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Perspective

The goal of this workshop appears to be to develop an architecture for atmospheric information exchange. Such an architecture needs to have multiple frameworks, and it should include a data system. The objective of the data system would be to provide data where and when it is needed. The data system must extend across all sectors while maintaining the integrity of individual organizations and meeting diverse user requirements. The objective should be to make sharing of data as painless as possible, so the system would be perceived as a win-win arrangement.

There are at least three frameworks to consider when developing an architecture for atmospheric information exchange. These frameworks are policy, legal, and societal. The following personal experiences help illustrate these frameworks:

- **Policy Framework:** When Mr. Pyke started at NESDIS he agreed to chair a group that ultimately developed a policy for global climate change research. One result of that policy was a methodology for sharing data for this research. That data had multiple purposes—it could be used in both commercial and research applications. This multiple use aspect garnered support from a variety of users and contributed to the successful implementation of the policy.

- **Legal Framework:** Within the legal framework, one model for data exchange is for agencies to provide data on a reimbursable basis. Other models such as time delays (for sensitive data) and legal agreements can help make as much of the information as possible available to the largest number of users.

- **Societal Framework:** Programs such as GLOBE (Global Learning and Observations to Benefit the Environment) make new and highly distributed sources of data available to the research and operations communities. In many of these programs volunteer students are observing and submitting observations on the Internet. For example, schools that are participating in the WeatherNet program are providing data automatically to GLOBE on the Internet. The data are used by media weathercasters and by researchers. In this way the data is used by the private and academic sectors.

As you would expect, there are some technical issues. The providers of environmental information are dealing with a lot of data. For example, NOAA currently disseminates environmental data at a rate of 100 Mbps 24X7X365. Of the 100 Mbps, approximately 70 Mbps of that are atmospheric data. Of the 70 Mbps, 50 Mbps of that represent model output data. In addition to moving that data around, there is also a need to make large amounts of data available at high transfer rates from the archives. Further, in addition to the fast data path implied by these needs, high capacity for connectivity is required, and that connectivity must be distributed to support a diverse user base. Components of the technical architecture need to be off-the-shelf as much as possible. IP technology is the way to go. In terms of formats of data, it is time to forget about GRIB and BUFR. Definitions of the data should be included in the meta-data, and a way to do that is with XML and intelligent agents. These technological tools can be combined with user-based standards to revolutionize atmospheric information exchange.