

WEST COAST GOVERNORS ALLIANCE on OCEAN HEALTH

CALIFORNIA OREGON WASHINGTON

Regional Data Framework Action Coordination Team

Work plan



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Regional Data Framework Action Coordination Team

This 3-5 year work plan organizes and communicates the goals and activities of the Regional Data Framework Action Coordination Team of the West Coast Governors Alliance on Ocean Health (WCGA). The work plan has gone through several rounds of public review and has benefitted from the comments submitted, before being approved by the WCGA Executive Committee.

Overview

In September 2006, the Governors of Oregon, Washington and California signed the West Coast Governors Agreement – now the West Coast Governors Alliance – on Ocean Health (WCGA). Under this agreement, the three states, together with federal agency leads and non-governmental stakeholders, coordinate their actions to improve the health of their coastal and marine resources. On July 29 2008, the WCGA released a final Action Plan that outlines priority management activities for issues ranging from marine debris and renewable ocean energy to ocean literacy and climate change. The Action Plan is implemented by Action Coordination Teams (ACT) of state, federal, tribal, and non-governmental members who collaborate to address these issues.

In February 2012, the WCGA created the Regional Data Framework (RDF) ACT, the first new ACT formed since the WCGA's inception. Comprised of data producers, data users, tool developers, and GIS practitioners, this new ACT will improve access to accurate, current scientific and geospatial information for coastal and marine planning, policy development, and resource management throughout the region. The RDF ACT intends to serve as a multi-state institution for regional data management, sharing, and coordinating the following three goals, guiding its activities over the next 3-5 years.

Goal 1: Improve access to regionally relevant coastal and marine geospatial data and information products for resource managers, researchers, and the public.

- Activity 1.1 Provide support to and coordination of State and Network partners for cost-effective acquisition, development and sharing of priority data sets and information products.
- Activity 1.2 Develop and maintain the core elements of a Data System as determined by the needs analysis, including a data catalog, data registry, and data portal; leverage existing data systems and networks whenever possible.

Goal 2: Promote the interoperability of web services and applications that support coastal and marine management, policy development and planning efforts.

- Activity 2.1 Develop and share best practices for discovery, visualization, and interoperability of data.
- Activity 2.2 Increase the capacity of State and Network partners to make data and metadata available online through standards compliant web and catalog services.

Goal 3: Support a resourceful and informed community of practice among West Coast data providers, data users, and GIS practitioners.

- Activity 3.1 Provide dedicated coordination and support capacity for RDF ACT activities.
- Activity 3.2 Develop and implement an outreach and communications strategy.
- Activity 3.3 Formalize membership in and support for the Human Network.

The RDF ACT’s scope of work encompasses 1) the establishment of a Human Network (Network), comprised of the people and communication mechanisms necessary for linking data managers and users and 2) the development of a Data System, including the hardware, software, and data necessary for linking the existing technological infrastructure on the West Coast (Figure 1). This dual mission recognizes the importance of both the human and technological elements needed to increase data access and discovery for coastal and marine planning, policy development, and resource management. The Data System is meant to provide a “front door” and framework for linking existing systems and data infrastructure and is not intended to duplicate Human Network partner efforts or serve as a clearinghouse of data.

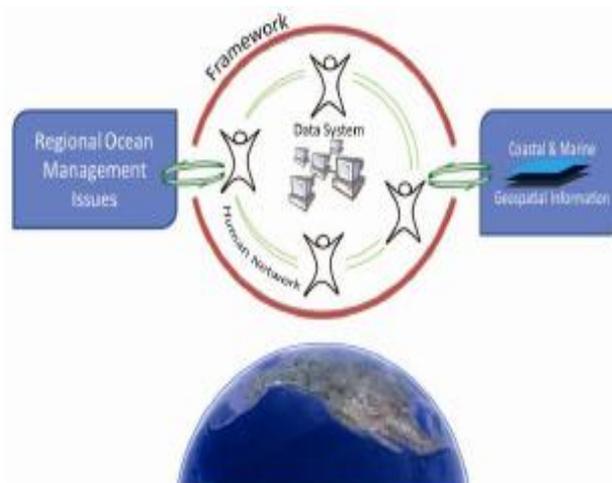


Figure 1: Conceptual diagram of how the Regional Data Framework, consisting of a Human Network and Data System, can inform regional ocean management issues through increased access to geospatial data.

The inspiration and momentum for the RDF ACT arose from the WCGA’s [December 2011 “West Coast Regional Data Framework” workshop](#),¹ where nearly 60 representatives of state and federal agencies, tribes and tribal communities, and non-governmental organizations gathered to discuss the establishment of a West Coast Regional Data Framework. The attendees discussed the scope, scale, audience, and vision of a Human Network, to be comprised of data managers, users, and GIS practitioners, as well as the essential technical elements of a Data System. By the end of the two-day workshop, the attendees had established three core working groups and drafted an initial plan for moving forward as an organization.

The primary mission of the RDF ACT is to help the other WCGA ACTs, state coastal and marine agencies, and their constituents gain access to the data, information products, and decision-support technologies that they need to address high-priority coastal and marine planning, policy development, and resource management issues. The RDF ACT will also serve as the steering committee for the broader Human Network established at the December 2011 workshop. As the RDF ACT matures, it may help West Coast decision-makers, resource managers, planners, and stakeholders address regionally important issues and policies, such as climate change adaptation, marine planning, ocean research initiatives, marine debris monitoring, supporting working waterfronts, and implementation and support of the National Ocean Policy.

Background

The policy context for West Coast efforts to improve access to scientific and geospatial information and tools

Public agencies, individuals, and organizations along the West Coast have expressed the need for easier and more reliable access to scientific and geospatial information in order to make informed, science-based decisions about the ocean and coast. Whether for understanding regional space-use conflicts with ocean energy development, sharing sea-level rise inundation maps with coastal legislators, or assessing fishery indicators on a regional scale, access to data is central to answering coastal and marine planning, policy development, and natural resource management issues. The WCGA, its member states, and the federal agencies have all prioritized increased collaboration to meet this need in cost-effective ways.

¹ http://www.westcoastcoceans.org/media/Data_Network_ACT/DataNetworkACT_WorkshopSummary.pdf

The WCGA has identified access to accurate, up-to-date data and information products as vital to the execution of its 2008 Action Plan. For instance, Priority Area 2 focuses on protecting and restoring coastal and marine habitats; Action 2.1 specifically calls for the creation of databases and geographic information systems that place up-to-date ecological and human use information in the hands of resource managers and stakeholders. Similarly, Priority Area 6 focuses on the expansion of scientific information, research, and monitoring among the three states and their partners. Action 6.2 calls for the creation of integrated information systems that make ocean observing and monitoring data more available to data users, while Action 6.3 calls for the creation of comprehensive seafloor maps and of infrastructure that makes mapping data more easily accessible. The Action Plan explains that comprehensive and integrated data sets are among the key tools by which the West Coast states can engage in ecosystem-based management (Priority Area 3) and monitor ocean health on a regional scale.

In August 2012, the WCGA Executive Committee met to reassess its ocean priorities and decided to focus on four ocean issues over the next two years: Climate Change, Marine Debris, Ocean Acidification, and the RDF. The WCGA priority ACTs require better tools to access and exchange scientific and geospatial information as they address regional issues. These focal areas and will guide the data resources needed in the System, as well as address important policy and management questions in the region. For example, the [Climate Change ACT](#),² seeks to facilitate access to important baseline information such as seafloor and shoreline mapping data in order to support coastal vulnerability assessment and sea-level adaptation efforts. The [Marine Debris](#),³ [Seafloor Mapping](#),⁴ [Renewable Ocean Energy](#),⁵ and [Integrated Ecosystem Assessment](#)⁶ ACTs have stated similar needs for better means of managing and sharing information.

At the state level, Washington, Oregon, and California are all implementing new policies that prioritize the gathering and sharing of scientific and geospatial information and the development of tools that enable more comprehensive and science-driven decision-making. For example, in 2010 the Washington State adopted a marine spatial planning law, which requires state agencies to incorporate “best available” spatial data into ongoing planning efforts and charges an interagency team with preparing for a plan in state waters. Washington’s interagency team identified improved access to information as a core element of coastal and marine spatial planning, and recommended that Washington invest early in data collection and data standardization. They also recommended that Washington evaluate the use of a “single point-of-access for Washington GIS data,” improve connections to regional GIS capacity, and improve data exchange networks as means of building needed planning capacity. In Oregon, the state recently developed maps of priority resources and human uses and used them to identify areas of low conflict in order to guide renewable energy development. In California, the Legislature in 2010 enacted Assembly Bill 2125, which prioritizes the development of data, information products, and tools for marine ecosystem-based management.

Finally, federal policy supports the creation of capacity, tools, and infrastructure to improve the availability of coastal and marine scientific and geospatial information. For instance, the Ocean and Coastal Mapping Integration Act of 2009 calls for coordinated, comprehensive mapping of state and federal waters, and the Interagency Working Group on Coastal and Marine Mapping recently released an ocean bathymetry portal. Similarly, the Integrated Coastal and Ocean Observation System Act of 2009 formally establishes the Integrated Ocean Observing System – of which three West Coast regional associations are members – and calls for the development of data management and communication systems for disseminating needed information among users.

Building on these and other laws, the President of the United States, via an executive order, has charged federal agencies with implementing the National Ocean Policy (NOP) on the West Coast and in eight other regions. The NOP prioritizes science-based decision-making – including CMSP – that incorporates “best available” scientific and geospatial information; it also promotes federal collaboration and coordination with states, tribes and tribal communities, and other partners. In early 2012, the National Ocean Council released a draft *National Ocean Policy Implementation Plan* that identifies high-priority actions for the coming years; many of these priority actions mirror those of the WCGA. The draft *Implementation Plan* notes, in particular, that “[a] core component of CMSP is integrating coastal and marine data and developing innovative visualization and other decision support tools;” it also

² <http://www.westcoastoceans.org/index.cfm?content.display&pageID=82>

³ <http://www.westcoastoceans.org/index.cfm?content.display&pageID=81>

⁴ <http://www.westcoastoceans.org/index.cfm?content.display&pageID=111>

⁵ <http://www.westcoastoceans.org/index.cfm?content.display&pageID=110>

⁶ <http://www.westcoastoceans.org/index.cfm?content.display&pageID=114>

calls for the “creation of an information management system and portal to provide public access to those data and information in support of coordinated planning.” Initial work has already been completed on this front and the National Ocean Council unveiled its ocean portal prototype to help provide “data, information, and tools to support people engaged in planning for the future of the oceans, our coasts, and the Great Lakes.” The NOP Priority Objectives “Inform Decisions and Improve Understanding” and “Observations, Mapping, and Infrastructure” will also guide the priority actions with regional and state counterparts, including:

- “Provide scientific information to support emerging sustainable uses of resources including renewable energy, aquaculture, and biotechnology. Greater access to data and information will enable better informed decisions about the feasibility and optimization of operations for sustainable uses of ocean, coastal, and Great Lakes resources and services.”
- “Provide the data and tools necessary to support science-based decision-making and ecosystem-based management. Improved decision-support tools and information services will further enable evaluation of trade-offs between alternative management scenarios, and enhance our ability to balance competing demands on ecosystems.”
- “Coordinate and leverage coastal and marine mapping efforts to improve access to existing data and efficiently collect future data. Sustained and coordinated coastal and marine mapping will support planning and decision-making about coastal and marine uses.”

It is clear that state, federal, and regional policies strongly promote collaboration to improve access to “best available” scientific and geospatial information for coastal and marine planning, policy development, and management. The RDF ACT will play a key role in helping to implement these policies, as outlined in this work plan.

Past and current efforts provide leveraging opportunities

To strengthen coordination and improve access to data and tools, the RDF ACT will build on existing institutions and data sharing efforts that are already serving state-level and regional audiences.

State and federal partners in all three WCGA member states have convened highly engaged, multi-agency, multi-stakeholder institutions to guide and conduct coastal and marine data management efforts. For instance, in 2009 California established a California Coastal and Marine Geospatial Working Group to improve interagency collaboration on data sharing issues and to inform the development of a California Geoportal. In 2010, a coalition of state, federal and non-governmental representatives formed the Oregon Coastal and Marine Data Network to improve coordination and communication among the many providers and users of relevant information and tools. In addition, in 2011, Washington hosted two workshops to address data collection and management needs for implementing its marine spatial planning law. Most recently, the West Coast’s three Integrated Ocean Observing System (IOOS) Regional Associations – [NANOOS](http://www.nanoos.org/)⁷ (Pacific Northwest), [CenCOOS](http://www.cencoos.org/)⁸ (Central and Northern California), and [SCCOOS](http://www.sccoos.org/)⁹ (Southern California) signed an MOU to conduct their activities in a coordinated fashion that will benefit each sub-region and the West Coast as a whole. Additionally, the work of [PaCOOS](http://www.pacoos.org/)¹⁰ looks at the coordinated delivery of information related to the California Current Large Marine Ecosystem. Finally, the [West Coast Coastal Atlas](http://ican.science.oregonstate.edu/)¹¹ community, an informal group of web atlas operators, state and federal agencies, academic institutions, and nonprofit organizations, evolved to link the region’s various institutions. Viewed together, the members of this broad community are highly experienced and capable partners already engaged with stakeholders and resource managers from the local to the national level.

Along the same lines, several West Coast entities have built data management and sharing systems that can be linked in a regional framework of services and infrastructure. For instance, Washington and Oregon currently

⁷ www.nanoos.org/

⁸ www.cencoos.org/

⁹ www.sccoos.org/

¹⁰ <http://www.pacoos.org/>

¹¹ <http://ican.science.oregonstate.edu/>

operate coastal and marine web atlases that can serve as nodes in a regional Data System. California invested in comprehensive data gathering and software development for implementation of the Marine Life Protection Act, and has recently begun the development of its own “geoportal” to serve coastal and marine data to agency and public users. The three IOOS Regional Associations have also developed information management systems and web portals for sharing real-time observing data and other information products. Finally, the federal government operates a number of data resources for coastal and marine management, including an [ocean data portal](#),¹² which serves as the National Information Management System required by the National Ocean Policy; the [Multipurpose Marine Cadastre and Data Registry](#),¹³ which are repositories and viewers of priority federal data sets; and the [NOAA CMSP Data Registry](#),¹⁴ “a collection of web-accessible NOAA geospatial data deemed essential for local, regional, or national-level CMSP processes.” With the cooperation of state, federal, and other partners, all of these resources can be incorporated into West Coast data sharing infrastructure.

Current and Future Funding Opportunities

Federal grant opportunities have provided an important mechanism for advancing West Coast data sharing priorities, and will hopefully continue to do so in the future. NOAA’s FY 2011 [Regional Ocean Partnership Federal Funding Opportunity](#),¹⁵ announced in 2010, provided West Coast partners with an important occasion to collaborate. In response to NOAA’s announcement, the WCGA determined that improved access to data and data management systems would allow the ACTs to implement their work plans more effectively while preparing for potential CMSP efforts. Moreover, during a series of regional stakeholder meetings, the WCGA received several strong proposals for supporting regional data management and sharing in ways that would also improve the effectiveness of state and local management efforts. The WCGA incorporated this input into a funding proposal that yielded \$116,000 for “Phase I” of the development of a regional Data System and Human Network. The RDF ACT has already begun a series of activities to carry out Phase I, as detailed below.

In April 2012, the WCGA applied for funding under NOAA’s FY 2012 Regional Ocean Partnership Program. The WCGA was successfully awarded approximately \$850,000, of which \$624,000 will be used to carry out “Phase II” of the Data System and Human Network efforts represented in this work plan. This federal funding will be used in conjunction with in-kind contributions and third party funding to meet West Coast priority needs for data and tools that improve coastal and marine management.

Finally, the RDF ACT – and the activities it will undertake – would not be possible without the ongoing support and collaboration of a broad group of regional partners. In this uncertain fiscal environment, the RDF ACT will greatly benefit from its partners’ contributions of time, expertise, and resources.

Regional Data Framework ACT Purpose and Structure

The RDF ACT formed to serve two overlapping roles that shape its structure and function. First, it is a formally recognized Action Coordination Team with a mission to help meet the data needs of the other WCGA ACTs and their constituents. Second, and equally importantly, it is intended to improve communication and data exchange among members of the fledgling Human Network to inform planning, policy development, and resource management among Network partners.

The RDF ACT is structured in large part by the [WCGA Charter](#).¹⁶ It must include representatives from each state, and may include federal, tribal, NGO, industry, and academic representatives as needed. The ACT also has a Point of Contact to the WCGA Executive Committee. Additionally, because the RDF ACT is part of the Human Network,

¹² www.data.gov/ocean

¹³ <http://www.marinecadastre.gov/default.aspx>

¹⁴ <http://egisws02.nos.noaa.gov/cmspgisdataaregistry/>

¹⁵ http://www.csc.noaa.gov/funding/_pdf/RegionalOceanPartnershipFundingProgramGrantAwardsAnnouncement.pdf

¹⁶ <http://www.westcoastcoceans.org/media/wcgacharterfinal10222011.pdf>

at least three of the members represent the three working groups established at the December 2011 workshop. The RDF ACT is currently chaired by Steve Steinberg and Andy Lanier, and includes the following members:

- Andy Lanier**, (*Co-Chair*) Oregon Dept. of Land Conservation and Development (DLCD)
- Steve Steinberg**, (*Co-Chair*) Southern California Coastal Water Research Project (SCCWRP)
- Matt Armsby**, Resources Law Group (RLG)
- Greg Benoit**, California Coastal Commission (CCC)
- Tim Doherty**, NOAA Coastal Services Center (NOAA)
- Laura Engeman**, California Ocean Protection Council (OPC)
- Tanya Haddad**, Oregon Dept. of Land Conservation and Development (DLCD)
- Emilio Mayorga**, Northwest Association of Networked Ocean Observing Systems (NANOOS)
- Samantha Murray**, Ocean Conservancy
- Jan Newton**, Northwest Association of Networked Ocean Observing Systems (NANOOS)
- Liz O’Dea**, Washington Dept. of Ecology (WDE)
- Jim Power**, U.S. Environmental Protection Agency (EPA)
- Rachel Rodriguez**, Yurok Tribe
- Chris Romsos**, Oregon State University (OSU)
- Rex Sanders**, US Geological Survey (USGS)
- Joel Shinn**, U.S. Fish and Wildlife Service (USFWS)
- Charles Steinback**, Ecotrust

One of the RDF ACT’s primary functions is to help meet the priority data needs of the other WCGA ACTs. Each of the ACTs was created to address a priority ocean issue such as climate change, marine debris, or renewable ocean energy. As the WCGA, its priorities, and its organization evolve over time, the RDF ACT will adapt as needed to serve a similar role.

The ACT will also serve as the steering committee for the Human Network, which currently consists of the participants of the December 2011 workshop. Membership in the Human Network is open to any interested member of the West Coast data community, and will benefit from the inclusion of additional interested individuals from West Coast states, tribes and tribal communities, federal agencies, NGOs, academic institutions, and other stakeholders.

The RDF ACT and the Human Network are organized to work in three primary but overlapping functional areas (Fig. 2) and established three working groups dedicated to regional coordination and support for Data, Information Technology (IT), and Outreach activities:

The Data Working Group supports the Network to help address and prioritize substantive data needs. It determines which data sets and information products to make available, recommends data and metadata standards, provides technical expertise to integrate data from disparate sources into regionally relevant products, and works with the IT Working Group to establish partnerships with data managers within the Network.

The IT working group works with regional Network partners to address infrastructure and interoperability needs. It provides technical advice for ensuring that data can be shared among users with disparate software and hardware requirements, leads the development of technological infrastructure such as a data registry and map viewer, and

Structure of the West Coast Regional Data Network

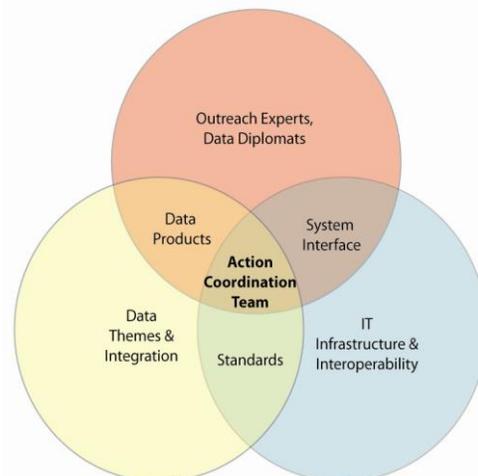


Figure 2: The three circles represent the three technical working groups: Data, IT, and Outreach. The overall goal of the Framework is to support the information needs of the WCGA and its constituents. The ACT will coordinate the activities of the three working groups.

works with the Data working group to establish interconnections with data managers.

The Outreach working group serves as the communication branch of the Human Network. It works with the Data and IT Working Groups to ensure that data products and applications meet user needs and to establish partnerships with data managers. The Outreach working group also works to educate decision-makers and supporters about the RDF ACT's mission, actions, and accomplishments.

The RDF ACT itself serves as a point of coordination and accountability. It coordinates the activities of the Outreach, Data, and IT working groups and fosters communication throughout the Human Network.¹⁷ It also incorporates input from the WCGA Executive Committee and the other ACTs to ensure that it meets the needs of the West Coast coastal and marine resource management community. It also oversees the activities described in this work plan.



Photo Credits: National Ocean Service

¹⁷ Once the Regional Data Network has gained a committed membership of developers and users, secured funding, and established its credibility as a reliable source for coastal and marine geospatial data, its members may ask whether the Network can operate on its own. At some point, they may decide that the ACT is no longer needed.

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Work Plan

The overarching purpose of the RDF ACT is to support and promote greater access to and sharing of accurate, current scientific and geospatial information for coastal and marine planning, policy development, and resource management along the West Coast. The ACT will focus its efforts on three primary goals over the next three to five years:

- Goal 1. Improve access to regionally relevant coastal and marine geospatial data and information products for resource managers, researchers, and the public.**
- Goal 2. Promote the interoperability of web services and applications that support coastal and marine management, policy development and planning efforts.**
- Goal 3. Support a resourceful and informed community of practice among West Coast data providers, data users, and GIS practitioners.**

As determined in the WCGA’s 2011 “West Coast Regional Data Framework” workshop and the ACT’s charter, the ACT will support both a Human Network of data producers, data users, and GIS practitioners; and a Data System of hardware and software infrastructure that promotes efficient discovery of and access to regional priority data. Both the Human Network and the Data System will be largely distributed, which, in the context of this work plan, means that they will build on and link the efforts and resources of the three states and their federal, Tribal, and non-governmental partners.

At the same time, the Human Network and Data System will be centrally supported. The RDF ACT will be responsible for organizing work, communicating with decision-makers, building partnerships, and helping the states and their partners seek funding for regionally beneficial projects. Moreover, the RDF ACT will work to develop and maintain core Data System elements such as a commonly accessible data registry and an interactive map viewer.

Below, each of the three primary goals is addressed with reference to the high-priority activities needed to achieve it, timelines for completion, and indicators of success. The activities will be carried out by the RDF ACT, the members of the three working groups, and, as needed, partners and consultants with appropriate expertise. Since the RDF ACT coordinates a network of *people* and to address their needs, consultation with data producers, data users, and GIS practitioners – with the goal of accurately understanding their needs – will be a fundamental component of every activity the RDF ACT undertakes.

Goal 1: Improve access to regionally relevant coastal and marine geospatial data and information products for resource managers, researchers, and the public.

- Activity 1.1 Provide support to and coordination of State and Network partners for cost-effective acquisition, development and sharing of priority data sets and information products.**

The RDF ACT first needs to understand the needs of the WCGA ACTs and Executive Committee as well as the needs of West Coast data producers, data users, and GIS practitioners so that it can determine the most

significant gaps to accessing and discovering data relevant to coastal and marine planning, policy development, and resource management issues. By surveying the existing WCGA ACTs and validating results with WCGA Executive Committee, State and Network partners, the RDF ACT can focus its efforts on supporting regional management, policy and planning efforts. In this exercise, data that is of high quality, is well documented, and covers a greater extent will be given a higher initial priority. Additionally, there is a need for coordinating regional data acquisitions and for management to improve consistency and reduce cost. At the Federal level, the NOAA Integrated Ocean and Coastal Mapping (IOCM) Program and the Interagency Working Group on Ocean and Coastal Mapping (IWG-OCM) provide one model for coordinating data acquisition. By connecting agencies and organizations that need similar types of data, there may be opportunities to leverage both financial and human resources and improve the comparability of that data over large geographic areas. The RDF ACT and the Human Network can also serve as a matchmaking service to communicate common data needs to data collecting entities and link those entities to shared hosting and financial resources.

Based on feedback from the WCGA, state-led data prioritization exercises, and other regional stakeholders, priority regional data sets will be selected for inclusion in the Data System. As the data needs of the WCGA and regional stakeholders grow, additional data in multiple and varied formats will be needed. By increasing the amount of data disseminated by the Data System, the RDF will be an increasingly important element in coastal management and planning efforts.

Tasks:

- 1.1.1 Prioritize needed data sets based on input from WCGA ACTs, State and Network partners, and the Human Network.
- 1.1.2 Provide a forum where data providers and data users can communicate to identify and prioritize data needs and work to address data gaps.
- 1.1.3 Work with partners to identify and pursue federal, state, and private funding for acquiring and/or developing priority data sets and information products.

Outcomes/Deliverables:

- Report identifying high priority, commonly needed data sets and information products that should be made available to the Network and broader public user community by Spring 2013 and updated as needed.
- Prioritized recommendations for collecting or creating scientific and geospatial data based on identified gaps and trends.
- Dissemination and/or creation of regionally relevant data sets and information products according to standards-based approaches.
- Development of an online forum for sharing information related to data needs.

Other Indicators of Success:

- Number of data collectors and data developers with data hosting and publication needs who have been “matched” with Network Partners who have capacity to host and publish data.
- Amount of funding sought and obtained by WCGA RDF ACT on behalf of partners to develop priority data sets and information products.

Estimated Completion Timeline: Task 1.1.1 (Spring 2013), Task 1.1.2 (Summer 2013), Task 1.1.3 (Ongoing)

Roles/Responsibilities: Initial work to be completed by Contractor (Tasks 1.1.1-1.1.2); ongoing work to be completed by RDF ACT and Outreach Working Group (Task 1.1.3).

Activity 1.2 Develop and maintain the core elements of a Data System as determined by the needs analysis, including a data catalog, data registry, and data portal; leverage existing data systems and networks whenever possible.

The Data System is the technological infrastructure of the RDF and will increase data discovery, be easy to use, and be built on a distributed network. Web viewing capability with interactive mapping and data access will be

priority functions of the Data System. Web viewing through Open Geospatial Consortium (OGC) Web Mapping Services (WMS) will enable visualization and facilitate easier, standardized, distributed data system maintenance. While the Data System will not host datasets directly, it will greatly enhance the discoverability and access to priority datasets managed by Human Network partners. Additionally, the Data System will have to be responsive to feedback to ensure that it meets users' needs.

In addition to web mapping services, accurate and standardized metadata are critical to providing context, establishing authority for data, and enabling discovery by users, including through state and national data systems. This metadata, or “data about data,” describes the basic characteristics of a dataset and represents the *who, what, when, where, why* and *how* of the data including its collection methods, web location, current availability, access instructions and any needed permissions. Full and abbreviated metadata standards have already been established and are supported nationally and internationally, and it will be important for the Human Network to promote and encourage use of these standards.

Core Data System elements include a **data catalog**, a **data registry**, and a **data portal**.

The **data catalog** is a database populated with essential information about priority data, contained in its metadata. The data catalog is a way to organize standardized metadata for priority West Coast coastal and marine geospatial data so that it can be searchable and compared with similar data sets. In early phases of this work plan, this data catalog will be largely populated and managed via manual entry by contractors and the RDF Coordinator; however, advocacy and support for the deployment of published metadata, web mapping, catalog services by Human Network partners will lead to progressively more automated maintenance of the West Coast data catalog as the more advanced data registry is developed to pull standardized metadata from common sources.

The **data registry** is a system component that includes several integrated capabilities, serving as a “catalog of catalogs” and providing functionality that makes catalog information accessible to both users and remote systems. It stores the web location and identifies priority datasets registered in standards-compliant catalog services hosted by partners; this core information is used to populate and update the data catalog entries for these datasets. The data registry also provides an online application for user access to the data catalog, with flexible, multi-faceted data searching and browsing capabilities, and clear access to the datasets via data-download or data-services links and information as provided by the Network Partners. It also provides such functionality as a standards-compliant catalog service for automated access by remote systems. The data registry will allow Human Network partners to register their own datasets, data catalogs and web services, facilitating a decentralized design, easy contribution by partners, and increased access to partner data.

The **data portal** builds on the catalog and registry by providing map viewing functionality and website components that facilitate Human Network communication. The map viewer enables users to preview data, visualize information and maps, overlay data sets to identify “hot spots” of human use and ecological resources, and perform rudimentary analysis. The data portal also includes communication tools to link the Human Network together through discussion forums, collaborative workspaces, and feedback mechanisms, and importantly identity management features to facilitate communication, manage permissions, and track Data System usage.

Tasks:

- 1.2.1 Assess the technical requirements for data producers, data users, and GIS practitioners to access and share multi-disciplinary data sets via the Data System.
- 1.2.2 Compile a West Coast data catalog with selected priority regional data sets.
- 1.2.3 Develop a data registry with data search and browse capabilities tailored to the needs of other WCGA ACTs and the user community.
- 1.2.4 Develop a “roadmap” guide for ongoing expansion of data, information products, and functional capabilities into the Data System.
- 1.2.5 Identify and procure hosting and maintenance for core Data System elements.
- 1.2.6 Develop a data portal tailored to West Coast needs that builds on existing systems.
- 1.2.7 Create or adapt tools to meet the visualization, analysis, or data integration needs of a WCGA ACT, State and/or Network partner.

1.2.8 Assess the usability of each element of the Data System through user workshops and meetings/forums.

Outcomes/Deliverables:

- Assessment report of the technical requirements for data producers, data users, and GIS practitioners to access and share multi-disciplinary data sets via the Data System.
- Continuously updated catalog of available data and information products, with complete standardized metadata and data-access information.
- Continuously updated data registry of available data, catalog services and information products accessible via an online user interface and standards-compliant catalog services.
- Web-based data portal with an interface, map viewer, and data download capabilities that are tailored to regional needs.
- Links to analytical tools that can be incorporated into the data portal based on specific use case development.
- Tracking document describing the ongoing expansion of data, information products, and functional capabilities into the Data System, including the updating schedule, interval, and responsibilities. Document will be publicly available.
- Workshop reports assessing Data System usability and identifying needs for further Data System changes and upgrades.
- Well-known, established RDF web presence that will guide interested parties to partner directories and data sources.

Other Indicators of Success:

- Number of linkages to interoperable federal and state data registries and portals.
- Number of data sets and information products available through the Data System.
- Web usage statistics (i.e. number of unique hits) demonstrating West Coast wide usage of the Data System.

Estimated Completion Timeline: Task 1.2.1 (Fall 2012), Task 1.2.2 (Winter 2013), Task 1.2.3 (Spring 2013), Task 1.2.4 (Summer 2013), Task 1.2.5 (Summer 2013), Task 1.2.6 (Fall 2013), Task 1.2.7 (Winter 2014), 1.2.8 (Spring 2014).

Roles/Responsibilities: Work to be completed by Contractor (Tasks 1.2.1-1.2.6), RDF ACT (Task 1.2.7), and Data and IT Working Groups (Task 1.2.8).

Goal 2: Promote the interoperability of web services and applications that support coastal and marine management, policy development and planning efforts

Activity 2.1 Develop and share best practices for discovery, visualization, and interoperability of data.

While numerous applications and databases currently exist to serve their intended audiences, a central problem is that these are often not compatible with one another. Different formats, platforms, and standards often prevent the integration and comparability of data and services from different sources. The Data and IT working groups will work together in coordination with the RDF ACT to develop best practices guidelines that describe actions needed to promote region-wide interoperability of data portals, data compatibility, user access, and metadata development. The guidelines will be used to help partner agencies and institutions easily share their data through the Data System.

Tasks:

- 2.1.1 Creation and distribution of best practices guidelines, publicly available online, to promote increased discovery, access, and sharing of data among members of the Network.

Outcomes/Deliverables:

- Best practices guidelines, publicly available online, to promote increased access, sharing, and synthesis of data among all partners to the RDF (description of specific actions needed to ensure region-wide interoperability of data portals, data compatibility, access, and metadata development).

Other Indicators of Success:

- Number of Network partners with whom the best practices guidelines have been shared.
- Number of unique downloads of best practices guidelines.
- Number and names of workshops and conferences in which the best practices guidelines are discussed or mentioned.
- Continued and active engagement of user community.

Estimated Completion Timeline: Task 2.1.1 (Spring 2013)

Roles/Responsibilities: Work to be completed by Contractor with consultation by the Data and IT working groups (Task 2.1.1).

Activity 2.2 Increase the capacity of Human Network partners to make data and metadata available online through standards compliant web and catalog services.

Interoperability describes the ability for technical systems to operate and function seamlessly. Data and system interoperability is based on adopting and using shared standards for metadata and system design so that information can be easily shared. Standards empower technology developers to make complex spatial information and services accessible and useful with all kinds of applications. The design of the data registry and data portal is built on a distributed/decentralized approach that encourages and supports partners to contribute data and metadata through standards-compliant web and catalog services. Most state and federal agencies already publish their data on the internet, and some do so through interoperable services. However, there are technical and financial hurdles to increasing interoperability. We hope to raise the capacity of Human Network partners to publish data so that it can be accessible through the Data System. This will be accomplished via multiple geographical and thematic partnerships whereby Human Network partners with capabilities to host data, web services or catalog services will be encouraged to link with data producers to jointly connect priority datasets with the Data System. Additionally, the RDF will strive to increase the capacity of State and Network partners to engage with the Regional Data Network through support for data and metadata development, regional data integration, and data catalog development. The Regional Data Framework needs to support State and Network partners' ability to update their own data and catalogs so they can connect fully to the Data System. By increasing the data holdings contained in the Registry, the Framework will address and inform more and varied ocean management issues as raised by regional stakeholders.

Tasks:

- 2.2.1 Actively encourage Human Network partners and partnerships to publish regionally relevant datasets via standards-compliant web and catalog services and support these efforts through letters of endorsement and assistance in writing funding proposals.
- 2.2.2 Provide training to Human Network partners through workshops, archived materials, and sharing of expertise through the "community of practice."
- 2.2.3 Hire one or more contractors to develop metadata and catalogs, provide priority data as web services, or integrate state and local scale data sets into priority regional scale data sets. This work could be conducted by university laboratories that specialize in integrating disparate GIS data, directed fellowships, private contractors, or paying for Network Partner staff time.

Outcomes/Deliverables:

- Training materials that can be used multiple times to help increase partner capacity.
- Letters of endorsement/statements of support to help partners gain resources to increase their published data holdings or to enhance their capacity to serve other partners as intermediate hosts of data, web and catalog services.

- State and Network partners who are able to contribute to the data catalog, registry, and portal individually or via larger partnerships, benefitting their own stakeholders as well as the region.
- Increased priority data made available through the Data System, better informing regional issues.

Other Indicators of Success:

- Number of priority data holdings published through Catalog Web Services (CWS).

Estimated Completion Timeline: Task 2.2.1-2.2.3 (Fall 2013 - Ongoing)

Roles/Responsibilities: Work to be completed by RDF ACT (Task 2.2.1), Outreach Working Group (Task 2.2.2), and contractors (Task 2.2.3).

Goal 3: Support a resourceful and informed community of practice among West Coast data providers, data users, and GIS practitioners.

Activity 3.1 Provide dedicated coordination and support capacity.

Beyond the technical solutions, the establishment of a formal organization of data managers, developers, and users operating under RDF can connect people and data in ways that have not been possible in the past. The Human Network should include a broad representation of data managers and users from state, federal, tribal, academic, NGO, and industry entities in order to reflect the varied array of stakeholders and interests on the West Coast. This Human Network would act as a “community of practice,” able to share lessons learned, connect people to data, and support and maintain the Data System. The Human Network would also help prioritize regional data sets and provide input on establishing entry requirements to ensure that data contributions meet the minimum standards. Importantly, the Human Network could conduct outreach to regional stakeholders to make sure that Data System functionality and available data meet the needs of users. Importantly to the establishment and engagement of this Human Network, the RDF ACT needs to reach out to regional partners and effectively communicate RDF goals, activities, and opportunities for involvement. To help facilitate partnerships and work to gain Human Network partner participation and “buy in” we propose hiring a full time RDF coordinator who will help conduct RDF ACT business, facilitate participation from Human Network partners, and develop the RDF web presence and communication materials.

Tasks:

- 3.1.1 Hire an RDF Coordinator with sufficient technical expertise and strong communication skills to provide dedicated coordination and administrative support to state and regional data service providers and users.
- 3.1.2 Convene the RDF ACT to develop RDF ACT and Regional Framework policies, make decisions, and track implementation of Work Plan and grant agreements.

Outcomes/Deliverables:

- One position, funded for two years, to help coordinate RDF ACT functions, solicit Human Network partner participation, implement work plan tasks, and develop RDF web materials.
- RDF ACT annual meeting reports detailing discussions, decisions, and outcomes made available to the public online

Other Indicators of Success:

- Work plan tasks, including administration and facilitation of RDF ACT business, are completed within the timeframe outlined in this work plan.

Estimated Completion Timeline: Task 3.1.1 (Winter 2013)

Roles/Responsibilities: Work to be completed by RDF ACT and WCGA Executive Committee (Task 3.1.1) and RDF Coordinator (Task 3.1.2).

Activity 3.2 Develop and implement an outreach and communications strategy.

Critical to the success of this effort is the broad support and “buy in” from West Coast policy makers as well as technical data managers and GIS users. To communicate the goals and achievements of the RDF ACT and garner the broad participation and high-level support that is needed, the RDF ACT will work with the Outreach working group to develop a long-term communication strategy. The strategy will outline the tasks needed to reach out to the various technical and non-technical audiences through workshops, online trainings and demonstrations, and printed communication materials.

Tasks:

- 3.2.1 Develop a communications strategy for the RDF ACT.
- 3.2.2 Establish good working relationships with IOOS regional associations, state geospatial working groups and coastal and marine data “hubs” to facilitate communication and support.
- 3.2.3 Communicate RDF accomplishments to members, regional stakeholders, and policy makers.

Other Indicators of Success:

- Number of quarterly or annual meetings or calls with stakeholders such as IOOS associations and state geospatial working groups, with active dialogue and participation amongst members.

Outcomes/Deliverables:

- Long-term communications strategy document for the RDF.
- Annual progress reports detailing completion and status of work plan tasks and progress on indicators of success.
- List of regional data contacts/managers identified in the metadata acquisition process.
- Identification of the existing and future technical, regulatory, and institutional barriers to cooperative data management.
- Functional technical working groups to provide guidance, assess progress, and recommend adjustments to meet the RDF goals and objectives and to provide coordinated technical advice to the regional planning body (RPB) for CMSP.

Timeline: Task 3.2.1 (Spring 2013), Task 3.2.2 (Fall 2013), Task 3.2.3 (Ongoing)

Roles/Responsibilities: Work to be completed by the Outreach working group (Task 3.2.1), RDF Coordinator (Tasks 3.2.2-3.2.3).

Activity 3.3 Formalize membership in and support for the Human Network.

The RDF is designed to take advantage of the distributed Human Network of partners and data holdings. To ensure the long-term maintenance and usage of the Data System, the RDF needs to identify points of contact for priority data holdings on the West Coast. These “data diplomats” are people who serve to maintain and update data housed in partner agencies and organizations and who will act as points-of-contact within their agencies for data-related questions from the Human Network and stakeholders. The identification of these individuals will help increase the “connectivity” in both the Human Network and Data System components of the RDF and provide for increased data discovery of coastal and marine data necessary for regional ocean management. Identification of these data diplomats and signed commitments of support from each partner agency will be critical to the success of this effort by increasing efficiency and ease of access to data.

Tasks:

- 3.3.1 Develop a model “statement of support” that outlines Human Network partner commitments and seek signatures from partners, where appropriate.
- 3.3.2 Identify “data diplomats” at partner agencies and organizations and identify capacity to host and publish data.

- 3.3.3 Establish a framework for the human network member roles, responsibilities, and key contacts, and create an online member directory with partner contact information, including names of data diplomats, to promote communication.
- 3.3.4 Convene West Coast Data Network to discuss member outreach and participation, RDF ACT work completed to date, upcoming project objectives and timelines, and partner interoperability efforts.

Outcomes/Deliverables:

- Member directory with partner contacts, including data diplomats so that Data System users and regional stakeholders have contacts for particular data sets.
- “Statement of support” signed by Human Network partners.
- Highlight achievements via development of case studies for informal and formal use.
- West Coast Data Network meeting reports detailing discussions, decisions, and outcomes made available to the public online.

Other Indicators of Success:

- Number of downloads and other requests of the model statement of support.
- Number of Network Partners who have signed the statement of support, indicating commitment to work with RDF and designating point of contact, or “data diplomat.”

Timeline: Task 3.3.1 (Fall 2013), Task 3.3.2 (Fall 2014), Task 3.3.3 (Summer 2013), Task 3.3.4 (Fall 2013)

Roles/Responsibilities: Work to be completed by Outreach working group (Task 3.3.1) and RDF Coordinator (Tasks 3.3.2-3.3.4).