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Canada



Working Group on Coupled Modelling (WGCM)

**WCRP Joint Scientific Committee
Nanjing, China**

Greg Flato and Cath Senior

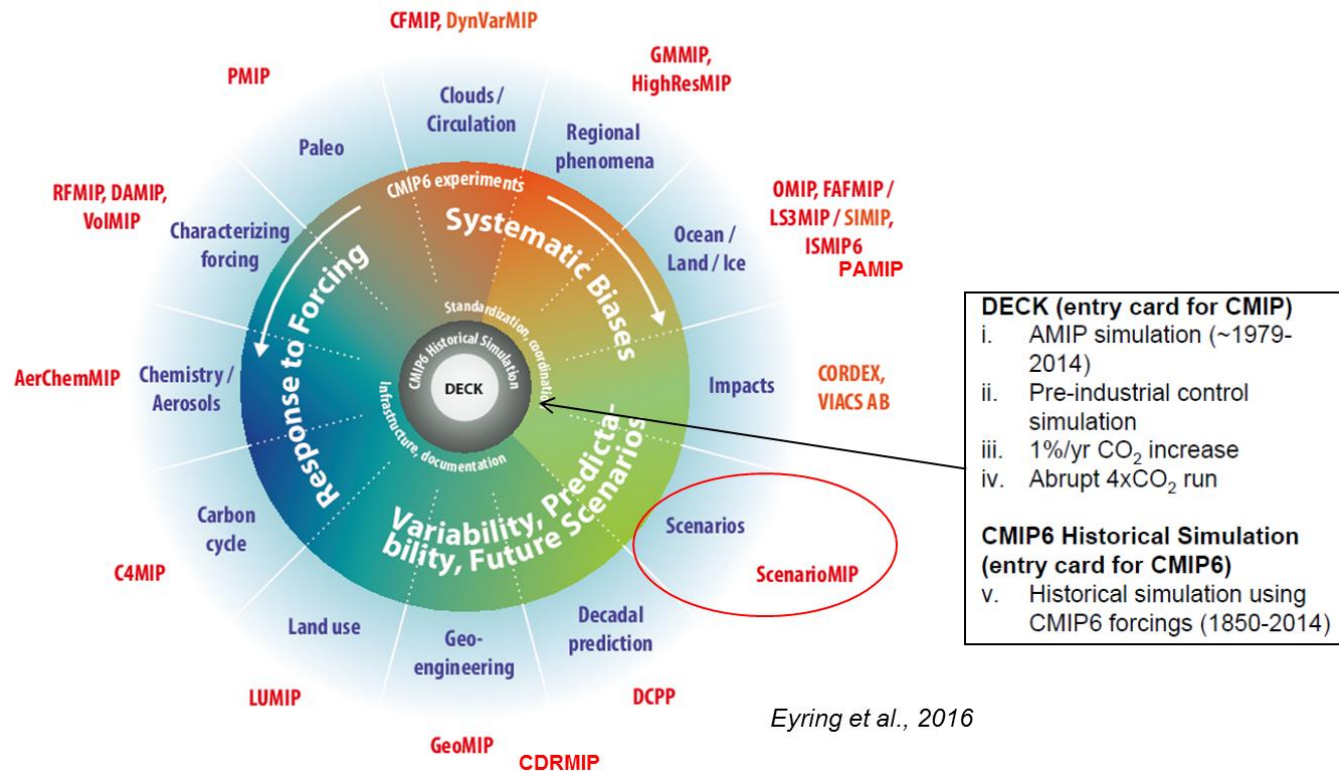
**Canadian Centre for Climate Modelling
and Analysis, Climate Research Division**

16 April 2018

Highlights

- **CMIP6 is now well underway**

- Overseen by CMIP Panel (chaired by Veronika Eyring)
- Currently 23 individual MIPs, each with identified leadership and community engagement



Highlights, cont'd ...

- There are 33 modelling groups worldwide who will be contributing to CMIP6, 13 of these are new to the process, including models from countries that have not been represented in the past (Brazil, India, Taiwan-China, Republic of Korea, and South Africa).
- DECK and Historical simulations now underway in several centres. Some delays encountered in availability of future forcing (vital for ScenarioMIP), but should be available by end of April.
- GMD Special Issue open until end of June, 2018, and will contain complete documentation of MIPs and forcing in a single volume.
 - There are currently 30 papers in the special issue.



Highlights, cont'd ...

- WGCM Infrastructure Panel (WIP) oversees impressive development of data archival and dissemination capabilities, based on ESGF.
 - We anticipate that, to be used in **IPCC AR6**, model results will have to be in the ESGF archive by **15 October, 2020**.

Major ESGF Node Sites

Institution	Gateway URL	Version	Country	Project(s)	Contact
1 CEDA	esgf-index1.ceda.ac.uk	2.4.0	U.K.	CMIP5, CORDEX, Obs4MIPs, SPECS, ESA CCL, EUCLIA, CLIPC	alan.lwis@rtr.ac.uk
2 DKRZ	esgf-data.dkrz.de	2.4.0	Germany	CMIP5, CORDEX, Obs4MIPs, IS4-MIP	berger@dkrz.de
3 ANU NCI	esgf.nci.org.au	2.4.0	Australia	CMIP5	ben.evans@anu.edu.au
4 NOAA GFDL	esgfdata.gfdl.noaa.gov	2.4.0	U.S.	CMIP5, ncpp2013, Obs4MIPs	hans.vahnenkamp@noaa.gov
5 NASA GSFC	esgf.nccs.nasa.gov	2.4.0	U.S.	CMIP5, Obs4MIPs, Ana4MIPs, NEX-GDDP, NEX-DCP30, CREATE-IP	daniel.q.duffy@nasa.gov
6 IPSL	esgf-node.ipsl.upmc.fr	2.4.0	France	CMIP5, CORDEX, Obs4MIPs	sebastien.demail@ipsl.jussieu.fr
7 NASA JPL	esgf-node.jpl.nasa.gov	2.4.0	U.S.	Obs4MIPs, GASS-YOTC, CMAC	luca.cinquini@jpl.nasa.gov
8 DOE LLNL	esgf-node.llnl.gov	2.4.0	U.S.	CMIP5, CMIP3, input4MIPs, ACME	sasha@llnl.gov
9 UIU	esg-dn1.nsc.liu.se	2.4.0	Sweden	CMIP5, CORDEX, Obs4MIPs	pcheng@nsc.liu.se



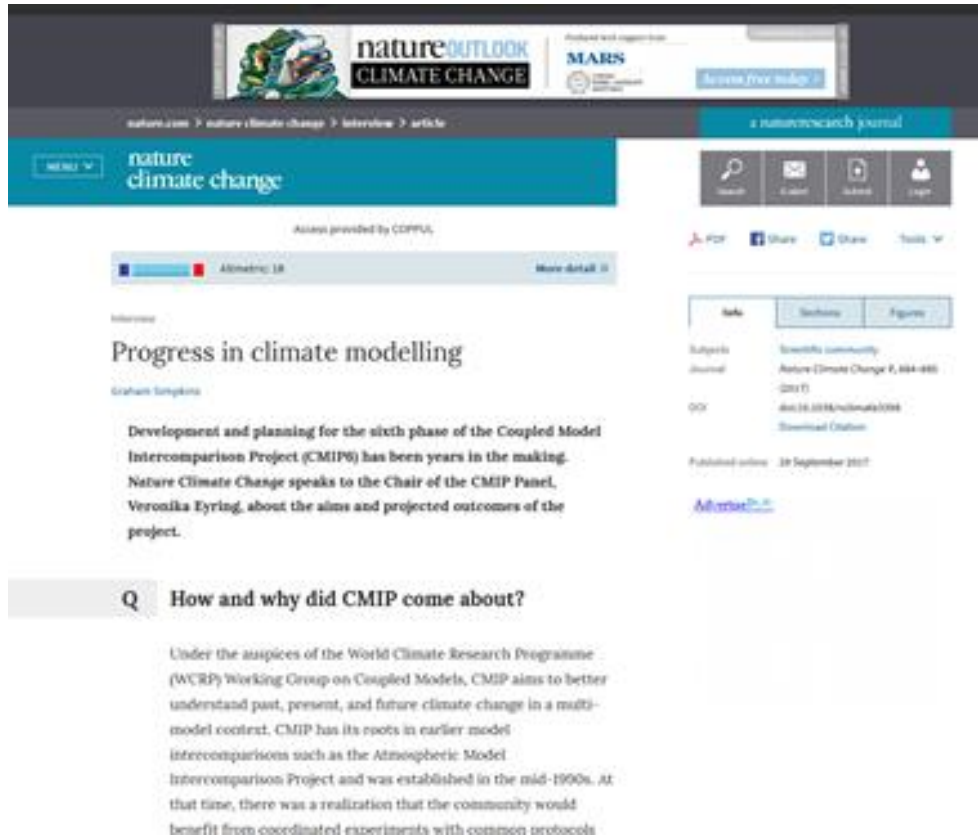
Highlights, cont'd ...

- Workshop on model '*fitness for purpose*' hosted by the Max Planck Institute for Meteorology in Hamburg, Germany, 23-24 February, 2017.
 - This proved to be influential in the design of the IPCC AR6 Working Group I outline in that model evaluation will be distributed across chapters where their fitness for relevant applications will be assessed.
- Aspen AGCI Workshop on '*model evaluation*', August, 2017, was very successful and a paper describing outcomes was submitted as a perspective piece to Nature Climate Change.
- WGCM meeting held in Exeter, October, 2017, as part of 'modelling summit' – provided a good opportunity to connect with other working groups/activities, particularly CORDEX.



Highlights, cont'd ...

- CMIP Panel chair, Veronika Eyring, was interviewed by Nature Climate Change, providing high-visibility to CMIP6.



The screenshot shows a web page from Nature Climate Change. At the top, there is a banner for 'nature OUTLOOK CLIMATE CHANGE' with a 'MARS' logo and a 'Access free article' button. Below the banner, the page title is 'Progress in climate modelling' by Graham Simpson. The article text begins with 'Development and planning for the sixth phase of the Coupled Model Intercomparison Project (CMIP6) has been years in the making. Nature Climate Change speaks to the Chair of the CMIP Panel, Veronika Eyring, about the aims and projected outcomes of the project.' Below the text is a section header 'Q How and why did CMIP come about?' followed by a paragraph: 'Under the auspices of the World Climate Research Programme (WCRP) Working Group on Coupled Models, CMIP aims to better understand past, present, and future climate change in a multi-model context. CMIP has its roots in earlier model intercomparisons such as the Atmospheric Model Intercomparison Project and was established in the mid-1990s. At that time, there was a realization that the community would benefit from coordinated experiments with common protocols'.



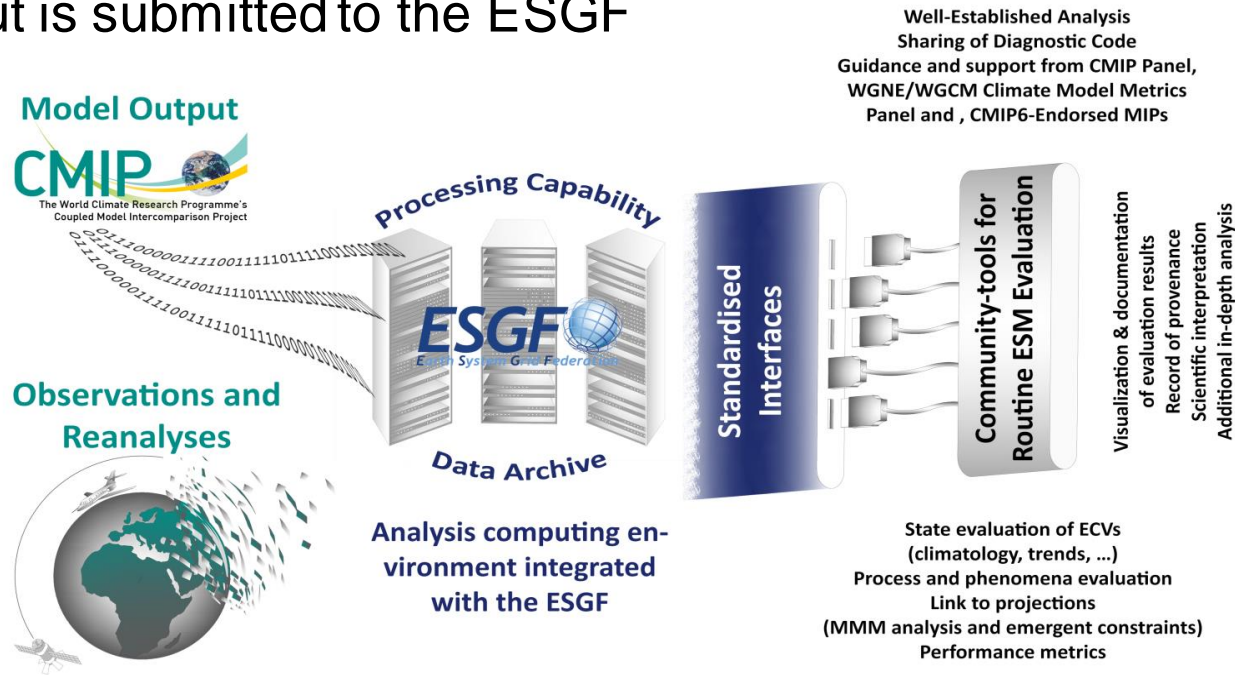
Early Success and/or planned activities

- WGCM-22 and CMIP6 Analysis workshop being planned for Spring, 2019 in Barcelona.
 - This will be held in conjunction with EU-PRIMAVERA following successful example of Dubrovnik joint meeting.
 - This will provide a first look at CMIP6 model results.
 - As this will be a long gap between WGCM sessions, a series of WGCM and CMIP Panel teleconferences are planned for Autumn, 2018.
- Also note that two additional MIPs were added to CMIP6 (PAMIP and CDRMIP) – an example of flexible strategy to broaden engagement in CMIP6.
 - PAMIP – focus on Polar Amplification
 - CDRMIP – focus on carbon dioxide removal (complementing GeoMIP)



Early Success and/or planned activities

- Evaluation tools (ESMValTool, PCMDI Metrics Package) now in place for routine evaluation of CMIP6 models as soon as the output is submitted to the ESGF



Eyring et al., ESD (2016)

Results at <http://cmip-esmvaltool.dkrz.de/>



Issues and Challenges

- Delays in CMIP6 forcing availability, and initial concerns about the response of models to historical aerosol forcing, have put CMIP6 behind schedule.
 - It has to be noted that most of CMIP6 is a voluntary, un-funded effort that aims to push the frontier of coordinated climate modelling.
 - CMIP provides the one mechanism for internationally-coordinated historical simulations, targeted multi-model experiments, and carefully executed future predictions/projections that *many others (including IPCC) depend on*.
 - Although CMIP leverages massive national contributions, the *current approach is not sustainable* and has to be addressed.



Issues and Challenges, cont'd ...

- WGCM and the CMIP Panel are well situated within the WCRP structure at the moment.
- It can be argued that WGCM and CMIP produce some of the most visible and influential outcomes of WCRP, and leverage a huge investment by many countries.
- Our concerns related to the Strategic Plan relate to maintaining (ideally improving) this visibility and effectiveness.
- We believe that WGCM has played a crucial role in both fundamental model development and coordinated intercomparison projects, providing high-profile input to climate assessments and policy development. These activities should remain core features of the new Strategic Plan, the Implementation Plan, and any revision to the WCRP structure.

