3.1 The Federal Committee for Integrated Observing Systems (CIOS): Its Purpose and Objectives

Stephen M. Holt[1*], R. N. Dombrowsky[2], S. J. Row[3], P. A. Pisano[3], F. L. Estis[4], B. K. Tsugawa[4]

[1] Mitretek Systems, Falls Church, Virginia
[2] National Weather Service, Silver Spring, Maryland
[3] Federal Highway Administration, Washington, DC
[4] Office of the Federal Coordinator, Silver Spring, Maryland

1. INTRODUCTION

At any given time, thousands of observations and measurements are being taken by a large number of atmospheric and environmental observing systems. These systems monitor the earth's atmosphere; marine, ocean, and coastal areas; inland lakes, rivers and waterways; power and utility systems; highways; railroads; as well as other land areas such as forests and agricultural fields. In so doing, they obtain a wide variety of atmospheric and environmental information. These observing systems gather, store, and disseminate this information to a large number of stakeholders and users to support their operations and activities. Over the years, these meteorological and environmental observing functions have shifted from manual, human operations to automated systems. In addition, ownership of these systems has shifted from largely federal agencies, such as the Departments of Agriculture, Commerce, Defense, Interior, and Transportation, to include state and local governments, academic institutions, and the private sector.

The technology applied in these observing systems has improved from simple sensor suites to systems capable of taking full observations through the use of sophisticated software algorithms. In addition to newer platforms, these observing systems are deployed over larger areas. Many systems are interconnected via high-speed networks where all the data are collected at a centralized location. Today, there are a variety of observing systems and networks such as atmospheric observing systems (e.g., Doppler radar, lightning detection, profilers, radiosondes, and aircraft reports), land-based observing systems (e.g., surface observing systems, observational mesonets, hydrologic observing systems, and cooperative observer networks), space-based platforms (geostationary and polar-orbiting, environmental satellites), and coastal marine and ocean observing systems (e.g., data buoys, and drifting and moored arrays), and ship observations.

Corresponding Author Address: Stephen M. Holt, Mitretek Systems, Inc., 3150 Fairview Park Drive South, Falls Church, Virginia 22042, E-Mail: sholt@mitretek.org.

There is a need to optimize the use of all this data, especially since most of these investments are funded with public dollars. But doing so requires significant coordination across many agencies and organizations.

2. CIOS PURPOSE AND OBJECTIVES

The Department of Commerce formed the Office of the Federal Coordinator for Meteorological Services and Supporting Research, more briefly known as the Office of the Federal Coordinator for Meteorology (OFCM), in 1964 in response to Public Law 87-843. The OFCM is an interdepartmental office established to facilitate the full coordination of federal meteorological activities through committees, councils, working groups, etc. Under the auspices of the Interdepartmental Committee for Meteorological Services and Supporting Research (ICMSSR), a standing Committee for Integrated Observing Systems (CIOS) has been established to coordinate present and future activities for providing atmospheric and environmental observations across these diverse groups. The Federal Coordinator for Meteorological Services and Supporting Research has charged the CIOS to focus on observations that will meet end users' needs and requirements for atmospheric and environmental information. Additionally, CIOS may recommend changes to the nation's observation system to more efficiently utilize observational resources in meeting valid user requirements, and address policy matters and issues as they relate to observing systems. CIOS membership currently consists of representatives from the Departments of Agriculture, Commerce, Defense, Energy, Interior, and Transportation and the agencies of the Federal Emergency Management Agency (FEMA), National Aeronautics and Space Administration (NASA), and the Nuclear Regulatory Commission (NRC). CIOS meets several times each year and the current co-chairs are Mr. Rainer Dombrowsky, DOC/NOAA/NWS and Ms. Shelley Row, DOT/FHWA.

The long-range objective of CIOS is to coordinate the

development of a framework or architecture along with key standards for weather and environmental related data. However, in the near term, CIOS is focused on better understanding the current observation capabilities and requirements of the various communities who use weather and environmental related data.

To achieve these near-term objectives, CIOS intends to:

(1) gather information from involved agencies on systems that currently exist;

(2) document a high-level statement of information needs for the government and other users; and

(3) identify opportunities to leverage existing and future system implementation.

More specifically, CIOS will perform a wide range of tasks to include the following:

(1) solicit user needs for weather and environmental data which may ultimately lead to requirements;

(2) facilitate interagency coordination and collaboration in defining a system architecture for integrated observing across the nation;

(3) address integration of observing systems in support of homeland security efforts;

(4) facilitate resolution of issues and problems in the meteorological community, such as dataset incompatibilities, observing and recording standards, communications formats and protocols, data quality, and sensor location/siting; and

(5) build a link between the public and private sectors regarding integrated observing systems.

3. NEXT STEP TO ACHIEVE NEAR-TERM OBJECTIVES

One of the first CIOS tasks will be to (a) establish a baseline of the weather observation data presently available, and (b) compare it to the observation data needs of the participating agencies. CIOS is focusing this work in the following disciplines: climate, natural hazards, urban meteorology/air quality, technological hazards, surface transportation, agriculture and energy.

In the case of surface transportation and, specifically, the Federal Highway Administration (FHWA), this effort has already begun. Once the FHWA completes its analysis, CIOS will combine the results with similar analyses from other agencies who are addressing issues related to, e.g., homeland security (Defense), frost formation and soil temperature (Agriculture), heating/cooling days (Energy), and air quality (EPA). In addition to identifying the gaps in data needs, CIOS will concurrently examine and address future systems and associated architectures, dataset structures, communication formats and protocols, data quality, siting, and metadata.

Other aspects of the analysis will include an examination of the deployment of new hardware and software and merging of these enhancements into existing systems and deployment schemes which optimize system siting.

4. SUMMARY

Through the OFCM Federal coordinating infrastructure, the CIOS is poised to make substantial contributions to issues related to integrated observing systems for the Nation. Its approach is to assist and advise those organizations that maintain these systems or those agencies and individuals who have a need to access these weather and environmental datasets.

Additional information on CIOS, its mission and structure, may be found on the OFCM website at http://www.ofcm.gov. Additional information can also be obtained from Mr. Rainer Dombrowsky at Rainer.Dombrowsky@noaa.gov, or Ms. Shelley Row at Shelley.Row@fhwa.dot.gov .