Deliverable D4.1

Lessons learned from the use of various formats for disseminating and communicating climate knowledge

Author(s) and affiliation(s)	Date	Version
Insa Meinke (HZG)	20.12.2019	First Draft
Request for contributions from each case study site	10.01.2020	
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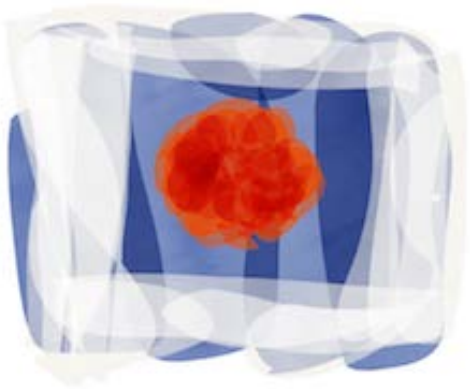

European Research Area for Climate Services

The CoCliServ project benefits from funding obtained through the ERA4CS Joint Call on Researching and Advancing Climate Services Development.

CoCliServ is funded by the following national funding agencies: Agence Nationale de la Recherche (**ANR**), France; Service public fédéral de programmation politique scientifique (**BELSPO**), Belgium; Deutsches Zentrum für Luft- und Raumfahrt EV (**DLR**), Germany; Nederlandse organisatie voor wetenschappelijk onderzoek (**NWO**), the Netherlands; Norges forskningsrad (**RCN**), Norway.

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1 Introduction

This deliverable D4.1 reflects on the lessons learned from the use of formats and modes for representing, disseminating and communicating climate knowledge in the different case study sited of CoCliServ.

At the beginning of the CoCliServ project, Milestone M4.1 and in particular Deliverable D3.1 (Gerkensmeier et al. 2018), provided a detailed overview on existing climate service formats. These overviews of climate services and their providers were compiled for the five local CoCliServ case studies to support their work on site during CoCliServ. Different available modes of representation and science mediation formats were collected and discussed as potential formats for CoCliServ activities. In this deliverable, the practical experiences of applying these different formats in the case studies and work packages are collected.

Leading questions of this feedback collection are:

a) What types of mediation formats have been applied from those, described in D3.1 (Gerkensmeier et al. 2018)?
   In which context were they applied and what for?
b) What experiences have been made under the individual, local circumstances?
   Was there any feedback from the audience / stakeholders? What worked well? Was something missing?
   Did you achieved the expected goal by applying the chosen method / format?
c) What are the key findings? (summarize the outcome in 1-2 lesson-learned sentences)

2 Dordrecht

2.1 Regional climate services reviewed in D3.1

Two climate service providers offer a considerable amount of climate services: the Climate Adaptation Services (CAS) and the Netherlands Meteorological Institute (KNMI). They focus on data and text based products, whereas dialogue and educational formats are rare (see D3.1 Figure 5 and Figure 10 Annex, (Gerkensmeier et al. 2018)). There is extensive climate information available on national and regional scale. Climate variables such as temperature, precipitation, wind, sea level, and river discharge are well-studied variables in both past and future. Water management (coastal and inland) is a major facet addressed on the national, regional and local level. This information is predominantly provided in the form of web applications and text-based services. These services are often long-term services, maintained continuously. In addition, local investigations for the Rijnmond-Drechtsteden Region (including Dordrecht) have been initiated already, focusing on impact and problem analysis in the area. This information is available as 'text-based product'.

2.2 Lessons learned according to the described climate services

During the case study work in Dordrecht (local & regional) and Vogelbuurt neighbourhood, we used text based (particularly climate scenario and impact studies and policy documents), web based (particularly the Dutch Climate Impact Atlas[1]), data based products (KNMI national & regional data; weather & climate stations near the city), as well as photographs, and physical and digital maps. These were used for early identification of relevant climate-related issues for Dordrecht and Vogelbuurt, and as background and backup material that could be used during interviews and workshops. We developed four new tools/formats, specifically for use in the scenario workshop. KNMI developed an Excel tool (with basic user interface and visualisations), based on KNMI regional data and national scenarios, in which users could tailor the format in which the data was presented. CAS developed a web based

[1] Dutch Climate Impact Atlas: http://www.klimaateffectatlas.nl/en/

tool, based on the Climate Impact Atlas, that allowed the user to overlay maps of climate impact projections and vulnerabilities over a satellite view of the Vogelbuurt neighbourhood. Studio Lakmoes designed a dialogue/educational visualisation format of three 'typical streets' and several cut-out leaflets with various elements that linked with climate vulnerabilities and adaptation options. Utrecht University, Studio Lakmoes and CAS designed a workshop format (dialogue/educational) that facilitated participants in reflecting on climate vulnerabilities, adaptation visions & options, and potential (climatic, policy and other) surprises.

Text based formats were used primarily to identify and provide evidence for which topics might be relevant for the city and neighbourhood, e.g. precipitation-related flooding, drought, soil subsidence & groundwater, et cetera. These allowed for little interaction. They were used more to provide argumentation and scientific backing for choices than deeper reflection and learning. Photographs, physical and digital maps, as well as physical artifacts in the environment (e.g. floodstones) were used to zoom in on specific vulnerabilities, local peculiarities and locations, and historical linkages. This material was more engaging to policymakers and residents, and they were often the ones providing the material (rather than the researchers involved) and using it as storytelling and sense making devices in their interactions with researchers. Web based tools, particularly the Climate Impact Atlas and similar tools, were used extensively by the policymakers to highlight local vulnerabilities and spatial patterns (e.g. differences between neighbourhoods and on street and building level). Policymakers used such tools both in their own daily work and in the conversations with researchers. Data was used in a much more limited extent, in discussions between researchers involved (e.g. KNMI, CAS, UU) and to develop other tools.

Among the new tools, we noticed that KNMI's databased Excel tool was very much appreciated by the policymakers. The standard KNMI climate scenarios present various data in the form of 'key figures', such as 'daily amount of precipitation (mm) that is exceeded once in 10 years', 'number of wet days (equal or more than 0.1 mm)', or 'maximum hourly precipitation per year (mm/hour)'. Policymakers noted that this gives an interesting indication, but for the local situation, more specific information is needed. Dutch municipalities often have a high level of technical and

engineering expertise, particularly on water management (water safety, sewer systems, green spaces, building codes, etc.). Policymakers were quite well aware of the levels of precipitation that led to specific places in the city flooding – leading to questions of e.g. how often is x mm/hour exceeded? Using the Excel tool, they could ask it to provide such locally relevant numbers and they noted that they had been looking for something like this for a long time. The CAS web based map tool on the other hand was very much appreciated by the residents. For the policymakers this was well-known information, but for residents it was new but at the same time very recognizable. E.g., they knew specific houses were older and had wooden foundation piles or low-lying gardens that often flooded, and the mapping tool sparked stories and conversations between residents, policymakers and researchers. The visualisation format and workshop format developed by Lakmoes, UU and CAS similarly helped spark conversations on local vulnerabilities, options, potential surprises and knowledge needs. This will be described in detail in deliverable D2.2.

Key observations include: (1) policymakers quite liked online and map-based formats that showed spatial differences (can be used to identify weak/vulnerable spots and set priorities) and data that can be easily tailored into formats that link directly with the local situation and local processes, and (2) residents appreciated mediation formats that were easily recognizable, such as photographs and local maps that could be linked to their experiences and knowledge of their neighbourhood.

3 Jade Bay

3.1 Regional climate services reviewed in D3.1

All common formats of climate services are available for the Jade Bay region. Many of them are data or text based products but also advisory and dialogue orientated services are offered, as well as data provision. Major providers of climate services located in Northern Germany are the Alfred-Wegener-Institut (AWI), the Climate Service Center Germany (GERICS) and the Northern German Coastal and Climate Office (Helmholtz-Zentrum Geesthacht). However, only the latter provides a substantial amount of localized climate services for the Jade Bay region. Climate information in the Jade Bay Region is available at the regional level of 50 km down to 0,1 km. Mainly text based climate service formats and operational web tools enable a comprehensive study of climate variables (temperature, precipitation, wind) and derived parameters (drought periods, heavy rainfall days etc.). Information is available for the recent past decades and projected in the future for this area until 2100. Moreover, scientific impact analyses for different sectors (e.g. agriculture, tourism, inland and coastal waters, coastal protection) were also emerging from regional research projects but are not transformed into particular information or service formats.

3.2 Lessons learned according to the described climate services

The Northern German coastal- and climate office, located at the Helmholtz-Zentrum Geesthacht, has been established as a long-term contact point for the public. At the beginning, this contact point had two main tasks: to answer individual user requests from the public and to provide a back-up consultant for stakeholders who need to deal with regional climate change in their job or in other areas of their live. Moreover, a major contribution of the work is providing an overview on regional climate change in Northern Germany or a certain sub-region, often with focus on a certain issue defined by the requesting stakeholder group. This dialogue process has been continued during CoCliServ. Among the more than 2000 registered users, about 7% are located in the Jade Bay region. They can be assigned to eight different

stakeholder groups: interested laypersons / citizens (20%), scientists (18%), education (18%), economy (17%), public authorities / agencies (12%), media (9%) civil society organizations (4%) and politics (2%). Within CoCliServ, various local climate service formats have been published and used. They are publication based, data based and dialogue orientated.

The Northern German coastal and climate office has contributed to about 27 stakeholder events in or with spatial references to the Jade Bay region. Contributions to stakeholder events have been mainly requested by educational institutions with ecological and environmental focus (6 events). Moreover, several contributions were given to stakeholder events from economy, civil society organizations and science (5 events, each). According to the requesting stakeholder group, particular fields of interest were energy supply, coastal protection and shipping. However, about half of the requests from these groups were about a general overview on regional climate change since their aim is to continuously provide lectures on current social relevant topics and activities. The events requested by public authorities / agencies had a clear focus on coastal protection and adaptation to regional climate change (four events) whereas the events organized by politics and media (one event each) were aiming at a general overview to regional climate change.

Besides the contributions to these various stakeholder events, several individual requests have been answered. The media is the largest requesting group here, mainly looking for an interview partner who is able to contextualize the actual (extreme) weather to climate change. Moreover, the print media is often requesting figures based on specific data analyses. This individual data analyses is also requested by science and public authorities, whereas students ask for a general overview and further information material. Through this ongoing stakeholder dialogue in the Northern German coastal and climate office, it was possible to identify returning information needs and service demands. Two main clusters were identified, one is on understandable summaries regarding regional climate change and methodical aspects; the other is on specific analyses of regional climate data regarding relevant parameters their actual state as well as their recent and possible future changes.

Based on peer-reviewed articles, the challenge for text-based products is that scientific knowledge is widely scattered on local scales. Thus, the Northern German coastal and climate office has coordinated mini IPCC like regional climate assessment reports. In 2018, the second Hamburg climate report has been published. The report documents systematically the findings on climate change in northern Germany that have been reviewed and published in peer reviews journals. The assessment report localises consensus and dissent regarding climate, climate change and climate impacts in Northern Germany and derives further research needs. All book chapters have gone through a review process. The second Hamburg climate report represents the central basis of scientific knowledge on climate change in Northern Germany and thus for the focus region Jade Bay. The report has been published as book at springer and has been downloaded more than 140.000 times, so far. Both Hamburg climate reports (von Storch et al. 2011 and 2018) have served as important scientific bases for the stakeholder dialogue in CoCliServ and various understandable summaries have been compiled on this base. These are e.g. on the interpretation of regional climate scenarios and their application in practice and on North Sea storm surges on the backdrop of climate change. In the Jade Bay region, about half of the booklet orders were made by interested citizens, whereas the other half was ordered by people from science, economy and public authorities.

Moreover, several web tools have been used during CoCliServ for the case study site Jadebusen. According to users' requests, specific data analyses was required referring to different time frames. Thus, different web tools were developed using different kind of climate data served as bases (observations, reanalyses and regional climate scenarios until 2100). For the climate state, the recent climate change (and variability) within the past decades, we combined several hindcasts with observations from the German weather service (www.norddeutscher-klimamonitor.de; Meinke et al. 2014). For possible future climate change, we analysed all currently available regional climate projections, which are currently available for Northern Germany (more than 120). Depending on future greenhouse gas emission, possible future climate changes are analysed for the parameters described above for northern Germany (www.norddeutscher-klimaatlas.de; Meinke and Gerstner 2009). Since water levels are of particular interest with regard to the need of coastal defence our

website, www.kuestenschutzbedarf.de shows an interactive map of the need of coastal defence at German coasts at three situations: 1) at normal tides today, 2) during storm surges under present climate conditions and 3) during storm surges under possible future climate conditions. Users may enter their address to explore if they live in an area where coastal defence measures are already effective or if there will be a need of coastal defence in future. (www.kuestenschutzbedarf.de; Weisse et al. 2015). About half of the coastal and climate office users in the Jade Bay region have registered for these web tools. Most of them (57%) registered for the climate atlas, about 30% for the climate monitor and 13% for kuestenschutzbedarf.de. About 70% of the web tool users came from three large groups: citizens, education and science. About 23% of the users are from public authorities and economy. The remaining 7% of the registration were from civil society organizations and the media.

Summarizing, all common formats (web tools, stakeholder events, individual requests and text-based products) are requested and used by the known Jade Bay users of the Northern German coastal and climate office. A stakeholder centred quantitative analysis suggests that most stakeholder groups are mainly requesting the provided web tools and stakeholder events. Stakeholders from politics and media are exceptions, here. According to the analysis, for the media is the most used format is the option for individual requests. Stakeholders from science, economy and public authorities are requesting all provided formats, whereas according to the quantitative analysis the stakeholder group of citizens and civil society organizations are only requesting two from the four main provided formats. For the civil society organizations, these are web tools and stakeholder events, whereas for the citizens these are web tools and text based products. A deficiency of these quantitative analyses is that several processes remain hidden. For example, many text based products are distributed from external institutions (e.g.) museums or they are requested and distributed during the stakeholder events; however these processes were not traced and, thus cannot be analysed. Similar hidden processes exist according to the web tools. Many registrations for the web tools are related to stakeholder events or articles in newspapers. The shows that although there are fewer request for stakeholder events and individual requests of the media the range

of influence of one request of these formats can be much larger than a single web tool registration.

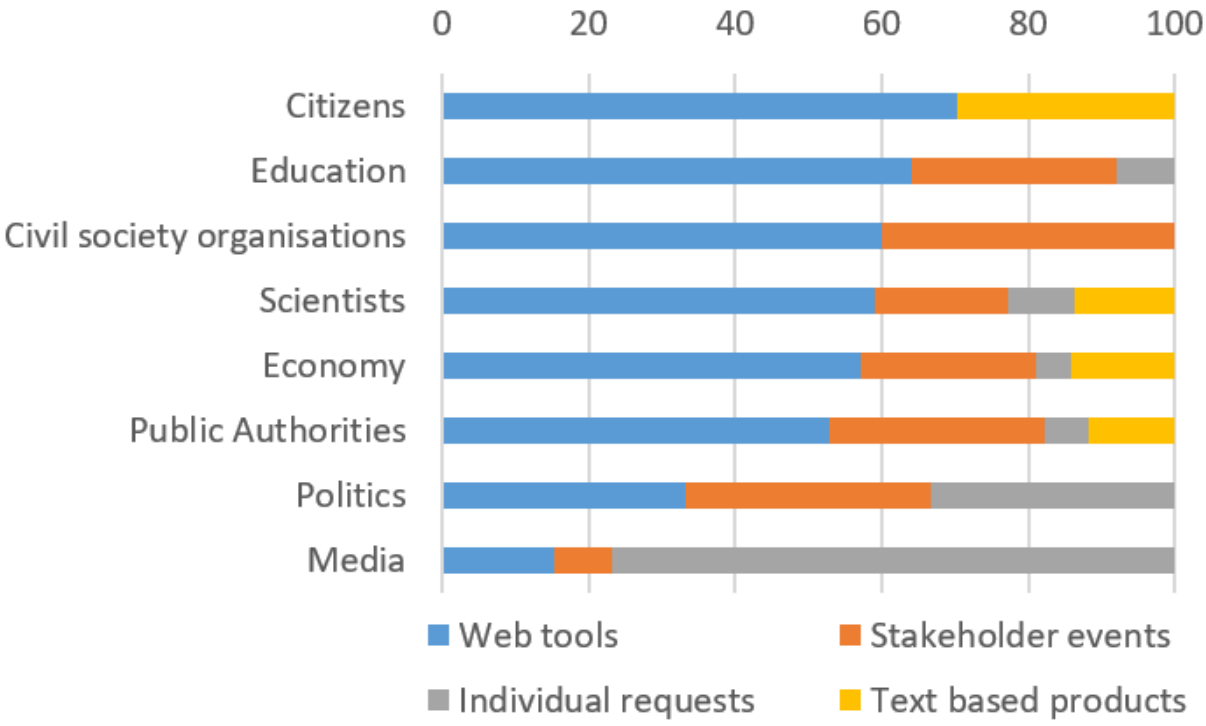

Figure 1: Requested information formats from the perspective of single stakeholder groups

It can be concluded that all formats are needed and fulfil certain purposes for the different stakeholder groups of the Northern German coastal and climate office. Although no further formats were explicitly requested, it cannot be excluded that they would be requested if they were available.

4 Bergen

4.1 Regional climate services reviewed in D3.1

Climate services investigated for the Norwegian case study are provided by a mix of providers. The Norwegian Climate Service Center (KSS) plays an important role as provider, in particular for climate change information on the national level. The inventory on climate services for the Norwegian case study showed a concentration of information provision on the national and partly on the regional level. Local contextualisation, many in terms of downscaling activities of climate information to the local scale and related climate service products processing this information for a local discourse, is scarce. Downscaling is commonly used to obtain results with a spatial resolution of 25-50km. With regard to the question how currently available information on climate change (in this case, at national and regional level) is processed and communicated, the inventory highlights the use of predominantly data and text-based products in the current Norwegian landscape (D3.1. Figure 5 and Figure 12 Annex (Gerkensmeier et al. 2018)). Most of these national and regional services consider climate changes in the 20th and 21th centuries, by addressing the inter alia the parameter of temperature, precipitation, wind speed. A lower proportion of the climate services under investigation here, focus on the future impact of changes and extremes on sectors of the society in Norway.

4.2 Lessons learned according to the described climate services

Climate knowledge from local climate service providers and climate researchers has informed our mapping of narratives of change (D1.1 and D1.2) and the background material for the scenario workshop in March 2019 (D2.2). In addition, a “Bergen anno 2100” poster, based on input from climate researchers at NORCE (Norwegian Research Centre AS), was prepared for our stand at “Forskningstorget”, a science festival for children, in September 2019, where we juxtaposed old, new and creative ways of knowing the weather, seasons and climate (WP4).

In October 2019 a Phd-course on 'Co-producing climate adaptation research´ was organized by Scott Bremer together with Erik Kolstad from the Bjerknes Centre for Climate Research, and with The Norwegian Climate Services Center as a partner (WP4). The autumn school was partly based on CoCliServ research.

Finally, as a case study for the Knowledge Quality Assessment (KQA) guidance framework, developed for CoCliServ by Scott Bremer and Jeroen van der Sluijs (D5.1), we are investigating Klimathon Bergen (M5.4). The Klimathon is an event gathering planners from different state levels (local, regional, national) and climate scientist to work together on concrete problem-solving for two days, using a "hackathon" type model. An important aspect of this is for the planners to learn more about climate science, and for the climate scientist to learn more about what type of knowledge planners and government need in order to develop efficient policy for climate adaptation. The main climate service providers in Bergen and Vestland county are involved in this event.

In our analysis of references to climate change in public narratives of Bergen, we distinguished between narratives inside the Bergen climate governance network and narratives in the broader public sphere. In both spheres we found a self-image of Bergen as a climate science city. Within the scientific network "there are moves to further Bergen's status as a global center for climate research" and the municipality "commit to integrating more science into climate governance" (D1.1, 43-45). In the wider public narratives, we found climate change and references to climate science to have a strong presence and to be built into the ways people talk about the weather in Bergen (ibid., 45.). News from geophysical research on climate change conducted at the University in Bergen is often covered in the local newspapers, and The Bjerknes Centre for Climate research's contributions to the IPCC reports is also noticed (D1.1 p.45, D1.2 p. 54). In the scenario workshop, we found that "all three groups saw climate sciences and related disciplines, as an essential dimension to their vision of Bergen in 2050, under climate change" (D2.2, p. 15).

At our stand at Forskningstorget we introduced the children first to the traditional Norwegian "primstav". The primstav is a type of calendar that was in use in Norway up until the 19th century. The primstavs was made of wood and marked with one line

for each day and engraved with images and symbols. The images depicted the different nonmoving religious holidays as well as important days like solstices and celebrations. The primstav would also highlight days connected with different activities for different parts of the year and give note of when to start or end different types of work, especially in farming. Then we would ask the children to make, by drawing on a primstav paper template, their own primstav for their own lives with important days and seasonal activities. During this, we would also show them the “Bergen anno 2100” scenario and discuss if they would want to change any of their seasonal activities in the future. The exercise was meant to start reflection on what climate adaptation could mean in their own lives and as a way to make the future climate information meaningful for them.

The case study for the KQA guidance framework is currently ongoing. We are interviewing both climate scientist and climate service providers, and local and regional planners working with climate adaptation, about their experiences with the Klimathon events. We are having interesting conversations about what constitutes a “climate service” for these groups, what characterizes a high quality climate service, and how to improve local climate services and climate adaptation. The interviewees so far have highlighted how the Klimathon can be an important contribution to this locally.

We have found a strong recognition of the importance of climate science and research, and support for local climate services, in both the weather-related and place-specific narratives of climate change (WP1), in the scenario workshop (WP2), in our outreach and dissemination activities at the science festival and the phd. course (WP4) and from the Klimathon case study (WP5). At the same time, and this was especially present in the scenario workshops, the issue of concrete actions for climate mitigation and adaptation we can do ourselves locally seems to be the more pressing issue for those we have been in contact with in relation to this project, rather than a focus on more and more detailed climate science. In addition the scenario workshop brought three broad insights for re-thinking climate services, that i), climate information needs are rarely packaged as carefully-defined research questions; ii) there is a need to mobilize diverse knowledge systems, and iii) climate

services should be more broadly constructed than as a scientific product, including as a social process or arena (D2.2, p. 23-24).

5 Gulf of Morbihan and Kerourien in Brest

5.1 Regional climate services reviewed in D3.1

For Brittany (France), Météo-France and IPSL are the two most important climate services, providing plenty of data and research media, involving ample content at local spatial scale. Data based products and text based products are well represented. The spatial resolution of the information provided ranges from very coarse (160 km to 50 km) to high resolution (25 km to 8 km) and most studies examine the 20th and 21th centuries. Major variables and derived parameters that are investigated in these services include for instance the temperature, rainfall, droughts and flooding. Two providers, namely the 'Brittany Environment Scientific Council' and the 'Scientific Council of Environment in Morbihan', already provide (regional) climate information for the particular study areas considered in CoCliServ. In this context, several activities specifically focus on the regional impact of extreme events (e.g. effect of droughts on soil water variability for agriculture) and coastal risks induced by extreme storm events are considered. In the French case study, we identified significantly more services tied to project duration in contrast to the others where most of the services are characterized as long-term activities.

5.2 Lessons learned according to the described climate services

Gulf of Morbihan

The identification of the regional climate services mentioned above was extremely valuable for the project. Interdisciplinary work was carried out upstream and downstream. The first fieldwork (February 2018) done by Charlotte da Cunha (social science) and Florentin Breton (climate science) permitted the interview of inhabitants of the Gulf of Morbihan, representing different economics sectors of the territory, in order to better understand how climate variability and changes play a role in their life and the issues or questions that they might have. This led to a preliminary

identification of local climate information needs, which were later used in a subsequent fieldwork carried out in March 2019, which further advanced the identification of such needs expressed by consulting a larger group of local stakeholders.

After identifying the regional climate services and the local climate information needs, we used the regional climate services in the incremental scenario co-construction process. We chose 2200 as a future timeframe to design a very long-term physical scenario with visible climate change impacts and to avoid preferences of stakeholders for short-term issues. This choice was driven by the geo-social narrative, which questioned the impact of the rise in sea level during the Flandrian transgression, since 10,000BP (Before Present). A foresight workshop was organized in March 7th, 2019, gathering twenty local stakeholders, to reflect collectively during a three-hours participative activity on a long-term vision for the Gulf of Morbihan. The climate information available from the climate services described in D3.1 (Gerkensmeier et al. 2018) was used to complete the future physical scenario with regional information on future precipitation, extreme events, seasons, temperature, sea level. This physical scenario was presented before the foresight activity in order to provide elements of boundary conditions (e.g. what is likely to happen or almost impossible in the future) in the design thinking.

To facilitate this foresight exercise we devised specific tools to encourage participants to consider multiple possibilities for the future of the territory. Adopting 2200 as a time horizon allowed to derive a map of the future coastline of the Gulf of Morbihan based on model simulations of future sea level rise by Kopp et al. (2017). The physical scenario considered 1 mm per year of local subsidence (based on regional geological studies), a mean temperature increase of 6.5°C (based on estimates from the IPCC, 2014), and a conservative (yet realistic) estimate of 2.5 m rise in sea levels (based on the mean value of the Kopp et al. 2017 model: K14 – RCP 8.5). The online visualizing tool “Climate Central’s Surging Seas” was used to represent the future coastline according to an increase in sea level by comparison to the present perimeter of the territory (including the local infrastructure e.g. cities and roads), and a map of the possible future territory was designed by the local designer Marianne Cardon using Illustrator®. This map of the possible future coastline was

essential in allowing the stakeholders to think about the future of the territory (Figure 2).

To put the future sea level rise in context, we illustrated the past coastline evolution with maps from geologists showing the 90-meter sea level rise over the past 15,000 years. These maps show that Vannes was several tens of kilometres inland and Belle-Île-en-Mer (an emblematic local island) was once an inland hill. To put the future warming in context, we compared the possible future seasonal temperature to the present one of a southern city with warmer climate. These illustrations of the possible territory in 2200 (coastline and seasonal temperature) helped establishing what the forthcoming geo-social narrative might be.

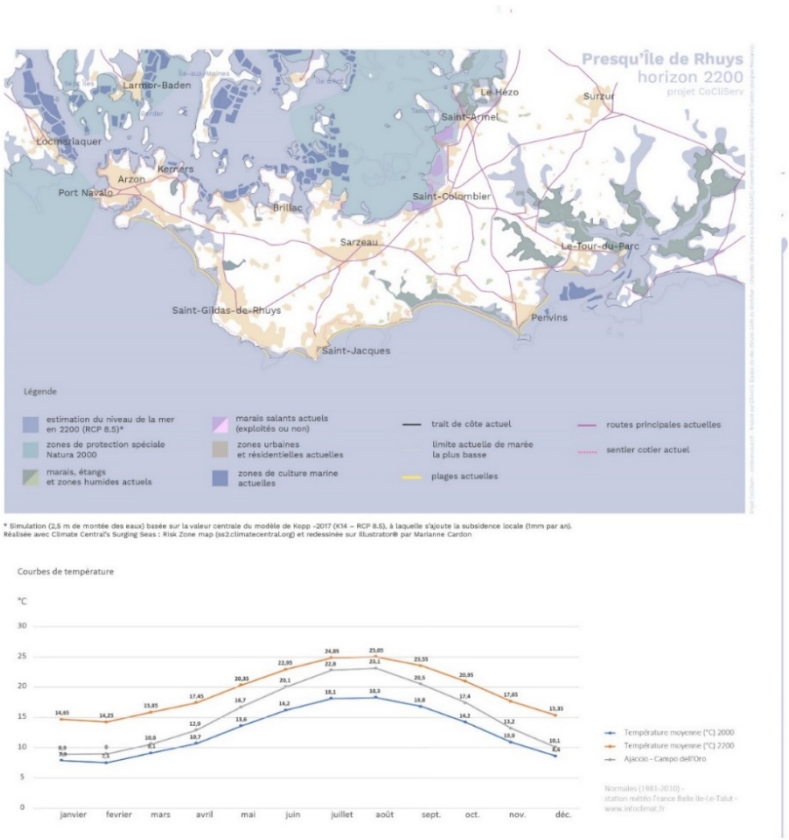

Figure 2: 2200 physical scenario map of the Rhuys peninsula (Elaborated by Marianne Cardon)

The regional climate services were also presented to stakeholders during the 2019 field interviews (February, March and December). The local actors did not know these services existed (despite their online accessibility) but showed a keen interest in the information especially regarding the short-term future (seasonal forecasts).

The choice of using 2200 as the time horizon for the foresight thinking involves both advantages and disadvantages. One main disadvantage is the large part of unknown and uncertainty. However, a main advantage is that the timeframe allowed the participants to overcome current restrictions and to propose innovative, even disruptive solutions. On the other hand, we presented a timeframe for which close generational links were no longer the main motivation for change (stakeholders' children, grandchildren or even great grandchildren are not likely to be alive to experience this imagined future). Reactions to this proposal were mostly positive, although some of the interviewees considered this exercise as "too abstract" and the long-term nature of this reflection to be anxiety inducing. This anxiety could be both because the reflection about the future moves beyond the timeframe of individual human-life (some participants reacted negatively to this timeframe, particularly the oldest ones), and because projecting far into the future was considered a challenging task by some stakeholders due to uncertainties related to current environmental and climatic changes. However, this negative perception decreased during the foresight workshop, probably in relation to the collective dimension of the activity and to the elements offered as creative supports. The participants quickly integrated the principles of the foresight activity and began to think long-term, freeing themselves from the present.

In terms of missing mediation formats, we had identified during field interviews (before organizing the workshop) that a few people in the Gulf felt a change in the seasonality of the weather, and that it impacted their activity. However, we found very few papers on the topic and no climate service to illustrate past and future changes, which was disappointing for preparing the workshop.

The collaboration between social and climate scientists allowed researchers to communicate a coherent vision of the issues at hand composed of climatic and socioeconomic dimensions to the participants. This set the tone of the collective discussions during the workshop and, as a result, the needs for climate information started to emerge from the joint approach of narratives and incremental scenarisation. The collaborative approach also facilitated the co-development of desirable visions and adaptive actions.

Kerourien

In relation to the Science mediation formats in Kerourien, seven main mediation formats have been used to date for dissemination and communication through CoCliServ task 4.1. These mediation formats have been applied, rooted in D3.1 (Gerkensmeier et al. 2018) results and beyond.

The seven main mediation formats are:

1. Slides with available climate knowledge related to the global and regional area. These have been used as an introduction before interviews with some key stakeholders.
2. Presentation with the CoCliSev aim and intentions during a day-long workshop where local stakeholders shared their individual points of view to build the collective one;
3. Leaflets with the project and relevant local information;
4. Regular stakeholder meetings during the first 15 months of the project;
5. Newspapers and radio news;
6. Posters for general society;
7. Scientific-standard production in conferences and a submitted paper.

Others formats used fit better with tasks 4.2, 4.3 and 4.4, mostly the art forms, and are detailed in the corresponding deliverables.

The experiences and key findings made under these particular local circumstances reveal that the available information reviewed in D3.1 (Gerkensmeier et al. 2018) does not reach local stakeholders; inhabitants do not seem to be consciously aware that the information has reached them; the information generated at international, national and regional levels seems to be far away from locally controllable climate-related trends, challenges and desires. We identify here a first gap we need to fill with further climate services. Stakeholders and the population are receptive to the information when it is shared via the mediation formats we used, but they do not seem to know how to connect this information with their daily lives, nor how to connect the information with their locally controllable concerns.

From the above points 1.-7., with the work still on going for Tasks 2, 3 and 5 where other mediation formats could be used, we already see local stakeholders and inhabitants are sensitive to points addressing their local short-term concerns, like the humidity of some parts of buildings, or social justice and migrations. We find the gap between available information reviewed in D3.1 (Gerkensmeier et al. 2018) and local concerns is too large to allow local communities the chance to operationalize it. Tools used such, as leaflets, posters and social media are clearly necessary but not sufficient. Insofar as part of our responsibility is to be explicit and share information, and recognizing the inhabitants and stakeholders like to have this information, it is not enough to solve the locally identified climate-related challenges as described in D1.1, D1.2 and D1.3. We reach a very similar conclusion as with science-based peer-review mediation formats such as conferences and papers; addressed to our own community, they are useful pieces of work but clearly, they are disconnected from local communities' codes and standards for daily life.

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