



Communicating Environmental and Sustainability Science

*Challenges, opportunities,
and the changing political context*

Part 2 of 5

Who communicates environmental science?

[Access the full report here](#)

Who communicates environmental science?

Introduction

This section maps out the environmental and sustainability science communication landscape. We recognise science communication also happens outside of these formal arenas, and that books, films and other cultural channels provide powerful ideas about science and scientists. However, this overview focuses on the formal routes of science communication. Although it is beyond the scope of this report to provide an exhaustive review of all science communication organisations, the list provided here is broadly representative of the types of activities and philosophies which define this activity. The distribution towards organisations in the global North is a reflection of what emerged from the research, rather than any deliberate filtering of the results.

Key topics in environmental and sustainability science communication

Table 1: Key topics in environmental and sustainability science communication

Table 1 maps the key topics in environmental and sustainability science relevant to communication and engagement. It provides a thematic overview of environmental issues collated from polls, surveys and journals. A 2016 Gallup poll of 30 US public environmental concerns revealed the top three to be 'pollution'; i. pollution of drinking water, ii. pollution of streams, lakes and reservoirs and iii. air pollution (McCarthy, 2016). Similar results emerge from European surveys (Eurobarometer, 2014b). Pollution, alongside conservation and species extinction, is a long-standing environmental concern which appears to be more front-of-mind for the public than climate change and related environmental issues. However, the distinction is not clear cut - many of the concerns about fracking for example appear to be connected to pollution fears, e.g. groundwater contamination (Brown et al., 2013).

Theme	The science involved	Prominent themes in communication and engagement
Climate change - Impacts	Atmospheric chemistry and climate modelling Ocean chemistry Ecology	Increased weather extremes; Warming; Ice sheet and glacier retreat; Sea level rise; Ocean acidification; Species decline/extinction
Climate change - Mitigation	Carbon sinks BECCS/Negative Emissions Alternative energy sources	Reforestation/Deforestation; Geo-engineering; Carbon capture and storage; Fracking; Wind and solar power; Nuclear energy; Air pollution; Tidal power; Hydro-electric
Biology	Agricultural Biotechnologies Ecology and ecosystem services	Genetically Modified Organisms (GMOs) Pesticides; Conservation/Species extinction; Water Pollution
Geosciences	Land surface processes	River management; Land management and zoning; Soil quality and soil conservation

A typology of science communication organisations

Our typology divides science communication organisations into six areas, presented in the six tables below

The activities carried out by the organisations identified in our review are to some extent fluid – in reality many of the organisations carry out more than one type of activity. The categorisation therefore reflects the activities to which the majority of the organisation’s resources are directed. Bearing that caveat in mind, the typology provided below indicates that the field is dominated by organisations with a focus on one-way communication rather than engagement, either training scientists to be better communicators, or providing networking opportunities for science communication professionals. Importantly, our analysis revealed recent expiration of organisations due to lack of funding and lack of activity.

Table 2: Organisations and forums for training and/or supporting scientists and others to communicate science with the public

The organisations in Table 2 vary in structure, history and in the scientific specialism they address. What they have in common is the conviction that scientists themselves are in principle well-placed to engage the public, given the necessary training, support and resources’.

Organisation name	Location
AAAS Center for Engagement with Science and Technology	US
Alan Alda Center for Communicating Science	US
Centre for Environmental and Climate Research	Sweden
Centre for Science Communication, University of Otago	New Zealand
CICERO (Centre for International Climate Research)	Norway
Climate Lab	US
Climate Nexus	US
Climate Outreach	UK
Compass Science Communications	US
ECSITE (European Network of Science Museums and Science Centres)	Europe wide
European Science Communication Institute	Europe wide
Future Earth	Europe wide
Indian Science Communication Society	India
Inter-American Network of Academies of Science	Chile
Latin American and Caribbean Network for the Popularization of Science and Technology	Latin America/Caribbean
Minerva Consulting and Communication	Europe wide
National Academy of Sciences	US
National Science Foundation	US
NERC (Natural Environment Research Council)	UK
Network for the Public Communication of Science & Technology	Global
Science Communication Network	US
Science Communication Unit at Imperial College London	UK
Singapore Society for the Advancement of Science	Singapore
Sissa Medialab	Italy
Swiss National Science Foundation	Switzerland

Table 3: Organisations communicating to and engaging the public directly with science

The activities in *Table 3* take place in a variety of settings, rather than within the walls of educational or advocacy institutions. The goal is typically to remove the barriers between science and society, by imparting the characteristics of science and the scientific attitude to the public.

Organisation name	Location
Arctic Centre Science Communications	Finland
ASTRA (Centre for Learning in Science, Technology and Health)	Denmark
British Science Association	UK
Centre for Environment Education	India
Ciencia Viva	Portugal
Citizen Science Association	Global
CitizenSci	US
Coalition on the Public Understanding of Science	US
CSIRO (Commonwealth Scientific and Industrial Research Organisation)	Australia
Earth Observatory Singapore	Singapore
Francophone Association for Knowledge	Canada
Institute for Energy and Environmental Research	US
March for Science	US
Norwegian Centre for Science Education	Norway
Royal Society	UK
SciCo	Greece
Science Communication Unit Bristol	UK
Science made simple	UK
Sciencewise	UK
Scientific Saudi	Saudi Arabia
Silverhill Institute of Environmental Research and Conservation	Canada
Smithsonian Environmental Research Center	US
Syrian Researchers	Syria
The National Institute of Science Communication and Information Resources	India
The Royal Institution	UK
Urania	Germany
Vetenskap & Allmänhet	Sweden

Table 4: Building communications and engagement into the culture of science

The organisations in *Table 4* seek to foster a culture within science that recognises the importance of public communication to scientific endeavours.

Organisation name	Location
British Interactive Group	UK
Climate Communication	US
European Network of Science Centres	Belgium
European Science Events Association	Austria
National Science Communication Institute	US
Scicomm Hub	US
Science in Public Research Network	UK

Table 5: Organisations for science communication professionals

The organisations in *Table 5* identify journalists, PR consultants and other professional communicators as having a set of skills separate and beyond that which scientists can expect to acquire on top of their own specific scientific expertise. They vary significantly – for example, while Stemptra seeks to connect scientists with professional communicators, the National Association of Science Writers is more akin to a trade body for science writers.

Organisation name	Location
Association of British Science Writers	UK
Association of Science Communicators	Canada
Australian Science Communicators	Australia
Canadian Science Writers' Association	Canada
Chilean Association of Science Journalists	Chile
Chinese Society for Science and Technology Journalism	China
Danish Science Journalists	Denmark
Dutch Association of Science Journalists	Holland
Earth Journalism Network	International
European Science Journalists Association	France
Finnish Association of Science Editors and Journalists	Finland
French Association of Science Journalists	France
German Association of Medical & Science Journalists	Germany
German Association of Science Writers	Germany
German Science Journalists Association	Germany
Italian Association of Science Journalists	Italy
Japanese Association of Science and Technology Journalism	Japan
Japanese Association of Science Communication	Japan
National Association of Science Writers	US
Science Communicators Association of New Zealand	New Zealand
Science Media Centre Germany	Germany
Science Media Centre NZ	New Zealand
Science Media Centre UK	UK
Society of Environmental Journalists	US
Spanish Association of Scientific Communication	Spain
Stemptra	UK
Swiss Association of Scientific Journalism	Switzerland
World Federation of Science Journalists	International

Table 6: Advocates, campaigners, lobbyists, consultants and think tanks

The groups in *Table 6* range from single issue themes (e.g. Ocean Conservancy) through to groups who communicate with either the public or policymakers to influence the ends to which science is applied.

Organisation name	Location
Alliance for Accelerating Excellence in Science in Africa	Kenya
Biology Fortified	US
Campaign for Science and Engineering	UK
David Suzuki Foundation	Canada
Environmental-Economics Policy Research Unit	South Africa
Euroscience	France
Institut de France Academie des sciences	France
IVL Swedish Environmental Research Institute	Sweden
National Center for Science Education	US
Ocean Conservancy	US
Scientists for Global Responsibility	UK
Sea Change	US
Stockholm Environment Institute	Sweden
The Energy and Resources Institute	India
The National Council for Science and the Environment	US
Union of Concerned Scientists	US

Table 7: Science communication organisations that have recently ceased operating

Finally, *Table 7* identifies science communication organisations which have recently ceased operating, in most cases due to a lack of funding.

Organisation name	Location
African Federation of Science Journalists	Kenya
Brazilian Association of Science Journalism	Brazil
Connecting Science	UK
European Network of Science Communication Teachers	Europe
Graphic Science	UK
Korean Science Journalists Association	Korea
Media for Environment, Science, Health and Agriculture Association in Kenya	Kenya
Nicaraguan Academy of Sciences	Nicaragua
Science View	Greece

Science communication journals

Increasing importance is being attached to effective science communication within academia. A Web of Science search using the term 'Environmental Science Communication' for the years 2010 - 2017 identified 68,790 articles across 24 journals. Research from Borchelt (2012) and Bauer & Howard (2012) showed a marked increase in the number of science communication papers published since 2005. This growth has been described as indicating that science communication is becoming an academic discipline in its own right (Schiele et al., 2012). However, journals dedicated to science communication have low 'impact factors' (the standard metric used to rank and evaluate scientific journals). This is especially true of journals focused solely on the communication of environmental science.

Science communication scholarship has until recently been dominated by male authors from English-speaking countries in the West (Guenther & Joubert, 2017, p. 2). Whilst male Western scholars continue to dominate the field - a review in 2014 found the USA and the UK jointly accounted for 60% of science communication publications (Bucchi & Trench, 2014) - there is emerging evidence that the geographical and gender profile of the field is diversifying (Guenther & Joubert, 2017, p. 2).

Conclusions from mapping the landscape

Science communication is growing into a global and diverse discipline but our overview of the science communication landscape confirms what Trench et al. (2014) note: the field remains defined by a focus on training scientists and connecting media professionals with scientists. Public outreach through informal settings - such as museums and other civic institutions - does feature prominently. There is less evidence, however, of a concerted attempt to build institutional capacity for combining research and practice; despite being vital for creating robust and durable strategies that encourage engagement with controversial science topics. The mapping has also revealed that some key organisations are losing funding, whilst many others are voluntary and not-for-profit organisations, typically operating on very limited resources.

Our review of science communication journals reveals research is spread across many different, often low-impact journals. In addition, the studies that make up the literature in this field are fragmented, issue-specific, and anchored in different disciplines; often addressing the theme of science communication only obliquely. This situation underscores the need for institutional capacity within research centres to collate, coordinate and share research findings with communication professionals working across the domains identified in our mapping of key organisations.

"There is little evidence of a concerted attempt to build institutional capacity for combining research and practice; despite being vital for creating robust and durable strategies that encourage engagement with controversial science topics."

Full report sections

- Part 1** Science communication:
from information to dialogue
- Part 2** **Who communicates environmental science?**
- Part 3** Progress in the field:
a synthesis of key trends in environmental
science communication research
- Part 4** Challenges 'beyond the lab':
the current social, cultural and political
context for science communication
- Part 5** Gaps and opportunities for
environmental science communication research

Access the full report at

<https://climateoutreach.org/resources/communicating-environmental-sustainability-science>

References

- Bauer, M. W. & Howard, S. (2012). Public Understanding of Science - a peer-review journal for turbulent times. *Public Understanding of Science*, 21 (3), 258–267. doi: 10.1177/0963662512443407.
- Borchelt, R. (2012). *The Science Communication Research Literature Mapping Project*. Plenary paper presented at the 12th International Science and Technology Conference. Retrieved from <http://www.slideshare.net/OPARC1/finenze-phd-slides>
- Brown, E., Hartman, K., Borick, C., Rabe, B.G. & Ivacko, T. (2013). Public Opinion on Fracking: Perspectives from Michigan and Pennsylvania. *The National Surveys on Energy and Environment*, The Center for Local, State, and Urban Policy. Retrieved from <http://closup.umich.edu/files/nsee-fracking-fall-2012.pdf>
- Bucchi, M. & Trench, B. (eds.). (2014). *Routledge Handbook of Public Communication of Science and Technology* (2nd ed.). London, U.K. and New York, U.S.A.: Routledge
- Eurobarometer (2014b). *Special Eurobarometer 416/Wave EB81.3 – TNS Opinion & Social*. Retrieved from http://ec.europa.eu/commfrontoffice/publicopinion/archives/ebs/ebs_416_en.pdf
- Guenther, L. & Joubert, M. (2017). A world map of science communication research. *Journal of Science Communication*, 16 (2), A02.
- McCarthy, J. (17 March, 2016). *Americans' Concerns About Water Pollution Edge Up*. Gallup. Retrieved from <http://www.gallup.com/poll/190034/americans-concerns-water-pollution-edge.aspx>
- Schiele, B., Claessens, M. & Shi, S. (2012). Introduction. In: B. Schiele, M. Claessens & S. Shi (Eds) *Science Communication in the World*. Dordrecht, Netherlands: Springer, xxiii–xxv
-