WCRP Data Advisory Council

40th Session of the WCRP Joint Scientific Committee

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WORLD METEOROLOGICAL ORGANIZATION

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

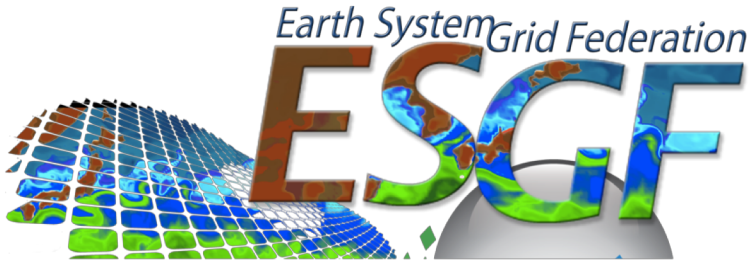
International Science Council

WCRP World Climate Research Programme

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 inter-comparison** efforts
- Promote **observational and reanalysis data** sets to support climate modelling
- 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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WDAC - Progress and achievements

obs4MIPS -

Observations for Model Intercomparisons Project

Observational products documented and organized according to CMIP output requirements

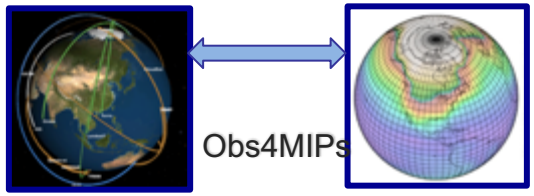
- Available on ESGF via a searchable distributed system
- Specifications = technical link with the modelling community
- Positioned to have substantial impact on CMIP6

Project is entering a new phase:

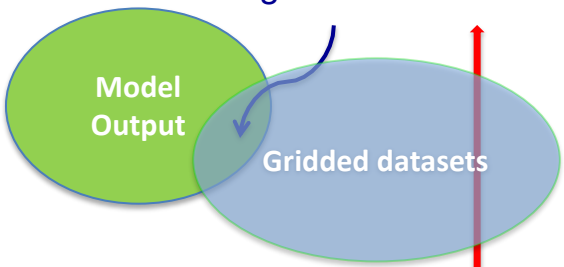
- Time to revisit the make-up of task team

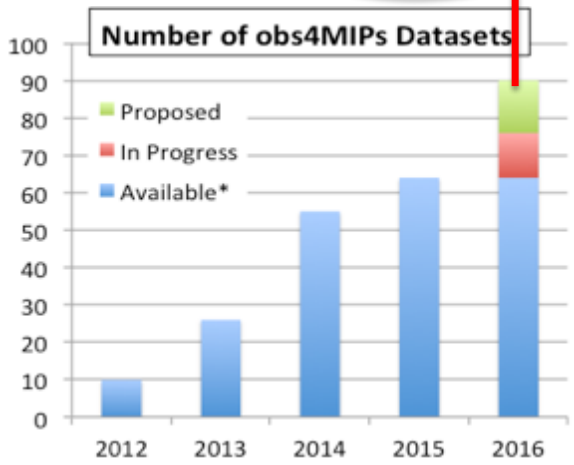
New contributors and substantial work needed for:

- Further enable datasets to obs4MIPs specifications
- Publish data on ESGF
- Expand the scope from gridded to in-situ data



Target Quantities



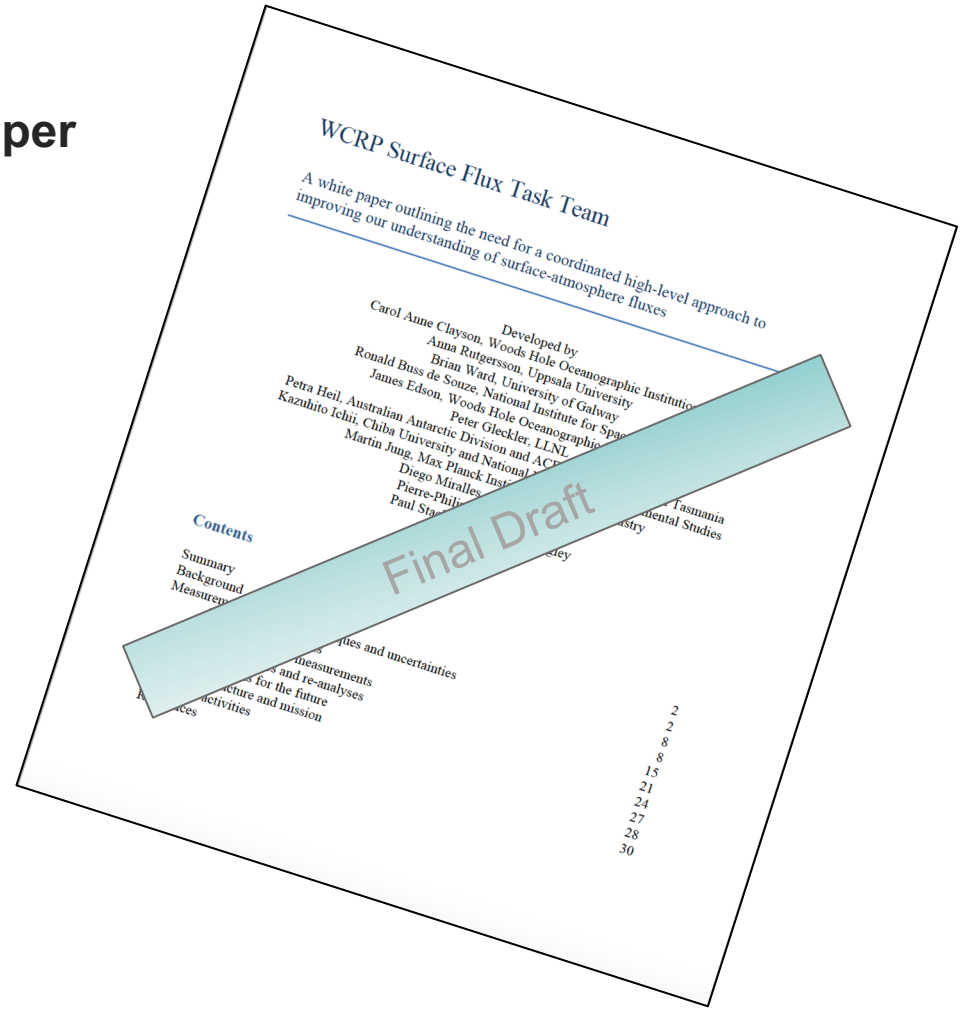


Need to assess scientific user uptake to dimension resources accordingly

WDAC - Progress and achievements

WCRP Surface Flux Task Team White Paper

1. Provide a single point-of-contact for **surface flux observations and analysis** in WCRP
2. Establish publication and use of **data, metadata, and documentation standards** for global surface flux datasets (consistent with standards in CMIP)
3. Establish **conventions for inter-comparisons and assessment** of global flux datasets
4. **Report to the WDAC and Core Projects** on activities overseen by the Task Team.



Fluxes will be increasingly important for coupled and seamless approach

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WDAC - Progress and achievements

Task Team for Intercomparison of Reanalyses (TIRA) in 2016

- Asked to develop a reanalysis intercomparison group for WCRP

5th International Conference on Reanalysis (Rome, 2017) *Buizza et al. (BAMS, 2018)*

- Develop a document that highlights best practices and terms of reference
- Develop Pilot Intercomparison Projects →

- Regional Project - Precipitation
- Possible Global Topics
- [1] Surface temperature
- [2] Ocean surface fluxes
- [3] Precipitation
- [4] Radiation
- [5] **Energy budget**
- [6] Water cycle
- [7] Surface Winds (Wind Energy)

Proposal to establish a WCRP Earth System Reanalysis Intercomparison and Evaluation group, 2019

1. Coordinate Reanalysis Intercomparison Projects (RIPs) through standards and best practices
2. Better understand, utilize and promote Earth System Reanalyses
   - Scientific support for users, such as policy makers
   - Provision of data necessary to enable downstream applications serving societal interests and needs such as hydrology, agriculture, renewable energy or economics.

Need to include reanalyses in WCRP infrastructure discussion

WDAC is currently …

What

Open data policies

Best practices for ECVs

Reanalysis inter-comparisons

Observations to support CMIP

Coordinate flux research

Review adequacy of observations

How

Cross cutting (across core projects)

Connecting to other climate research activities
e.g., SOLAS

Connecting to other data products
e.g., GLODAP/SOCAT

Connecting to international projects
e.g., GCOS, CEOS/CGMS WGClimate, Future Earth

Linking to research and operations and exploit synergies on infrastructures, protocols, standards

What is missing to serve the (new) WCRP structure?

Future plans (outcome of WDAC8)

Integration?

Whole system approach?

1. Observations

- Observations for process understanding
- Sustained reference data sets

2. Earth System Reanalyses and data assimilation

3. Data science and data management

- Data science and data mining
- Data infrastructure and management

Topics such as mitigation, adaptation, geoengineering?

Identify vulnerabilities?

WDAC - Future plans/IP

1. Observations

Already included

Future plans

- **Observations for process understanding**
  - Official WCRP document on observations required for key research?
  - Targeted field experiments
  - Characterization of bias and uncertainties
- **Sustained reference data sets**
  - Synergies/consistencies between observing systems – GCOS
  - Products for model evaluation and cross cutting research projects
  - Benefits of new sensors/micro-satellites, citizen science?
  - Observational needs, data rescue
- **Information on (and access to) datasets via inventory?**
  - Across WCRP activities (partnership: GCOS, core projects, challenges)

WDAC - Future plans/IP

Already included

Future plans

2. Reanalyses and data assimilation

- **Earth System Reanalyses**
  - Common framework, umbrella for Reanalysis Intercomparison Projects (RIPs)
  - Highlighting scientific research topics such as cycles
- **Data assimilation**
  - Oversight of OSEs/OSSEs
  - Earth system approach
  - Opportunities for coordination with WWRP/DAOS/PDEF and WGNE

WDAC - Future plans/IP

Already included

Future plans

3. Data science and data management

- **Data science and data mining**
  - Information and knowledge exchange across WCRP entities
  - Promote transfer of knowledge from other disciplines
  - Identify areas for international collaboration on big data, AI
- **Data infrastructure and management**
  - Open data access policy
  - Common data formats, metadata requirements, and citation standards (observations, reanalyses, simulations)
  - Research-operations synergies
  - Training and education

Emerging Issues - Implementation Plans

Need to coordinate observations, reanalyses, data science and data management issues across the programme.

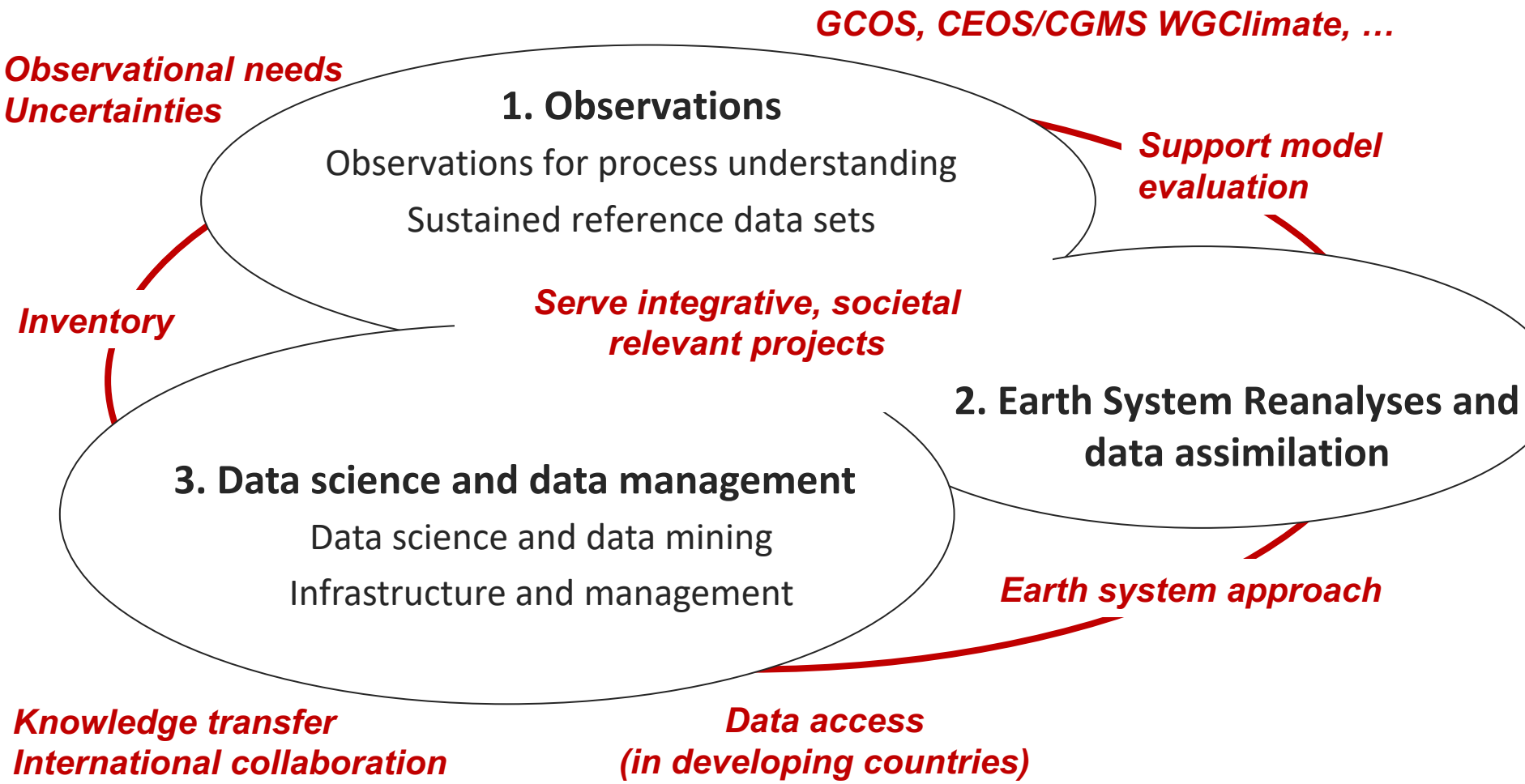
What is the ideal structure?

Maintain a WDAC/WDAC successor? Or a JSC role?

Fluxes

- Are broader than data, also involve models
- Will become increasingly important (coupled and seamless)
- Where should this sit, what priority, what structure, etc?

WDAC - Future plans



What is missing to serve the (new) WCRP structure?