
Facilitating Distributed Climate Modeling Research and Analysis via the Climate Data eXchange

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Climate change research requires the ability to rapidly find, access, manipulate, and combine massive, heterogeneous, physically distributed model output and satellite remote sensing data sets. Current data and analysis systems are inadequate: they are isolated from one another, and deliver only static products in their native, disparate forms. Such systems do not permit interactive combination, exploration and analysis of the data and model outputs. To address these needs, we are constructing the Climate Data eXchange (CDX) system at NASA's Jet Propulsion Laboratory, leveraging our past experience building large-scale data systems for planetary science (NASA's Planetary Data System) and for biomedicine (the NIH Early Detection Research Network).

CDX is a science data analysis environment that employs grid computing technology to share and analyze climate data by a) connecting isolated sub-networks, across NASA and externally to, e.g., the DOE; and by b) pushing as much computation as possible to nodes where data reside, minimizing movement of data. We envision an organic network of networks around the country, all using open source CDX technology to interconnect.

We discuss our plans to erect core infrastructure to support CDX, including establishing a two-way connection between JPL's CDX services and PCMDI, making critical observational data sets (e.g., AIRS Level 2 data products) and PCMDI model outputs seamlessly available to NASA and the DOE.
