Adam Brenthel’s dissertation *The Drowning World: The Visual Culture of Climate Change* treats one of the most debated subjects of our time, namely the climate change and the inadequate communication of climate change to the public. Instead of putting the blame on the receiver, the public, as most studies tend to do, Brenthel directs his attention to the sender and the circumscribing visual conventions climate science is ruled by. His interest is therefore on the information the scientific image conveys. He finds that the major problem with the scientific image is its abstract level of visual information and its inability to bring a feeling of the need to act promptly; the climate crisis is often depicted as located in an unpopulated landscape in an indeterminate future.

The abstract representations in the scientific image he connects to an ontological problem: the scientific image being ruled by values such as authority, readability and convention. These norms make the scientific image lose some of its ability to present new thoughts. Images of water are especially recurring as are projects that use immersive environments, for example virtual reality. While the scientific image fails to communicate that the climate crisis is a fact and there is need to act promptly, the supplementary aesthetic images do, concludes Brenthel. The aesthetic images, together with the way the narrative of the changing world is told, manage to bring a feeling of change with them.

Brenthel's study aimed to contribute with an answer to the overall question about the problem with climate science communication is highly motivating. The study has been carried out within the field of Art History and Visual Studies. The author comes from the natural sciences and he also fetches theoretical resources from Cultural studies. He describes his study as an Environmental Humanities study «even though the analysis of images must be described as Visual Studies». (p. 24)

His work is grounded in three hypotheses. 1) There are limitations to how climate scientific images can be shown within the scientific boundaries, 2) Crucial aspects of climate change become unrepresentable within the visual regime 3) Aesthetic images are supplemented in the parergon (frame) position to compensate for what the scientific ergon (work) fails to represent.

This is not the place to give a fair summary of the thesis but before I continue my review I must say
I find the study highly interesting with its overarching philosophical perspective on visual scientific communication. Probably many of the conclusions regarding the visual norms for scientific representations in climate sciences are valid for other scientific disciplines. The theoretical fields that his work covers is impressive as is the study’s ambition to fuse art history, iconography and philosophy into an operative analytical concept. Brenthel’s background in natural sciences makes him no doubt conversant with scientific readings of diagrams, charts and scientific illustrations which brings credibility to the study as a whole. The theoretical philosophical framework is based on Kant and Derrida, followed by Lyotard, Baillard, Deleuze, Bachelard and Barthes. From an art history perspective Martin Jay and Didi-Huberman play important roles. Important analytical notions for the study is fetched from Derrida’s use of ergon (work) and parergon (frame) and Didi-Huberman’s notion «dissemblance». A key notion is also the «visual regime», originally from Jay’s «scopic regime», here contextualized to climate sciences, «to be the conditions that limit what can be shown in the ergonal position in climate communication.» (p. 43) The relation between the text and image is related to Barthes’ analytical pair «anchorage and relay». (p. 153)

The analyzed material is selected from a wide range of media, both printed matter, websites and films, and covers a time span of ten years, 2006–2015. To choose the year 2006 as starting point is motivated by the great impact Al Gore’s *An Inconvenient Truth*, from the same year, had on climate science communication. The study is well disposed. It is divided into three sections. First there is an informative introduction where the aim, hypotheses, framework, theory and method, research background and finally a section that discusses the relevance and topicality of the subject. The second section, with chapters «The dark background», and «The double recurrence of the sea» presents examples of scientific visualizations of the climate issue and discusses and gives possible explanations to the gaps between scientific thinking about climate sciences and the scientific images in the communication to the public. The third section contains conclusions and gives examples of artistic expressions such as *Ice Watch* and *Drowning world* and suggests explanations for their success to raise awareness of the climate issue.

Even though my overall view is positive there are some problematic points connected to the formulation and use of notions and concepts that give the study an unnecessary vagueness. My first point regards the notion of scientific image. There is no reliable explanation as to how a scientific illustration/image might be defined and how it differs from an aesthetic image in the climate science communication. Even though Brenthel’s theoretical stance is thorough it still lacks a discursive discussion about the distinctions between different kinds of images. What is a scientific image, an aestheticized scientific image and a supplementary image? Brenthel writes that a clear-cut division between a scientific and an aesthetic image is not possible to make and the notions are therefore only heuristic. That may of course be so, but Brenthel should have convinced the reader by giving some distinct traits of each heuristic type in the introduction or at least presented the premises for his heuristic division. It is also unclear if scientific illustration has the same significance as scientific image.

The second point that I find questionable is the «visual regime». It is an interesting and a thought-provoking concept, however it could have been articulated further. If the visual regime decides the limits for what can be shown in the ergonal position as Brenthel puts it, next question is how this ergonal position is defined. Brenthel divides the visual material into work and frame. The work is the «scientific illustration, table, graph, map or curve» (p. 32). The frame is «the aesthetic material in the parergon that supplements the scientific image» (p. 32). With this said I do not consider Brenthel’s division between ergon and parergon, the latter also called supplementary, being distinct enough. My main objection to the concept of visual regime is thus that a philosophical perspective necessarily explained by intangible entities (social, cultural, epistemological) is made into an operative
analytical tool to mark boundaries between the scientific and the non-scientific in empirical material. The division between the scientific and the aesthetic information is therefore an issue that Brenthel not sufficiently deals with. I thus question if the «work and the frame-division» is sufficiently thorough as it is not clear what the division is made up of; it seems sometimes to be metaphoric or mental and sometimes spatial, «which surrounds this kind of image [scientific image], how illustrations relate to the text they illustrate, and what kind of images that supplement these images.» (p. 37) An enlightening discussion of this chosen analytical stance based on the Derridean thought model would have been welcome. A model that presents classifying principles of the division of the material between work (scientific) and frame (aesthetic) would be beneficial for the study. Also a model that tries to sort out the vast and heterogeneous aesthetic material, for example by categories such as genre, text, paratext, peritext, and epitext (Genette) would make the analysis more systematic. In my view, the present rough division is unfortunate in a communication analysis. The dissertation has therefore a somewhat rudimentary explanatory model and would also have gained by being combined with a semiotic analytical approach from multimodal and intermedial studies, particularly from visual communications studies by Gunther Kress and Theo van Leeuwen.

Now to my third and last point: it is not sufficiently clear what principles have guided the selection of the images in the analyzed material except that «most of the material» is within the time span 2006–2015. (p. 37) Are the analyses carried out on the most widely spread scientific images or are there other priorities? Because of the unclarity it is difficult to judge how representative the tendencies are that Brenthel has found in his chosen empirical material.

Notwithstanding my objections, I find this study a motivating and interesting read. It is well-structured and pedagogic. Brenthels' argument, to locate the «noise» in the communication to the sender position, is convincing and the results might function as advisory guidelines for future climate science communication and probably the results are transferable to other disciplines and other media. I look forward to a popularized and brief version of the dissertation.