C3S **Sectoral Information System**: from useful to usable climate information

Climate Change

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UEF2020, 1-4 June

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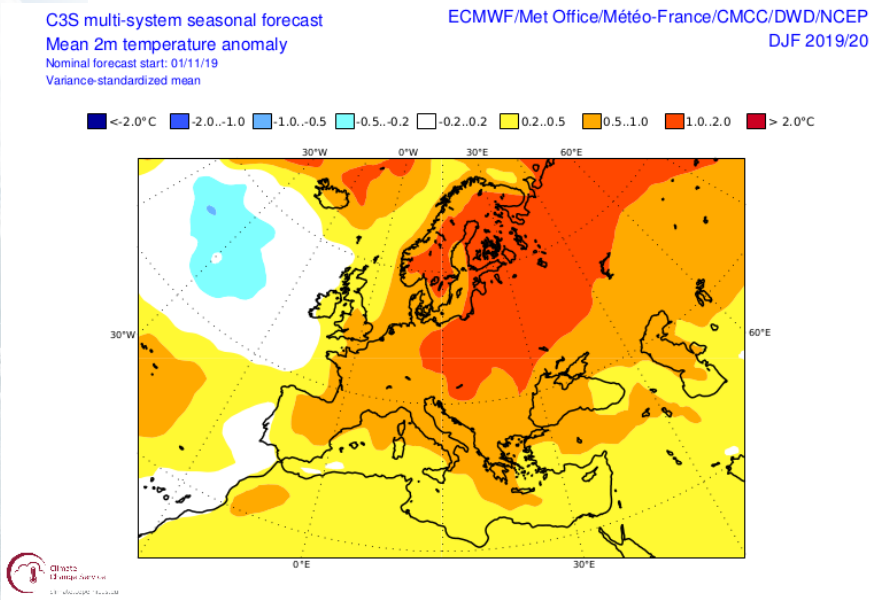
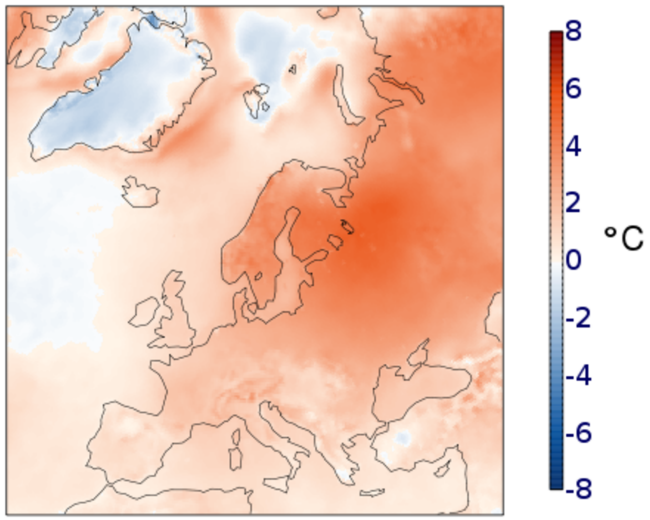
Winter 2019-2020

The boreal winter season 19/20 was by far the warmest winter season ever recorded in Europe

Surface air temperature anomaly for December 2019 to February 2020 relative to 1981-2010





https://climate.copernicus.eu/charts/c3s_seasonal/

https://climate.copernicus.eu/boreal-winter-season-1920-was-far-warmest-winter-season-ever-recorded-europe-0

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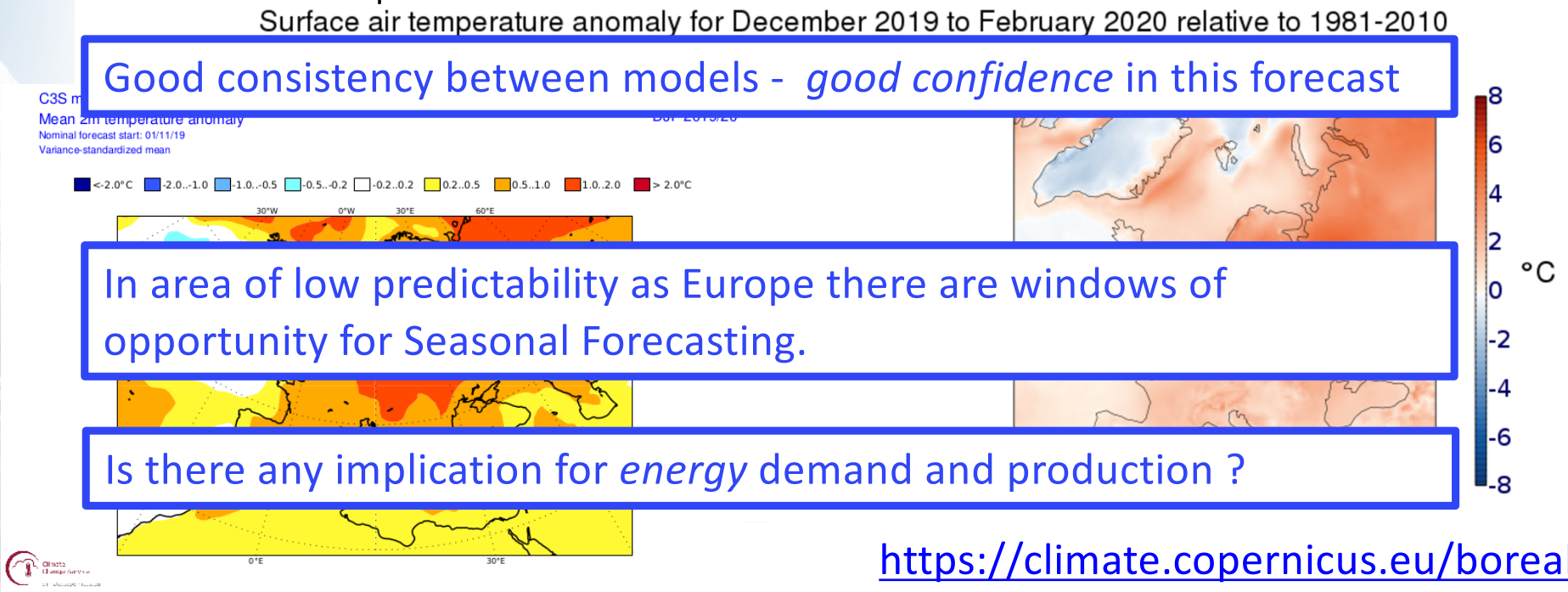

Good consistency between models - *good confidence* in this forecast

In area of low predictability as Europe there are windows of opportunity for Seasonal Forecasting.

Is there any implication for *energy* demand and production ?

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The SIS component of C3S

- Why?

Climate Change and Climate variations impact different sectors around the world

- To Whom?

Many different actors

- What ?

The SIS is collection of a **reliable** set of indicators, tools, applications, workflows, reference examples, stories…

The SIS component is built on the CDS data and technology.

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Sectors

Infrastructure, Transport and Associated Standards

Biodiversity

Energy

Disaster risk reduction

Health

Water management

Insurance

Coastal areas

Agriculture and forestry

Tourism

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Data in Action

Useful, usable and used information

Useful: Reliable, Credible, Quality..

Usable: Tailored, Flexible, Interactive, Timely, Explorable..

Used: Fully supported, Added value

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Example 1 : Health Sector

Heatwaves in summer pose substantial risk to human health

Heatwaves are becoming more common. Intense heatwaves more frequent due to human-induced climate change

The minimum need : To learn from the past and to *estimate* what to expect for later

Application 1: https://cds.climate.copernicus.eu/apps/c3s/app-health-heat-waves-projections
Application 2: https://cds.climate.copernicus.eu/apps/c3s/app-health-temperature-exposure-current-climate

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European urban climate from 2008-2017

Climate Data Store - Health-33: European urban climate from 2008-2017

City

Barcel...

- Alicante
- Amsterdam
- Antwerp
- Athens
- Barcelona
- Bari
- Basel
- Belgrado
- Berlin

Variable

Minim...

- Minimum temperature
- Mean temperature
- Maximum temperature
- Specific humidity
- Relative humidity
- Surface wind speed

Statistic

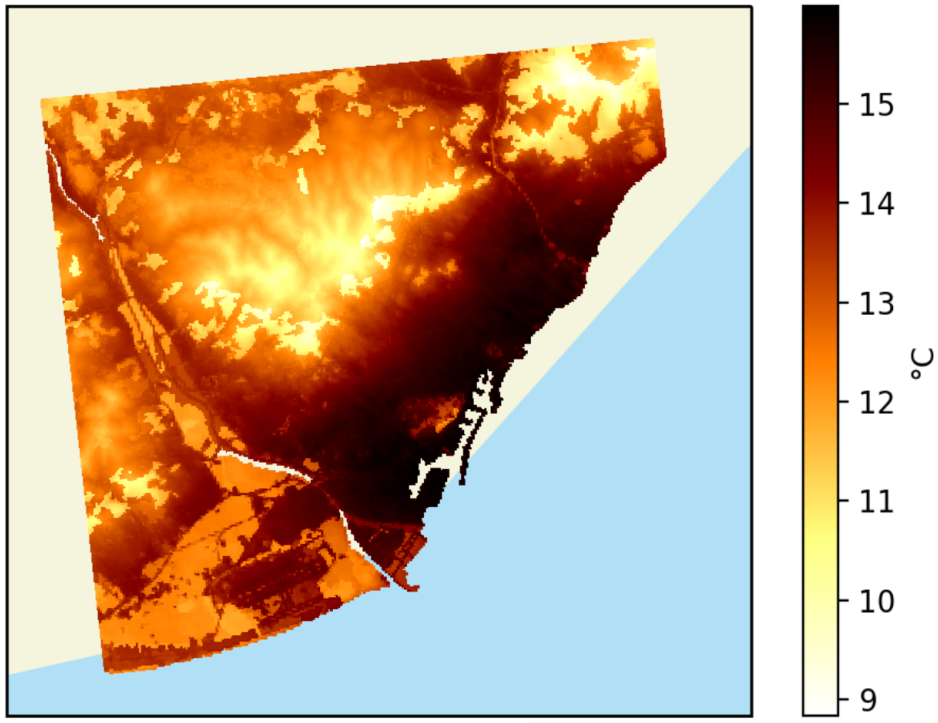
Mean

- Mean
- 10th percentile
- 25th percentile
- 50th percentile
- 75th percentile
- 90th percentile

Period

Annual

Mean of annual minimum temperature for Barcelona averaged over 2008-2017



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Lessons Learned

Common Users needs across Sectors

High resolution (space and time)

Aggregation (space and time)

Bias-adjustment (w.r.t several datasets)

Extremes

Interactivity - felxibility

Simple - Easy to tailor

Way forward

Tools – Examples – Workflows – Applications

Reference – Benchmark

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Example 2: COVID-19 Climate Explorer

https://cds.climate.copernicus.eu/apps/c3s/app-c3s-monthly-climate-covid-19-explorer

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Lessons learned

Fast response to urgent / compelling need

Different data sources

This is not the only example : CAMS

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Challenges

- How to stay general enough but specific at the same time
- How to put user at the center, from the beginning (from being ‘science-based and user-informed’, to being ‘user-based and science-informed’)
- How to maintain quality
- SIS across Services
- Uncertainty
- Often need of difference source of data - Interdisciplinarity
- Evaluation

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App. on the European Health Sectors

Heatwaves: https://cds.climate.copernicus.eu/apps/c3s/app-health-heat-waves-projections

Heat exposure: https://cds.climate.copernicus.eu/cdsapp#!/software/app-health-temperature-exposure-projections?tab=app

Mosquito suitability: https://cds.climate.copernicus.eu/apps/c3s/app-health-aedes-albopictus-suitability-projections

Urban: ready soon !

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