

Chat from the webinar on visualization of information on climate and climate change with answers from the speakers

May 14, 2020 2:28 PM: Slide with information of summer precipitation in the future (there were maps too): 2050 represents one exact year or an interval just like the reference period?

Bernadet: It's an interval: 30 years around 2050.

May 14, 2020 2:30 PM: do you conduct activities with stakeholders to co-design products? How are those activities/?

May 14, 2020 3:22 PM: very interesting presentation about how to get ensure uptake of knowledge: do you try to connect actively in your stakeholders venues, like conferences of energy providers, their umbrella organization's meetings etc.?

Bernadet: We conduct many stakeholder activities, both for the last climate scenarios which we published in 2014, as for the coming products which will be released in '21 and '23. We have a user feedback group with representants of many different user groups. They give feedback on the different products, like the website and the brochure. We also have many workshops with the broad group of users. Sometimes we have a workshop for a specific group, for example about health issues, for the policymakers at the ministry of infrastructure and Water Management, or specifically for the engineers and advisors working at the executive agency responsible for the design, construction, management and maintenance of the main infrastructure facilities in the Netherlands.

Sometimes we set out broader surveys in which we inventorise user requests among the attendees of our Climate Newsletter (about 1000 attendees). And we are in close contact with research groups on the subject water and climate via: <https://waterenklimaat.nl/en/about-nkwk/>

See also p. 11 in the background doc of the climate scenario's '14 about user requests: http://www.climatescenarios.nl/images/KNMI_WR_2014-01_version26May2014.pdf

This article might also be interesting to read about user-inspired climate scenarios: The social and scientific values that shape national climate scenarios: a comparison of the Netherlands, Switzerland and the UK (Maurice Skelton et al): <https://link.springer.com/article/10.1007/s10113-017-1155-z>

Isadora: coproduction of knowledge is key for climate services. In early stages the main activities to understand needs and requirements are remote ones like surveys, interviews or focus group workshops. When the concept is more clear co-design requires closer interaction so we try as much as possible to engage stakeholders in the development. In the case of S2S4E some energy stakeholders were part of the project so all their time was paid, this helps them to be able to devote more time to help you. Also once you get the first concepts of a service and you have a prototype there may be rounds of activities to engage with more stakeholders and gather feedback, in a more informal way (one-on-one meetings, discussions in conferences) or with proper user testing of a prototype (e.g. the test shared in the third example)

In general sectorial conferences/fairs are the place to go, otherwise climate knowledge remains within the field of climate science. The first service I

presented was shown in E-World in prototype phase and once launched, also in Windeurope and other events. Events from Umbrella organisations are also a very good place.

May 14, 2020 2:30 PM:I have a question about example 5: the upper right photo was a good example of a kind of image that performs well, but I missed what it was that performed well

May 14, 2020 3:18 PM:the idea one gets is that there is something wrong there, a sledge should run on ice

May 14, 2020 3:19 PM:so the implicit message is to suggest (unusual) melting

May 14, 2020 3:19 PM:I agree with Paolo it's misleading, you can say it's normal but the title on the picture was about IPCC reports, so climate change is implied.

May 14, 2020 3:20 PM:I teach climate change at university, and this is a recurring problem for me, to find effective images, that are accurate at the same time

Bernadet: We show a real person, not a staged figure. Authentic pictures intent to score higher in credibility (according to the 7 principles of climatevisuals.org, which are based on research): <https://climatevisuals.org/evidence-behind-climate-visuals>

May 14, 2020 2:30 PM:were the regional translations of climate scenarios docs tested? are they well understood and received by the public?

Bernadet: No, the regional translations were not specifically tested. We made them in order of local water boards or governments and they were very enthusiastic. I did present them on congresses and workshops where I got new requests for translations like this. They are not only meant for the general public but also for the directors of local governments. For them we gave presentations (local climate top meetings) on which we did get direct positive feedback, that the regional translations did give more urgency for action.

May 14, 2020 2:30 PM:For decisions makers and politicians ... do you have special approaches?

May 14, 2020 3:06 PM:and the message to politicians should be different?

Bernadet: We don't have real different products, but do have different approaches and messages if we organize a workshop or give a presentation for one or another group.

Isadora: Each type of audience has its own key messages, preferred channels and more specific material they are used to work with. For decision makers and politicians our most common approach is to prepare "Policy briefs" for the implications at policy level of the research findings of a particular part of your work. Also "Science summaries" are sometimes useful (a one-page summary of the key findings of a research or paper that could be relevant for decision makers). There are specific events and conferences with policy focus, it is good to be in the one related to your field. And in general, most importantly to partner with research institutions specialized in policy advice as they know much more. I add here some useful examples: [Future Earth's 10 insights in climate science](#),

Inside this document each of the white papers inside is an example of policy brief about issue and recommendations ([EU-PolarNet White reports summaries](#)), or [Climateurope recommendations on future research needs for Horizon Europe](#).

May 14, 2020 2:31 PM:interest aspect of the challenge of picking the right picture - the example of Greenland sled seems indeed misleading. It's a recurring problem

Bernadet: It's indeed a recurrent problem and has nothing to do with climate change. You did convince me that it might be misleading, although we didn't say it was presenting climate change, it's suggesting it because a sled is not supposed to be on water. It's a real challenge to find good pictures which are strong/ eye catching and don't give the wrong impression/ are too depressing / give too few urgency or have been used too many times (like polar bears).

May 14, 2020 2:41 PM:I like the tool, but why do you require people to register for your decision support tool? It increases the barrier to entry quite a lot... You should really consider providing a no-registration demo to ease people into it.

Isadora: We discussed it internally as we also had the concern you comment. Finally we opted for registration. In order to learn about the tool we needed insights about how many people were using it, their fields of interest (we knew that non-energy people could also be interested). It was a major challenge to put this tool in operational and we needed to know who was using the tool to be able to inform them about upgrades in the tool or incidences in the operation. Also when discussing with energy stakeholders having a log in was not a barrier for them, what's more, somehow they indicated that this gave them some perception of robustness and of this being a system that someone was maintaining.

May 14, 2020 2:47 PM:This is a great tool (clean energy). Is your conclusion about "interactive UI" mainly true for educated users (such as the energy specialists)? Do you think that it could be too complex to use for a broader spectrum of users?

Isadora: We have a paper in preparation about this. We tested the interactivity of the DST with non-experts and the performance was much better that using a static version. So Interactivity is key feature for any interface. The tool in general is highly technical, particularly if you expand the detailed panel that appears in the right. But although it has a bit of a learning curve, reading the map (not other parts of the detailed panel) should not be a problem for broader audiences.

May 14, 2020 2:50 PM:Your web portal (especially the map about Europe with the big and small dots) looks great! I would like to know more about the technical details, for example which web framework are you using?

Isadora: The tool is implemented in Angular. The hurricanes page is implemented in Drupal with specific developments in html for the homepage. The journalists application is not developed yet, but most probably will be developed using React. If you are interested in learning more please contact me directly.

May 14, 2020 2:58 PM:How are you getting these amazing tools out there? What channels of communication are you using to engage the users?

Isadora: Ideally you launch them with at least a press release, social media campaign and if possible a physical launch aligned as a side event in a relevant event for your target audience. But each project is different so we have to adapt. To give visibility to them we organize webinars with hands-on sessions, we present it in workshops and we have active participation in relevant events for the target audience. For S2S4E we had a stand in E-World the year before and after the launch. E-World is the largest event for energy traders so it was worth investing in time to be there. We also give talks or posters in conferences with the target audience (e.g. Windeurope). Then one-on-one meetings are important to engage new users. There are many small activities that help.

May 14, 2020 3:00 PM:Isadora - really enjoyed your presentation, very impressive portals/tools! Question - roughly how many people do you have working on projects like these? Developers, Communications team etc... Thanks!

Isadora: Many and with many different profiles! It depends on the project and the budget we have. For the Energy platform we had very different profiles working on it: Climate scientists, Science communication experts, a User Experience researcher, a Data visualization expert, a Designer, Front end developers, Back end developers, a Data architect (to define the databases behind) and Computer scientists specialized in data processing. I think I have not missed anyone. For the Hurricanes web, instead, we were 2 climate scientists, 2 science communication experts, one Front end developer, one designer and sometime of advice from a data visualization expert.

May 14, 2020 3:00 PM:I am quite interested in knowing if we can use all this free information to inform the public in general....if it's a problem if organizations like Friends of the Earth, Extinction rebellion, Green Peace can use it

May 14, 2020 3:04 PM:Can all the information shown by the two presenters be used for campaigning for Green peace, Extinction rebellion?

May 14, 2020 3:03 PM:Can be used for organisations activist fighting climate change??

Bernadet: The KNMI information can be found back at www.klimaatsscenarios.nl/ and is free to use. When using photos you should carefully check the author rights.

Janette: The information is free to use for everyone, so also for organizations such as Friends of the Earth, Extinction rebellion, Green Peace. As with all users, so also politicians, journalists, sceptics, etc.: when we see that information is misinterpreted or not presented in the correct way, we may react to indicate this.

Isadora: Most of what we do is open, and therefore open to anyone who want to use it. For the journalists portal, although we simplify by saying "journalists", we also target as secondary audience, all types of communicators about climate change and this includes organisations like Green Peace, Friends of the Earth or Extinction rebellion. So they will be definitively able to use it. Indeed in our

second round of research of user needs we would like to have some interviews and we would like to include someone with this profile to understand how the current structure fits their needs.

May 14, 2020 3:01 PM: About uncertainties we have seen that this is difficult to understand and that a lot of 'users' want 'one message/one number'. Also we find we need to convey what we do know in combination with what is uncertain - so really say that - this we know is certain - like a certain level of increase and above this it is uncertain. So maybe a bit like in the IPCC reports...

Bernadet: Specifically for communicating uncertainties, I found this uncertainty handbook of climate outreach very useful: <https://climateoutreach.org/resources/uncertainty-handbook/>

They have 12 principles for smarter communication about climate change uncertainties, of which the second is indeed, show what you do know. :

1. Manage your audience's expectations
2. Start with what you know, not what you don't know
3. Be clear about the scientific consensus
4. Shift from 'uncertainty' to 'risk'
5. Be clear what type of uncertainty you are talking about
6. Understand what is driving people's views about climate change
7. The most important question for climate impacts is 'when', not 'if'
8. Communicate through images and stories
9. Highlight the 'positives' of uncertainty
10. Communicate effectively about climate impacts

You could also check out the lesson about communicating uncertainties at the User Learning service of Copernicus: <https://uls.climate.copernicus.eu/browse-lessons?packageld=948&slide=1> (also first registration is needed, but it's really easy)

Isadora: This is a central conversation in climate services too. In general we try to solve it by giving different levels of detail regarding uncertainty. First a qualitative assessment, then a numeric approach. In the Energy tool probabilities deal with the uncertainty in the forecast and we use: color for simple approach >> ball size for threshold information >> detail panel for the actual probability number >> and probability distribution for further detail.

For the uncertainty regarding the quality of the forecast (skill) we use: mask to remove bad forecasts (any forecast with skill smaller than 0) >> give the user the capacity to raise their level of exigence in the forecasts quality >> once they select a grid point they can see the actual score value + a qualitative scale.

We prepare monthly outlooks (<https://s2s4e.eu/climate-services/outlooks>) and there in the explanations we used specific wording to give a fast idea of probability level and skill.

In general we find that they would like us to give "one number" that takes everything into account, but this is extremely difficult and even when we have used qualitative scales for a parameter then we also get feedback on the other direction, of someone who wants to know your criteria for making that qualitative scale.

May 14, 2020 3:02 PM: How to you collect the information about what the audience needs for the C3S Data Store? Small focus groups or surveys?

Isadora: For the portal for journalists: interviews and surveys mainly. For the whole Climate Data Store there are specific focus groups that are organized periodically, training sessions in each country, surveys, interviews and the feedback link in the CDS (<https://cds.climate.copernicus.eu/contact-us>) all feedback is being analysed to learn how to improve the CDS service.

May 14, 2020 3:03 PM: Are all these resources also available for Mobile devices or only through the web?

Isadora: As with color-blind safe tools, nowadays any product developed for the web should be RESPONSIVE, that is that any device should be able to display the website. Most of the platforms we develop are already designed to be adapted to most sizes of screen. However sometimes it is not possible. In the DST tool the tool is also implemented to work well in tablets, but we did not design a specific version for smartphones because the target audience of the tool and the tasks they want to do with it is rarely (never) done from a smartphone. Still, it can be accessed from a smartphone, it is only that the panels are not optimized for the device so the experience for the users is not smooth.

May 14, 2020 3:06 PM: Can be the data be used to campaign against global warming, climate change?

Isadora: In case you mean if it could be used by climate skeptics, that is one of the risks of having open data. We had to discuss about this in the design of the portal for journalists. If you allow the user to select the type of graphic they want to display and select the time range, etc. there is a risk that it is used to show information in a way that it could be misleading and having the “logos/watermark” of the Copernicus service. However there is hardly something we can do against it.

May 14, 2020 3:09 PM: Wondering really what you think works with regards to how to show uncertainties?

Isadora: It is one of the great challenges for visualization of climate information. I am particularly happy with the solution in the S2S4E DST. However it does not mean it works well for everyone. Depending on the potential user of the information, and the type of decision they make, and how relevant is climate information in that decision, “what works well” could be extremely different. e.g. if the focus of the decision maker is avoiding all risks, a single threshold that takes into account high probability and skill above 0 could be enough to trigger action. Some users only want a qualitative scale (bad, good, very good) for uncertainty, while other need to understand the scores you are using to report uncertainty and may even prefer that you try to implement specific scores useful in their sector even if that is not the score a climate scientist would choose.

May 14, 2020 3:14 PM: Are the results of your Journalist survey published or citable?

Isadora: The information is not available yet, because this is work in progress

May 14, 2020 3:29 PM: We also have just started an EU H2020 project focusing on Storytelling for climate change, it's called RECEIPT (<https://climatestorylines.eu/>)

Isadora: Very interesting, I'll take a look.

May 14, 2020 3:30 PM: I think a main concern of the society is "what can we, as individuals and society, do to cope with climate change?" These CS can help

Isadora: Definitely when communicating climate change conveying the message that anyone can do something is key. Climate services are indeed closer to individuals or organisations and this makes climate a less remote issue, it relates climate to their daily activities. And particularly climate services providing climate predictions, because they provide forecast of climate variability for the coming weeks, months and years. These forecasts fall in their vital timescales so they help perceive climate as something happening now, not just a projection of what will happen in 50 years.