

# How to communicate climate change?

## An all-in-one solution with a practical case on climate services

Climate change is one of the greatest global challenges, and despite scientific progress, a significant gap remains between available knowledge and effective action. This knowledge-action gap implies that, although valuable climate data are available, they are not always translated into effective public policies or communicated to citizens in an accessible and engaging way.

To address this challenge, the Knowledge Integration Team (Earth Sciences Department, BSC) applies a transdisciplinary approach based on the use of innovative communication tools. These tools help simplify and visualize the complexity of climate data, enabling society to explore the climate, better understand its evolution, and grasp the impacts of climate change on our lives.

In this contribution, we present the results of a systematic literature review on climate change communication (CCC) methodologies, structured as a benchmarking of innovative methods for communicating and visualizing the impacts of climate change. The outcome is an inventory of resources that can support communication-related activities and enhance engagement strategies.

By examining peer-reviewed literature alongside communication strategies applied by practitioners, this approach bridges academic discourse and practical implementation to provide a comprehensive understanding of methodological developments in the field of climate change communication. To illustrate how this benchmark can be applied in practice, we include a case study on climate services developed within CLIMA-GAP, a project that aims to understand the characteristics that make climate services good<sup>1</sup>.

## CCC benchmarking

The benchmarking report summarizes the analysis of "Innovative methodologies on climate change communication"<sup>2</sup>. It presents, in a synthesized and engaging way, relevant results with examples to facilitate the use of the information by science communicators, so they can choose the best methodology according to the audience, purpose and communication context.

### WHAT'S THE CCC BENCHMARK ABOUT?

This document presents a scoping review of climate change communication methods from a benchmark perspective. Findings are presented in 4 parts:

1. What is being done (methodological materials)
2. The audiences (with/for whom)
3. The evaluation or performance
4. Lessons learned

To illustrate how to use this all-in-one solution, we will present a practical case on climate services described in detail in the section below.

### How is CCC done?

Scoping review/  
Benchmarking

#### WHAT is being done?

- 5 general method's types
- 3 examples for each type

#### WITH/FOR whom?

- Agents/stakeholders roles
- Audience contexts
- Some demographic characteristics
- Grouped or individuals

#### HOW good?

- How Good? (evaluation)
- Good for... (advantages)
- Not so good for (limitations)

#### WHAT can we learn from this?

- The most unique (6 examples)
- 3 lessons: mindsets, hues, purposes
- Health Chapter and Appendices

### WHAT is being done?

- 137 methodological materials in total
- No methodological framework exists
- In the CLIMA-GAP case study, games and interactive activities, in particular games, platforms and maps, and data visualisation were the most relevant methods

Although no methodological framework was found to characterize the methodological materials, their intrinsic similarities show 5 different types in which climate change communication (CCC) is made.

CCC is made through:

1. Climate arts and narratives
2. Discourse strategies
3. Games & interactive activities
4. Lessons and teaching
5. CCC Guidelines & instructions

### 3. GAMES & INTERACTIVE ACTIVITIES

There were 44 methodological materials with an interaction/participation aim in some way. These include:

- Co-design activities
- Creativity facilitation techniques
- Games (virtual and analog)
- Platforms and maps
- Data visualization

### WITH/FOR whom?

Defining a communication project's audience is rarely straightforward. Actions can target multiple audiences, and the same audience can be segmented differently depending on stakeholder role, context, demographic characteristics, or even at the individual versus group level.

#### RESEARCH audiences

How are they?

This audience consists of actual climate change science researchers (exceptionally, other fields scholars) or team/organization leaders.

They act as the audience when CCC focuses on them to align language and show a coherent discourse from scientific institutions.

How are they reached?  
Guidelines with institutional CCC policies and ready-made arguments

#### CC COMM audiences

How are they?

Institutional efforts for scientific correctness, consensus communication, and field language articulation target science communicators, journalists, and facilitators. Since many of them are practitioners and not necessarily researchers of CCC, the materials found differ from academic production.

How are they reached?  
Guidelines, sharing knowledge platforms, complex databases, contacts, and webinars.

#### CIVIL SOCIETY audiences

How are they?

This approach to audience designation is meant for the widest range of audiences. Other names for it are non-experts, non-scientific participants, general public, and lay people.

Due to flexibility the methodological materials aim to work with audiences diversity. It's the practitioner's task to adapt to it.

How are they reached?  
Comics, events, Lifestyle challenges, workshops, games

In our case study, we identified three distinct audiences to target. The benchmark descriptions help guide us in choosing the communication actions that best fit each audience profile.

### HOW good?

The "How good" part of the benchmark includes an overview of the evaluation processes explicitly found in the methodological materials, linking to concrete examples. It also includes a synthesis of the advantages and limitations of the materials.

Among the methodologies, some work better for reaching the audience, others for content optimization, stakeholder engagement, or material readiness.

#### Content optimization

What is it about?

1. Persuasion
2. Knowledge "translation"
3. Making complex information more accessible
4. Message evaluation (how clear, how political, how relatable)

### Stakeholder articulation

What is it about?

The methodological material is said to be ready for:

1. Community engagement
2. Diverse audiences
3. Bi-directional communication
4. Balances personal objectives with collective needs

In our case study, we sought materials that could make complex information more accessible and engage diverse audiences.

### WHAT can we learn from this?

One purpose of the search was to capture diversity and innovation, these are presented in different formats in the "Lessons Learned" section of the benchmark.

#### THE NEVER BORING

Kurzgesagt "in a nutshell" products and merch

Communicative situation: Kurzgesagt is a content developer agency focused on not being boring. Started as a YouTube channel. Has developed products with our world in data. (7h of views)

Strategy: Defined their own animated language, bright colors and special characters. Their tools are stories, visual metaphors with full transparency of knowledge sources.

Product: NUCLEAR PASTA

Category	Material
Climate arts and narratives	Example/application/project
Games	Kurzgesagt - Company/agency/media
Platforms and maps	General public-citizens
Lessons and teaching	Practical/technique
Discourse strategies	Video/Streaming, product design/digital/Web/app/virtual
Co-design activities	Platform/individual
Games (virtual and analog)	Climate change, Philosophy, Physics, Technology, Interdisciplinary climate solutions

To highlight variety, we included a section on the most unique materials. For our case study, the standout was "The Never Boring", praised for its use of metaphors and friendly, easy-to-digest visuals.

## A practical case study on climate services

The CLIMA-GAP project aims to bridge the climate knowledge-action gap by exploring what makes climate services successful. A key part of this effort is a collaborative online platform where users can explore, contribute, and interact with climate narratives, in the spirit of citizen science.

To develop the platform's communication strategy, we drew on insights from our benchmarking tool to identify communication elements best suited to making climate services clear, engaging, and accessible for diverse audiences, such as the use of metaphors, visually appealing elements, and simplified definitions.

### CLIMA-GAP

Climate information plays a fundamental role in achieving a green recovery and climate neutrality in Europe, and a central one for a climate-resilient Europe. However, climate information should be delivered appropriately and used effectively in order to be integrated into decision-making processes to better manage risks and realize opportunities. This can be achieved with climate services, understood as the provision of climate information for use in decision-making.

What's a climate service? See our map

### What is a climate service?

A climate service turns climate data into useful information to help people make decisions. It can provide forecasts, risk maps, or guidance for sectors like agriculture, water, or health.

But a climate service is more than just information. To be effective, it should:

- Engage users and providers in a two-way process
- Be based on scientifically credible information and expertise
- Have easy access for users
- Respond to users' specific needs

### What makes a good climate service?

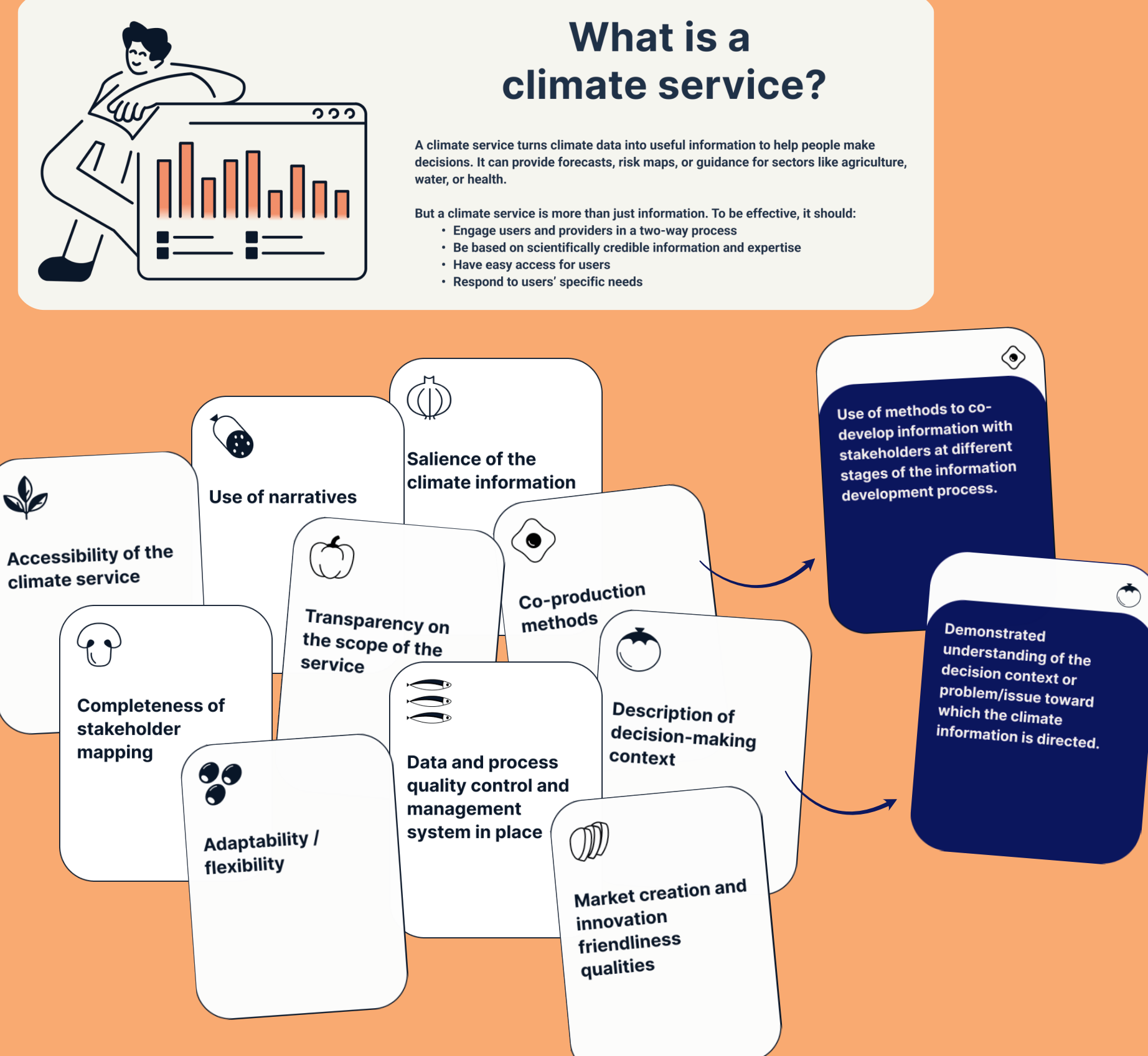


Think of it this way: imagine the best pizza you've ever had. Why was it so good? Was it the crunchiness, the flavor, or just how tasty it was? Yummy!

If we compare this to a climate service, the "tasty and crunchy" part is whether the user is satisfied or whether it actually helps in decision-making, for instance.

Now, back to the pizza, what ingredients made it so delicious? Was it the mozzarella, the smoked ham, or the combination of both? For a climate service, the key "ingredients" might be co-production methods, access to reliable data, or a user-friendly platform to visualize information.

In other words, success indicators tell us whether the "recipe" turns out tasty, while the criteria represent the ingredients used.



The platform also includes an additional section with specific information for climate services researchers.

### Our case studies

Here we've assembled a list of successful climate services that have been analysed using an agreed-upon set of criteria. We hope that by highlighting these cases, we can build a community within the climate service field and inspire others to contribute.

MED-GOLD	
<b>Geographical region and scale</b>	Mediterranean region, with a global potential market. The spatial scale includes Douro (Portugal), the Andalusia region (Spain) and areas in Italy
<b>Type of information</b>	Both essential climatic variables (ECV) and impact assessments.
<b>Temporal Scale</b>	Short-term seasonal predictions and long-term impact assessments from 2020 to 2080.
<b>Sector</b>	Agriculture
<b>Subsector/ Theme</b>	Grape and wine, olive and olive oil, and durum wheat and pasta.
<b>Climate service delivery format</b>	Semi-operational dashboard, the MED-GOLD Dashboard Prototype stage: demonstrated proof-of-

Studying climate change communication (CCC) poses many challenges, including how the fields of communication, science communication, and CCC are conceptualized, their scientific histories, and the interdisciplinarity in both theory and practice.

As a result, despite the variety of CCC approaches, there is no single framework to determine the most innovative or effective method, since practices are highly context- and purpose-specific. Researchers and practitioners must continue exploring and evaluating strategies to identify the best ways to communicate about climate change in each situation.

<sup>1</sup> References: CLIMA-GAP (CLIMAtE change narratives and storylines to close the knowledge-action GAP) Grant CNS2023-145143 funded by MICIU/AEI/10.13039/501100011033 and, by "European Union NextGenerationEU/PRTR".

<sup>2</sup> Gómez, E., Huertas, C., Nicodemou, A., Bailey, K., Terrado, M., 2025. Innovative methodologies on climate change communication. Internship project. Technical report. Barcelona Supercomputing Center.