Architecture Overview

NOAA is focused on building "an integrated global environmental observation and data management system"—an Earth observation system that is comprehensive and sustained. We believe we are in a new era where human ingenuity must be more rigorously applied to develop a deeper understanding of the complex systems of Planet Earth.

Three imperatives frame our concept for this Earth observation system: ***social, economic, and scientific.***

The ***social imperative*** recognizes population growth and redistribution trends that will impact crucial Earth resources like air, water, and food. Sustainable development captures the range of ***economic imperative*** issues that arise from these demographic population changes and the impact on economic well being of Earth's stewards. The ***scientific imperative*** is critical in helping us understand and manage these precious resources of Planet Earth.

Today, NOAA operates a complex network of observing systems. These systems include satellites, ships, and aircraft, and an extensive network of buoys, balloons, radar towers, and human observers. Yet today, that complex network is insufficient to meet all dimensions of these social, economic, and scientific imperatives. The increased complexities of tomorrow will require all of us to do more.

NOAA has begun to address the challenge of determining the configuration of tomorrow's more complex network of observing systems and the associated information processes necessary to translate those environmental observations into actionable information. NOAA's architecture development uses a structured architecture process with four main components:

- ***Our existing structure as foundational***—documented in NOAA's Baseline Observing System Architecture.
- ***The Builder***—the NOAA observing systems architect leads the architecture development process.
- ***The Toolset***—the set of software collaboration and visualization tools used by the NOAA architect, the architecture development team, and NOAA personnel to build the architecture.
- ***The Plan***—the structured process that transitions user requirements into concepts for future systems. The plan will also include a reassessment of current systems against future requirements and may result in decommissioning some systems and developing new systems.

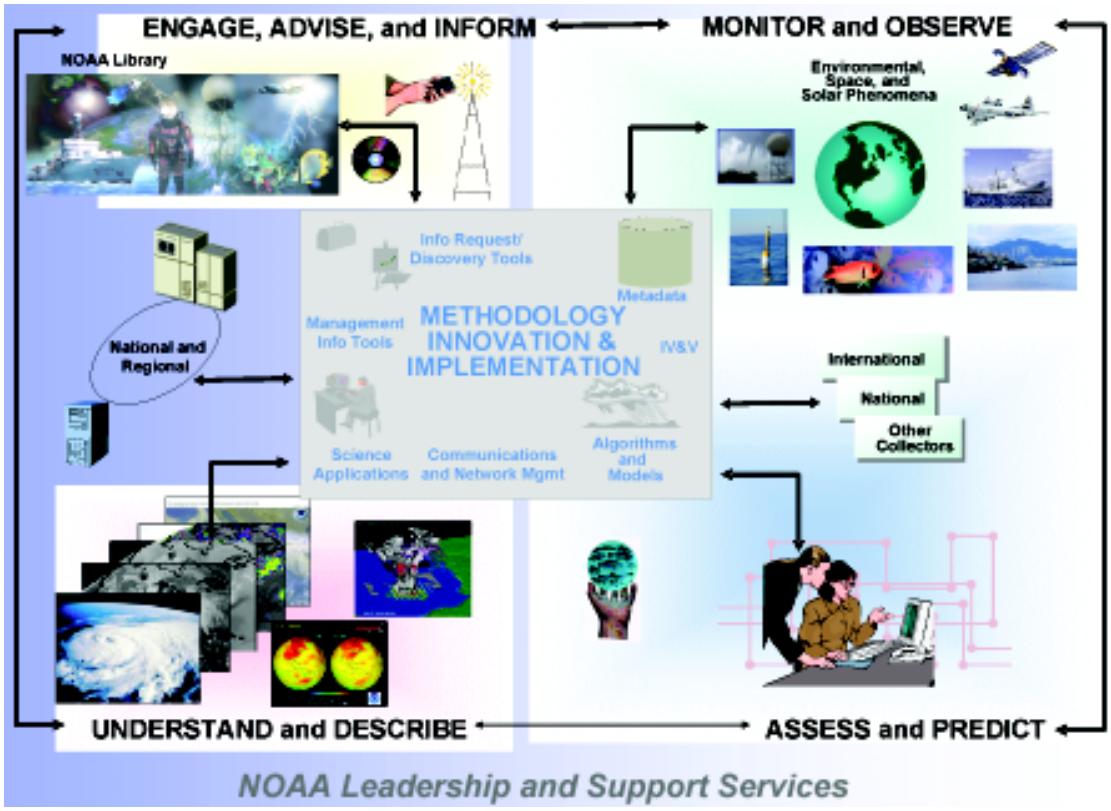
Since the summer of 2002, NOAA has aggressively pursued building the enterprise

architecture. The NOAA Information Service Enterprise (ISE) is that future NOAA enterprise architecture supporting the NOAA missions (Ecosystems, Climate, Weather and Water, Commerce and Transportation). The NOAA Information Service Enterprise recognizes the “lifeblood” of NOAA is the environmental information provided by the enterprise to the users.

The NOAA Information Service Enterprise is an end-to-end system that recognizes the value of environmental observations and addresses all of the essential functionality necessary to satisfy the future needs of users.

As our users’ future operations will change over time, NOAA’s internal concepts of operation (CONOPS) must also change to support our users and their new ways of conducting business. The CONOPS for the ISE captures those internal changes for our future.

Figure XX. NOAA Information Services Enterprise.



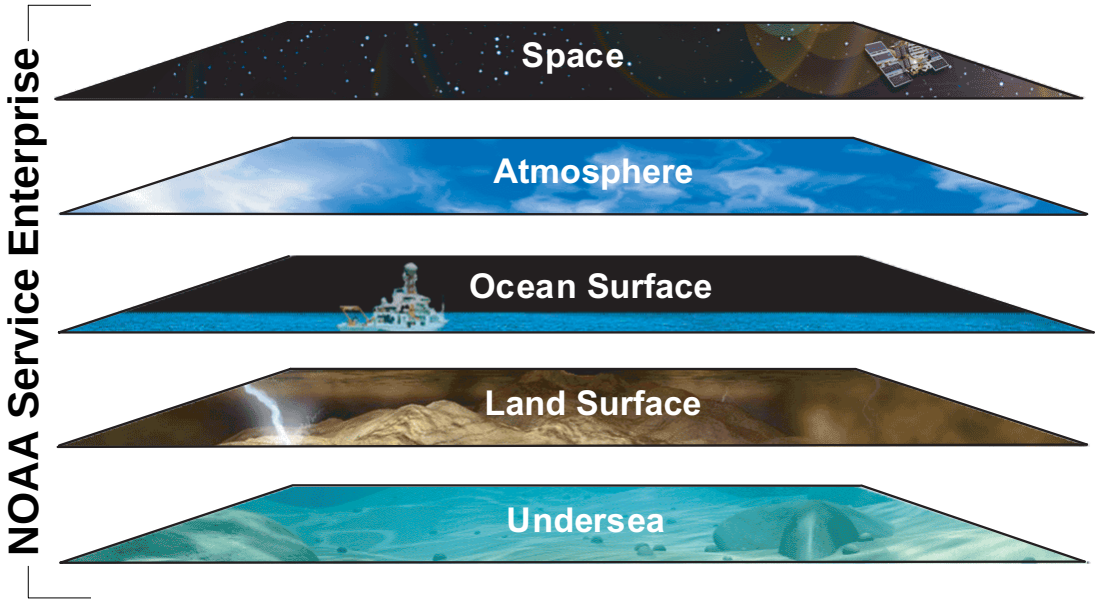


Figure XX. The NOAA Service Enterprise data model allows data collection and organization from all observational domains.

The environmental observations cover all domains that affect Planet Earth. Figure XX presents a construct for an observations data model within the NOAA Information Service Enterprise and would include observations collected from space, atmosphere, oceans, land, and for undersea. To maximize our efficient use of the data in our enterprise, we must organize the data. A data model is a method to assist us in that organization.

Milestones (and progress) in the development of the NOAA enterprise architecture include:

- Concepts of Operation (Draft)
- Requirements process, including our new responsibility to collect requirements of the other Federal agencies and NOAA external partners (Refined)
- Baseline Observing System Architecture (Established)
- Integrated Planning Process for the Target (Future) Observing Systems Architecture (Established)
- NOAA Observing Systems Council (Established)
- NOAA Observing System Architect Office (Established, along with the architecture development team and toolsets)

Figure XX illustrates the interrelationships between Earth observations and decisions benefitting society. The Integrated Systems Architecture is a broader view of the important role of the environmental observations within a more complex and complete systems architecture construct. Our environmental observations have no intrinsic value but accrue value through their use in scientific models and decision support tools—and result in value to society through policy and management decisions.

Figure XX. Integrated Systems Architecture.