

## Purpose:

- NOAA is a data-driven agency. Increasingly, its data sets and model outputs must be melded into validated, coherent, and easily usable supersets to address NOAA's own, and the community's complex environmental problems of interest.
- The purpose of this whitepaper is to communicate DAARWG's perspective and recommendations on the urgent need to establish a NOAA-wide Environmental Data Management Framework (EDMF) that will efficiently satisfy the ever increasing and critical demand for NOAA's diverse environmental data sets and model outputs. By EDMF, DAARWG means the organization and governance structure (i.e., roles and responsibilities, policies, procedures), data management principles and practices, technical standards, etc. needed to manage the *life-cycle* of environmental data across the NOAA enterprise.
- DAARWG's recommendations are based largely on information provided by NOAA staff over the past 18+ months through presentations and discussions at DAARWG meetings and at the annual NOAA Environmental Data Management Committee (EDMC) Workshops.

## Introduction:

DAARWG has gained knowledge and insights into on-going initiatives and the challenges faced at NOAA relating to environmental data management. While DAARWG's past assessments and recommendations have centered on the access and archive elements of data management, DAARWG increasingly believes that those two elements cannot be addressed in isolation. Any comprehensive and sustainable solution for those two elements can and should be developed only as an integral part of an overall EDMF.

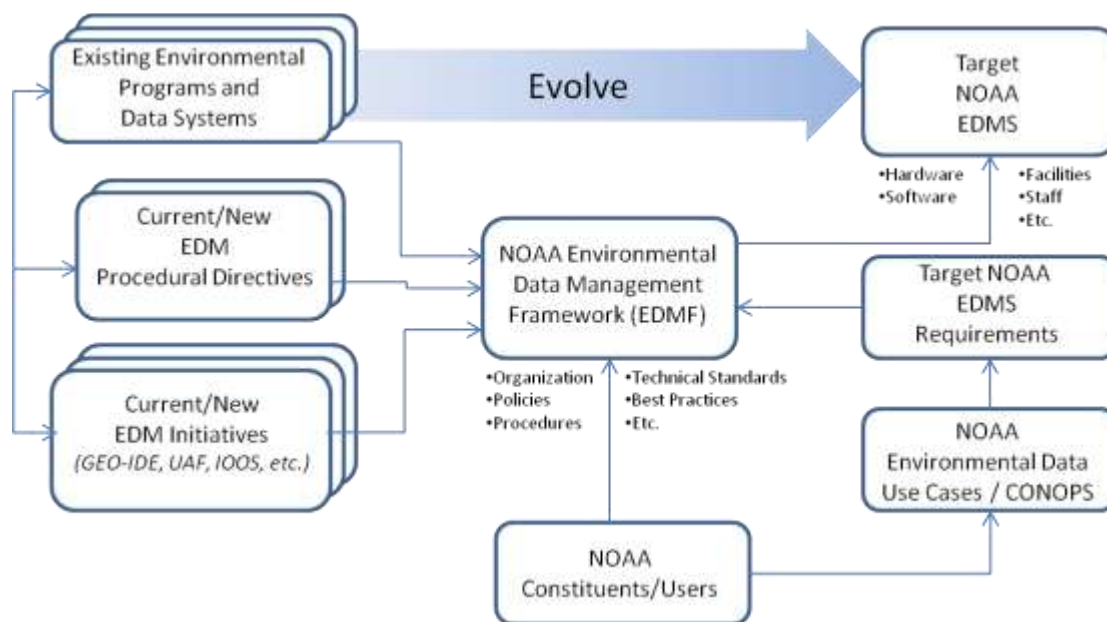
DAARWG applauds the various initiatives NOAA has undertaken to date —such as the Global Earth Observation—Integrated Data Environment (GEO-IDE), Integrated Ocean Observing System (IOOS), and Unified Access Framework (UAF)—toward implementing a robust environmental data management solution that supports NOAA's critical mission of collecting and providing accurate environmental data, products, and services to the nation as well as to the community of users world-wide.

While such initiatives definitely move the ball forward and meet NOAA's tactical needs, DAARWG believes that at this juncture of explosive growth in environmental data usage for various national and societal imperatives, it will be extremely beneficial if NOAA launched a parallel effort to establish a EDMF into which these initiatives and any new ones can fit seamlessly to create an effective end-to-end environmental data collection/discovery/dissemination/preservation system. DAARWG further believes that -

- a) Without such a EDMF in place, the shortcomings of the current array of 'stove piped' data systems (hard to find, hard to use, slow response during crises, etc.) will only perpetuate - making it exponentially more challenging and more expensive to solve, with every passing year generating increasing volume of environmental data.
- b) Such an EDMF would actually enable improved efficiency of NOAA's internal resource utilization, and accelerate the achievement of a NOAA-wide solution for environmental data management notwithstanding anticipated budget constraints in the coming years.

## Recommendation:

DAARWG recommends that NOAA develop its EDMF upon the framework presented by Jeff de La Beaujardière at the November 15-17, 2011 DAARWG meeting in Seattle, WA and submitted by NOAA as input to the data management chapter of the draft National Earth Observations (NEO) strategy. Such an EDMF should be central and guide the implementation of the NOAA-wide environmental data management system (EDMS). The target EDMS will not be a single system of hardware and software in one facility rather a system-of-systems built around a federated architecture. Figure 1 below illustrates DAARWG’s view of the EDMF and its relationship to current initiatives, procedural directives, and to the target NOAA EDMS.



**Figure 1: NOAA Environmental Data Management Framework and Relationships**

### Key points to be noted from the illustration:

- 1) The EDMF is largely a knitting together of elements from existing NOAA systems, EDM initiatives, and procedural directives into an umbrella framework for adoption NOAA-wide.
- 2) The target EDMS should be based entirely on the EDMF.
- 3) The target EDMS should provide an evolution path for all existing programs and systems in order to continue serving their user communities.
- 4) EDMS requirements—both NOAA internal and external—should be ‘filtered’ and validated through the EDMF.
- 5) Any new initiatives and procedural directives developed should be consistent with the EDMF so that they can migrate easily into the target EDMS.
- 6) NOAA constituents and users should have a significant role in shaping both the target EDMS requirements and the EDMF.
- 7) NOAA should use an agile approach in implementing the target EDMS using techniques and designs that have been demonstrated to work successfully.

Past DAARWG data access and archiving recommendations can be accommodated in the above NOAA EDMF.

**Concluding Remarks:**

Current NOAA data management initiatives are laudable and significant forward steps. DAARWG recommends that NOAA adopt and use an Environmental Data Management Framework (EDMF) as outlined in this paper that will serve to guide its current and future environmental data management initiatives into an enterprise-wide environmental data management system meeting NOAA’s critical mission requirements, as well as those of its constituents and users, over the long term.