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Federated Climate Research Software: improving data and workflow management for climate researchers

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Climate researchers have access to astronomical amounts of data; but finding that data and downloading it so that it can be useful for research can be burdensome and expensive.

The team at Data Analytics for Canadian Climate Services (DACCS) is solving that problem by creating a new system for conducting climate research and providing the software to support it. The system works by providing researchers the tools to analyze the data where it's hosted, eliminating the need to download the data at all.

In order to accomplish this, the DACCS team has developed a software stack that includes the following services:

- data hosting
- data serving (using OPeNDAP protocols)
- data search and cataloging
- interactive computational environments preloaded with climate analysis tools
- remote analysis tools (WPS and OGCAPI features)

Partner organizations can deploy this software stack and choose to host any data that they wish. This data then becomes available to every other participating organization, allowing them seamless access each others data without having to move it for analysis.

This system will allow researchers to more easily:

- discover available data hosted all over the world
- develop analysis workflows that can be run anywhere
- share their work with collaborators without having to directly share data

The DACCS team is currently participating in the Open Science Persistent Demonstrator (OSPD) initiative and we hope that this software will contribute to the ecosystem of earth science software platforms available today.