

## Visiting artist researchers as therapists for climate scientists

---

Hans von Storch

### Abstract

Many climate scientists find themselves confronted with the challenge of purportedly “knowing better” — while this is a valid claim with respect to a small segment of reality, namely their narrow field of expertise, the public expectation often is that they know better about the “world’s problems”, and what to do about it, sometimes even with the rhetoric of “saving” the world. Artists may help in this situation by bringing forth different viewpoints, challenging hidden assumptions and suggesting surprising links; however, more often, the arts seem to be considered as a useful supporter in attempts to save the world. In the present project, however, the artists seem to have taken climate science mostly as a point of departure for their individual curiosity and joy of experimenting.

---

### Prologue: issue and approach

As a working natural scientist, my interest in “science meets art” projects is whether art has the potential to be a constructive driver of the scientific process. Presumably, scholars have thought about this question over the course of time, but shamefully I am unaware of such pivotal thinking, of concepts of such transdisciplinary cooperation, of empirical work considering the boundary work between art and science. Even worse, I do not have a clear understanding of what “art” is, so that my contribution may be evidence of the eternal arrogance of physicists rooted in their ability to compactly reduce some natural phenomena into neat differential equations.

Nevertheless, I comment on this issue not with the claim of scientific accuracy and double check but to share my personal thoughts on the background and potential of an experiment we did at the Center of Excellence in Climate Studies at the University of Hamburg (CliSAP) and at my own Institute for Coastal Research together with the University of Fine Arts (HFBK) in Hamburg. I look at the potential of art interacting with science from the standpoint of a practitioner in the scientific process, more specifically: the process of climate science.

## Science and scientists

How could “art” help us climate scientists to do our work “better”? Certainly not in designing methodical approaches, better instruments, more efficient computer codes, more sensitive statistical algorithms. But these components — instruments, computer codes and statistical algorithms — are only the visible parts of scientific practice at the core of science. There is more, in particular the curiosity to understand the dynamics behind natural phenomena, the ability of explaining complex relations, and of describing at least part of future developments. Doing “science” means constructing knowledge, based on existing knowledge and on new observations. For physicists, the concept of “state space models” [Robinson, Lermusiaux and Sloan III, 1998] may be a suitable metaphor for this process — which implies that there is the permanent, albeit often hidden challenge that the process of scientific progress does not lead to “truth” but merely to “best explanations for the time being”. We must satisfy our curiosity on the shaky ground of plausible and “scientifically good” explanations, which may turn out to be inconsistent with future observations.

On the other hand, knowledge which goes with the attribute “scientific”, is a very powerful resource; it gives social status, authority for explaining to others how the world functions, what needs to be done in society. We scientists often enough forget about the tentative ground of our knowledge claims, and dress up in the white coat of scientific authority, playing the role of guardians of superior explanatory and predictive power. At the same time, we feel obliged to follow Merton’s CUDOs norms [Bray and Storch, 2014], which stipulate among others “organised skepticism” (Os) and “disinterestedness” (D). But climate science is no longer, if it ever was, in a state of innocent curiosity. Rather, it finds itself in a “post-normal” situation (see for the concept Funtowicz and Ravetz [1985]; for the case of climate science van der Sluijs [2010], Bray and von Storch [1999] and Krauss and von Storch [2012]), in which the value of scientific results is weighted not only according to methodology but also to political utility. When art is taking “science” as its point of departure, the structural conditions within which scientists work and operate, should be taken into account — by recognizing that science is a social process, and that scientists are social actors with preferences, interests and good or bad intentions (see the observations by Paál [2014]).

## Art and artists as outlets of scientific knowledge claims

My impression is that most cases of art-climate science interaction follow a linear model: scientists spell out certain facts, perspectives, or warnings with relevance for society, ecosystems, and the political process. The presentations at the final event of the Hamburg science-art collaboration by theoreticians of art also largely followed this linear model. Similarly, the discussion by Giannachi [2012] follows this concept when she discusses several categories of roles for climate change in “contemporary art” (p. 125). One of the categories is “Representations — emphasizing visualization and communication”; an example is the project “Cape Farewell”:

“Its primary objective is the communication of climate change through art, which they achieve by organizing expeditions intended to encourage interdisciplinary debate on climate change and to affect artists so that they may create inspiring work on this topic (emphasizing behavioral change). The organization states as its mission ‘to develop the production of art founded in scientific research’, ‘by exposing artists to the world’s climate tipping points’ and incorporating scientific collaboration into artistic practice.” (p. 125).

The starting point is described as being given by science, as assertions beyond doubt, pure facts, no social actors on the science side, but social actors on the art side.

Another category is “Performance environments — emphasizing immersion and experience”, described as “art facilitating the experience of climate change”. Giannachi’s example here is the *Sonic Antarctica* project by Andrea Polli.

“The work features natural and industrial field recordings, geosonifications and audifications, interviews with weather and climate scientists and soundscape compositions. ‘Through an effective sonification, data interpreted as sound can communicate emotional content or feeling, and I believe an emotional connection with data could serve as a memory aid and increase the human understanding of the forces at work behind the data.’ Moreover, [...] whereas weather models are increasingly detailed, weather forecasting remains an ‘imprecise science’ that does not reveal much about ‘how the weather feels to a person experiencing it, precisely the information the public wants’” (p. 128).

The intended purpose seems to be to enable the audience to emotionally grasp the subject of climate change. Whether it is possible to feel climate change is certainly an open question; what can be felt is the sequence of weather events, and the social construct of climate change as perceived by people. For most people, it will be difficult to discriminate between the weather, climatic events and climate change. These artistic projects employ the “linear model”, with “science” speaking “truth to power”, and to the arts, for that matter. Certain policies are framed as a direct consequence of proven knowledge claims, which are beyond critical questioning about validity, legitimation and efficiency. Science is not understood as a social process, nor as a body of knowledge loaded by uncertainties and tentativeness; not as an arena for actors but a bulwark of truth. In this context, art is supposed to convey the significance of scientific insights to the public.

Arts, then, are simply another stakeholder for climate scientists, a user of scientific results similar to environmental organisations, industries or administrations. Art takes on the role of a transmission belt to the masses. In this view, we scientists deliver, and art selects suitable points of departure and constructs images of reality, of future, of meaning, of significance, or whatever. When the issue of art and climate science was discussed on our weblog “Klimazwiebel”, somebody wrote about “climatological realism” [von Storch, 2014].

For alarmists, who announce catastrophic developments as a consequence of man-made climate change, many opportunities show up because dramatic images and scary setups are more interesting and better in moving people than “move on, there is nothing to be seen here” voiced by skeptics. The latter, are also a kind of alarmists but they sound an alarm about a purported conspiracy of elites. For such skeptics, the challenges are more demanding because such a conspiracy is hard to convey in images, sounds, or installations. However, conspiracy is a good subject matter for novels, such as Crichton’s *State of Fear* (Crichton [2004], or a review see Allen [2005]). Unfortunately, this novel is mostly a platform for pronouncing certain claims — the characters are wooden, the action is boring, but at least science is described as a process with social actors.

In the course of artistic processing, a certain dramatisation is nothing out of the ordinary, because art is a subjective transformation of personal experiences and perceptions. Art is not a broker of scientific knowledge, but constructs reality in manifold ways. An important element is making use of emotional appeals, on both sides of the aisle of the antagonistic climate debate [Aufenvenne, Egner and Elverffeldt, 2014].

Another observation, consistent with the presentation by Giannachi [2012], is that there is a tendency to list all types of environmental degradation, such as loss of forestry or contamination of landscapes by plastic bags, as a consequence of man-made climate change. Another example for the tendency of attributing many if not all unwanted environmental trends to climate change is given by the volume “klima kunst kultur” edited by Ebert and Zell [2014]. The issue of man-made climate change becomes a one-fits-it-all argument for dealing with unpleasant issues. To sum up, in this constellation, art takes on the role of an amplifier of certain worldviews, but does not challenge such views. It preaches to the converted, and maintains and cements the landscape of antagonistic views and values.

## Impact of art on science

Instead, the approach that I favour is the capacities of the arts to unsettle the taken-for-granted. This can assume the form of asking climate scientists about implicit assumptions, about dynamics and processes, which we scientists no longer consider. Ideally, this approach leads to irritation and to questioning of accustomed standpoints. Also consistent sense-making narratives, beyond technical details, may emerge as a result of interaction between scientists and artists.

I know of one example from the literature that constructs such an irritating narrative: McEwan's *Solar* (McEwan [2010], for a review see von Storch [2010]) tells the story of a midlife crisis-ridden Noble Prize winning physicist who tries to exploit climate change concerns for his own advantage. An interesting detail is that the protagonist Michael Beard at one point joins an expedition to the Arctic, quite similar to the Cape Farewell project mentioned above. One may or may not like the linguistic artistry, the details of the narrative about the (moral) failure of a Nobel Prize winner, but what makes the novel special and interesting, is that it describes science as a process, with actors and a milieu with marked personal interests. The people in this novel, different from Crichton's *State of Fear*, have something to do with real scientists.

The recognition that science is a social and cultural process is the central message. Science typically presents itself to the public as a body of objective descriptions of reality, of its dynamics and interrelationships. When confronted with claims of subjectivity in the scientific process, often enough scientists consider this as an insult — and I would agree that many technical procedures, such as reading a measurement, the transfer of equations into computer codes or mathematical analyses is in most cases indeed practically free of subjective elements. But there are more serious issues of subjectivity. Maybe the most important is the formation of scientific schools of thought, as first described by Ludvig Fleck in 1933 [Fleck, 1980]. While these schools summarise the body of knowledge conveniently, they also function as a filter to reject irritating hypotheses and observations. If a measurement shows an unexpected result, we scientists often blame the instrument

as being inaccurate. An example is the first measurements of the Antarctic ozone hole which originally were dismissed as implausible, and thus false. Other standard excuses refer to overlooked errors in computer codes, or in homogeneities in data series. To come up with concepts or data inconsistent with the school of thought is worse than making a technical error. Young scientists, who argue outside the school of thought, are easily dismissed as stupid. In general, it depends on the school of thought how much and how good evidence needs to be to persuade us to accept or reject a hypothesis. Another process which is loaded with subjectivity is the selection of issues with which we work — this is influenced by opportunities related to financing, personal interests and social preferences.

Here I recognise the potential of art to support science — to observe without prejudice, or at least to observe processes, dynamics and interactions in a different way. If science's business as usual is guided by persistence, by righteousness, and by the tendency to merely 'repair' knowledge claims when inconsistencies emerge, then science is in need of therapists, who are trained to construct and allow access to different realities. I believe that some artists may be such therapists. To this purpose, it is not important if the artistically constructed realities are consistent with the scientifically constructed realities. In most cases they will not be — the key point is the demonstration that other, alternative constructions of reality are possible. These other realities are mirrors, which may help the scientist to overcome their own dogmatism.

## References

- Allen, M. (2005). 'A novel view of global warming. Book reviewed: *State of Fear* by Michael Crichton'. *Nature* 433, p. 198.
- Aufenvenne, P., Egner, H. and Elverffeldt, K. von (2014). 'On Climate Change Research, the Crisis of Science and Second-order Science'. *Constructivist Foundations* 10, pp. 212–213.
- Bray, D. and Storch, H. von (2014). 'The Normative Orientations of Climate Scientists'. *Science and Engineering Ethics*. Epub ahead of print. DOI: [10.1007/s11948-014-9605-1](https://doi.org/10.1007/s11948-014-9605-1).
- Bray, D. and von Storch, H. (1999). 'Climate Science. An empirical example of postnormal science'. *Bull. Amer. Met. Soc.* 80, pp. 439–456.
- Crichton, M. (2004). *State of Fear*. New York, U.S.A.: Harper Collins.
- Ebert, J. and Zell, A. (2014). *Klima Kunst Kultur: Welche Fragen formulieren Kunst und Kulturwissenschaften?* Göttingen, Germany: Steidl Verlag.
- Fleck, L. (1980). *Entstehung und Entwicklung einer wissenschaftlichen Tatsache: Einführung in die Lehre vom Denkstil und Denkkollektiv*. Frankfurt am Main, Germany: Suhrkamp Verlag.
- Funtowicz, S.O. and Ravetz, J.R. (1985). 'Three types of risk assessment: a methodological analysis'. In: *Risk Analysis in the Private Sector*. New York, U.S.A.: Plenum, pp. 217–231.
- Giannachi, G. (2012). 'Representing, Performing and Mitigating Climate Change in Contemporary Art Practice'. *Leonardo* 45, pp. 124–131.
- Krauss, W. and von Storch, H. (2012). 'Post-Normal Practices between Regional Climate Services and Local Knowledge'. *Nature and culture* 7, pp. 213–230.
- McEwan, I. (2010). *Solar*. London, U.K.: Jonathan Cape.
- Paál, G. (2014). 'Wo Niklas Luhmann sich verrannt hat'. *Meta*. URL: <http://meta-magazin.org/2014/11/22/wo-niklas-luhmann-sich-verrannt-hat-2> (visited on 3rd December 2014).

- Robinson, A.R., Lermusiaux, P.F.J. and Sloan III, N.Q. (1998). 'Data assimilation'. In: The Global Coastal Ocean. Processes and Methods. The Sea Vol. 10. Ed. by K.H. Brink and A.R. Robinson. New York, U.S.A.: John Wiley & Sons Inc, pp. 541–593.
- van der Sluijs, J.P. (2010). 'Uncertainty and complexity: the need for new ways of interfacing climate science and climate policy'. In: From Climate Change to Social Change: Perspectives on Science — Policy Interactions. Ed. by P. Driessen, P. Leroy and W. van Vierssen. Utrecht, The Netherlands: International Books, pp. 31–49.
- von Storch, H. (2010). 'Under the skin of climate change. Book reviewed: *Solar* by McEwan'. *Nature* 464, p. 1283.
- (2014). 'Input needed — synergies of science and art'. URL: <https://www.blogger.com/comment.g?blogID=8216971263350849959&postID=2538626646105751588&isPopup=true> (visited on 14th December 2014).

## Author

Hans von Storch, Dr. rer. nat, Dr. h.c., director at the Institute of Coastal Research, HZG Geesthacht (Germany), and professor at the University of Hamburg (Germany) and at the Ocean University of China, Qingdao; mathematician and Earth scientist, with more than 20 years of experience in cooperating with social and cultural scientists. For more information on his professional activities see <http://www.hvonstorch.de/klima>. E-mail: [hvonstorch@web.de](mailto:hvonstorch@web.de).

## How to cite

von Storch, H. (2015). 'Visiting artist researchers as therapists for climate scientists'. *JCOM* 14 (01), C05.



This article is licensed under the terms of the Creative Commons Attribution - NonCommercial - NoDerivativeWorks 4.0 License.  
ISSN 1824 – 2049. Published by SISSA Medialab. <http://jcom.sissa.it/>.