



## The Decadal Climate Prediction Project

### Overview

The term 'decadal prediction' encompasses predictions on annual, multi-annual to decadal timescales. The potential to make skillful forecasts on these timescales, and the ability to do so, is investigated by means of predictability studies and retrospective forecasts (termed hindcasts) using climate models and statistical approaches. Predictability and prediction studies have focused largely on temperature, and there is evidence of skill in the prediction of variations in annual means of temperature over much of the globe for several years, conditional on the initialization of the forecasts. As the forecast range increases initialized skill decreases but some skill is maintained due to external forcing from greenhouse gases, aerosols and volcanoes. There is currently less skill in predicting precipitation and other variables compared to temperature although progress is expected to be made as a consequence of the Decadal Climate Prediction Project (DCPP) and other projects and investigations.

### Decadal Climate Prediction Project

#### Overview

[Experimental Protocol](#)

#### Other Activities

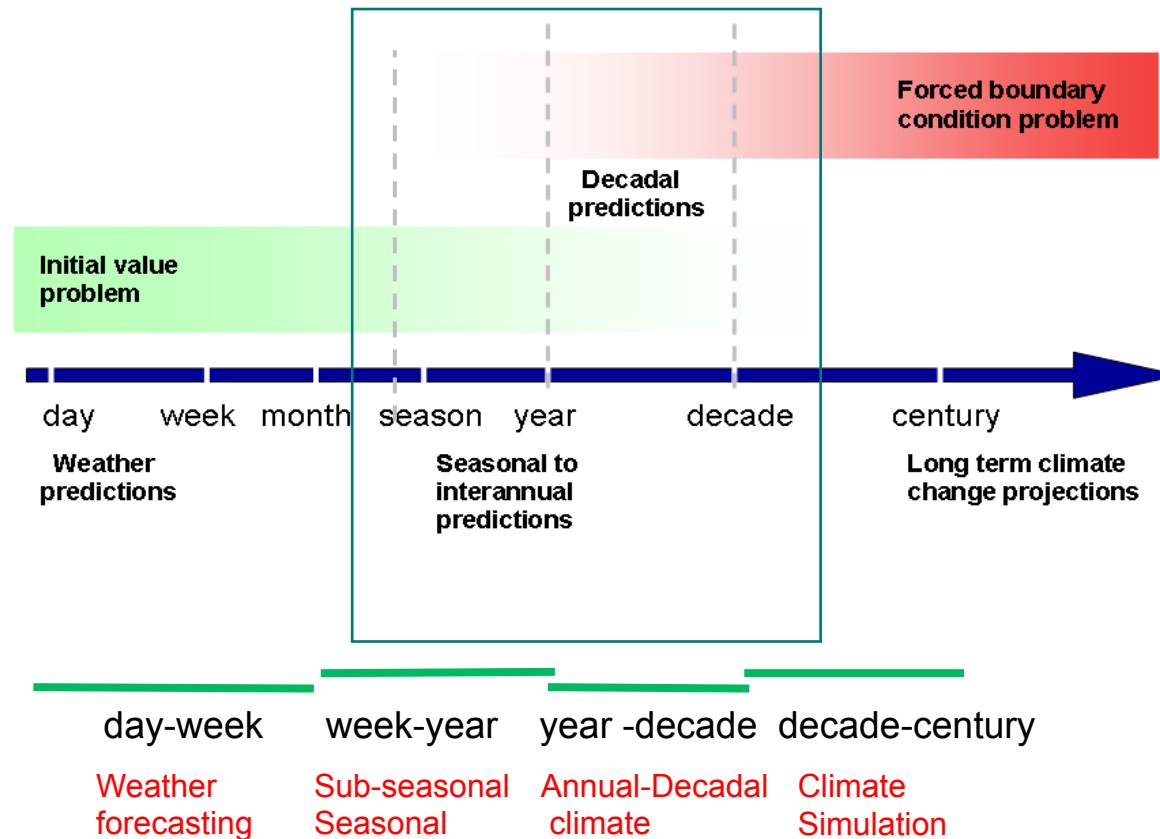
[Multi-model Decadal Forecast Exchange](#)  
[CMIP5 Decadal Prediction](#)

[Panel](#)

[Meetings](#)

[← Back to Modelling Overview](#)

# Where does a decadal climate fit?



## Decadal prediction:

- annual, multi-annual, up to a decade
- initialized forecasts of both forced and internally generated components of variability

# The Decadal Climate Prediction Project (DCPP)

The term "decadal prediction" encompasses predictions on annual, multi-annual to decadal timescales. The possibility of making skilful forecasts on these timescales and the ability to do so is investigated by means of predictability studies and retrospective predictions (hindcasts) made using the current generation of climate models and by empirical methods. Skilful decadal prediction of relevant climate parameters is a Key Deliverable of the WCRP's Grand Challenge of Near-term Climate Prediction .

The DCPP envisions three components:

- A ○ **Hindcasts**: the design and organization of a coordinated decadal prediction (hindcast) component of CMIP6 in conjunction with the seasonal prediction and climate modelling communities
- B ○ **Forecasts**: the ongoing production of experimental quasi-operational decadal climate predictions in support of multi-model annual to decadal forecasting and the application of the forecasts
- C ○ **Predictability, mechanisms and case studies**: the organization and coordination of decadal climate predictability studies and of case studies of particular climate shifts and variations including the study of the mechanisms that determine these behaviours

# DCPP Website provides a focus

The experimental protocol for the Decadal Climate Prediction Project (DCPP) contribution to CMIP6 is described in detail in Boer et al. (2016). The paper is available here:

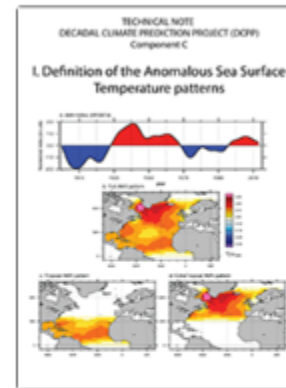
## The Decadal Climate Prediction Project (DCPP) contribution to CMIP6



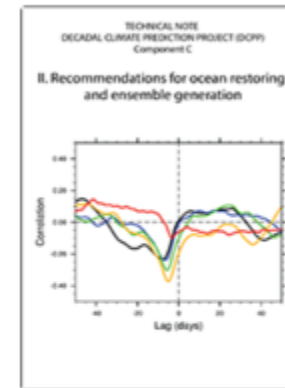
**The Decadal Climate Prediction Project (DCPP) contribution to CMIP6**  
Geosci. Model Dev., 9, 1–27, 2016

## Tech Notes: Component C

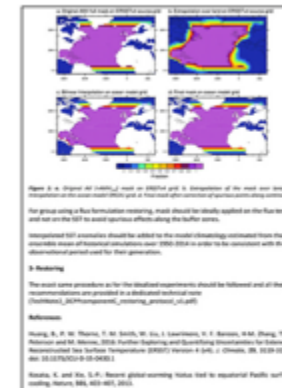
There are three Technical Notes dealing with Component C experiments. They are available here



**I. Definition of the Anomalous Sea Surface Temperature patterns**  
TECHNICAL NOTE 1, DECADAL CLIMATE PREDICTION PROJECT (DCPP) - Component C



**II. Recommendations for ocean restoring and ensemble generation**  
TECHNICAL NOTE 2, DECADAL CLIMATE PREDICTION PROJECT (DCPP) - Component C



**III. Guidelines for Component C Pacemaker Experiments**  
TECHNICAL TECHNICAL NOTE 3, DECADAL CLIMATE PREDICTION PROJECT (DCPP) - Component C

Links to

- Experimental protocol in GMD paper
- Tech notes and data for Component C
- Participant List
- Forum

Group/Model	Institution	Country	Component		
			A	B	C
EC-Earth	BSC/SMHI	Spain/Sweden	Y/M	Y/M	M/M
GFDL	NOAA	USA	Y	Y	M
FIO-ESM	FIO	China	Y	Y	M
NUIST-CSM	IPRC	USA/China	Y	Y	N
BCC	BCC	China	Y	N	N
CAS-ESM	CAS	China	M	M	M
MIROC	JAMEST/JMA	Japan	Y	y	Y
Can-ESM5	CCCma	Canada	Y	Y	M
CNRM-CERFACS	CNRS	France	M	M	Y
MetOffice	MetOffice	UK	Y	Y	Y
Ureading/Stat	UReading	UK	Y	Y	Y
IPSL	LOCEAN	France	Y	N	Y
NERCS/NorCPS	GRI	Norway	Y	Y	Y
CMCC	CMCC	Italy	M	M	Y
MPG	MPI	Germany	Y	Y	Y
NCAR/CESM	NCAR	USA	Y	Y	Y
BESM	INPE	Brazil	Y	M	M
FGOALS	IAP	China	Y	M	Y
INM	RAS	Russia	Y	N	Y

## 20 Groups

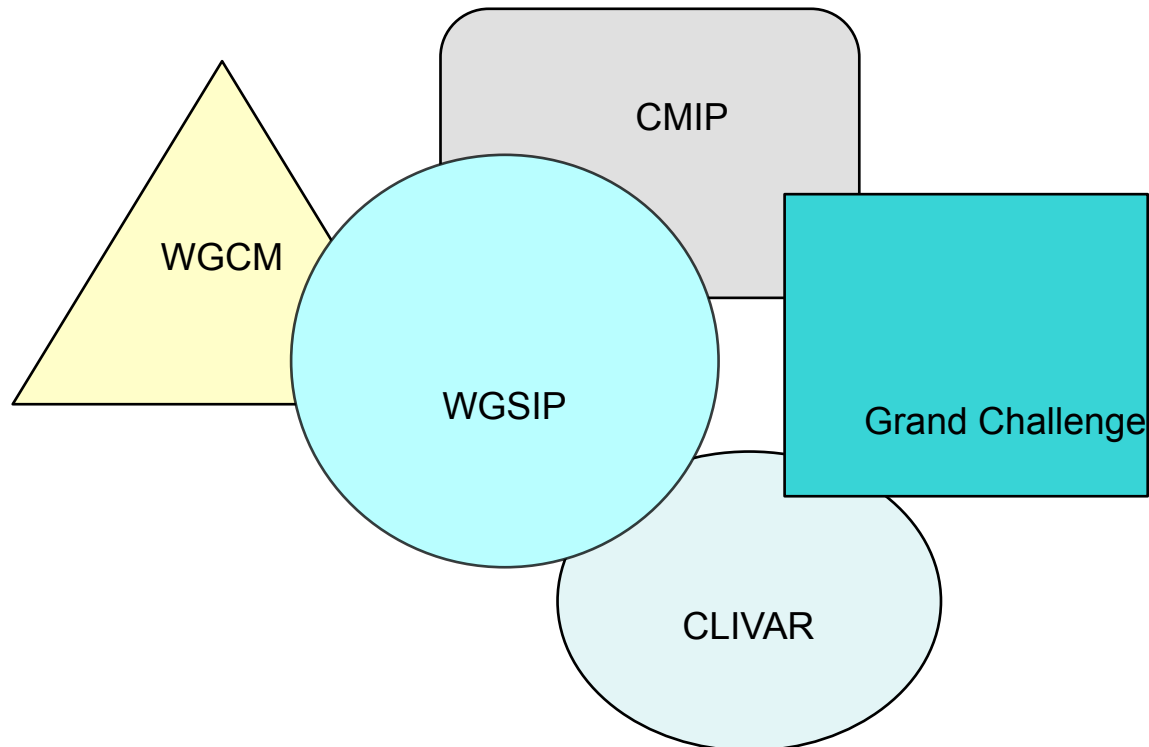
- 13 Countries
- Component A (hindcasts)
  - 16 Yes, 4 Maybe
- Component B (forecasts)
  - 11 Yes, 6 Maybe, 3 No
- Component C (mechanisms)
  - 11 Yes, 7 Maybe, 2 No

# Where are we?

- DCP Phase 1 (nearing completion)
  - experimental protocol endorsed and published
    - required data sets and tech notes
    - data retention tables specified
    - website and forum established
  - as contribution to
    - CMIP6
    - Grand Challenge of Near Term Climate Prediction
    - interest in decadal variability and prediction across WCRP
- DCP Phase 2
  - Panel and WCRP organization/renewal
  - development and evolution of connections
    - within WCRP
    - WMO and operational aspects
    - IPCC, Stocktake, ...
  - support of activities in production, analysis and application
    - multi-model comparison with DCP co-authors
    - actions in support of
      - drift amelioration, bias adjustment
      - statistical/empirical benchmarks
      - combination, calibration, skill assessment
    - climate services
  - meetings and workshops
    - s2S and S2d Workshop, NCAR, Sept 2018

## Broad interests in decadal climate variability and prediction

- WGSIP
  - Sub-seasonal to (inter)annual prediction
- WGCM
  - Forced climate change and natural variability
- CMIP
  - Coordinated experimentation including scenarios, decadal prediction ....
- CLIVAR
  - "Focus" on decadal variability and predictability
- Grand Challenge of Near Term Climate Prediction
  - research and development leading toward operational annual, multi-annual forecasts
- IPCC
  - Near term climate a contribution to AR6, Stocktake
- DCPP
  - Decadal climate prediction project currently reports to WGSIP and WGCM, is an endorsed CMIP MIP and has connections to all groups
- WMO
  - coordination and production of annual to decadal outlook



# What do we want from the meeting?

- To take advantage of the current energy and interest in decadal timescales
- Encourage the evolution of approaches to, and coordination of, WCRP research into decadal variability, predictability and prediction
  - new groupings?
  - matrix approach?
  - end-to-end focus?
  - applications?
  - .....