

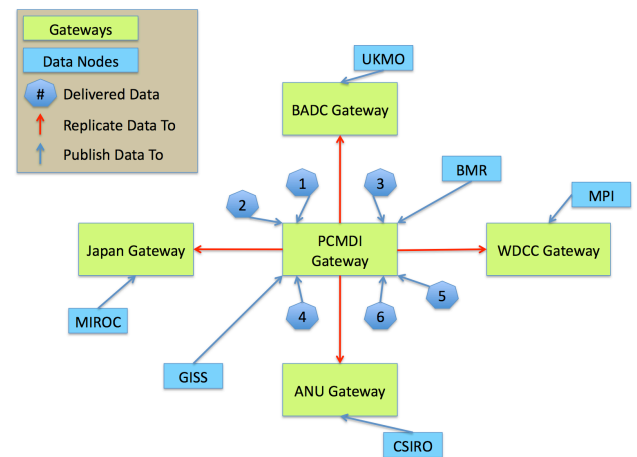
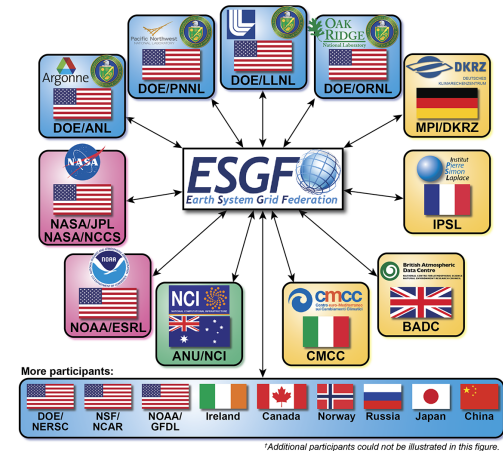
Selected Activities Overseen by the WDAC

- Some background
- obs4MIPs
- ana4MIPs
- CREATE-IP (in planning stage)

Contributions from: M. Bosilovich, O. Brown, V. Eyring, R. Ferraro., P. Gleckler, R. Joseph, J. Potter, M. Rixen, J.-N. Thepaut, D. Waliser

Data accessibility for Climate Model Intercomparisons (MIPs):

- For CMIP3 (circa IPCC AR4) and earlier, data from CMIP and several other MIPs were centralized (at PCMDI)
- Since CMIP5, data is now distributed via the Earth System Grid Federation (**ESGF**)
- CMIP5 data ~5Pb



The conventions for **CF** (Climate and Forecast) metadata are used in the organization of all CMIP data

Common goals of obs4MIPs, ana4MIPs and CREATE-IP*

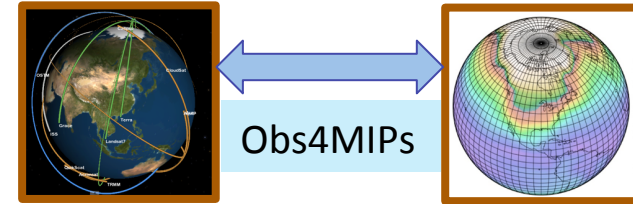
- Making observational data and reanalysis more accessible for evaluation of CMIP class simulations

The data:

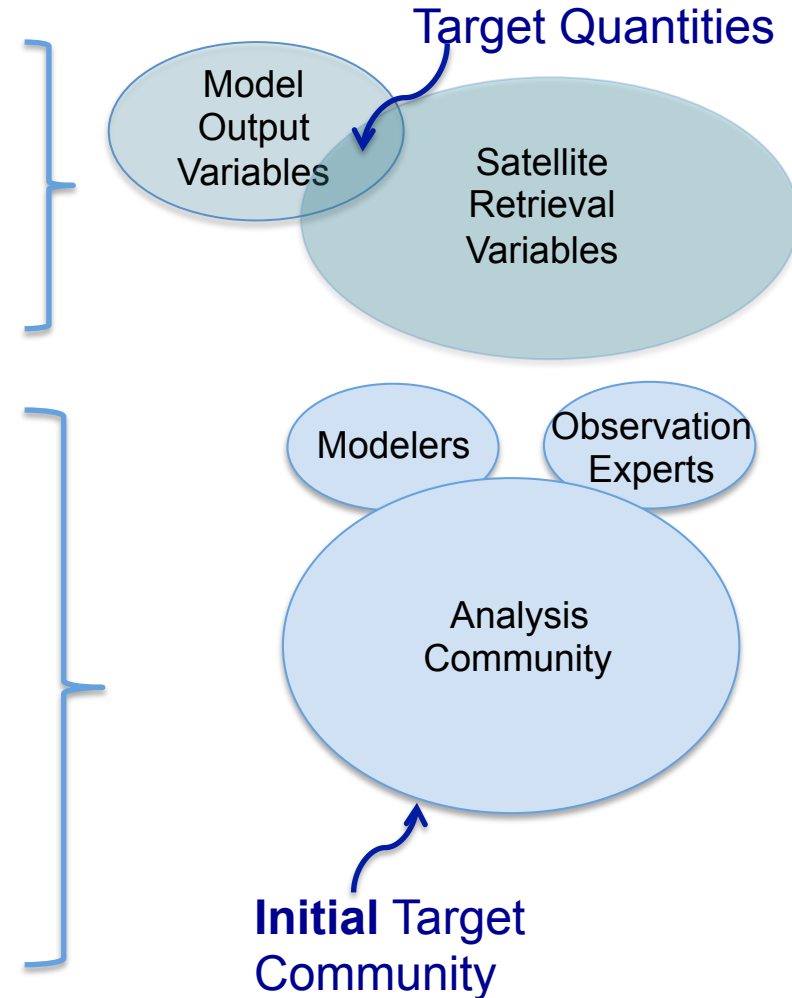
- Match fields included in the CMIP5 standard model output
 - Technically aligned with CMIP data conventions
 - Available through the ESGF
- Provide high level data quality information of particular relevance to climate model evaluation

*CREATE-IP has additional goals to be discussed shortly

obs4MIPs: The 4 Commandments



1. Use the [CMIP5 simulation protocol](#) (Taylor et al. 2009) as guideline for [selecting observations](#).
2. Observations to be [formatted the same as CMIP Model output](#) (e.g. NetCDF files, CF Convention)
3. Include a [Technical Note](#) for each variable describing observation and use for model evaluation (at graduate student level).
4. Hosted side by side [on the ESGF](#) with CMIP model output.



.... and growing!



obs4MIPs: Current Set of Satellite Observations

Sorted by CF Variable *Long Name*

Air Temperature

Ambient Aerosol Optical Thickness at 550 nm

CALIPSO 3D Clear fraction

CALIPSO 3D Undefined fraction

CALIPSO Clear Cloud Fraction

CALIPSO Cloud Fraction

CALIPSO High Level Cloud Fraction

CALIPSO Low Level Cloud Fraction

CALIPSO Mid Level Cloud Fraction

CALIPSO Scattering Ratio

CALIPSO Total Cloud Fraction

Cloud Fraction retrieved by MISR

CloudSat 94GHz radar Total Cloud Fraction

CloudSat Radar Reflectivity CFAD

Fraction of Absorbed Photosynthetically Active Radiation

ISCCP Cloud Area Fraction (Joint histogram of optical thickness and CTP)

ISCCP Mean Cloud Albedo (Cloud-fraction weighted & daytime)

ISCCP Mean Cloud Top Pressure (Cloud-fraction weighted & daytime)

ISCCP Mean Cloud Top Temperature (Cloud-fraction weighted & daytime)

ISCCP Total Cloud Fraction (daytime only)

Leaf Area Index

Mole Fraction of O3

Near-Surface Wind Speed

PARASOL Reflectance

Precipitation

Sea Surface Height Above Geoid

Sea Surface Temperature

Specific Humidity

Surface Downwelling Clear-Sky Longwave Radiation

Surface Downwelling Clear-Sky Shortwave Radiation

Surface Downwelling Longwave Radiation

Surface Downwelling Shortwave Radiation

Surface Upwelling Clear-Sky Shortwave Radiation

Surface Upwelling Longwave Radiation

Surface Upwelling Shortwave Radiation

TOA Incident Shortwave Radiation

TOA Outgoing Clear-Sky Longwave Radiation

TOA Outgoing Clear-Sky Shortwave Radiation

TOA Outgoing Longwave Radiation

TOA Outgoing Shortwave Radiation

Total Cloud Fraction

Water Vapor Path

obs4MIPs planning for CMIP6

Meeting held at NASA HQ in April 2014, structured to promote discussion between experts in model development and evaluation, and experts in satellite data products

Selected consensus recommendations that applied to all of the meeting topic areas:

- Expand the inventory of included datasets
- Include higher frequency data and model output. High frequency model output could be limited to an observationally-rich “golden period”
- Reliable and defensible error characterization/estimation of observations is a high priority, and obs4MIPs should press harder for the inclusion of these estimates as part of each dataset
- Include datasets in support of off-line simulators (prime example: COSP—Cloud Feedback Model Intercomparison Project [CFMIP] Observation Simulator Package)
- Collocated observations, including sparser in-situ datasets, are particularly valuable for diagnosing certain processes and their inclusion in obs4MIPs should therefore be encouraged
- Precise definitions of data products (what’s actually being reported), including biases, and precise definitions of the model output variables are required. In some cases, it is not clear how closely the observations correspond to the model output, even though they have the same names and units

Ferraro et al., *BAMS in press*

For complete meeting report see <https://www.earthsystemcog.org/projects/obs4mips/planning201405>

Data access and project connectedness

The screenshot displays the Obs4MIPs website interface. At the top, it features the University of Colorado Boulder logo and the Earth System Grid Federation (ESGF) logo with the text "Welcome to the Earth System Grid Federation. You are at the CoG-CU node." Below this is a navigation bar with "Home", "About Us", "Governance", and "Contact Us". The main content area is titled "Observations for Climate Model Intercomparisons" and includes a sidebar with "Products" (Satellite, Reanalysis, In-situ) and "Visitors" (List All News, List All Files). The main text describes the activity and provides a list of four criteria for data selection. A sidebar on the right contains "Search & Download Data", "Read News", and "Browse Projects" sections. The footer contains ESGF sponsors and partners, version information, and contact details.

University of Colorado Boulder

Welcome to the Earth System Grid Federation. You are at the CoG-CU node. ESGF

Welcome, Guest. | Login | Create Account

Obs4MIPs

Home About Us Governance Contact Us

Observations for Climate Model Intercomparisons

Obs4MIPs (Observations for Model Intercomparisons) is an activity to make observational products more accessible for climate model intercomparisons.

To Get Data - Please go to the "Search Data" box or "Advanced Data Search" link to the right.

A wide variety of observationally-based datasets are used for climate model evaluation. Obs4MIPs refers to a limited collection of well-established and documented datasets that have been organized according to the 5th Coupled Model Intercomparison Project (CMIP5) model output requirements and made available on the Earth System Grid Federation (ESGF). Each Obs4MIPs dataset corresponds to a field that is output in one or more of the CMIP5 experiments. This technical alignment of observational products with climate model output can greatly facilitate model data comparisons. Guidelines have also been developed for Obs4MIPs product documentation that is of particular relevance for model evaluation. This effort was initiated with support from NASA and the U.S. Department of Energy (DOE) and has now expanded to include contributions from a broader community including CFMIP-OBS and products that rely on ESA satellites.

To summarize, products currently available via Obs4MIPs are:

1. Directly comparable to a model output field defined as part of CMIP5
2. Open to contributions from all data producers that meet the Obs4MIPs requirements
3. Well documented, with traceability to track product version changes
4. Served through ESGF (and directly available through this COG).

Efforts are underway to coordinate obs4MIPs with CMIP6

Last Update: Nov. 7, 2014, 4:57 p.m. by Robert Ferraro

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No Comments

Project Activity

Search & Download Data

Enter Text

Advanced Data Search

Read News

Obs4MIPs-CMIP6 Planning Meeting Final Report is now available
Go to the left sidebar and click on ...

Browse Projects

This All My

Parent projects (0)

Peer projects (1)

Ana4MIPs

Child projects (0)

Enter Tag

Start typing, or use the 'Delete' key to show all available tags.

ESGF sponsors and partners
DoE Office of Science | IS-ENES | NASA | NOAA | NCI | NSF

CoG version 2.10.0
ESGF P2P Version 1.7.1-phoenix-release-master

Earth System CoG sponsors and partners
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http://www.earthsystemcog.org cog_support@list.woc.noaa.gov | privacy policy

- ana4MIPs and obs4MIPs data are available through the CoG
- CoG is directly connected to ESGF
- CMIP6 is expected to be hosted on the CoG, as is CREATE-IP

Reanalysis for model intercomparison and more...

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Reanalysis for model intercomparison projects (Ana4mips)

- Collection of variables from selected major reanalysis efforts that are underway today
- Follow-on effort to obs4MIPs, supporting the CMIP model intercomparison and validation exercise.
- Each dataset is reformatted similarly to facilitate comparison with each other, observations and with the CMIP models
- Selected variables included directly in obs4MIPs

Purpose of ana4MIPs

- Provide data for CMIP evaluation that is not directly observable
- Selected variables with high potential for model evaluation
 - List is currently under consideration by obs4MIPs panel
 - Including, but not limited to monthly mean:
 - Standard CMIP5 pressure level Temperature, winds and geopotential height
 - 2m surface temperature and specific humidity
 - Mean sea level pressure and surface winds
 - Possibly some higher frequency data

Current reanalysis sources converted to the CMIP5 standard format

Name	Source	Time Range	Assimilation	Resolution Available
MERRA	NASA	1979-present	3D-VAR, with incremental update	2/3 lon x1/2 lat deg 3d Analysis and 2d variables; 1.25 deg 3d Diagnostics
ERA-Interim	ECMWF	1979-present	4D-VAR	0.75x0.75
CFSR	NCEP	1979-present	3D-VAR	.5x.5 and 2.5x2.5
JRA25	JMA	1979-present	3D-VAR	T106
JRA55	JMA	1958-2012	3D-VAR	1.25x1.25
20CR	NOAA/ESRL	1871-2012	Ensemble Kalman Filter	2x2

Currently transitioning to an expanded project

- The scope of ana4MIP limited
 - Variables
 - Levels
 - Temporal resolution
- In order to provide data for a reanalysis intercomparison – new project was envisioned

Collaborative REAnalysis Technical Environment

– Intercomparison Project (CREATE-IP)

- Expanded reanalysis intercomparison
 - Up-to-date (annually if not monthly)
 - Monthly data
 - High frequency (1hr, 3hr, 6hr) for limited number of variables
 - All available levels
 - Include increments (O-A and O-F)
 - Include observations as available
 - Part of a total environment – science cloud, analytics, ontology, visualization, API
 - Interaction with reanalysis and outside user communities

Purpose of CREATE-IP

- Improve reanalyses and access
- Co-location and improved data discovery
- Common data formats
- Broader use by other communities
 - Biodiversity, water supply, agriculture, wind power, pandemics
- Uncertainty quantification - assessing appropriate use of reanalysis
 - Study inhomogeneity

Current Typical monthly averaged data holdings – expansion is underway

Current CREATE-IP Monthly Average Variables Available	
Air Temperature	Specific Humidity
Condensed Water Path	Surface Air Pressure
Convective Precipitation	Surface Downward Eastward Wind Stress
Eastward Near-Surface Wind	Surface Downward Northward Wind Stress
Eastward Wind	Surface Downwelling Longwave Radiation
Evaporation	Surface Downwelling Shortwave Radiation
Geopotential Height	Surface Temperature
Ice Water Path	Surface Upward Latent Heat Flux
Near-Surface Air Temperature	Surface Upward Sensible Heat Flux
Near-Surface Wind Speed	Surface Upwelling Longwave Radiation
Northward Near-Surface Wind	Surface Upwelling Shortwave Radiation
Northward Wind	TOA Incident Shortwave Radiation
Precipitation	TOA Outgoing Clear-Sky Longwave Radiation
Relative Humidity	TOA Outgoing Longwave Radiation
Sea Level Pressure	Total Cloud Fraction
Snowfall Flux	Water Vapor Path
	omega (=dp/dt)

WDAC oversight

- The WDAC has established a task team that provides guidance for obs4MIPs and currently also ana4MIPs
- A WDAC white paper is under discussion for the advancement of CREATE-IP
- It is anticipated that a second task team will be established for CREATE-IP (and its connections with ana4MIPs and obs4MIPs)