



## Enhancing the value of climate data - translating risk and uncertainty utilizing a living labs approach

EVOKED is now up and running and has started the process of initiating Living Labs at five case study sites in Europe. The project tailors the presentation and specification of climate data to the user's knowledge and needs, thus enhancing the value of the data. The process of user-driven presentation of data is meant to improve the interface between the climate science community and policy makers with regard to adaptation measures to address the impacts of climate change. The project team engages end-users in a Living Labs approach at established case study sites in Norway, Sweden, Germany and the Netherlands.

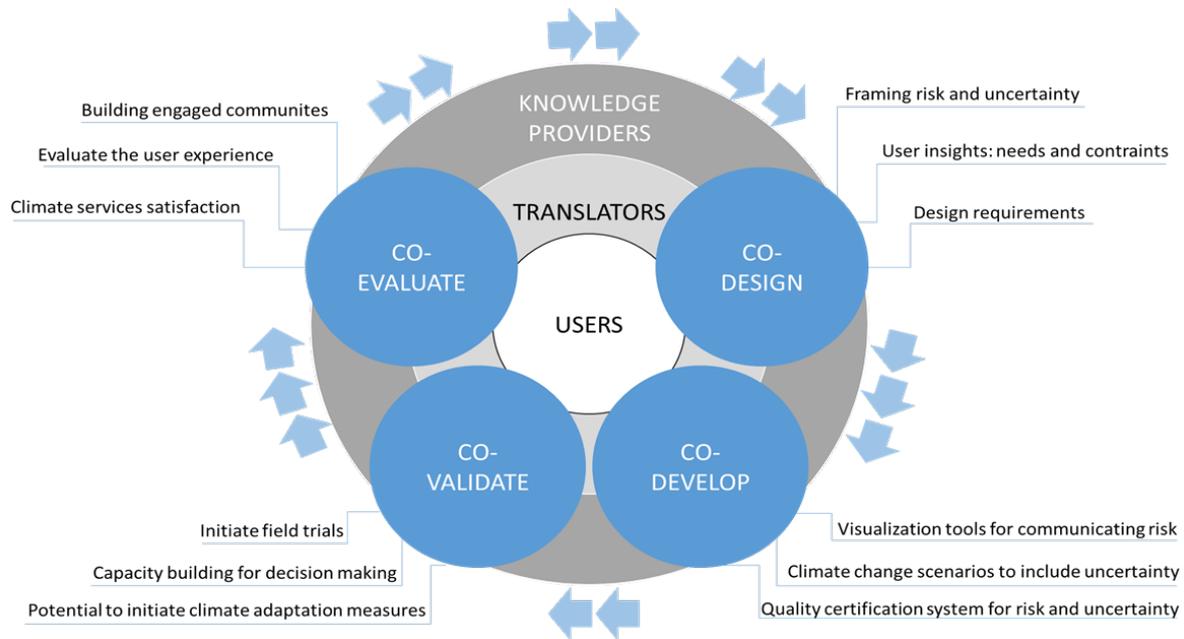
**Climate services** are defined as the transformation of climate products in relation to climate that may be of use for the society at large. The problem facing end-users is not a "lack of knowledge", but rather (i) knowing which knowledge to use and when, as well as (ii) knowing how to deal with risks and uncertainties related to different types of climate knowledge. There is a need to engage knowledge providers, users, and translators to identify improvements to climate services through co-design, co-development, co-evaluation and co-validation. EVOKED aims to address this challenge by re-framing the risk and uncertainty associated with climate data into knowledge products more understandable and useful for end-users concerned with risk mitigation and adaptation.



The city of Flensburg, Germany, March 2018 (photo: Jana Koerth).

**Framework.** EVOKED places an emphasis on integrated transdisciplinary research that creates a bridge between existing climate knowledge (observations, forecasts and predictions, operational products), information translation and the user experience. The project team therefore includes climate knowledge providers, end-users with local, regional or sector-specific expertise as well as translators who operate within climate sensitive sectors and also have experience in facilitating stakeholder dialogue. The Living Labs methodology is a central feature of EVOKED in order to ensure a user-contribution innovation methodology. The method includes the EU's focus on the co-creation aspects of climate services (co-design, co-development and co-evaluation) as well as the co-validation of products and services in real-life environments. Each step in the EVOKED framework methodology adds value to the service chain to generate synergy and innovation with the final result greater than the sum of its parts:

- Beginning with a user-centered design ensures that the needs, wants, and limitations of a potential product or service are placed at the forefront (WP1 Co-Design).
- Transforming design to developing visualization tools and climate change scenarios generates new ideas and encourages knowledge exchange between our partners to better understand risk and uncertainty (WP2 Co-Develop).
- Validating assumptions on climate adaptation measures and their implementation using a collaborative modelling process will facilitate the joint formation of negotiated solutions, increasing ownership and acceptance (WP3 Co-Validate).
- Assessing user satisfaction provides feedback to bridge the process-content gap to improve each step in the EVOKED framework and ultimately help build engaged communities (WP4 Co-Evaluate).



### The EVOKED definition of Living Labs for climate services

Living Labs have been emerging as a form of collective governance and experimentation to address societal challenges and opportunities on many subjects for example urbanization, climate change and health. Living Labs have different goals, they are initiated by various actors, and they form different types of partnerships. Although there is no uniform Living Lab definition, it is important for the EVOKED project to develop a common understanding of what a Living Lab is and how it is bound in time and space. Thus, our original definition of a Living Lab is "...to involve a range of committed stakeholders in real-life 'laboratory' settings to test and develop alternative solutions for complex challenges, such as climate adaptation or risk and uncertainty assessments."



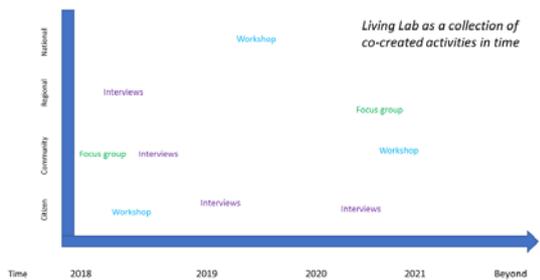
Flood at Lågen in 2015, Larvik municipality, Norway (photo: Larvik municipality)

A Living Lab is an ongoing, iterative process. It is much more than just a workshop or observation of activities, but active participation of various stakeholders in a number of events and forums for the testing and producing a climate service.

Each Living Lab will look slightly for the case study sites different depending on the climate service that will be produced, the problem to be solved, the people involved and the context. However, it will be composed of a collection of activities including workshops, interviews, focus group activities, surveys, policy studies etc. that test how concepts of risk, uncertainty resilience and vulnerability are operative in climate services.

The characteristics of Living Labs include:

- Geographical embeddedness
- Bounded in time
- Experimentation and learning in real life setting
- Multi-method approach
- Participation and multi-stakeholder involvement
- Leadership and ownership
- Evaluation of actions and impacts
- Progress towards the production of a climate service



Example of Living lab as a collection of co-created activities in time (EVOKED Deliverable D1.1).

Key principles that will guide how the Living Labs will be practiced at the different case study sites include:

- Continuity
- Openness
- Realism
- Influence
- Value
- Sustainability

### End-user and multidisciplinary research

EVOKED's end-user partners have a central role in the project with activities tailored to their needs. The end-users have also identified specific areas where EVOKED can enhance the value of their ongoing climate adaptation processes.

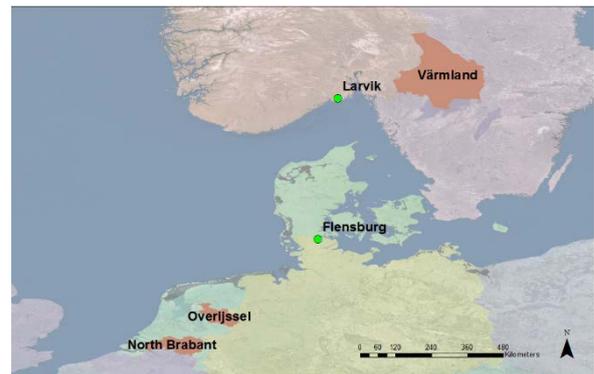
**Larvik municipality, Norway:** The knowledge needs and the perception of risk and uncertainty in Larvik municipality will be further explored to improve the visualization of climate data for the local authorities as well as the community of Larvik.

**Värmland County Administrative Board, Sweden:** Finding ways to communicate the integrated risks associated with a changing climate and bring together different experts in order to improve the knowledge capacity of different target groups.

**Province of North Brabant, the Netherlands:** Improving the access and applicability of climate knowledge by using the experiences and results from the stakeholder sessions in the building of a climate knowledge portal.

**Drents Overijsselse Delta Waterboard, the Netherlands:** Learn how (and to what extent) the collaborating governments are able to shape the preparedness of communities at risk through effective communication strategies.

**City of Flensburg, Germany:** Support in assessing vulnerability and in exploring potential adaptation options that are less engineered and subsequently more acceptable for stakeholders.



Map over the EVOKED case study sites in Norway, Sweden, Germany and the Netherlands.

In addition to the end-user partners, the climate science community is represented by the research organizations involved (NGI, SGI, Deltares and the The Department of Geography at Christian-Albrechts University Kiel). These multidisciplinary partners cover a range of expertise and complementary competencies:

The **Norwegian Geotechnical Institute (NGI)** is a private foundation and a leading centre of research and consultancy on engineering-related geosciences. NGI provides expertise with regard to the technical aspects of EVOKED related to flooding, disaster risk reduction and coastal management, modelling different climate scenarios and GIS capabilities. NGI is project leader in EVOKED, responsible for quality assurance and leader for WP4 Co-Evaluate.

The **Swedish Geotechnical Institute (SGI)** is a national authority with responsibility for geotechnical issues, including landslides, erosion and the consequences of flooding and extreme weather events. The policy-relevant knowledge produced and mediated by SGI

comprises sustainable land use planning, foundation engineering, polluted land / sediments and remediation, as well as climate change adaptation. SGI is leader for WP1 Co-Design.

**Deltares** is an independent institute for applied research in the field of water and subsurface focusing mainly on deltas, coastal regions and river basins. Managing these densely populated and vulnerable areas is complex, which is why Deltares works closely with governments, businesses, other research institutes and universities at home and abroad. Deltares is leader for WP3 Co-Validate.

**Christian-Albrechts University Kiel (CAU)** is a public institution of the German State of Schleswig-Holstein. The Department of Geography at has a long tradition in coastal research, which has been further strengthened with the establishment of the Coastal Risks and Sea-Level Rise (CRSLR) research group of the "Future Ocean" Excellence Cluster. The research of CRSLR focuses on understanding how coastal systems respond to combined pressures from natural and anthropogenic forcings. CAU is leader for WP2 Co-Develop.



Water Nuisance in municipality Hoozeveen, the Netherlands, July 5th 2012 (photo: Hoozeveen municipality).

### EVOKED – project facts

Duration: Sept. 2017 – Sept. 2020 (36 months)

Website: [www.evoked.info](http://www.evoked.info)

Project leader: Amy M.P. Oen

Contact info: [ao@ngi.no](mailto:ao@ngi.no)

Keywords: Climate services, Risk, Uncertainty, Living Labs, Co-design



## Partners: end-users and research organizations



## Acknowledgements: Research funding organizations



*Project EVOKED is part of ERA4CS, an ERA-NET initiated by JPI Climate, and funded by RCN (NO), FORMAS (SE), NWO (NL), BMBWF (DE) with co-funding by European Union (Grant 690462)*