



Architectures and technologies enabling the diffusion and use of atmospheric science information.

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Earth Science data, models and other information resources are now primarily distributed through the Internet which allows almost instantaneous ‘horizontal’ diffusion of information. Recent developments of the Web, in particular, “uploading” results in a considerable expansion of the World Wide Web because more and more participants can be both user and provider. Another new development is software mash-ups where network nodes can be software agents or services of which combination can create new structures and behavior. Thus, the architecture of the Web can be viewed as a system of systems of autonomous components whose interaction creates the emergent behavior.

In this presentation, we will review these evolving concepts and present atmospheric science applications and use cases that are built and emerged from this Service Oriented Architecture. In particular, we will illustrate DataFed, an infrastructure for real-time integration and web-based delivery of distributed air quality monitoring data. Building on the emerging pattern of the Internet itself, DataFed assumes that datasets and new data processing services will continue to emerge spontaneously and be maintained autonomously on the Internet. The key roles of the federation infrastructure are to (1) facilitate registration of the distributed data in a user-accessible catalog; (2) ensure data interoperability based on physical dimensions of space and time; (3) provide a set of basic tools for data exploration and analysis.