HOUSE OF COMMONS

Environmental Audit Committee

Oral evidence: Water Quality in Rivers, HC 902

Wednesday 10 March 2021

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Watch the meeting

Members present: Philip Dunne (Chair); Duncan Baker; Dan Carden; Barry Gardiner; Mr Robert Goodwill; Helen Hayes; Ian Levy; Caroline Lucas; John McNally; Dr Matthew Offord; Nadia Whittome.

Professor Ian Barker, Special Adviser to the Committee, was in attendance.

Questions 1 - 64

Witnesses

I: Professor Nigel Watson, Professor of Geography and Environmental Management, Lancaster Environment Centre, Lancaster University; Professor Steve Ormerod, Professor of Ecology/Co-Director, Water Research Institute, Cardiff University; and Dr Michelle Jackson, Associate Professor of Freshwater/Marine Ecology, Somerville College, University of Oxford.

II: Guy Linley-Adams, Solicitor, Salmon and Trout Conservation; Amy Slack, Head of Campaigns & Policy, Surfers against Sewage; and Dr Rob Collins, Head of Policy and Science, The Rivers Trust.

Written evidence from witnesses:

- Professor Nigel Watson
- Salmon & Trout Conservation
- Surfers against Sewage
- The Rivers Trust

Examination of witnesses

Witnesses: Professor Nigel Watson, Professor Steve Ormerod and Dr Michelle Jackson.

Q1 **Chair:** Good afternoon and welcome to the Environmental Audit Committee for our first session of oral evidence in our new inquiry into water quality in rivers. We will be hearing from two panels today, first from academic experts and, secondly, from water quality campaigners. I will start by reminding members of the Committee that I have a Private Member's Bill currently stuck in the system and I have been working with some of the witnesses that we will be seeing in the second panel. We thought people should be aware of that and I will say it again before that panel begins. I would also like to welcome to the Committee Professor Ian Barker, who is acting as our specialist adviser appointed by the Committee for this inquiry.

To kick off, I invite our first panel of witnesses to introduce themselves, very briefly, starting with Professor Steve Ormerod.

Professor Ormerod: Thank you, Chairman. I am Steve Ormerod. I am Professor of Ecology at Cardiff University. I have worked for 40 years on various river issues. I am representing myself as an academic today but I should record that I am Deputy Chairman of Natural Resources Wales, I am on the Science Advisory Committee of the Environment Agency and I also chair the invertebrate charity Buglife.

Professor Watson: Good afternoon. I am Nigel Watson. I am Professor of Geography and Environmental Management at Lancaster University. My expertise is water policy and institutional arrangements for water resources management.

Dr Jackson: My name is Dr Michelle Jackson. I am a specialist biologist at the University of Oxford, interested in river quality and biodiversity.

Q2 **Chair:** Thank you very much. This Committee in the previous Parliament undertook an inquiry into nitrates and that covered pollution of our waterways from agricultural practice. This inquiry is focused on the other two primary causes of pollution in our rivers, namely activities of the water companies and road and industrial runoff.

I would be grateful if we could start the session, perhaps first with Professor Ormerod, by you giving us an overview of the state of our rivers. My understanding is that we have only a single river of bathing water quality standard compared to over 500 in Germany and 10s of rivers in other countries in Europe. Why is that?

Professor Ormerod: To answer your overall question about the state of our rivers, the answer depends on the scale at which you look and where you look. Globally, freshwaters are in crisis in that they are losing freshwater biodiversity faster than any other ecosystem type. That tells us something about the resource available for people. Here in the United Kingdom—and England and Wales in particular—we generally see an improvement in the general sanitary quality of the urban river network.

For example, in the 1970s something like 70% of our industrial river network was closely polluted by sewage and on the whole we have got on top of that urban water quality problem. We have seen clean water organisms, various species of insects, Atlantic salmon, dippers, otters recolonising the urban rivers. Interestingly, rural rivers tend to have gone in the opposite direction.

That is not to say that the urban river environment is completely free of problems. We are in a situation where we are seeing new kinds of pollutants affecting urban river systems—pharmaceuticals, plastics and a whole range of different new chemicals that are emerging. They are adding to problems created by legacy pollutants in urban areas. These are industrial chemicals that have long been banned but still have effects.

Part of our challenge now is to unpick exactly where those urban problems are arising from. We are hearing a lot about combined sewer overflows and the contributions they may be making to pollution problems as we have cleaned up wastewater treatment works. We have evidence that CSOs are a problem in areas like the Thames. There are also local issues in places like Oxfordshire and the Chilterns. I think that we need to know far more detail about how extensive CSO effects are, what they are contributing and how we can manage that particular problem.

Q3 **Chair:** Are you able to elaborate on what the Environment Agency has indicated as the main sources of pollutants in our rivers, which are now 40% from agriculture, 36% from water company activities and the balance from highway runoffs? Are those figures familiar to you and do you agree with that?

Professor Ormerod: We have increasingly improved our source apportionment of where different pollutants arise from. It differs depending on the pollutant type that you are looking at. For example, in the case of nitrogen, on average roughly 80% of the flux in rivers is from agriculture, about 14% from wastewater treatment works and probably about 1.5% from combined sewer overflows. Phosphorus looks like 30% from agriculture, almost 50% from wastewater treatment and almost 10% from CSOs. The exact pattern depends on where you look. Again, I think we have to be better at understanding beyond those major pollutants what kind of contributions CSOs make, for example to the fluxes of plastics, to untreated veterinary products or pharmaceutical products that are coming through the sewage system.

Q4 **Chair:** Have you provided those figures to us in your written evidence thus far? If not, could you do so with the analysis?

Professor Ormerod: Those are not my data. They are data that come from published scientific papers. In fact, I did not submit written evidence to the Committee. I was called as a witness recently.

Q5 **Chair:** I think it would be very helpful if you could point us to where those data sources are and we will be coming on to CSOs later in the evidence.

Dr Jackson, you have been looking at the aquatic species that rely on our rivers for their very existence. I am fortunate that in my constituency I have one of the last remaining locations for river water pearl mussels, although nobody has seen one in recent years so it may have been one of the species that has suffered local extinction. Could you give us a sense of where pollution ranks within the other threats to freshwater biodiversity?

Dr Jackson: Yes, certainly. I will start by saying that, according to Environment Agency data, only 14% of rivers meet the criteria for good ecological status, so this is a really worrying trend. This status is based on things like species surveys and knowing their sensitivities but also measuring things like oxygen and changes to flow. Despite this, as Steve said, there have been some improvements in the last few decades—mainly due to some reduced nutrient inputs and recovery from acidification—but these improvements have appeared since about 2015. Many in recent years appear to be caused by elevated phosphorus.

To go back to your question about where pollution would rank with other stresses in the ecosystem, freshwaters are uniquely affected by multiple different stresses because they occupy the lowest point in landscapes. They are affected by human impacts that occur within the river itself, things like pollution from boating activity or invasive species, but they are also affected by anything happening in the wider catchment from urban creek or agricultural activities. Then, of course, every ecosystem is affected by global climate change. The interactions between these local catchments and global stresses have the potential to interact in ways that are non-additive, causing what is often known as ecological surprises, which means they have an effect that is larger than the sum of their parts.

When we think about water quality and pollution, we need to think about how it also interacts with all these other stresses in the catchment. At the moment I would probably be most worried about the effects of land use change, the associated pollutants that come with that and the potential for chemical cocktails, for instance, and pollutants that might interact with one another to make an effect that is much worse than the sum of their parts.

Q6 **Chair:** More so than sewage spills?

Dr Jackson: Sewage spills also will have chemical pollutants in them. Especially if it is untreated sewage coming from overflow drains, you are going to have all sorts of different things from down the drain, chemicals and pharmaceuticals, coming out in that as well.

Q7 **Chair:** And biological. Covid has been found in water downstream of treatment plants, hasn't it? Thank you.

Professor Watson, as we have now reclaimed responsibility for our own environmental regulation, having come out of the EU, I think you have been looking at the governance structures that may have some responsibility. How well do you think our regulators, the Environment

Agency and Ofwat, are performing their function to help improve water quality?

Professor Watson: I think Environment Agency officials themselves would acknowledge that there has been some significant reductions in monitoring in recent years. I understand that the 2019 assessment included some data from pre-2016 that was effectively rolled over to fill in some of the gaps. I think we have a very limited picture overall of what the actual situation is.

Having said that, I think the Environment Agency has been very supportive of new initiatives, such as the catchment-based approach that was started in 2012, and has addressed some of the issues and problems that we have encountered with the implementation of the Water Framework Directive. In that context, the Environment Agency has done a pretty good job. Having said that, it is an unusual organisation. It has a regulatory function and partly an operational function too, and you could argue there is a conflict of interest there potentially. The Environment Bill and the suggestion of establishing an office for environmental protection could be a very welcome development that could improve the situation considerably.

In the 1990s and 2000s Ofwat agreed to some substantial increases in water service charges. That allowed the water service companies to invest and address some of the big problems that Professor Ormerod described. In recent years Ofwat has permitted only some very low or modest price increases, so that has put pressure on the water companies to try to find ways of improving things with much fewer resources.

The other thing to say is that we tackled the easy wins with respect to water quality in the first few decades and now we are left with a more complicated mixture of micropoint sources, multiple diffuse sources, which are a really wicked problem that are not amenable to the sort of simple solutions that we have been able to apply in the past.

Lastly, Ofwat is not particularly strong in public understanding and transparency. It is really difficult for an everyday citizen to find the information to understand how your water company has approached Ofwat, what agreements have been struck for future price increases and how that investment has been spent and how effective it has been.

Q8 **Chair:** On Ofwat specifically, do you see the five-year pricing review—and we are going to come on to this in the next panel as well—as an effective tool to prioritise water treatment? Has that been given enough priority by Government in their guidance to Ofwat?

Professor Watson: From my perspective, the basic mechanism, the prospective forward-looking five-year approach, makes sense. However, there needs to be some greater accountability around that. There have been well-reported cases where significant price increases have been agreed but not all of the investment has materialised in some of the actual operational plans of the water companies. A prospective, forward-looking approach makes sense. However, there needs to be some

feedback to ensure that the agreed investment actually happens and, of course, ultimately that investment has fed through into tangible improvements in environmental quality.

Chair: Thank you. I am now going to move on to questions from other members of the Committee. Helen Hayes is going to ask some questions about plastic and chemical pollution.

Q9 **Helen Hayes:** My first question is for Professor Ormerod. How prevalent is plastic pollution in freshwater environments and what risks does it present to biodiversity?

Professor Ormerod: I think we are still in the early stages of putting together a complete picture of what the concentrations are, what the fluxes and movements of plastics are through freshwaters, what the actual source apportionment looks like and what the effects are. In some respects we are early days, nevertheless the evidence we have indicates that microplastics are absolutely ubiquitous. They are everywhere we can look in the freshwater system. Some data collected in the River Irwell system a few years ago illustrated that in some sections of the river there were 500,000 fragments of plastic for every 1 square metre of riverbed. That is many, many times more than the number of insects, for example, that are so important in those same riverbed environments.

Our own data collected in the south Wales river system—and we have no reason to believe this is not representative—show that every other insect already contains plastic. These are insects that feed in different ways, some of them filter from the water column, some of them graze from the surface of the bed, and no matter how the insects feed, a half of them already contain plastic. We know also that that material is being passed through food webs so river birds like dippers or trout or otters that feed on insects also contain plastic.

Our evidence from this wonderful river bird, the dipper, which is an indicator of the health of rivers, shows that daily an adult dipper is probably eating inadvertently about 200 fragments of microplastic every day and inadvertently it is also feeding that material to its nest-bound young. At this stage we do not know what the effects are. Clearly there are risks here. The plastic could be directly damaging, it could be transporting other chemicals that are toxic, or it could be toxic in its own right. We have little bits of emerging evidence that things like algae can be affected by the presence of plastic but we are very much at the beginning of the learning curve.

Q10 **Helen Hayes:** That is a really shocking situation that you describe. When you talk about it being in early days, could you elaborate a bit on what you mean by that? Is it early days in our understanding of the impacts of plastic pollution, the monitoring of it, or that it is a relatively recent phenomenon in the history of rivers? What do you mean by that?

Professor Ormerod: It is certainly early days in understanding the full impacts and where and how they might be felt, but also the exact picture on, for example, the sources and the makeup of the types of plastic are

producing some conflicting evidence. It appears that material such as plastic clothing fibres is one of the dominant types of material we find. We expect that that should come from wastewater treatment works, because it is associated with the washing of clothes. However, it is possible to find that material upstream of wastewater treatment works and that implies that there may be some land-based route as well that makes people question, for example, the disposal of sewage sludge on to land that could then release that material in other ways.

There are other kinds of plastic that we are not fully on top of understanding. Most of the assessments look for visibly identifiable material, fragments, particles, but there may be much more amorphous plastic, things like tyre dust, for example, which is plastic based that we are only starting to get some kind of handle on what the amount present might be and at that stage we cannot know what the effects might be.

Q11 **Helen Hayes:** Thank you very much. My next question is for Dr Jackson. How concerned should we be about emerging chemical pollutants such as antimicrobials, new chemicals that we have not seen before in our water sources? How concerned should we be and what are the impacts?

Dr Jackson: I think we should be very concerned. I do not work on antimicrobials but I know there is a lot of worry about antibiotic resistance that could deliver in rivers due to the antibiotics that get into our water column. I research more the emerging chemicals associated with personal care products and farming practices and many of these are widespread in rivers around the UK but in quite low concentrations. It is more when you have the pollution events where they get into the river in high concentrations that they have these catastrophic effects.

A really good example of this is one in about 2013 that was detected by a volunteer monitoring group. The Environment Agency was not able to detect it because its monitoring is rather patchy at best and the volunteer groups often pick up on localised pollution events, whether that is from agriculture or storm overflow drains. They found that this pollutant, which is called chlorpyrifos, I think, wiped out almost all of the invertebrates in that stretch of the stream for a few months before they were able to recover.

Q12 **Helen Hayes:** Thank you. My final question is for Professor Watson. With emerging threats and new forms of pollution that are not yet fully understood, how effective are existing regulatory frameworks at adapting to new threats? Do we have a comprehensive framework that can cope with everything that is emerging anew or are there gaps? Is there a need for our regulatory framework to be more fleet of foot to address these new threats?

Professor Watson: I do not think we have a sufficient framework and it is partly because of the way that the framework has been developed from the outset. It would be much more effective and appropriate if we focused on ecosystem services of our rivers and catchments and identified indicators of ecosystem health rather than some of the basic

measures that we have at the moment that tend to assume that there is a fixed natural condition for a river to be in and to measure the distance between that and where we are at the moment. From my perspective, catchments and rivers are open dynamic systems, they are always changing, so we should not be aiming for some sort of static standard, whether we are talking about established long-term pollutants or new-term pollutants.

It is slightly outside my field but there is a lot of concern about the so-called forever chemicals, chemicals that were introduced in the 1940s for waterproofing, fire retardants and firefighting foam, things that were used in products like Teflon where we are seeing these forever chemicals starting to appear in the monitoring samples. Essentially, they are almost impossible to get rid of and consequently almost every river in England would fail on that single count.

To answer your question, no, I do not think we have an adequate framework at the moment.

Chair: Now we go to Barry Gardiner about the Water Framework Directive and its legacy.

Q13 **Barry Gardiner:** Professor Ormerod, you had your hand up at that point. Do you want to come in?

Professor Ormerod: I want to elaborate on the forever chemicals that Professor Watson drew our attention to. Some of our own data in urban rivers in south Wales—and we think this is representative—show that chemicals like PVCs and flame retardants and some organochlorines are present at concentrations that are still high enough to cause impairment to the development of nesting birds in the same catchments. The concentrations of flame retardants we found in the eggs of those birds are among the highest in songbirds anywhere in the world.

This is just to support the notion that these are still serious chemicals, but of course to that is added increasingly other emerging things. We are looking at issues associated with pet flea treatments, for example, that we now know are widespread in the river environment. To those legacy chemicals, new emerging problems are being added. Sorry to interrupt the flow.

Q14 **Barry Gardiner:** No, not at all. I think that is really helpful and your comments about Cinclus cinclus were well taken by me. It is one of my favourites. Down to brass tacks, how well does the Environment Agency's monitoring programme reveal the true state of our rivers?

Professor Ormerod: There have been a whole range of changes in the intensity with which all of our statutory agencies look at the environment. We have seen what essentially has been a thinning out in the number of locations that we have looked at through time. In the 1980s and 1990s, probably about 25,000 individual locations were frequently assessed for the regulatory framework that was in operation at that time. As we have moved into Water Framework Directive territory, although organisms

biota have come to the fore in monitoring, some of the changes that have occurred have been a focus on specific elements that reflected the risk in any particular location, which meant some alteration in exactly what was measured.

As we have gone further forward, we have seen a progressive reduction in the number of locations that are assessed and that is likely to diminish further under cost constraints. That is general across our regulatory sector in the United Kingdom. The question is whether or not other monitoring can fill the gaps so there is regulatory monitoring carried out, for example, by the water industry of itself. There is the growing potential of citizen science. I was looking at some data yesterday—

Q15 **Barry Gardiner:** Sorry to interrupt you, Professor. I think we will discuss some of those in other questions. I wanted to be quite specific here about the monitoring programme of the Environment Agency. Dr Jackson alluded to the report on the Water Framework Directive that only 16% of our water bodies were in good ecological status. My question is whether its monitoring programme is effective in telling us it is as bad as it is? If it is effective in telling us as bad as it is, we can move—and I think we probably will in subsequent questions—to why we are not doing the right things to sort it. But the first thing is to get the data, isn't it? I am asking you about the data that the Environment Agency programme achieves.

Professor Ormerod: Those data are Environment Agency data that illustrate that we have only 14% of English rivers have a good ecological status. I think there is a serious question about how effectively and to what extent of detail we will be able to get an appropriate handle on how good and how rapidly we return those rivers to good ecological status.

There is also a question about whether or not the monitoring is carried out in locations that are appropriate to assess all of the pressures that impinge on the river environment. The Water Framework Directive has always had a problem in that it has tended to miss out on the smaller water bodies, upland headwaters in catchments less than about 10 kilometres square, which are important biologically, they are important for water supply. I would suggest that we need to be augmenting our assessment of the water environment rather than diminishing it and we also should be more representative of all the water bodies that are at risk from different pressures.

Q16 **Barry Gardiner:** Thank you. I will turn to Professor Watson. In written evidence, Professor Watson, you told us—and you repeated some of this to my colleague—that, "Our rivers are actually dynamic, constantly evolving, 'open' systems that continually change in terms of their character, shape and condition, and our approach to management and regulation should be founded on that principle". In your response to my colleague, you also said that we have adopted simple solutions for early wins in the past but, in the stats that Professor Ormerod described, about 80% of the problem is from runoff and only 14% of rivers are in good ecological status. It does not seem that we have had much out of those simple early wins. Are you proposing in this more flexible approach

something that is going to enable us to do more to remediate the situation and, if so, how?

Professor Watson: I absolutely am advocating high—if not higher than we have ever had before—environmental standards. My point is that we need to rethink the approach to that. Fundamentally it is the ecosystem services that rivers and catchments provide for humans and nature that are important. Those functions continue to evolve and change in a dynamic way. It is essentially about ensuring that those systems continue to have integrity, that they are healthy, that they are productive and that they provide the cultural services, the provisions and recreational opportunities that we need. It is pinning our targets and our objectives around our understanding of those functions and services, rather than arbitrary notions of a natural system that may have been possible several decades ago but where the system has evolved on since then, partly due to climate change and changes in human activities.

My point is that it is the ecological function of rivers that we need to be focusing on, setting our objectives and standards around those as opposed to an arbitrary measure of the condition of a particular river.

Q17 **Barry Gardiner:** Presumably the functioning is the outcome of certain chemical and other conditions. Therefore, when assessing whether the ecosystem service that you want to flow from the body of water—to mix my metaphors—is able to happen and the value that it provides in terms of public good, you do need to get a handle on what is causing it either to be able to, or to fail to, perform it and that will be a matter of chemical composition and other things.

Professor Watson: Absolutely. What I am arguing is almost the other way around. I would advocate a system where we look at ecosystem functions and services—if you want inland recreational swimming, for example, what are the corresponding water quality standards that we need to enable that to happen safely—as opposed to an arbitrary standard for things like that, which we then relate to the uses of our rivers. Focusing around what we currently want from our rivers and what we aspire to have from our rivers in the future, not just for people but for nature, would be a good and better starting point for rethinking our future standards.

Q18 **Barry Gardiner:** Let me push you on that. Take your example, if we wanted a river for swimming in, it might have a very high chlorine content and that might impair its other functions in terms of the ecosystem services that it delivers. Simply looking at what particular human benefit we happen to want out of a system may not be the most holistic way of looking at how that river functions as part of the whole ecosystem and the catchment.

Professor Watson: You are absolutely right. I was not trying to suggest we look at each ecosystem service in isolation. This is really the spirit of the integrated catchment approach; we look at all the functions and the services of a particular catchment and ultimately there have to be some trade-offs and balances.

To reiterate the point, focusing on ecosystem services does not imply a lowering of environmental standards. If anything, it would imply a more ambitious set of targets.

Q19 **Barry Gardiner:** Dr Jackson, I come to you for bringing this down to a point. The Environment Bill will give the Secretary of State powers to set targets for water quality. We know that at the current rate of good ecological status, if we were to remediate our water at that stage it would take 200 years. What indicators do you think the Secretary of State should be using to gauge the health of rivers?

Dr Jackson: Can I go back quickly to talk about the current monitoring and the problem with it?

Barry Gardiner: Please, yes.

Dr Jackson: Steve mentioned that we need to start monitoring smaller water bodies. I 100% agree with that. The current monitoring has some spatial bias, so we are not looking at headwater streams that will then, of course, affect everything that happens lower down in the catchment.

Also, the current monitoring has many measures that do not overlap in time or space. To really understand what is going on we need to put the biology, the chemistry and the hydrology together: they cannot be understood in isolation. However, it seems at the moment that some of the monitoring, even within the biology, might happen at a different space on the river to where we are taking chemical samples. That is problematic because you cannot link the drivers with the response so that needs to change.

The current monitoring is slightly outdated in that it does not consider emerging stresses. As far as I am aware, it is mainly focused on nutrient pollution and not any other emerging chemicals.

Q20 **Barry Gardiner:** That is helpful. If this Committee was making a recommendation to Government, how would we focus that recommendation to ensure that the lacuna you have just identified is eliminated?

Dr Jackson: It would be that the Environment Agency probably needs more funding in order to be able to do more regular sampling across more time points. Many of the big pollution incidences that are picked up, as I mentioned earlier, are picked up by volunteer groups because they monitor a lot more regularly than the Environment Agency.

Q21 **Barry Gardiner:** Would it be greater integration of both spatial and temporal monitoring systems?

Dr Jackson: Exactly, yes, more regular monitoring. I know there has been some talk recently of in situ continuous monitors of some variables. It is also making sure we are measuring the impact, response and drivers at the same place. Rather than different groups that are doing the sampling choosing to do it wherever they can access the river, it needs to be more co-ordinated than that.

I agree with what Professor Watson was saying about how using a functioning approach will give us a good overall holistic understanding of a river's health. If we look at the multiple functions that are provided by a river, it will let us know how the biodiversity is doing and how the food web is structured. You can even use it in the future as an indicator of what chemicals might be in the system, particularly if you look at the microbial community that might indicate by what genes they have switched on what chemicals are in the ecosystem.

Chair: Thank you, Barry. That is a very neat segue onto Robert Goodwill's questions on data monitoring and quality of data.

Q22 **Mr Goodwill:** Thank you very much indeed, Chair. Yes, I think it has become quite clear from what we have heard already that there is a dearth of data on what is going on in our rivers. I know from experience in my constituency with Staithes Beck, it very much matters on the day they come to take the sample whether there has been heavy rain, which can have diluted the river or, in some situations, flushed some of the diverse pollution into the Beck. On other occasions, when it is very dry weather, then whatever is in there is concentrated or, indeed, the state of the tide at the mouth of the Beck as well.

Dr Jackson, is there any element going on in terms of constant monitoring equipment that could be used and maybe made available more generally so everybody could see what was going on at that time.

Dr Jackson: I do not use any constant monitoring equipment myself, but I think there are much more rapid methods being developed that could be useful. Lots of citizen science programmes now run by Earthwatch, for instance, can test water quality in situ. There are also rapid methods of looking at biodiversity. In my lab we use something called a FlowCam, which uses machine learning to identify what organisms are in a sample to rapidly tell us about the health of an ecosystem. You can also put in loggers that continuously log things, like temperature and oxygen, which would be helpful. I think perhaps Steve might know a little bit more about these continuous loggers.

Q23 **Mr Goodwill:** Yes, Professor Ormerod.

Professor Ormerod: I want to go back a little bit, to some other parts of the debate and then I will come to your question, if I may.

There is one particular hare that we set running about the balance between ecosystem services and other types of assessment. I sat on the National Ecosystem Assessment for DEFRA, which set up the ecosystem services approach, and we wrote the chapter for fresh water, so I have bit of an insight into this.

We should be aware that, although there are major benefits in understanding ecosystem services, there are also some risks. If we completely shift our monitoring system, there is a major danger that we would be losing something like 40 to 50 years of data accumulation made using existing methods. Those assessments are not arbitrary. They are based on predictive models and methods that have assessed what

organisms and communities look like in certain locations. Let us not forget that ecosystem services can be delivered with a fraction of existing biodiversity and, therefore, might not capture the full biodiversity complement, so there are some counterarguments that I think we need to be aware of.

To turn to the specifics around continuous monitoring and assessment, there is a whole range of techniques that are being deployed and used; continuous monitors, passive samplers, for example, which can be deployed in particular locations and act a little bit like a biological membrane. Through time they can integrate the array of pollutants that are passing a particular location, very much as organisms do. Let us not forget that one of the reasons we look at biota in river assessment is because the species present in the water integrate long and short-term change.

One of my arguments would be very much about making better use of the data that we have, rather than necessarily looking for more and new data. We have to be better at understanding the signals that come out of biological monitoring. We have to be better at diagnosing the problems that are present in any particular location.

By combining a sound understanding of the chemical environment and the hydrological environment we can get a better handle on how the biota of rivers, and indeed the risk to people, are also changing. Therefore, better use of existing data should be a large part of what we are intending to do. However, absolutely appropriate; rollout of continuous monitoring technology in the places where we need to get a handle on dynamic circumstances.

Q24 **Mr Goodwill:** Would there be any merit in making that data publicly available, or could that result in people misinterpreting one day's results, or not having the benefit of the historical background or the scientific knowledge to crunch that data?

Professor Ormerod: The analysis of data is a shared effort, of course. We all come to a shared view in the battle of ideas in the way that data is analysed and interpreted. My understanding, in fact, is that publicly funded data—including from the Environment Agency and others—is publicly available and can be used, analysed and interpreted by others. We in the university make use of Environment Agency data.

Q25 **Mr Goodwill:** We have heard mention of citizen scientists, and we also know that water companies and maybe some industrial companies will monitor water quality. Do you believe this could be a useful way of extending the amount of data available, or is there a risk that people with an axe to grind, either trying to prove the water was cleaner or dirtier than maybe it is, could result in some distortion of what we know about some of these watercourses?

Professor Ormerod: As long as people are collecting data in appropriately quality-augmented ways that are compared and quality assessed, the notion of large data frameworks that bring together data

from different providers should be increasing our ability to understand the river environment. Certainly, here in Wales we have been thinking for some time about how we can bring together regulatory data, water company data and others into some kind of central repository that would allow its full interpretation and assessment by a range of users.

There are, of course, issues around arguments of over-interpretation. One of the important elements is that anyone working in this area—be it a citizen scientist, an NGO or a regulatory body—should maintain the technical capabilities and expertise to be able to understand and interpret the data that they are collecting in an appropriately quality-assured way.

Q26 **Mr Goodwill:** We have obviously been monitoring bacterial load, phosphates and nitrates in rivers for a long time. With some of the new pollutants that we are hearing about—plastic pollutants, endocrine disrupters and other new types of pollutants that are emerging as we use new technologies—are there vacuums that we need to fill in terms of information? How do we select which are the things we wish to monitor, because we obviously have only limited resources?

Professor Ormerod: Taking microplastics as an example, at the moment there is no clear regulatory standard against which microplastic monitoring would take place. Most of the assessments are ad hoc. They are not, for example, including ingestion by organisms very often. That also goes for a lot of the other 'watch list' type pollutants. We know that things like flea treatments from veterinary products are present in the river environment, and we do not understand yet the extent to which they may be impacting invertebrates or may be entering the membranes of invertebrates.

There are clearly some gaps around making proper assessments of the biological significance, the occurrence and the uptake of a lot of those emerging pollutants.

Q27 **Mr Goodwill:** Finally—this is a problem that I hope we might have sometime in the future—is it possible, given that ecosystems rely on nutrients to feed them, that we could end up making rivers too clean and that the organisms that require that sort of feedstock would find that a limiting factor?

Professor Ormerod: There have been instances. When we cleaned up wastewater treatment from major organic sewage pollution—

Mr Goodwill: I think the River Trent was a case I read about.

Professor Ormerod: Yes, all of the evidence indicates that the nutrient loads in European rivers in general, British rivers included, are orders of magnitude higher than they would have been under natural background circumstances. We have appropriately functioning ecosystems with integrity that are naturally low nutrient, so I would not ever envisage too little nutrient being a problem.

Mr Goodwill: Thank you, that puts it into context. Back to you, Chair.

Q28 **Chair:** Thank you, Robert. Can I follow that up with a quick question of my own, Professor Ormerod?

The event duration monitors, which water companies have been obliged to install for the last few years, provide information on the frequency and duration of sewage spills into our rivers but nothing on the impact of those spills into the rivers. Are you aware of technologies that are emerging to allow for much more sophisticated monitoring of water quality downstream of water company assets?

Professor Ormerod: Again, we have to be making better use of those samples that are collected. At the moment they tell us quite a bit about when CSOs are firing, not necessarily everything that is coming out of the CSOs.

There is also an interesting scientific problem, which is that quite often CSOs are emptying into locations that are already affected by wastewater and other urban runoff sources. Therefore, our use of data has to be better in those instances at understanding the additive effects against that background of polluted conditions that any given CSO might be causing. I think that is where we need a more systematic improved assessment of CSO impact.

Q29 **Chair:** That would include monitoring downstream of a water company asset, which at the present does not happen, is that right?

Professor Ormerod: I am not familiar with all of the water company monitoring procedures. Typically, the approach will be an upstream and a downstream comparison but sometimes that can be compounded by other problems that are present in the same reaches.

Chair: Thank you very much. Now Caroline Lucas has some questions on the regulatory framework.

Q30 **Caroline Lucas:** Thank you, Chair. I have a couple of questions for Professor Watson.

Professor, you have touched on it already, but could you say a little bit more about the extent to which current institutional arrangements for water governance protect and improve rivers and what can be done to improve that, assuming that some improvement might be necessary?

Professor Watson: Thank you. If I can focus on one particular element of the institutional arrangements. Since 2012 in England, and in Wales too, we have seen the development of what is called the Catchment Based Approach. These are collaborative groups—often involving rivers trust organisations, public agencies and water company representatives—which essentially join together to work at a local catchment scale.

This has helped to address some of the challenges we have been facing with the Water Framework Directive, particularly around river basin districts that are spatially, geographically, enormous. The north-west river basin district goes from the Scottish borders all the way down to Cheshire. At that scale of analysis, it is difficult to understand what is

going on, to assess conditions and to generate actionable management plans.

The big shift, which has been very welcome, is the move to more of a catchment base, to recognise that a catchment is not just a river system but is a land and water system and that human activity is an integral part of that. That institutional development in the last 10 or 11 years has been very welcome and positive. Having said that, because of some of the monitoring issues that we have spoken about previously, the positive impacts of that local action are not being picked up or seen in the river basin district scale monitoring and the river basin district plans that the Environment Agency has been producing.

We have set off in a new direction in the last decade, which has been very encouraging and positive. However, I would say the catchment partnerships are still very much in their infancy. They often resemble voluntary organisations or voluntary collaborative groups. We could go much further with that in terms of developing their capacity.

Doing things such as state of the catchment reports, for example, for public understanding and public consumption could be a positive development. That is something that is done in other countries. In the US and Canada, for example, the respective agencies routinely produce state of the environment reports for whole watersheds or whole catchments and make that very clear and transparent for the public. That is something I would hope to see and encourage to see here in the coming years.

Q31 **Caroline Lucas:** Would you say that one of the problems that that approach is trying to address is a fragmentation of different roles across the scene? Surveying the different actors in this—whether it is Ofwat, the water companies, the Environment Agency or local authorities—it does feel as if it is very fragmented.

In terms of where the powers lie and where the incentives lie, are they in the right place? Do the organisations that have the power to change things have the resources to do that as well?

Professor Watson: In the context of local authorities, the answer is clearly no. If you go back to the regional water authorities of the 1960s and 1970s, local authorities were strongly represented in those bodies and they had a major input into decision-making. That no longer seems to happen. Local authorities are starting to take a very keen interest in flooding, understandably so. However, from my experience, local authorities are not so engaged in matters around water quality.

Some of the catchment partnerships have local authority representation, but many do not and that is particularly unfortunate. Potentially, local authorities could be a major player in terms of protecting water quality and rivers in the future, particularly around highways, nonpoint pollution inputs and more localised sources.

Ultimately, catchment partnerships are operating on a spirit of open co-operation. As we go forward, we might need to try to formalise that a little bit more, without making it too bureaucratic, so there is a more joined-up collaborative approach that goes beyond information sharing and joint grant applications, for example, which is typical of what many of the catchment partnerships are doing at the moment.

Caroline Lucas: Thank you. Again, this is a question you have touched on a little bit. Do Ofwat and the water companies have clear accountability and transparency in decision making and expenditure on river management? To the extent that they do not, is that a question simply about providing more detail or is it a more systemic problem?

Professor Watson: From a public perspective there is not that accountability. Water companies do clearly report and are accountable to Ofwat, and Ofwat responds appropriately when a water company is seen to not be performing efficiently or effectively. However, I do not see that transferring over to the public domain. From a water consumer perspective, it is very difficult to understand or to know what price increases might have been agreed and on what basis, and what kind of improvements we can expect on the back of some level of increase.

There are elements that are working very well but, particularly when I look at what is happening in North America, there is a much stronger sense of water citizenship and awareness about what is going on and how the governance arrangements work. If I can pick on an example, in Ontario in Canada conservation authorities have been operating at a watershed scale since the 1940s. They have local authority municipal involvement, alongside provincial agencies. They have a shared funding model; local with provincial, joined together. They also have a big focus and effort on public engagement and understanding. There are some very successful examples out there that we could learn from.

Q32 **Caroline Lucas:** I don't know anything about that example. Is that an example of water authorities being in public hands or, like Welsh Water, being not for profit? Standing back and looking at the bigger picture, is there an argument here for a more joined-up approach that could have greater potential to happen were it back in public hands?

Professor Watson: An interesting question. Again, if you think of Ontario, they do not have privatised water companies, but water services are operated by municipalities on a cost-effective basis so there are similarities and parallels.

One of the consequences of privatisation in England was that we were able to see some big improvements in the 1990s and 2000s around the obvious problems because there was more money available in the system to do that. As those relatively obvious problems have been tackled and eradicated, we are now left with some more complicated and expensive problems. At the same time, Ofwat has insisted that water charges should not increase at the same rate as they have done in past decades. Therefore, water companies are in a difficult position, and perhaps that

explains why we are not seeing the same rate of progress now as we have done in previous decades.

Q33 **Caroline Lucas:** It would be fascinating to explore that further. What could be done about that very last point you raised, what does it require?

Professor Watson: One suggestion and one thought, in line with the 25 Year Environment Plan, is that it would be interesting to at least consider time-limited water commissions for some of our major catchments or groups of smaller catchments, with a focus not only on environmental improvement but ensuring that water company investment is targeted appropriately, whether that be around ecosystem services or the approach that we have at the moment. A catchment or watershed-scale focus, time limited to drive improvements over the next few years and decades, could be really constructive and helpful.

In the Environment Bill there is the suggestion of an Office for Environmental Protection. Depending on how that is organised and developed, that could potentially have an equally positive impact too.

Chair: Now some questions from Dan Carden, making his debut at our Committee as a questioner.

Q34 **Dan Carden:** Thank you, Chair. Can I welcome all the witnesses today? I think we have covered the regulators quite a lot: particularly I have been interested to hear about the new Catchment Based Approach and some of Professor Watson's views on how local authorities and regions can play a bigger role.

Can I ask about international comparisons? When the public hear about CSOs, the discharge of untreated sewage, what would be the highest standards that we could expect? It is shocking that we have untreated sewage being pumped into our rivers. How does that look internationally, where does the UK stand?

Professor Watson: Can I pass on that question? I am not sure I have the information to answer that question about CSOs and technical aspects.

Q35 **Dan Carden:** Professor Watson, are the regulators being robust enough with the water companies in this area?

Professor Watson: I think they are but they are equipped with limited evidence and data. To pursue a water company or any other kind of organisation, you need the evidence and the data to support not only that an incident has happened but be able to apportion that incident to a particular source.

Because of some of the limitations that we have around monitoring—and my understanding is there have been severe reductions in human resources in the Environment Agency and some of the other organisations—there is limited capacity to observe when these events are happening and provide the necessary evidence to follow through with legal action. That would be my perspective on it.

Dr Jackson: I would imagine that any country that is still using combined sewage and storm-overflow drains will have similar problems. The reason that we have this raw sewage ending up in our rivers is, when you flush the sewage down the drain, it goes into the same system as water that falls on to streets in urban areas and it mixes in the pipes there. When you get heavy rain, the water companies are permitted to discharge some of that raw sewage because they cannot cope with the demands at the water plant.

In most of the UK our system comes from over 100 years ago—Victorian times even—so any country where they have the same sort of infrastructure, they will potentially be suffering from the same problems. That is just a guess. I don't know anything about international regulations on this. Perhaps Steve would know more.

Professor Ormerod: The problems and the solutions differ across Europe. Predominantly, the major source of comparison we have is the water framework directive. The directive shows us that there are problems of a similar scale to the United Kingdom pretty much across the whole of Europe, a bit less as you go further north into Scandinavia. The German model is slightly different. As you go into the south, you have problems of abstraction and low water availability that create differences.

It is interesting that similar types of problems occur everywhere. They are related to nutrients, they are related to emerging contaminants, they are related still to organic problems in some areas. I do not know if other nations have the same degree of detail, in particular around CSOs, that we have, even though our detail is still quite limited.

For example, we know here in the United Kingdom that in the Thames system some of the estimates suggest that there is something like 39 million tonnes of untreated sewage going into the river environment on an annual basis from around 50 or 60 CSOs. We need to get that improved handle on our own CSOs and improve the general picture we have. Comparators are available but there is clearly a lot that we have to do here to make the problems of what is often hidden from public gaze, the problems of the freshwater environment, more visible.

Chair: Thank you very much, Dan. That concludes our conversations with the panel. I would like to thank Professor Steve Ormerod, Professor Nigel Watson and Dr Michelle Jackson for joining us today. Thank you very much. You are very welcome to stay and listen to the next panel if you would like.

Examination of witnesses

Witnesses: Guy Linley-Adams, Amy Slack and Dr Rob Collins.

Q36 **Chair:** I would like now to move straight on to the panel with NGOs and

introduce firstly Amy Slack. Could you explain what your role is and who you are from?

Amy Slack: Thank you, Chair. My name is Amy Slack and I am head of campaigns and policy at Surfers Against Sewage. I lead all of our campaign work in relation to water quality and I have done for the last two years. Thank you for having me today.

Q37 **Chair:** Thank you. Cherilyn Mackrory, who is a member of the Committee and is a Cornish MP, as you are aware, is unable to be with us for this session. She has asked to make sure you are aware that she is aware that you are here. I think you are both from Cornwall. You have also been working with me on my Private Member's Bill.

Dr Collins: Good afternoon, I am Rob Collins and I am head of policy and science at The Rivers Trust. I have a background in water quality, both rural and urban-produced pollution. In the last two or three years I have been heavily involved in the Catchment Based Approach that was alluded to at the end of the last session.

Q38 **Chair:** Thank you very much, Rob. I have been working with your colleagues but not with you on my Bill.

Guy Linley-Adams: I am Guy Linley-Adams. I am a solicitor in private practice and I am instructed by Salmon & Trout Conservation here.

My background is I am a biologist initially by training. I have worked for various environmental NGOs over the years—the Marine Conservation Society, Friends of the Earth, WWF and the like—and retrained in law later on in life. I worked as head of legal for Fish Legal, what was the Anglers' Conservation Association, so in many respects polluted water has run through my career.

Chair: Thank you, and you have also been helping me on my Private Member's Bill. I am going to ask Matthew Offord to kick us off with the first set of questions.

Q39 **Dr Offord:** For the sake of transparency, I would say that for many years I was a member of Surfers Against Sewage. Having grown up in Cornwall, I was also a lifeguard on Cornish beaches so I am very much aware of the organisation. Indeed, I met with Amy two summers ago. It is good to see you again here today.

In the written evidence that has been submitted by Surfers Against Sewage, you mentioned a lot about the wellbeing benefits of water environments. Many people on the Committee—and I am sure you—will be aware of books such as "Waterlogged" by Roger Deakin and Jessica Lee's "Turning", which are about their experiences of open-water swimming.

Can I ask you for some thoughts about the connection of the individual health of people and the connection between the ecological health of our rivers, particularly when they swim in such water bodies?

Amy Slack: Thank you. That is a very good question. It is widely known that pollution from water, from sewage, agricultural runoff and surface-water contamination carries pathogens. That is what makes us sick. As you know, that is why Surfers Against Sewage was founded about 30 years ago by surfers who were getting sick from the sea.

Considerable progress has been made to improve our coastal bathing waters. To clarify, most of our work of assessing sewages are on our coastal environment but we are doing a lot more work on our inland water quality as well now.

In our coastal waters we are still seeing worrying signs of the impact of water pollution on human health. Through our Safer Seas Service—which is a phone-based app and the UK's only real-time water-quality information service that provides pollution notifications directly to people's phones—we had 153 health reports submitted during the 2020 bathing season that runs from the middle of May to the end of September.

It is important to think about each report representing a period of time when other water users were also exposed to illness. The most common illnesses that were reported through our Safer Seas Service were gastroenteritis, 61% of the health reports submitted, followed by ear, nose and throat infections at the second most common, with 16% of health reports submitted.

We have also had reports of infections such as viral infections, respiratory illnesses and eye infections. Through those reports, two of the most serious illnesses, rather worryingly, required antibiotic treatment. In one instance it required emergency care, so we are still seeing a significant impact in human health from poor water quality. It is interesting to note that the bathing water with the highest reported incidences of ill health is classified as excellent under the current testing regime.

Also—and this is an issue that was touched on in session one—we have collaborated with the European Centre for Environment and Human Health on a number of recently published studies. It is surprising just how much bathers are still at risk from water-borne illnesses compared to the background population. Some of the studies that we have undertaken with our colleagues there have shown that bathers are just as likely now to experience illness compared to what we saw in the 1990s, and surfers are three times more likely to have antibiotic-resistant bacteria in their gut than non-surfers. This is something that was raised in the first session.

Antibiotic resistance is a particularly worrying emerging fact for us. Some of you may have heard on Radio 4 at the end of last year Dame Sally Davies, who is the UK special envoy for antimicrobial resistance, reported recently that, if no action was taken, by 2050 there will be more deaths due to antimicrobial resistant bacteria than deaths from cancer. It is an extremely worrying trend and something that we need to take note of.

Finally, as you touched on, Matthew, mental health impacts from water pollution are also on the rise. We have seen significant reports over the last 12 months on raising the importance of the environment in waterways for mental health and wellbeing. Our Generation Sea Survey that we undertook in the middle of lockdown one, which was completed by over 500 members of the general public, showed that 80% of respondents have an increased appreciation for the environment. It shows the importance of the environment for recreation and wellbeing.

As I am sure Rob will testify to, we have seen a massive increase in stand-up paddle boarding and outdoor swimming. We have had significant booms in those sports and particularly in our river ways.

On the coast, the impacts of sewage pollution in particular, we are seeing up to 6% of swimmable days—those are days in the bathing season that we see as swimmable—are being lost due to pollution. The loss of these blue spaces due to pollution is likely to have an impact on our health and wellbeing if we deem the risk high enough not to warrant going in the water.

We need to see action taken and a real result in the reduction of pollution into rivers from sewage and diffuse pollution, an ambitious target set so that we can swim and play in safe, clean water. That goes hand in hand with the improvement in environmental health as well. They are not mutually exclusive.

Q40 **Dr Offord:** You mentioned particularly pathogens being present in seawater and I am aware of how that gets into the sea, the ocean. To what extent does the polluted state of UK rivers make it dangerous to engage in activities such as stand-up paddle boarding. There has been a huge explosion in that. Even I have a stand-up paddleboard. So many engage in that now. I have seen people on places such as the Thames all the way up past Oxfordshire engaging in those kinds of sports. How does the quality of the water make it dangerous for those people?

Amy Slack: The quality of the water with the threats of antimicrobial resistance, the threat of E.coli, the threat of intestinal enterococci are similar as a result of diffused pollution and sewage pollution whether you are using the sea or the inland waterways. Unfortunately, we only have one river that has designated bathing water at the moment in the UK, Ilkley, and a few other inland waterways and other freshwater environments. We do not do any monitoring in river environments in the way that we do on the coast because there is not a legal obligation to do that in the same way.

To answer your question, our assumption would be that we have a similar kind of risk. Obviously, we are seeing a huge amount of inland recreational water use, particularly as a result of the current health pandemic. It is a particularly worrying trend and, as reported in your first session, the state of our rivers is particularly poor, with 14% meeting ecological status. We would assume that the human health impact is equally severe in river ways.

Q41 **Dr Offord:** Thank you. Mr Collins, I would like to come to you. Back in 1998 Councillor Joan Stocker, who was a Liberal Democrat councillor on Cumbria County Council, raised the issue of bathing-water quality and water quality generally in the Lakes where she is a councillor. I did know Joan at the time and I was very impressed with what she was doing. Can you explain to us why it has taken us until 2020 for the English Government to begin designating river waters as fit for bathing?

Dr Collins: I can only speculate as to the reasons why. I assume successive Governments going back decades now have been concerned around cost to water industry, cost also to the agricultural sector. Let us not forget about the water industry, raising livestock contribute faecal microbes to our rivers as well. There has been a concern around cost and probably unfortunately not enough focus on benefit. Some of the benefits around public health and aquatic health are quite hard to monetise, so people have not bothered over the years.

Unfortunately there are some strange irrational approaches we take to our water environment, whereby there are locations around the country where we pollute a whole range of chemicals only for us to abstract that same river water some kilometres downstream and to incur a significant water treatment cost. It seems a slightly irrational way to run things.

I can only speculate as to those causes but it is particularly strange when you think that we have one river water now designated, just a few weeks ago, and a solitary gravel pit, if I am correct. If we compare that to our northern European neighbours—so comparable climates, let's take that out of the equation—Belgium has something like 75 inland bathing waters designated and has done for some years; the Netherlands, it is in the hundreds; France and Germany higher still. So we do stand out here. Not with the coastal bathing waters, but with inland waters it is a very strange state of affairs. I can only speculate that it was a perceived cost issue all those years ago.

Amy Slack: It is worth adding as well that there is a big opportunity here for us to make changes. We are falling way behind our European neighbours. I just pulled up some stats to add to Rob's. In the UK 3% of our bathing waters are inland, Spain is 11%, Italy is 12%, 22% in Portugal and 33% in France. There is clearly a public appetite for designation of bathing waters and I am sure we will come on to that shortly.

There is an opportunity to make progress on this. There is real potential to designate some of our rivers that could be beneficial to both environmental and human health. We can state the same journey with our rivers as we have seen on our coastline. In the 1990s, 27% of our coastal bathing waters achieved minimum status and now we are seeing 98% reaching those minimum statuses today. There is a real opportunity for us to take our rivers on a similar journey. It is a fantastic opportunity for us to be progressive on this issue.

Q42 **Dr Offord:** I mentioned two books at the beginning and both of those

authors describe swimming throughout the year. If you look at people posting on Facebook and other social media who are members of the Outdoor Swimming Society, colder has no relevance on the basis of people entering the water anymore. It is almost a sense of bravado that people want to demonstrate that they are swimming all year round. It certainly is not the weather in this country that would stop people from swimming, in my opinion.

Amy Slack: Wayne Carter has had a massive impact on that, I am sure.

Q43 **Dr Offord:** Mr Linley-Adams, I want to ask you about the wild fish populations in the United Kingdom—particularly in regard to their health—and what are the pressures and the stresses upon fish and their populations?

Guy Linley-Adams: If I could quickly add to what has just been said. I could perhaps shed some light on the history. Back in the early 1990s I was editor of the "Good Beach Guide" for the Marine Conservation Society. The reason that was given then for inland bathing waters not being designated was cost and the old Department for Environment set its face very firmly against designating inland bathing waters. That ran for many years.

People swim near me; I am in Herefordshire. They swim on the Lugg, the Wye, the Arrow, the Teme in the Chair's constituency. The Wye is a navigable river under order of Parliament, all 100 miles of it, from Hay-on-Wye down to Chepstow. It is used for all sorts of water sports, not just swimming; fishing, canoeing paddle boarding, the lot. There is no reason why that whole river should not be designated as an inland bathing water. That would drive the investment that is required to clean up the CSOs along the stretch of the Wye.

Q44 **Dr Offord:** There was a book that came out just before "Three Men in a Boat", which is a very famous book, and in it these four guys paddled down the Wye. It never got the publicity, so that is why I smile.

Guy Linley-Adams: Turning to the fish populations. They are in a poor state. The Environment Agency does surveys every year of the state of salmon populations and we have 42 main salmon rivers in England. In 39 of the 42 the populations are categorised as being at risk or probably at risk. No rivers are categorised as not at risk at all. The salmon population is in a bit of a mess. There are other threats other than pollution facing salmon but pollution of the rivers, where they spawn, is a serious one.

For sea trout, 20 of the 44 sea trout rivers are at risk or probably at risk. If you look at fish class assessment under the Water Framework Directive. In 2019, only 18% of water bodies have the fish class assessment in the good or high category. We are looking at a sorry state of fish populations across England.

This is due to pollution, loss of habitat, loss of flow—over-abstraction of rivers is a serious problem. One exacerbates the other. If you take too much water out of a river and then add the pollution you are causing a greater problem than if you had not already abstracted the water.

Pollution from sewage and from agricultural sources, ammonia causing low oxygen levels in the water, you get a lot of fish kills. I noted from written evidence the Committee has received from a senior fisheries officer from the old National Rivers Authority that existed in the early 1990s, he said that in 1989 at privatisation CSOs were killing fish then. They are still killing fish. He is absolutely right. We have known about this problem of pollution of waters killing fish for decades. What has been missing is the political will from successive Governments, all Governments of different political shades to get a grip of this problem.

Q45 **Ian Levy:** I would like to direct my first question to Dr Collins. Just so you get a little bit of a feel about what I am about. I live in Northumberland and represent a constituency right on the coast. We have a fish and chip shop there that offers children the opportunity to collect a bucket from the fish and chip shop and go and collect plastic off the beach. If they bring that back to the shop they get a free ice cream, which goes down really well; it is fantastic. It has highlighted in Blyth Valley the awareness of plastic pollution on the beach, but how aware and concerned do you think the general public are about the levels of pollution in rivers?

Dr Collins: On the issue of sewage, WWF produced a report two or three years ago that published the results of a questionnaire to the general public, which showed pretty clearly that their awareness was relatively low of some of these issues but concern was high. A lot of the people in that survey were astounded that raw sewage was allowed to be discharged to our rivers. Something like 80% or more of those people responding said that absolutely was not okay, in their opinion, and that all our rivers should be safe enough to bathe and swim in.

Obviously, since then, we have had a lot of interest in designation of inland bathing water sites, particularly in the locations we heard earlier. There must be 20, 25 more community groups around the country who are very interested in their little local stretch of river being designated. Understanding and awareness has risen there.

Plastics has certainly risen in the public consciousness, particularly when you see it strewn all over a beach, but slowly understanding of its impacts; microplastics in terms of blocking drains and culverts and increasing the chances of flooding in a local sense.

We are in an interesting time in terms of public awareness and also in terms of citizen science. It is beginning to accelerate, as we have field kits and mobile phone apps where we can record data in real time using harmonised methods. That direction of travel is only going to continue here. It is an important issue.

We heard in the last session mention of the Catchment Based Approach in these river catchment partnerships—106 of them around the country now—and our network of Rivers Trusts are heavily involved in those. What frustrates us a little bit is that that framework exists for us to have much greater engagement with the general public on a whole range of

issues, so plastics and litter, but importantly also engagement around or awareness-raising and education around, for example, a whole load of issues that are relevant to this inquiry: sustainable use and disposal of household and garden chemicals; so do not put paints, oils and pesticides down the drain. Not that many people are aware of things like medicine take-back schemes. We end up with antibiotics being flushed down the toilet. Fats, oils, greases, wet wipes, these sorts of issues, which exacerbate flooding.

We have a fantastic framework to increase public engagement and help change behaviour. For the want of a little bit more funding and some sustained funding we can make a step-change here. All of this is about tackling the problem at source, which is always the most cost-effective way of doing it. Not the main solution but if we can get the general public much more aware and engaged and educated we can begin to make a difference.

Q46 **Ian Levy:** I totally agree with you. Certainly, in my constituency, the general public have become more acutely aware of it. Whether that is because of the fact that, due to Covid, one of the positive things that has come out it is they have been able to get out and use the environment and see what is happening there. Thank you for that, I appreciate that.

Amy, if I could direct my next question at you. I was quite concerned when you said that we only have one river that is attributed to be bathing quality. Is there sufficient information for swimmers and other river users to make informed decisions at the risk level of pollution?

Amy Slack: I will just add to what Rob said in terms of awareness. The issue of water quality has been on the public agenda since the 1990s but from our vantage point, Surfers against Sewage, we have never seen greater awareness and appetite for change as we are now. It is even greater now than we saw in the 1990s when we started as an organisation.

People do not want to be swimming and playing in polluted water and are generally shocked when they find out the extent of the problem, particularly with sewage discharge into waterways, to add to the evidence that Rob just gave.

Covid has played its part in the last year. We have seen increased concern around the transmission of bacteria and viruses in water and in the news around testing of sewerage treatment plants for Covid. We have seen an increased awareness and I would stress that the risk of Covid is seen to be very low or non-existent from swimming in the sea or rivers. Nevertheless, there is public concern around it.

We have also seen over 44,600 people from the general public sign the End Sewage Pollution petition, which we launched with a number of organisations, including the Rivers Trust and the Salmon and Trout Conservation, which was handed to the Secretary of State in November. There is a significant amount of public concern there.

The Safer Seas Service, which I referred to earlier, which is our water quality information service and has 35,000 users, provides real-time notifications to water users across the UK, mostly in coastal locations, but we are going to now be calling it the Safer Seas and Rivers Service as we are going to be including some inland waters in that as well.

We have had 4,000 e-mails sent to MPs through the Safer Seas Service, many of whom are on this call today, highlighting pollution events in their constituency. There is a huge amount of concern and of course we have had 6,000 e-mails sent to MPs asking MPs to support the Sewage (Inland Waters) Bill, and 131 MPs are now doing so, which is great. It does highlight the public concern around this water issue.

To your question on provision of data, people do want this real-time information. They want to know when it is safe. They want to be given the information to make an informed decision about the risks of entering the water, whether that is coastal or inland, and that is not a requirement on water companies to provide that information at the moment. We have voluntarily, through the Safer Seas Service and through the water companies' own notification services, but there is a real opportunity to provide that information to water users across the UK and make sure that inland water users have the same information as they do on the coast. We are starting to see that come through, but if we designate water and bathing water in rivers then we can provide that information to water users. That is really important, so that they have that information at the tip of their fingers.

Q47 **Ian Levy:** Rob, if I could come back to you. Can you expand a little bit on how reliant we are on the goodwill of volunteers in all of this in their efforts to protect, enhance and look after our rivers?

Dr Collins: As I mentioned, citizen science has really grown over the last few years and it is developing into something that is robust and can be trusted. We heard in the earlier session about some of the limitations of regulatory monitoring both in time and space, and voluntary or citizen science or environmental NGO collection of data can only help improve our understanding of current pollution levels and the current state of our rivers and coastal waters.

At the moment, strictly speaking, volunteer engagement is at a relatively low level. We find our trust and the catchment partnerships mobilise local communities. There are a number of different mechanisms where they can get involved, so for example monitoring outflows for signs of pollution, including plumbing misconnections for example, looking out for drains and culverts that are blocked with litter and wet wipes and so on.

As I mentioned before, the field kits nowadays are really useful and can give you real-time information on a relatively narrow range of pollutants. You can go out and measure them in real-time. We find, while it is at a relatively low base at the moment, that sort of additional information is invaluable for helping to identify issues and prioritise action. I think we are in a low base. I can see it only continuing into the future as we

mobilise more of the general population and fill in those gaps, both spatially and temporally, that we have in the regulatory monitoring.

Q48 **Ian Levy:** Thanks, Rob. You have kind of covered my next question. It was going to be about citizen scientists. If you could expand a little bit more on that, then I will leave it at that. Is there anything more we can do to help citizen scientists?

Dr Collins: There are two big issues here. Citizen scientists go very cold if they understand that the regulation and enforcement is not sufficient, is not apparent, is not strong enough. People are very keen to get involved, that is one thing. It brings a sense of health and wellbeing and an important sense of ownership of local environmental issues, which can lead to behavioural change, which is a great thing, but that goes cold if people understand that there is not enough enforcement or the legislation is non-existent. That is a really important point.

I mentioned before about funding for the catchment partnerships that came up in the previous session. We have this network of 106 collaborative river catchment partnerships, which encompass the whole of England, that have been funded by DEFRA now for seven or eight years. They run off pretty low core funding, but they do a fantastic job of trying to engage local communities, engage all sectors of the water cycle: local authorities, businesses, water companies and others. I think greater funding for them, because they have the tools, the means, that framework by which we can undertake much more citizen science. That is one key thing.

Ian Levy: Thanks, Rob. You have been very helpful there. I will leave it at that and I will hand back to the Chair.

Chair: I have just heard that the current debate going on in the Chamber, which I and I know a couple of other members of the Committee are due to join, is maybe coming a bit earlier than we expected. If we can get through this quickly that would be much appreciated and I apologise to our witnesses if we do have to cut this a little bit short.

Q49 **Duncan Baker:** I want to come on to talking about regulation and enforcement. When we hear further this afternoon on the evidence that just 14% of English rivers meet good ecological status that is particularly worrying. It says to me that something is not functioning as it should be and where is the resource and the enforcement mechanism in this?

First to Mr Linley-Adams, how well do you think regulators are fulfilling their responsibilities in dealing with standards in monitoring compliance, enforcing permits to discharge pollutants and so on? How is your feeling around that at the moment?

Guy Linley-Adams: To start with, it is clear that we have enough legislation: the Water Resources Act 1991, the Environmental Permitting Regulations, Agricultural Diffuse Pollution Regulations and the regulation of the water industry under the Water Industry Act 1991. The powers are all there. What we have suffered from is that successive Governments

have not allowed the Environment Agency to get on with the job. The agency has not so much had one hand tied behind its back, but it has been starved of funds and, in many respects, it has been chained to its desk. Most people would agree it is a pale shadow. The agency, in respect of rivers, is a pale shadow of what the old National Rivers Authority used to be. The National Rivers Authority was merged into the Environment Agency by the 1995 Act.

What we have seen are a lot of plans drawn up, river-based management plans, diffuse water pollution plans, nitrate reduction plans, phosphate reduction plans. It is the implementation of those plans that has been lacking. No shortage of plans, but it is the implementation and the enforcement against those polluters that has been lacking and I am afraid it is getting worse. It is not the fault of Environment Agency staff. The Environment Agency has been under pressure. It started in the early 2000s, the Legislative and Regulatory Reform Act 2006 that spun out of the Better Regulation taskforce. That was all about lowering burdens on business and by "business" that includes a lot of the main polluters of rivers.

Then you go to the Regulatory Enforcement and Sanctions Act 2008 that followed the Hampton review on deregulation and reducing burdens on business, then you come to the McCrory review that brought in sub-prosecution civil penalties, so it removed the useful stigma of a prosecution for a lot of these environmental offences.

You come forward to 2014 and you have the Regulators' Code, that again is all about the pursuit of growth. That followed Lord Heseltine's report, "No stone unturned: in pursuit of growth", arguably no river unpolluted in the pursuit of growth. Then you get to the 2015 Deregulation Act and the statutory growth duty, all these have combined to put pressure on the Environment Agency to make sure that when it regulates, when it enforces, it does so in an extremely soft manner with business rather than producing the penalties that we need to see to change the polluting behaviour in the first place.

I think funding is a massive problem for the Agency. We heard from Professor Watson in the earlier session about the reduction in the overall monitoring of rivers. That is a really big problem. The numbers of staff deployed to rivers has dropped like a stone. That has to be reversed.

Q50 **Duncan Baker:** Thank you very much for that, and almost following on in sequence to Amy Slack. First, I have to say that I have 50 miles of the best beaches in the country, being the MP for North Norfolk, and we have six blue flag beaches, as you will know. I do not even think Cornwall beats us any more. When we have not just shy of a quarter of a million miles of rivers and streams and the Environment Agency seems to have a very low prosecution record, not to mention a very low level of fines, do you think that when breaches occur the enforcement response is reflective of the damage and the environmental impact?

Amy Slack: That is a good question. The short answer to that is no. We have seen fines levied on water companies recently, which I do not feel are truly reflective of the environmental damage that they are doing. If you look at the fines that were given to Southern Water a couple of years ago, they equate to probably about 11 days' worth of profit. That is levied essentially on the consumer and it does not really deter it from doing the same thing again. Southern Water is notoriously problematic in this field. We have seen it in court recently as well.

To answer your question, I do not think they are responsive enough and they need to reflect and understand the true environmental cost, not just to the environment but also to the human health of the risk that their pollution causes. Regulation needs to tackle the problem at source and, to Guy's point, we are really not seeing that.

Q51 **Duncan Baker:** In which case I will bring in Rob Collins. If they do not have the significant clout and powers to fine effectively, or to act as a deterrent, that says to me: does Ofwat have the necessary powers? The Chair touched on that in the first session. It goes back to also regulating the regulatory watchdog, Ofwat, and is it doing its job well enough? Rob Collins, in your opinion, where is Ofwat sitting with this?

Dr Collins: I think Ofwat has a strong focus on domestic customer builds, understandably, but it would seem that the environmental impact of the water industry has not received anywhere near enough attention for some time. I see it as a perfect storm. I pretty much agree with everything Guy said except in one slight aspect: that we do not have the legislation around CSOs and that is the point of the inland waters Bill, but I see it as a lack of implementation of that legislation where it is there. It is lack of enforcement.

As Guy said, we have seen something like a 50% decline in agency funding for enforcement activities. The agency undertakes something like 50% less water quality sampling than it used to, so they really are under resourced for this. I do not know the ins and outs of Ofwat, so I cannot give you a really detailed answer, but I think certainly there has not been anywhere near enough focus upon the environmental impacts of the water industry.

Q52 **Duncan Baker:** My final question, and I just want to finish off again with Mr Linley-Adams: the UK has said that post-Brexit standards will not regress at all, but does the water framework directive's classification focus effort in the right places and what should perhaps a post-Brexit standard framework look like?

Guy Linley-Adams: Drawing on what Professor Ormerod said in the first session, we do need to do more sampling particularly of headwaters and smaller water bodies. By and large, the monitoring system under the framework directive is a good one. The assessment of ecological status by way of the "one out, all out" system, so if you fail one parameter it cannot be good status, you drop down, is also a good one. The simple reason for that is it is basic biology. If all but two or three aspects of a

river are functioning well, but those two or three are significant ones, the river is not healthy. You have to have that system.

I would put out a plea for whatever changes are in mind. Let's not do what we did when we moved from our own general quality assessment to the water framework directive assessment back in 2010. The two systems were incompatible, so we were left in 2011 not being able to compare how we were that year from how we had been in the 2000s. Let's make sure that, whatever we do, we maintain some sort of comparability between years. Otherwise we end up with shifting baselines. We do not know whether we are any better or not and that is really very important.

Can I leap back briefly to talk about the provision of information provided by water companies? Would that be all right, Chair?

Chair: Please do.

Guy Linley-Adams: We know that event duration monitoring is being rolled out across CSOs. Water companies are public authorities for the purposes of the Environmental Information Regulations 2004. That was decided finally by a fish legal case that went to the European Court of Justice. Under those regulations there is a duty on all public authorities to proactively publish environmental information they hold in a form that is accessible to the public. That monitoring data out of those EDMs should be being published already by the water companies. It is exactly that information that water users—as Amy referred to—need to know before they get in the water. I can think of no better use of the environmental information regulations than to tell members of the public whether or not the water they are about to get into has just had a sewage discharge or not. That seems to me absolutely fundamental.

Duncan Baker: Thank you very much indeed. It is extremely interesting. Chair, I am now finished with my questions.

Q53 **John McNally:** Thank you. I will keep my questions fairly brief but I would like to say my first question is to Mr Linley-Adams, but I did fish the River Tay last summer. I never caught any fish and it was absolutely nothing to do with the quality of the water.

My first question to you is: the CSOs are relief valves in the network that are designed to operate during heavy rainfall and are necessary to avoid stormwater and sewage blocking up the pipes, but in England and Wales last year, 2019-20, there were 3,713 instances of properties being flooded internally and 27,127 externally from sewage. Fortunately our own Chair's private Member's Bill is going to require water companies to set out plans progressively to reduce their reliance on the CSOs, the overflows. My question to you is: what will it cost to fix this problem and how long will it take to fix, and will the water companies eventually charge their customers to pay for this?

Guy Linley-Adams: The answer to how long it will take first. It will take a long time because we have to retrofit an awful lot of sewerage systems. If we had started immediately, post-privatisation, with this system we

would be 33 years into it by now and we would be making some very good progress.

Whether it is flooding of domestic properties with sewage or using CSOs, they are both indications of the same problem. The problem has been that Ofwat has allowed water companies—in fact, encouraged water companies—to sweat their assets, to run their sewage works at near capacity and has not allowed the water companies to invest in the spare capacity that all sewage systems should have, so that when they do become overloaded the CSOs operate, and there is sewage being discharged into rivers. As you have alluded to, they can even back up into properties causing sewage flooding of properties. That is what needs to be reversed.

Sir James Bevan, the Chair of the Environment Agency, said recently you get the environment you pay for and I am afraid somebody has to pay for this. Whether it is bill-paying customers through the water bill or whether it is the investors in the water companies, somebody has to pay for this. Perhaps I could plug the corporate structure of Welsh Water here. It is a not-for-profit organisation. It does not pay dividends to shareholders. That is ploughed back in. Perhaps, if that is within the scope of this Committee, you could look at whether or not water companies should not be moving down that line in order to make sure that the costs to the bill-paying customer are kept as reasonable as possible, but somebody has to pay for this.

Q54 **John McNally:** I would have one comment, that Scottish Water recently being a publicly owned company and responsible, but I will refrain from that today. Sorry, thank you for that.

My next question is to Rob Collins. It is about the Storm Overflows Taskforce. As you know, it was set up in August 2020 with DEFRA, with the Environment Agency, Ofwat, Consumer Council for Water and Blueprint for Water. Basically, it is a collective agreement and a long-term goal to end pollution from storm overflows. Do you think the Storm Overflows Taskforce recommendations go far enough to solving the problem?

Dr Collins: It is a good start. It is promising that the water industry is committed to improving monitoring of CSO events, duration and flow and releasing in-time alerts for the general public, but there are some major challenges still. *The Guardian* newspaper investigation last year found that in England only there were over 200,000 CSOs discharging into English rivers for a combined time of more than 1.5 million hours. Permits for CSOs are meant to be for a few large storm events to take the stress off the system. Clearly, that data shows a triggering at very low rainfall and triggering very often. There is a huge task to do something about that.

Going back to previous points, we know nothing about pollution levels in CSOs, so it is all very well monitoring their duration and the flow but, if you think about it, they combine raw sewage with what runs off the

urban environment. That is a huge chemical cocktail: faecal microbes, hydrocarbons, industrial chemicals, plastics, pharmaceuticals, personal care products will be found in those flows. We know something about their impact on the aquatic environment but we know very little—going back to the very first question—about their impact upon human health if you ingest a big mouthful or two of that.

There is a lot of work to be done and that is why I think the Bill is so important, because we need to see investment in the infrastructure, we need to see policy change and we need to revoke the automatic right of new developments to connect to the sewer system. That policy is not fit-for-purpose at all.

I understand that Water UK have made some progress around identifying products, such as wet wipes and so on in terms of their non-flushability. That is great but we need to see legislation that sees labelling on all of that. We have a long way to go.

Q55 **John McNally:** That has brought me on to my next question. The advances in digital technology are amazing. I wonder if they are addressing these things to alert people more quickly to when any of these products are getting flushed down. Could I move on to Amy because we are going to run out of time? Amy, these discharges from the CSOs are causing harm. You have just mentioned they are unsightly, the pollution from these products such as wet wipes, sanitary products. Can you tell us briefly what greater controls should be on these pollutant products and how could we identify them better?

Amy Slack: First, to say it is part of the mix of the systematic change that is needed to address flushables, which I think is what you are referring to. We can definitely look at labelling products to inform customers about the impacts of flushable materials. I think customer behaviour change is a small part of a much bigger problem in terms of our sewerage system and we need to look at ways to tackle the problem of the source of sewage discharge. That involves looking at nature-based solutions in terms of tackling the problem, as well as infrastructure investment.

There are a whole range of measures we need to take. We need to empower the public and give them the information in terms of flushables and reduce the pressure on the sewerage system. The ultimate problem is taking that sewage discharge into the waterways and tackling that problem at source, as Guy and Rob have both alluded to previously.

John McNally: Thank you. Thames Water did say that 85% of the 75,000 blockages they clear annually from the sewers were caused by things that should go in the bin, and that certainly needs to be addressed at the source. Thank you, Chair. That is me now finished. I will hand back to you now.

Q56 **Chair:** Thank you very much, John, and it is also a nice segue for me to pick up on nature-based solutions. The issue that got me going on this whole private Member's Bill was the fact that there are well-proven

methodologies for treating sewage using nature-based solutions, which are barely used in this country despite their lower cost of capital to establish and lower cost to run. It was the work that was done, in particular, by the Rivers Trust bringing that to my attention that got me interested in the subject. Rob, my first quick question to you is: how do you see nature-based solutions being able to play a significant part in improving water quality in our rivers?

Dr Collins: We see a really important role for them. As you mentioned they are cost-effective. We know they have great efficacy for treating a whole range of pollutants. There are one or two examples where they are used to improve treated effluent coming from a wastewater treatment plant. They have so much potential for use in terms of capturing and attenuating urban runoff and holding back that flow, letting it infiltrate into the ground, attenuating all those pollutants that come in that runoff, thereby helping to address the question of storm overflow. You are preventing or certainly delaying that water from getting into the sewer network. They can play a really important role there.

Our work with individual trusts in our network has shown even modest-sized wetland-type solutions have great efficacy for knocking out nutrients, metals and hydrocarbons if designed right, and this is where it is really important. If you leave it until you are down at the main river stem where you have tens of cubic metres of polluted water rushing through at a fast rate, it is probably too late. You need to intervene early and distribute these features throughout the catchment and collect all that runoff from impervious land. Located in the right place, they have real health and wellbeing benefits for local communities. Local people can enjoy them and interact with them.

Their uptake has been slow partly through the inertia of the water industry and local authorities as well, to be fair, because 20 years ago the evidence base was not there, perhaps, around the efficacy and the cost benefit. There is a huge body of evidence now. You only have to look at the CIRIA susdrain manual that runs to 900 pages, with dedicated chapters on the efficacy of a SuDS nature-based solution, including cost benefits. There is no reason. We really need to take a more holistic approach to this problem and implement these solutions distributed around the rivers.

Q57 **Chair:** Thank you. I know Amy wants to come in on this and if you could also, Amy, address for me the question of the Government consultation on the targets for water quality that they announced last August coming under the Environment Bill. What do you think those targets should look like, but perhaps you want to pick up on the nature-based solution first.

Amy Slack: A quick point on the nature-based solutions is that they are really valuable in the mix of solutions available, but they should not be seen as a mechanism to replace the need to reduce sewage discharges in the first place. Just a point on that, and I agree with all of Rob's points.

In terms of the targets, I think we really need to think about progressive targets to end sewage pollution. We need to keep that in mind when we are talking about targets and the Environment Bill and the target setting framework. It is really important to keep that in mind and make sure that all of the legislation moves towards a system where we are seeing real action—to Guy's point earlier—and real reduction of sewage discharges into the rivers and the coastline. That is the most important thing we need to think about when we come to those target-setting frameworks.

Q58 **Chair:** Guy, another Government consultation was launched today into the draft environmental principles policy. I am not asking you to comment on it because you may not have read it but it covers five principles that can be neatly summarised as: the integration principle, the prevention principle, the rectification at source principle, the polluter-pays principle and the precautionary principle. Without having had a chance to look at this consultation, would you agree that those are the right kinds of measures if they are adopted properly across the whole gamut of factors influencing water quality in this country, and that they should be effective, provided those principles are properly adopted and applied by regulators if the polluter—whoever the polluter is—causes a problem?

Guy Linley-Adams: The lawyer in me would like to see exactly how those principles are defined in legislation first. Nevertheless, they sound like a good collection. One perhaps I would add to it is the principle of transparency or freedom of information, so that the general public is much more aware of what goes on in its name, whether it is Ofwat, whether it is the Environment Agency, whether it is the water companies doing it, but with the proviso that I have not really looked at it.

Q59 **Chair:** On transparency, the experience that I think a number of NGOs have had in trying to get access to the data that are available has been perhaps best described as poor. Indeed, it requires freedom of information requests to be repeatedly submitted in order to get water companies to provide the event duration monitoring data to them. As a result of the pressure this year, some of the water companies have started to publish this data voluntarily. Do you think there is an opportunity for the Government to require more from the water companies in terms of transparency and, secondly, to improve the quality of data provided by looking for other things other than just what is available from the EDMs?

Guy Linley-Adams: Absolutely. The water companies are missing a trick by not publishing this information and not becoming more transparent. I notice you use the word "voluntarily"—that they voluntarily agree to publish this information. That is not really true. They have been under a duty since 2004 to publish their environmental information. If any of the water companies are not doing this they should be hauled over the coals. Unfortunately the enforcement mechanisms within the regulations, the enforcement being the Information Commissioner, are not that effective when it comes to the overarching duties in the 2004 regulations.

It seems an absolute no-brainer that, if you are discharging something into the public wider environment, the public should have the right to know what it is and when it is happening.

Q60 **Chair:** Indeed. In relation to enforcement and regulatory facilitation of change, do you think that Ofwat needs to change how it regards capital investment by water companies to allow nature-based solutions to be part of the mix, rather than—as appears to have been the case—not really regarded as credible places to invest by water companies through the Ofwat regime?

Guy Linley-Adams: Absolutely they should. I think the Water Act 2014 and the ability of the Secretary of State to give strategic guidance to Ofwat is perhaps the mechanism for dealing with that. Using nature-based solutions is an obvious thing we have to do. It is cost-effective; it brings all sorts of other benefits and, if Ofwat is a barrier, Government need to remove Ofwat as a barrier to that process.

Q61 **Chair:** Thank you very much indeed. Is there anything you would like to add, Rob, to what has been said before we wrap up?

Dr Collins: Just that the drainage and wastewater management plans offer an opportunity for the water industry to move away from that CAPEX-type focus that you just mentioned. We like the framework behind those plans and the suggestion of collaboration, distributed SuDS, nature-based type solutions around the catchment but, as Guy said earlier, there are many plans for environmental protection and it depends how they are implemented. It all remains to be seen how effective those are.

Q62 **Chair:** Amy, just a last word from you. Do you see the strategic guidance as being the key to unlock change with water companies in particular?

Amy Slack: A tough question. I am probably not the right person to answer that. Guy probably has much more of a clear head on that.

Q63 **Chair:** I think Guy indicated that he thought so, but perhaps I am putting words into his mouth?

Guy Linley-Adams: No, I think that is correct. If the guidance is strong enough, if the Government make it very clear to Ofwat that is what they expect Ofwat will have to deliver.

Q64 **Chair:** Amy, any last word from you on anything we have not covered that you would like to raise?

Amy Slack: That is fine for me. Thank you very much for the opportunity.

Chair: Thank you very much indeed. I am going to bring the proceedings to a close now, because some of us have to get into the Chamber and we are being chased by the digital operators, or at least I am, so thank you to Amy Slack, Dr Rob Collins and Guy Linley-Adams for your really intriguing evidence today.