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Uncertainties:
Lessons learned and recommendations from the "Confidence in Climate Services" (CiCS) workshop

CLIPC
co-organised by EUPORIAS, EUCLEIA and QA4ECV

Published as BAMS Meeting summary (in print)

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https://apecewamogo.files.wordpress.com/2012/02/uncertainty_scr.jpg

"Confidence in Climate Services (CiCS) – Presenting Uncertainty with Confidence" workshop

Who: 25 participants from ten European projects and two European institutions

Organiser: funded and initiated by CLIPC and organized jointly with EUPORIAS, EUCLEIA and QA4ECV

When: 15-17th February 2016

Where: Climate Service Center Germany (GERICS), Hamburg

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Climate Service Center Germany (GERICS)

- **Founded in 2009** by the German Federal Ministry of Education and Research
- Since June 2014 **scientific organizational entity** of Helmholtz-Zentrum Geesthacht
- Financed by **programme-oriented funding** of Helmholtz Association
- Director is **Prof. Dr. Daniela Jacob**
- Based in Hamburg's **Chilehaus**
- **Interdisciplinary team** of natural scientists and socio-economists (approx. 40 staff members)

Chilehaus Hamburg

www.climate-service-center.de
www.gerics.de

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CLIPC is one of 5 projects funded in the last FP7 SPACE call to support the launch of the Copernicus Climate Change Service

Eucleiα

Detection and attribution

Quality assurance

Global re-analyses

Regional re-analysis

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Uncertainty assessment

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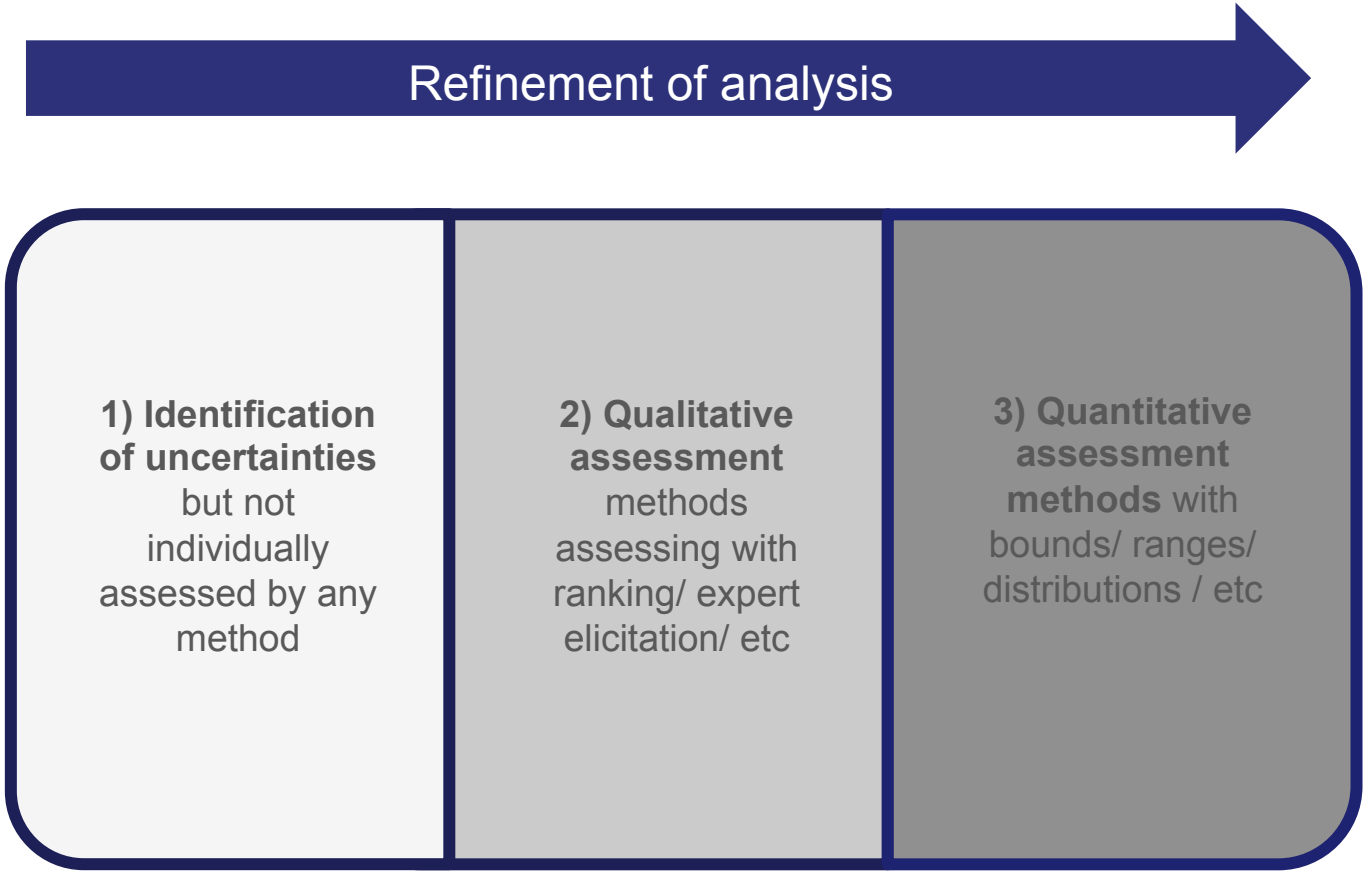

Source: Adapted from European Food Safety Authority (EFSA), Guidance on Uncertainty in EFSA Scientific Assessment, Draft, 2015

Climate Information Portal for Copernicus (CLIPC)

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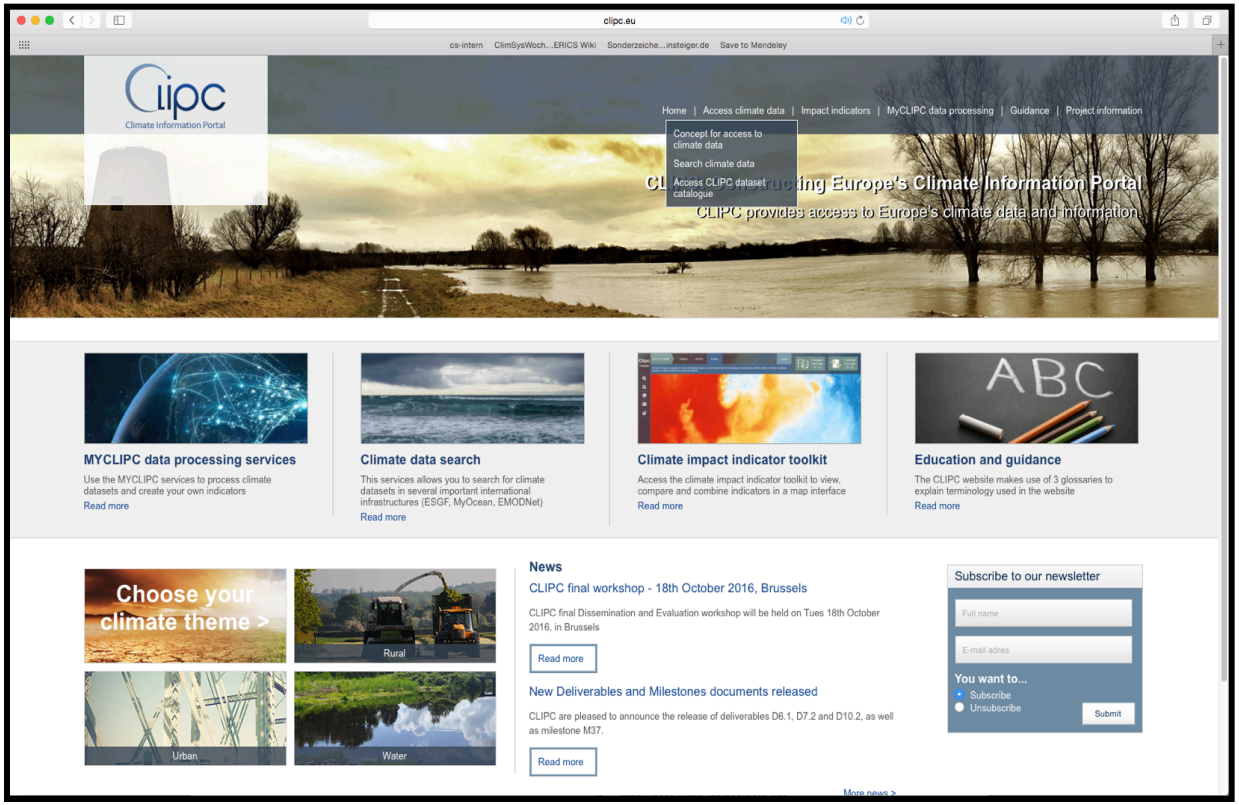
http://www.clipc.eu

FP7 Project: until Nov 2016

CLIPC provides access to Europe's climate data and information.



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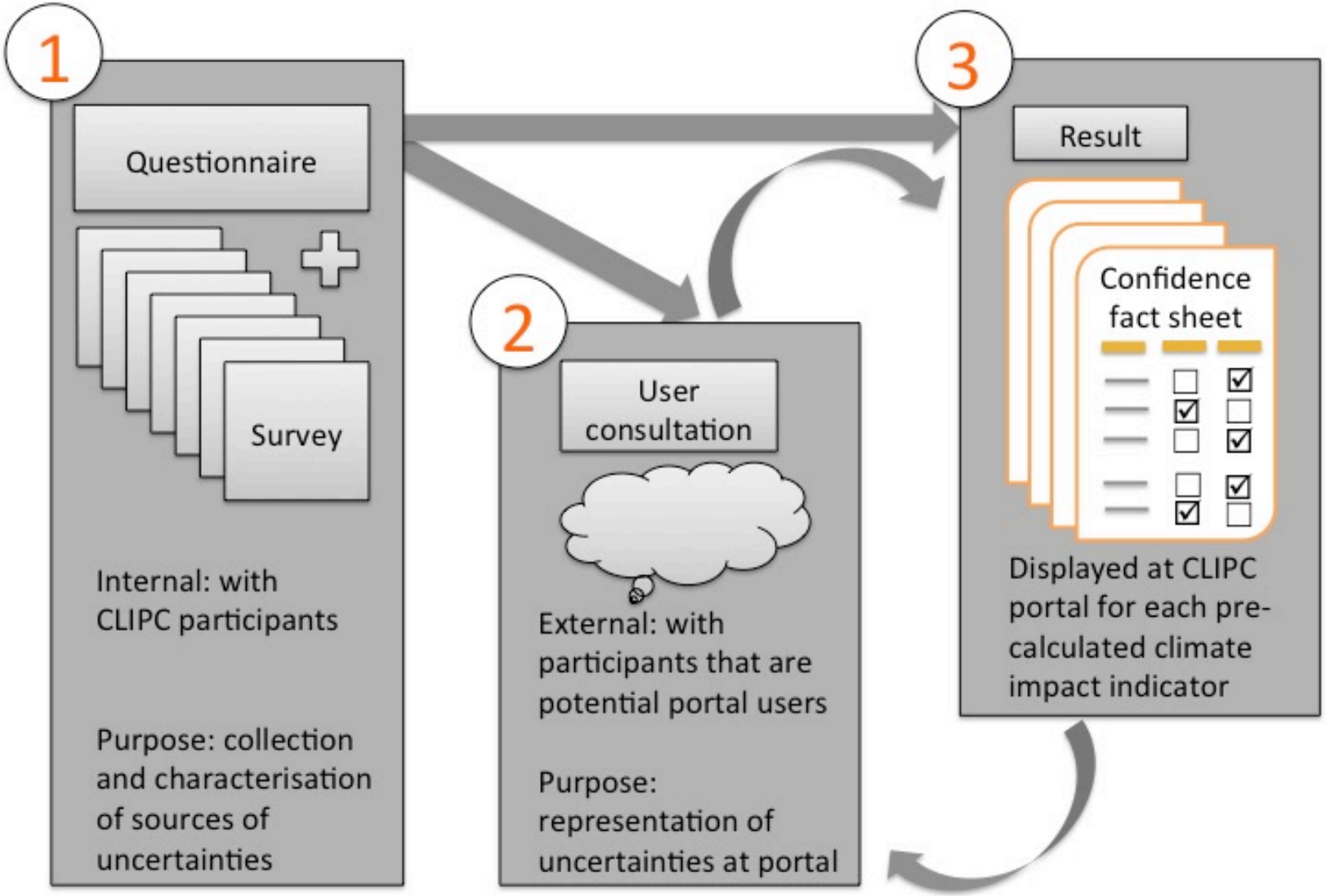
CLIPC: qualitative uncertainty assessment



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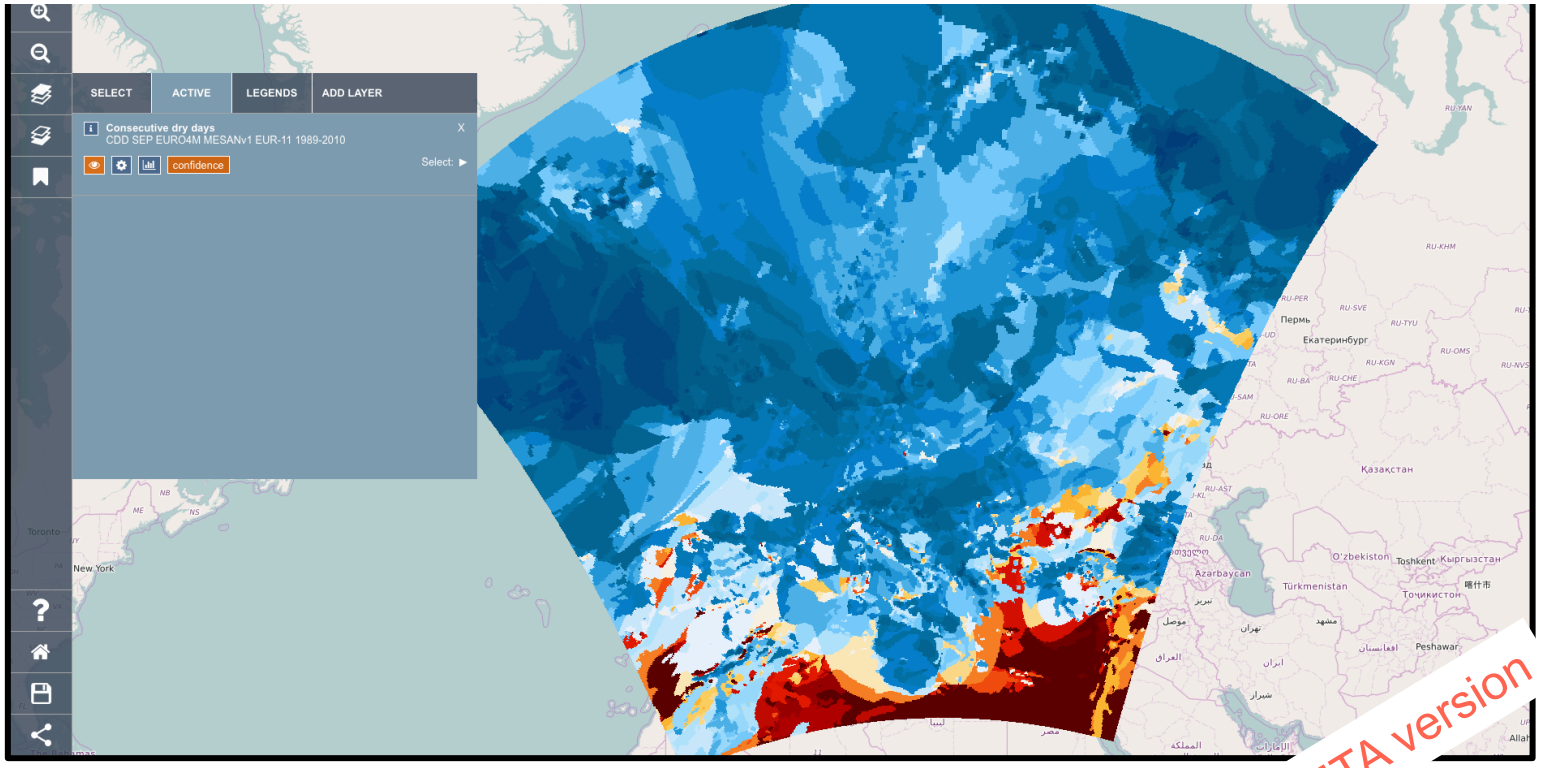
CLIPC: qualitative uncertainty assessment

A **climate impact indicator** is an observed or projected measure that indicates a 'relevant' environmental/human/economic impact that can be linked to changes in the climate.



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CLIPC: qualitative uncertainty assessment

Degree of confidence:

expresses the degree to which we trust an outcome.

- evidence and agreement
- type of method
- ranges from low (red), medium (orange) to high (green)

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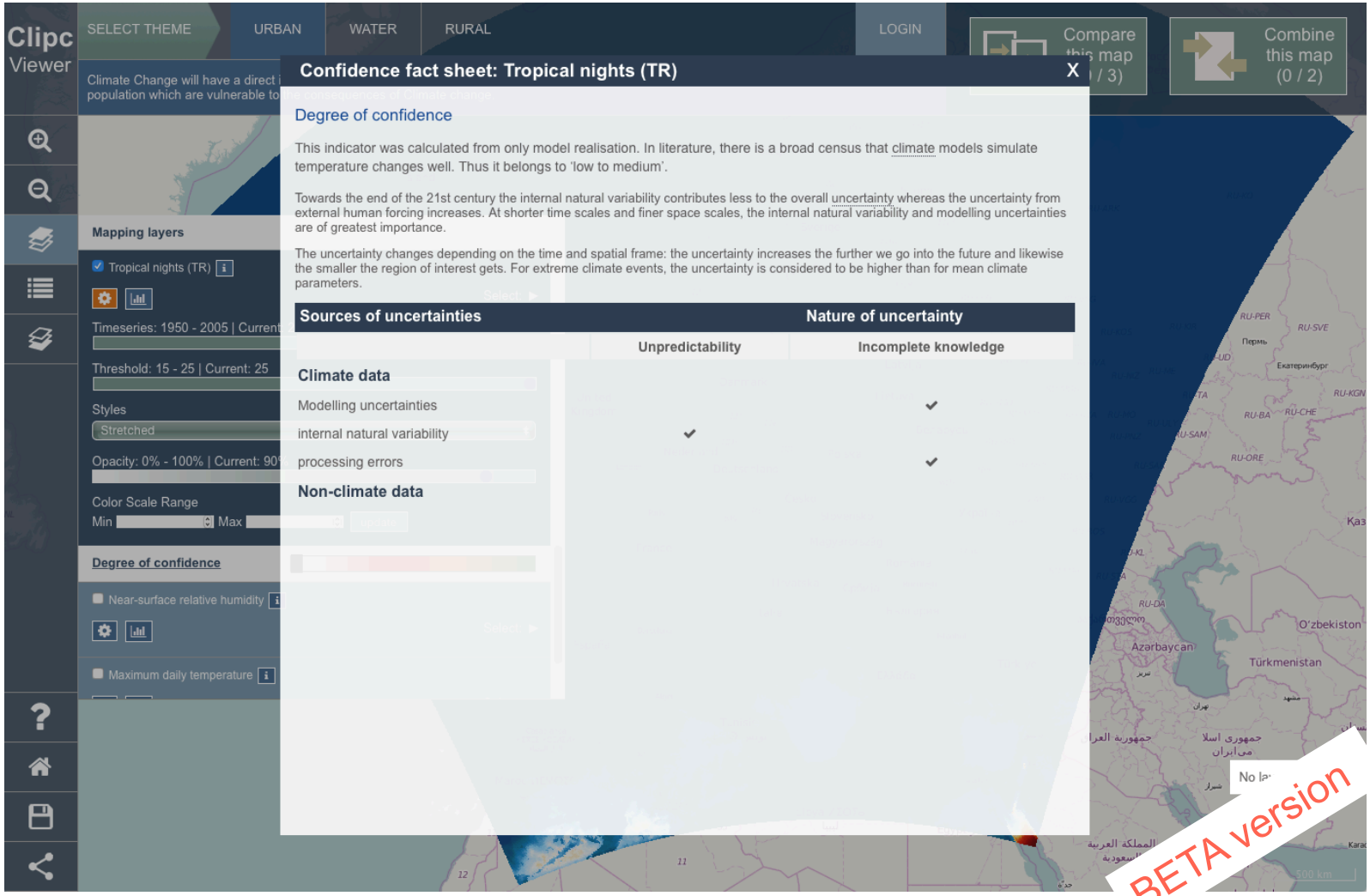
CLIPC: confidence fact sheet



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CLIPC: quantitative uncertainty assessment

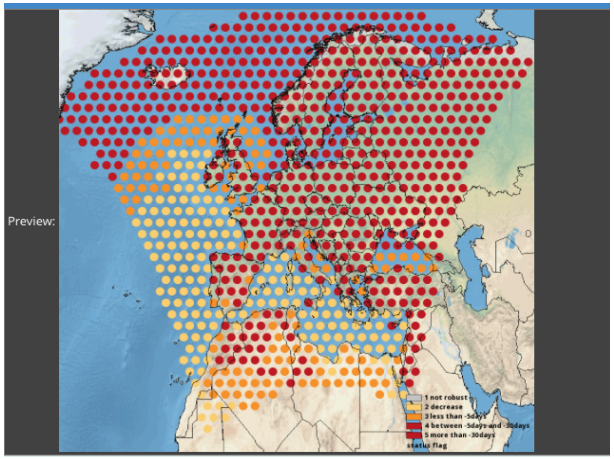
Climate Signal Maps: help to identify regions where robust climate changes can be derived from an ensemble of climate change simulations. Robustness is defined as:

- combination of model agreement
- the significance of the individual model projections.

Example: Increase in tropical nights (RCP 8.5) 1971-2000 to 2036-2065

Without robustness tests

With robustness tests



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(Pfeifer et al, 2015, *Atmosphere*)

CLIPC Uncertainty assessment

Source: Adapted from European Food Safety Authority (EFSA), Guidance on Uncertainty in EFSA Scientific Assessment, Draft, 2015

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CiCS Workshop: participants

European Union FP7 and H2020 projects:

CLIPC
EUCLEIA
EUPORIAS
FIDUCEO
GAIA-CLIM
IMPACT2C
IMPRESSIONS
QA4ECV
SPECS

European institutions:

C3S
EEA

European Space Agency project:

SST CCI

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CiCS Workshop structure

Part 1:

delegates presented their strategies in their projects or institutions

Part 2:

in-depth discussions in six breakout groups:

Assessing uncertainty

- Methods group
- Scale group
- Category group

Communicating uncertainty

- User engagement
- User preferences
- Language

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Lessons learned for best practices

Transparency:

- while information about uncertainty may need to be condensed from provider to subsequent users, a traceable chain of documentation is necessary for full transparency.

Layering:

- a layered approach allows tailoring the amount of information on uncertainty under different decision frameworks.

Disclosure:

- aims to detect and document all known components of uncertainty, including knowledge gaps and issues relating to methodology and processing of data.

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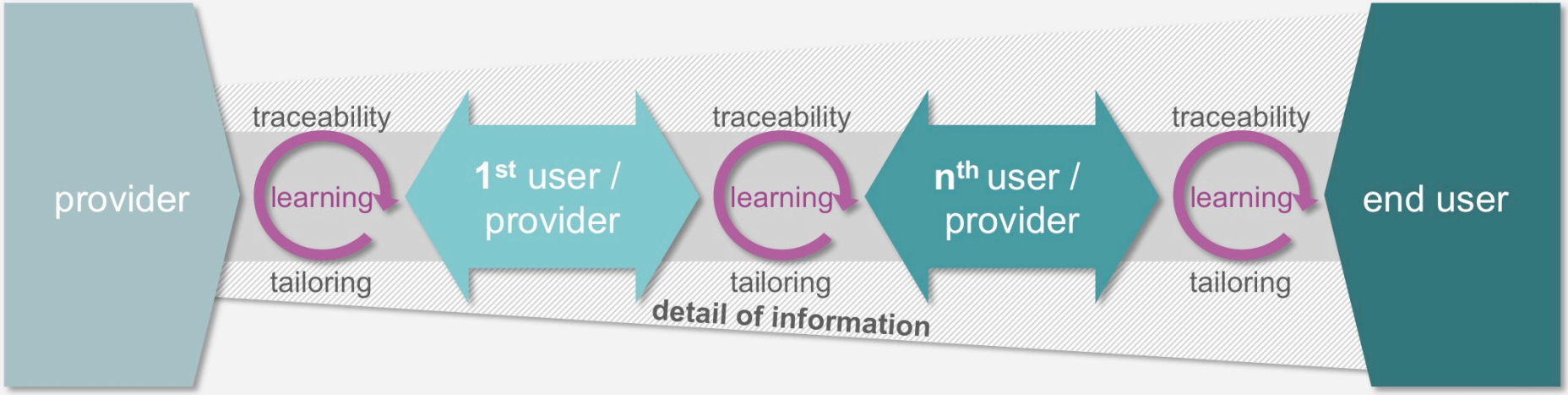
The ‘chain’ of providers and users



MEASUREMENTS / SIMULATIONS

- satellite, airborne and ground-based observations
- climate simulations
- data assimilation (re-analyses)

CLIMATE DATA PROCESSING

- climate data records (observational and re-analyses)
- ensemble simulations/ post-processing/ analyses
- impact modeling

CLIMATE INFORMATION

- confidence analysis
- extracting decision relevant knowledge
- co-development of prototypes

PRODUCTS

- application of user-tailored products by decision makers, public, media

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Barriers in building confidence

Barrier:	**Potential solution**:
Uncertainty is often seen as a barrier to action.	Integration of user needs at early stages of data product design is essential. It avoids unrealistic expectations by the users and it adds knowledge about which sources of uncertainty are most relevant.
Each community has its own methods for treating uncertainty.	Continued collaboration between communities in their role as users and providers
Presenting uncertainty in a clear, user-focused manner is a challenge.	Learning from other sectors as how to communicate uncertainty to users (e.g. finance or insurance).

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Otto & CiCS author team, BAMS in print

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Lessons learned but also challenges

Lessons learned:

transparency, layering, disclosure

User preferences are not only restricted to end-users only:

a “chain” of providers and subsequent users/providers with differing information requirement exists

Two future challenges:

- **Validation of communication:** methods for testing the efficacy of communication strategies
- **Guidance**: similar workshops, preferably together with users, can serve as a good basis to share information between communities and to collect lessons learned

➢ Otto & CiCS author team: ‘Lessons learned for climate services’, BAMS meeting summary, in print.

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