An Update on the ESGF Needs for Obs4MIPs

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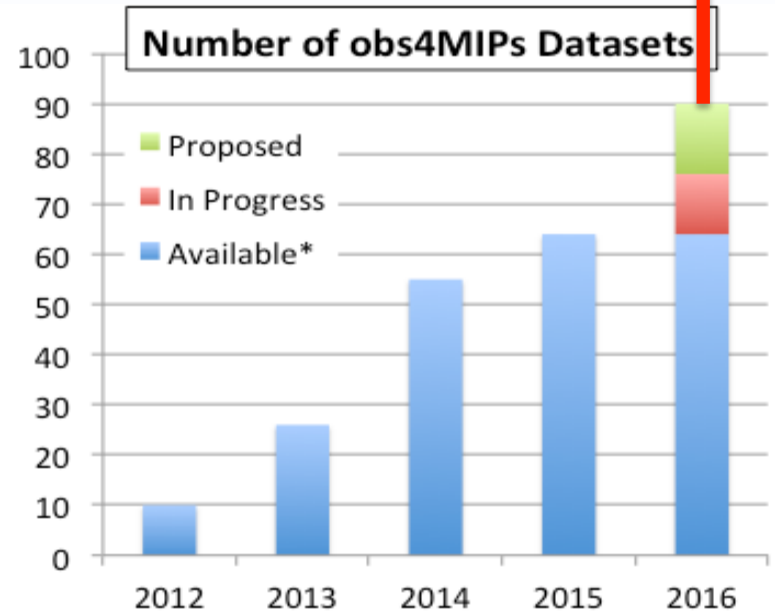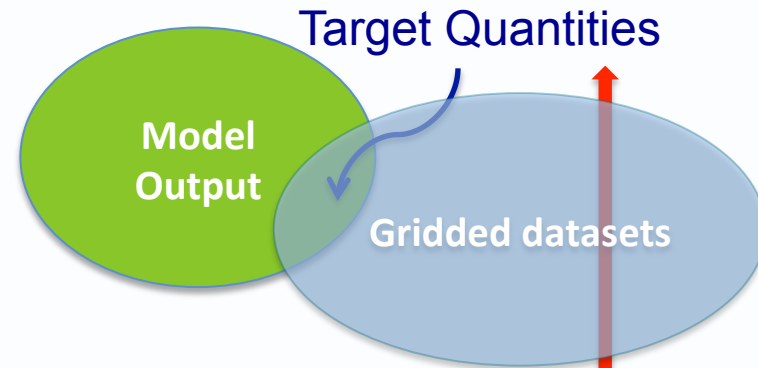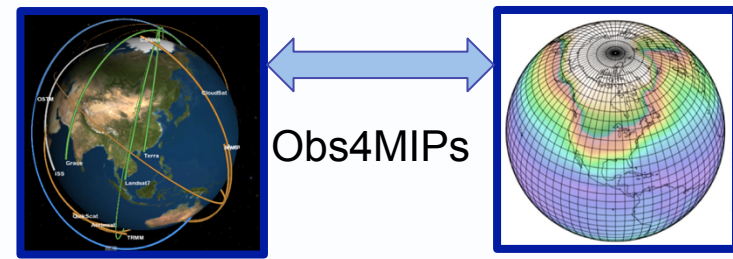
… and many others

obs4MIPs

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

Obs4MIPs

- A Project for identifying, documenting and disseminating observations for climate model evaluation.

- Data sets accessible on the ESGF alongside CMIP model output, **adhering to the same data conventions**

- Guided by the WCRP Data Advisory Council obs4MIPS Task Team

Target Quantities

Model Output

Gridded datasets

Number of obs4MIPs Datasets

- Proposed
- In Progress
- Available*

…. and growing!

obs4MIPs leverages key protocols and infrastructure

- Experiment protocol and **CMIP standard output**

- **Climate Forecast (CF) Convention (as applied in CMIP)**

- Software to ensure data complies to CMIP structure: **CMOR**

- Distribution: **ESGF**, technically aligned with CMIP data

- **CoG**: Project information and interconnectedness with others

Desired enhancements
Publishing obs4MIPs data on ESGF

- Preparing observational data needs to become easier
  - CMOR3 accommodates describing gridded observations ✔
  - <u>Apply CMIP6 standards with CMOR3, including examples</u>

- Publishing needs to become easier

- Ability to monitor downloads

- **Identifying dataset "suitability" via search**

- **After searching for "best estimate", having access to "ancillary data"**

Technical Requirements

Meets obs4MIPs data technical requirements	Data suitably processed with CMOR and/or consistent with obs4MIPs standards	Largely complete with minor metadata inconsistencies	Non-compliant. Should be removed from database!
Includes obs4MIPs technical note information	Complete technical note information provided	Technical note information incomplete and/or could be improved	Technical note not provided

Dataset Suitability and Maturity

Closeness or robustness of measurement to observed reference quantity	Firmly established and/or validated methodology	Indirect means of calculation or observations only providing partial constraint (e.g. ocean surface latent heat flux)	Largely model-derived quantity (e.g. LAI, root zone soil moisture, NPP)
Maturity with respect to climate model evaluation	Multiple peer-reviewed examples of application to CMIP climate model evaluation	One peer-reviewed example of application to CMIP climate and/or examples of other sorts of model evaluation.	As of DATE-TBS, no significant application to climate model evlauation
Provision for robust uncertainty information	Uncertainty information provided per retrieval/grid point	General uncertainty information given relative to the methodology and dataset as a whole - backed by actual field/in-situ validation exercises	No uncertainty information provided

Comparison Complexity

Complexity of Model Observation Comparison	Comparison can be made directly with CMIP model output variable	Comparison requires some simple post processing of CMIP output variable(s) (e.g. vertical integral or ratio of two variables)	Comparison requires complex processing of CMIP output (e.g. "simulator", budget calculation)

obs4MIPs
Dataset Suitability
&
Maturity Indicators
(DRAFT)

Currently under discussion by WCRP Task Team
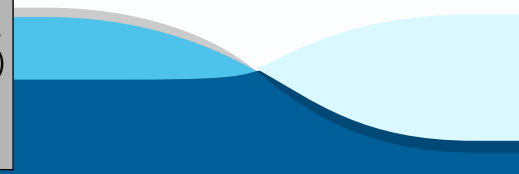
Illustration Of Dataset Suitability And Maturity Indicators
Based on typical obs4MIPs dataset search

Linked as a single entity to explanatory page of color codes

An emerging need: Being able to access to ancillary data

How things work now . . .

Scientist using CMIP variable X goes to obs4MIPs CoG site and finds observational analog(s)

These "best estimate" data strictly adhere to CMIP/ obs4MIPs data conventions

An emerging need: Being able to access to ancillary data

How things work now . . .

What is needed …

Scientist using CMIP variable X goes to obs4MIPs CoG site and finds observational analog(s)

After finding "best estimate", the user has access to a diversity of data and metadata

These "best estimate" data strictly adhere to CMIP/ obs4MIPs data conventions

These supporting data sets may not adhere to data standards and therefor not be directly searchable

Summary

- Commitments to contribute new datasets: NASA, NOAA, ESA, EUMETSAT, and now many traditional gridded in-situ products

- CMOR3 accommodates observational data, should improve process

- WCRP/WDAC urging obs4MIPs to extend beyond satellite data

Desired enhancements to CoG/ESGF:

- **Color code identification of dataset "suitability" via search**

- **After searching for "best estimate", having access to "ancillary data"**

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