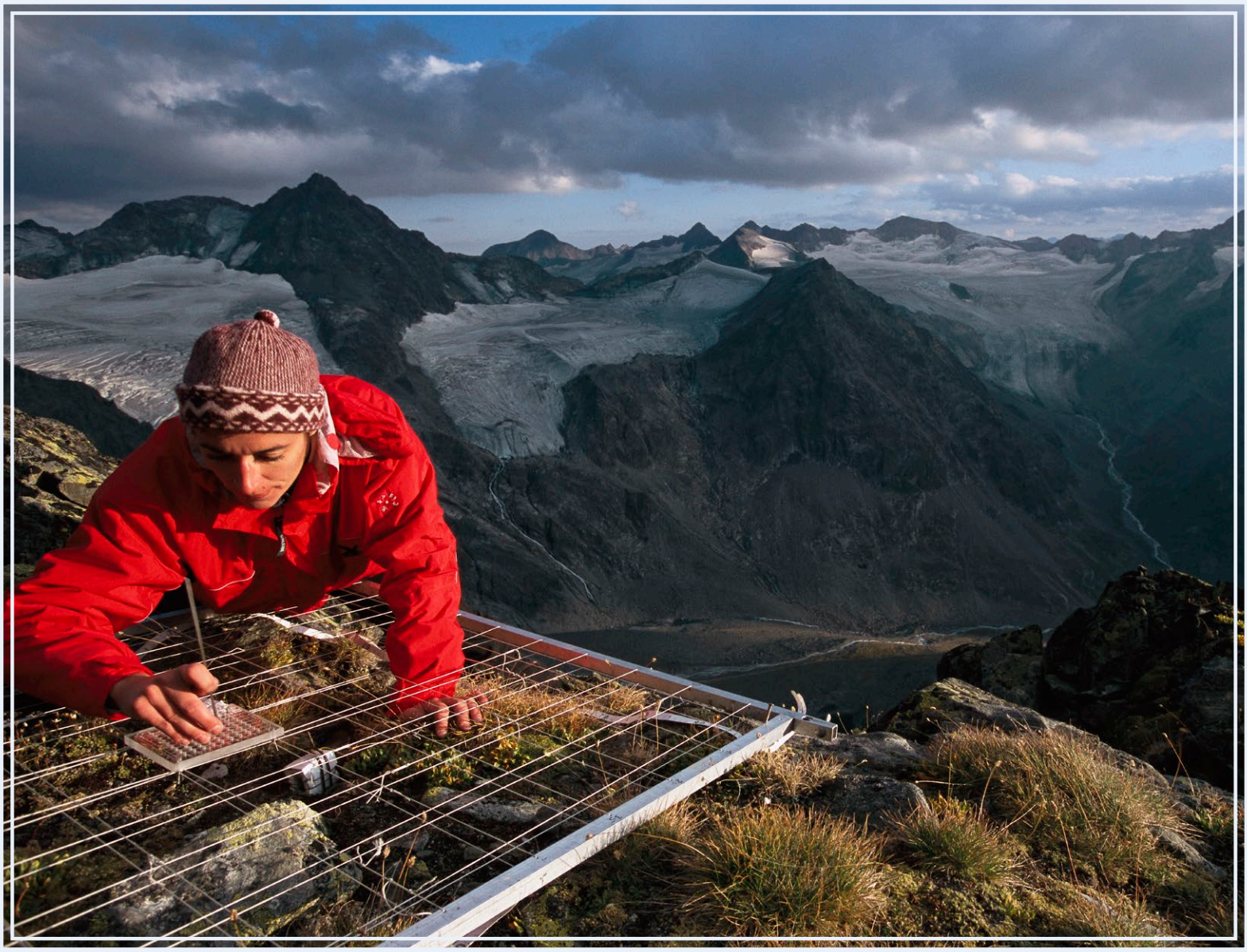
Principles for effective communication and public engagement on climate change

A Handbook for IPCC authors



CLIMATE outreach

The Working Group I Technical Support Unit of the Intergovernmental Panel on Climate Change (IPCC) commissioned Climate Outreach to produce an evidence-based, practical communications handbook tailored for IPCC authors. This publication has not gone through an official IPCC approval process and is not formally endorsed by the IPCC.

Climate Outreach

Climate Outreach is one of Europe's leading specialists in climate change communication, bridging the gap between research and practice. We produce world-leading advice and practical tools for engagement by combining scientific research methods with years of hands-on experience. We have over 13 years of experience helping organisations communicate about climate change in ways that resonate with the values, sense of identity and worldview of their audiences. We work with a wide range of partners including central, regional and local governments, international bodies, charities, business, faith organisations and youth groups.

www.climateoutreach.org info@climateoutreach.org @ClimateOutreach

Working Group I TSU, Intergovernmental Panel on Climate Change

Reflecting a significant recent investment in communications capacity within the IPCC as a whole, the Working Group I Technical Support Unit is pleased to have commissioned this first-of-a-kind resource for IPCC authors and staff. With a wealth of research on the 'science of climate change communication', the intention behind this Handbook was to distil only the most essential principles for effective communication and engagement. With a focus on practical tips and tailored specifically to IPCC scientists, we hope this Handbook serves as a valuable resource for IPCC authors, as well as the wider scientific community, to engage audiences with climate change.

Commissioned by the IPCC Working Group I Technical Support Unit

Project team

Lead Authors

Dr Adam Corner, Research Director, Climate Outreach
Dr Chris Shaw, Senior Researcher, Climate Outreach

Contributing Author

Jamie Clarke, Executive Director, Climate Outreach

Editing & Production

Léane de Laigue, Head of Communications, Climate Outreach
Anna Stone, Project Manager, Climate Outreach
Elise de Laigue, Designer, Explore Communications - www.explorecommunications.ca

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Dr Jan Fuglestvedt - Research Director, CICERO Center for International Climate Research and Vice chair of IPCC WGI
Susan Hassol - Director, Climate Communication
Jonathan Lynn - Head of Communications and Media Relations, IPCC
Dr Valérie Masson Delmotte - Co-chair of IPCC WGI
Maike Nicolai - Communications Officer, IPCC WGII Technical Support Unit
Tim Nuthall - International Communications Director, European Climate Foundation
Prof Nick Pidgeon - Prof of Environmental Psychology & Director of the Understanding Risk Research Group, Cardiff Uni
Dr Anna Pirani - Head of IPCC WGI Technical Support Unit
Dr Elspeth Spence - Research Associate, Cardiff University

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FOREWORD

Why a Communications Handbook for IPCC authors?

Dr Roz Pidcock
Head of Communication
IPCC WG1

As several decades of awareness-raising and initiatives to engage the public have shown, climate change doesn't communicate itself.

A burgeoning evidence base on the social science of climate change communication now provides many explanations for why engaging on climate change can be challenging. Climate science is filled with uncertainties, a notorious stumbling block for communicating with non-scientists. For some, the topic can seem abstract and intangible. For others, the abstract statistics that define the climate discourse can feel distant from their day-to-day experiences. In some nations, the issue is politically polarised; in others, the absence of a public and political discourse is the problem.

But the same social science literature that documents the challenges posed by engaging the public with climate change also provides some robust guidance for how to communicate more effectively. That our worldviews, values and social norms dictate how we receive information and apply it to our own lives is well understood. It has also long been recognised that the messenger is at least as important, if not more so, than the message itself. Scientists are trusted in society and there are a wealth of opportunities to engage the public around key moments in the climate change calendar, such as the release of IPCC reports. The purpose of this Handbook is to offer guidance to IPCC scientists on how to make public engagement at these key moments as impactful, effective and evidence-based as possible.

By synthesising evidence and recommendations from primary social science research, and existing communication 'guides' and resources, this Handbook sets out a series of principles for effective communication and public engagement, tailored specifically for IPCC authors.

The work builds on the substantial body of knowledge and experience in climate science communication, particularly in the UK and other English-speaking countries – but the insights it contains are relevant for engaging communities in all regions of the world.

What those social science insights tell us is that it is possible to communicate climate science in a way that makes that message easier for non-scientific audiences to understand, and makes it more relevant to their lives and experiences. Connecting with your audience on the basis of shared values builds trust between the communicator and the audience. There may be no 'magic words' that will resonate universally, but there are better and worse ways to start a conversation about climate change; more and less effective ways to use language and narratives. There is guidance available on talking about the link between weather and climate, and the uncertainty inherent in climate science. And even in largely 'untested waters' in terms of public engagement - such as talking about negative emissions technologies - there are some basic principles to keep in mind that will help ensure conversations are constructive.

This Handbook is fully referenced but with a strong focus on practical guidance for real public engagement scenarios (e.g. preparing a presentation for a public meeting, or thinking about material for a discussion with a local community group). Like the Summary for Policymakers (SPM) produced from the longer IPCC Assessment Reports, the aim of this Handbook is to distill the most relevant and useful information.

This is the first time the IPCC has produced a guidance document of this kind specifically for authors. I hope this Handbook will be a tool for IPCC scientists to feel confident in going about public engagement in the best possible way, based on the best possible evidence.

Dr Roz Pidcock

EXECUTIVE SUMMARY

6 principles for IPCC authors to use in public engagement

This Handbook provides a resource for IPCC scientists in their public engagement and communication activities. It captures key research findings from the social science literature and relates them to practical examples and situations a communicator might face.

Here's what you need to know about each of the six principles:

1. Be a confident communicator

Scientists are generally highly trusted. By using an authentic voice, you can communicate effectively with any audience.

2. Talk about the real world, not abstract ideas

Although they define the science and policy discourse, the 'big numbers' of climate change (global average temperature targets and concentrations of atmospheric carbon dioxide) don't relate to people's day-to-day experiences. Start your climate conversation on common ground, using clear language and examples your audience is more likely to be familiar with.

3. Connect with what matters to your audience

Research consistently shows that people's values and political views have a bigger influence on their attitudes about climate change than their level of scientific knowledge. Connecting with widely-shared public values, or points of 'local interest' in your communication and engagement makes it more likely that your science will be heard.

4. Tell a human story

Most people understand the world through anecdotes and stories, rather than statistics and graphs, so aiming for a narrative structure and showing the human face behind the science when presenting information will help you tell a compelling story.

5. Lead with what you know

Uncertainty is a feature of climate science that shouldn't be ignored or sidelined, but can become a major stumbling block in conversations with non-scientists. Focus on the 'knowns' before the 'unknowns' and emphasise where there are areas of strong scientific agreement around a topic.

6. Use the most effective visual communication

Choosing images and graphs is just as important to do in an evidence-based way as verbal and written communication. The Climate Visuals project, plus new guidance from the Tyndall Centre, offer a useful set of tools for how to communicate effectively in the visual medium.

PRINCIPLE 1

Be a confident communicator

What you need to know

Scientists are generally highly-trusted. By using an authentic voice, you can communicate effectively with any audience.

Scientists are generally well-trusted by wider society.[1,2] There are certainly some exceptions to the rule, but even among a challenging audience it is possible to build trust by communicating confidently and authentically. As an IPCC author, your scientific expertise and command of your subject gives you credibility, but trust is also driven by the extent to which a communicator speaks authentically, drawing on their own experiences and perspective.[3,4]

IPCC authors all have different specialities and areas of expertise, but public audiences will typically not confine their questions and comments to one specific area. Instead, communicators are increasingly called upon to speak across the vast array of topics that collectively comprise the content of an IPCC report. This is likely to mean talking about how the climate is changing, impacts on human and natural systems, and options for limiting climate change.

There is no one 'correct' role for a scientist to take when communicating about their research, or the wider field. What one scientist may consider 'advocacy', another might view as simply communicating the implications of their findings. The late Stephen Schneider believed it was possible to be effective in communicating climate change to a non-specialist and retain credibility as a scientist, but that navigating this 'double ethical bind' came down to personal choice.[5]

Where your expertise allows you to give an informed perspective and you are comfortable doing so, it will often be better than letting another less-qualified voice fill the void. In general, being clear about whether you are speaking in a personal or professional capacity will help your audience interpret the information you give them.

As an IPCC scientist, it is also important to distinguish between when you are speaking in an official IPCC capacity and when you are speaking as an expert in your own right. Just as IPCC reports are scientifically balanced and policy-neutral, refraining from communicating personal views on climate policy or expressing views beyond the scope of the IPCC reports when speaking as an IPCC scientist is important for maintaining the trust and confidence placed in the IPCC by its audiences. But as long as you are clear with your audience about the capacity in which you are speaking, there's no reason being an IPCC author should restrict you from engaging a wider audience with your work and with climate change more broadly.

Marine biologists examining corals on the Great Barrier Reef in Australia. Photo: Fredrik Naumann

FROM THEORY TO PRACTICE

Being aware of public opinion

Research suggests there is widespread concern about climate change and support for climate policy in both the US and Europe. For example, a recent survey found public support for renewables – such as solar, onshore and offshore wind and hydroelectric power – exceeded 70% in France, Germany, Norway and the UK. In general, most people in most countries surveyed accept that climate change is a reality and is at least in part caused by humans, and are concerned about it to some extent. So there is no need to worry unduly about widespread scepticism towards climate change.[6,7,8]

However, on other policy options there is less agreement. In the same survey, 40% of respondents in the UK had positive views on nuclear power, whereas only 14–23% did in Germany, Norway and France. Hydraulic fracturing was perceived positively by 7% of respondents in Norway, 8% in France, 16% in Germany and 19% in the UK.

Emerging research suggests that people are likely to hold very different opinions about the cluster of technologies falling under the banner of Negative Emissions Technologies (NETs). These opinions range from largely positive (e.g. reforestation, weathering) to cautious or negative (e.g. ambient C02 capture).[9,10,11] NETs are increasingly part of the scientific and policy discourse – especially around ambitious mitigation goals, such as limiting warming to well below 2°C – but they are not yet part of the social consensus. Being aware of these dynamics in public opinion can help ensure that communicating as a scientist can be done in a way that is sensitive to public opinion.

PRINCIPLE 2

Talk about the real world, not abstract ideas

What you need to know

Although they define the science and policy discourse, the 'big numbers' of climate change (global average temperature targets and concentrations of atmospheric carbon dioxide) don't relate to people's day-to-day experiences. Start your climate conversation on common ground, using clear language and examples your audience is more likely to be familiar with.

Although they are the 'go-to' metrics for discussing climate change, global temperature targets or atmospheric concentrations of greenhouse gases are unlikely to be understood or seen as personally relevant by a majority of the public.[12,13,14] A focus on abstract, global metrics such as temperature may also provoke an unintended reaction - for some parts of the world two degrees of warming is welcomed, if it means winters will be less cold.[15]

One challenge presented by the use of global scale numbers or long term trends is that it can reinforce perceptions that the problem is an abstract technical issue that has little to do with people's everyday lives. This makes it easier for audiences to engage in what's known as 'psychological distancing', dismissing climate change as a problem that only matters at some distant point in the future for people who live far away.[16,17]

To counter this, it is important to use language that positions your science in a way that is relatable for your audience (known as 'framing'). All information is 'framed' in some way - framing simply means using language to convey an idea in a particular way, or in a certain light.[18] For example, the growing use of solar panels could be framed *economically* (in terms of the rapidly reducing price of producing solar energy) or *environmentally* (in terms of reduced carbon emissions). In both cases, attention is drawn to a particular aspect of the issue, and a considerable research effort has been dedicated to documenting the effects of different frames on public engagement with energy and climate change.[19]

FROM THEORY TO PRACTICE

Examples of frames and the audiences they are helpful for engaging

Avoiding wastefulness. The frame of avoiding wastefulness has positive connotations for all audiences and resonates particularly strongly with conservative audiences. This is a powerful frame for energy efficiency narratives.[20]

Health benefits. Research from the US shows that emphasising the health benefits of cleaner air, less traffic on the road and increased levels of cycling and walking met with a positive response across a broad cross-section of the public.[21]

Balance. Balance is a frame that speaks to the core values of centre-right audiences. Balance in this context means avoiding overly grand or ambitious claims and taking a common sense middle of the road approach.[22] For both centre-right and faith audiences, balance is also a frame that can be used metaphorically, for climate change as a symptom of the natural world being 'out of balance'.[23,24]

Bicycle rush hour in Copenhagen, Denmark. Photo: Mikael Colville-Andersen/Copenhagenize Design Co./Copenhagen

Metaphors and analogies are a type of framing, and offer a way of seeing the unfamiliar in familiar terms by carrying over knowledge from one domain of experience to another.[25] Metaphors and analogies are especially relevant to how we make sense of largely abstract, complex problems like climate change[26] by describing the unfamiliar in more familiar objects and language.[27] They can act as mental shortcuts for people to evaluate complex information,[28,29] and make climate science messages more inclusive and relevant to a broader spectrum of the public.[30,31] They can potentially circumvent the polarisation that characterises responses to the presentation of facts and statistics.[32]

FROM THEORY TO PRACTICE

Using metaphors and analogies to communicate climate science

Scientists have been using the metaphor of 'loaded dice' to illustrate that whilst it is still difficult to predict when and where extreme weather events will happen, and though we cannot say an extreme weather event is *caused* by climate change, we do know climate change is loading the weather dice, making some types of extreme weather events more likely.[33] Be careful not to suggest with the 'loaded dice' metaphor that scientists are 'fixing' their findings to show a certain result (as this isn't the case – but a gambling metaphor could unintentionally suggest this).[34]

The metaphor of greenhouse gases acting as a 'heat trapping blanket' has tested to be an effective metaphor for communicating the basic principle of the greenhouse effect.[35] More greenhouse gas emissions from burning fossil fuels make the blanket thicker, raising the temperature of the planet.

The idea of the atmosphere as a 'bathtub' filling up with carbon dioxide and other greenhouse gases has also been shown to increase comprehension and support for stronger policy action on climate change.[36] The idea to get across here is that even if we 'turn off the tap', existing carbon dioxide emissions will stick around (the bath won't suddenly become empty). This could be one way of introducing the idea of Negative Emission Technologies, which would seek to reduce the level of water in the bath.

PRINCIPLE 3

Connect with what matters to your audience

What you need to know

Research consistently shows that people's values and political views have a bigger influence on their attitudes about climate change than their level of scientific knowledge. Connecting with widely-shared public values or points of 'local interest' in your communication and engagement makes it more likely that your science will be heard.

There is now a large body of evidence demonstrating that public opinion about scientific subjects such as climate change is not linked to levels of subject-specific knowledge or general scientific literacy in a straightforward way.[37,38,39] This doesn't mean that accurate, clearly delivered factual content should not be at the heart of any scientific communication, or that the facts are somehow not 'relevant' for effective communication. But if accurate facts are necessary for good science communication, they are (for better or worse) not *sufficient* for effective public engagement. Achieving this requires connecting with the values of your audience.

People's values (that is, guiding principles in their lives such as 'security' or 'equality'[40]) and their political ideology (i.e. progressive vs conservative; left vs right) are much more fundamental in shaping views about climate change than any other issue.[41,42,43] In practice, what this means is that people 'filter' the information they receive – on climate change and other topics – according to whether it fits their values.

Notoriously, this has produced political polarisation on climate change in some English-speaking nations. For example, research suggests those on the right of the political spectrum may reject the conclusions of climate scientists (e.g. that a rapid drop in emissions is required to prevent dangerous climate change) because the conclusions are perceived as threatening their values (e.g. that tackling climate change may require federal and/or state regulation).[44]

The facts and figures of a scientific message should be grounded on a platform of shared values wherever possible: in short, try to find common ground with your audience.

FROM THEORY TO PRACTICE

Key values that underpin perceptions of energy system change in the UK

In an analysis of public perceptions of the changing energy system in the UK,[45] researchers at Cardiff University identified the following values that underpinned people's views about a range of energy technologies, as well as 'demand side' changes to household energy use:

- Reducing waste and increasing efficiency
- Environmental protection, the importance of 'naturalness'
- Secure, stable and affordable energy
- Maintenance of people's autonomy, choice and freedom
- A just and fair system which embodies principles of honesty and transparency

Although this is a case study that applies to one country in particular (the UK – a lot of climate change communication research focuses on UK and US audiences), it provides a useful starting point for conversations about tackling climate change.

A woman installs insulation in her home. Photo: Nick Nguyen

As well as engaging with people's values, connecting with local points of interest is important. This means knowing something about the kinds of things the audience are likely to be interested in (so you can start the conversation on terms they are familiar with) and using this as a platform to introduce facts, figures and statistics (rather than leading with the science, then explaining why this is relevant to people's lives).

With limited time and resources, the extent to which any communicator can truly know an audience has limitations. But if for example you're planning a talk, taking a small amount of time to reflect on the obvious demographics of the area, the typical attendees for the location you're speaking in, or (as the section below emphasises) liaising with a local partner to connect what you're saying with local concerns will pay dividends. For example, if speaking to amateur gardeners, talk about changes to the growing season that they will inevitably have noticed. This provides a bridge into discussion of national and international policies designed to limit the impact on the things that people love.

FROM THEORY TO PRACTICE

Build a point of connection with your audience

1. Research the place where you are speaking. Find a fact or story about the place that relates to you, which you can share with the audience.
2. Partnering with a local group or organisation is a powerful means of connecting with your audience. Find out about the audience from a representative of the group and start your presentation or event on terms they are familiar with. (Note that if you are speaking in an IPCC capacity, you should avoid the perception that you are advocating any particular policy – so do your research first.)
3. Professional organisations, such as a farmer's union, will offer the opportunity to speak to shared experiences of weather and the seasons. Groups organised along the basis of hobbies (e.g a sports club) or faith groups also mean you can quite easily speak to a theme that the audience will have in common.

What does your audience care about that is affected by climate change?[46]

Ask your audience what they love, or care about, that is affected by climate change.

Share with your audience one thing you care and are passionate about – something that many people can identify with – and the risk climate change poses to that.

Research a few climate projections around broad themes, for example; food, landscape, leisure activities, or biodiversity, which can be used in conversation with your audience about how climate change affects the things they love.

PRINCIPLE 4

Tell a human story

What you need to know

Most people understand the world through anecdotes and stories, rather than statistics and graphs, so aiming for a narrative structure and showing the human face behind the science when presenting information will help you tell a compelling story.

The IPCC is an incredible, in many ways unprecedented undertaking. But it has historically been perceived as a dry, bureaucratic and even unapproachable organisation, and this is in part due to the absence of 'human faces' behind the science. Who are the IPCC scientists? What are their stories? What is involved in an IPCC process, at a human level? Science communicators understandably seek to keep their language balanced and unemotional when describing research findings and summarising data.[47] But the personal stories of scientists – who they are, why they do the work they do, what inspires and motivates them, what they care about and are fearful of – are an incredibly valuable resource.[48]

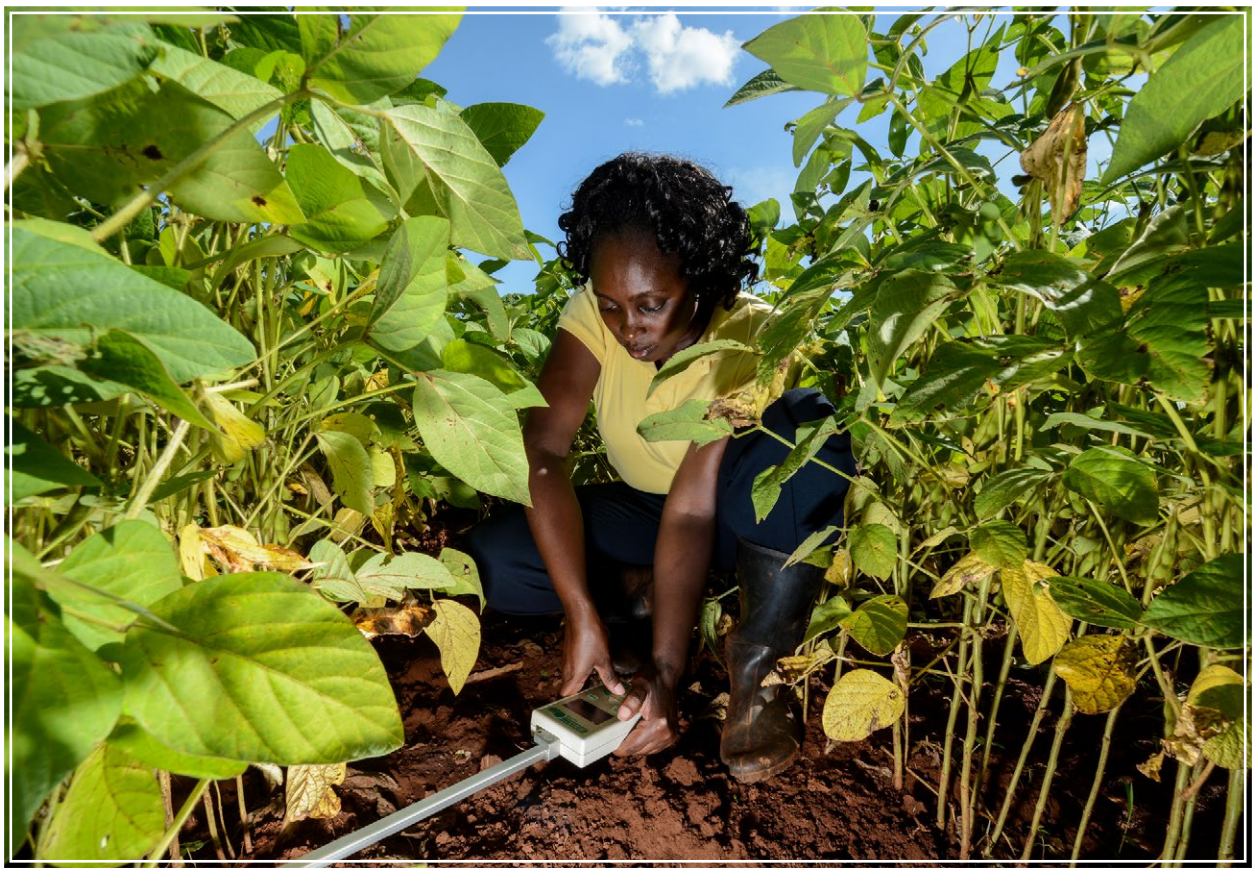
FROM THEORY TO PRACTICE

Showing the human face behind the science

Sharing with your audience something about yourself outside your work as a scientist provides a powerful point of connection.

The 'More than Scientists' project run by the University of Colorado's 'Inside the Greenhouse' project has a number of short (2–4 minute) videos made by climate scientists talking about the relationship between their professional and personal lives.[49] The videos provide several examples of how scientists can connect the science with common human experiences.

In two short videos (Climate Change Evangelist and How to talk about climate change) Katharine Hayhoe talks about how her evangelical faith has informed her work both as a climate scientist and as a communicator of climate science.[50,51]



Testing soil health in Kenya. Photo: Georgina Smith/CIAT

Stories – that is presenting information in a narrative format – offer a way of building more sustainable and meaningful engagement with science because people are more used to communicating information through stories than graphs and numbers.[52] The concept of using the narrative form for communication has become increasingly common among science communicators.[53] Not only does the use of narratives help public audiences understand complex and abstract science issues,[54] but it also makes the science easier to remember and to process relative to traditional forms of scientific communication (such as lists of facts or the use of graphs and figures).[55] Communicating science in a narrative form is more effective when those narratives use language that reflects the concerns of the audience.

For the purposes of climate change communication, using a narrative form means describing the problem, laying out its consequences and talking about solutions.[56] Including this final element (talking about solutions) is crucial, because research shows that without a clear indication of how people can respond to the risks of climate change, it can feel overwhelming.[57] To involve the audience in your story, the structure has to flow in a way that is familiar to your audience. A simple but effective way to achieve that is to use the ABT (And, But, Therefore) template, which brings 'conflict' and 'resolution' (two key elements of story structure) into your story.[58] The box on the following page demonstrates how the ABT template works.

FROM THEORY TO PRACTICE

Using the And, But, Therefore (or ABT)* template developed by Randy Olson to turn your message into a story

The '**And**' part of the story is the exposition, the '**But**' part brings in the conflict, and '**Therefore**' provides the resolution. Below is an example from Chris Shaw, one of the authors of this Handbook, of a personal story using the ABT* approach.

As a parent of two boys I have always enjoyed being able to share with them the experiences and activities that I enjoyed as a child, and seeing the joy on their faces on running into the sea on a warm summer's day, or throwing snowballs in the winter.

And *I get great solace knowing that we were part of an unbroken chain connecting past and future generations.*

But *as I have brought them up I have seen the changing seasons become disrupted and I experienced that as a very deep and profound challenge to my own sense of wellbeing and my sense of what it meant to be a good father.*

Therefore *I made the decision quite late in life to learn what I could about what was happening and what I could do about it, so I returned to university, studied the social science of climate change and now here I am standing in front of you.*

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* Olson, R. (2015). Houston, We Have A Narrative: Why Science Needs Story. Chicago: University of Chicago Press

PRINCIPLE 5

Lead with what you know

What you need to know

Uncertainty is a feature of climate science that shouldn't be ignored or sidelined, but can become a major stumbling block in conversations with non-scientists. Focus on the 'knowns' before the 'unknowns' and emphasise where there are areas of strong scientific agreement around a topic.

General levels of scientific literacy amongst the public are quite low, and it has historically proved difficult to communicate uncertainty in IPCC reports.[59] Most adults' experience of science is from school, and as a result many are likely to view science in a binary way – as a series of facts and figures, rather than as a method of understanding the world (filled with uncertainties).[60] For the purposes of public engagement (e.g. a town hall meeting) the focus should be on a narrative approach (see above) rather than a detailed quantitative analysis of uncertainty.

One simple approach to help ensure that uncertainty doesn't derail a compelling narrative is to focus on what is known (even if that is 'old news') before discussing uncertainties. Because of the nature of scientific inquiry (where a premium is placed on exploring new areas rather than repeating established statements of fact), there tends to be a focus in much science communication on what scientists *don't* know before emphasising points of agreement.[61] But this can give the impression that there is a lack of agreement amongst scientists on the basic facts of an issue.[62] It is often the case that uncertainty in science is misinterpreted by the public as ignorance and it is well established that in many countries around the world, members of the public dramatically overestimate the uncertainty associated with climate change science and underestimate the level of scientific consensus.[63]

FROM THEORY TO PRACTICE

Leading with a focus on what is known

Don't **Lead with the unknown**

"Although there is a great deal that is unknown about how local services in (town where you are speaking) will be affected, climate change is likely to lead to heavier downpours and more flooding in the future."

Do **Lead with what is known**

"The risk of heavier downpours and more flooding in (town where you are speaking), disrupting your businesses and schools, is now higher because of climate change."

One simple way to make the point that there is a great deal that is agreed on by mainstream scientists is to make reference to the level of consensus on the basic fact that humans are responsible for climate change. A recent meta-analysis[64] of dozens of academic studies analysed the factors that predict belief in the reality and seriousness of climate change. The authors argued that judgements of the scientific consensus played a major role, leading some to dub acceptance of the scientific consensus as a 'gateway belief' on which other climate-related opinions are predicated.[65] With the important caveat that simply stating the level of consensus among scientists on climate change will not overcome deep-rooted divides that stem from differences in values and political beliefs,[66,67] incorporating the consensus on climate change into your story about the science can be a useful communication tool.

The link between weather and climate is a key example for applying effective communication around uncertainty. Extreme weather events can provide tangible evidence of climate change and offer an opportunity to discuss climate risks, but discussion of extreme weather needs to be handled with care: despite being confronted with the 'evidence of their own eyes', the same political polarisation that afflicts other areas of climate communication can apply to extreme weather events.[68,69]

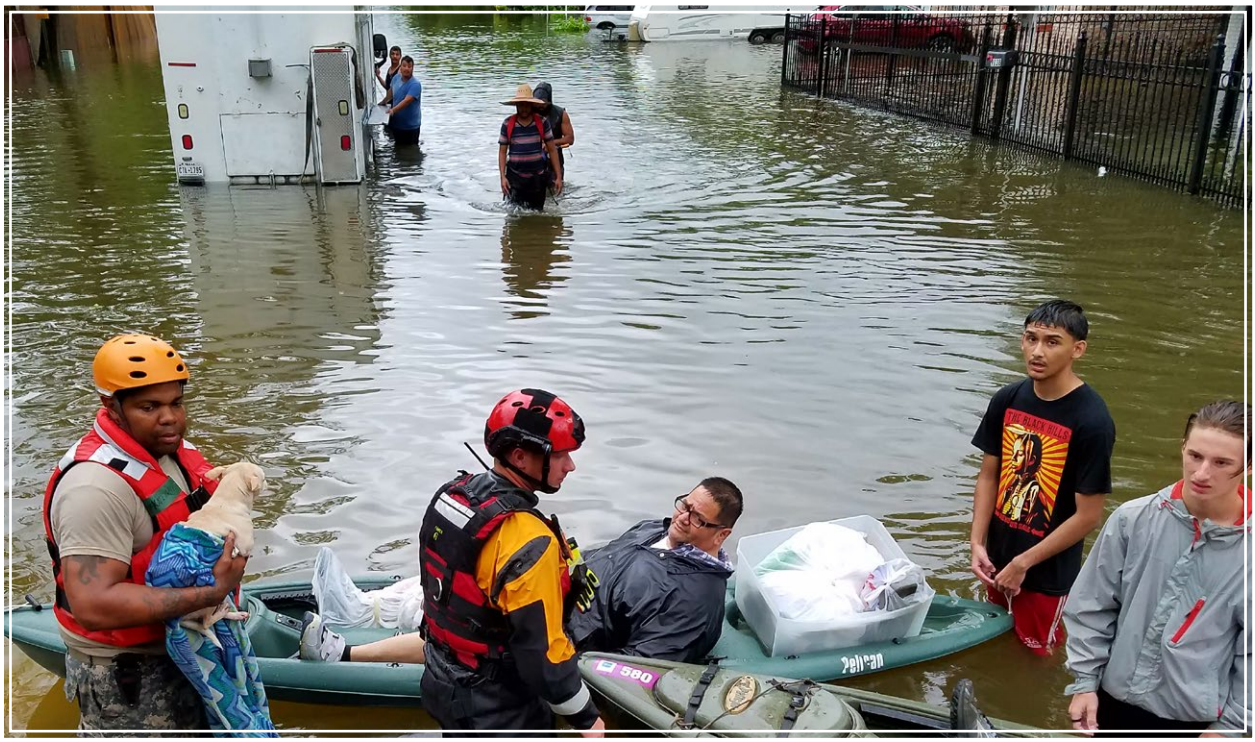
This does not mean climate communicators should avoid talking about extreme weather events. They provide an opportunity to discuss the future risks and impacts of climate change. The question is, how to do it effectively and navigate this difficult and emotionally charged space. There is the added complication that not all extreme weather is affected by climate change in the same way, so answers tend to be far more complicated than the questions. But by taking a careful and considered approach, sticking to the science and avoiding overly technical language, talking about the known links with extreme weather can be an extremely powerful way to relate climate change to our everyday lives.

FROM THEORY TO PRACTICE

Talking about extreme weather events

Following the 2013/14 floods in the UK, Climate Outreach led a workshop with communication specialists to identify consensus on best practice in communicating flood risks in a changing climate. The points agreed included:

- Climate scientists are increasingly able to quantify the link between some extreme weather events and climate change. Communicating the growing confidence in 'attribution' is important (rather than starting from the position that 'no single weather event is caused by climate change', which used to be the standard response).
- Public audiences around the world increasingly understand the links between extreme weather and climate change – a recent survey of four European nations found a variety of impacts including storms and floods were viewed as signs of climate change,[70] and there is a similar picture in many US states affected by drought.[71]
- Where the science allows, talking about the link between weather and climate is crucial, though ideally before (rather than during or after) an extreme weather event occurs. This helps to normalise the idea and prevent communicators appearing opportunistic.
- Experience of extreme weather does not override the cultural and ideological filters through which people interpret the world – it remains important to understand the values of your audience and frame any discussion of extreme weather events using language that speaks to those values.[72,73,74,75]



Texas National Guard soldiers help victims of Hurricane Harvey in the US. Photo: Staff Sgt. Tim Pruitt

PRINCIPLE 6

Use the most effective visual communication

What you need to know

Choosing images and graphs is just as important to do in an evidence-based way as verbal and written communication. The Climate Visuals project, plus new guidance from the Tyndall Centre, offer a useful set of tools for how to communicate effectively in the visual medium.

Photographic images

In exactly the same way that the language you use has a powerful impact on how people conceptualise climate change, the 'visual language' of climate change is also extremely important. A narrow visual vocabulary currently frames climate change in the public mind: polar bears, melting ice-caps, smokestacks and potentially polarising images of environmental protesters. This can undermine the effectiveness of outreach activities by failing to engage audiences, and can detract from the reach and value of efforts to engage with the public and communicate the importance of climate change.

The Climate Visuals project[76,77] conducted research in three countries (the UK, Germany and the US) with members of the public, producing a set of principles for more effective communication, as well as an evidence-based image library based on these principles.

FROM THEORY TO PRACTICE

Using the Climate Visuals* principles and photo library to select effective climate imagery

Here are five principles from the Climate Visuals project most relevant for IPCC authors' public engagement initiatives:

1. **Show 'real people' not staged photo-ops**: A person expressing an identifiable emotion is powerful, but use 'authentic' images, not staged photographs, which can be seen as gimmicky or manipulative.
2. **Tell new stories**: Familiar, 'classic' images – polar bears, smoke stacks, deforestation – can prompt cynicism and fatigue. Less familiar (and more thought-provoking) images can help tell a new story about climate change.
3. **Climate impacts are emotionally powerful**: Images of climate change impacts can be overwhelming. Coupling images of climate impacts with a concrete behavioural 'action' for people to take can help overcome this.
4. **Show local climate impacts**: When images of localised climate impacts show an individual person or group of people, with identifiable emotions, they are likely to be most powerful.
5. **Understand your audience**: Images depicting 'solutions' to climate change generated mostly positive emotions – for those on the political right, as well as those on the left.

This example shows how you might use the Climate Visuals principles and photo library to select an evidence-based image for climate change communication:

Topic: The role of international meetings between scientists, policy makers and civil society in driving forward international climate change agreements.

Image normally used: Typically news reports and other coverage will show world leaders and (anonymous) representatives of global institutions sat in a row as part of a panel negotiating various points of the agreement.

Problem: Such images are familiar, do not show people and activities relevant to everyday life and, lacking any discernible emotion are unlikely to evoke a strong reaction in your audience. This is a missed opportunity for deepening engagement with your topic.

Solution: Visit the New Stories Climate Visuals gallery[78] to choose evidence-based images which show real people in real situations taking action which responds to the findings and recommendations emerging from those international processes – for example, the two images on the next page.

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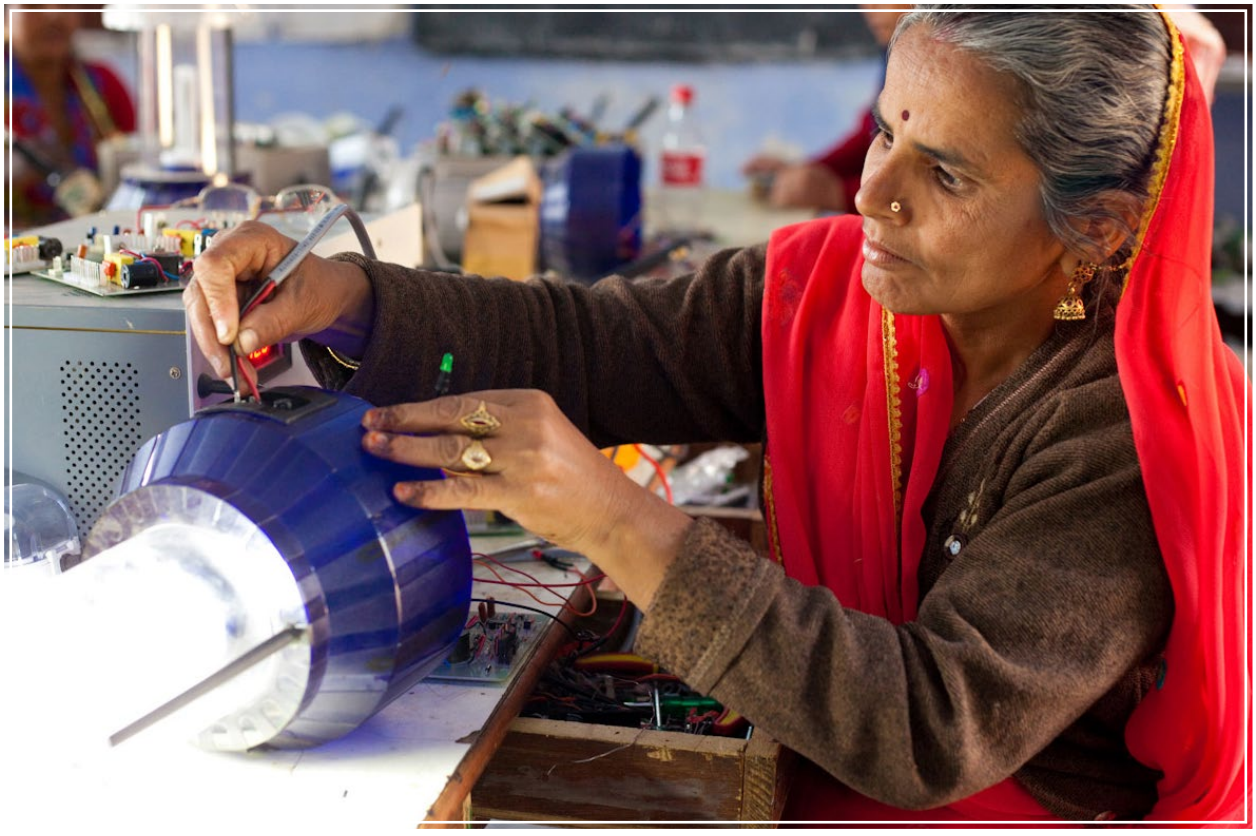
* Chapman, D., Corner, A., Webster, R. and Markowitz, E. (2016). "Climate visuals: A mixed methods investigation of public perceptions of climate images in three countries." *Global Environmental Change*. 41, 172–182

Two men repair breached sections of embankment in Sri Lanka. Photo: Dominic Sansoni/World Bank



A solar engineer trainer in India. Photo: UN Women/Gaganjit Singh

Data visuals

Data visuals are integral to the work of the IPCC and there is a clear desire within the IPCC to ensure information is communicated effectively. Whilst data visuals often contain important information relevant to diverse stakeholders in society, they can often be difficult for non-experts to understand.

A new evidence-based report has developed 12 principles to use to ensure data is represented in the clearest and most accessible manner possible.[79] These principles mirror many of the approaches to aligning your message with your audience that run through this Handbook. The data visuals report summarises these principles in the acronym **MADE**: consider your **Message**, your **Audience**, the **Design** of the visual, and its **Evaluation**.

FROM THEORY TO PRACTICE

Putting the Tyndall Centre's key MADE* principles into practice

Message	**Identify your main message:** Be clear what message or messages you want your audience to be able to take away from the visual.
Audience	**Assess your audience's prior knowledge:** Try to understand their information needs, and how the visual meets those needs.
Design	**Consider how your audience thinks:** Ensure you use visual formats that your audience is familiar with.
Evaluation	**Evaluate by testing drafts of a visual on your target audience**: If representative members of your target audience are not available, test the visual with people who have a similar level of prior knowledge as your target audience.

* Harold, J., Lorenzoni, I., Coventry, K. R., & Minns, A. (2017). Enhancing the accessibility of climate change data visuals: Recommendations to the IPCC and guidance for researchers. Report published by the Tyndall Centre for Climate Change Research, Norwich, UK. Available at: http://www.tyndall.ac.uk/datavisuals

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