



Communication about scientific uncertainty in environmental nanoparticle research – a comparison of scientific literature and mass media

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The research about the fate and behavior of engineered nanoparticles in the environment is despite its wide applications still in the early stages. ‘There is a high level of scientific uncertainty in nanoparticle research’ is often stated in the scientific community. Knowledge about these uncertainties might be of interest to other scientists, experts and laymen. But how could these uncertainties be characterized and are they communicated within the scientific literature and the mass media? To answer these questions, the current state of scientific knowledge about scientific uncertainty through the example of environmental nanoparticle research was characterized and the communication of these uncertainties within the scientific literature is compared with its media coverage in the field of nanotechnologies.

The scientific uncertainty within the field of environmental fate of nanoparticles is by method uncertainties and a general lack of data concerning the fate and effects of nanoparticles and their mechanisms in the environment, and by the uncertain transferability of results to the environmental system. In the scientific literature, scientific uncertainties, their sources, and consequences are mentioned with different foci and to a different extent. As expected, the authors in research papers focus on the certainty of specific results within their specific research question, whereas in review papers, the uncertainties due to a general lack of data are emphasized and the sources and consequences are discussed in a broader environmental context. In the mass media, nanotechnology is often framed as rather certain and positive aspects and benefits are emphasized. Although reporting about a new technology, only in one-third of the reports scientific uncertainties are mentioned. Scientific uncertainties are most often mentioned together with risk and they arise primarily from unknown harmful effects to human health. Environmental issues itself are seldom mentioned.

Scientific uncertainties, sources, and consequences have been most widely discussed in the review papers. Research papers and mass media tend to emphasize more the certainty of their scientific results or the benefits of the nanotechnology applications. Neither the broad spectrum nor any specifications of uncertainties have been communicated. This indicates that there has been no effective dialogue over scientific uncertainty with the public so far.