

Sectoral Information System

How to ensure that existing global, European and national capabilities are fully supported and augmented by the CCCS?

National services do have in several cases a sustained climate service activity. However there are several gaps that could be filled by a European service:

- Users are often lost among national or private services, and a **European catalogue** describing the existing reliable products, and a **one-stop shop** to access them, in a timely manner, could be of important added value; The mapping of these services (national, private) could be facilitated by existing activities, e.g. Copernicus User Forum, CSP, JPI, GFCS, EU projects,...
- A common definition of **reference data sets, reference periods and scenarios** would be of large benefit to national services and users in order to avoid inconsistencies among services and products available in Europe, in particular for trans-boundary issues

- Products **at the scale of the European continent**, aggregated at regional and national level are necessary, and can be, if required, further downscaled, but probably outside Copernicus. For example, indicators of climate change for the major river catchments or for common impacted systems such as forest types, ecosystems and species, etc...
- **Ocean areas** where vulnerable ecosystems and economic activities linked to Europe should not be forgotten in the services, benefitting from the recent development of regional coupled models
- **New high-resolution (12km) coordinated climate scenarios** for Europe (EURO-CORDEX) are now being released, providing a common basis for European bias-corrected data and derived indicators in the SIS; new regional reanalysis will be produced at higher resolution (~5km) and should also be a basis for products.

- National agencies dealing with local regional/national specificities or use specific data sets, or are designed to define national strategies activities **could be supported by CCCS**, in particular for countries with less developed climate services.
- SIS should produce tailored bias/altitude-corrected data sets, and progressively more impact indicators. This will have to be sector specific. Socio-economic analysis and adaptation options should be **thought of from the beginning of the construction of products but should not be included in the SIS products in the first phase** of the CCCS. The tailoring of climate impact indicators requires that users and other disciplines be included in the definition phase.
- General recommendation for the CCCS to harness its capacity **building with a number of projects/initiatives**: CLIPC, IS-ENES, ...

How to ensure from the outset that the CCCS is user-driven?

- Priorities should be based on the **maturity of science and evaluation** of methodologies and the chain of uncertainties
- In the case of the SIS, the tailoring of products requires a clear **interaction platform with the end users** and the European policy needs. The SIS cannot be seen as a pure production system and should be continually fed by evolving science and technology.
- User requirements definition may need **iterations with providers** in order to formulate products. This may necessitate intermediate products such as fact sheets, prototypes, in order to reach complete dataset specifications and production.
- The **Copernicus User forums** should be complemented by sector-specific communities of practice and established networks.
- Experience from **other Copernicus Services** (eg Atmosphere, Marine) should be drawn from by the CCCS.
- An efficient **interface between EQC and SIS** is crucial for this iterative process and should be clearly defined.

What are the criteria for including climate datasets in the CDS? In the SIS?

- The **time scales** discussed are past climate (covered by reanalyses and earth observation - in situ and remotely sensed - based ECVs), current events (especially extreme events), seasonal time scales and decadal to century time scales.
- The CCCS should address a wide variety of scales in space and time, ranging **from global to regional** and from seasons to centuries, according to user needs. In particular, regarding climate reanalysis and projections, the scope should be *global* in nature, while for more specialized services, such as climate impact or high-resolution re-analysis, the scope could be restricted to more *regional* applications, with a strong focus on the *European region* (or areas from which Europe is climate change sensitive -eg Arctic). The specifications of CCCS services, including their sampling in space and time and accuracy, should be tailored to meet the specific user needs, across societal sectors and European policies.

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- For impact analyses, available **high-quality European datasets** should be exploited, which may necessitate interactions with the data providers. However European stakeholders may have interests in others regions or countries of the world, therefore the service should also aim at covering whenever possible the global scale. While this is clearly possible (using a lower resolution, typically 0.5°) for climate variables, calculation of dedicated climate impact indices may necessitate external data and partnership. The CCCS should be dimensioned to gradually integrate new and more specific datasets and services as they mature, through a network of external collaborations.

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- Datasets should be **well qualified and with quantified uncertainties**. CCCS should have a clearly defined quality assurance and certification mechanism to set the example in terms of best practices.
- This necessitates validation of ensemble of model outputs, both for climate data, indicators and impact data, and a **full traceability** and assessment of the uncertainty chain. The maturity of such data in the impacts case is in many cases not achieved.
- Therefore, if not done already by the scientific community, the **Service should contribute at an exhaustive validation** of ensembles of climate impact indices against observations for the European scale, and use existing intercomparisons (eg ISI-MIP) for the global scale. It should progressively extend the number of CC indicators as they are validated

What is the best model for a given component of the SIS?

- We chose wind energy as an illustrative example: the CCCS should at the same time provide **high quality climate data to already trained users and national services** for specific applications and inform European level with atlases of resources and their expected climate-change related evolutions to facilitate the construction of **energy & policies and scenarios**
- The group recognises that some climate indices can serve different sectors and EU policies. The definition of key European sectors should aim at responding to the European policy needs as well as broad economy sectors. **More than eight sectors were discussed....**