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The Charge from BASC

In 1998 the National Research Council (NRC) issued a report entitled "The Atmospheric Sciences Entering the Twenty-First Century". In that report the Board on Atmospheric Sciences and Climate (BASC) recommended that "OFCM should lead a thorough examination of the issues that arise as the national system for providing atmospheric information becomes more distributed...and....develop a strategic plan." Data (observations) form the basis for numerical weather prediction and are inseparably linked with analysis, and models. All these components must be improved together as a system rather than as individual components. A collection of optimized components does not necessarily make an optimized system.

The vision for the 21st Century articulated in the BASC report emphasized that improvement in atmospheric observations and scientific understanding will combine with advances in technology to enhance atmospheric analysis and prediction. Meanwhile, advances in information technology will foster broader and more effective use of atmospheric services. Ultimately, society will enjoy greater confidence in atmospheric information and will manage weather and climate risk more decisively and with greater sophistication.

The process of acquiring atmospheric information carries two imperatives. First, global observation and modeling capabilities must be integrated. This will require a specific plan, the development of which must involve examining proposed configurations with rigorous observing system simulation experiments (OSSEs). Issues to consider in the process include the following:

- Integration with modeling efforts.
- Increases in computer power.
- Assimilation of new forms of data.
- Multiple uses of data bases.
- International collaboration.

The second imperative is the need to commit to a strategy, priorities, and a program to address the issue directly.

The atmospheric sciences community must broaden its involvement and capabilities. This will involve the investigation and understanding of atmospheric interactions with other components of the Earth system and enhancing the understanding of interactions between atmospheric phenomena at different scales. In addition, forecasting must begin to expand into experimental areas like atmospheric chemistry, climate, and space weather.

The development of a strategic viewpoint to maximize the benefits of an increasingly distributed national and global structure for providing atmospheric information requires acknowledging the changing role of the meteorologist. The meteorologist has become more involved in designing risk assessment and decision-making processes. The economy of the United States is increasingly dependent on atmospheric information. Roughly one third of the Nation's GDP is based on weather sensitive industries, and this dependence is the basis for the emerging interest in weather risk strategies. The meteorologist will help design these new strategies, which will require new approaches to acquiring and providing data and information. This also reinforces the need for higher skill in longer-range forecasts (e.g., out to 10 days).

When considering strategies for providing information, it will be important to bear in mind the laws of information:

- Information is not conserved – it multiplies.
- We can all use the same information without wearing it out.
- Some of us convert information into more valuable forms; some do not.
- A lot of information is wrong, some of it thanks to computer routines.
- Information flows both downhill and uphill.
- Information frustrates almost all attempts at confinement, and yet it fills all available hard discs.
- Trying to stop the flow of information is like trying to stop the tide.

To achieve the vision of significantly improved atmospheric information and services we must do the following:

- Integrate and optimize observations and modeling,
- Work together in an increasingly distributed atmospheric information system,
- Acquire the resources for scientific advance, and then
- Drive to results and improved service.