



IMPETUS
4 CHANGE
TO CHANGE



Comprehensive dataset assessing
extreme winds over Europe in
Regional Climate Models

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impetus4change.eu

 @I4C_eu



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BJERKNES CENTRE
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Nansen Center, Bergen

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Euro-CORDEX Data

Euro-CORDEX downscaling of CMIP5 models

Horizontal resolution of 0.11° (~12 km)

15 combinations – 6 GCMs downscaled with 6 RCMs

Daily maximum wind speed

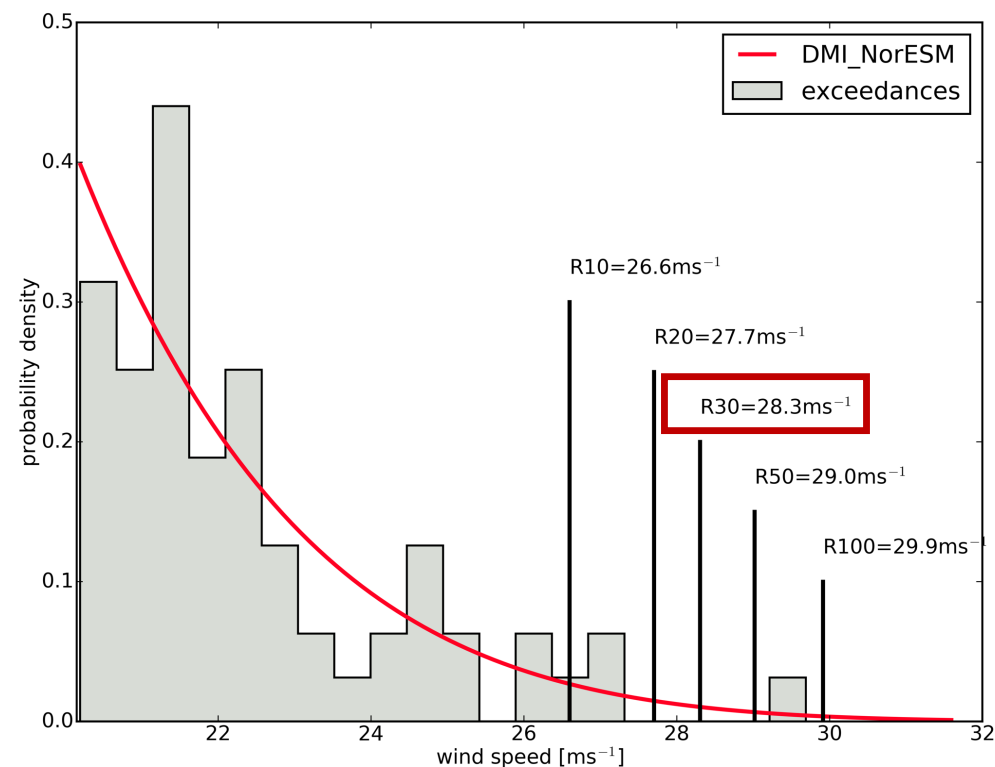
Historical and Future RCP8.5

Four 30-year periods

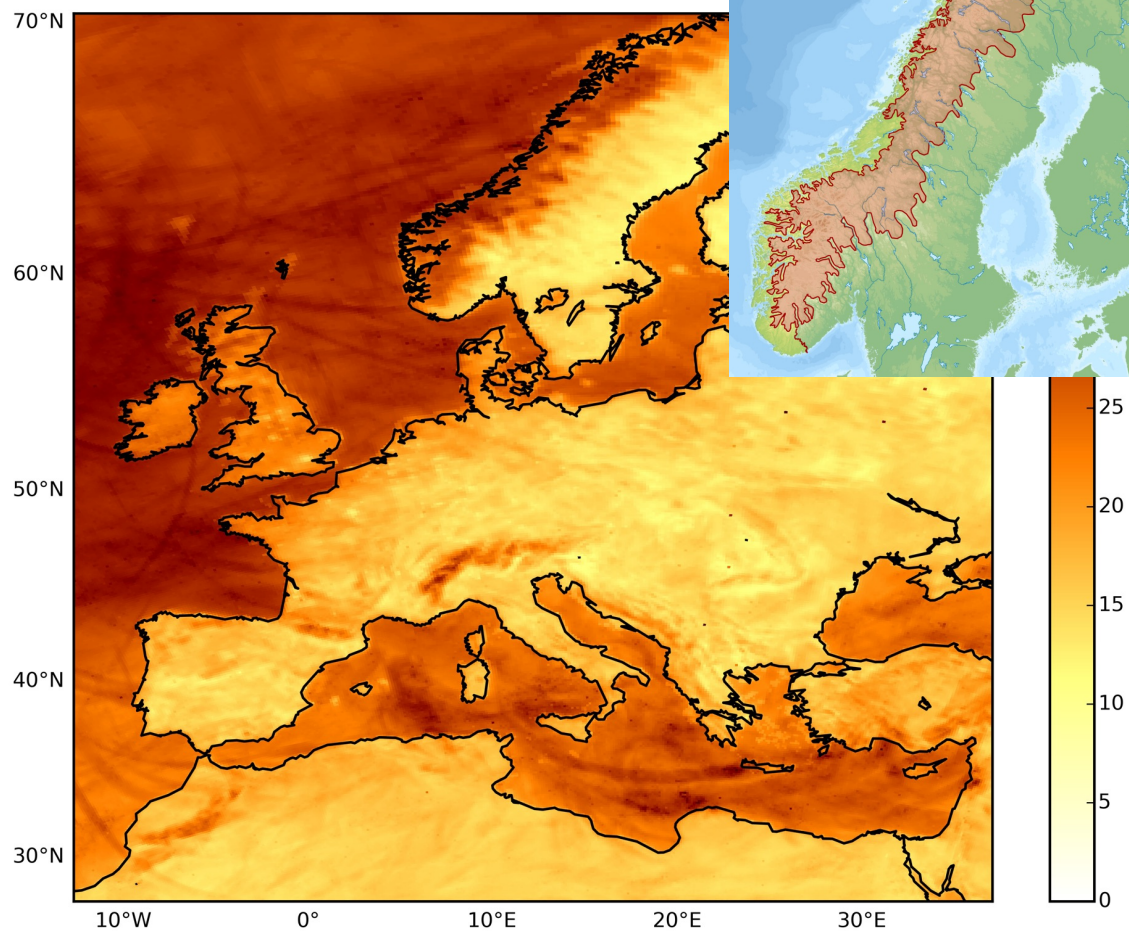
European domain

Employed peaks-over-threshold approach

Euro-CORDEX

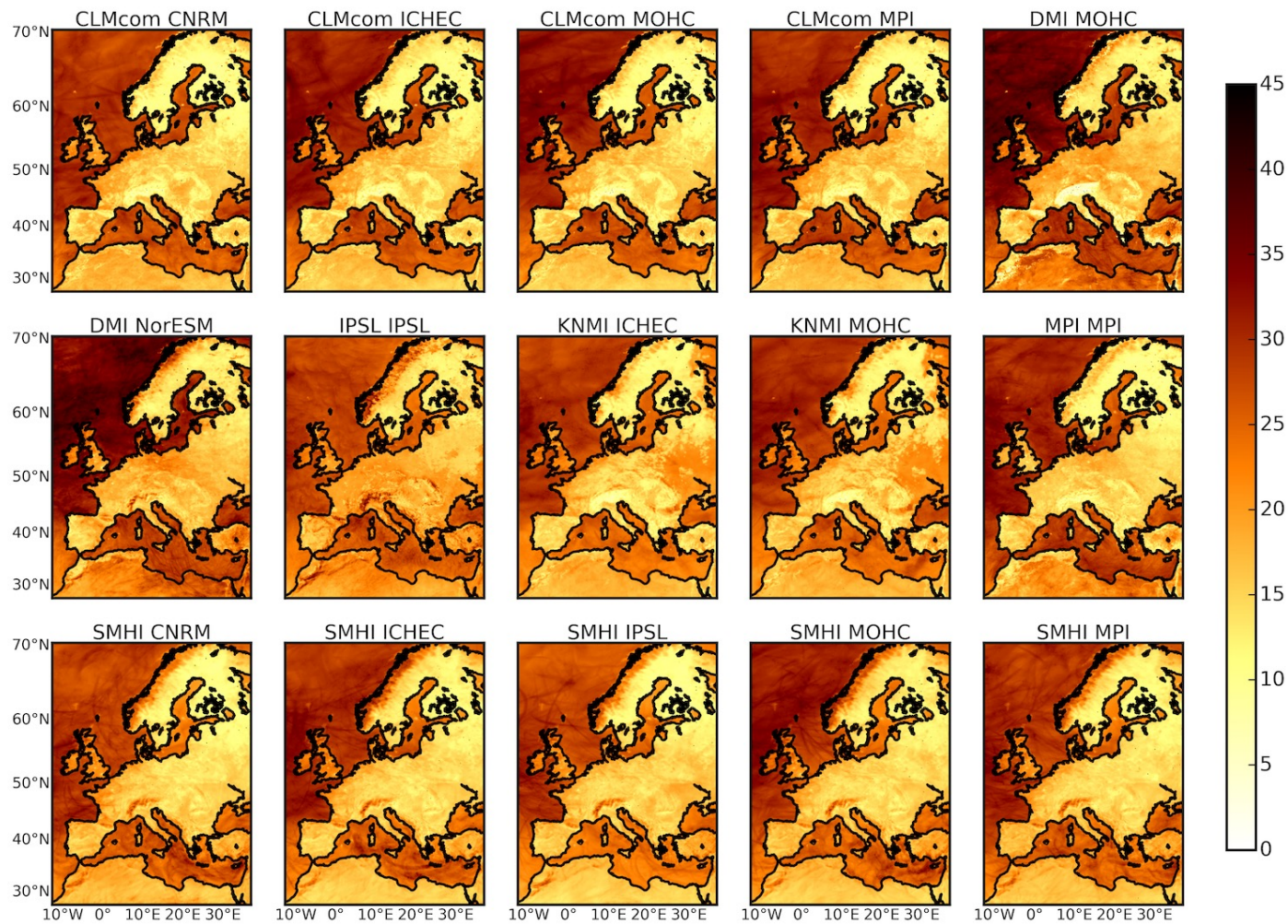


NorESM1-HIRHAM5 – 30 year return 1976-2005

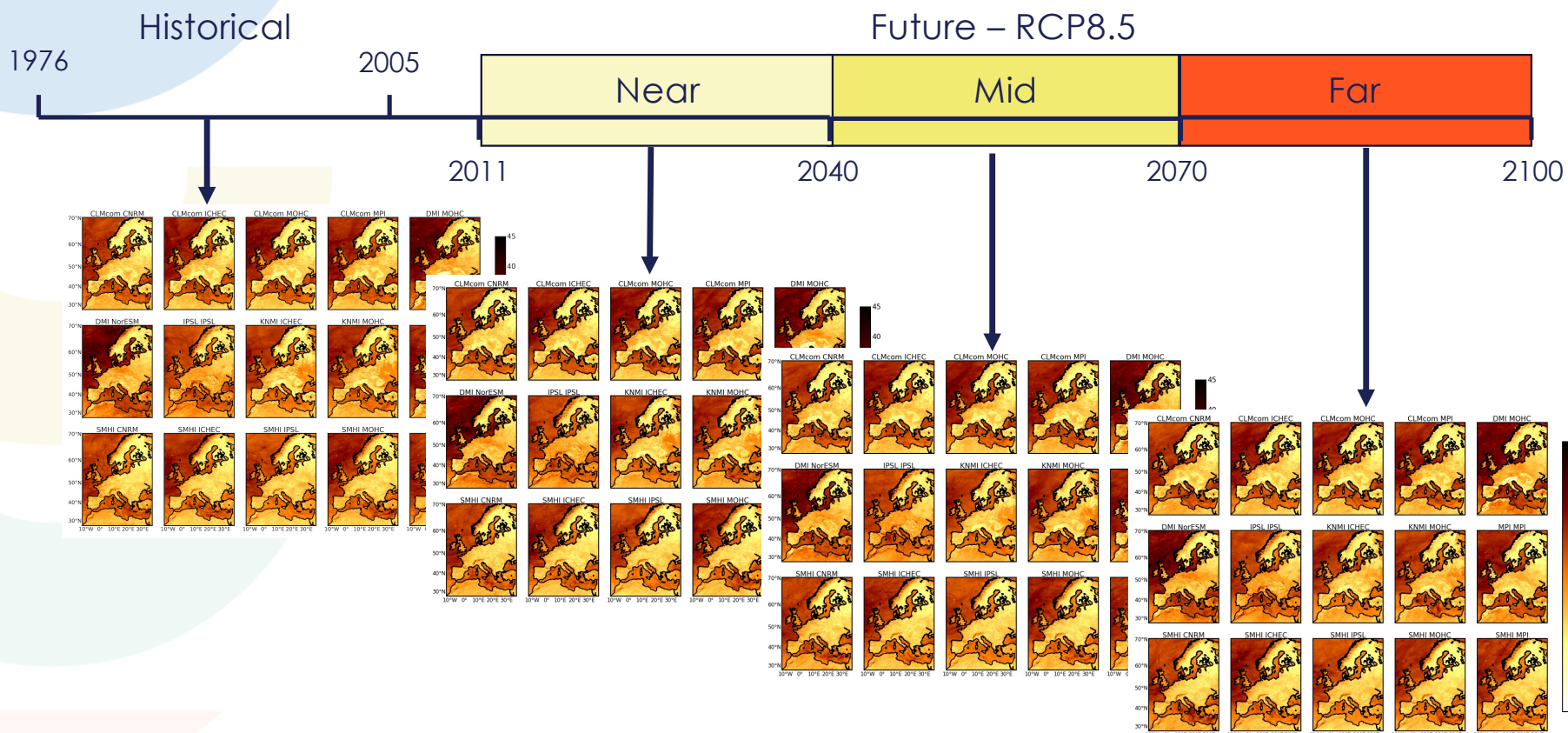


(ms^{-1})

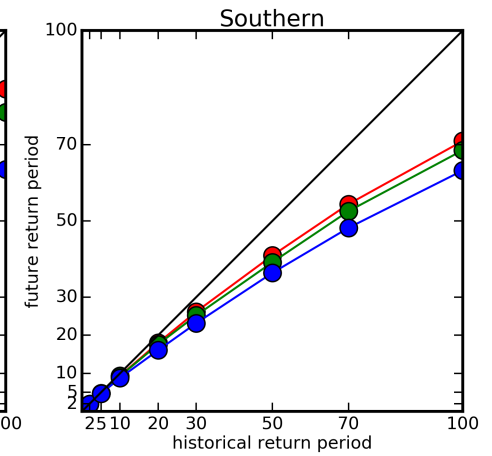
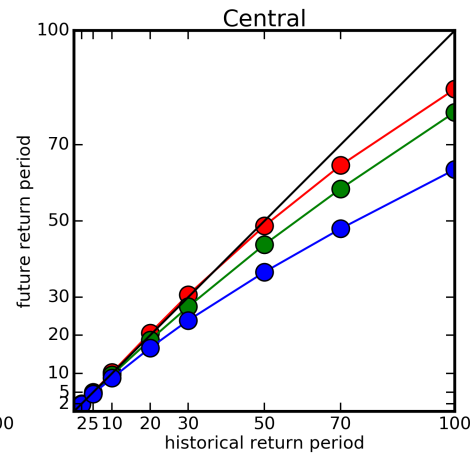
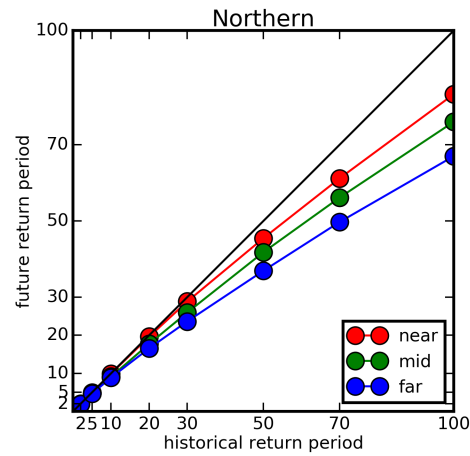
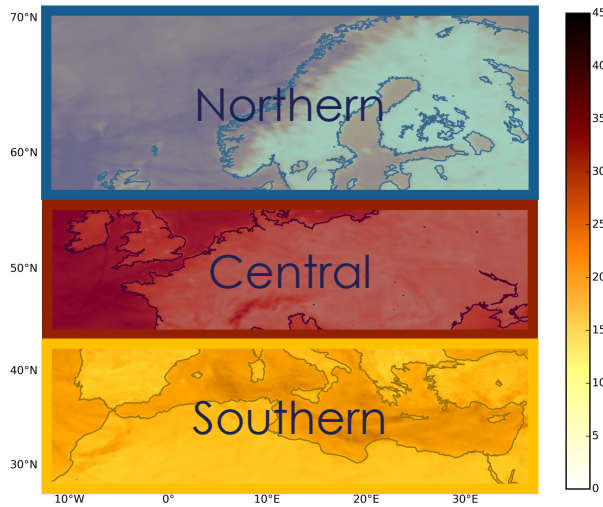
Euro-CORDEX – 30 year return wind speeds (ms^{-1})



Euro-CORDEX Future Periods - R30 (ms^{-1}) – RCP8.5



Under future conditions extreme winds over land increase as climate warms



Summary

State of art RCMs such as those used in Euro-CORDEX 0.11 simulations realistically reproduce extreme winds

Simulations exhibit upscaled added-value and show fine scale information

Broadly, extreme winds are projected to increase in frequency over European land areas as climate warms

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Extreme winds over Europe in the ENSEMBLES regional climate models

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Climatic Change
DOI 10.1007/s10584-016-1661-x



Multi-hazard assessment in Europe under climate change

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Michalis Vourdoukas^{1,3} · Lorenzo Alfieri¹ ·
Stephen Outten⁴ · Mirco Migliavacca⁵ ·
Alessandra Bianchi¹ · Rodrigo Rojas⁶ · Alba Cid⁷



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Enter the Matrix

	CLMcom CCLM 4-8-17	CNRM ALADIN63	DMI HIRHAM5	ETH COSMO- crCLIM	GERICS REMO 2015	ICTP RegCM4-6	IPSL WRF381P	KNMI RACMO 22E	MOHC HadREM3- GA7-05	MPI CSC-REMO 2009	SMHI RCA4
CNRM-CM5	X										X
EC-EARTH	X							X			X
IPSL-CM5A-MR							X				X
HadGEM2-ES	X		X					X			X
MPI-ESM-LR	X									X	X
NorESM1-M			X								

Enter the Matrix

	CLMcom CCLM 4-8-17	CNRM ALADIN63	DMI HIRHAM5	ETH COSMO- crCLIM	GERICS REMO 2015	ICTP RegCM4-6	IPSL WRF381P	KNMI RACMO 22E	MOHC HadREM3- GA7-05	MPI CSC-REMO 2009	SMHI RCA4
CNRM-CM5	X	X	X	X	X	X	X	X	X		X
EC-EARTH	X		X	X		X	X	X	X		X
IPSL-CM5A-MR			X		X		X	X			X
HadGEM2-ES	X	X	X	X		X	X	X	X		X
MPI-ESM-LR	X	X	X	X	X	X	X	X	X	X	X
NorESM1-M		X	X	X	X	X	X	X	X		X

Euro-CORDEX – 30 year return wind speeds – POT approach



Anomalies in 30 year return winds against GCM ensemble mean



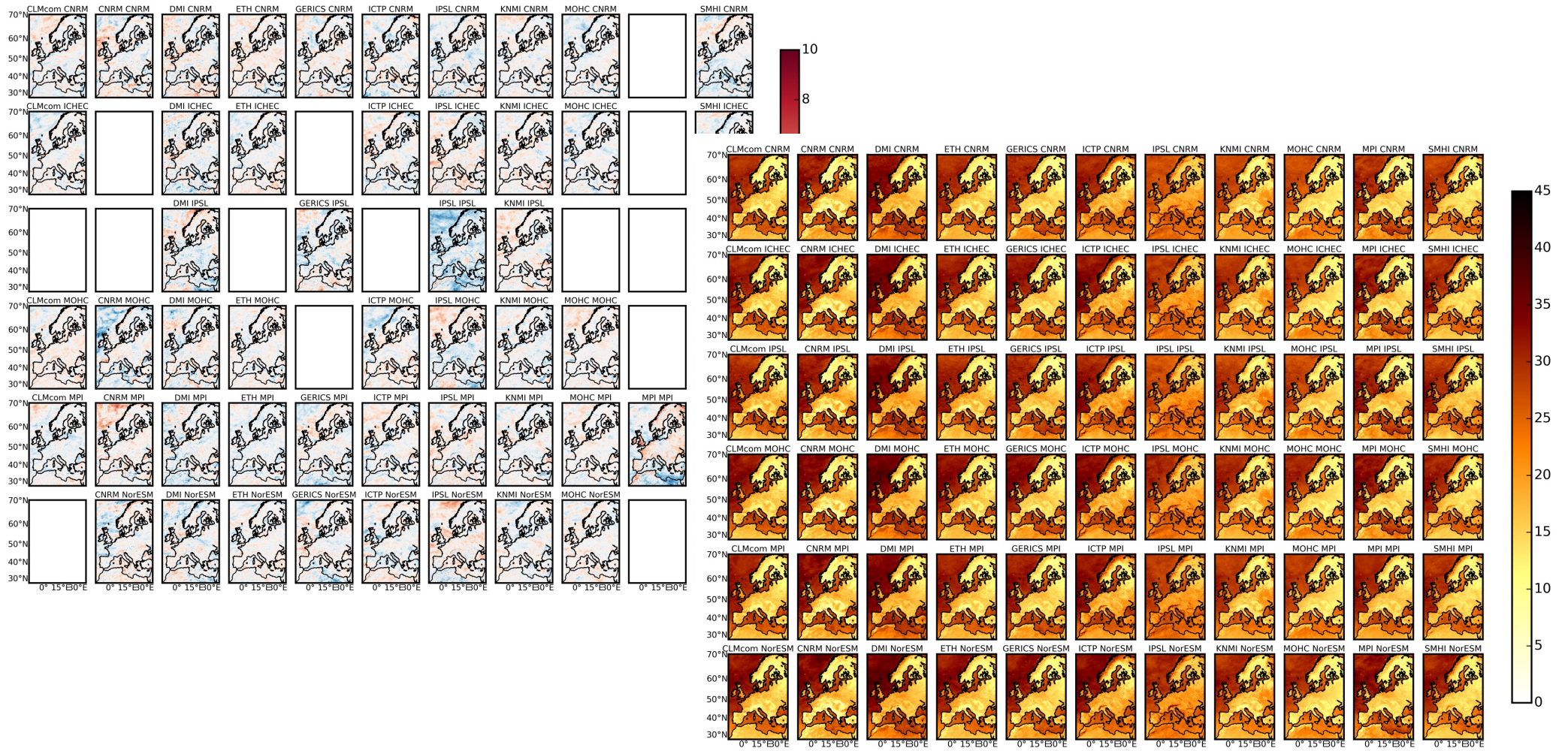
Euro-CORDEX – 30 year return wind speeds [ms^{-1}] – POT approach



Anomalies in 30 year return winds against RCM ensemble mean



Reconstructing extreme winds



Dataset to be published soon...

- 52 simulations of Euro-CORDEX
- Peaks over threshold and block maxima approaches (GPD and GEV)
- Maximum daily wind speed and 5-day precipitation
- Four 30-year periods - End of Historical, Near, Mid, and Far future based on RCP8.5
- Parameters for distributions, and R2, R5, R10, R20, R30, R50, R70, R100, and R200
- NetCDF format with appropriate metadata

WP4 Analysis of extreme events

T4.1 Define hazard indicators relevant for city stakeholders

T4.2 Assessment of near-term hazards indices

T4.3 Investigation of local tipping points and thresholds

T4.4 Toolkit development for hazards in risk assessment

Thank You

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