# Earth System Grid: A Federated Climate Model Data Management Infrastructure


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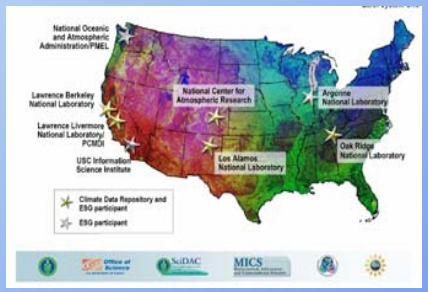
***The Earth System Grid (ESG) is a virtual collaborative environment that links distributed centers, users, models, and data in a Grid computing environment. The primary goal of ESG is to support the infrastructural needs of the national and international climate community by providing crucial technology to securely access, monitor, catalog, transport, and distribute data. The next generation ESG Center for Enabling Technologies (ESG-CET) will support petabyte dataset volume in a distributed environment through the federation of data centers.***

## ESG Team and Sponsors




## Current ESG-II

- The ESG was enhanced to support the **IPCC Fourth Assessment Report (AR4)**.
- PCMDI assembled an unprecedented set of model data from **12 experiments, 13 countries and 23 models**, so called **CMIP3 database.**

CMIP3 AR4 (2004-2007) Worldwide User Base

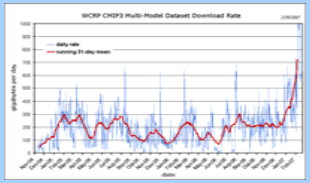
**PCMDI** - Program for Climate Model Diagnosis and Intercomparison at LLNL
**IPCC** - Intergovernmental Panel on Climate Change
**CMIP3** - Coupled Model Intercomparison Project phase 3

## CMIP3 Facts

- **32 TB** of data at the PCMDI (73,000 files)
- **1000 registered users**
- FTP, web portal, and analysis tool access
- **"Virtual Datasets"** with subsetting, aggregation
- **247 scientific papers** published

***Downloads to date:***

- **171 TB**
- **703,000 files**
- **300 GB/day (average)**

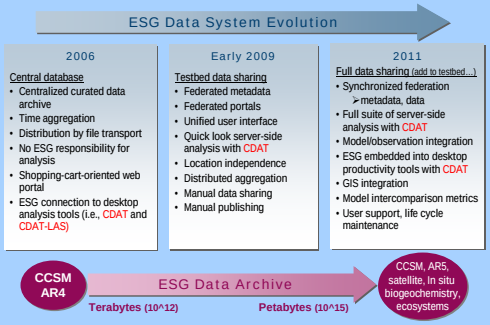



## ESG Portal


**http://www-pcmdi.llnl.gov**
**https://esg.llnl.gov:8443/index.jsp**

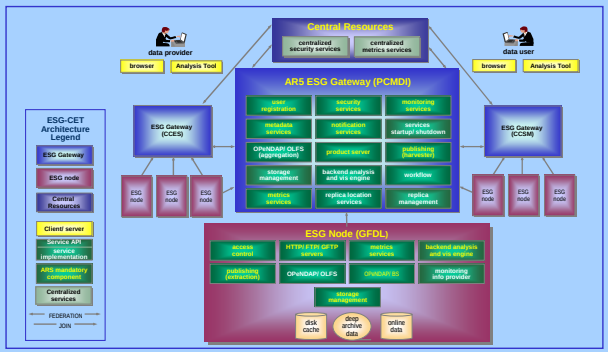
## Next Generation ESG-CET

### Evolving ESG for the future




**CDAT** - Climate Data Analysis Tools developed mainly at PCMDI;
**CCSM** - Community Climate System Model (NCAR);
**LAS** - Live Access Server
**GIS** – Geographic Information System

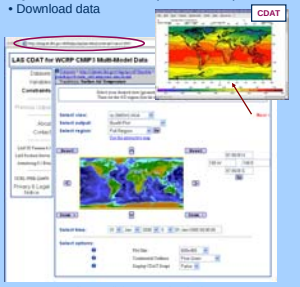
### Future ESG-CET architecture




**AR5 –** IPCC Fifth Assessment Report (~year 2012)

### Current Scenario

- Browse PCMDI's centralized database
- Select data
- Perform time aggregation
- Quick Look server –side (**LAS – CDAT**)
- Download data




http://esgcet.llnl.gov:8090/ipcclas/

### Future Scenario

- Search, browse and discover distributed data
- Remote site:
  - ➢ Request data
  - ➢ Regrid
  - ➢ Diagnostics
- ESG return results



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