



**Barcelona
Supercomputing
Center**

Centro Nacional de Supercomputación



EARTH SYSTEM SERVICES

ICTA-BSC synergies

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Services – Earth Science Department



OUR OBJECTIVE:

Facilitate technology transfer of state-of-the-art research from local, national to international levels in five areas:

Air quality assessments

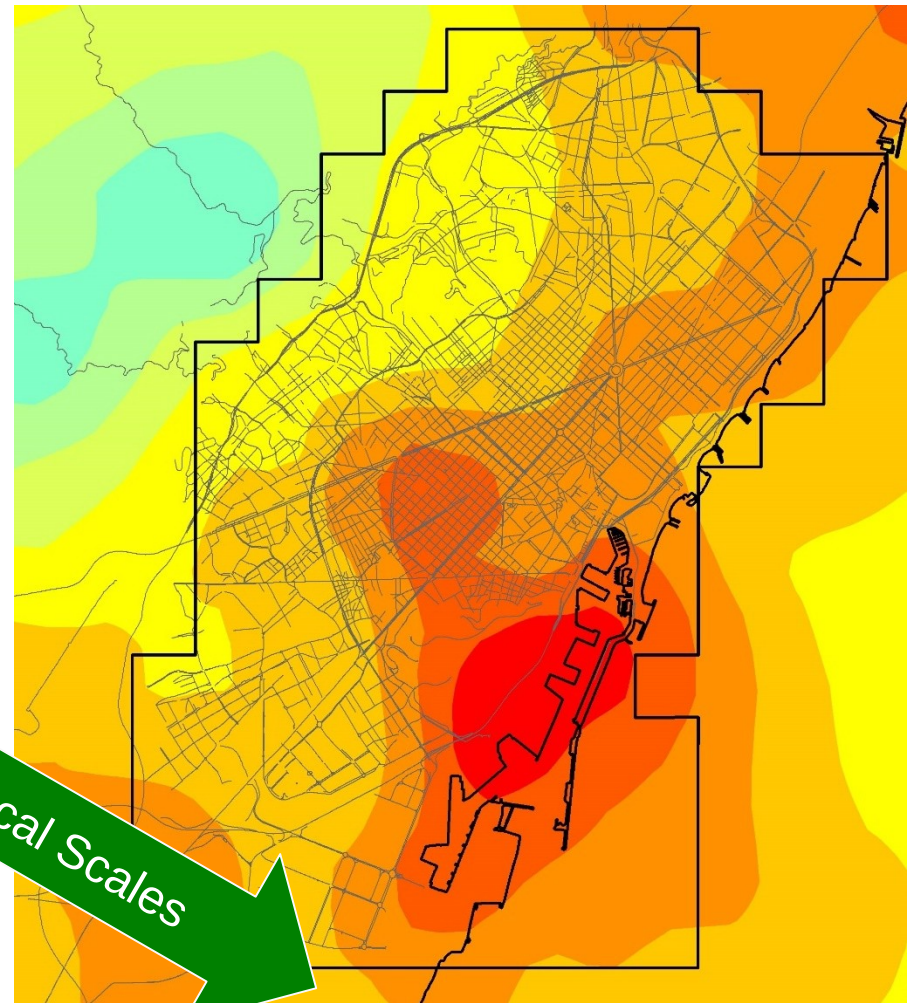
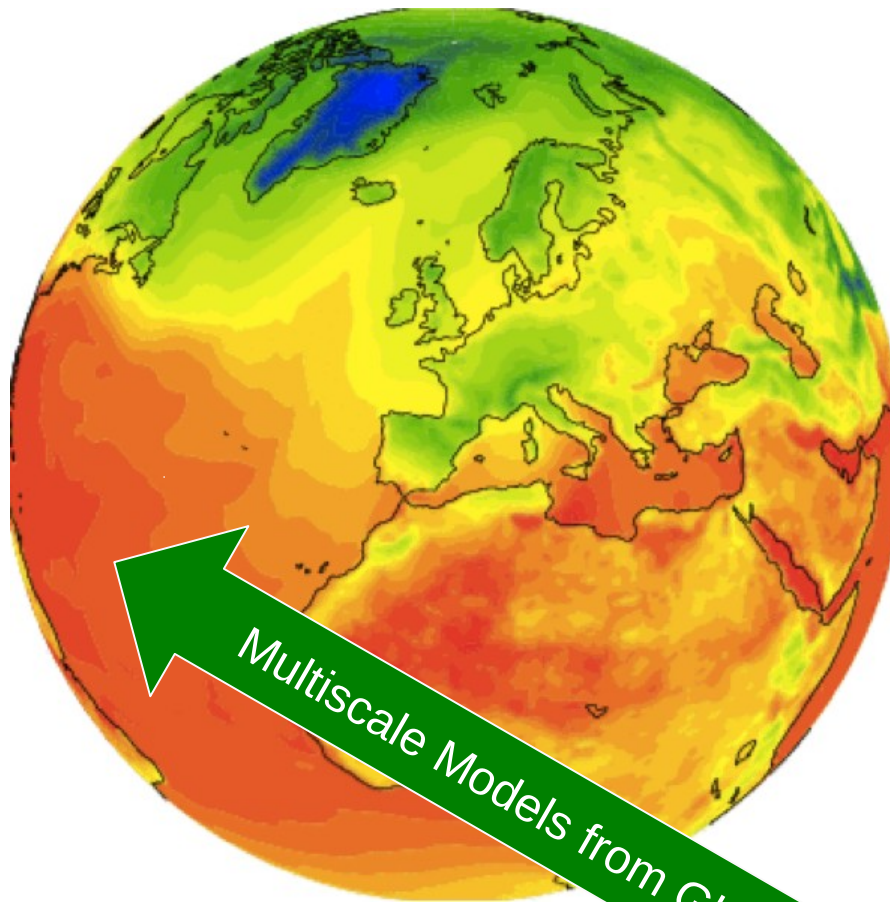
Mineral Dust modelling

Weather forecasting

Climate predictions

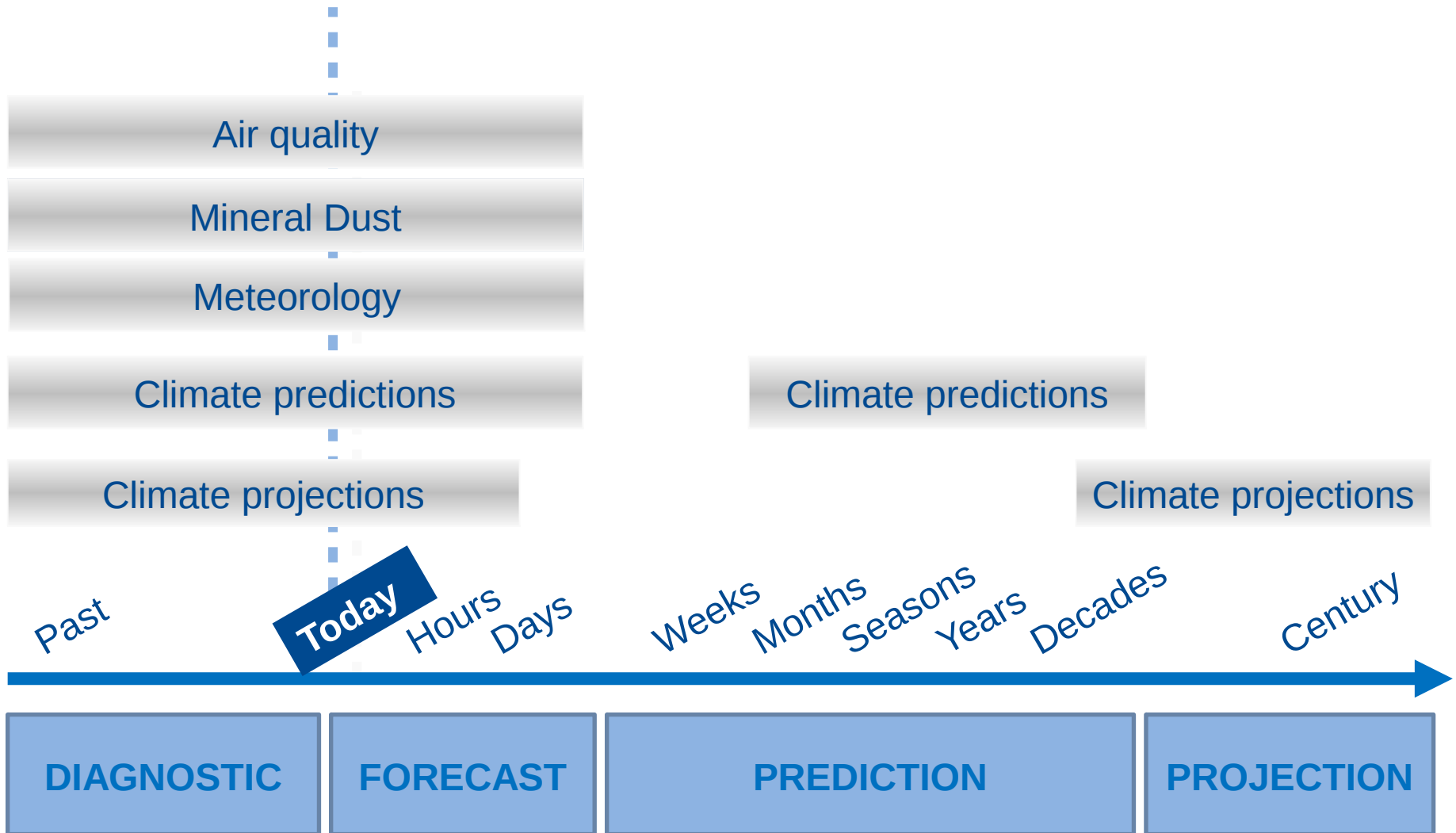
Computational Earth Services

Multi-scale models from global to local scales



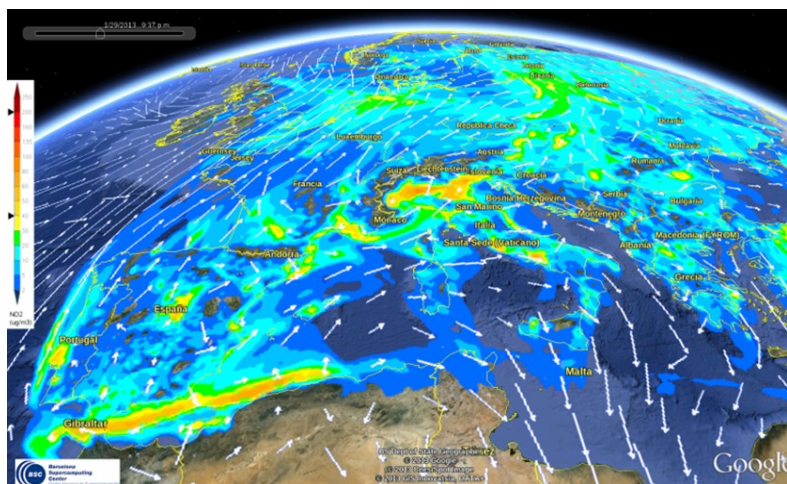
Multiscale Models from Global to Local Scales

Temporal scales



Air quality forecast system: CALIOPE

Provides air quality related information for the coming days and for the application of short term action plans for air quality managers.

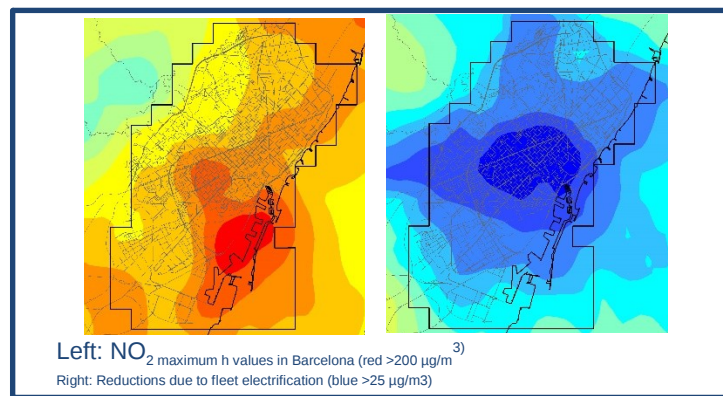
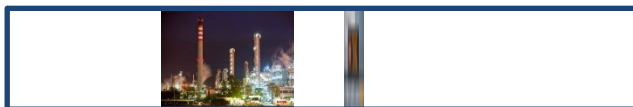


Information is delivered using both online or custom applications:



Air quality impact assessment

Air quality modelling provides comprehensive description of air quality problems by relating emission sources and atmospheric conditions

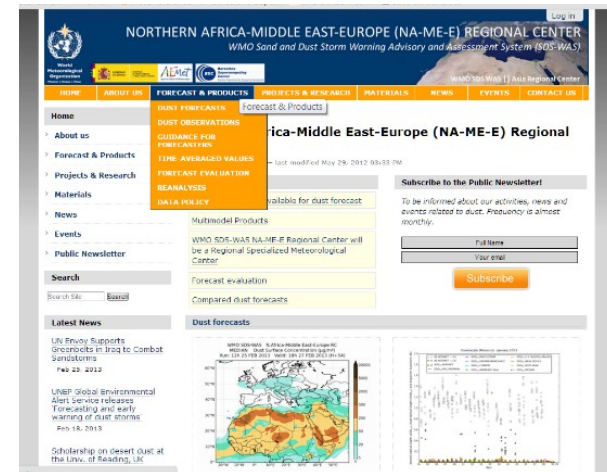


These projects have received funding from:



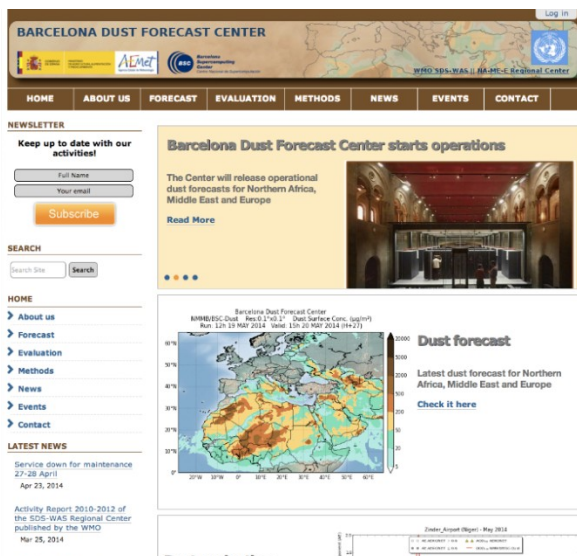
Mineral dust forecasts SDS-WAS North Africa, Middle East and Europe Regional Center

Early warning system
started in 2010

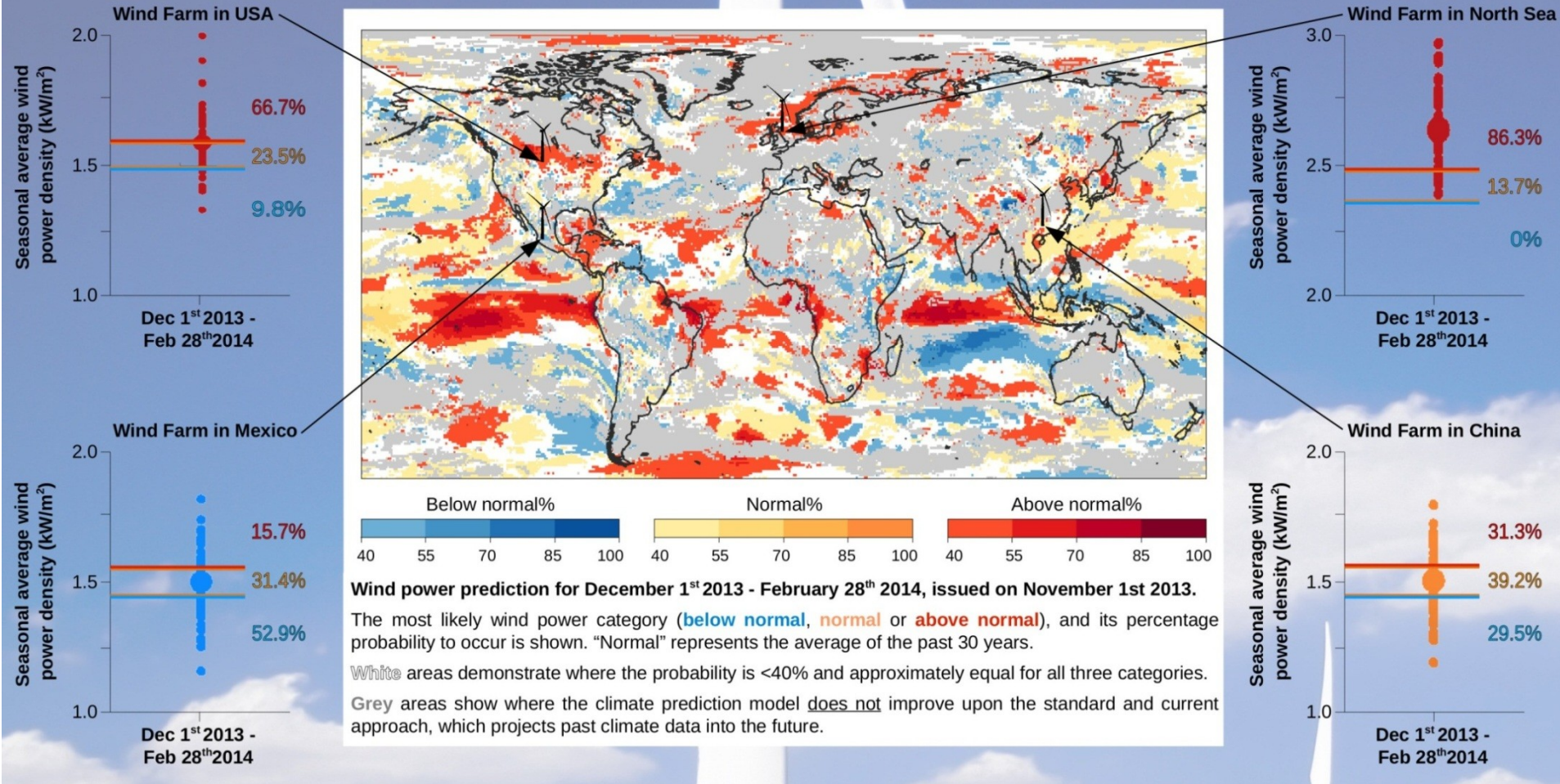


Barcelona Dust Forecast Center

First specialized WMO Center for
mineral dust prediction
started in 2014



Illustrative examples of seasonal wind power predictions



These projects have received funding from:



EUPORIAS



We are in contact with:



VORTEX



- Pollen forecast (Dr. Jordina Belmonte). FMI example.

- Which models do you use.

CFD, dispersión models?

Are microscale models nested with mesoscale models?

Air pollution has any relation with aerobiological pollution?



An example of a project: Planting new vineyards for Bodegas Torres

A case-study: climate projections for wine-makers

Objective: identify if and where grape can grow in Patagonia in 2050



A case-study: climate projections for wine-makers

Wine Indices

Winkler Índice

Winter severity Index

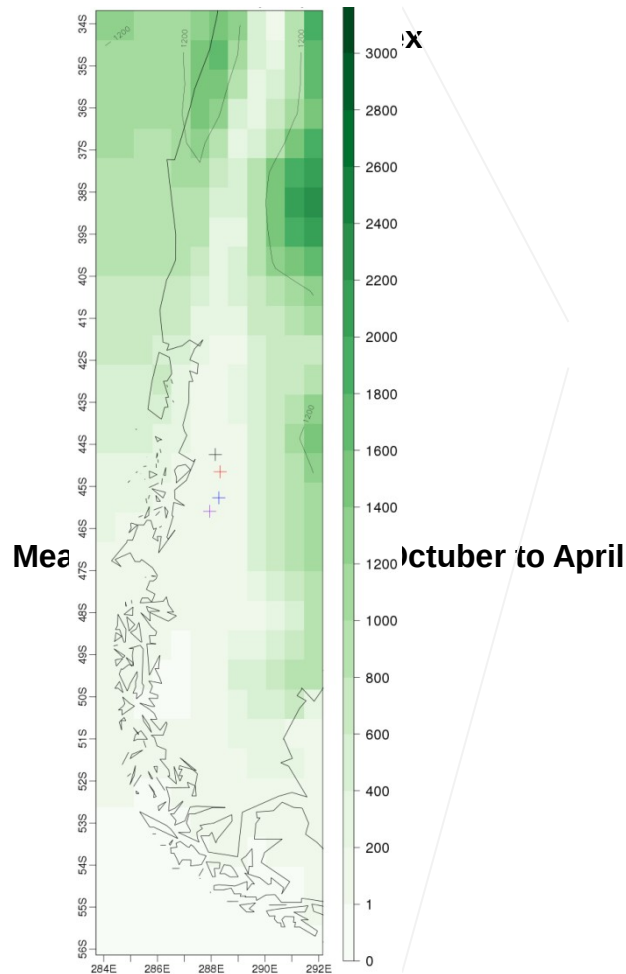
Mean Temperature from October to April

Total Rainfall from October to April

A case-study: climate projections for wine-makers

Present climate

Wine Indices



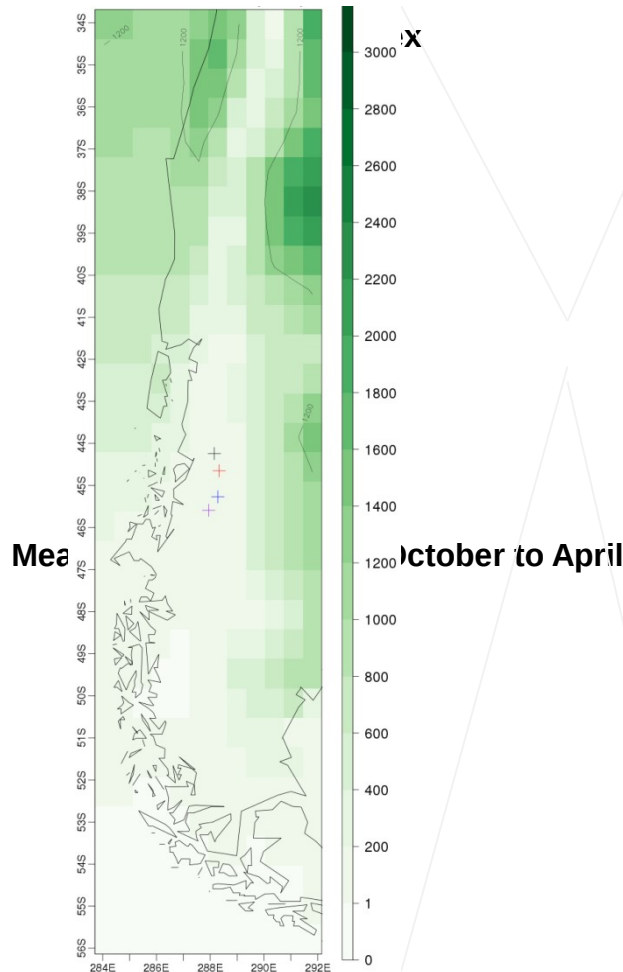
Winter severity Index

Total Rainfall from October to April

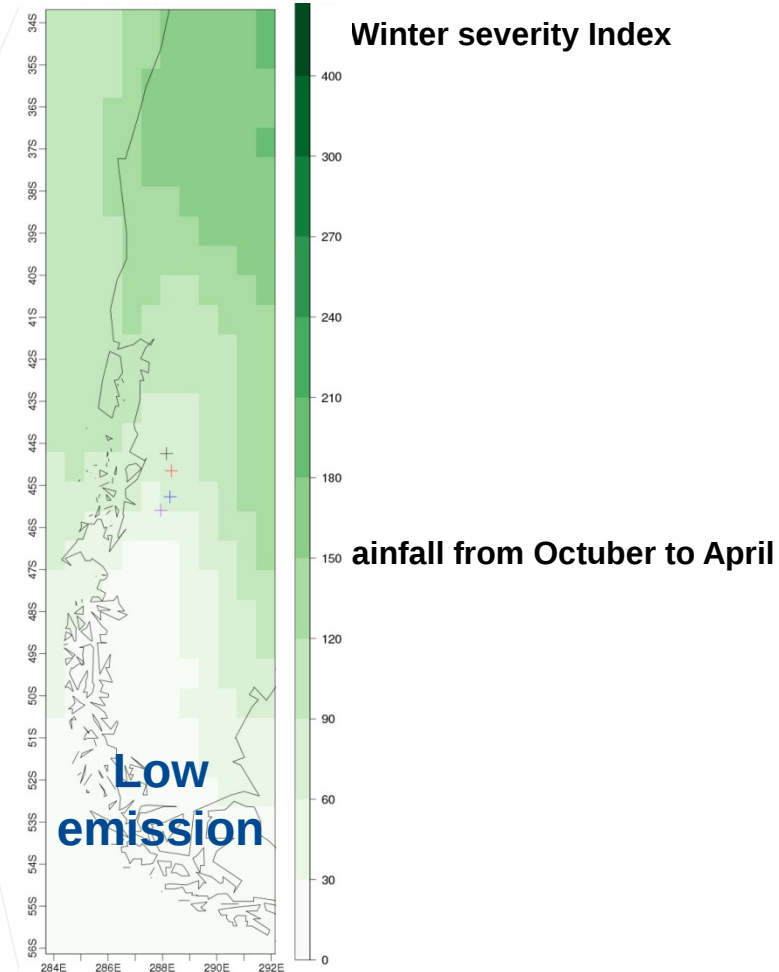
A case-study: climate projections for wine-makers

Climate change for two emission scenarios: Future Climate (2031-2050) – Present climate

Present climate



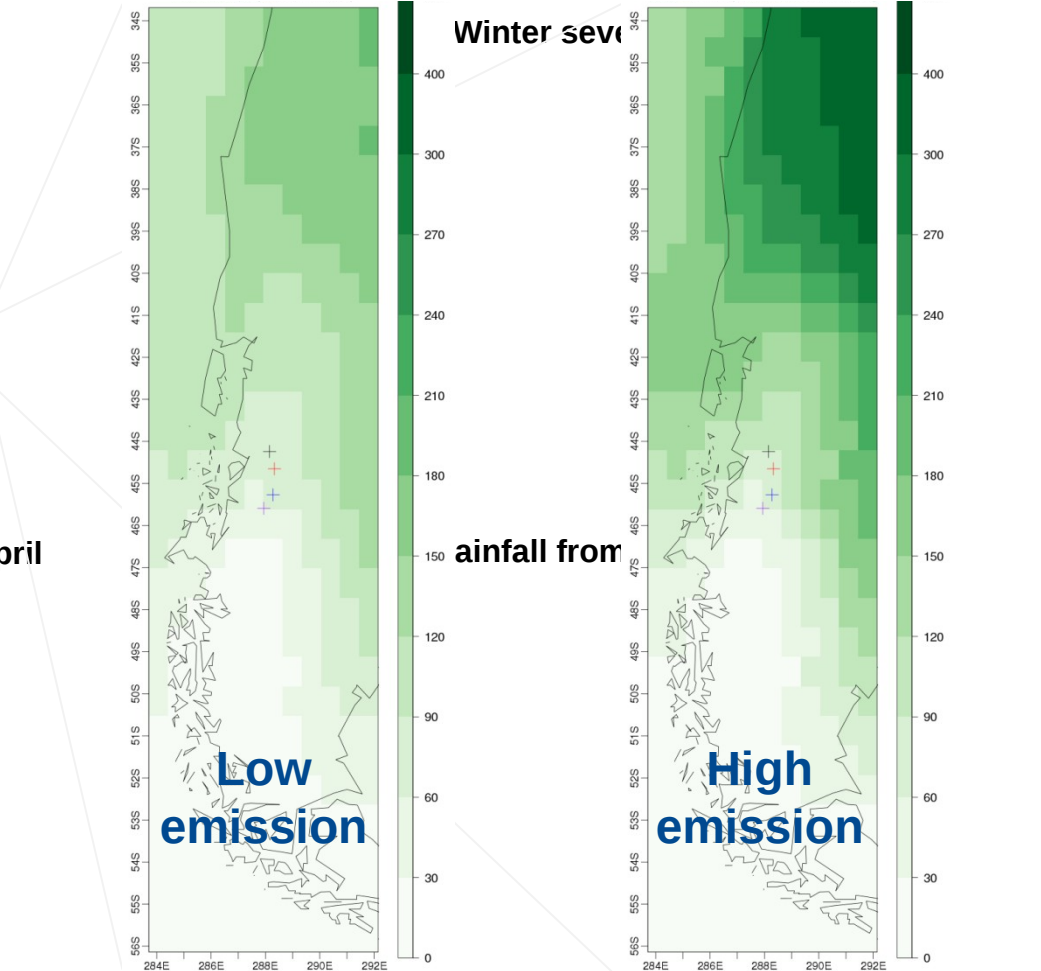
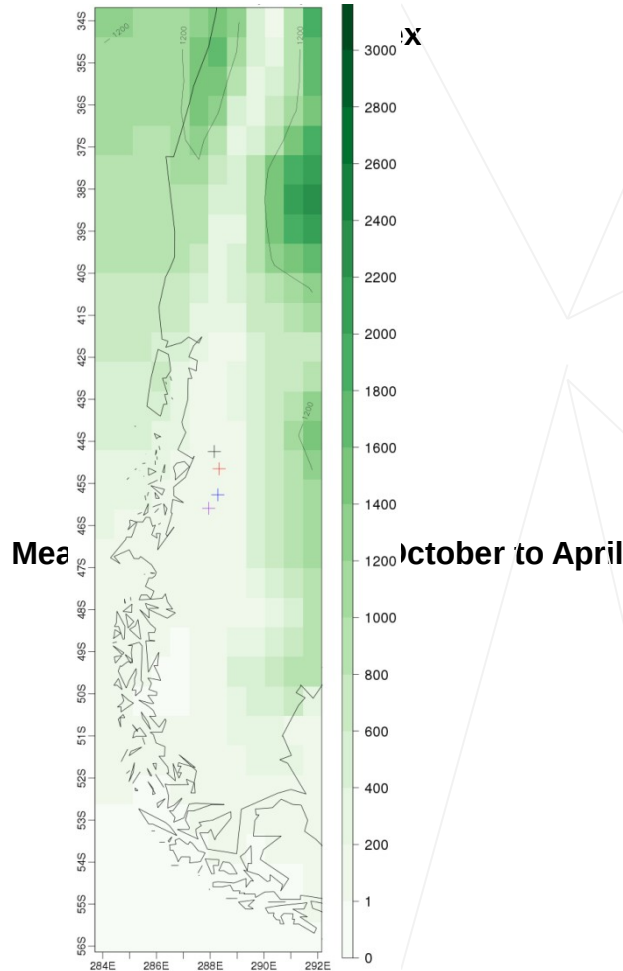
Future Climate (2031-2050) – Present climate



A case-study: climate projections for wine-makers

Climate change for two emission scenarios: Future Climate (2031-2050) – Present climate

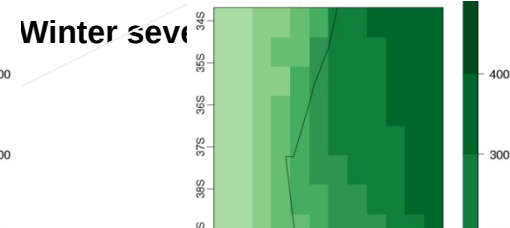
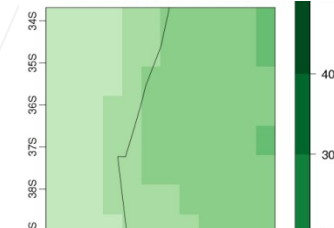
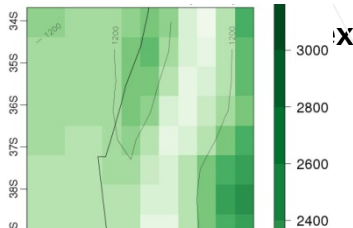
Present climate



A case-study: climate projections for wine-makers

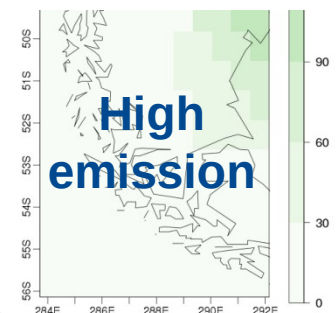
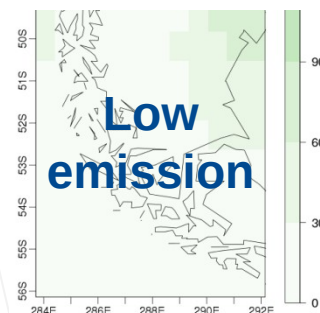
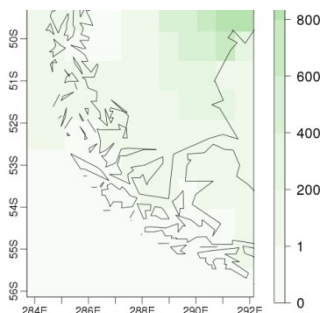
Climate change for two emission scenarios: Future Climate (2031-2050) – Present climate

Present climate



<u>Wine index</u>	<u>Site 1</u>	<u>Site 2</u>	<u>Site 3</u>	<u>Site 4</u>
<u>Mean yearly temperature</u>	1.03°C	1.03°C	1.05°C	1.03°C
<u>Mean temperature oct-apr</u>	1.16°C	1.14°C	1.14°C	1.10°C
<u>Winkler index</u>	75.6°C	77.3°C	59.3°C	44.5°C
<u>Winter severity index</u>	0.85°C	0.86°C	0.96°C	0.97°C
<u>Total yearly rainfall</u>	-114 mm	-109 mm	-85 mm	-96 mm
<u>Total rainfall oct-abr</u>	-95 mm	-93 mm	-71 mm	-79 mm

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EXCELENCIA
SEVERO
OCHOA

Thank you!

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