DRAFT **REQUIREMENTS FOR IOOS DMAC REGISTRY/CATALOG/VIEWER** **DRAFT**

This spreadsheet documents requirements for the registry, catalog, and viewer (RCV) components for DMAC. The IOOS Program office intends to establish basic capability in this area during FY2010, with enhancements in future years. The Requirements tab contains a candidate list of functional requirements. **Your input is requested** concerning either the existing list or additional requirements we may have missed. Some requirements will be deferred until after version 1 because of resource constraints.

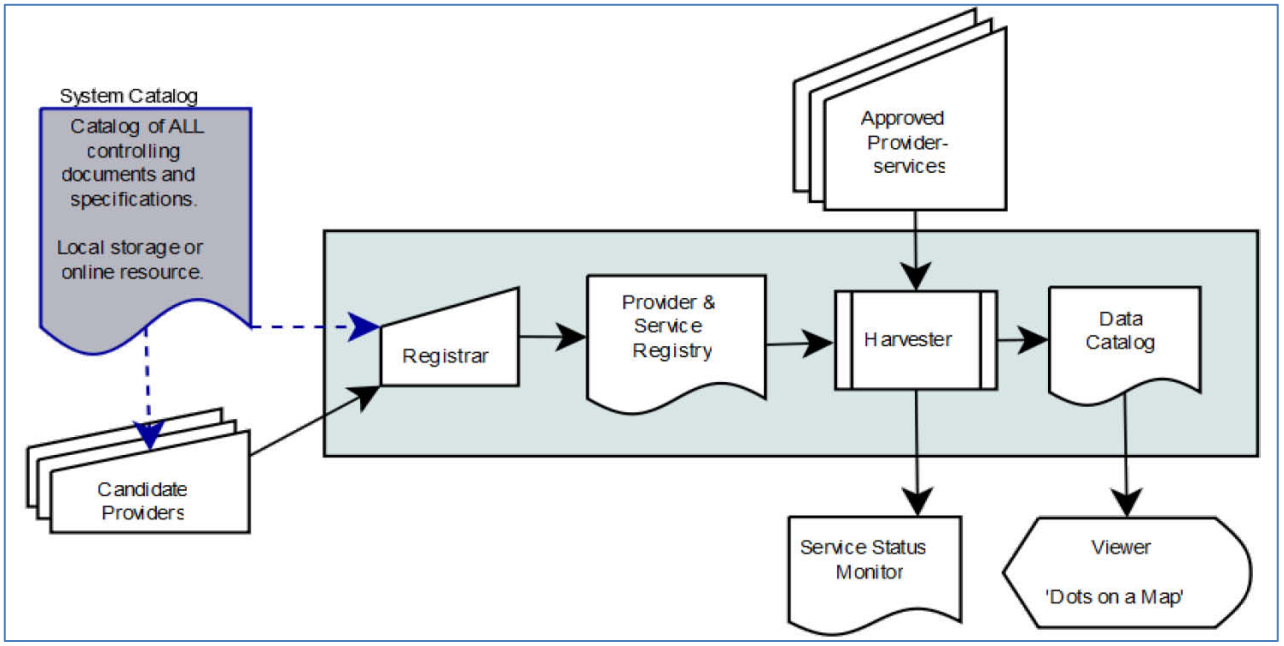
Points of contact:

Jeff.deLaBeaujardiere@noaa.gov, John.Ulmer@noaa.gov, Hassan.Moustahfid@noaa.gov

Sources of candidate requirements:

DMAC Plan for research and Operational Integrated Ocean Observing System (March 2005)
DIF Functional Requirements document (2007)
principles of SOA design
IOOS Program Office

Notional wiring diagram:



Working definitions:

Registrar	The role, initially assisted by a human in the loop, that controls and coordinates population and functioning of the Registry.
Provider & Service Registry	This service provides the master list of all U.S. IOOS data providers as well as the master list of DMAC-offered services. The registry is the official record of what is included in IOOS. The registry may be accessed by data customers directly, but data customers will more likely use catalogs derived from the registry to discover sources for their needs. The Registry also may include controlled vocabularies.

Data Catalog	This service provides the means for users to search for specific data sets and to browse the data holdings of U.S. IOOS data providers. Data discovery may be accomplished by manual or automated means. U.S. IOOS will provide catalogs that allow a data customer to search for data in a variety of ways. For example, a data customer can search for water temperature and can narrow that search by location of the sensor, time and date of the observation, level of quality control, and metadata offered. Catalog searches allow customers to identify a source for the data they need.
Viewer	This component provides a web-based user interface to the Data Catalog and the Service Registry. It allows humans to issue searches for data using map-based or form-based query interface, it displays results of searches in either map or tabular form, and it provides links to the actual data and metadata corresponding to the search results.
System Monitor	This component enables monitoring of the status of DMAC services. Monitoring allows U.S. IOOS to identify problems and take action to resolve issues. Monitoring *may* also include gathering of usage statistics if data searches and request are made via an IOOS Catalog or Viewer. However, because data requests may go directly to the data providers, this monitoring service will not provide a complete view of system usage.
Harvester	This component supports the catalog by periodically harvesting service metadata and data metadata from each service instance in the Registry.

Approximate schedule for Registry/Catalog/Viewer version 1.0 effort:

	Description	Start	Finish
a)	Define requirements for basic Registry, Catalog and Viewer components. (Advanced requirements will be recorded but may not be met in version 1.)	10/2009	11/2009
b)	Assess and select from existing implementations of RCV-like components, including: IOOS Obs Registry, OSMC, OpenIOOS, NANOOS portal, GEOSS Registry, etc.	11/2009	12/2009
c)	Determine where to host RCV implementation. Arrange for software installation and modification privileges. Options incl. NDBC, CO-OPS, AWS cloud, IOOS RA.	11/2009	01/2010
d)	Populate Registry with known IOOS data provider services (incl. NDBC, CO-OPS, RAs).	02/2010	02/2010
e)	Establish capability to populate Catalog using metadata harvested from provider services.	03/2010	04/2010
f)	Establish Viewer that can display Catalog holdings (i.e., obs platform locations at minimum; footprints of HFR, regional models, satellite data if possible)	05/2010	06/2010

DRAFT Requirements for IOOS DMAC Registry/Catalog/Viewer Components

ID	Component	Source	Description	Comments/Status	Priority
1	Registrar	SOA Fxn.	Provide candidate data providers with clear and full requirements for certification. In the short term this may include a requirements document combined with a human point of contact. Eventually, this will be converted to a largely automated system.		
2	Registrar	IOOS PO	Define data provider certification levels or classes. Allows for providers from modest to robust (specific levels to be defined).		
3	Registrar	SOA Fxn.	Upon first publication, test each service for compliance with service specifications.		
4	Registrar	SOA Fxn.	Occasionally retest each service for compliance.		
5	Registrar	IOOS PO	Manage authoritative list of service endpoints.		
6	Provider & Service Registry	SOA Fxn.	Must be immediately accessible and responsive to Registrar.		
7	Provider & Service Registry	SOA Fxn.	Facilitate the certification process by managing all data required to do basic conformance testing (e.g. service end point, service type, organization contact info., etc.)		
8	Provider & Service Registry	ADM001	Provider Service Registry must support continual monitoring of service availability and performance.		
9	Provider & Service Registry	XPT020 DMAC, SOA Fxn., QC010, QC005	Provide service level metadata (such as service type, version, supported operations, supported response formats)		
10	Provider & Service Registry	MTD025	Record controlled vocabularies as necessary (e.g. parameter names, units of measure, etc.).		
11	Provider & Service Registry	SOA Fxn.	Maintain, and provide upon request, authoritative list of service endpoints.		

12	Provider & Service Registry	IOOS PO	Maintain high level metadata about data owner		
13	Provider & Service Registry	IOOS PO	Maintain high level metadata about service providers and data stewards.		
14	Provider & Service Registry	IOOS PO	Record data provider certification levels or classes.		
15	Provider & Service Registry	IOOS PO	Support use of controlled vocabularies hosted elsewhere (e.g., MMI/CF phenomenon names)		
16	Harvester	SOA Fxn.	Periodically queries service metadata for each service instance to update Data Catalog (available phenomena, spatial coverage, temporal coverage, etc.)		
17	Harvester	IOOS PO	Collect and cache in the Data Catalog as much metadata from each service as needed to satisfy allowed queries.	*Note: will not harvest or cache <u>all</u> the available metadata.*	
18	Harvester	SOA Fxn.	Report failures back to registrar (human) and System Monitor (component)		
19	Data Catalog	DMAC, IOOS PO	Allow search of available data filtered by phenomenon.		
20	Data Catalog	DMAC, IOOS PO	Allow search of available data filtered by time range.		
21	Data Catalog	DMAC, IOOS PO	Allow search of available data filtered by geographic bounding box.		
22	Data Catalog	IOOS PO	Allow search of available data filtered by named geographic/oceanographic region (e.g., "Gulf of Mexico")	*NOTE: Probably not in v.1. Need established Gazetteer that provides bounding polygons, and means of subsetting based on polygons*	
23	Data Catalog	DMAC, IOOS PO	Allow search of available data filtered by foot print of regional scale.		
24	Data Catalog	DMAC, IOOS PO	Allow search of available data filtered by foot print of model output.		

25	Data Catalog	DMAC, IOOS PO	Allow search of available data filtered by foot print or listing of satellite data sets.		
26	Data Catalog	DMAC, IOOS PO	Allow search of available data filtered by dataType (measured||modeled).		
27	Data Catalog	IOOS PO	Allow search of available data filtered by specific output formats or 'return types'.		
28	Data Catalog	DMAC, IOOS PO	Allow search of available data filtered by status (online || maintenance || offline).		
29	Data Catalog	DMAC, IOOS PO	Allow search of available data filtered by sensor or platform ID.		
30	Data Catalog	DMAC, IOOS PO	Allow search of available data filtered by depth.		
31	Data Catalog	DMAC, IOOS PO	Allow search of available data filtered by provider.		
32	Data Catalog	DMAC, IOOS PO	Allow search of available data filtered by provider type (federal, non-federal, IOOS region, etc.)		
33	Data Catalog	DMAC, IOOS PO	Allow search of available data filtered by collection event (e.g. trajectory, profile, single, volunteer ship, etc.)		
34	Data Catalog	IOOS PO	Data Catalog search response shall include URLs for accessing individual data offerings (in one or more formats available from corresponding service)		
35	Data Catalog	QC010, QC005	Data Catalog search response shall display (or shall include URLs for accessing) relevant metadata about Provider, service, sensor characteristics, quality control processes and results, and other metadata relevant to a particular search result (to the extent available from the service provider).		
36	Data Catalog	IOOS PO	Search within a geographic region shall return all data instances that intersect that region, regardless of whether data was collected at a fixed location, along a trajectory, or within an area		
37	Data Catalog	IOOS PO	Basic format of search results shall be XML (schema t.b.d--use existing from OGC CS/W?).		

38	Data Catalog	IOOS PO	Search result XML shall be transformable to HTML or other format for textual display.		
39	Data Catalog	IOOS PO	Search result XML shall be transformable to KML or other format for map display.		
40	Data Catalog	IOOS PO	Enable **search** for data from multiple service instances at once.		
41	Viewer	XPT005, XPT045	Provide a user interface to enable human queries against the Catalog, including all query types and filters supported by the Catalog		
42	Viewer	DMAC, IOOS PO	Display search results in a textual or tabular format		
43	Viewer	DMAC, IOOS PO	Display search results in a graphical or map-based format		
44	Viewer	IOOS PO	Enable **retrieval** of data from individual service instances.		
45	Viewer	IOOS PO	Enable **retrieval** of data from multiple service instances at once.		
46	Viewer	IOOS PO	Display high level metadata about data owner		
47	Viewer	IOOS PO	Display high level metadata about service provider		
48	Viewer	IOOS PO	Display data provider certification levels		
49	System Monitor	IOOS PO	Frequent poll of each service instance to check online status and response latency		