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Data spaces for climate data analysis

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Climate change, both natural and anthropogenic, is a pressing issue of today, for which data-based models and decision support techniques offer a more comprehensive understanding of its complexity. The understanding of climate change is critical for supporting the needs of an ever broadening spectrum of society's decision-makers, as they strive to deal with the influences of Earth's climate at global to local scale. To this purpose, climate data analysis is facing new challenges as the growth in the size of the datasets increases and a growing gap between technological sophistication of industry solutions and scientific software arises. Contributions to the increase in climate data volume include the systematic increase in model spatial and temporal resolution; number of components on model output; number of simulations to sample uncertainties; developments in the field of data-driven climate models that enable the creation of rapid and inexpensive, large-ensemble forecasts with thousands of ensemble-members and new sources of observational data. In order to provide new approaches to data analysis that accommodate this data volume, research is moving towards a notion of data space integrated systems, targeted for decision support, and to the deployment of Climate Analytics-as-a-Service (CAaaS) based on cloud native data repositories. The purpose of this work is to describe the current state of the art of climate data analysis, the challenges that the community is facing, and provide a vision on data analysis solutions based on data spaces, in an attempt to find synergies between diverse disciplines and research ideas that must be explored to gain a comprehensive overview of the challenge.

Any relevant links

Topic

Data Spaces

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