

WORLD METEOROLOGICAL ORGANIZATION

CIMO/OPAG-UPPER-AIR/
ET-RSUAT&T-1/Doc.6.1(3)

**COMMISSION FOR INSTRUMENT AND
METHODS OF OBSERVATION**
OPAG-UPPER AIR

(17.II.2005)

**EXPERT TEAM ON REMOTE SENSING UPPER-AIR
TECHNOLOGY AND TECHNIQUES**
First Session

ITEM: 6.1

Geneva, Switzerland, 14-17 March 2005

Original: ENGLISH ONLY

**INTEGRATED PROFILING SYSTEMS AND OTHER UPPER-AIR MEASUREMENT
TECHNIQUES**

Projects for Integration of Ground-Based Observing Systems

(Submitted by R. Dombrowsky, NOAA, NWS, USA)

Summary and purpose of document

This document provides information on the National Oceanic and Atmospheric Administration (NOAA) Forecast Systems Laboratory (FSL) vision "Observations when and where needed" and their effort to integrate multi-purpose observing systems and networks within extensible enterprise architectures to meet cross-functional observational requirements cost-effectively.

Action proposed

The meeting is invited to take information provided in the document in discussing projects for integration of different ground-based observing systems.

Projects for Integration of Ground-Based Observing Systems

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6. Integrated Upper-Air Observing System

The National Oceanic and Atmospheric Administration (NOAA) Forecast Systems Laboratory (FSL) declared a vision "Observations when and where needed." The goal of this vision is to achieve break-through performance in information content both effectively and efficiently. Resolving global, regional, and local scale phenomena is vital to improving prediction of high impact weather events, changes in weather patterns, and climate change.

As NOAA moves toward an integrated observing system it must identify and integrate multi-purpose observing systems and networks within extensible enterprise architectures to meet cross-functional observational requirements cost-effectively. To accomplish this goal NOAA must exploit its IT and communications backbone, platforms and research-to-operational capacities, and education and training capabilities. This system of systems (IOS) will have three elements; the Integrated Upper-Air Observing System (IOUS), the Integrated Surface Observing System (ISOS), and the Integrated Ocean Observation System (IOOS).

- IUOS – Climate, Aviation, and NWP Focus
 - GOES, POES
 - WSR-88D, TDWR, NPN
 - GPS radio occultation
 - Radiosonde, ACARS
 - Commercial Radar

- ISOS – Climate, Public, and Surface Transportation Focus
 - ASOS, COOP, CRN, RAWS
 - Federal, state, local, private, and commercial Mesonets

- IOOS – Climate and Marine Transportation Focus
 - Buoys, CMAN, SHIP, TAO, and DART
 - PORTS, NWLON, and NERRS
 - Research Buoys

6.1 IUOS Mission: The mission of IUOS is to support NOAA’s ocean and surface integrated observing systems, IUOS will optimize NOAA’s observing capabilities. Such integration will improve time and space resolution as well as accuracy. Integration would also lead to opportunities for optimization through the leveraging of non-NOAA observation and monitoring systems, lead to the development of adaptive observation strategies, and ultimately lead to the creation of a seamless system of systems.

The end state goal of IUOS is to improve short term warnings and forecasts by observing precursor conditions related to high-impact weather events, detect changes in regional and hemispheric conditions impacting transportation, and provide climate quality information for monitoring climate change.

Key Performance Objectives:

- Temporal – 1 sounding every three hours (goal: 15 minutes)
- Parameters – Winds, temperatures, humidity, precipitation, cloud properties, air quality, and turbulence.
- Horizontal Resolution – 160 km or less
- Vertical Resolution – 300 meters or less
- Vertical Domain – Surface to 6 km, needed to resolve mid-latitude and tropical leaf transition (16 km).