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Pasadena, California

Observations for CMIP5 Simulations

JPL/NASA and PCMDI Collaboration

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AIRS, CERES, CloudSat, JASON, MLS, QuikSCAT, TES, TRMM

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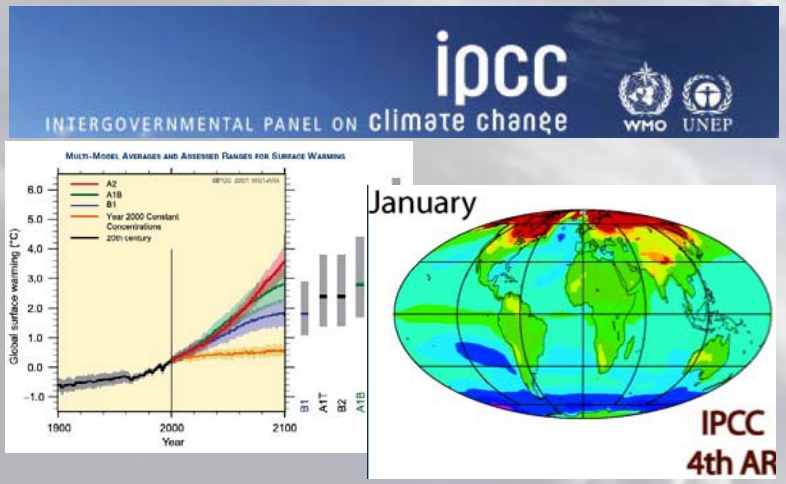
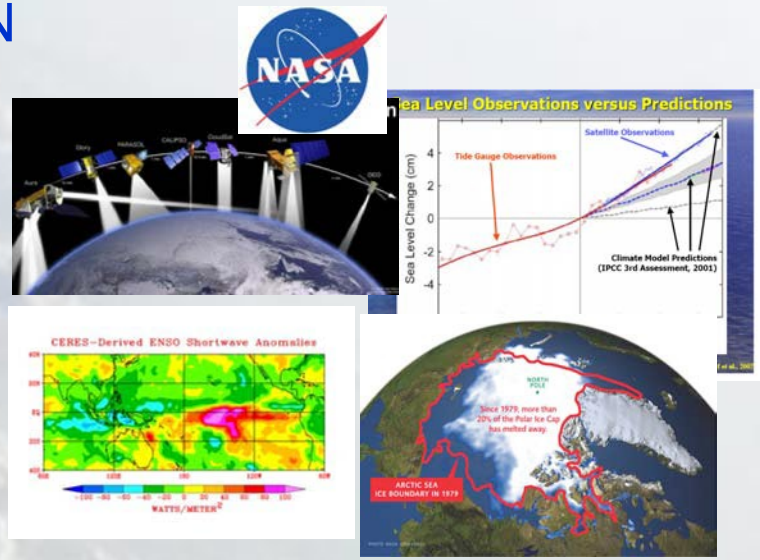
MOTIVATION



How to bring as much observational scrutiny as possible to the IPCC process?



How to best utilize the wealth of NASA Earth science information for the IPCC process?

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Objective

To Provide the community of researchers that will access and evaluate the CMIP5 model results access to analogous sets of observational data.

§ Analogous sets in terms of periods, variables, temporal/spatial frequency

§ This activity will be carried out in close coordination with the corresponding CMIP5 modeling entities and activities -> E.G. PRESENTED TO AND ENCOURAGED BY WCRP/WGCM, SEPTEMBER 2009; TO BE PRESENTED BY K. TAYLOR TO WOAP, MARCH 2010.

§ It will directly engage the observational (e.g. mission and instrument) science teams to facilitate production of the corresponding data sets.

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Background

§ Taylor et al (2008) have defined the protocol for the CMIP5 simulations that will be used for the next IPCC Assessment Report, AR5.

§ The protocol defines the scope of simulations that will be undertaken by the participating modeling groups.

§ For several of the prescribed retrospective simulations (e.g, decadal hindcasts, AMIP and 20th Century coupled simulations) observational data sets can be used to evaluate and diagnose the simulation outputs.

§ However, to date, the pertinent observational data sets to perform these particular evaluations have not been optimally identified and coordinated to readily enable their use in the context of CMIP5.

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Main Tasks

Given the complexity of the observational datasets, a simple framework to identify, organize and disseminate them for CMIP5 will be developed.

Use the CMIP5 simulation protocol (Taylor et al. 2008) as guideline for deciding which observations to stage in parallel to model simulations.

The main tasks are:

1) Work with modeling/observation communities to identify data sets;
   [Initial contacts: AIRS, MLS, TES, QuikSCAT, CloudSat, Topex/Jason, CERES, TRMM, AMSR-E]
2) Work with observational teams to produce 2-3 page technical document describing strengths/weaknesses, uncertainties, dos/ don'ts regarding interpretations comparisons with models. Transform into CF compliant format. [Planned with above observations/teams] [late 2010; subject to NASA approval]
3) Organize these datasets and provide a strategy for accessing them that has close parallels to the model data archive. [Ongoing collaboration with PCMDI – see next slides] [early 2011]
4) Advertise availability of observations for use in CMIP5 analysis.

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NASA/JPL, PCMDI and ESG

- JPL and PCMDI have established a collaboration through the ESG to share observations to support model-to-data comparison
  - A prototype ESG node was established at JPL in 2009, on internal funds, demonstrating sharing of AIRS data between JPL and the ESG
  - Next, JPL and PCMDI plan to deploy a NASA/JPL "gateway" for access to multiple NASA observational data sets in June 2010, pending NASA support.

- Provide access to a wealth of NASA observations through the ESG
  - AIRS will be the first planned test data set that will be operationally available when the gateway is released in June 2010
  - PCMDI and JPL are planning enhancements to the ESG portal to improve access to observations in conjunction with the models
  - Additional observational data sets will be subsequently added through March 2011, pending NASA support.

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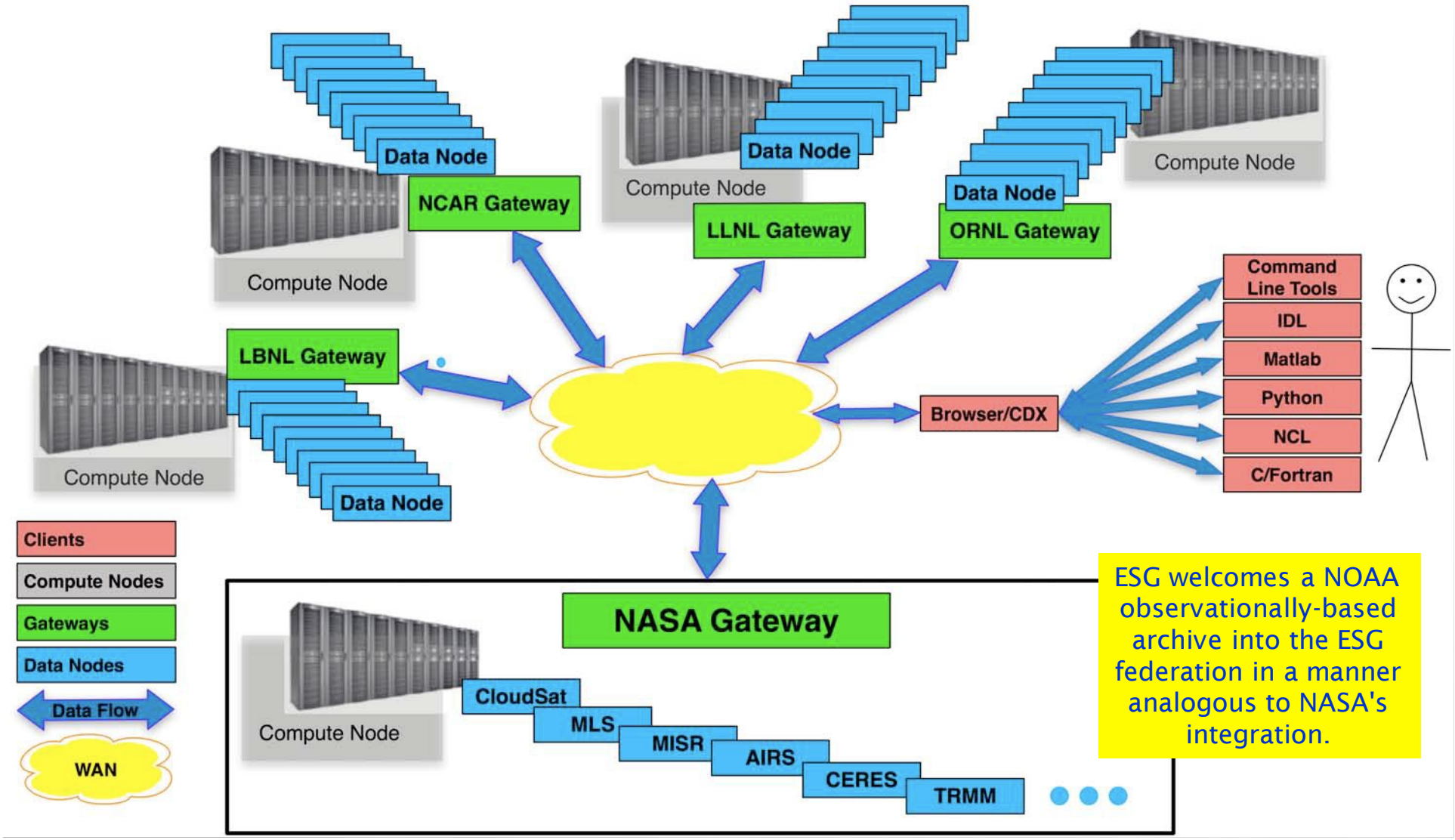
With apologies to Dean Williams!



ESG welcomes a NOAA observationally-based archive into the ESG federation in a manner analogous to NASA's integration.

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Summary

A collaborative effort between JPL/NASA and PCMDI is underway to provide the community of researchers that will access and evaluate the CMIP5 model results access to analogous sets of observational data.

A number of NASA satellite data sets have been identified that have model equivalents. Thus far: AIRS, MLS, TES, QuikSCAT, CloudSat, Topex/Poseidon, CERES, TRMM, AMSR-E.

Plans have been developed for converting the data into CF-compliant format, documenting it for technical details for their use/application to IPCC model assessment, and to make them available via ESG and links from PCMDI model access web portal.

This activity is being carried out in coordination with the corresponding CMIP5 modeling entities and activities (e.g. WGCM, PCMDI).