



Evaluating the use of visualisation for communicating about climate change

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The need for evaluation

Guidance is needed on the most effective communication methods, for both research and practice

Complicating factors:

- ✦ Pace of technological development
- ✦ Expertise available within research teams
- ✦ Project timescales

How can we evaluate visualisations?

Evaluation = ‘what works best?’ – must be tied back to the underlying purpose for the visualisations

- ✦ Improved understanding of climate trends and their causes
- ✦ Improved engagement with the participatory process
- ✦ Greater support for wider policies/initiatives
- ✦ Greater willingness to change personal behaviour/lifestyle

All of these need to be assessed in different ways

Evaluation must also extend to the overall process within which the visualisations are used

How can we evaluate visualisations?

Assessment methods vary according to:

- ✦ Affective or cognitive responses (broadly, qualitative/quantitative)
- ✦ Revealed/implicit or stated/explicit responses
- ✦ Context (anonymous questionnaire, focus group...)
- ✦ Timescale of response (lasting effects?)

How can we evaluate visualisations?

Practical considerations:

- ✦ Real-life applications or purely academic tests
- ✦ Sample nature and size
 - ✦ Diversity of different attitudes/conceptualisations (Lorenzoni *et al.*, 2007)
 - ✦ Impact on data collection and analysis
- ✦ Time conflict between process and evaluation
- ✦ Ethical issues in having different treatments?

What evaluation has been done?

Historically, evaluation of visualisations has been done in terms of response equivalence (e.g. Daniel & Meitner 2001, Bishop & Rohrman 2003, Lewis & Sheppard 2006, Wergles & Muhar 2009)

Relatively little evaluation of climate change visualisations in particular, and their effect on understanding, engagement, action.

What evaluation has been done?

	Sample size	Engagement	Visualisation quality	Process objectives
Sheppard et al., 2011	~100	Observation	Pre/post quest'res	Short term only
Sherren et al., 2011	22	Researcher reports	Discussion, quest'res	Discussion, quest'res
Cohen et al., 2011	19		Pre/post quest'res	Pre/post quest'res
Pettit et al., 2011	89		Interviews, quest'res	Interviews, quest'res
van Lammeren et al., 2010	45		Quest'res	Task performance; quest'res

Comparison of selected recent evaluative work on visualisations related to climate change or other environmental change

Future evaluation

It is well-recognised that more, systematic evaluative research is a priority, particularly on affective responses (Lange 2011).

There is a strong argument that what we need most is not new technology, but more research on the methods we already have (Sheppard 2005).

Future evaluation

- ✦ Visualisation must be integral to a project/application, with a clear purpose; evaluation should be designed with this in mind
- ✦ Consider research team composition: visualisation specialists and social scientists should be involved from the design stage
- ✦ Embedding visualisation in ongoing dialogue-based processes will allow greater understanding of its effects
- ✦ With careful design, evaluation could be focused on principles which are to some extent transferable between technologies
- ✦ For community engagement and social action, real-life applications are key; 'purely academic' work may help assess new technology

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