

# Review of: "Responsible Geosciences, or Geoscience Literacy for Urbanites"

Robert Wasson

Potential competing interests: No potential competing interest to declare

This is an important topic and the paper by Martin Bohle is very welcome and will hopefully spark a wider discussion. The author raises important issues of geo-ignorance, a lack of engagement with geosciences by urbanites, the fact that in the modern world we live in is a socio-environmental system that requires deep understanding by all citizens not just experts (although this point is implied rather than developed), and that we need to work out how best to overcome geo-ignorance. I have several issues with this paper that I believe deserve further consideration.

1. The emphasis on urbanites, while important, misses the fact that in the modern world with more people living in cities than outside cities, and cities depending upon their hinterlands for resources and waste disposal, the whole world could be considered urban. That is, the connections between the urban and non-urban are so profound that the distinction being made in terms of geoscientific literacy may be artificial.
2. The example of meteorology is used to begin a process of working out how ignorance about other geosciences may be mitigated. It is not clear to me however that the lessons from meteorology are directly applicable to other applied geosciences such as hazard mitigation except in a general sense of better communication and awareness raising. Certainly forecasting is possible for flooding, a point made by Bohle without recognizing that in some countries this is already done. But landslides, volcanic eruptions, earthquakes, and tsunamis are 'predictable' probabilistically but not in real time. And some meteorological phenomena also are presented to the general public probabilistically and Bohle does not discuss the difficulty of explaining and understanding probability.
3. The idea that engineering is socially enacted is not controversial. Neither is the idea that engineering relies on geoscience, at least in the cases of for example tunnel and dam design. But engineers are also involved in other matters where they should use geoscience but don't. One case is the use of levees for flood mitigation where the dynamics of rivers are ignored and levees are either ineffective or worsen damage by breaching, and have unintended consequences such as starving floodplains of sediment. Where engineers argue for hard flood mitigation when nature-based solutions may be better an explanation may lie in 'technological lock-in'. This is when a technological solution is adopted early and then gets stuck partly because of professional blindness and self-interest. The need for multi-disciplinarity is clear in this and many other cases, to break the lock-in.
4. I hope that the author further develops ideas about how to overcome ignorance in a wide range of geosciences. Meteorology may not be the model for the mitigation of ignorance in all geosciences, but certainly we can learn from it.

