Plymouth 9/03/2015

I: Interviewer (Gregor Halfmann)

R: Respondent (Matthew Frost)

I: My first questions would be on your position as the deputy director of the MBA and, as I read on the websites of the MBA, you are concerned with strategic directions the MBA is taking in various areas and one of them is “data and information services”, which I would be interested in. One other area is “knowledge exchange”. I wonder if you could tell me a bit what is actually behind these terms. What could a strategy for data and information services actually be for an institution?

R: Okay, there are different strands to this. The data we have … we have a team led by Dan Lear who oversees all the data work and that really is about … Obviously, when you are working in science you are generating data, you will know this more than I do. You are utilising data, you are interpreting data. What you then need to do is think about things like how that data is stored. It is not just a case of having it on your hard drive or whatever it is. It is about storing it in formats that are acceptable and recognised formats so that other people can use it. How do you store raw data? How do you store metadata? So our team is an expert in all sorts of protocols and in how that is stored. Also in looking at things like permissions: Who can access data, how you can access data. For the whole of the UK we are essentially a data archive service, so we are funded by the Scottish government and the UK government to run this service. It means that essentially, any biological habitats and species data anywhere, should eventually be deposited with us. And we are responsible for making sure it is all stored in standard ways and it can be accessed. When we give it out, we understand about protocols that have to do with who can use the data and all the rest of it. I think that is an area we have got a lot of expertise.

I: That is DASSH, right?

R: That is DASSH, but it is also projects built around DASSH. It is not just DASSH. It is mainly DASSH, but we have also projects then built around things like making GIS layers out of the data. And then of course the other aspect of the data, and this would be something more like how marine evidence works, it is interpreting the data and outputting it. This is where it links with knowledge exchange as well, so that the wider community, whether it is governments or whoever, can use it. So it might be a project to say “Where are the biodiversity hotspots? Where do we have the highest species counts?” So it might be making GIS layers to show where biogenic reefs are. There are lots of things you can do with the data. So on the one hand you got the DASSH aspect which is storage, dissemination, etc. On the other hand you got “How can this data be used for the greater good?”, if you like. And that is really the working end.

I: I am wondering how these strategies are actually expressed or implemented. Is there some kind of policy for the people working here?

R: You are talking about the researchers, or?

I: Yeah.

R: Well, I think one of the things we do is help the researchers understand that … because to be quite blunt, your average researcher is addressing a hypothesis or answering a question using data, generating data, collecting data, etc. Once they have answered that question all they really want to do, and this is the classic research position, is publish a paper and move on. Now we think that what we can do is help them to say, “Okay, what is happening with the data that you generated?” We are helping them with things like data storage, whether that is explaining protocols to them or offering storage. So we are probably not making as much of it as we could but I think having all this in-house expertise … and of course part of my job is to also make sure that the results of marine research are communicated. Part of that may be “Here is some data.” And one of the things we are looking at in the moment, for instance, is one of our journals, Marine Biodiversity Records, always has data attached to it. One of the things we are talking to the publisher about now is “What do we do with that data?” Because there are moves now to publish datasets, once again, I am sure you know all this, but with DOIs, a dataset is a recognised contribution to a journal. Or do we move it out and put it into maybe a separate section of the journal to deal with data. I think there are loads of issues and I think we are still working through it because things have changed so much. Ten years ago, as I said, you published your paper and you moved on and then that was the end of it.

I: You mentioned that one part of your job is to make sure that things are communicated …

R: That’s right.

I: I am wondering, what is actually the work you have to put into this? You probably have to talk with a lot of people …

R: Right.

I: What different actors or groups are you communicating with or interacting with to address these issues?

R: Obviously it is not just me, it is the kind of time that I work with and oversee so you are going to have a number of aspects. So I rely on the data team to be doing the talking to the researchers about what is happening with their data. Then we have our communications directly, people like Guy Baker who I rely on to liaise with the researchers and making sure that if there are any stories coming out of the data or the research that they are communicated in the right way. Then you have people like those in Marlin and the marine evidence work; that is very much about “with all this information, can we use it to work on contracts?” So this is where our government will ask us to do things around, say, marine protected areas, some information to help them with, or it might be marine spatial planning. So that is more the applied side. So we will also then be trying to work with the researchers to say is there anything that you have got that can feed into this more applied contract work. Then of course we have the education work that is going on. It probably does not feed as directly into that, but sometimes there are overlaps. So citizen science is a big thing now. So if you take one of our researchers, for instance, she is doing a lot on mapping the movement of species in response to climate change and temperature and then she is collecting all this data and then she is liaising with our education team or doing some of her own education work to bring in citizen science. So you are actually then training students or amateurs or young people to go and make their own observations which can then form part of the data. So it is not a clear, it’s a massive area. My job is, to put it bluntly, to make sure that as an organisation we are out there and all our information and data and everything we are finding is, whether it is in the media or the government for policy which is another big thing we do. So we might get a consultation saying “these are all our marine protected areas; do you agree with our plans for them?” So I might be able to go to somebody in-house and find out that they do not realise that we have got species that they missed out. Or they talked about a protected habitat that we know is not there any more. I would say right across the board, right across all of this, whether it is policy and advice, or whether it is marine evidence, or education, it all feeds in. So my job is to make sure that all these pathways, sort of, are working.

I: Coming back talking a little more about data again, you already mentioned that ten years ago data was handled differently in terms of publications and journals, it has taken a different status. I wonder if you can talk about, right now and compared to the past, the characteristics of data or science that make this work or this effort actually necessary, you know, in your position to negotiate all this …

R: Yeah, I think there are lots of drivers. At the very basis, you can take funding. That is what it really boils down to at the moment. So in the old days you would say “we are going to do this project” and you would tick a box and say you put your data in an archive or whatever it was, but it did not seem that big a deal. It was really about just … you could get on with your science. Now there is this huge push, you can see it in things like the REF in universities and the move to Pathways and Impact studies. I think there is this huge push now to say that science is not in an ivory tower. When you do your science it has to be out there. The public wants to know why you are doing it and of course to your funders, it is a really big thing now not to just say, I keep saying in the old days but years ago, you could say “that went well, because we published three papers in high-impact journals.” Now you almost would have to say we had some media articles or maybe we had a meeting in parliament and talked to government about our findings. So I just think there has been this massive shift now that science is very much done in the public eye and we are expected to contribute to the wider good and actually make that clear, to state how we are doing that, you know, things like Pathways to Impact … and I think that has had a huge issue on data; it is the same philosophy. So people used to have data and they would guard it very jealously. It is their data and they would lock it away and nobody can have it. That is not acceptable any more. You have to have a really good reason to say, so …

I: You are talking about science in general having that push. Are there any particular challenges or things about marine biology and data in marine biology that makes it …

R: Different to science in general?

I: I don’t know if you are also in exchange with people from other fields about such things or …

R: Yeah, I would say that marine biology is slightly … I am not an expert in every field but I do know different fields have their own way of doing things and classically, the physicists have always been famous for quickly sharing data and you got the medical profession where obviously it is in everybody’s interest that data get shared and findings get shared quickly. I would say with marine biology there are probably slightly different drivers. We probably got a way to go to catch up with some of the other areas of science in sharing data. I am trying to think what the main drivers would be … If there are things that were unique … Obviously we have a lot of long-term data and that is a real issue, we will come to talk about the MECN. There has been this massive recognition in the last ten, twenty years that actually some of the datasets that we have been collecting for a hundred years are really crucial. That poses challenges, because of course for a researcher that is a goldmine. The push to make this data available gives us all sorts of challenges; there are some people not that keen. But in terms of marine biology as a whole, I mean obviously it is a much newer subject, I think. We are still collecting new data, you know, unlike on land … Well there are still species being found on land, but we are still discovering masses, so there is still this sense that there is a lot of novel data and as I said, that portends certain challenges, because for a researcher that could be their career or their PhD. It is not just a case of collecting stuff and then just putting it out there straight away.

I: One last question about your work as a director. I was wondering, how do you divide your own work? How much of your time actually goes into these strategic issues that we have talked about, I guess it is a lot of time, and how much time is actually left for you to do what I would think of as actual basic research?

R: The answer is not a lot. I do publish papers, but first-author papers I aim and try, you know, if I get one out in a year it would be great. I am usually author on others’ papers. I would say that most of my work, because I am overseeing such a wide area, journals, libraries, you name it, most of my work is sort of one step removed from the basic, you know, going out on the shore collecting stuff. If I do get a chance, fantastic; and I do sometimes. Also I do publish in the areas of policy and climate change, not as much as I would like but … and also some of my policy works, for instance, I have been working with the government over years on things like assessments and indicators for the Marine Strategy Framework Directive, I got a load of stuff from this published as well. I think my job has got to the stage now where it is really overseeing lots of areas, so it is very hard for me to spend time to say “I am gonna go out and do a project.”

I: But that is how you started out, right?

R: Oh yeah, my degree is in marine biology and my PhD is in benthic ecology, I started off doing basic research. Yeah absolutely, that is my background.

I: How does that benefit you in what you are doing now? That you have all this experience?

R: It is invaluable. I mean, I was in a meeting in London yesterday for a policy task force for another [unclear] . They were saying the issue they have got is they tend to bring in sort of admin and comm’s type people to do their policy work and they then have to liaise with others in order to understand the science, whereas for me and actually other people I work with here, because most of us have got very strong science backgrounds, Dan who runs the data and his people, most of us have come from marine science background and it makes a massive difference, because it means that if I sit in a room and somebody starts talking about biotope richness or statistical measures of biodiversity or whatever, I understand that. That’s my background. I don’t have to take that away and have another layer of people interpreting it to me. So yeah, it is really useful actually.

I: Do you think there is a shift or push to bring in more administrative type of people?

R: No, I think the pathway that I have ended up doing, there are one or two people I have met that have done it. It is a difficult one to take because people tend to come from one side or the other. So people tend to go into policy, into environmental management and that’s what they do or people do pure science. Actually, for somebody like me who has done sort of pure science, if you like, for many years, but then moved into the sort of policy and outreach type of thing, is quite unusual. I think more and more people are interested in doing it because as I said to you, the landscape has changed. Nearly every organisation, if you go to any science organisation, they now have their knowledge exchange, their policy people; that has been a massive shift. So I think there are going to be more and more people like me.

I: So let us start with the second block of questions. I want to know about your work on scientific evidence and how it relates to policy as evidence for policy making. What are the most important questions in this regard? What are the problems and the issues that you address?

R: Once again, unfortunately, it’s hugely varied. There are a couple of key drivers over the last few years, in the UK in particular. We have got the marine conservation zones, MPA’s in Scotland, etc., which make up the Marine Protected Area Network. Since the UK Marine and Coastal Access Act there has been this massive push, it has gotten a lot of media attention, everybody knows about it. This push to have marine protected areas around the UK has really necessitated a lot of need for data; not just data, but interpreted data. So for instance, I have also been employed, just out of interest, another of my roles was … When they are designating these zones they are very concerned about being challenged by local fishermen or other interest groups. So the Scottish government, for instance, paid me to go and review the way they used data and evidence. So on the other hand, if they designate an area and say “that’s a marine protected area,” then I wrote a report, it’s all online, you can find it anyway, but basically saying “I have checked the evidence.” I have looked at the amount and quantity of evidence they have used to designate these areas. I have also analysed the way they interpreted that evidence, so what analysis they have used. I have also looked at issues around the way that evidence has been made available to the wider public. Is it videos, photos, is it abundance data, or is it diversity data … I went through all these analyses and then in the end in my report I have to say “I think this is absolutely fine to designate the MPA based on this evidence and the way they have used it is good.” And then they use that as an independent science review to say “Look, …” The reason I bring that in is because it shows how important this whole thing is. Because the whole process of the way we are managing the seas and establishing MCZs and everything stands or falls on evidence. We had quite a controversy a couple of years ago when we had like 131 or 127 MCZs that we were going to designate, well, I say “we”, the UK government, and they only designated a number of them, because they said there was not enough evidence for the others or the evidence was not sufficient. I actually sat before a parliamentary committee and said “I think we are being a bit daft here. We have got loads of evidence, we cannot keep raising the bars, especially in the marine where it is much, much harder to go and collect stuff. So, I would say the whole issue of what we know about our seas and oceans is absolutely vital. The other area of [unclear] is marine spatial planning which is a huge thing. So basically, coming up with plans about how we manage the whole of the UK and also the really big one is the Marine Strategy Framework Directive which means we have got to report to the European Commission in 2020 to say that we have achieved good enough environmental status for all of our seas. So all of these things stand and fall on the science community being able to provide them with evidence and interpretation. So evidence is data and information, interpreted data. So yeah, it is kind of huge, it is a big subject.

I: I thought it would be more like “how is scientific data or scientific knowledge kind of translated into what politicians can use?” But it is not just that, is it?

R: It is not just that and in some ways that … I mean, I chair the Marine Climate Change Impact Partnership. I don’t know if you know what that is, but in 2005, we produced Charting Progress which is an assessment of the entire UK sea. It is to say what state are the seas in.

I: Yeah, I have seen that.

R: And what happened is that we did not really know much about climate change. I’ll give you a few of these. So the government said that as this group called the Marine Climate Change Impact Partnership our job is every year to report on what is going on around climate change as a whole or in particular aspects of climate change. And this is an absolute classic example. So if you take 2013, you can see down here this is the working group which I chair. What we do is we start off with just working with researchers who have data, so it might be data about the extent of arctic sea ice or temperature records or whatever, we then ask the researchers to produce reports or papers saying what is actually going on. And what is interesting is that our job is to take that and make clear to policy-makers what is going on. I mean, even the media got this wrong: Look at something like the extent of Arctic sea ice. We know that what is important is the trend about a number of years, but of course that is not what the media pick on. You get these headlines saying “there is loads of sea ice this year, so maybe climate change is not happening.” And in another year they will say “the lowest sea ice ever.” So if you look at the headline here: “The seven lowest Arctic sea ice extents in the satellite era were recorded between 2007 and 2013. The continuing downward trend is providing opportunities for the use of polar transit routes …” Now what does that actually mean? That is the important thing for policy people. It is a bit like the IPCC, this is what it is similar to. But we talk about very simple diagrams about scientific understanding. And when you are interested in, say, arctic sea ice, there are detailed reports behind this, but we give these to the policy-makers, ministers, civil servants. We have been told, whether it is true or not I don’t know, that environmental ministers will carry these in their briefcase. And you can do things like that: A map of what is going on all around the UK with what could happen, what is already happening. So this is a good example, I think, of going from researchers having some data in a database to having something that a minister will have in his briefcase to be able to pick it up and understand what is going on with climate change. You can take these. A new one is being published in two weeks’ time. Sorry, I forgot what the original question was. I went off on MCCIP …

I: No, that’s alright. I was actually asking about exactly this, the translation from science to policy.

R: Ah, yeah.

I: So, I read a bit in the report of the MECN, we will talk about that later, but I read that questions might come up about definitions of things. Say, we do a more ecosystem-focused approach, then we have to know what an ecosystem is. How does this relate to evidence? If you say “we have evidence for change here,” but then we have to know, what are we talking about …

R: Yeah, I think the language is important. I would agree that there is a challenge in translating to policy-makers. So we are really careful when we end up with things like this or even in Charting Progress, where I was the lead author on the assessment. We might say something like “we used functional ecology approach” or “a [unclear] ecosystem approach to address this” and “based on biotope analysis”, you know. You start talking like this, but of course to the average civil servant it does not mean anything, so I think definitions are really important. Also scientists, sometimes, don’t think hard enough about definitions. I think in the MECN report, one of the things I would think about very early on was definitions around monitoring, around long-term data and that sort of stuff, because there are so many … If I say to you “oh, we have got some really good long-term data,” that means different things to different people. I give you an example of this. I was talking about one of our journals, Marine Biodiversity Records, and I was talking about it to our new publisher, because we had to classify this journal and I listed it as a new journal. And they got back to me and said “No, yours is a long-term journal.” I said “why?” and they said “well, it’s ten years old.” I said “yeah, but our other journals are 130 years old. To us, this is a new journal, it’s only ten years.” It was interesting. That is quite a nice illustration. To the publishing world a ten-year-old journal was really old, their new journals are six months old. Whereas to me, dealing with journals that have been going for well over a hundred years, that is relative. And I think it’s the same when you come to data. If I say to a politician “oh, we have been collecting data over a long period,” to me that means a hundred plus years. You have got to come up with good definitions, basically.

I: That part of the report was really interesting to read. I was wondering if you could talk a bit more about the role of data for evidence. You mentioned that you need interpreted data and that politicians need interpreted data.

R: Yeah, definitely.

I: So, I wonder if there is a path from research data to interpreted data and whatever we have then … knowledge?

R: Yeah, knowledge or information.

I: I am just wondering, if one could visualise that. It’s probably difficult …

R: No, I don’t think there is a standard pathway. I think there is more recognition that most data at its basis, for us ecological data, is usually spreadsheets, just reams and reams of “x number of this species,” or it might be “this amount of this habitat.” So you end up with these spreadsheets. Now, say, if Natural England were interested in what is going on out here and around Drake’s Island and said “we got some issues and we want some help in what is happening,” it is really no good sending them hundreds and hundreds of Excel spreadsheets. Then you take your grab samples, you identify everything in it and you say “there is x number of each species” and what the grid reference is. You got all that information but of course what they really want to know is “what is the most common species?” versus “Are there any rare species? How are they distributed?” “What about variability? Are they seasonally or annually or decadal?” So one of the big challenges with the data is that every time you get a request from a party for information, you then have to go back to your data and work out how to make that data into the information they need. And it actually works the other way around because one of the issues with monitoring and data collection over the years is that what we found out in some cases, is that if very early on the end users had some input, we could have done things slightly differently and made it more useful. There are stories of people who have been collecting data for years and years and when it comes to some of the big questions about, say, how fishing and climate change is having an impact, they can’t answer that question because they did not collect the data in the right way or a the right temporal scale. So I think it’s a two-way thing. It is not just saying “this is the data we’ve got. How do we turn that into information?” It is also saying early on “we are about to be collecting data” or “we are collecting data in this way. Tell us what questions you are likely to have.” If we have got a programme that collects data twice a year out there and then somebody says to us “well, if you collected it four times a year it would be much more useful to us for this reason,” then we can change the way the data is collected. So I think it’s a two-way conversation. And I think there is more of that happening now. So when people are doing stuff, very early on, they are trying to engage other people. There is a big NERC project called the Marine Ecosystem Research Programme, which PML lead on, and I chair the stakeholders and advisory group which brings together policy-makers with the scientists. And this is what we do all the time. So they are saying “we are going out to measure the depth of [unclear]” or “we go out and collect this data.” What we do is we sit with them and say “well, it would be really useful …” At the end of the day, what we need to know, and we have listed all the policy-questions, we have given them to the scientists and said “look, this is what we really need to know in a few years’ time. Can you please bear that in mind now, while you are going out collecting data.” Rather than in five years’ time, they come back and say “oh, you should have told us that earlier, we could have collected that as well.” So yeah, it’s a two-way conversation I think.

I: I am wondering how difficult it is to say “Well, we have this evidence and we know this.” I mean, you can never be a hundred percent sure. So is there good evidence or bad evidence or better evidence?

R: This has come up massively over the whole marine protected area thing, where there was an enormous effort put into producing the evidence base, but at the end of the day, there was a review panel which the MBA were involved in. In some cases, they said “this evidence was weak” or “it is incomplete, the people have not collected all the right evidence.” On that basis, a lot of MPAs of that time did not go forward and that was very controversial. My feeling is, and I have said this to parliamentary committees, we are almost making a rod for our own backs because we do have enough evidence to be getting on with a lot in terms of managing our oceans. But, for instance, if you say that in your Marine Protected Area, you need to know the location, the condition, what’s going on with every single species and habitat, it’s just crazy. It’s the sea, it’s really expensive to get to, it’s really expensive to collect and generate this data. So I think there is a philosophical problem in there. I think often governments are expecting a level of detail that, working so tightly, is just unrealistic. I had this discussion with someone doing a [unclear]. There was a report in 2000 that Professor Dan Laffoley wrote and where he said that we probably got the best known seas in the world in the UK because of all the data and all the history of marine science, but you wouldn’t think that. Talking to politicians, you would think it’s just a complete, massive grey area we don’t know anything about anything and all the rest of it. So there is this [unclear] balance and you can’t say fundamentally that data is not good or bad. There is trustworthiness and reliability of the data and most data will have some sort of confidence attached. So if I am reading a report on some data on a beach and it lists thirty seaweed species, if I look and it is being collected by the head of alcohol collections of the natural history museum, I got pretty much high confidence in the data. With all respect to the public, if it’s coming from the local natural history’s day with the kids going out on the seashores, then I might want to double-check that. I worked for something that is called the Marine Nature Conservation Review for years and for about fifteen years it was mapping the whole of the UK, what species and habitats existed inter-tidally and sub-tidally for the whole coast, and that was constantly a decision we had to make. He had a quality of data box that you ticked and it was really interesting because it has to do with who was on the survey. So did he have experts in the field or did he have helpers along? How long did he have? Did he do it in a rush because the tide was coming in or did he have ages to do it? What was the weather like? All these things can affect that quality of data, but I think the scientists are well aware of that. That’s quality of data, but in terms of [unclear] whether it is good or bad data, you can’t really say because it depends on what question you are asking. So for years, the long-term data that we and others have collected, so people going out collecting the fish hose and measuring the temperature for decades and decades and in the 80s, everybody said “Why are we doing this? What a waste of time!” So they started closing it down. There is a paper by Carlos Duarte, which said that about 40% of all the long-term monitoring programmes in the whole of Europe were just shut down at that time. NERC closed down a lot of them. They just said “we don’t see why we’re doing this.” Within about five years, climate change shot up the agenda and everybody said “what we really need are people to go out and collect data over decades.” So very quickly, everybody was scrambling to get all these things ready again.

I: I was going to ask you exactly this: Why in the 80s they said “we don’t need this, let’s shut it down.” They just didn’t know why they did this?

R: Yeah, they didn’t know. They were not thinking about … You know, at the moment, it’s a really fundamental question: How things change over long periods and why are they changing? And of course trying to say whether ocean acidification or sea surface temperature is a major driver of change or is it actually rather anthropogenic threats like fishing? These questions are really big questions for how we manage the oceans. But those questions weren’t really on the agenda. So in the mid-80s, someone from whatever lab was going out just taking CTD readings or something for the 80th year on the trot and people were saying “well, if it’s not generating an immediate question …” It was basically short-term thinking. If it could not fit into a three to five year research project and develop three papers, why do it? Funnily enough, I would say we are in danger now of losing them to funding and because we still have the same issue. The big problem with these long-term datasets is that you are not generating a hypothesis or questions every other year and you are not publishing. It takes a long time and funders who are really, really pressed with ever shrinking pots of money. If they think “well, actually it costs you x hundred thousand to take your ship out every month and carry on” … So we are still losing them; not as much as we were then, I think the difference now is people know that they are really important, they just don’t know how to get the money to keep them going; whereas maybe in the mid-80s, a lot of people just looked at them and thought “well, why are we doing this?”

I: So we started talking about the long-term datasets already. If we talk about the MECN now, what was really the main motivation to start MECN?

R: The motivation actually is exactly what we have just been talking about. There was a review by name: John Portman, I think in 2000, and it was really asking the question about these long-term datasets, because they slipped through the gaps. The monitoring which is generally known about and is okay is all the statutory monitoring. This the monitoring we have to do legally, that agencies carry out, things like the Bathing Water Directive, the Habitats Directive, a lot of these European directives especially, and CEFAS and the Environment Agency will do this. They will go out and they will measure pollutants in the sediments and eutrophication to measure water quality. They are doing all this monitoring simply so that they can classify things, whether the beach is safe, whether the drinking water is okay. That’s all fine but there is also what name: John Portman said: There is this whole other area of monitoring which is not being used day-by-day, it’s not statutory. You don’t have to do it, but nevertheless it has been going on for years. I will give you an example: In the North Sea, the Dove Marine Laboratory has been sampling the benthic sediments there for a good forty, forty-five years now because they were interested early on in how things moved around and all the rest of it. So they started doing it and carried on. The MBA, we have been doing the standard fish hose since about 1912, 1913? Just originally, it was done very descriptively, saying what is out there, how does it vary seasonally or annually or over the years. So a lot of people were collecting this data and it can be biological data, it can be chemical or temperature data. There were a lot of laboratories, marine laboratories and others, doing this, Millport, Port Erin Marine Lab, which is [unclear] and closed down, SAMS, and actually, it was recognised that there is a danger that they were not being coordinated. So nobody is actually saying “hang on a minute, shouldn’t we all be working together and collecting stuff in the same way?” But also, there was a danger that they were just disappearing. You know, one day somebody will look at their budget and say “we cannot afford to send [unclear] on the boat, get rid of that!” So the MECN was set up in recognition that these long-term datasets were really important. It’s been running a long time now. It is not funded at the moment. The funding ran out but it is still running as a project and we have got some bids in at the moment to the government to get some more money. They gave us a little bit of money this year to keep one of the monitoring programmes going, but it is not really funded. So I would say it has been a mixed success.

I: I was going to ask about this, because I was not really sure whether it had ended at some point or if the work is just carried on by the people?

R: I will try to keep this brief but essentially what happened is, when it started, it was funded by government totally, with a focus on bringing the partners together and it was very practical. They bring partners together saying “let’s make sure we calibrate all the equipment we use,” “if I have a CTD probe here, let’s make sure it is matched up to the probes that you are using up in Scotland,” “let’s look at when we all take our samples that we do it in the same way,” “let’s all do it in the spring, in the summer, and in winter,” or whatever it was. So we were looking at all these practical questions and bringing people together and on the back of that we wrote some early reviews on, say, the long-term change in the North Sea or the long-term change in the Western English Channel. So we produced these reviews early on. We then got to the stage where DEFRA in particular, because it was mainly DEFRA at the time before the DAs were on the scene, said “look, we are not really going to be able to just fund you to keep collecting data and calibrating your equipment for the next decade. What we want is help with our assessments, with all our legislative commitments and we want you to come up with pathways.” So at that point, the MECN became two things: It became the money to carry out the science and then it became “how do we translate that to policy-makers?” And at that point, I got involved in things like MCCIP and in the Charting Progress assessments, all because I was developing a sort of expertise in what was going on more widely. So we started doing the policy side of it. Now at that point, NERC also started to recognise the importance of long-term time series, so they had their Oceans 2025 programme at that time and they had a theme within that programme, theme ten, where they picked up a lot of the long-term datasets and funded them. So at that point it was all looking great. The MECN had almost done its job, we said “this is really important,” NERC was starting to fund it. Now the problem is then that for a start, NERC did not pick up all of those long-term datasets. There were still a number that were running year-to-year, hand-to-mouth. And of course also Oceans 2025 was no such thing essentially, that started to come to an end a lot sooner than anybody thought. That funding stopped. At this point DEFRA said to me “as far as the MECN goes, we don’t think it is our job to fund the science directly. We are not funding monitoring programmes, especially multiple monitoring programmes. We are just going to fund you to translate evidence.” Essentially the MECN became a way of the government paying for me to do work around the Marine Strategy Framework Directive and other things but the funding for the actual data collection itself finished. And it is still at the stage now, where it is hand-to-mouth, where we are getting little bits of money. So we are getting little bits of money from NERC, the Dove Marine Laboratory is self-funding. We are actually collecting a lot of our data and not analysing any of it. We are literally taking the data, putting it in [unclear] and put it in a shed to analyse later. So the MECN is officially still running but there is no money for it any more because nobody really knows … There has also been the Marine Science Coordination Committee, which is sort of the top level of the government’s work on marine science that oversees all of it. They set up a group called the long-term monitoring group which I sat on and which was all about how do you fund all this long-term work. I said to parliamentary committees that that group didn’t really work very well, so [unclear] it didn’t really achieve anything. So I think at the end of the MECN, we did achieve a lot and potentially, what we are saying now is “we are written in to the Marine Strategy Framework Directive.” So the European Commission knows that the MECN is there to provide all these contacts for the directive. We still have the problem: Who is going to pay for the monitoring? That is really what it boils down to, because the government want all the information, everybody kind of recognises that it is already useful, but it is not cheap and nobody wants to pay for it. So that’s where we are now.

I: That is interesting. So there is really not anything like a project for long-term data all over the UK for those time series. It is really fragmented …

R: The MECN was that project, but as soon as they said essentially “we are not paying for the monitoring, we will pay for the interpretation, we are not paying for the monitoring itself.” As soon as they said that, that left us with a real headache. We have just put in a bid to, as I said, JNCC, the Joint Nature Conservation Committee, they have got a biodiversity monitoring programme which is basically their plan for all the biodiversity monitoring to cover all of the legislation for the next few years. Now the MECN is sitting in there and if the “go ahead” is given, we will then get the money to at least do a couple of more years of collecting data, to interpret and work up all the data that we have collected over the last three or four years without any money. So we are just waiting on that and it has gone through about five committees now to say who is going to fund it. And you know the situation at the moment economically. The government agencies have got no money, they are shutting and cutting back all their staff. So to say “actually, we need a couple of hundred thousand pounds to analyse all this data,” it is the same problem we had ten years ago. What people wanted to happen was: If you take the Marine Management Organisation or something like that, people thought it would be a good idea to have an agency that basically oversees all of this, but we don’t. There isn’t a single agency. We got also things like UK-IMON, do you know about that?

I: No.

R: The United Kingdom Integrated Marine Observing Network, you can find it on the internet easily. I have been involved a lot with that. They are trying to do a similar thing for the oceanographic data as opposed to biology. They are trying to bring their community together and I won’t go on too long, because your tape will run out, but if you look at UKMMAS, the United Kingdom Marine Monitoring and Assessment Strategy, you look at GOOS, the Global Ocean Observing System … International down to national, there is this very detailed framework all about capturing all this long-term data analysis and monitoring, but it is all fragmented, it is poorly funded, it is all relying on scientists finding their own money to attend these meetings. So yeah, there is a real issue because at the end of the day, if the government doesn’t have any money, you have got this monitoring here which tells you, you know, the nitrate levels in the water and it goes towards European directive, or you have got this over here which at the moment appears to be people just measuring fish and they don’t see the point of that, even though that can be absolutely vital in managing the oceans. So yeah, there is a real issue.

I: So is it a particular issue of long-term projects?

R: Yeah definitely, because the short-term projects they are quite straight forward. If you have got a PhD project, I think back to my PhD and it was quite standard, you would spend the first year or 18 months going out collecting all my data, doing all my analysis. I went out and did surveys and I took things up and spent all my time in the lab identifying everything and then I interpret it and in the end I publish it. That’s how it works, that’s how a standard, short-term project works. The long-term stuff, as I said, is really difficult because you are essentially saying “here is something I have been collecting for years or decades or whatever,” you may have a reasoned paper on it, you may not. To say to somebody “I just want you to fund it” …

I: Do you have an idea how this tension could be overcome? What would be the solution? If they just said …

R: I have sat on so many committees … The last decade, I must have contributed so many reports and discussions on committees … I have seen groups being set up and disbanded, I have seen projects, we actually had a large European project we put in and it didn’t get funded. So I think there is a recognition everywhere that people are trying to do this. The biologists are slightly struggling to catch up with the oceanographers. The oceanographic community is way ahead on this. There are some really nice European projects bringing it together. And if you think about weather forecasting and the Argo system is the classic one with all the Argo floats. When you are looking at oceanography on large scale you can then really stress the importance of that in terms of risk, shipping, insurance. It has got a very clear link to society. And also, bizarrely, they want more money, but they are using satellites, they are using autonomous underwater vehicles, gliders, so you have got this whole very high-tech system and I think they have done a really good job of saying “that is really necessary, it helps us understand earth’s climate.” The problem we have got in ecology is that it is a lot harder to sell because you are actually saying “okay, what this is going to tell you is movements of fish population and things coming and going.” Okay, that is of interest to marine managers and those of us who are interested in conservation and other areas. But it is much harder to sell that to the wider government, I think, to say “this is really vital.” So yeah, there are lots of things going on at the moment …

I: But fishing must be a very important issue, right?

R: It is, but if you think about the fishing, the statutory requirements to look at fishing are carried out by CEFAS. So they are going out there and measuring populations of commercial fish and all the rest of it. What we are doing here is, and this makes the MBA fish trawls unusual, we are looking at all fish, not just commercial fish. So we are able to then look at other drivers than just fishing pressure. One of the big questions we have been looking at over years, David Sims and his group in particular, are climate change versus fisheries. What are the big drivers? What are going to be the key drivers? How do the [unclear] react? And a lot of the statutory fishing stuff is not geared up to do that, it is just geared up to say “How many cod? How many herring? How many whiting? What should the quote be for next year?” That’s how classic fisheries monitoring works. We are actually asking more fundamental questions. We are measuring everything and say what’s driving the system. What are the key pressures that we need to manage? But it is not just fishing, I think invertebrates, [unclear], and the system as a whole really. Yeah, it’s definitely a harder sell.

I: I was going to ask a few more practical questions. In the MECN report about the time series, it says that some of them were discontinued and picked up again. I don’t know how much you have been involved in that in particular, but the time series of the MBA, for example, how difficult was it to get them up and running again? Actually, what state were they in when you found them?

R: Yeah, it is really difficult and it depends on what data you are looking at and why they stopped. There are gaps, say, if you take one of the early gaps in some of the early time series, because of World War I and World War II, when it was not safe to go out there and collect stuff. That is fine, you just pick it up afterwards and carry on. So from a drivers’ point of view, why are we doing this, it doesn’t matter. You just think we could not do it and we carry on and you have a small gap in the time series, but that gap becomes less important the longer the time series goes on. So a ten-year time series with a four-year gap is a bit of an issue, but a 130-year time series with a four year gap, you think "okay, that’s fine, we can measure the trends.” The challenge when the MECN started, so this is really doing stuff right at the beginning of this century, 2000 and 2001, picking up monitoring then, was that you would have some gaps going back to ’87, around there. What we were able to do, in particular with temperature data it was really good, because PML had got their remote sensing working, because remote sensing all of a sudden had started to do all this SST stuff. We were able to then fill in the gaps using the SST. We were also able to do a lot of calibration. So how that can work is you can then overlap the remote sensing with the in-situ monitoring. So you calibrate it and make sure it is being measured in the same way. The only thing we have lost is that, because remote sensing is only measuring surface temperature, SST, whereas what we measure is the water column, so we are going down to 60-70 metres measuring the temperature, so you are getting the whole picture of stratification and how that changes. But essentially, we could keep the overall picture intact. And as I said for things like the fish, I can’t remember what the gaps are, but there are gaps, but because it has been going for so long, those gaps are less important. Their only problem, I would say, it’s unfortunate not just for us, but for a lot of people, that those gaps in the late 80s were an issue in a sense that that was when we really started to see increasing sea surface temperature, climate change effects started to really come in, and it’s a shame that we are really missing some data there. But ultimately the length of the time series means it is fine. Fundamentally, however, I will say that it is much harder to restart or start a time series and to keep on going, which is why I am so nervous about the state of the long-term data. If you look at Port Erin Marine Lab, that lab had been there for well over a hundred years and they just shut it down. They didn’t have the money. Now a couple of those long-term measurement duties were picked up by [unclear] and the Isle of Man, they said “okay, we will take that on,” but some of them just stopped. A hundred years and they just stopped overnight and there are quite a lot of stories of that happening. Once it stopped, it is really, really difficult to get going again.

I: I guess it is also a matter of how well they are documented and where they are stored …

R: That’s right, yeah.

I: So how was that here at the MBA? How were they preserved, so to speak? It depends on the type of data, probably …

R: Yeah, they were really well documented. We have had so many projects here, we published some papers on a hundred years of change around the Eddystone Lighthouse and what we had to do is go back to some of the benthic data that was being collected firstly by people like Ford in the late nineteenth century, but then mainly by Norman Holme in the ‘50s and early ‘60s, they did tons of work out here. So we did a lot of projects repeating that work to look at comparisons and that was great because we had all the original notebooks, so the staff here that went out from the late nineteenth century, Norman Holmes, all their notebooks were [unclear], we were able to transcribe all the notebooks and do the work to interpret what they meant in their notebooks. We could then compare those notebooks to the papers they actually published and the reports, and not only that, the actual specimens and stuff they collected was all in the natural history museum. So I went to the natural history museum with somebody else and we logged all the species that they had collected, which are all in jars there and all labelled. What we found is this phenomenally good audit trail that we have got. Not only that, but we had the original [unclear], so the actual dredges they used were still here. So we could go back and look at the dredge and say “can we rebuild this in the same way?” All of those things make life much, much easier, if you have got all of that, really good audit trails. That happened with some of the chemistry as well, that PML were doing. They came up with new ways of measuring certain parts of the chemistry but because they have got this fantastic audit trail of how things were measured, they were able to redo the whole time series and recalibrate it to get the new measurements. So, I think with any long-term work that is crucial. And we are good at that now, everything is kept and monitored and written down.

I: How difficult is that then to communicate with other institutions which do their time series and you say “well we have to do it the same way,” but they have been doing it differently?

R: When we started the MECN there was a real push to do that. You can’t always do that because if you have been doing that the same way for fifty years, you can’t just change it overnight. I mean, you can change it, so you might be able to add stuff than you were doing before, but you can’t stop some of the stuff you have been doing. If you have been monitoring every summer for fifty years it is pretty hard to say “well, would you mind doing it in the winter instead?” You can say “I’ll do it in the winter as well,” that’s great. You know, SAHFOS has this issue all the time with the Continuous Plankton Recorder. They are developing the whole time, “we want to add more equipment to our tows.” That’s just the way it is, you can’t go back and change things. There is also, of course, that different organisations have different drivers and this is the problem we had with the long-term monitoring group. People were saying “we do it for our own reasons” and they can’t always just change it. The problem with the MECN is unless somebody says, top-down, unless the government says “we’ll fund it directly and you will all do it this way and this is why you will do it and this is what we are trying to do,” then that’s fine. But otherwise it is just lots of organisations and we do it because it might be done opportunistically. They might do it, because that’s when the boats are available, you know that sort of thing.

I: I think we have talked about this already. I was wondering again about what is changing the overall interest in long-term time series. In the report I read about “compliance monitoring” and “pure surveillance” and that there has been a shift towards the recognition that pure surveillance is necessary. But what are other drivers of change? I am wondering about the roles of climate change, of technology, of economic concerns. Well, we probably covered that already, but …

R: Yeah, we have covered that. We have talked about climate change which is obviously a big driver. Now technology we have not talked about a lot. There is some concern around the way governments are viewing technology, so obviously if we can get technology that makes it cheaper, more accurate, etc. to collect data then that is great. And I know things like autonomous underwater vehicles are now being pushed as much cheaper than ship-based measurements. The issue is that there is a danger that their limitations are not recognised. As I said, if you take remote sensing, you could just say “we get our temperature from remote sensing,” but you are only ever getting surface layer data, you are not getting the depth of the water column. You can say “we send out autonomous underwater vehicles” and they are great for mapping the seabed, taking videos, photos, and all the rest of it. You get a broad sense of mapping. But if you actually want good, quantitative data that you would get from a grab sample, that involves taking some of the sediment from the seabed and counting the number of worms in it. You are not going to get that from an AUV. I know that there is a real push at the moment to use technology, which is great and I think in the deep sea with broad mapping, it is really going to help us. But I think classical ecology is being overlooked slightly. You know people going out there and …

I: Perhaps that makes it even more difficult to continue the long-term series …

R: It does make it more difficult, because as I said, it is a dreaded word, but sometimes it is not seen as sexy. When you are going for a meeting and somebody is showing how they got this ship and satellite and AUV and they have got these systems measuring how the ocean circulations change, you know … That is something, which your average funder and policy-maker will think “yeah, I can see that.” But when you go out there and you are talking about “we found this number of ribbon worms versus this and this shows us that this is happening,” it is on a smaller scale, I guess. But even when you go up to the larger scale, we still got this issue that involves people going out and getting their hands dirty, taking grab samples, and digging things up. Sometimes it is seen as slightly old-fashioned, but it is absolutely crucial. And it is needed to calibrate all the other stuff. I know from some of the assessments I have done, you can have all the videos and photos, but somebody needs to go down there eventually with a sponge and slice a bit off it and identify it, so that you know what you are looking at when you take the photos and the videos. There is always this need for a really solid underpinning and actually there have been a few editorials written recently saying basic taxonomy, classical ecology, is being overlooked now. Everybody wants this new, fancy technology and as I said, I think that is an issue for biological long-term monitoring. It is people going out, I did it with PML a couple of years ago. We did the classic thing, we drove out, we dug stuff up, we put stuff in buckets, we measured stuff, we sat on the microscopes, and it is a lot harder to say that it is really, really important.

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