

Climate Local Information in the Mediterranean
region Responding to User Needs



CLIM-RUN



The CLIM-RUN project

Climate Local Information in the
Mediterranean Region Responding to
User Needs

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Wind Maghreb 2013, Rabat



- What is CLIM-RUN?
- What CLIM-RUN can do for you
 - Forecast suite
 - Products
- What you can do for CLIM-RUN



What is CLIMRUN

Climate **L**ocal **I**nformation in the **M**editerranean Sea **R**esponding to **U**ser **N**eeds

A WCC-3 Initiative



CLIM-RUN

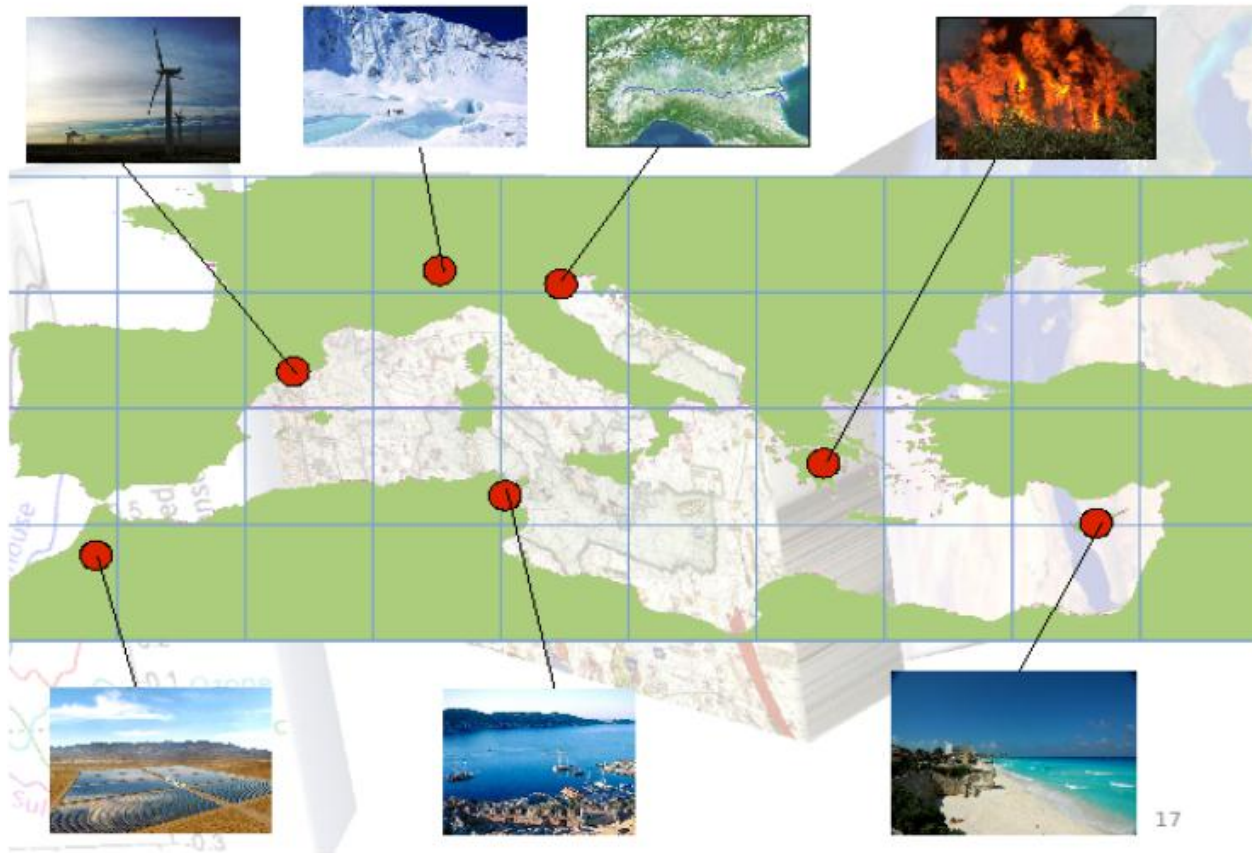


We, Heads of State and Government, Ministers and Heads of Delegation present at the High-level segment of the World Climate Conference-3 (WCC-3) in Geneva, noting the findings of the Expert Segment of the Conference:

DECIDE

to establish **a Global Framework for Climate Services** (hereafter referred to as “the Framework”) to strengthen the production, availability, delivery and application of science-based climate prediction and services.

Source: World Climate Conference-3 Declaration, Geneva, September 2009.



Case studies

Tourism: Tunisia, France, Cyprus

Energy: Spain, Morocco, Cyprus

Wild Fires: Greece

Integrated Case Study: North Adriatic

CLIMRUN & other EU initiatives



- ECLISE is the twin project focusing on Northern Europe
- EUPORIAS FP7 – climate services, seasonal to decadal products
- ECOMS FP7 - European initiative for climate service observation and modeling (consortia of EU projects - towards Horizon 2020 thematic paper)

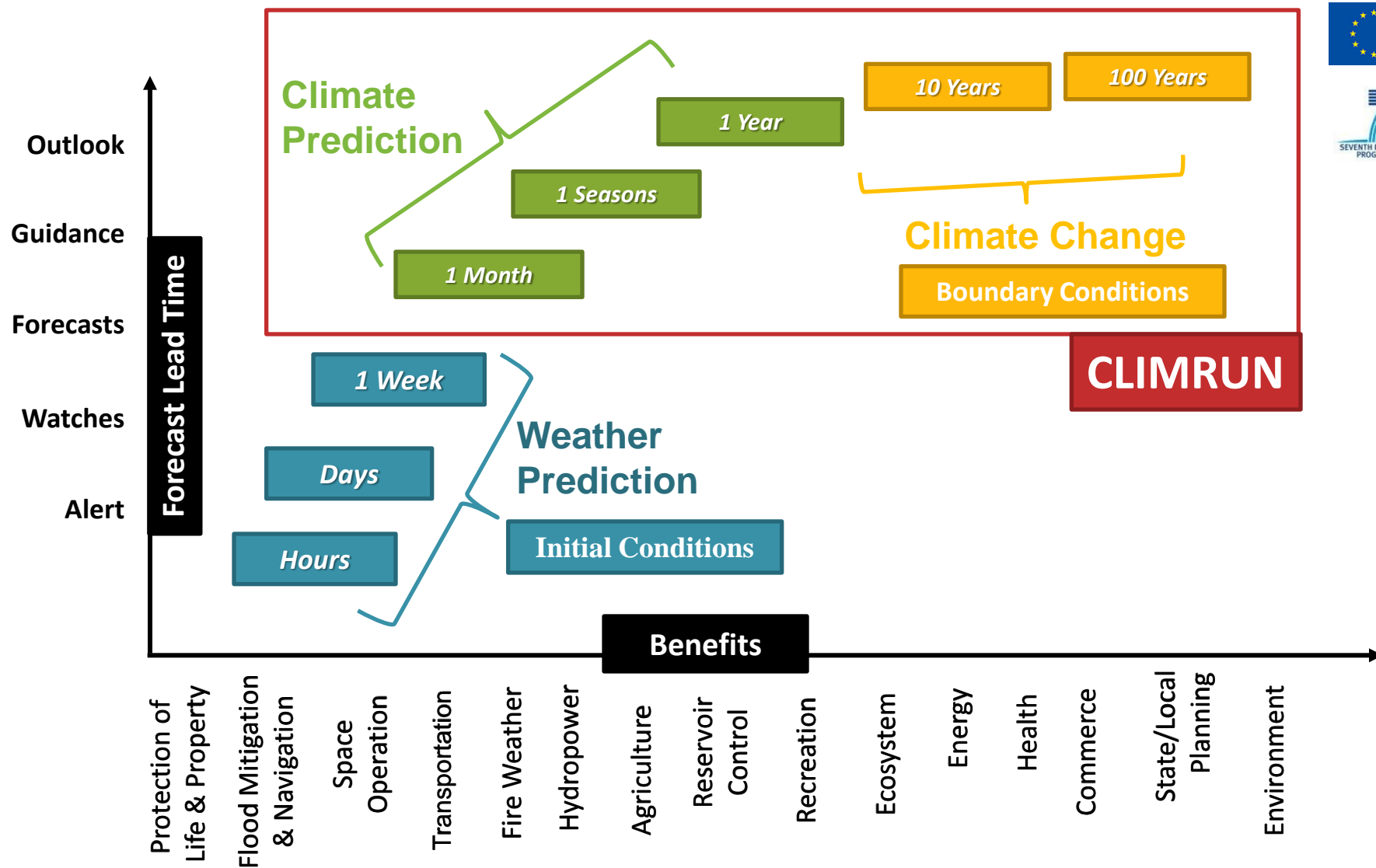


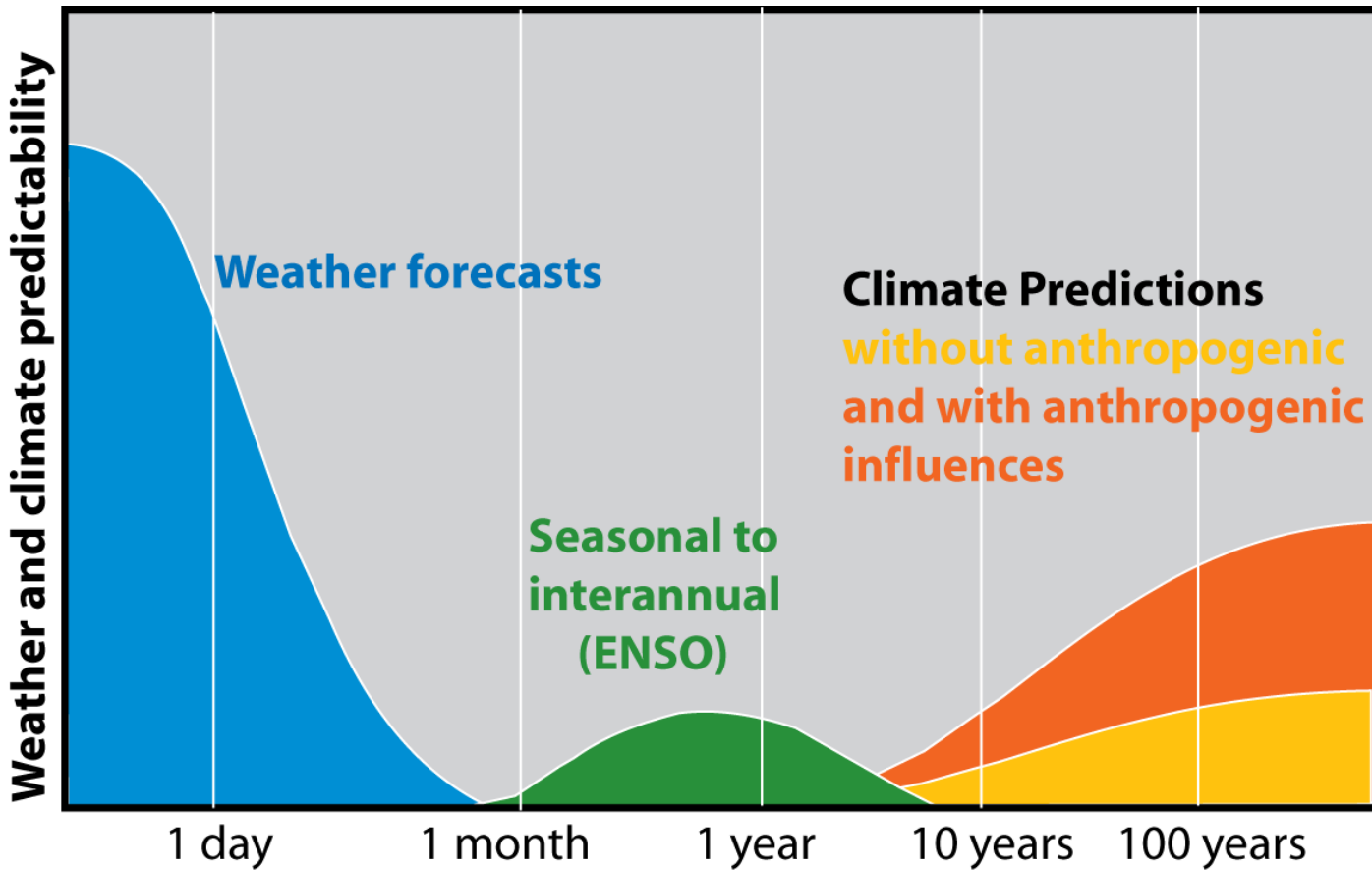
What CLIMRUN can do for you

A forecasting suite



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Predictability of weather and climate



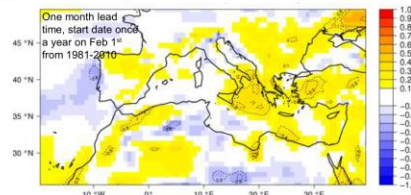
ADVANCED WIND RESOURCE RISK MANAGEMENT: Wind Speed Forecasting over Seasonal Time Scales

Product Example

Seasonal wind forecasts for Spring (March, April, May)

STAGE 1 : An estimate of the climate forecast system quality is made, by reproducing wind predictions for as many cases *in the past* as possible, and validating these forecasts against the 'observations'

Figure 1. 10m wind speed re-forecast anomaly correlation (AC) skill
(Climate forecast system : ECMWF S4, reanalysis 'observations' : ERAInterim)

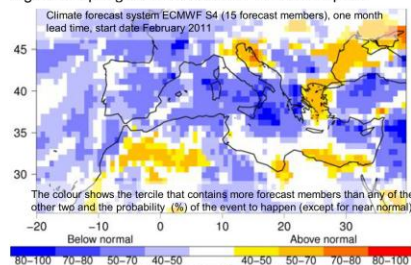


Result: Low, but predominantly positive skill is observed across the Mediterranean where the direct model output reaches approximately AC: 0.3 (Where 1 corresponds to a perfect forecast and 0 to a no information system). A low climate forecast quality skill (figure 1) does not mean that there is no useful wind information in the forecast. The best way to extract this information is using probabilistic forecasts (figures 2, 3).

STAGE 2 : Operational predictions are issued that provides probabilistic *future wind information*

- Regional -

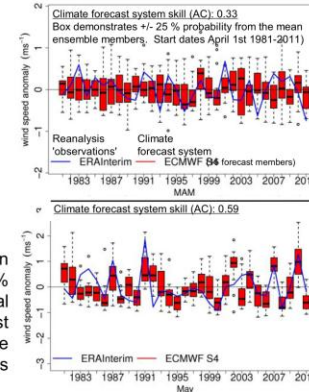
Figure 2. Spring 2011 forecast for 10m wind speed



Result : Below normal winds are generally predicted in western Europe in Spring 2011, with a probability of 70 % and higher. N.b. The credibility of these operational predictions is partially based upon the system forecast quality (stage 1), but a detailed analysis of the ability of the forecast system to reproduce the resource availability is needed for a full assessment of its value.

- Site Specific -

Figure 3. Three-month spring 2011 (above) and one-month May 2011 (below) forecast for 10m wind speed, Pamplona, Spain



Result: Some skill (AC: 0.33) is seen when predicting the wind variations for spring (3-month forecast). Considerably greater skill (AC: 0.59) is seen for a 1-month forecast during spring. N.b. In both cases, the fit varies from year to year.

Sample product 1

Wind Forecasting at the seasonal scale

Making the Product Usable

The skill of the climate forecast system to be able to predict spring winds (figure 1) suggests that an operational, probabilistic seasonal forecast (figure 2) contains some useful information for risk management when planning and operating wind energy projects over certain geographical regions. The 3-month probabilistic spring forecast for Pamplona, Spain (figure 3, above) shows certain years that demonstrate a reasonable forecast (e.g. 1997, 2000), although other years show little or no correspondence. The 1-month forecast (figure 3, below) over all years (1981-2011) in Spring shows promising skill of 0.59, and highlights the potential for using sub-seasonal wind forecast information in wind energy operational risk management for a given project site.



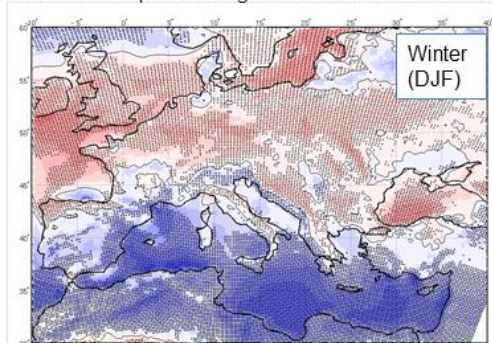
Sample product 2

Wind Scenarios (MAPS)

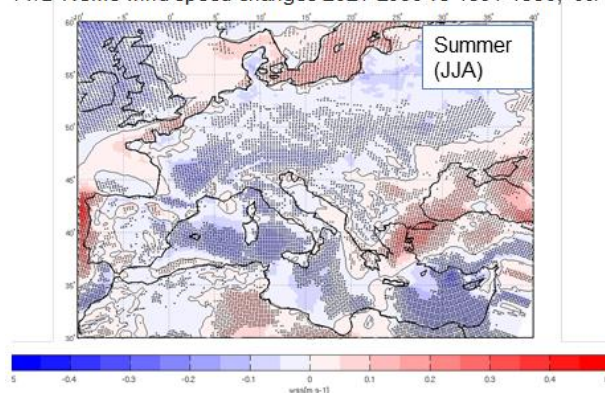
ADVANCED WIND RESOURCE RISK MANAGEMENT: Wind Speed long term scenarios

The product

A1B RCMs wind speed changes 2021-2050 vs 1961-1990; DJF



A1B RCMs wind speed changes 2021-2050 vs 1961-1990; JJA



Maps of projected changes in wind speed over Rabat. Wind speed changes are derived from the regional downscalings of A1B scenario performed during the EU-FP6 project ENSEMBLES.

Projected changes for 2021-2050 against 1961-1990 are reported.

Colours represent the average change in wind speed over 19 climate scenarios.

Stippled areas is where more than 2/3 of the considered models agree in the sign of the wind speed change.

Making the product usable

The CLIMRUN team is seeking collaborations with stakeholders in the energy sector to make climate products usable. Areas for potential cooperation include:

- Derive tailored indices based on wind speed products
- Statistics of extremes
- Identify critical thresholds
- Calibrate climate model output to sites of interests

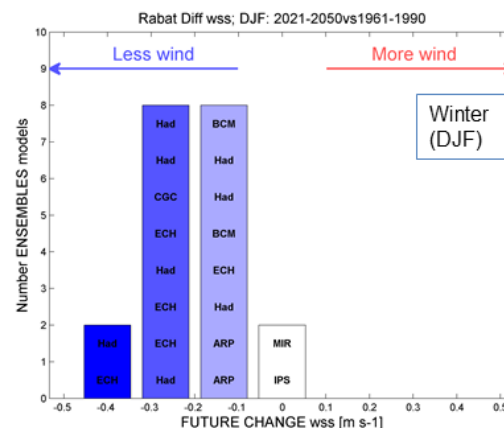


Sample product 3

Wind Scenarios (DISTRIBUTION)

ADVANCED WIND RESOURCE RISK MANAGEMENT: Wind Speed long term scenarios

The product



Distribution of projected changes in wind speed over Rabat. Wind speed changes are derived from the regional downscalings of A1B scenario performed during the EU-FP6 project ENSEMBLES.

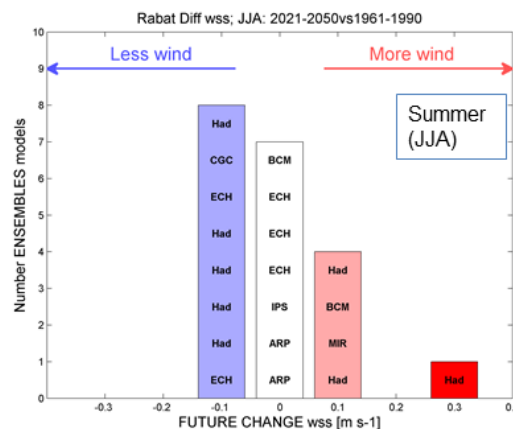
Projected changes for 2021-2050 against 1961-1990 are reported.

Each bar indicates the number of Regional Climate Models (RCMs) producing a wind speed change of a given amplitude over the selected location.

The labels inside the bars represent the global climate models (GCMs) adopted as global drivers for the corresponding regional downscaling.

The prevalence of single GCM in one of the bars, indicates that a given change in wind speed is mainly attributed to a single large scale driver.

A mixture of GCMs in one of the bars indicates that a given change in wind speed does not depend on the adoption of a specific global driver.



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What you can do for CLIMRUN

What you can do for CLIMRUN



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- Derive tailored indices based on wind speed products
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Thank you!

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