# A Forward Look for Environmental Science

## Summary findings

## March workshop - contributions to NERC's

## Public Engagement Strategy

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# A Forward Look for Environmental Science

## 1. Method

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# Workshop method

One 4.5-hour workshop was held in Birmingham on Saturday 15th March 2025. It was attended by 16 participants who had previously taken part in the public dialogue commissioned by the Natural Environment Research Council (NERC) in 2023: *What matters when we think about environmental science?*

The workshop was facilitated by the independent social research agency Hopkins Van Mil (HVM), which designed and ran the 2023 dialogue. It was observed by members of NERC's public engagement team. The purpose of the workshop was for NERC to hear the views of people who had already considered environmental science on the next stage of NERC's plans. The workshop was intended to explore what environmental science is important to participants, now it affects their lives and how they think the wider public can bet involved with environmental science research.

Dr. Liam Haydon, NERC's Head of Strategy & Planning, presented a short summary of the three research and innovation priorities to inform participant discussions on these topics:

- Green Growth
- Environmental Security
- Responsible Innovation.

Participants began their discussions by thinking back to what mattered most to them during the earlier public dialogue, so that they could build on these discussions. For the rest of the workshop participants discussed the research and innovation priorities in turn. They considered key points on the issues raised, on the environmental science, and on how the public should be engaged in the issues and the science.

The key findings from this workshop are summarised in this short report.

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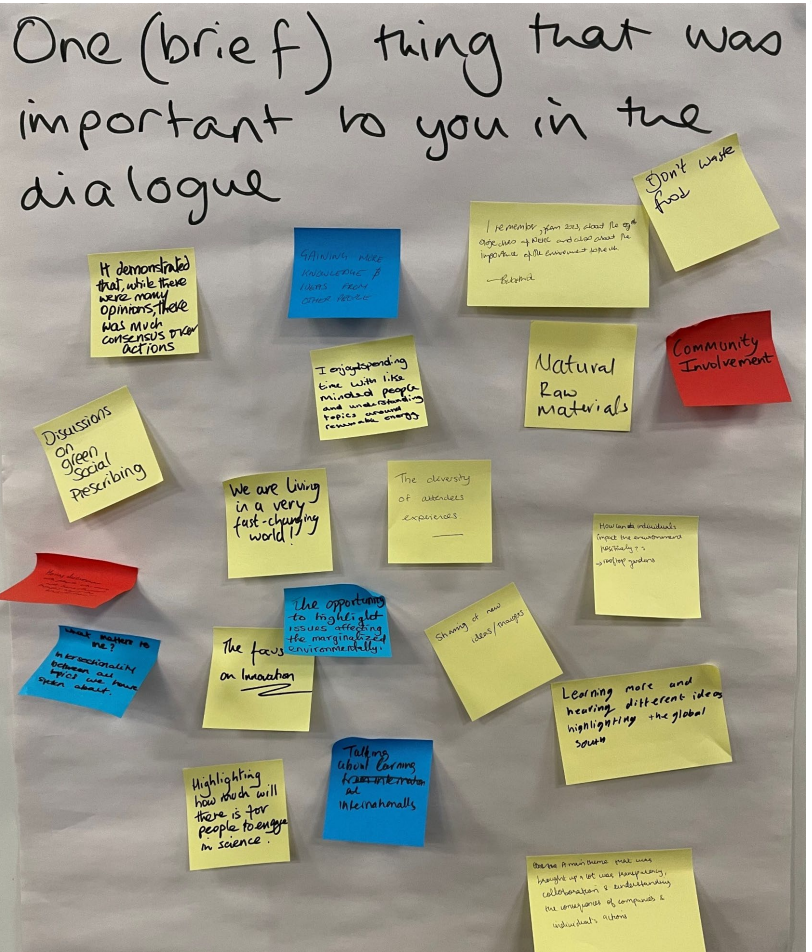


## 2. Building on the 2023 public dialogue

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# Building on the 2023 public dialogue

*I learned such a lot about what NERC does and what it funds, and I've really appreciated that subsequently. I'm keen to continue that involvement.*

When participants reflected on the 2023 public dialogue *What matters when we think about environmental science* the main aspects that they remembered were the powerful opportunity to learn about environmental science, and to discuss this learning with other people with diverse experiences from across the country. They:

- Remembered extensive discussions on diverse topics such as:
  - Social prescribing, mental health and wellbeing
  - The negative impacts of our current food system on the environment
  - The innovations in and value of NERC-funded science.
- Shared how much they valued discussions on all aspects of environmental science.
- Highlighted how much scope there is for people to be engaged in both the science and on the strategic thinking about where science is most needed to respond to significant issues in today's society.
- Reflected on the importance of collaboration so that there is transparency on the impacts of governmental, industrial and individual actions on the environment
- Welcomed the opportunity to highlight issues affected those who environmentally marginalised or vulnerable e.g. from climate change and its impacts.

*I'm thinking about what brilliant people from across the country we had the opportunity to meet. It demonstrated that while there were many opinions, there was much consensus over actions.*

*We are living in a very fast-changing world. It's important for all of us to think about innovation in environmental science and how it's keeping up.*

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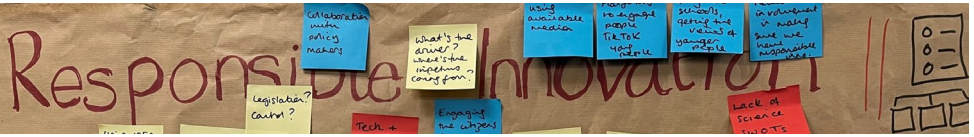


## 3. Forward Look research & innovation priorities

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# Forward Look research and innovation priorities

The Forward Look sets is a ten-year framework which sets out how NERC wishes to guide and shape environmental science and its funding goals.

Within the Forward Look are three broad priorities. These were described to the workshop participants as follows:

## 1. Environmental Security

The impact of a changing climate affects everyone. Many of the challenges we face now and in the future are a direct result of, or exacerbated by, environmental change.

The impacts of a changing climate will increase pressure on food systems, access to clean water and availability of energy. These environmental issues will have broader societal impacts too. Volatile food prices caused by crop failures, health impacts caused by changing climate and population displacement can lead to geopolitical instability.

NERC plays a critical role in predicting environmental change and providing evidence to policy makers.

## 2. Green Growth

Much of the UK and global economy relies on natural assets to support our daily lives such as food, utilities and manufacturing. Natural assets include natural raw materials like forests, fisheries and minerals; air and water and a variety of life (biodiversity).

For the UK to return to the upward trend in economic growth, high productivity and improved living standards it is important that growth in these areas continues in an upward trajectory, and this is best achieved by having a positive effect on nature. We need to restore ecosystems, protect natural resources and reduce waste.

Over the next decade NERC will help businesses to make positive changes to their supply chains, adapting our infrastructure and working towards net zero.

## 3. Responsible Innovation

New technologies are emerging at greater speed and scale than ever before, creating new industries and reshaping the way we live and work. However, advancements in technology and climate change solutions must ensure that further damage is not caused to the environment and they have a positive impact on nature.

As the global climate deteriorates, large scale interventions to avoid the impact of climate change seem appealing, however it is important to minimise potential harms and avoid unintended consequences.

Policy makers, industry and academic researchers need to ensure that any innovations developed to address climate change are responsible, ethical and avoid potential harms.

# A Forward Look for Environmental Science




## 4. Reflections on each priority area

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# Environmental security: key issues

*The one main underlying issue here is climate change, everything links back to that when I think about environmental security.*

When thinking about environment security participants said many key issues are linked to climate change and the urgent need to address it. They felt many issues were rooted in the climate crisis including the impacts it has on people's lives due to, for example, coastal erosion and extreme weather events. Many issues raised relate to this fundamental issue including:

- Globalisation and it's impact on climate, food security, energy and transport infrastructure for example
- Food security and shocks to the food system due to crop failure and conflict
- A dependence on meat and fast food in our diets
- Waste across all aspects of our lives, from food to medicine
- Energy security and an over-reliance on other countries for UK energy supplies
- Poor, and worsening air, water and soil quality

*We discussed the inequalities – some people can afford to practice more pro-environmental behaviours, while others can't. It's very expensive being poor.*

Participants also reflected on issues caused by inequalities globally e.g., the extent to which the countries emitting the least greenhouse gases are most affected by climate change impacts. They also considered inequalities in the UK in terms of access to nature and understanding of the environment and environmental science outcomes, including the data informing governmental decisions on environmental security.

*I've become increasingly conscious of waste, in food for example, but also because I'm a diabetic. You know, test strips, needles, all of the different things that come from managing the condition – but it all adds to plastic waste.*

*We were talking about general lack of awareness of environmental issues. This is an underlying point, if people don't understand or don't have access to the data about the environment and the impact of climate change, they won't know that they have to do things differently, or why this matters.*

*Everything you hear about is how humans are carrying all this trauma, but it's the whole earth, and everything in it that is carrying the trauma, not just humans.*

# Environmental security & the role of environmental science

Given the issues raised when thinking about environmental security, participants reflected on the following roles for environmental science:

- Research to combat greenhouse gas emissions
- Research to show the benefits of low emission zones to health and the climate, addressing the resistance to the ULEZ scheme in London for example
- Using technology and modelling to monitor changes to our environment (negative and positive) to be able to plan environmental security policies based on the evidence for example on air pollution; toxins and sewage in water; plastics in our oceans; and how and why soil is degrading
- Demonstrating the inter-connectedness of all species and environmental health, going beyond the current human-centric approaches to the environment
- For environmental scientists to communicate effectively what they are doing, including through social media, which is more likely to reach the young people who will be most impacted by current environmental insecurities.

*Science needs to be communicated in new ways for the modern age, perhaps focusing on the positive. Humanity is brilliant, we can sort this. I think the media is very full of feat and that creates anxiety and people disconnect. If science can put out positive messages it can light the way.*

# Green Growth: key issues

*You need economic growth for a functioning society, so you can't have green policies that are directly opposed to economic growth or you won't have governmental support and they won't be supported by the public.*

When thinking about green growth participants reflected on the following key issues:

- The alignment of green and economic policies
- Working to ensure that farming develops sustainably, including support for farmers to transition to environmentally positive methods, with a concern that financially sustainable farming could be in conflict with environmentally sustainable methods
- Global travel, including food transport, and it's impacts on climate
- Creating a greener transport infrastructure
- Raw materials being used, e.g. in construction and tech industries, without thought to the environment or sustainability
- Public expectations for all year-round food, whatever the season e.g. strawberries in December
- A lack of knowledge about food and how/ where it is produced which means that people don't think about the environment when they are shopping
- A lack of global commitment to reducing greenhouse gas emissions, and a continued reliance on traditional forms of fuel despite the evidence of its harms
- Investment in sustainable technologies
- Making a business case for addressing biodiversity loss, demonstrating the impact and benefits of improved biodiversity
- Transparency on how large energy companies generate profits
- A lack of access to green space and nature for those living in urban and deprived areas of the country, green growth would address these inequalities.

*We've got out of the habit of seasonal eating. We get food imported from Morocco, Spain, whatever, but if we were eating locally we wouldn't have strawberries in the UK in December, and that would be better for the local economy.*

*We should be thinking about sustainable investments and finance, marrying environmental with economic needs. Having greener financial infrastructure.*

*A lot of what we are seeing in growth has been caused by big energy companies, but it's everyday people that are paying the price in increased energy bills.*

# Green Growth & the role of environmental science

*There is a strong link between environmental and social science, a lot of green growth will depend on behaviour change and to understand that scientists will have to collaborate.*

Given the issues raised when thinking about green growth, participants reflected on the following roles for environmental science:

- To undertake collaborative research projects where environmental scientists and social scientists can work together to explore green growth initiatives
- Research into innovative/ renewable energy and new ways of investing in these rather than in fossil fuels
- Research which focus on how to address social inequalities through green growth initiatives
- Research into initiatives which make urban green spaces more productive e.g. for community gardens and food production
- Continuing to research biodiversity loss, the reasons for it, the impacts of it, to raise political and public awareness to address it
- Learning from green growth initiatives internationally, sharing research knowledge globally
- Making environmental science more visible on political and popular agendas, to inform policy making and raise awareness of the issues
- Research into creating more circular systems of produce, use, recycle with embedded feedback loops so that people who engage with these systems can see the benefit

*Scientists should tell us when we've done something which has a positive benefit on the environment, tell us what it is so that those people who might not see what the point is will understand that it has a point, and it has a value for everyone and the planet.*

*We have lots of developments going on around, we have a lot of construction companies bringing up new settlements. How about having a farm in each settlement. The scientists could look at the benefits. I live in a block of flats, why not use the roofs and the space in the courtyard for a community garden, growing food for the flats.*

# Responsible Innovation: key issues

*Working responsibly means really thinking through what the ethical implications are of doing some of this research.*

When thinking about responsible innovation participants reflected on the following key issues:

- Maximising the potential in terms of engineering and technology in relation to the environment
- Keeping up with fast-moving technologies such as AI - technologically and ethically, ensuring they are working for public benefit
- Companies focused on profit rather than public benefit when they are innovating, establishing the framework for 'responsible innovation' will be important
- Not seeing innovation as an end in itself, responsible innovation should be an underpinning for green growth and environmental security
- Creating and investing in a skilled workforce to take forward this responsible innovation priority
- Ensuring effective risk assessment is done for any innovative technologies to make sure the benefits outweigh any risks
- Global equality in terms of responsible innovation, so that the global south can benefit as much as the north from these developments
- Ensuring we are innovating for a purpose, not just because we can
- Thinking about innovation in all aspects of the food system - from how food is produced to how it is sold, consumed and disposed of – should be a priority in terms of reducing environmental impacts.

*It feels like technology could be a risk, sometimes that risk is worth it, but we need to assess that properly before leaping forward.*

*We should prioritise the food we produce and consume as an area for responsible innovation. How can we innovate without doing harm to the environment?*

*There should have been some sort of modelling about our use of satellites, I assume there wasn't. If there had been we wouldn't have this huge amount of junk in space.*

# Responsible Innovation & the role of environmental science

*We're imagining that this will involve collaboration with industry, but when companies set up they aren't necessarily thinking about environmental sustainability, so that needs to be put at the forefront of any work in this area.*

Given the issues raised when thinking about responsible innovation, participants reflected on the following roles for environmental science:

- To understand the impacts of innovative technologies to ensure they are being used for positive benefit and public good, not for exploitation and profit
- Ensuring the technologies do not have unintended consequences which cause environmental harm
- Working globally with international partners
- Seeing where UK funded research can have the most significant impacts for global issues
- Developing apps and other tools that can monitor $CO^2$ emissions, water or air pollution, biodiversity loss and other environmental harms
- Bringing innovation into food production, and the whole food system, so that it causes less harm to the environment
- The potential for geoengineering to improve the environment
- Using modelling to test innovation to understand the potential implications before any real-world implementation.

*In a field like this, in environmental science, it's important that you do have international partners, learn global lessons and appreciate the wealth of knowledge that is global.*

Some also suggested that NERC could create and fund an award for responsible innovation, for companies and scientists who work within clear climate goals and with environmental sustainability at the forefront of what they do.

*If we're going to use large-scale geoengineering is there a way we could actually improve our planet's environment rather than just making sure it doesn't get any worse?*

*The impact UK funded research could have is super important. Because climate change is a global problem, and there is a heavy disparity in where the consequences are.*

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## 5. Public engagement

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# Public engagement

*Making research more accessible and more localised. Engaging local communities better into the research, because quite often the ideas are really at that level rather than the national level.*

There was consensus amongst participants that people across the UK should be engaged with and be more aware of environmental science. They said:

- It is important to create opportunities for citizens' science across the priority areas including for example in water, air and soil quality monitoring
- Awareness raising is important in all areas of environmental science so that people understand what is possible through the science, and the benefits/ positive outcomes from the research
- Such awareness raising would help people to see the route from research to policy, gaining more public support for the former
- Using social media and digital tools to share information on the science, and data from the science, with public audiences more systematically across NERC funded programmes
- Engage young people in all the aspects of working as an environmental scientist – encouraging the next generation of problem solvers to become researchers
- Conduct more programmes where people from across society can come together to talk about the issues and provide their insights on what matters and where funding should be targeted – this could be integrated into all programmes as a requirement of funding.

*If there was more engaging comms about what environmental scientists were doing – or at least better communication of where to find what's there, that would inspire and engage people.*

*Getting people involved, what are they noticing around them, what they are seeing in the air, the biodiversity. It's people like us who are realising there are fewer bees than there used to be.*

*We've been talking today about all sorts of environmental science and research, but how do we know they haven't already been working on these things for years? We need to be aware of what's going on in order to comment on it properly.*

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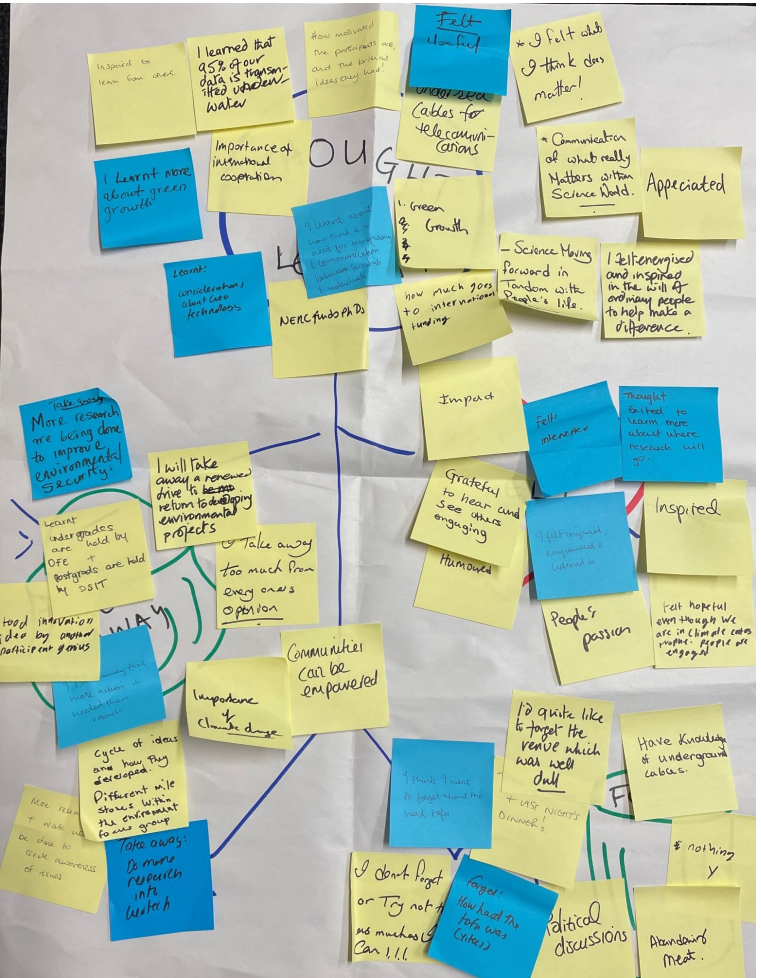


## 6. Participant reflections

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# Summary of participant final reflections

The 16 participants in the dialogue agreed that coming together to discuss the Forward Look priorities was an important activity, demonstrating NERC's commitment to public engagement in the development of its framework strategy. They highlighted the:

- Fact that for them climate change remains the biggest and most critical issue that affects every part of our planet
- Significance of the three priority areas they had discussed and the interconnections between them
- Importance of international collaboration on environmental science
- Value in evidence-based policy making, informed by robust research across a broad portfolio of environmental science which works in inter-disciplinary ways to achieve the greatest public benefit
- Need for NERC to continue to raise awareness of environmental science, the work that scientists do and its value for policy and decision making
- Desire for NERC to continue to take seriously it's commitment to public engagement through ongoing dialogue, awareness raising and effective communications
- Priority participants place on being involved in discussions on environmental science and its strategic direction, it gave them hope and showed that their views matter.

*I feel hopeful. Even though we are in a climate catastrophe people are, and wish to continue to be, engaged.*

*I feel energised and inspired in the will of ordinary people to make a difference. This has shown me again that what I think really does matter.*

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