Mapping the Landscape of Open Science

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Workshop on Openness & Reproducibility in Science
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Two Visions of Open Science

**open science for sustainability**

"the democratisation of science"

**Extended peer review**

Hulme, M. & Ravetz, J. 2009. ‘Show your working’, BBC News

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**Infrastructure**
- A trusted, open environment for sharing scientific data
- Open and seamless services to analyse and reuse research data
- Linking data
- Connecting scientists globally
- Connecting across borders and scientific disciplines
- Long term and sustainable
- Improving science

**Ethos**
- Show your working
Two Visions of Open Science, Overlapping Normative languages

- Good for science.
- Good for science in all parts of the world
- Good for society, good for democratic reasons
- Good for solving ‘grand (global) societal challenges’
Openness as Infrastructure

Open science

From Wikipedia, the free encyclopedia

**Open science** is the movement to make scientific research (including publications, data, physical samples, and software) and its dissemination accessible to all levels of an inquiring society, amateur or professional. Open science is transparent and accessible knowledge that is shared and developed through collaborative networks. It encompasses practices such as publishing open research, campaigning for open access, encouraging scientists to practice open notebook science, and generally making it easier to publish and communicate scientific knowledge.

An explosion of openness is about to hit scientific publishing
Meanings of Openness as Infrastructure

- Data
- Making data
  - Accessible
  - Share-able
  - Reproducible
  - Re-usable
- Global connectivity
- Platforms & Infrastructures
Methods for Open Science as Infrastructure

https://www.fosteropenscience.eu/content/what-open-science-introduction

"Figure 1. Promoting openness at different stages of the research process [Open Science and Research Initiative, 2014]"
Openness as Ethos

- Science/society/policy interface
- Controversies
- Public engagement across science-policy system
- Plural inputs (knowledge, values)
- Judgments & decisions about shared societal problems
- Ways of life & living together

Cultures of Uncertainty

Opening up knowledge systems for better responses to global environmental change

We outline a vision for the coordination and organization of knowledge systems that are better suited to the complex challenges of sustainability than the ones currently in place. This transformation includes inter alia: societal agenda setting, collective problem framing, a plurality of perspectives, integrative research processes, new norms for handling dissent and controversy, better treatment of uncertainty and of diversity of values, extended peer review, broader and more transparent metrics for evaluation, effective dialog processes, and stakeholder participation. We set out

Cornell, S., Berkhout, F. et al. 2013. Opening up knowledge systems for better responses to global environmental change. Environmental Science & Policy, 28, pp.60-70
What is openness in science about?

- **Infrastructure**
  - Scientific Practice – doing science better

- **Ethos**
  - The Place of Science – doing the collective stuff better
Openness as Infrastructure *and* as Ethos: a coming together of different visions?


**Responsible Research and Innovation is:***

- Involving society in science and innovation ‘very upstream’ in the processes of R&I to align its outcomes with the values of society.
- A wide umbrella connecting different aspects of the relationship between R&I and society: public engagement, open access, gender equality, science education, ethics, and governance.
Concluding questions for discussion

▪ Perhaps the data-infrastructure vision of openness needs more attention to matters of ethos?

▪ While the ethos vision of openness needs more attention to matters of infrastructure?

▪ And both could do with more attention to the challenges?