

Story mapping to communicate scientific information

Storytelling has a large potential to raise awareness for a specific topic (Harder & Brown 2017) and can help to simplify complex information or to make it more relevant for a specific target group. In EVOKED we have developed a new story map template that allows us to share the source code and remove any restrictions usually imposed on the format or design functionalities of the story map. It further allows more flexibility in the visualisation of the scientific information and can be used actively in the co-development process as it gives room for adjustments according to feedback from the stakeholders.

Story map for Flensburg, Germany. In order to visualise and to communicate complex information on climate change impacts, we have produced a pilot story map as a climate service focusing on sea-level rise in Flensburg and addressing the general public as a target group. Adaptation to sea-level rise has become an emerging topic for the city of Flensburg. Thus, our story map has the goals to:

- Raise awareness and inform about sea-level rise.
- Contribute to decisions in dealing with local sea-level rise.
- Support the adaptation process.



Figure 1. Title slide of the Flensburg story map.

The first part of the story map includes short information on the scientific background, such as global mean sea-level rise trends, and defines specific terms such as uncertainty and risk. The second part visualises coastal flood risk and provides information on areas vulnerable to coastal flooding with assistance of a flyover map. The last part of the story map contains information on adaptation options in general, primarily in text-based form and for specific locations in Flensburg.

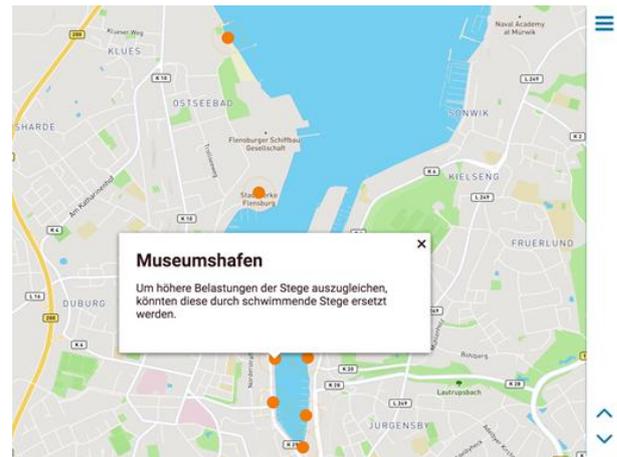


Figure 2. One section of the story map, emphasizing potential adaptation measures for Flensburg (<http://meeresspiegelanstieg-in-flensburg.info/>).

One specific purpose of the EVOKED project is to increase the usability of climate services through a feedback loop. Thus, we have included a feedback form at the end of the story map. We finalised the feedback process in September 2019 and adjusted the story map based on the feedback to improve the usability of the climate service. Flood maps considering different sea-level rise scenarios were included and more details on adaptation measures are given.

Story maps for in other EVOKED case studies.

The Swedish Geotechnical Institute (SGI) plans to produce two story maps by the end of this year. One story map will concentrate on decision makers of the Värmland Country Administrative Board to raise awareness of how climate change may impact society and to understand their own role in climate adaptation work. The second story map targets citizens in Arvika and addresses water quality problems and actions to improve water quality.

The Province of North Brabant has produced a story map for the very dry summer of 2018. The story map aims to use this event to inform the public about the effects of climate change in Brabant. It is also used as an introduction to the risk dialogues in the EVOKED pilot region of Northeast Brabant. Specific effects are described and include health, nature, agriculture, recreation and housing.

Story maps as a climate service. In the past, web applications and web tools on climate change-related issues have been developed, but they rarely have been connected to the concept of climate services. Thus, research is very limited on how effective such web applications are as climate services. One of the first reviews that assesses web portals as climate services recommends that these should take a wide diversity of users into account, assure and manage quality of data presented, be complemented by additional services, take care of continuity also after the project, and ensure that their guidance is appropriate (Swart et al. 2017). Story maps, as web-based applications, can be an effective tool to function as a climate service, taking all the characteristics and challenges of climate services into account.

References.

Harder C, Brown C (eds) (2017). *The ArcGIS Book. 10 big ideas about applying the science of where*, Second Edition. Esri Press, Redlands, California.

Swart RJ, Bruin K de, Dhenain S, Dubois G, Groot A, Forst E von der (2017). *Developing climate information portals with users. Promises and pitfalls*. *Climate Services*, 6:12–22.

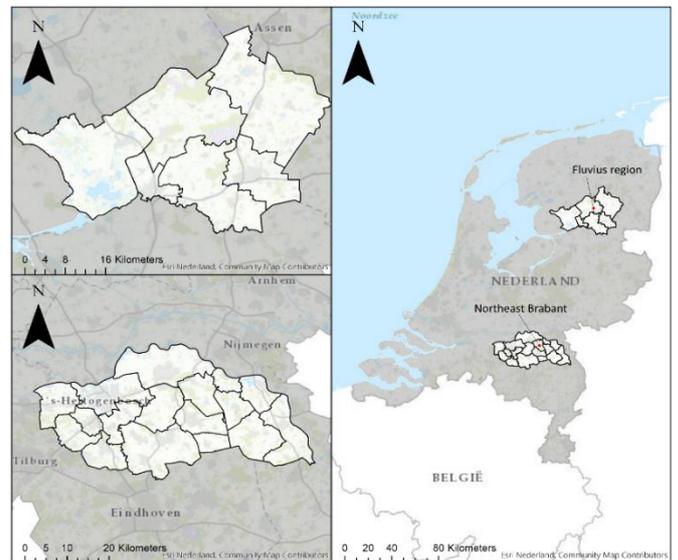


Figure 3. Map showing the location of both regions with the Netherlands.

Fluvius region and Northeast Brabant, Dutch case study sites

EVOKED's Dutch partner, Deltares, is working with two different case study sites in the Netherlands. This allows for sharing knowledge and experiences between both case study sites as well as cross-study comparison within the Dutch national context.

The Fluvius region, located in the north of the Netherlands (see Figure 3), is home to roughly 200,000 inhabitants and consists of 6 municipalities and a water board that work together. As the region is quite rural, agriculture is an important sector and thus the region is vulnerable to both extreme precipitation and drought as these can lead to crop failure. However, it is not just the rural areas that are experiencing climate change. For example, the city of Hoogeveen has experienced pluvial flooding several times in the past decade and in 1995 long periods of rain almost flooded the regional water system in the city of Meppel. In addition to extreme precipitation in the more urban areas, heat stress, especially in the summer, is also becoming an increasing problem.



Figure 4. Photos showing different climate impacts in the Fluvius region (Source: Meternieuws.nl; RTV Drenthe).



Figure 7. Extreme weather impacts in the region of Northeast Brabant in the last years.

objective to the climate service that has already been developed for the Dutch National Adaptation Strategy (see Figure 6).

This climate service provides an overview of the expected impacts in the Netherlands (flooding from the main/regional water system, extreme precipitation, drought and heat stress). These impacts are then translated to the regional effects this impact will be expected to have as well as which stakeholders in turn will be affected.

For the risk dialogues, the work of Deltares will focus mainly on testing whether this approach will be useful and fulfils to the expectations and information needs of the local and regional stakeholders. This can then for example result in changing the graphical representation the impacts and socio-economic consequences of climate change within a local climate adaptation strategy.

Partners: end-users and research organizations



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