VISUAL COMMUNICATION IN SCIENCE AND LANDSCAPE DESIGN

Deltares experts use a variety of visual representation techniques such as maps, 3D models and graphs to communicate with scientific experts, engineers, planners, architects, policymakers and local participants. These images, however, are not always interpreted as intended.

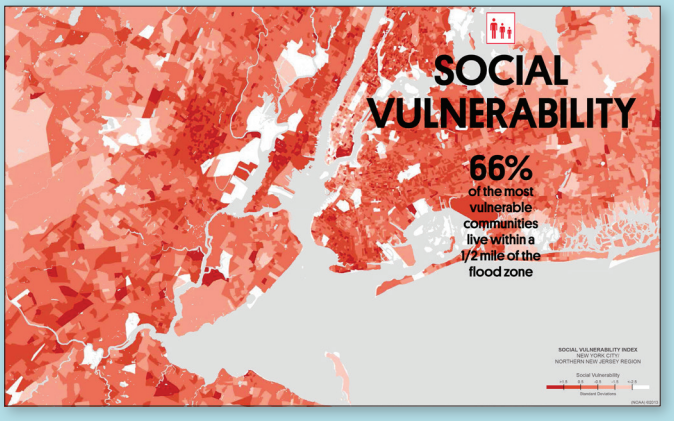
On the one hand, planning and design processes for multifunctional flood defence landscapes are becoming increasingly complex and there is a wide variety of expert and non-expert stakeholders. This calls for a critical reflection on visual representations for landscape design. On the other hand, it is not clear how traditional drawing techniques and state-of-the-art digital visualisations function as communication tools in new planning and design contexts.

A visual research framework was developed by Kevin Raaphorst during his PhD study at Wageningen University and Deltares. The framework was demonstrated using the images and design processes of the Deltares contribution to the Rebuild by Design (RbD) competition of the US Department of Housing and Urban Development as an empirical case study. The visual research framework allows for the development of an integrated visualisation strategy that includes the entire process of visual communication as opposed to only the 'visualisation' component.

Three important communicative qualities of design representations are key elements in the framework: validity, readability and interactivity. The validity of a design's content depends on the way scientific knowledge is used and framed. The readability of an image – whether people can read and understand it – is determined by the visual design of the content. Third, the interactivity of the medium determines the extent to which participants can access and adjust the content and form of a design. This is particularly important in participatory contexts.

The new framework also sheds light on the exchange of scientific knowledge in general. An image can never be seen independently of the purpose for which it was created, or of its target audience. A customised representation strategy is required for specific stakeholder groups in order to understand valuable scientific knowledge and use it properly. This is about more than just changing the colour scheme: it starts with the question of which data are relevant, for whom and how they may be understood or misinterpreted. An example of a misinterpretation is the NOAA 'social vulnerability map'. A quick look at the map could lead one to believe that the shade of the colours is related to the social vulnerability index. The scale bar tucked away at the bottom right in a very small font, however, indicates that the shade is related to the standard deviation of this index. The conclusion that 66% of the most vulnerable communities live within half a mile of the flood zone does not correspond to the picture. Moreover, it is not clear where the flood zone is situated. This map delivers a confusing message.

The New Meadowlands (source: Rebuild by Design)



Example of easily misinterpreted map (source: Rebuild by Design)

The insights of this PhD research will be applied in the European Joint Programme Initiative for Climate, 'EVOKED', which aims to properly visualise climate data in terms of 'climate services'.

Contact
Kevin Raaphorst, kevin.raaphorst@wur.nl, t +31 (0)6 1432 5570
Gerda Roeleveld, gerda.roeleveld@deltares.nl, t +31 (0)6 1246 9376

Further reading

Raaphorst et al. (2018, in press) Reading Landscape Design Representations: an interplay of validity, readability and interactivity. *Visual Communication*