



CLIPC DELIVERABLE (D10.6)

CLIPC Policy Briefs

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Revision table			
Version	Date	Name	Comments
1	24 September 2015	First brief	First brief on project aims and objectives completed
2	28 November 2016	Final briefs	All three briefs completed

Abstract

This deliverable consists of a number of policy briefs, written to inform policy makers and members of the general public about the aims and achievements of the project.

The first focuses on the project's objectives and the second on early project outputs and planning for the 2nd period. The final policy brief describe sthe achievements of the project. The policy briefs are restricted to a single A4 sheet (printed on both sides) and distributed as Portable Document Format (pdf) files.

Project co-funded by the European Commission's Seventh Framework Programme (FP7; 2007-2013) under the grant agreement n°607418

a single point of access for authoritative scientific information on climate change. This ambitious objective is made possible through the Copernicus Earth Observation Programme for Europe, which will deliver a new generation of environmental measurements of climate quality.

The data about the physical environment which is used to inform climate change policy and adaptation measures comes from several categories: satellite measurements, terrestrial observing systems, model projections and simulations and from re-analyses (syntheses of all available observations constrained with numerical weather prediction systems). These data categories are managed by different communities: CLIPC will provide a single point of access for the whole range of data. Information on data value and limitations will be provided as part of a knowledge base of authoritative climate information.

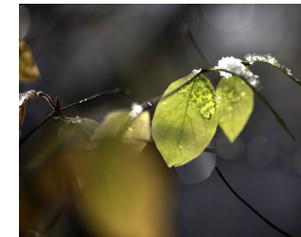
Indicators of climate change and climate change impact will be provided, and a toolkit to update and post process the collection of indicators will be integrated into the portal.



Climate Information Platform for Copernicus



A comprehensive catalogue of climate data and impact indicators



Advanced data discovery, visualisation, transformation and delivery



Documentation on data quality and uncertainty



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The CLIPC project is developing an integrated platform of climate data services portal to provide a single point of access for authoritative scientific information on climate change and climate change impacts. This ambitious objective supports the Copernicus Earth Observation Programme for Europe, which will deliver a new generation of environmental data for Europe's citizens, decision-makers in the public and private sector, and academics.

Climate change is real and its initial impacts are being felt around the world. The most visible effects are changes in the frequency and magnitudes of extreme events such as heat waves, floods and droughts. Our society can respond by reducing greenhouse gas emissions (the cause of climate change), but this only reduces the impacts in the longer term. In the short term, Europe has to respond by adapting to the changes.

Reflecting the urgency of developing a comprehensive response to imminent threats posed by climate change, the second half of the CLIPC research and development project is running in parallel with the initiation of the Copernicus Climate Change Service (C3S). CLIPC is not part of C3S, but will feed into the initial development of the service by building and sharing knowledge and by deploying a prototype service.

Deciding on the most effective and efficient response requires accurate and relevant information in usable and understandable forms. Information about climate change is currently held in a number of national and international, public and private sources. They provide different, often overlapping, information which many users find confusing and difficult to exploit.

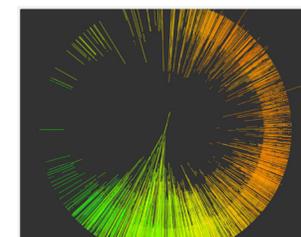
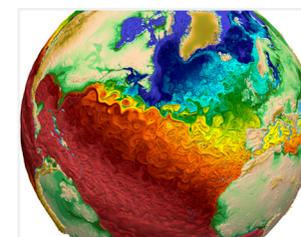
The data used to inform climate change policy and adaptation measures comes from many sources, including satellite measurements, terrestrial observing systems, and computer models. These data are managed by different communities in very different formats software and hardware systems, which can be confusing. Decision makers are not interested in the individual streams but in highly aggregated products which have gone through many layers of analysis to deliver information which is meaningful in the business, social or political context. CLIPC will also be exploring methods of enhancing the timeliness and robustness of the products, known as Climate Change Impact Indicators (CCI), of this processing chain.

Climate Change Impact Indicators for Europe are available from many sources. The diversity of approaches and data sources reflect the rapidly evolving nature of the underlying science. The quantity and quality of data is highest for primary climate data, and steadily decreases as we move through observed and modelled changes in natural systems and on to socio-economic impacts. To provide clear guidance on the use of these socio-economic indicators, a structured review of their strengths, weaknesses, technical requirements, purpose, limitations and coverage is

Who are the users of CLIPC?

Anyone could be a CLIPC user, but the platform design needs to focus on particular requirements. CLIPC is organised around the needs of four categories of scientific and non-scientific users: climate scientists, climate impacts researchers; intermediaries such as consultants, and end users such as policy makers, private sector decision-makers and citizens.

End users, particularly those without a scientific or technical background, often rely on others for their information, and so CLIPC user engagement has focused on the first three categories. The CLIPC platform is taking into account user needs, based on a survey of needs, interviews, and a user panel that will feedback on each versions.



required. This work will be carried in CLIPC, focusing on urban, rural and water themes.

CLIPC is itself a melting pot, bringing together a diverse range of climate information experts. These are split into two overlapping sectors:

1. Climate scientists and information technology specialists working harmonisation of data and access to climate datasets derived from models, observations and re-analyses (syntheses of all available observations constrained with numerical weather prediction systems).
2. Climate impact researchers developing a climate impact toolkit to evaluate, rank and aggregate Climate Change Impact Indicators.

CLIPC services will provide:

- A single point of access for the whole range of data on climate and climate impacts allowing quicker, easier and harmonised access in a wide range of data formats;
- Access to climate data from satellite and in-situ observations, re-analyses and climate model projections and simulations on both global and regional scales;
- Integrated access to climate change impact indicators in urban, rural and water thematic areas;
- Integrated support for a wide range of users, from climate scientists to policy and decision makers;
- Supporting information about the data, its limitations and uncertainties, and guidance on how to use it, as part of a knowledge base of authoritative and expert-provided climate information;
- Services to transform and visualize data to suit the needs of different users;
- Climate Change Impact Indicators transparently linked to underlying data;
- Visualisation data transformation tools allowing flexible exploration of the whole range of data products;
- A toolkit to support aggregation of Climate Change Impact Indicators;
- A sandbox allowing users to explore variations in the parameters and data choices involved in the production of Climate Change Impact Indicators

About CLIPC

Climate change is impacting the environment, society and policy decisions. Information about climate change is available from many sources, but not all of them are reliable. The CLIPC project is developing a portal to provide

With a multitude of existing portals providing access to different sources of climate information, CLIPC acts as a “one-stop-shop”, offering information about and access to data from a wide variety of sources. The CLIPC portal also offers a toolkit, allowing the climate impact indicators and climate datasets produced in CLIPC to be viewed as overlays on the base map.

Links between the CLIPC portal and the European Climate Adaptation Platform Climate-ADAPT (<http://climate-adapt.eea.europa.eu/about>) are being explored. Already, a description of the CLIPC portal has been included in the Climate-ADAPT database, linking to the CLIPC portal on the Climate-ADAPT website. CLIPC and its components are fully compatible with the Copernicus Climate Change Service (C3S) objectives and future use of the portal and/or components in the operational phase of C3S is being explored.

CLIPC is a Collaborative Project (2013-2016) funded by the European Union under the 7th Framework Programme. Contract N°: 607418. It is coordinated by STFC Rutherford Appleton Laboratory (<http://www.stfc.ac.uk>) and operated by a 22-member consortium.

CLIPC FINAL DEMONSTRATION AND EVALUATION WORKSHOP FOR USERS



WORKSHOP

Date and location:
Thursday 20th October
2016 – BRUSSELS

Further information at
<http://tinyurl.com/CLIPCworkshop>



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In order to adapt to and moderate the effects of climate change, trustworthy, relevant and salient information needs to be made available to those responsible for planning decisions. The CLIPC project has developed an integrated platform of Climate Data Services to provide a single point of access for authoritative scientific information on climate variability and change, and climate change impacts. This project has been conceived to support the Copernicus Climate Change Services (C3S), which will deliver a new generation of environmental data for Europe's citizens, decision-makers in the public and private sector, and academics.

The CLIPC portal

The CLIPC project enhances access to climate and climate impact information, and supports the translation, post-processing and visualisation of climate data in order to tailor climate and climate impact information to user needs.

The CLIPC portal provides quick and easy access to Europe-wide climate and climate impact data, along with the supporting information required for its effective and meaningful use. This information meets the highest feasible standards in terms of credibility (from a scientifically trusted source, as evidenced by clear metadata), legitimacy (through an internationally-supported mechanism) and saliency (linked to user needs, including comprehensive access to available climate and climate impacts indicators, but also data translation, visualisation functionalities and adequate guidance).

Specifically, the CLIPC portal provides direct access to reliable core data sources, harmonised metadata and post-processing tools, and indirect access to additional data sets. It provides a comprehensive overview of data supply, indicator availability and guidance, and a combination of satellite and ground-based data and modelling results.

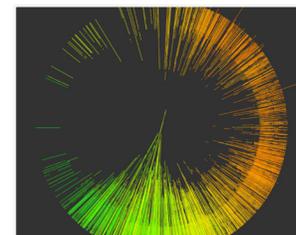
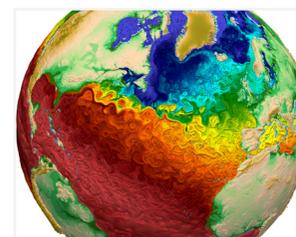
In addition to improved access to existing datasets, CLIPC offers a novel impact indicator toolbox, which includes an explorative tool for users to combine datasets, along with guidance on how to interpret the produced combinations.

A unique aspect of CLIPC is expert-based qualitative uncertainty information of impact indicators for which a quantitative analysis is not always possible. Special attention is placed on communicating information about the confidence users may have in the various data sets and indicators in a qualitative and transparent way. Despite the value and importance of this information, the CLIPC portal does not aim to replace expert consultancy – it is a decision-support system that still may require tailoring to satisfy specific user needs.

Who are the users of CLIPC?

Anyone could be a CLIPC user, but the platform design needs to focus on particular requirements. CLIPC is organised around the needs of four categories of scientific and non-scientific users: climate scientists, climate impacts researchers; intermediaries such as consultants, and end users such as policy makers, private sector decision-makers and citizens.

End users, particularly those without a scientific or technical background, often rely on others for their information, and so CLIPC user engagement has focused on the first three categories. The CLIPC platform is taking into account user needs, based on a survey of needs, interviews, and a user panel that provides feedback on new versions.



Guidance for different users

The CLIPC portal allows access to climate and climate impact information for a variety of users including climate scientists, impact researchers, intermediary (or boundary) organisations (e.g. consultants, Environment agencies) and societal end users (including policy makers and NGOs). Different users have different requirements, needs and skills, and usually look for more than just mere access to data – they need information that is relevant, robust and legitimate.

A distinction between expert users (users with relatively high level of scientific understanding and technical skills to download and manipulate data) and non-expert users (users without the aforementioned characteristics) is important for the design of digital information portals. The CLIPC portal's design speaks to all user categories, allowing them to navigate through the portal in a natural way.

The portal has several different types of guidance, including:

- Examples of use cases;
- FAQs;
- Traffic lights and other types of 'warnings' / recommendations;
- Glossary.

User type	Top 3 features ranked by majority as Very important/important
Climate scientist	Free open access Availability and quality of metadata Verifiability of information and data provided
Impact researcher	Free open access Accessibility of data Amount of data available
Intermediary/boundary organization	Free open access Explanations of climate data and climate impact indicators Usage of understandable language
Societal end user	Free open access Diversity of subjects Usage of understandable language

Table 1: Most relevant user needs for the portal, by user category

- Glossary, based on other European and IPCC glossaries
- Training videos on how to use the portal and the toolkit

User Feedback

User feedback was a key component in the development of the portal. In breakout sessions during the final dissemination and evaluation workshop, the participants discussed and tested the diverse features and functionalities of the CLIPC portal. In general, participants were impressed by the achievements realised and they appreciated the way information about the confidence users may have in the various data sets and indicators is communicated. The participants were impressed by the speed of handling big data sets. Use cases were seen as valuable for less experienced users.

CLIPC – supporting an expanding number of users in accessing and understanding climate impacts data

CLIPC offers many opportunities for further development and application of the portal as a whole, as well as selected individual components, dependent on future funding. The primary follow-up is related to the application of the portal in the Copernicus Climate Change Services (C3S), managed by ECMWF. Additional opportunities have been identified, including integrating CLIPC components such as the map viewer and impact indicator toolbox into the European Climate Adaptation Platform (Climate-ADAPT). Another interesting potential future application is the use of CLIPC and its data sources and functionalities for climate stress testing of investments in other parts of the world, including adaptation projects, such as those supported by national and multinational governments and financial institutions.

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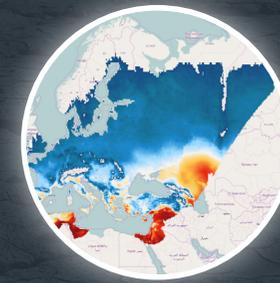
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Climate Information Platform for Copernicus (CLIPC) Project Achievements



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Climate change is one of the greatest issues impacting humanity's future. In order to adapt to and mitigate against its effects, trustworthy, legitimate and useful information needs to be made available to those who need them, including scientists, those responsible for planning decisions in the public and private sectors, their advisors and the public at large.

The Climate Information Platform for Copernicus (CLIPC) project has developed an integrated web- platform of Climate Data Services to provide a single point of access for authoritative scientific data and information on climate variability and change, and the impacts of these. CLIPC supports the Copernicus Climate Change Services (C3S), which will deliver the next generation of climate and climate impacts data for Europe's citizens.

The added value of the CLIPC portal

The CLIPC portal provides access to Europe-wide climate and climate impact data, from scientifically trusted sources, along with the supporting information required for its effective and meaningful use. This "one-stop-shop" portal facilitates users in their search to answer questions related to climate change impact. It has been developed to accommodate the needs and demands of diverse users across Europe to the largest extent possible. The CLIPC portal has important advantages over other European climate information portals:

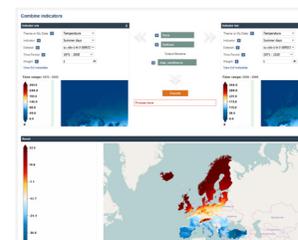
- **Access to different data types.** The portal includes data from satellite and in-situ observations, climate models and data re-analyses, transformed data products enabling impact assessments, climate change impact indicators, and socio-economic data that are important to assess vulnerabilities.
- **Access to a large variety of data sources.** The climate data search service allows users to search for climate datasets in several important international infrastructures. The portal complements existing services, but focuses on datasets providing information on climate variability on decadal to centennial time scales from observed and projected climate change impacts in Europe.
- **Data provenance.** CLIPC ensures that the provenance of data products is well-documented, by providing access to intermediate data products and documentation on the technical quality of data, on metrics related to scientific quality, and on uncertainties in and limitations of the data.
- **Enhanced functionalities.** Users can store the results of their searches in their own environment (MyCLIPC) and combine the information with other data files for their specific purposes. Various post-processing options are available; for example, the novel Impact Indicator Toolbox allows users to combine, compare and rank indicators and generate new ones.



CLIPC website portal



Indicator toolkit map viewer



Indicator toolkit combine function

Despite the value of these features, the CLIPC portal is not intended to replace expert consultancy – the CLIPC portal is a decision-support system with potential for further tailoring in order to satisfy specific user needs, e.g. at the local or sectoral level.

The CLIPC Impact Indicator toolkit

The CLIPC toolkit enables specialist and non-technical users to assess possible impacts of climate change in an effective and trustworthy way, by combining climate and climate impact indicators. The user can view and explore impact indicators calculated for different climate change and socio-economic scenarios. Available datasets for the indicators can be selected and combined with each other using built-in operators and normalization functions. In addition, the toolkit allows users to perform decadal averaging "on the fly" to time series of indicators, and spatial averaging of these results across the regions of Europe. Toolkit results can be saved and retrieved from a personal data-basket.

Users can also compare the selected datasets via a map view, compare the supporting metadata, or "combine" two datasets into a new dataset. With this functionality users can add up climate impacts, or create a difference map. This opens up many new possibilities for climate change impact and vulnerability analysis, but it has to be used with caution to avoid combinations that are technically possible, but do not provide meaningful results, the interpretation of which remains the responsibility of the user.

Guidance for different users

The CLIPC portal allows access to climate and climate impact information for a variety of users, who have different requirements, needs and skills, and usually look for more than just mere access to data – they need information that is relevant, robust and legitimate. The portal's design allows users to navigate through it in a natural way. Fictitious use cases are provided to demonstrate the chain of analytical steps leading from climate and climate impact indicators to tailored information in local workflows and, finally, to decision support in specific sector management. Initial use cases cover questions as diverse as prioritization of forest land purchase, assessment of heat stress in urban areas and comparison of the phenology of moth species under climate and seasonal changes.

In addition to these use cases, the portal has several different types of guidance, including:

- Frequently Asked Questions (FAQs)
- Traffic lights and other types of warnings and recommendations while applying the portal's functionalities