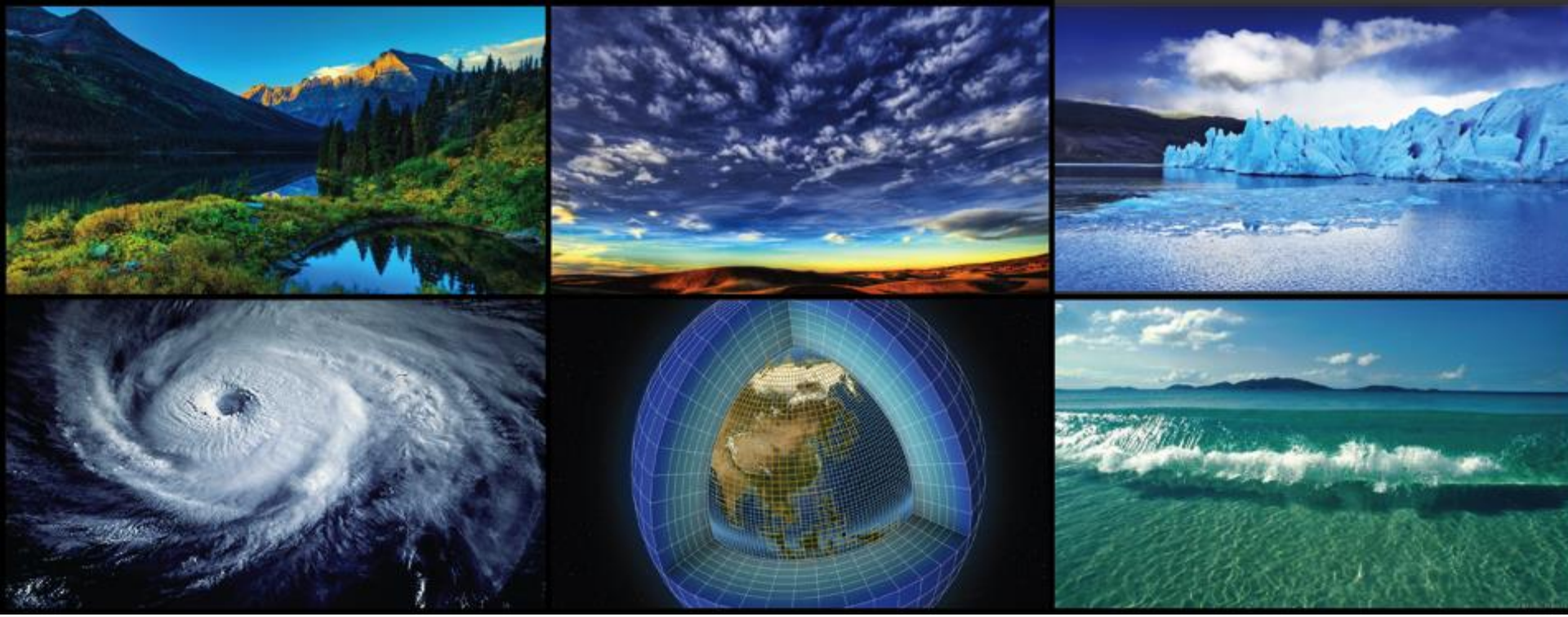


WDAC Report to JSC39

Nanjing, Jiangsu, China
April 18, 2018

Jean-Noël Thépaut
Co-chair, WDAC

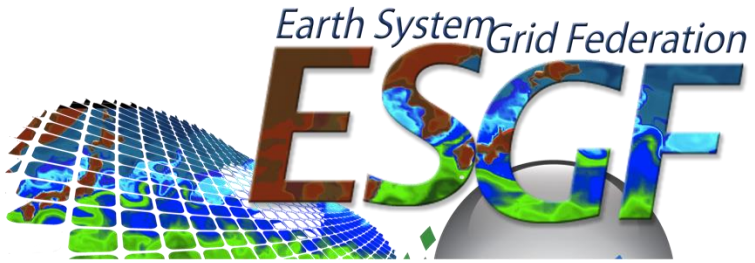
WCRP World Climate Research Programme

WMO IOC ICSU International Council for Science

WCRP Data Advisory Council

Focal point for all observational and data matters across the programme

- ***Promote open data policies***, protocols and standards across the programme
- ***Recommend best practices*** for ECV data set development and assessments
- ***Coordinate reanalysis intercomparison efforts***
- Promote and publish observational and reanalysis data sets to support climate modeling
- Coordinate flux research and promote development of associated data sets
- Review adequacy of observations and data assimilation techniques
- Sponsor ***International Data Prize***



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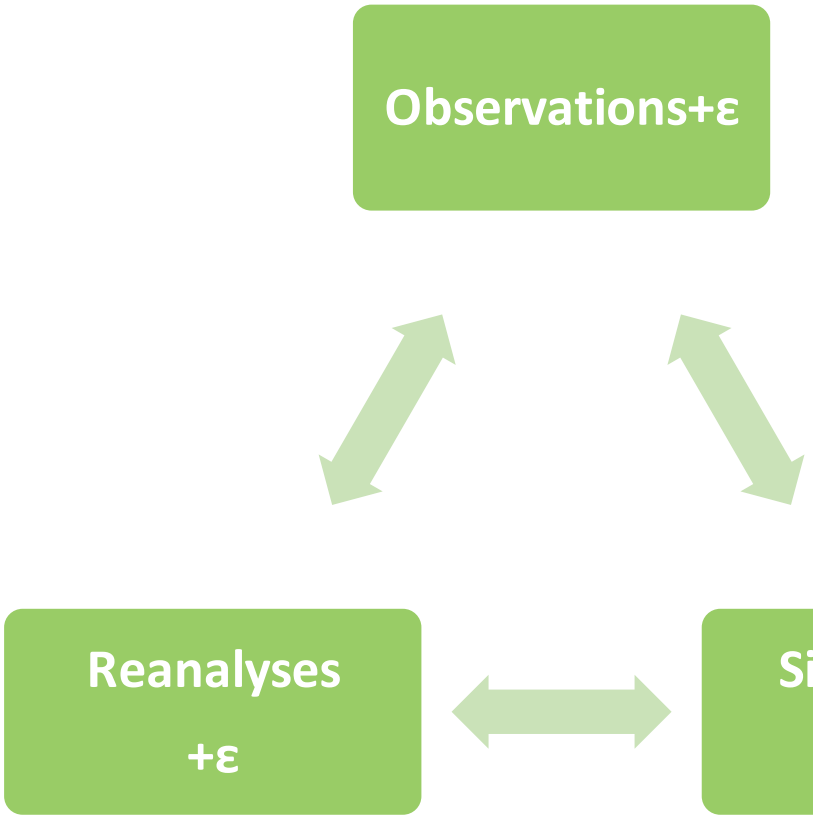
Current Activities

- **obs4MIPs**
- **Reanalysis**
- **Surface Fluxes**
- **WCRP/GCOS Data Prize**
- **Polar Challenge (see www.wcrp-climate.org/index.php/polarchallenge)**

- **Feedback on Strategic Plan / WCRP Review**

WCRP strategy for data

Earth System Grid Federation as enabling technology



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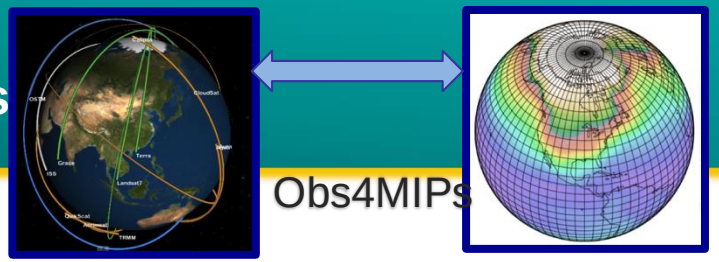
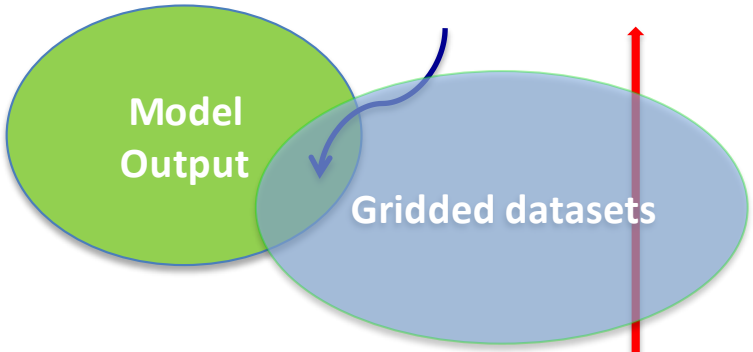
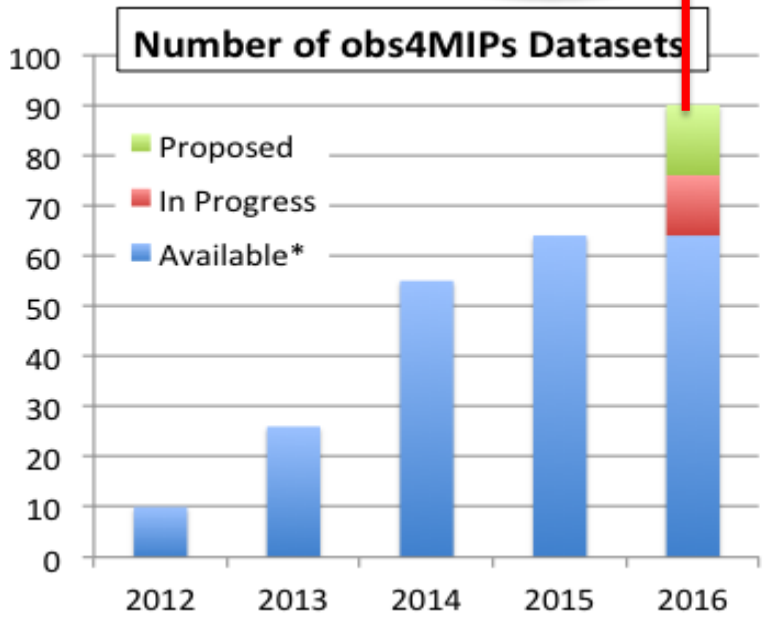
obs4MIPs
https://www.earthsystemcog.org/projects/obs4mips



- A project for identifying, documenting and disseminating observations for climate model evaluation in WCRP model intercomparisons, notably CMIP.
- Data accessible with the distributed CMIP model output, adhering to same conventions
- Guided by the WCRP Data Advisory Council obs4MIPS Task Team
- ana4MIPs: sister effort on reanalysis

Complete (~125*)
In Progress* (~15)
Proposals from Data Call (~100)





NASA esa cnes CENTRE NATIONAL D'ÉTUDES SPATIALES NOAA EUMETSAT DLR INTERNATIONAL COUNCIL FOR SCIENCE WCRP World Climate Research Programme

Obs4MIPS progress

- obs4MIPs is well positioned to have substantial impact on CMIP6 and other WCRP MIPs
- obs4MIPs TT has been able to address many recommendations (e.g., enable more data and documentation – e.g. maturity - to be included)
- Key challenge continues: further "greasing the wheels" so that datasets can *efficiently meet the obs4MIPs data specifications, and be published on ESGF*
- The goal for the coming year is to greatly expand the obs4MIPs archive, exploiting the new obs4MIPs data specifications (ODS2.1), supplemental information and data indicators
- Efforts to advance obs4MIPs remain focused on gridded datasets. Expanding the scope to include in-situ data will required new contributors prepared to do substantial work

Reanalysis Activities

WDAC TIRA Task Team

Task Team for Intercomparison of Reanalyses (TIRA):

- **Develop a reanalysis intercomparison project plan with the following objectives:**

  1) To foster understanding and estimation of uncertainties in reanalysis data by intercomparison and other means

  2) To communicate new developments and best practices among the reanalyses producing centres

  3) To enhance the understanding of data and assimilation issues and their impact on uncertainties, leading to improved reanalyses for climate assessment

  4) To communicate the strengths and weaknesses of reanalyses, their fitness for purpose, and best practices in the use of reanalysis datasets by the scientific community

- **Coordinating role for reanalysis**
  - **Membership including disciplinary projects (S-RIP, ORA-IP, ..) as well as developing centres**
  - **Maintain and promote best practices across disciplines, and communication of results**
  - **Pilot projects (e.g. on Energy Budgets) under development**
  - **Regular teleconferences**

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5th International Conference on Reanalysis (ICR5)

The TIRA TT played a major role in the organization of the event


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Advancing Global & Regional Reanalyses

Roberto Buizza[1], Paul Poli[2], Michel Rixen[3], Magdalena Alonso-Balmaseda[1], Michael G. Bosilovich[4], Stefan Brönnimann[18], Gilbert P. Compo[5,6], Dick P. Dee[1,6], Franco Desiato[7], Marie Doutriaux-Boucher[8], Masatomo Fujiwara[9], Andrea K. Kaiser-Weiss[10], Shinya Kobayashi[11], Zhiquan Liu[12], Simona Masina[13,25], Pierre-Philippe Mathieu[14], Nick Rayner[15], Carolin Richter[16], Sonia I. Seneviratne[17], Adrian J. Simmons[1,6], Jean-Noel Thépaut[1,6], Jeffrey D. Auger[19], Michel Bechtold[20,21], Ellen Bertnell[22], Bo Dong[23], Michal Kozubek[24], Khaled Sharif[25], Christopher Thomas[23], Semjon Schimanke[26], Andrea Storto[13], Matthias Tuma[3], Ilona Välisuo[27], and Alireza Vaselali[28]

[1] European Centre for Medium-Range Weather Forecasts (ECMWF; Reading, United Kingdom)
[2] Météo-France (Brest, France)
[3] World Climate Research Programme (WCRP), World Meteorological Organization (Geneva, Switzerland)
[4] NASA GSFC GMAO (Greenbelt, Maryland, USA)
[5] University of Colorado Cooperative Institute for Research in Environmental Sciences & NOAA/ESRL Physical Sciences Division (Boulder, Colorado, USA)
[6] Copernicus Climate Change Service (C3S) of the European Commission
[7] Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA, Rome, Italy)
[8] European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT; Darmstadt, Germany)
[9] Faculty of Environmental Earth Science, Hokkaido University (Hokkaido, Japan)
[10] Deutscher Wetterdienst (DWD; Offenbach, Germany)
[11] Japan Meteorological Agency (JMA, Tokyo, Japan)
[12] National Center for Atmospheric Research (NCAR; Boulder, Colorado, USA)
[13] Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC; Bologna, Italy)
[14] European Space Agency (ESA; Frascati; Italy)

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WDAC Surface Flux Task Team: TORs

1. Point-of-contact for surface flux observations and analysis in the WCRP.

2. Establish and encourage the publication and use of data, metadata, and documentation standards for global surface flux (ocean, land, or ice and atmosphere) data sets that are consistent with standards and infrastructure used in major climate model intercomparison efforts.

3. Establish conventions for intercomparisons of global datasets, and for assessment of the global datasets with available in situ data, making use of established assessments for other components of the Earth system from GEWEX and other WCRP entities.

4. Report to the WDAC and WCRP Core Projects (e.g., GEWEX/GDAP and CLIVAR) on progress, status, and plans for activities overseen by the Task Team.

WDAC Surface Flux Task Team: Status and Challenges

- Monthly telecons for communication, discussions and updates.
- Webpage (under development, soon to be public)
  - Will contain info about available direct and indirect flux estimates, info on in-situ, satellite and reanalysis flux datasets, agreed standards, intercomparison efforts
- White Paper (in progress):
  - Outlining the need for a coordinated high-level approach to improving our understanding of surface-atmosphere fluxes
    - Radiative and turbulent fluxes (air-sea, land-air, ice-air)
    - Measurements/modeling techniques and uncertainties
- Challenges:
  - many players, convoluted landscape, different networks
  - need for more effective collaboration on fluxes within WCRP, but also external to WCRP.
  - Critical observing/measuring systems under financial threat

WCRP/GCOS Data Prize

WCRP/GCOS International Data Prize 2017

Dr Markus Donat has been awarded the WCRP/GCOS International Data Prize 2017

We are pleased to announce that Dr Markus Donat from the University of New South Wales, Australia, has been awarded the WCRP/GCOS International Data Prize 2017.

The Prize Committee – consisting of representatives from WCRP, the Global Climate Observing System (GCOS) as well as their joint panels, the Atmospheric Observation Panel for Climate (AOPC), Terrestrial Observation Panel for Climate and Ocean Observations Panel for Climate (OOPC) – was greatly impressed by his strong profile and the outstanding quality of his contribution to the development of climate data sets.

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WDAC comments on Strategy

- O1 should be broaden to capture "analysis/assessment of climate" beyond "processes"
- Observations at the heart of model development and process understanding, in addition to data assimilation, model verification and model initialization
  - Uncertainty characterization is critical
- Data infrastructure as cornerstone for WCRP science (obs, reanalyses, (ensemble) simulations, metadata,..)
- (Big) Data science should be strengthened

WDAC comments on Strategy

- (Earth System) Reanalyses: growing role towards consistent picture of past climate
  - *: note that attracting funding for data assimilation development is as problematic as model development
- Fluxes: essential as we move into Earth System Models ("climate system and interfaces")
- Implementation Plan: need to review WCRP-GCOS linkages and governance (panels, "obs" vs "data", etc)
- Notwithstanding the future WCRP structure, the need for a cross-cutting "observations/analysis" forum remains.


Thank You
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