbrella makes it a bit trickier to create clarity around what a program is going to look like to be effective at meeting an individual fisheries' needs. Because if you think about comparing that to something like a Vessel Monitoring System, that is essentially just tracking, a GPS location sends some frequency, and that is more or less it. There is just a much bigger variety of ways in which EM can be used than some of these other technologies.

Kyle Medin ([08:22](#)):

So, there are some serious challenges adapting management to the newest Electronic Technologies.

Libba Rollins ([08:27](#)):

Right. But both Chris and Melissa also emphasized how hard it can be to get buy-in from fishermen when it comes to new tech.

Melissa Garren ([08:35](#)):

I think another piece of the pushback has come from the impression that EM is really a compliance tool. And it bears a cost. So, it's an extra expense, and it's just being used for compliance in many fishermen's minds. And so that really has not motivated the uptake of it, as you might imagine, and there has not been as much of an emphasis put on how data collected through EM can benefit other stakeholders, benefit fishermen directly and the business of fishing.

Libba Rollins ([09:12](#)):

Here is Chris, again.

Chris Cusack ([09:14](#)):

I think you have to start off at the level of the fishermen and think about how fishermen are independent people who are often highly dispersed across the ocean, think of the Wild West on the oceans. That is how fisheries have been. So, I have taken new things and convincing people to try new things is generally hard. When fishermen are doing well enough, doing pretty much what they have been doing for decades. There is no real incentive to change. But this relies on there being a lot of uncertainty about what is possible, if fishermen were to be more certain of the benefits that tech could give them. And I think more fishermen would be persuaded to adopt the technology. And that is all the preamble to the biggest reason that the digital revolution has not reached the fishing sector and that is that the business environment in most fisheries is not conducive to technology adoption.

Chris Cusack ([10:06](#)):

To make long term investments in a fishery, there has to be stability. Fishermen and others need to know that they should be stewarded and well managed, and that they will get a long-term return on their investment. But fisheries are naturally variable, they go through change, they go through changes every year. And that makes it difficult for fishermen to plan. And if the medium to long term outlook is not good, for example, if the fishery is not particularly well managed, stocks are overfished, people are concerned about climate change and so on, then where are the incentives to invest in a fishery? Where are the incentives to invest in technology? There is no certainty.

Libba Rollins ([10:42](#)):

What Chris is really getting at here is that, as a business, it only makes sense for a fishing operation to put up the capital to invest in new technologies, if there is some sense of certainty about the future business of the fishing operation.

Kyle Medin ([10:55](#)):

Right. But there is also somewhat of a catch 22 here. Broader adoption of VM systems and other Electronic Technologies could improve fisheries management strategies and decisions as Chris mentioned, which could deliver that needed certainty to commercial fisheries and in turn incentivize further investments in new tech.

Ines Nnoko ([11:13](#)):

Precisely. But greater business certainty is not just necessary for the fisherman to invest in EM. Both Chris and Melissa told us that greater certainty about how the industry might use new technology is paramount. If tech companies are going to invest in the research to develop new Electronic Technologies.

Chris Cusack ([11:31](#)):

The kinds of technologies that could generate value for fishermen are slow to be developed. It is a harsh environment on the ocean. And it is definitely not tech friendly.

Melissa Garren ([11:42](#)):

EM technology is an immature marketplace. So, for these smaller companies that are moving into this new space, they don't have the resources that they would need to do government outreach and develop interoperability and some of the things that could help uplift that whole marketplace. In order for that market to develop, there needs to be a bit more security for the tech companies to be able to predict

market size, the rate of growth, and all the things you need to make smart business decisions as a tech company of how to invest your resources.

Ines Nnoko ([12:22](#)):

Okay, let's pose and quickly review what Chris and Melissa have told us so far.

Libba Rollins ([12:27](#)):

Okay to solve. So Electronic Technologies that could help improve the management of fisheries are getting better and better every day. Yet, for a variety of reasons that Chris and Melissa just told us about, uptake of new tech for compliance and management in commercial fisheries in the US has generally been very slow.

Ines Nnoko ([12:45](#)):

The health and harvesting rights of many fisheries remain too uncertain for fishermen to make long term investment in new tech. And the marketplace is too volatile for companies to engage in the kind of research and development necessary to bring cutting edge technologies to the commercial fishing arena.

Kyle Medin ([13:05](#)):

And systems of management tend to lag behind the tech because they have not been set up with the goal of accommodating technological improvements.

Ines Nnoko ([13:13](#)):

Okay, so we have painted this as somewhat of a broken system so far, haven't we?

Libba Rollins ([13:18](#)):

Yeah, we have. But there are a whole range of solutions to some of these problems. Chris gave us a fantastic example of a fishery, where the uncertainty of the industry was reduced through improved management strategies, which led to some pretty amazing changes in terms of the technology being utilized on vessels.

Chris Cusack ([13:37](#)):

The Alaska Bering Sea Pollock fishery implemented cut shares over 20 years ago. And what that did was effectively assign fishermen, durable, flexible privilege to harvest the resource. And durable means it is long term. So, fishermen have a long planning horizon. And it is flexible, meaning that they can trade clause, so they can sell clause, so they can lease clause to increase their flexibility on the marketplace. So, the fishermen were assigned a percentage of the quota in the fishery. And as long as they played by the rules, they could keep doing it. And that completely changed the incentive structure in the fishery. And that is the same all over the world, in places that have implemented these rational systems of management, we call them. And suddenly fishermen have something they can take to the bank, they can plan and invest and as a result, the Bering Sea Pollock fishery is probably the most technologically advanced fishery in the entire world.

Kyle Medin ([14:36](#)):

Melissa said management decisions for EM programs can be equally valuable to reduce uncertainty for tech companies developing new tools for these fisheries.

Melissa Garren ([14:44](#)):

One of the things that I think can help the EM market mature is having some federal guidance that draws essentially the lines around the playing field and helps define the game at the national scale so that an individual company can start building solutions that will be scalable and transferable to different regions and different fisheries. Right now, so many of the requests are for pilot projects, first of all, so a small number of boats. And they are for configurations that require fairly custom builds. And sometimes that is necessary. And sometimes that is just an artifact of lack of communication across regions, or insufficient discussion ahead of time of what's possible and where cost savings could happen.

Melissa Garren ([15:36](#)):

And so being able to build a product, that can be the platform, and maybe customize some, but at least have some basis that is the same across different regions and different fisheries would help a lot with the cost effectiveness for programs at the national scale. And so, one of the opportunities that we have in creating a federal EM framework is to draw some of those lines of the borders of the playing field for EM in overall, what might that look like? What are the minimum requirements to be useful and to be effective?

Melissa Garren ([16:17](#)):

And then within that playing field, once we all know we're playing a single game, we're playing football, for example, then each individual region, and each fishery can pull together the teammates that they think are going to work best for them, they can choose their own place, and they can decide how to captain that game for themselves, but we need that border, so that at the high level view, a technology company can make some reasonable business decisions about where to invest, where they want to specialize in the market, and what they're going to offer stakeholders that's going to be unique and most effective.

Libba Rollins ([16:59](#)):

At the end of the day, everything Chris and Melissa are hitting on has to do with creating a system that provides incentives for EM adoption.

Chris Cusack ([17:07](#)):

The point is that every piece of technology that is being used generates an advantage for somebody. That is why it's being used, you really have to think about what are the processes and structures that you can create that generate a direct benefit to fishermen that also have management value? And the Dynamic Spatial Mapping example that I was talking about earlier is a really good example. You could potentially use Dynamic Spatial Mapping and predict where bycatch levels are probably going to be low. Fishermen can take this information and direct their fishing to areas that would hopefully result in less bycatch, those kinds of things could lengthen their seasons. It also reduces bycatch and improves management. And so those are win wins.

Ines Nnoko ([17:56](#)):

Methods like these could incentivize great attack adoption by fishermen where such tools will have reduced business uncertainty.

Libba Rollins ([18:05](#)):

Right. And at the same time, managers and policymakers can create incentives for tech companies to develop better EM systems and other Electronic Technologies for fisheries' management, by developing clear EM frameworks as Melissa described.

Ines Nnoko ([18:19](#)):

Right. And as new technologies are developed and deployed, the management of fishery will almost certainly improve. And those improvements will create new levels of certainty for all the players, which will help drive the cycle of tech adoption forward, while supporting the health of the fishery.

Kyle Medin ([18:40](#)):

One of the big reasons this is such an important conversation to be having is that the tech is continuing to evolve and improve every day. So not only do we have to sort out how to better integrate today's technologies into the fisheries' data world, but we also need to design EM programs and incentives that account for continued evolution of VM into the future.

Ines Nnoko ([19:00](#)):

Here is what Chris had to say about what we might expect from the evolution of EM technologies, including artificial intelligence, or AI, and associated incentives in the future.

Chris Cusack ([19:13](#)):

In the distant future, the incentives facing fishermen will be so refined, that there will not be any compliance monitoring technology on boats. That is my view. The only tech on boats will be there for business or stock assessment and management purposes. I think fishermen will be following their rules because they see the value in doing so. By bringing it back a few decades, I think we will see a huge expansion in the use of VM systems, across the world markets in the United States, museum systems will be able to generate management ready data through edge computing.

Chris Cusack ([19:47](#)):

That means that the analysis of video and sensor inputs will happen on the vessel. These systems will transmit data in close to real time via satellite to managers who will then turn around and use those inputs to make in-season adjustments to management controls, such as closed areas, I think vessels are just going to get better at catching fish, but also doing it selectively, and with less environmental impact, for example, four looking sonars will be used to automatically steer boats towards target species and away from bycatch.

Chris Cusack ([20:20](#)):

Fishermen will be using environmental variables to help them decide where to fish, but management will also get a lot better. It is a sad fact that even with the brightest minds on the planet, on the job, we still didn't have a good idea of how we should be consistent at work. And let alone what happens when humans remove fish and disturb the environment. I think that is to be expected because there's billions of variables that govern what happens in an ocean ecosystem. And they all interact in different ways. I think AI has a lot of potential to improve management by identifying relationships between some of these variables and informing good management measures.

Libba Rollins ([20:58](#)):

Chris said that the process of better integrating emerging technologies into fisheries may be challenging, but it is ultimately necessary.

Chris Cusack ([21:05](#)):

I think what people are afraid of is the development process and the pain they might feel in the interim. But that development has to happen. Technological advancement that lowers the cost of doing something happens everywhere, all the time. That is how we got to us talking via a computer on a bright bass podcast platform. And I just felt that we should really embrace that, we should embrace technological advancement, and the advantages that it gives us.

Ines Nnoko ([21:35](#)):

We will be talking with Chris and Melissa more about how we can better embrace future fisheries acknowledgments after the short break.

Part 2: The future of technology in the fisheries world

Libba Rollins ([21:48](#)):

Dear listeners, please submit your questions and comments at FishingforDatapodcast@gmail.com by June 15th. We look forward to reading your thoughts. Stick around, we will be right back.

All right, so we left off talking about the current status of Electronic Technologies in fisheries, and why uptake of new tech can be so challenging.

Ines Nnoko ([22:14](#)):

Right. And now we want to shift into thinking about some of the solutions of these challenges, including how the fisheries hold, can better prepare for, and embrace emerging technologies in the future. Here is Melissa Garren.

Melissa Garren ([22:31](#)):

If we do not leave room for the tools and the methodologies to evolve in more real time than we currently do. We are always five to 10 years behind. And therefore, we are never actually able to manage with the best available science. We are managing with the best available science from 10 years ago, or best available tools from 10 years ago. And that is not getting us to where we want to be.

Kyle Medin ([22:56](#)):

Melissa said getting management to be elastic to technological innovation ultimately, is not all that complicated.

Melissa Garren ([23:03](#)):

The crux of elasticity is getting to performance standards instead of technical standards. A performance standard is one that is focused on the outcome of the regulation, as opposed to the pathway of getting to that outcome, a technical standard focuses on the technical details of arriving at that outcome,

whatever that might be, delivering a specific piece of data, when we start shifting to focus on the outcome that we want from a regulation or from a rule, we begin to create space for innovation, for creative thinking about how to achieve that end point, how to get to that goal.

Melissa Garren ([23:46](#)):

And that is a shift from the more traditional prescriptive technical standards that really focus on how you are going to get to that goal? How are you going to collect this data? How are you going to transmit it? As opposed to what are the core minimum data elements that we need to have? What are the bounds on certainty? How accurate do we need it to be? What is the minimum frequency that we need to receive it? That is really the fundamental shift for making space for innovation, and allowing technology to evolve at its natural pace, which is much faster than regulation, while the regulatory structures can stay in place and continue to serve through multiple generations of technology.

Melissa Garren ([24:31](#)):

And this has been acknowledged by every administration that we have had since the Clinton administration. And despite the diversity of administrations, we have had since then, they have all upheld that and agreed with that trajectory. So, I think to me, that says there must be something in there that is working.

Ines Nnoko ([24:52](#)):

Melissa said that if we are able to collect the data necessary to meet a given performance standard, the tools we use along the way should be less important. And regulating around those tools versus the information those tools produce can really slow technological innovation and adoption.

Melissa Garren ([25:13](#)):

Part of what we want to do is start treating the data elements separately from the tools that collect the data, and the methods that you use to gather that information, which is just another way of saying, using a performance standard versus a technical standard. But it is really separating the way you get there from what it is you are gathering. Because those tools do not belong in the overarching regulations, the tools are what need to be able to change and the methods of data transmission and all of that sort of stuff need to be able to evolve with the time. But the actual core data elements that you need to manage a fishery, well, are not changing that quickly.

Melissa Garren ([25:57](#)):

So those can belong in the Code of Federal Regulation. The challenge that we have seen in our research is really that when we regulate around individual technologies, having a VMS Technology Policy, AIS, regulating around these individual technologies, creates gaps in how the data flow, and can be used for different purposes. So, for example, some of these vessel tracking technologies, both VMS and AIS have potential applications for supporting Fisheries Management Science, they have their caveats, but they could be used sort of as a side benefit in applications that were not necessarily their primary focus when they were put in place.

Melissa Garren ([26:48](#)):

So, VMS is under the Office of Law Enforcement, that is really very much an enforcement tool, AIS is regulated by the Coast Guard, and is meant very much to be a safety at sea tool to prevent collision. So, having different entities in charge of individual technologies makes this patchwork of regulatory space

really challenging for having a modernized, integrated data flow that supports all the different buckets that we need for sustainable fisheries, the management, the science, the enforcement, the business aspects, all of those things. So, the challenge that we really see is how this patchwork quilt of regulatory structures really inhibits an integrated data system that can support all of the stakeholders towards a shared goal of sustainable fisheries, financially sustainable, socially sustainable, environmentally sustainable.

Libba Rollins ([27:53](#)):

A lot of what Melissa is saying here gets at the opportunities for secondary uses of Electronic Technologies and data to benefit fishermen and managers, which we explored in our last episode.

Ines Nnoko ([28:03](#)):

Exactly, Libba. And Chris echoed the same ideas when we asked him about the best strategies to support technological innovation in fisheries.

Chris Cusack ([28:13](#)):

Anything that sets performance standards, permits, flexibility and achieving these standards, encourages innovation by giving everybody a long flat runway to plan and addresses the important data ownership and data use questions. These are the important policies and changes in legislation that would help to facilitate our evolution in terms of data use and management and fisheries, data collection systems. They are currently monolithic. And by that, I mean, the people who collect the data are the ones that use it. And data is not shared with other industries who could benefit from it. And even within the same industry, that are shared, for example, between enforcement and stock assessment managers, for example, in some cases.

Kyle Medin ([29:04](#)):

So how do we build performance standards into fisheries management? In her research, Melissa has looked at examples of how other federal agencies have accomplished this goal as potential case studies we could apply to the fisheries world.

Melissa Garren ([29:18](#)):

There are a number of good examples of other federal agencies that are working to build flexibility into their regulatory frameworks using performance standards. One of them is the Federal Aviation Administration that started to use performance standards to regulate the safety of small aircraft. And one of the key elements of making a performance standard that will function well is ensuring that the regulated entity has enough clarity that they know how to meet it. So, if your standard says you have to bring people home safely, and that's all it says, that's fine.

Melissa Garren ([30:00](#)):

As long as there's clear guidance outside of that overarching regulation, the details of what that can look like, what are the concrete ways that industry can actually meet the agency's expectation. And so those details in the case of the Federal Aviation Administration have gotten worked out in consensus standards, where all of industry sits down, and they say, "Okay, given the technology we have today, here are the ways that we think we can bring people home safely." And they have a two-way dialogue with the FAA, saying, "This is what we think we can do and how we think we can do it."

Melissa Garren ([30:41](#)):

The administration reviews that and says, "Yes, this will meet our expectations. Maybe in this piece, you would need more detail." Or "This doesn't meet our expectations, because X, Y, Z." And provides all of that detailed clarity of how you actually get the job done on the ground today. And the advantage of doing it separately in consensus standards and administration bulletins, and other non-binding policy directives is that those can then be updated as new technology comes to be. As new materials are made, new designs are available. And that dialogue continues in much more real time than if you have to go back and through the whole federal registry process and actually update the Code of Federal Regulation.

Ines Nnoko ([31:35](#)):

Melissa said the FAA is a great example because the agency is doing more than just spotting performance standards for the commercial aviation industry, as it exists today.

Melissa Garren ([31:48](#)):

The FAA is fascinating to me, because not only are they leaving room for flexibility in meeting these standards and new technology to come on board, but they are actually leaving room for whole new industries that we haven't yet clearly imagined, like commercial space travel. They are now applying these performance standards, to the safety standards for space travel, and writing them broadly enough that as commercial space travel comes to be a potential real possibility, that whole new industry can evolve within the existing regulation, we do not actually need to change the Code of Federal Regulation in order to accommodate that new industry. It becomes an ongoing discussion of consensus standards and dialogue between industry and the administration and regulators of what is going to be acceptable.

Libba Rollins ([32:45](#)):

Melissa said that the fisheries' management world is pretty far from this vision of using performance standards.

Melissa Garren ([32:51](#)):

Thus, far the fisheries' arena has relied predominantly on technical standards. And I think if the Federal Aviation Administration can leave room for an entire field that does not yet exist, like commercial space travel using performance standards, I am certain that we can find good ways to implement them within fisheries to be able to evolve with Vessel Tracking Evolutions, EM and Electronic Technologies or ET more broadly.

Ines Nnoko ([33:22](#)):

One of the best places to start would be with our primary fisheries management law. The very good old Magnuson-Stevens Act, which we discussed in episode one.

Melissa Garren ([33:33](#)):

As we think about MSA reauthorization on the horizon, I think there is an incredible amount of opportunity to set the stage for making a shift towards performance standards in fisheries management, and really fundamentally shifting towards a perspective of data. What data do we need? And what are the data standards while the tools that we use to collect that data start to be treated separately thus far, we have really focused on one tool at a time.

Melissa Garren ([34:07](#)):

And I think the opportunity in MSA reauthorization is to rethink how data is collected for fisheries' management at large and modernize the whole system. So that we can start to incorporate these tools as part of the toolkit and support base for the management that MSA is outlining. I think there is a great opportunity with the reauthorization of the MSA to move EM and Electronic Technologies or ET more generally out from under the observer program. Right now, the interpretation is that EM and ET more generally are contained to the observer program.

Melissa Garren ([34:50](#)):

And that's great because it serves a lot of purposes within that program, but they could be used much more broadly to benefit science, enforcement, business and a whole suite of other applications, that moving it out from under that observer program would make a lot of sense to open up the opportunities to really maximize the benefits that having EM or any type of VT onboard a vessel has for all the different stakeholders. Part of the reason why EM could and should move out from under the observer program is that it is a body of technology that is fundamentally different from a human being.

Melissa Garren ([35:33](#)):

So, there are uses of EM that very much belong in the observer program, because it is very good at gathering certain types of data that can help support observers. Human observers are very good at doing things that EM is not yet ready to do and may never be ready to do with a lot more fine detail information and a lot of the science that fisheries' management benefits from. And so, there's room to use EM in complement and in support of observers, but also for completely different use cases that have nothing to do with what the observers are there to do on the vessels.

Melissa Garren ([36:16](#)):

And those, for example, might be business use cases for the fishermen themselves. Part of what we want to do by moving EM out from a specific program and allowing it to be simply a tool that is supporting a variety of data collection, that is going towards science, going towards enforcement, going towards business, all the different things that data is used for. And thinking of these tools, EM or ET more broadly, are simply pathways of acquiring that data that's required. We do not want to have to rewrite regulation every time there is a new type of camera available, or we want to transmit the data wirelessly instead of by moving hard drives around. So, we have to leave enough space, so that the tools themselves can continue to evolve. And managers have the best available science at their fingertips.

Libba Rollins ([37:16](#)):

Both Melissa and Chris said that as we plan for future technologies and fisheries, one of the most important elements will be to ensure fishermen are involved throughout the process and can maximize the benefits from the data being collected on their vessels.

Melissa Garren ([37:30](#)):

Part of what I think is most important about encouraging multiple use cases of EM data is ensuring that the fishermen have access to the data from their own vessels. Because right now, very often they do not. And so, there is no opportunity for a fisherman to use electronically collected data to their business advantage, to their own benefit if they can't access it. And so, when we are talking about multi-stakeholder access to data, it absolutely requires careful consideration and clear rules about data

privacy, data security, what granularity level of access, are you going to be aggregating a whole region? A certain number of vessels? For whatever the use case is.

Melissa Garren ([38:24](#)):

How are you providing access in a way that protects privacy, and the confidentiality of business practices, but also ensures that those who are putting in all of the effort of collecting the data, EM, for example, cannot be done without the fishermen onboard the vessels, they are an integral piece of the collaboration that makes the technology work. And at the moment, in many situations, they don't have the opportunity to benefit from that data directly. And they could, there are many good uses of that data that they should have access to.

Ines Nnoko ([39:01](#)):

Chris said he thinks we are on a trajectory, where more and more fishermen will be pushing for technological innovation, to support the health of fisheries, which will in turn support their own livelihoods.

Chris Cusack ([39:16](#)):

I think fisheries are on an evolution towards this utopia, especially utopia where fishermen actually demand accountability. And once you get there, then fishermen will demand these technologies. And if it saves the money in the long run, if it allows them to check a management or compliance box at a lower cost than the alternative, then they will do it. People are recognizing that an immense amount of value lives in data. We do not understand exactly how that value will be created from it, but just the value is huge. And to realize this future, we need to really think about the widespread sharing of data in a new ocean data ecosystem. And increasing access to data and reducing the barriers to use, increasing interoperability, and so on, and so on, and policies that can either hinder this process or policies can help it. But either way, this is the future.

Libba Rollins ([40:16](#)):

So that wraps up the final episode of our series.

Ines Nnoko ([40:20](#)):

That is right, Libba. We have covered a lot of ground in these series, talking to a range of experts in the fields of fisheries and others with more of an outsider perspective.

Libba Rollins ([40:31](#)):

But we are not quite finished yet. As we have mentioned, throughout this series, we will be hosting a live session with some of our guests to talk about major conclusions from the podcast and answer your questions.

Kyle Medin ([40:42](#)):

That session will be on June 18th, next Friday. And you can submit your questions ahead of time to FishingforDatapodcast@gmail.com. Please try to get those in by June 15, so we have time to review.

Libba Rollins ([40:54](#)):

Thanks to the Net Gains Alliance, The Duke University Center on Law and Technology and EM4FISH for their support. We hope that everyone has found this helpful, and we look forward to hearing from you at our live Q&A. Thanks again for listening.

About this podcast series

Fishing for Data is produced by a legal, policy, and environmental science team of fellows from the Duke Center on Law & Tech and sponsored by the [Net Gains Alliance](#), a nonprofit global initiative dedicated to better information for better oceans.

More information can be found at <https://law.duke.edu/dclt/em/>.



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