Earth Sciences Department

Barcelona Supercomputing Center
Centro Nacional de Supercomputación

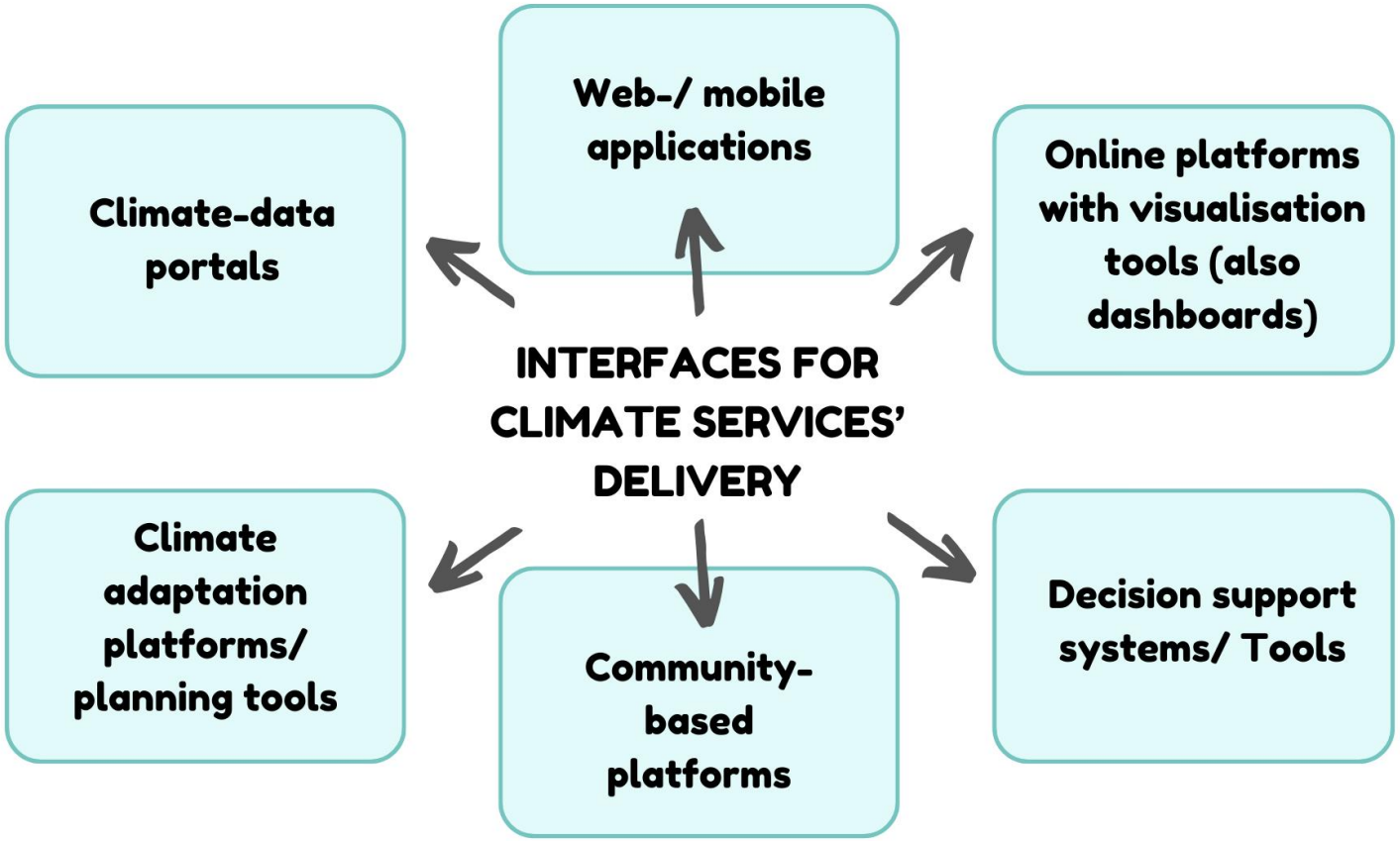
Co-production of knowledge and tools to mainstream climate adaptation

Marta Terrado & colleagues from the Knowledge Integration team, Barcelona Supercomputing Center

9th January, 2024, online

FutureMed WG2 Inaugural Meeting on Climate Adaptation

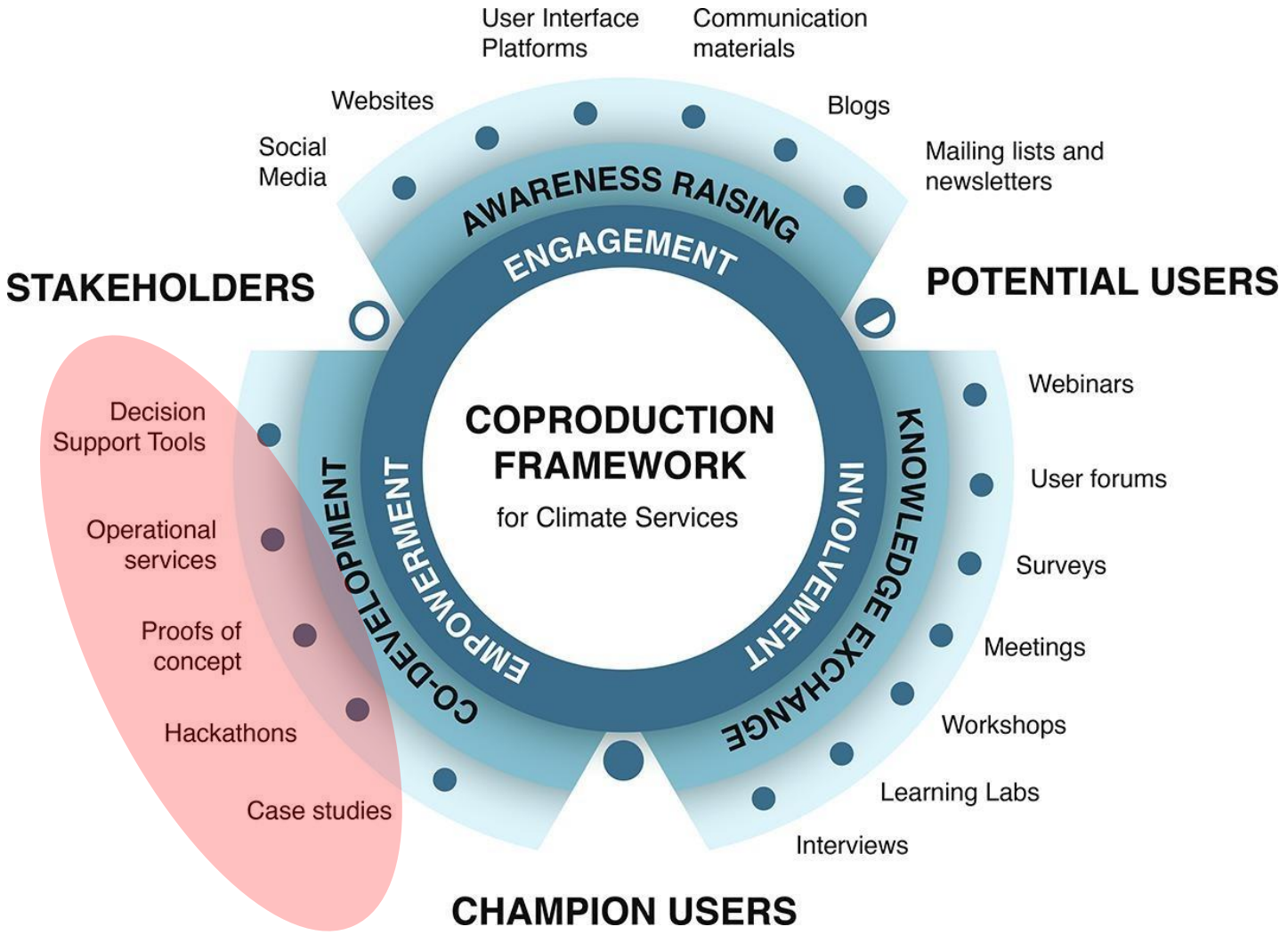
Types of climate knowledge tools/platforms



Co-production framework

We apply a transdisciplinary knowledge co-production framework that allows feedback loops between users and providers of climate information.

Bojovic et al. (2021) Engagement, involvement and empowerment: Three realms of a coproduction framework for climate services. Global Environ. Change



Co-developed climate service platforms

COORDINATION

S2S4E Decision Support Tool

Sub-seasonal and seasonal forecasting tool

EXPLORE ›

DST
Energy (wind, solar, hydropower, energy demand)

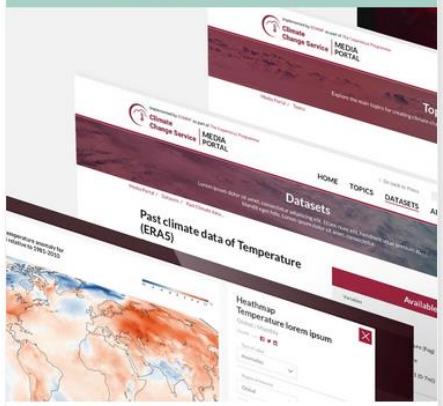
MED-GOLD

Climate services for the Mediterranean grape, olive and durum wheat sectors

EXPLORE ›

DST
Agriculture (grapes/wine, olives/olive oil, durum wheat/pasta)

COORDINATION



FINISHED

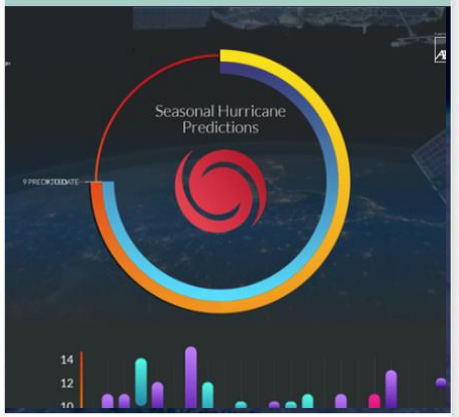
C3S Press Data Portal

Climate data tailored for journalism

EXPLORE ›

Data portal
Journalists, communicators

OPERATIONAL



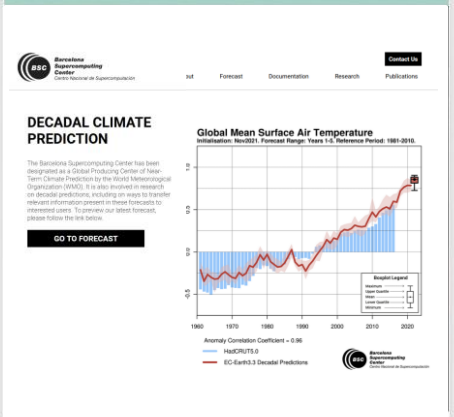
Seasonal Hurricane Predictions

Atlantic hurricane season forecasts

EXPLORE ›

Information platform
Re-insurance, general public

OPERATIONAL



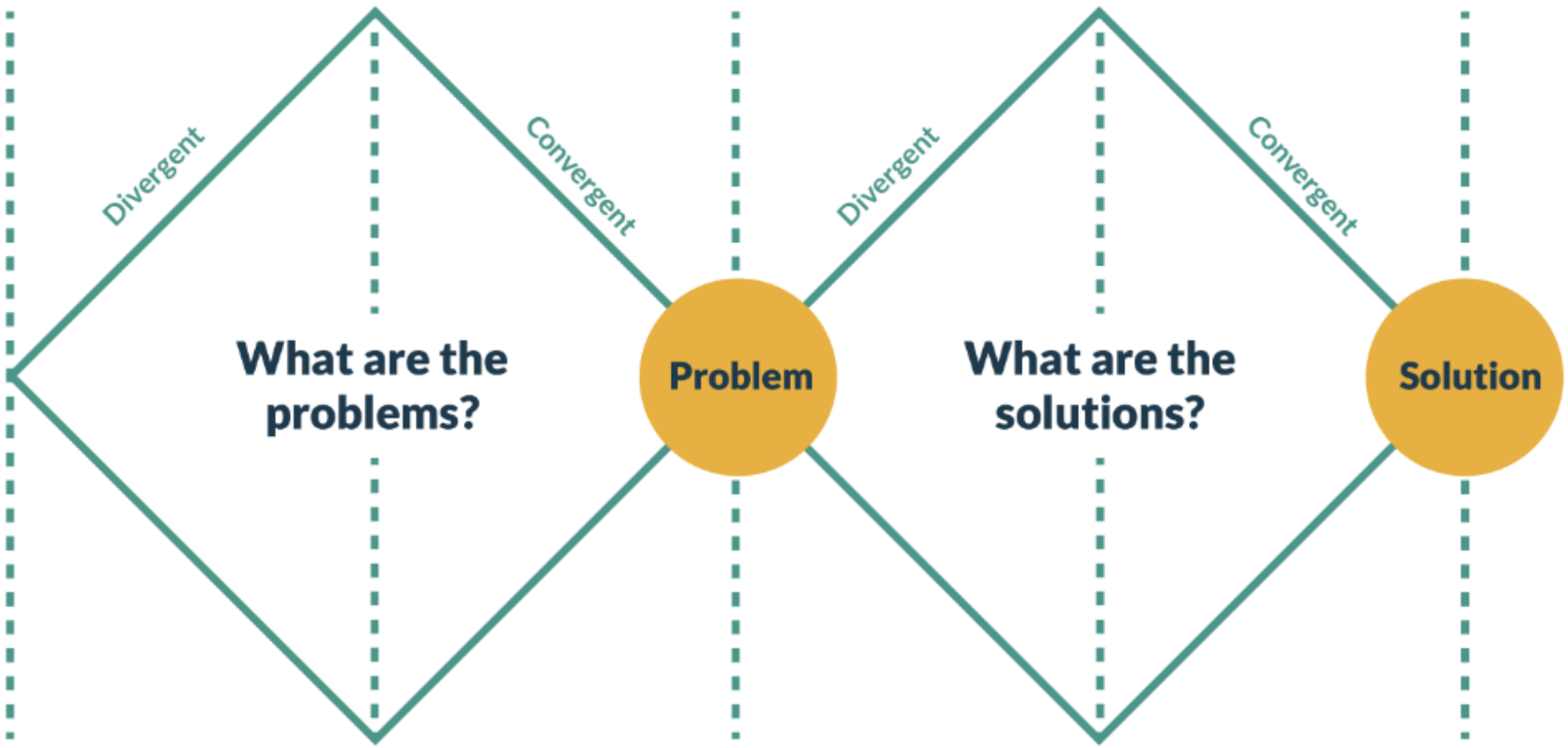
Decadal climate predictions

Decadal climate prediction system

EXPLORE ›

Information platform
Academia

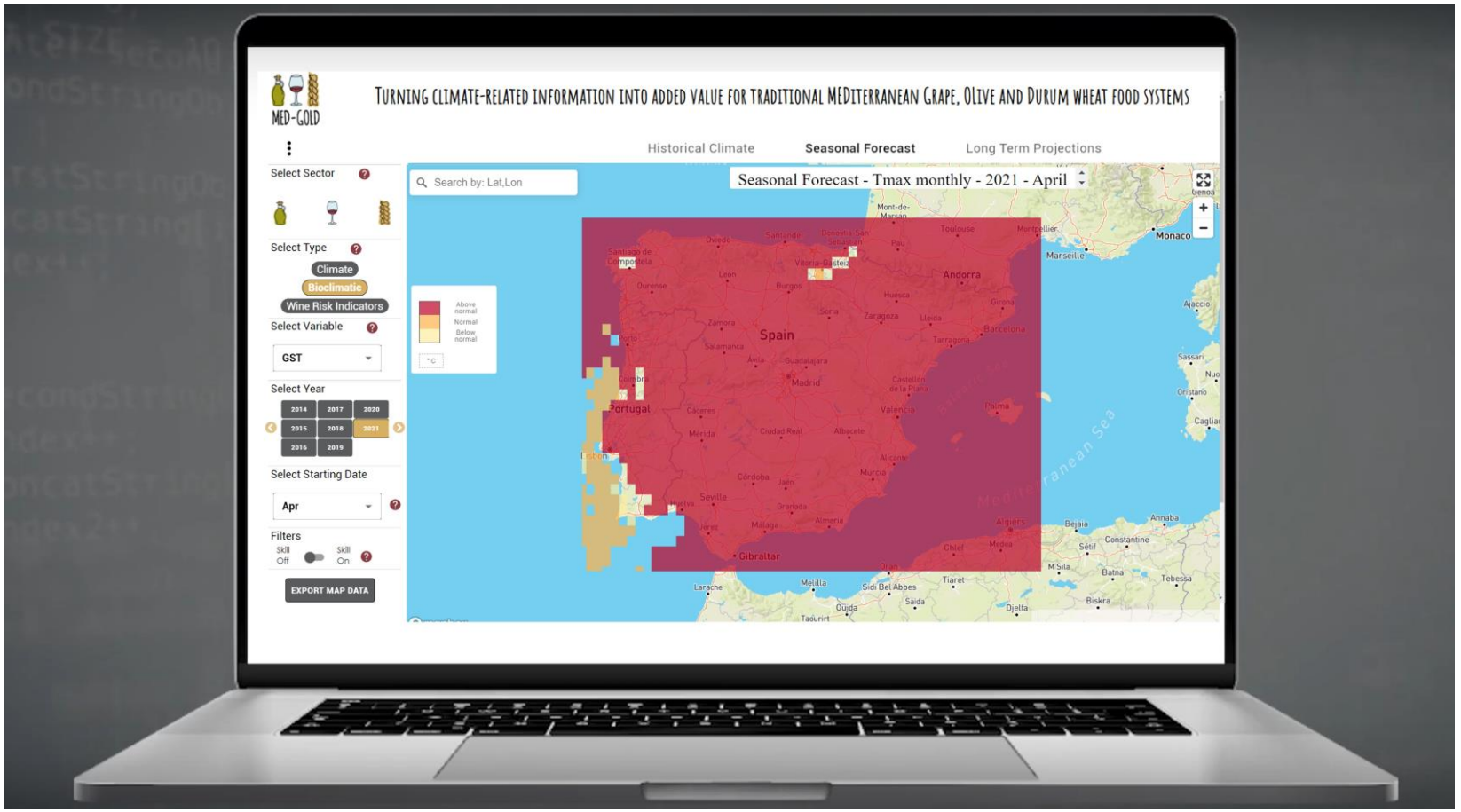
Human Centered Design



MED-GOLD Dashboard: decision support tool for the agri-food sector in the Mediterranean

MED-GOLD Dashboard

Decision support tool – agriculture



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Terrado et al. (2023) Co-production pathway of an end-to-end climate service for improved decision-making in the wine sector. Clim. Serv.

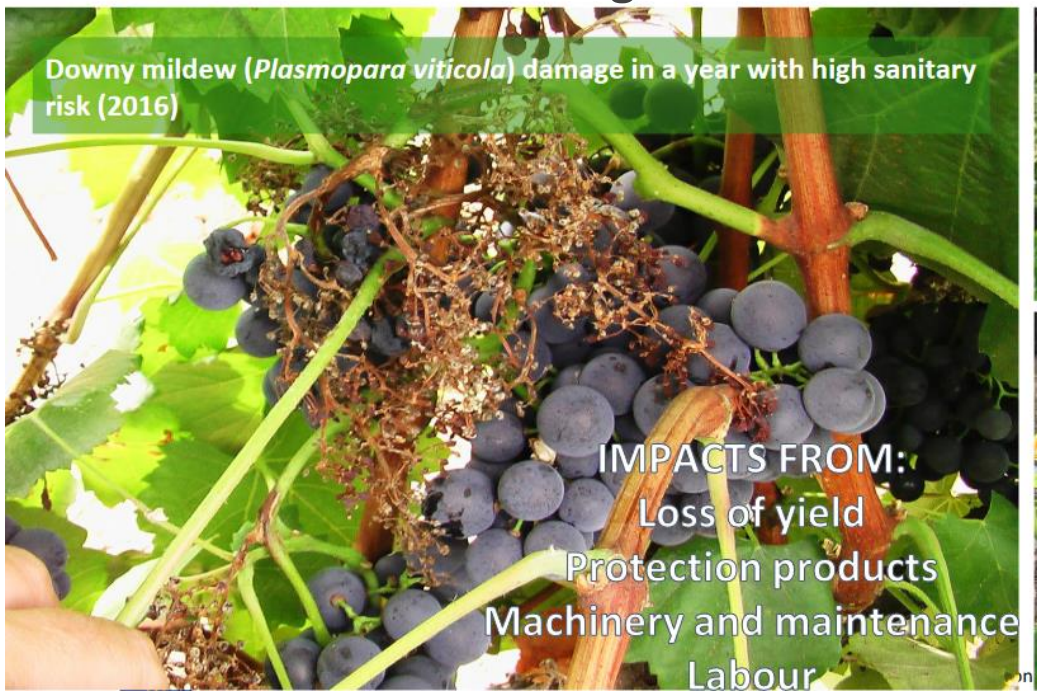
MED-GOLD

MED-GOLD Dashboard

Decision support tool – agriculture

Spring rain and temperature: increase in the risk of fungal diseases

Challenge



Related user decisions

USE CASE

You are a viticulturist.

It's March and you need to decide how much stock of plant protection products to buy this season.

Rainy and warm springs can favor pest outbreaks in vines.

Is this spring going to be particularly dry or wet?

MED-GOLD Dashboard

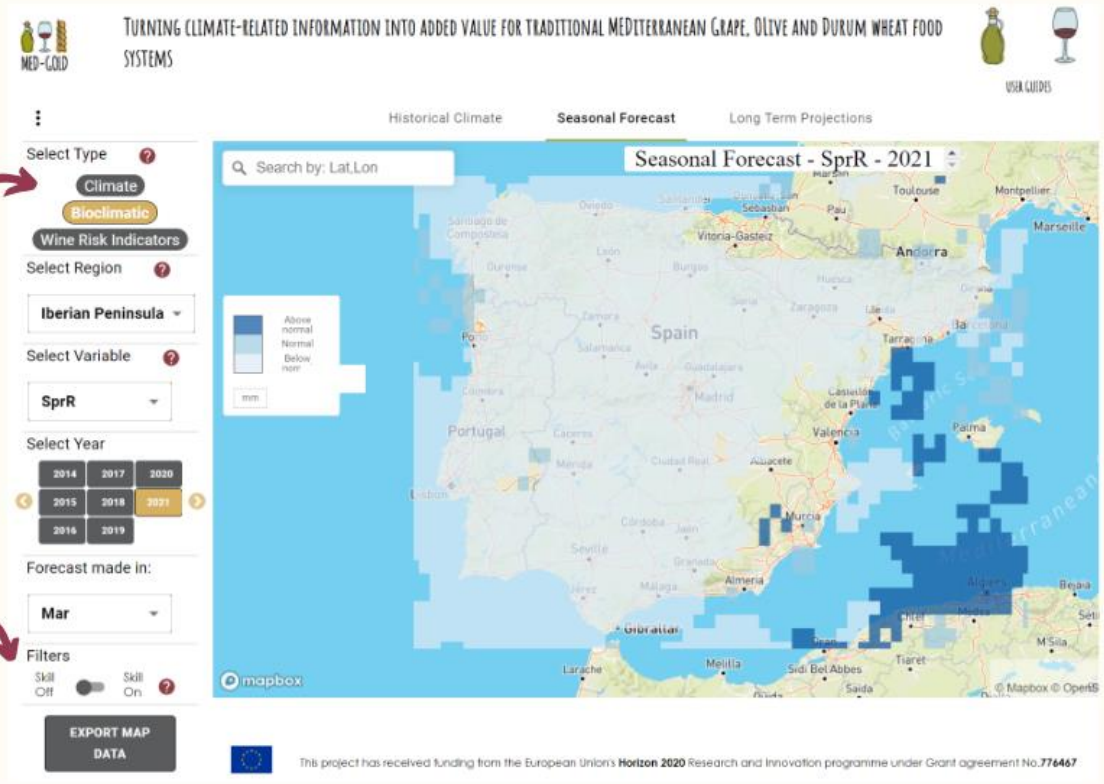
Decision support tool – agriculture

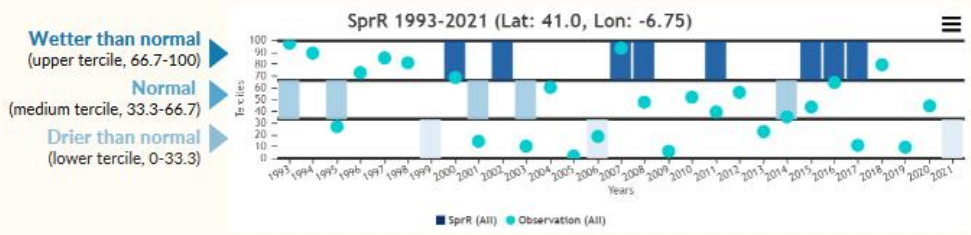
RISK OF PESTS & DISEASES?

To better assess the risk of pests and diseases, you can also look at the temperature forecast in "Climate" variables alongside the spring rain information.

HOW ACCURATE IS THE PREDICTION?

Turn on the "Skill" filter option to hide areas where the prediction is not reliable enough for decision-making.





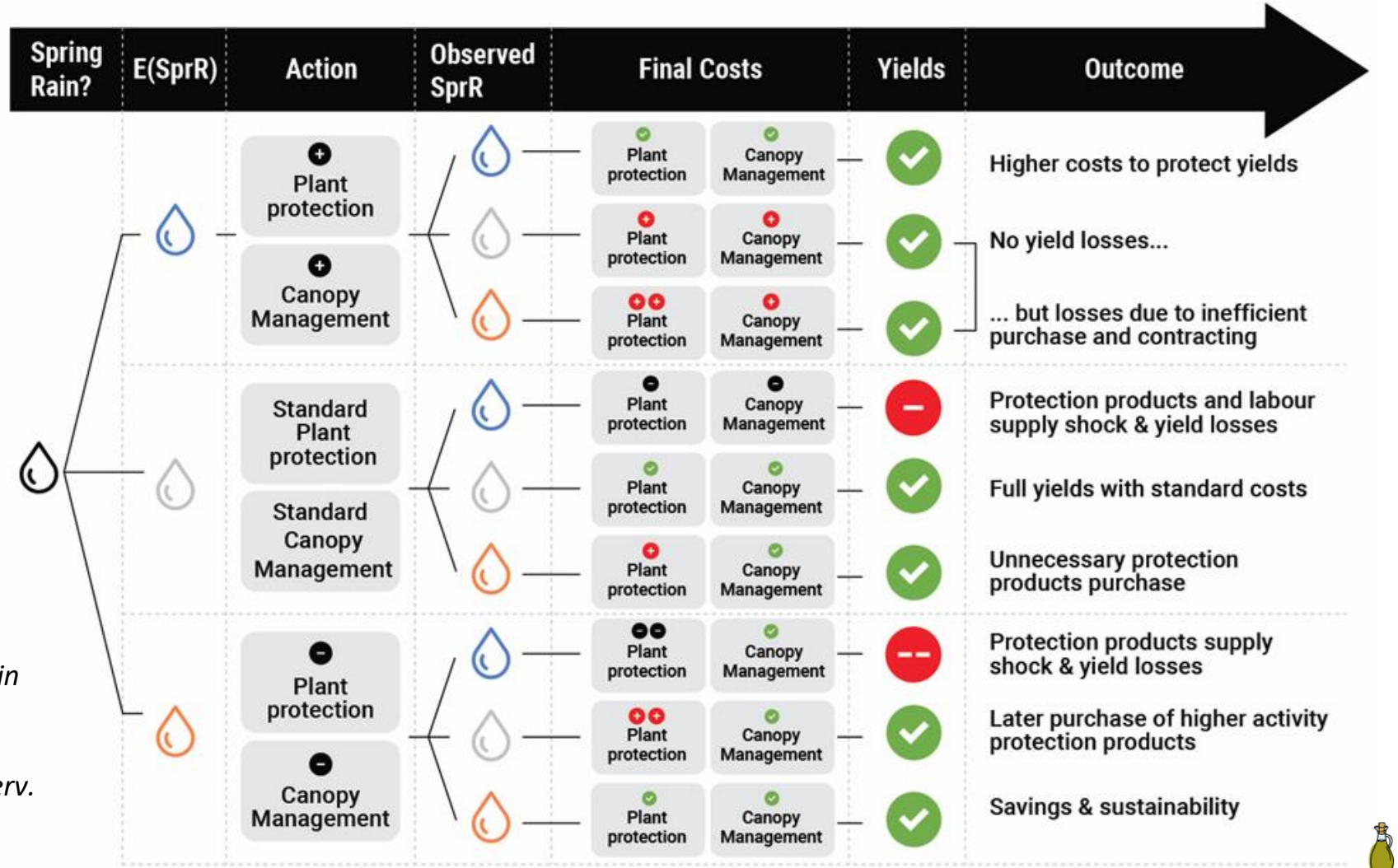
HOW WELL WAS SPRING RAIN PREDICTED IN THE PAST?

By clicking on the map, a chart will appear where circles correspond to values of spring rain observed in past years, and squares show model predictions (*above normal, normal and below normal terciles*).

MED-GOLD Dashboard

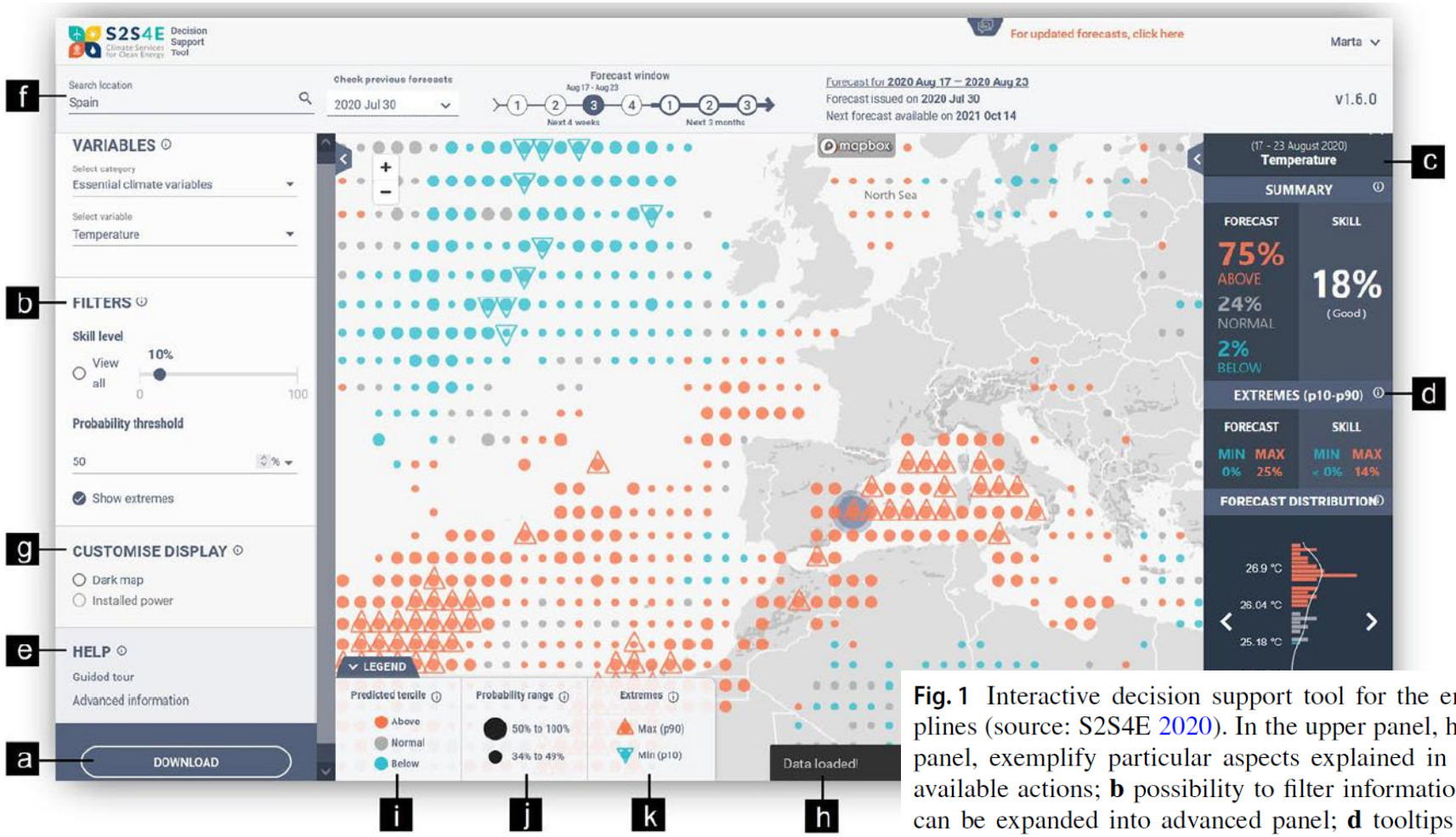
Decision support tool – agriculture

Value assessment



Vigo et al. (2023) Managing Spring rain risks in vineyards: A user-centred approach to identify climate decision triggers in seasonal forecasts. Clim. Serv.

Developing effective visualisations: lessons from other fields



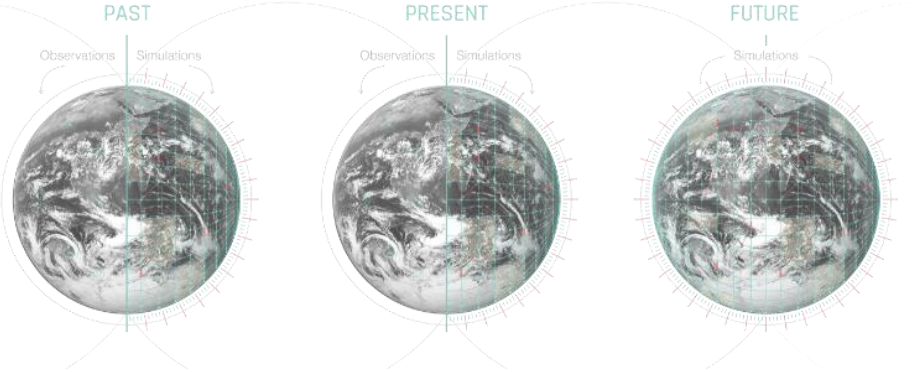
Terrado et al. (2022) Towards more effective visualisations in climate services: good practices and recommendations. Climatic Change.

Fig. 1 Interactive decision support tool for the energy sector that considers aspects from different disciplines (source: S2S4E 2020). In the upper panel, highlighted features that are further expanded in the lower panel, exemplify particular aspects explained in the paper. *User experience aspects*: **a** button reflecting available actions; **b** possibility to filter information for skill, probabilities and extremes; **c** basic panel that can be expanded into advanced panel; **d** tooltips and hyperlinks; **e** help documentation section; **f** search location; **g** customisation options; **h** feedback of system status. *Visualisation design aspects*: **g** use of intuitive patterns and conventions, **i** and **j** glyph map variables' representation (e.g. temperature, precipitation) with circles of changing size and colour and use of contrasting colour hues in a dynamic legend. *Graphic design aspects*: **i** typography with good readability and use of colour blind-friendly palettes. *Psychology aspects*: **k** use of triangle symbols for extremes to enhance attention, **i** simple visual encoding

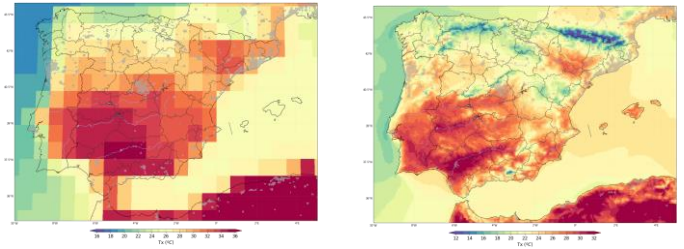
Towards multi-application tools

Seamless climate information

ASPECT
FACILITATING SEAMLESS CLIMATE ADAPTATION



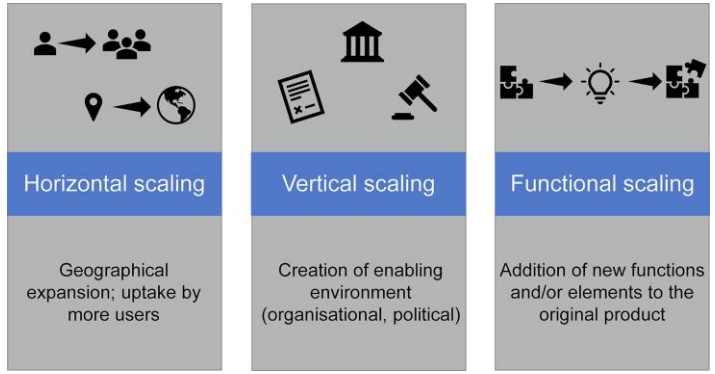
Higher resolution for local adaptation



Daily Tx averaged over JJA for Spain (2020). Source: EC-Earth3, SSP2-4.5 CMIP6 (left); NextGEMS Cycle 2 ICON 5km (ngc2009 / R02B09) (right)

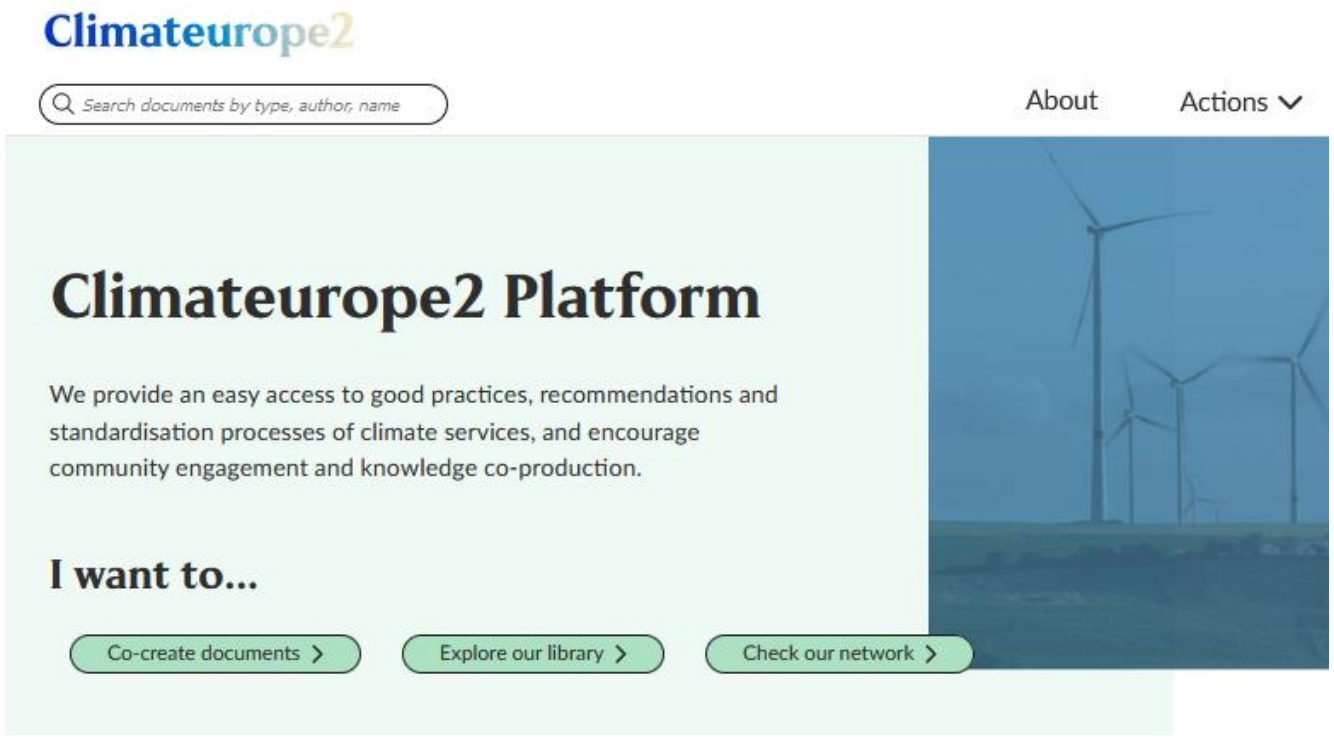
Upscaling of solutions

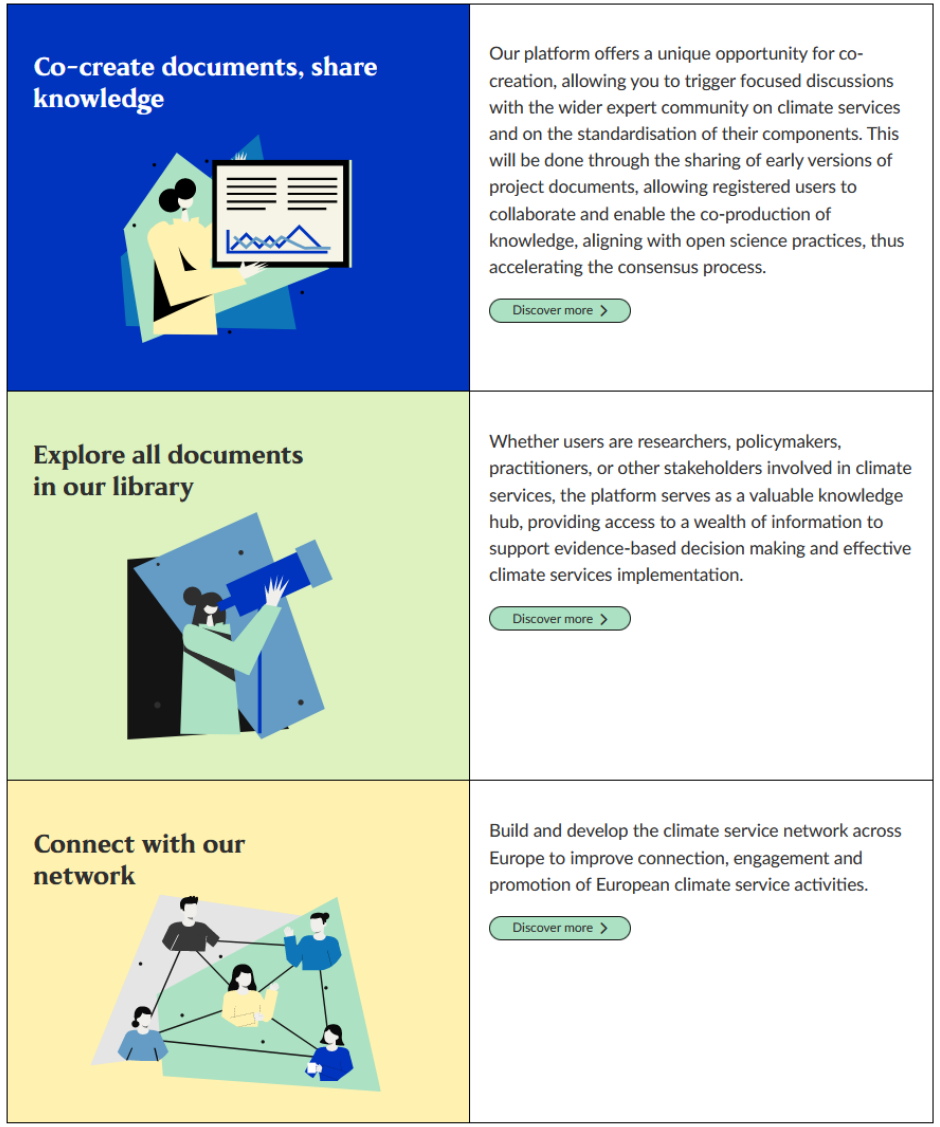
Guentchev et al. (2023) Clim. Serv.



Towards standardisation of climate services

Climate services good practices/collaborative platform
community-based platform – climate services community





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Thank you!

Climateurope2

ASPECT
FACILITATING SEAMLESS CLIMATE ADAPTATION

MED-GOLD

S2S4E
Climate Services for Clean Energy

Seasonal Hurricane Predictions

Destination Earth | European Centre for Medium-Range Weather Forecasts

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