



Seasonal-to-decadal climate Prediction for the
improvement of European Climate Services

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WP 6.2 Forecast visualization and dissemination

**Deliverable D6.2.1: Real-time multi-model decadal
predictions disseminated, displayed and published
annually**

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Dissemination Level/ Audience		PP - Public	
	X	PU - Restricted to other programme participants, including the Commission services	
		RE - Restricted to a group specified by the consortium, including the Commission services	
		CO - Confidential, only for members of the consortium, including the Commission services	

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1	22/10/2015	Doug Smith (Met Office)	First version
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1. Executive summary

Many climate centres have now developed a decadal forecasting capability using coupled models initialised with observations. This was primarily done to inform the IPCC fifth assessment report, which for the first time included a chapter on near term climate predictions. To assess the likely skill of forecasts, historical tests were performed following the CMIP5 protocol. However, most centres are also producing quasi-operational forecasts, updated each year in near real time. These are potentially very valuable for informing the Global Framework for Climate Services (GFCS). Recognising this the WMO have recommended that these forecasts should be gathered together, to assess uncertainties and provide a consensus multi-model forecast for the coming years, thereby avoiding over-reliance on individual models.

The Met Office has therefore coordinated an informal “exchange of decadal predictions” each year since 2011, now consisting of output from about 9 dynamical models and two empirical predictions. This procedure now needs formalising under WMO, building on the structure already in place for seasonal forecasts with designated “global producing centres” contributing forecasts.

As part of SPECS D6.2.1 a website (<http://www.metoffice.gov.uk/research/climate/seasonal-to-decadal/long-range/decadal-multimodel>) has been developed so that the different forecasts along with the ensemble mean and verifying observations for previous forecasts may be viewed. This website originally went live on 31st March 2014, and has been updated annually with the latest forecasts and observations. Furthermore, additional variables, including precipitation, mean sea level pressure, and the Atlantic overturning circulation, have been included. Example screenshots are presented below.

A proposal to formalise decadal predictions was submitted to WMO in 2014, and is now under review. Furthermore, the generation of ongoing near real-time decadal forecasts is one of the components of the Decadal Climate Prediction Project (DCPP) contribution to the next Coupled Model Intercomparison Project (CMIP6). Participants in DCPP-CMIP6 will therefore be in a good position to contribute to the ongoing exchange of decadal predictions.

2. Project objectives

With this deliverable, the project has contributed to the achievement of the following objectives (see DOW Section B.1.1.2):

No.	Objective	Yes	No
1.	To achieve an objective exhaustive <i>evaluation</i> of current forecast quality from dynamical, statistical, and consolidated systems to identify the factors limiting s2d predictive capability	X	
2.	To test specific hypotheses for the improvement of s2d predictions, including novel mechanisms responsible for high-impact events using a <i>process-based verification</i> approach		
3.	To develop innovative methods for a comprehensive <i>forecast quality assessment</i> , including the maximum skill currently attainable		
4.	To facilitate the <i>integration of multidimensional observational data</i>		

No.	Objective	Yes	No
	of the atmosphere-ocean-cryosphere-land system as sources of initial conditions, and to validate and calibrate climate predictions		
5.	To achieve an <i>improved forecast quality at regional scales</i> by better initialising the different components, an increase in the spatial resolution of the global forecast systems and the introduction of important new process descriptions		
6.	To assess the best alternatives to characterise and deal with the <i>uncertainties in climate prediction</i> from both dynamical and statistical perspectives for the increase of forecast reliability		
7.	<i>To achieve reliable and accurate local-to-regional predictions</i> via the combination and calibration of the information from different sources and a range of state-of-the-art regionalisation tools		
8.	<i>To illustrate the usefulness</i> of the improvements for specific applications and develop methodologies to better communicate actionable climate information to policy-makers, stakeholders and the public through peer-reviewed publications, e-based dissemination tools, multi-media, examples for specific stakeholders (energy and agriculture), stakeholder surveys, conferences and targeted workshops		
9.	<i>To support</i> the European contributions to <i>WMO research initiatives</i> on s2d prediction such as the GFCS and enhance the European role on the <i>provision of climate services</i> according to WMO protocols by creating examples of improved tailored forecast-based products for the GPCs and participating in their transfer to worldwide RCCs and NHMSs.	X	

3. Detailed report on the deliverable

As part of SPECS D6.2.1 a website (<http://www.metoffice.gov.uk/research/climate/seasonal-to-decadal/long-range/decadal-multimodel>) has been developed so that the latest decadal forecasts from the international community, along with verifying observations for previous forecasts, may be viewed. This website originally went live on 31st March 2014, and has been updated annually with the latest forecasts and observations. Furthermore, additional variables, including precipitation, mean sea level pressure, and the Atlantic overturning circulation, have been included. Example screenshots are presented below.

[Overview and strategy](#)[Climate science](#)[Monitoring](#)[Research news](#)[Foundation science](#)[Our scientists](#)[Publications](#)[Applied science](#)[Collaboration](#)[Home](#) > [Research](#) > [Climate science](#) > [Monthly to decadal](#) > [Long-range predictions](#) > [Forecasts](#) > Multi-model decadal for

Multi-model decadal forecast exchange

The Met Office coordinates an informal exchange of near-real time decadal predictions. Many institutions around the world are developing decadal prediction capability and this informal exchange is intended to facilitate research and collaboration on the topic.

[The contributing prediction systems](#) are a mixture of dynamical and statistical methods. The prediction from each institute is shown below, alongside an average of all the models. When possible, observations for the period of the forecast are also shown. Currently three variables are included: surface air temperature, sea-level pressure and precipitation. These are shown as differences from the 1971-2000 baseline. More diagnostics, including ocean variables are planned for the future. Please use the drop-down menus below to explore the data collected to date.

This work is supported by the European Commission SPECS project.



To learn more about decadal forecasts at the Met Office, see our current [decadal forecast](#).

Images last updated 2015-03-24

Issued

2014 ▾

Period

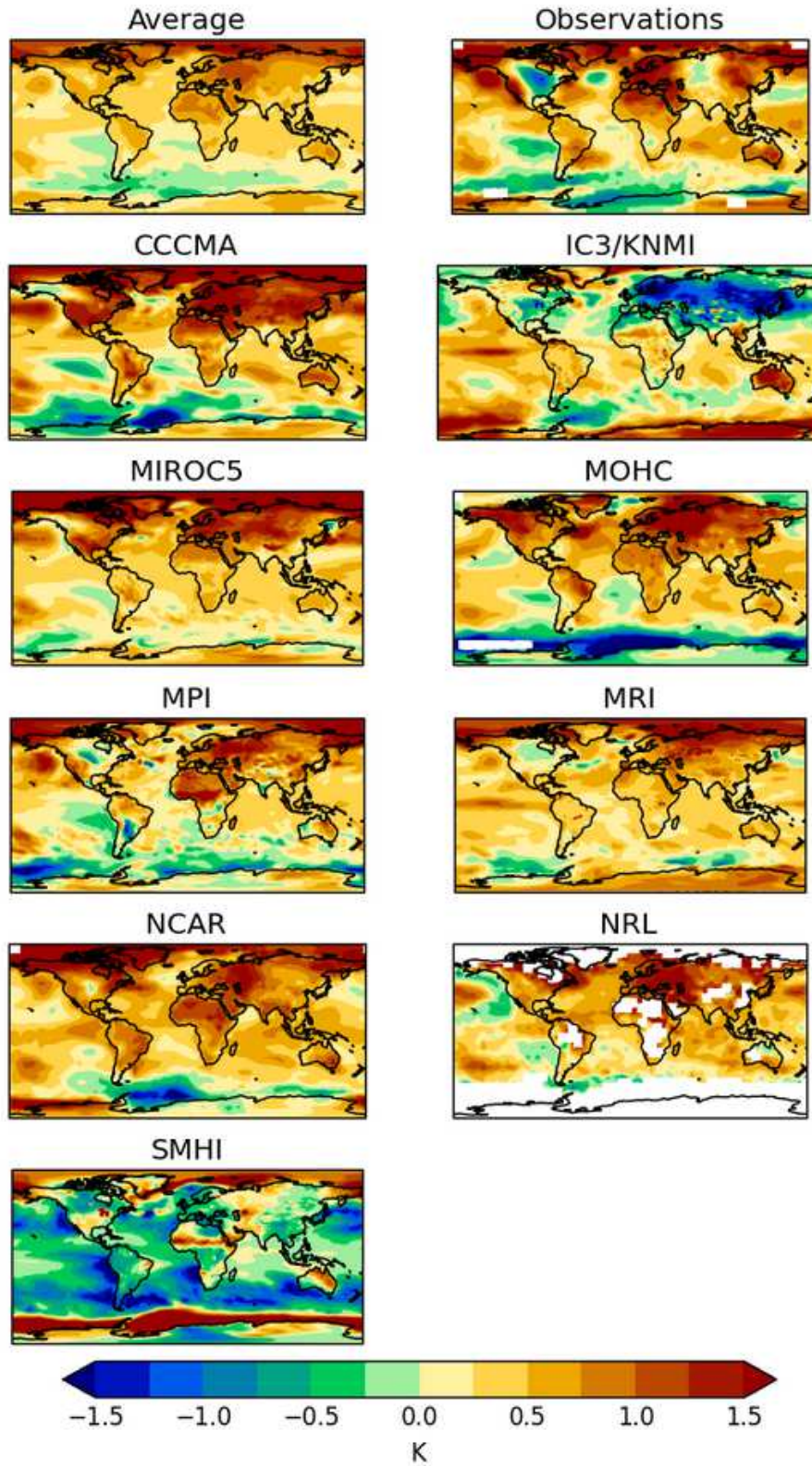
year 1 ▾

Element

surface air temperature ▾

Decadal forecast exchange 2014 predictions for year 1 surface air temperature

2013 predictions for 2014 surface temperature





To learn more about decadal forecasts at the Met Office, see our current [decadal forecast](#).

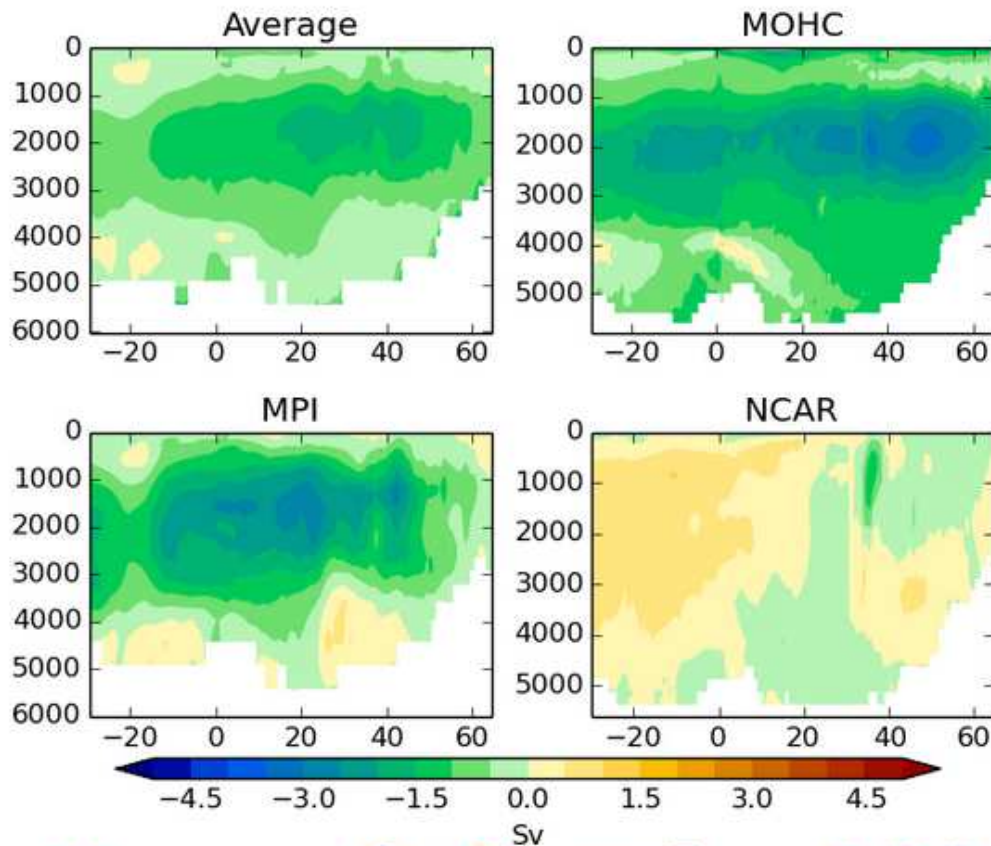
Images last updated 2015-03-24

Issued: Period: Element:

Decadal forecast exchange 2013 predictions for years 1 to 5 Atlantic MOC

Decadal prediction is still experimental and the forecasts should not be relied on for making decisions, particularly on regional scales.

2013 predictions for 2014-2018 Atlantic MOC



4. References

Not applicable

5. List of publications

Not applicable.

6. Efforts for this deliverable

Partner	Person-months (actual)	Person-months (in-kind)	Period covered
1.IC3	8	-	36 months
3. MPG	1		36 months
4. KNMI		1	36 months
7. CERFACS		1	36 months
14. MetOffice	12		36 months
15. SMHI		1	36 months
16. CNRS	1		36 months
17. UREAD		1	36 months
Total	22 PM	4 PM	36 months

7. Sustainability

SPECS has facilitated the continued exchange of decadal predictions and enabled results to be displayed on a website. For future sustainability this exchange needs to be formalized under the auspices of the WMO, following the framework already established for seasonal forecasts. A proposal for this has therefore been submitted to the WMO.