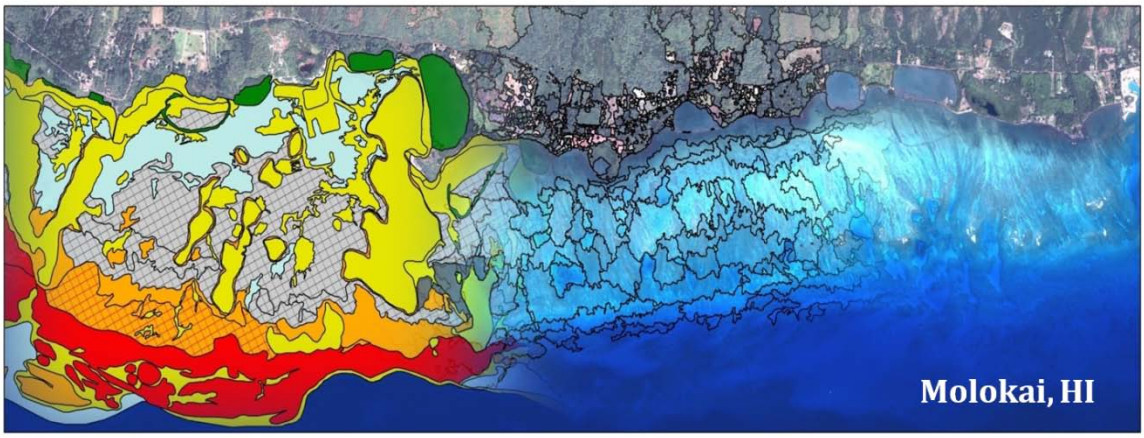
WORK PLAN

Gap Analysis of Marine Ecosystem Data for Department of Interior - National Park Service Inventory & Monitoring Program



Prepared
September 2009

By

NOAA/NOS/NCCOS
Center for Coastal Monitoring and Assessment
Biogeography Branch

A Cooperative Investigation by NOS' Center for Coastal Monitoring and Assessment Biogeography Branch and the National Park Service

Gap Analysis of Marine Ecosystem Data for Marine Parks

GOAL

Through the implementation of a multi-year Interagency Agreement, the National Oceanic and Atmospheric Administration's (NOAA) Biogeography Branch (BB),will conduct information collection, integration, synthesis and evaluation services for the Department of Interior (DOI), National Park Service (NPS), Inventory and Monitoring Program (I&M). The focus of FY2010 partnership activities will be to identify, obtain, synthesize and evaluate all relevant ecological, oceanographic, socio-economic, cultural, and remote sensing datasets available for several NPS managed Pacific and Caribbean marine Park Units. BB will collect and integrate available geospatial datasets to support Park Service management of marine resources. BB will also conduct a gap analysis of spatial information resources, indicating gaps in available data.

This work is an expansion of ongoing mapping and monitoring efforts conducted by NOAA and NPS in the Caribbean and Pacific, using standardized protocols that will enable the condition of the coral reef ecosystems within National Parks to be evaluated within local, regional, and national scales. The products from this effort will provide an accurate, contemporary assessment of the abundance and distribution of biological, physical and socioeconomic information within Parks to support more effective management and conservation of ocean resources within the National Park System. BB will identify information gaps and provide recommendations for filling these information needs.

OBJECTIVES

1. Indentify and synthesize relevant biological, physical, and socioeconomic data sets for each Park Unit. Organize the data into a common framework with a geographic information system (GIS).
2. Produce a web-based mapping and database portal to provide access to the data and metadata with security access enabled.
3. Identify additional data needs to support monitoring and management – information gaps.

BACKGROUND

As part of President Bush's U.S. Ocean Action Plan, the National Park Service developed an Ocean Park Stewardship Action Plan to focus organizational and scientific capacity on conserving marine, estuarine, and Great lakes resources. The Ocean Park Stewardship Action Plan strives to prevent the loss of productive fisheries, habitats, and wildlife, and continue to conserve ocean resources and recreational activities they afford to park visitors. The National Park Service manages and protects more then 250,000 acres of coral reef in ten National Park units. These include USVI – Buck Island Reef National Monument, Virgin Islands National Park, Salt River Bay National Historic Park and Ecological Reserve and Virgin Islands Coral Reef National Monument; Guam- War-in-the Pacific National Park; American Samoa – National Park of American Samoa; and

Main Hawaiian Islands – Kalaupapa National Historic Park and Kaloko-Honokohau National Historic Park.

Implementation of successful management and monitoring strategies for National Park Service Caribbean and Pacific Park Units is predicated on having complete inventory of past and present datasets and information. While a host of academic, Federal, State, NGO, and Territorial entities have collected information for the respective Park Units, this information is disparate in its temporal, spatial, and quantitative coverage. Developing a systematic and synoptic inventory and monitoring program requires understanding of baseline mapping and databases available so as to be able to strategically target and fill existing information gaps. Furthermore, these efforts will catalyze the ability to develop standardized data collection and sampling efforts for future investment, but relevant to regional place-based management priorities.

As part of the ocean stewardship effort, the Ocean Park Stewardship Action Plan serves to improve scientific capacity so as to better understand ocean ecosystems and human influence. This includes providing improved products and information resources to better inform resource managers of current resource inventories and benthic habitat distribution to better evaluate the efficacies of marine management decisions, increase scientific understanding of coral reef processes, evaluate the impact of human-uses, and monitor changing ocean conditions.

PROJECT OVERVIEW

Through a “gap” analysis of spatial data resources, this project serves to identify, obtain, synthesize, and evaluate all ecological, oceanographic, and related socio-economic, cultural, and remote sensing datasets available for the identified Park Units. The information will be evaluated both by BB and by relevant Park Service managers and partners. A spatial information framework will be developed to support the information management needs of each Unit. Gaps in information will be identified and recommendations for filling these gaps will be provided. NOAA/NCCOS/BB is a leader in the development, integration, and analysis of spatial information for coral reef ecosystems and benthic habitat mapping. Through this interagency agreement, NPS is taking advantage of the expertise and experience developed by NCCOS to integrate and manage accurate and spatially resolved marine ecosystem information in the DOI/USGS/NPS Caribbean and Pacific parks and monuments.

The synthesis of existing geospatial data will provide the most contemporary compilation of data within the network of NPS managed marine Ocean Parks. These products will provide spatial information on shallow-water coral reef habitats, distribution of marine flora and fauna, and socioeconomic information as it relates to the status of marine resources for the identified Park Units. The results of these efforts will provide NPS increased technical capacity for ocean exploration, monitoring, management, and stewardship.

The information which will be collected, integrated, and formatted for dissemination will focus on resources which directly support monitoring and management needs for the Park Units. The integration of biological, ecological, physical, geological, and socioeconomic information resources will enable Park Managers to develop an

integrated view of management needs and monitoring efforts. The project deliverable will also serve as a potential repository for storing and accessing monitoring information and can be maintained and expanded over time.

In addition to the synthesis of existing geospatial data, NOS/NCCOS/CCMA/BB will identify information gaps in current geospatial datasets for each Park Unit. BB will also provide recommendations on potential approaches to filling in these "gaps" of information needs. This will include discussion of desired state of information resources and the consideration of approaches, techniques/technologies, resolution (time & space), level of investment, and prioritization of acquisition.

The following project plan details the specific products to be produced, milestones, technical strategy, and deliverable requirements.

PROJECT TASKS

Task 1. Project Scoping Meeting and Work Plan
(Estimated completion date: September 2009)
This work plan will describe the overall project and serve as a blueprint for implementation. Discussions will occur in September, 2009, to refine objectives, tasks, milestones, technical strategy, and deliverable products in the work plan. As such, the work plan should be viewed as an evolving document that will be modified during early phases of this project. The BB will work closely with collaborators to ensure that analyses address the resource management and conservation needs of each study area, and that acceptable methodologies are implemented and products are produced.

Task 1. Products:

- Preliminary list of deliverables
- Preliminary list of contacts to meet and/or talk with
- Scoping meeting with partners
- A final work plan

Task1. Milestones:

- Deliver final work plan (September, 2009)

Task 2. Data Gathering
(Estimated completion date: March, 2010)
NOAA will conduct a data gathering exercise for each of the Park Units in three stages. First will be a data exploration effort. This will consist of meeting with key partners, identifying available data resources, and obtaining any readily available or distributable information. Preceding the initial meetings with Park Unit personnel and partners, BB will distribute a geospatial information resources questionnaire to individual Park Unit contacts. BB will request that Park Unit contacts distribute to questionnaire to key partners and data providers. The results will be used to identify initial contacts, available data resources, and to establish requirements for data sharing. Following the initial data exploration, collection, and integration, NOAA will provide follow up in contacting potential data providers, requesting data, working out data sharing requirements and obtaining additional data where/when possible.

Following the initial round of meetings with individual Park Units, BB and NPS will meet to review progress and refine approaches.

2a) (October, 2009)
US Virgin Island - Buck Island Reef National Monument, Virgin Islands National Park, Salt River Bay National Historic Park and Ecological Reserve and Virgin Islands Coral Reef National Monuments; initial data identification and collection.

2b) (November, 2009)
Main Hawaiian Islands – Kalaupapa National Historic Park and Kaloko-Honokohau National Historic Park: initial data identification and collection & follow-up data review, additional data identification, and collection.

2c) (November, 2009)
American Samoa – National Park of American Samoa: initial data identification and collection.

2d) (December, 2009)
Guam- War-in-the Pacific National Park: initial data identification and collection.

Task 2 Products:

- Geospatial data inventory.
- Information needs identification.

Task 2 Milestones:

- Initial list of targeted datasets for each Park Unit (following initial meetings)
- Initial draft integrated datasets & relational databases (January, 2010)
- Initial information gap identification (January, 2010)
- Meeting with BB and NPS to review progress and refine approaches (January, 2010)

Task 3. Data Review and Gathering
(Estimated completion date January, 2011)
Following the initial identification, collection, and integration of geospatial data resources for each unit, BB will meet with individual park units and their partners. These meetings will allow an opportunity to review acquired information resources and the relational database structure design. These meetings will also provide an opportunity to identify additional datasets for integration and to obtain input on functionality required to provide the Park Service with greatest utility for information access.

Following the second round of meeting with individual Park Units, BB and NPS will meet to discuss project progress and potential refinements to approaches.

Task 3 Products:

- Revised information inventories

Task 3 Milestones:

- Initial presentation of integrated relational databases (February-April, 2010)
- Completed list of targeted information resources (April, 2010)

- Meet with NPS project manager to review progress and refine approaches (May, 2010)

Task 4. Geospatial Integration
(Estimated completion date: June, 2010)
NOAA will evaluate and integrate relevant spatial information into an effective spatial relational database framework designed in consultation with NPS to meet the inventory, monitoring, and management needs of each Park Service unit as well as regional and national management needs. This framework will be populated with available relevant information resources. NOAA will provide a format which can readily accept additions and/or revisions in order to develop a product which can be maintained and updated through time.

Task 4 Products:
- Spatial Information Framework
- Populated spatial relational databases for each Park Unit.

Task 5. Web Portal/Database Development
(Estimated completion date: March, 2011)
NOAA will develop a web portal and distributable formatting for dissemination of collected data for Park Service Units. NOAA and NPS will collaborate to establish a plan for data management, up-dating, dissemination, and long-term maintenance of spatial information resources. This plan will address the needs of individual park units as well as the needs of the national Inventory & Monitoring program.

Task 5 Products:
- Spatial information web portals or preferred approach to information dissemination.

Task 6. Final Product Delivery
(Estimated completion date: September, 2011)
Conduct final review, revisions and reporting for the project. Complete compilation of available information resources, information needs, and recommendations for addressing information gaps.

Task 6 Products:
- Deliver final spatial information databases for each Park Unit
- Activate spatial information web portal
- Prepare and deliver final project report –final reporting will include the identification of information gaps for each unit and recommendations for addressing these needs.

Task 6 Milestone:
- Final delivery and project completion (September, 2011)

SCHEDULE
See Figure 1 for proposed project process and schedule.

PROJECT PERIOD
September 1, 2009 through September, 2011

PROJECT TEAM
The CCMA Biogeography Branch of the National Centers for Coastal Ocean Science (NCCOS) will lead this collaborative effort in partnership with the National Park Service.

Contact Information

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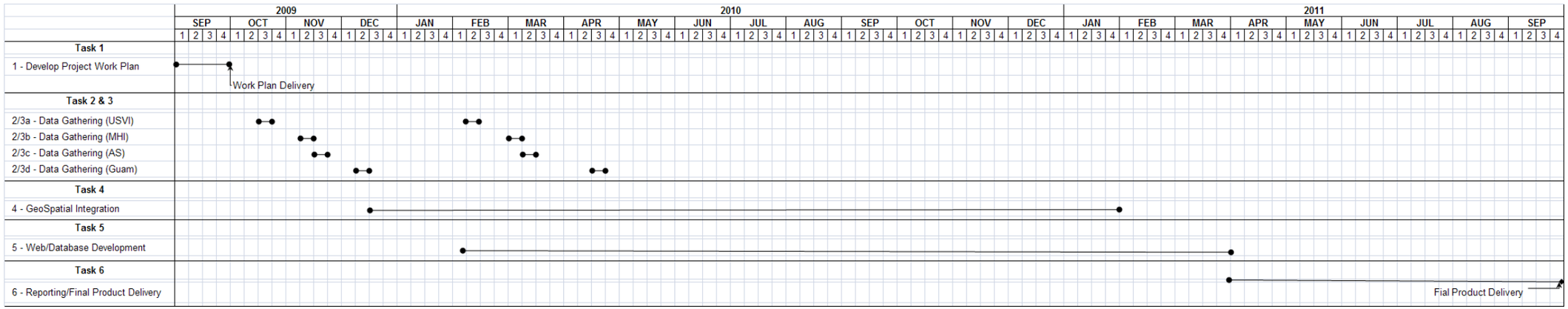
Table 1: GAP Analysis Project Schedule



NPS/NOAA Gap Analysis of Marine Ecosystem Data
Scoping Meeting Notes
9/22/09

Attendees:
Jeff Cross, OCRB
Eva DiDonato, OCRB

Mark Monaco, NOAA-BB
Tim Battista, NOAA-BB
Dan Dorfman, NOAA-BB

Matt Patterson
Rafe Boulon
Mark Capone
Peter Craig
Sallie Beavers
Ian Lundgren for Zandy Hillis-Starr
Greg Kudray
Caroline Rogers, USGS St John, US Virgin Islands

Introductions:
Introductions for NOAA Biogeography Branch, the Marine Ecosystem Data Gap Project, Biogeography staff, and Park Unit representatives.

Presentation of draft project work plan, objectives, milestones, and approaches:
BB presented the project objectives, work plan, milestones, and approaches, along with discussion of methodologies, priorities, discussion of alternatives and potential adaptations on the work plan.

Project Scoping:
All parties participated in an open discussion of the project, objectives, methods, and priorities.

The handling of historical data and/or data not available in digital format was discussed. It was determined that data recovery is not an intended project component. However, historical datasets which are noted as significant with respect to supporting monitoring and management needs within Park Units will be identified. The status of these datasets and the expected activities which would be required to access this information will be covered in the Information Gaps section of the project report.

The utilities of a web portal approach were discussed in detail. There are several advantages to web-based information dissemination, including broadly available information resources, spatial analysis capabilities which do not require advanced training in GIS (geographic information systems), and streamlined cartography development. However, several of the Park Units and their partners will not have continuous high-speed internet access. This will greatly reduce their ability to make use of a web-based map server and may interfere with the ability to download large datasets. Alternatives to a web-based approach for information dissemination were discussed. Several approaches have the potential to serve the needs of this project. These include but are not limited to: a localized map server, a portable approach such as DVD or external hardware distribution, or a set of personal map files. Each of these alternatives and others have advantages and drawbacks. Over the course of the project we will continue to work with individual Park Unit contacts to insure that their capacities, access needs, and desired utilities are incorporated in the development of product deliverables. On-going consideration and discussion will enable the project team to develop innovative solutions to address NPS needs.

The level of priority was also discussed with respect to information dissemination. All parties agreed that the highest priorities for the project were the collection of relevant spatial information, information integration, and identification of additional information needs. Information dissemination is an essential component of the project. However, it will not be the primary component for the allocation of project resources.

Obtaining data from external partners was discussed. In particular academic researchers and NGOs were mentioned as important sources for spatial information resources. In some cases, academic researchers will want to restrict the distribution of spatial information resources while conducting research and preparing publications. BB has asked Park Unit contacts to consider these information sources and where possible identify datasets currently held by external partners that are appropriate and available for inclusion in the project.

Data sensitivity was discussed. Of particular note is the need to restrict the distribution of select species which could potentially be at risk if location information is distributed.

Spatial extent of the project was discussed. The primary focus for each study area is the Park Unit. However, some information extending beyond the Unit boundaries will be important for supporting the project objectives. These include data which provides an ecological context for the Park Unit, data which enables comparative studies inside and outside of park boundaries, and datasets which are broad or regional in scale. To accommodate these needs a sliding spatial scale will be employed based on data type.

Several existing documents and data collections were identified as providing support for project needs. A variety of reports are already available for each Park Unit. Several of the units already have spatial information collections in a variety of formats. Several national datasets which have information relevant for project objectives have been identified. And the existing products available from NOAA were discussed and targeted for inclusion.

Scheduling for collaborations at individual Park Units was discussed. While the general response was one of flexibility an important exception was noted. Specifically, Paul will be leaving the National Park of American Samoa at the end of October. Because familiarity with Park Unit current information resources, external partner resources, and the context for information exchange will be critical for project success, it is anticipated that initiating collaborations and data collection for American Samoa prior to the end of October, 2009, is desirable.

Discussion of available resources from BB included spatial information resources, examples of spatial databases developed for similar projects, examples of data dissemination approaches used in similar projects, and tools which have been developed at BB to serve similar projects. Most notable among these is the Sampling Design Analysis Tool. This tool will assist managers in the development of biological and ecological monitoring schemes.

Metadata was discussed both in the context of retaining and managing metadata where it is available or can be readily developed and for data for which metadata is currently unavailable.
Metadata is available for all spatial datasets developed by NOAA-BB. Spatial data developed by other federal agencies is expected to have readily available metadata. Providing FGDC compliant metadata is a requirement for projects funded by the federal government. Most data generated under federal funding is expected to have readily available metadata. All readily available metadata will be incorporated into the spatial information framework and will be available for product users. Data without metadata will be considered on a case by case basis. This project is not intended to support data recovery. Therefore, investment in recovering metadata where it has not been provided will be limited. In general, spatial data without metadata will not be included in the spatial information framework. Exceptions can be made when datasets are considered critical to project success and metadata can readily be developed. Primarily, spatial datasets which do not have metadata will be evaluated and reported on as a component of information gaps. Where metadata is needed for project success, metadata development will be limited to information required for FGDC compliance and the information which will enable users to meet monitoring and management objectives.

Additional comments:
Brian Witcher was identified as the data manager for the Virgin Island Park Units.
Viet Doan was identified as GIS lead for Virgin Islands Park Units and is located in Miami.
Sarah Boone was identified as Paul’s successor in American Samoa.
Kelly Kosar was identified as the Data Manager for the Park Unit in Guam.
Christy is a GIS and data management representative for one or more of the units in the USVI.