

DMAC Priority Component Definitions. These were requested by the Regional DMAC Implementation Team to provide greater definition to the components discussed on the last conference call. These are not the only components of DMAC, but rather those to be addressed first. This list is not necessarily in priority order. These definitions are based on the input found in these documents:

- S. Hankin et al., 2005, *Data Management and Communications Plan for Research and Operational Integrated Ocean Observing Systems*, Ocean.US Publication No. 6 (the “DMAC Plan”).
- J. de La Beaujardière (2009), “IOOS Data Management Activities”, *Proc. MTS/IEEE Oceans '09*.
- J. de La Beaujardière et al. (2009), “Ocean and Coastal Data Management”, *Proc. Ocean Obs '09*.

1. Standardized Access Services: Services that enable requesting IOOS data using standard formats and protocols based on widely-accepted industry standards to simplify integration of data from multiple sources. Each IOOS data provider is expected to establish standardized access services or arrange for an intermediary to do so on their behalf. The *DMAC Plan* classifies these services as “Data Transport.” Examples include the Data Access Protocol (DAP) and OGC Sensor Observation Service (SOS).
2. Registry of Services: An official list of all IOOS data access services and other types of services. The Registry may also serve as the repository for controlling documents such as schemas, controlled vocabularies, data dictionaries, process control documentation, etc.
3. Mapping & Visualization Services: Services that produce graphical representations of data, such as geographic maps or time-series graphs, which can be displayed in simple viewers (e.g., web browsers, paper) that cannot directly ingest numeric data. An example is the OGC Web Map Service.
4. IT Security Plan and Validation: The procedures and approvals necessary to ensure, at minimum, the protection of individual servers in the system and, more generally, to guard against data loss, corruption, or unwanted dissemination.
5. Metadata Profiles: Metadata provides information about the data, instrumentation, data collection methods (field and laboratory), data processing and quality control methods, and data access services. Metadata must be collected at various points in the data life cycle by the appropriate personnel and then remain accessible and associated with the data. A Metadata Profile is defined as documentation establishing the list of metadata fields that IOOS considers mandatory or optional in various contexts. Typically this list will comprise more than the small set of fields defined as mandatory by metadata formats such as ISO 19115/19139 and OGC SensorML, but less than the complete set of fields defined by such formats.
6. Catalog for Data Discovery: A service that enables users to search for data of interest, either manually or through an automated request. Discovery will involve searches of metadata rather than actual “data mining,” at least initially.
7. System Monitoring Client: A service that enables monitoring of the DMAC services to ensure the data is accessible.

NOTE (JeffDLB): I propose we replace this somewhat narrow component by the following:

IOOS Portal: A web site that provides a human user interface to view IOOS data holdings

and drill down to data of interest. The Portal is essentially a web front-end to the Registry and Catalog components, and may make use of the Mapping and Visualization Services, and enables the user to invoke the Data Access Services without prior knowledge or specialized client software. The Portal provides the “Uniform On-line Browse” functionality described in the *DMAC Plan*.

8. Format Conversion: This type of transformation service serves as an intermediary between the data provider and data customer, and is used when data exists in one format but is requested by a customer in another format.
9. Data Subscription and Alert Services: *Subscription* services push data to registered users of the data. The data push is an automated process to move the data between data centers and from data center to data user on a routine basis. The intent of a subscription is to send all data of interest to particular user. *Alert* services, on the other hand, only push data to registered users when a predefined data threshold or condition has been met. Examples of subscription services include WMO GTS and Unidata IDD/LDM.
10. Data archiving and retrieval: Services that preserve data indefinitely and reliably in a manner that allows for retrieval in the future. All observations and model outputs supported by IOOS funding should be reliably archived. In addition, archival data should be accessible using the same standard data access protocols as real-time data to allow for seamless data retrieval across both recent and historic time periods.
11. Data Integration Services: Services that combine data from multiple data providers--and especially from distinct disciplines such as physical oceanography, marine biology and water quality monitoring--into a single presentation to meet specific request criteria. Integration may be purely visual (overlays, mashups) initially (and possibly provided by the Portal described above), but could also involve aggregation of numeric data values into a single package, or eventually sophisticated interpolation and assimilation schemes.
12. Quality Control/Quality Assurance: Documented procedures to ensure data are as consistent, accurate and reliable as possible, and to ensure the availability of metadata regarding the results of any QA/QC procedures that were applied.