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***March 31, 2011***

***ADMINISTRATION AND OPERATIONS NMFS***
***DATA AND INFORMATION MANAGEMENT***
***NMFS DATA DOCUMENTATION***

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Signed /s/ 3-17-11
Eric C. Schwaab Date
Assistant Administrator for Fisheries

# NMFS Data Documentation Procedural Directive

**Version 5.0**

## Fisheries Information Management

## Advisory Committee

## February 10, 2011

# VERSION HISTORY

| Version # | Implemented By | Revision Date | Approved By | Approval Date | Reason |
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| 1.0 | FIMAC Policy Team | September 3, 2010 | | | Draft 1.0 |
| 2.0 | FIMAC Policy Team | September 23, 2010 | | | Revised and edited draft |
| 3.0 | Ted Habermann | October 14, 2010 | | | Restructured |
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| 5.0 | Coordination Team | February 10, 2011 | NMFS General Council | February 4, 2011 | Edited |
| | | | | | |

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# I. Introduction

Data collected and produced by NMFS scientists and managers form the basis for characterizing and understanding important aspects of coastal and marine ecosystems. In a changing environment these irreproducible observations form the foundation for future generations to understand the global environment. NMFS's core data collections, and the results or products derived from these collections; need to be credible and authoritative now and in the future. High quality documentation must accompany these data and analyses, and be readily accessible and understandable, so the data will be trusted and easily integrated into the international data fabric. If detailed documentation that meets accepted standards is not available, the data will not be accepted or used. This document outlines expectations and processes for creating documentation for purpose of the NMFS Data and Information Policy Directive and ensures the future value of NMFS data collections and analytical products. This Procedural Directive is intended to be flexible to meet new requirements, especially during the first year of implementing the Data and Information Management Policy Directive as we learn how to document our data.

# II. Purpose

The NMFS Data and Information Policy Directive explicitly acknowledges the importance of documentation for NMFS datasets: "All data shall have a standard set of metadata… and an authoritative source for the data shall be identified". This Procedural Directive provides operational guidance for documenting NMFS data and information, and reiterates that data documentation shall be a required component of any data collection or analytical production effort.

# III. Authority

The NMFS Data and Information Policy Directive NMFSPD 04-111 approved in July 2010 requires that all NMFS data collections "have a standard set of metadata."[1]

# IV. Scope and Requirements

This Directive covers all NMFS data, information, products, tools, services, and data processes as described in NMFS Policy Directive NMFSPD 04-111.

Specifically:

- All NMFS data collections and products derived from these data shall be documented.

[1] NMFSPD 04-111 July 5, 2010 General Policy and Requirements Sec. E.

- Data collections funded by NMFS, and products derived from these collections that are funded by NMFS, shall be documented as a project deliverable.
- Data collections currently in progress and products derived from these data shall be documented as soon as possible but no later than the end of the calendar year in which this Directive is approved.
- Documentation for ongoing collections and products derived from these data must be updated at least annually.
- All active and planned data collection programs shall provide documentation compliant with the standards established in this Directive, as well as applicable law and other requirements, as a condition of approval and funding.
- Participants in cooperative data collection programs, such as state agencies and Interstate fisheries commissions, shall be encouraged to fully document their data contributions according to guidance established in this Directive.
- FMCs and HQ Offices will submit Implementation Plans for implementing this Directive to the FIMAC for review and comment.
- Documentation will be publicly available in NMFS metadata Catalog.

NMFS includes a wide variety of Offices and Programs that collect and steward several broad categories of data. Some of these programs and data types have special documentation requirements:

**Continuous Monitoring Data**: Data collections used to monitor commercial and recreational fisheries, such as collections of dockside biological data and vessel permitting data, are often modified to respond to changes in management requirements, collection technologies and regulations. Documentation of these collections should be updated whenever a change in collection protocols occurs, or annually at a minimum. Documentation of these data shall include the primary documentation associated with the collection as well as documentation describing the method of summarization used to protect proprietary information.

**Research Data**: Research data collected episodically shall have documentation that include the experimental design, collection protocols, and data parameters. These records shall be created as part of the data collection proposal prior to initiation of the collection. The proposal includes the basic documentation describing the project (i.e., who, what, when, and where). This type of documentation is frequently found in the methodology section of scientific publications. More detailed data documentation shall be provided upon completion of the collection or whenever there are changes in the overall design or scope of the research.

**Historical Data**: All FMCs should initiate documentation of existing historical collections immediately to avoid further loss of pertinent information about the collections. Documentation shall include use restrictions and guidance on quality and fitness for use.

**Software Tools:** If data sets are made available with tools (services or application software), the tools need to be identified in the discovery metadata and documented independently. The metadata must provide enough information for users to find, access, and use the tools, as appropriate.

# V. Implementation Approach

Implementation of this procedural directive will be performed as specified by NMFS Regional Offices, Science Centers, and HQ Offices in their Implementation Plans, outlined in Appendix 4 of this document. The SCs, RAs and HQ ODs will submit the plans according to the scheduled outline below. They will be submitted to the FIMAC, which will review and provide comments to the FMC Information Management Coordinator.

This section addresses specifics to be considered when developing the plans.

## a. Types of Documentation

Documentation content standards include elements and associated structures designed to address a wide variety of documentation requirements for a wide variety of datasets. These generic elements can be divided into groups depending on the requirements that they are designed to address. In this Directive we consider three groups: Inventory, Discovery, and Understanding.

Inventory metadata is the starting point for identifying the datasets. Inventory includes a unique ID, title, date, and abstract for each data set. They are mandatory for all NMFS data and products.

Discovery Metadata is generally used to describe datasets in a catalog so that they can be discovered by users. The metadata address the following questions:

- Does a dataset on a specific topic exist ('what')?
- For a specific place ('where')?
- For a specific date or period ('when')?
- Where can I obtain the data and who can I ask about the data ('who')?

Discovery metadata allows users to search and find NMFS data holdings using text, keyword, temporal, and spatial queries, and to locate a contact person for the data they discover. This type of metadata is shared with major discovery portals (e.g., Geospatial One-Stop, data.gov, GEOSS, etc.). Inventory and discovery documentation shall be used to populate the NMFS Metadata Catalog.

Understanding metadata is the most extensive of the types considered here. These metadata enable users to display, analyze, and compare NMFS data in web-based and desktop tools, and contain

information about software parameters needed for direct access and online display and query of data. They:

- Provide information about the quality and accuracy of data sets, the sources used to create them, collection methodologies, processing history, and archival procedures required for users to understand and fully utilize NMFS data, as well as to trust the decisions made using those data.
- Supply adequate descriptions of the data fields and the quality and geographic extent of datasets so potential users of data can assess their suitability for other purposes.
- Provide projection specifications, map scale, exchange format, compression type, and data format to facilitate data transfers and enable coherent use by other organizations.
- Allow users to determine whether they want to access the raw or derived data asset, and to understand the potential limitations of data usage.
- Support the preparation, publication, and future assessment of scientific reports.
- Ensure that data shared inside and outside NMFS are readily and independently understandable.

It is essential that derived and analytical products and tools also be documented with adequate understanding metadata. All documentation needs to be kept up to date, since many NMFS data sets are dynamic, with new records added, existing records updated, and data stewardship responsibilities possibly changing.

## b. Roles and Responsibilities

Successful documentation efforts require input from a variety of groups, each with specific experience and knowledge. The first group manages the effort. All program managers and program staff with responsibilities for data collections have important contributions to make to delivering well documented primary and derived data sets to NMFS users all over the world. These responsibilities should be reflected in performance plans using an element that requires documentation of all existing and proposed data collections in compliance with the requirements outlined in this Directive. A breakdown of various levels of responsibility for NMFS metadata creation and management follows.

**NMFS Information Architect** – Responsible for coordinating the implementation of this policy throughout NMFS.

**Information Management Coordinators** – Responsible for coordinating and overseeing data asset documentation efforts at their NMFS offices.

**Office Administrators** (including Regional Administrators, Science and Research Directors, and Office Directors at NMFS Headquarters) – Responsible for compliance with this Procedural Directive including certifying that their office is in compliance with the requirements of this Directive or that they are making measurable progress towards compliance as per their Metadata Implementation Plan.

**Program Managers** – Responsibilities include making all staff aware of this policy and its requirements, implementing procedures to incorporate data documentation into normal workflow process, and to keep all metadata accurate, thorough, and current.

The actions required for success in the documentation effort depend on collaboration between several other groups:

**Data Catalog Librarians** are responsible for managing the metadata assets within the NMFS Metadata Catalog. They have experience with the tools and practices used throughout the NMFS community.

**Data Owners** are generally NMFS scientists, resource managers, or other programmatic persons involved with acquiring data to be documented. They are responsible for providing the scientific or programmatic metadata. Data Owners are the foundation of the documentation process and understand the sometimes arcane details that affect the data. They also provide the original source materials (either physical or mental) for the documentation.

**Users** are the group that must be able to understand the data they receive and to confidently apply them to problems they are trying to solve. They are the "rubber on the road" and their capability to understand and use the data is the metric used to characterize the success of the documentation process. These people are referred to as the Designated Community in the Open Archival Information System Reference Model (OAIS-RM). This group provides real-world experience using the observations, data, and insight into documentation requirements derived from that experience.

## c. Phases of Documentation Creation

The work of developing and publishing the documentation needed for the data assets and products of any office's science or management programs can be divided into four consecutive phases – inventory, collection, entry, and publication. The first phase is to complete a comprehensive inventory that includes, at a minimum, inventory documentation for all data assets. Once scientists and managers have identified and located all of their assets, they must collect metadata that documents how to discover, access, use, and understand them. In the collection phase, it will be important to involve all those with expert knowledge of how the data were collected, processed, and/or stored. This phase involves all of the team members described above. Metadata can be recorded by data owners involved directly in the collection programs, or they can be gathered by a data steward through interviews or standard metadata collection forms.

After the metadata content is collected, it must be structured into a standard form. Documentation may be created using any tool capable of producing FGDC or ISO 19139 compliant XML files that can be

imported into the NMFS Metadata Catalog. The Information Portal (InPort)[2] repository and the Metadata Enterprise Resource Management Aid (MERMaid)[3] provide Web Interfaces with extensive help for structuring metadata. Many desktop metadata tools, such as METAVIST[4] , CatMDEdit[5], or ArcCatalog, and XML editors, such as XMLSpy, or Oxygen, may also work for particular groups. If tools other than InPort are used for metadata creation, the XML files output by those tools will need to be imported into the NMFS Metadata Catalog using inPort. This metadata entry phase should be accomplished through a collaborative effort that involves data technicians with expertise in the use of InPort or any of the alternative tools and managers responsible for the data collections and data products.

The final phase in the process is the actual publication of the metadata to make it available to all interested parties. Exporting the metadata into XML files and making those files available on the web is a straightforward mechanism for addressing this requirement. Publication of the metadata is a mandatory requirement of this procedural directive and it should be a primary objective and performance metric for all scientists and managers.

### d. Tracking Progress

Progress of Headquarters Offices, Fisheries Science Centers, and Regional Offices on implementing this Procedural Directive will be assessed through a rubric which will be developed by the FIMAC Catalog Team. The rubric will provide a score for each data set. The rubric will focus on the phases, described above, that can be applied to each of the documentation types as consecutive tasks. An example of a rubric may be found at http://www.ngdc.noaa.gov/metadata/published/iso/NMFS/SEFSC/1list.html. The inventory documentation is simple enough (ID, title, date, and abstract) to be addressed as a single task. It may be helpful to approach creating more complete Discovery and Understanding documentation using a series of smaller steps or spirals. This approach is similar to the Spiral Development approach that has been used successfully in software engineering projects. Potential spirals are outlined below and described in more detail at https://geo-ide.noaa.gov/wiki/index.php?title=Documentation_Spirals.

The chair of Fisheries Information Management Advisory Committee shall report annually to the Leadership Council on status of data collection documentation by each FMC.

### e. Schedule

[2] https://inport.nmfs.noaa.gov
[3] http://www.ncddc.noaa.gov/activities/mermaid/
[4] http://metavist.djames.net
[5] http://catmdedit.sourceforge.net/

Each FMC shall include in their Implementation Plan a detailed schedule that adheres to the deadlines specified below. This schedule was developed to meet the requirements in the President's December 2009 directive on Open Government, and the requirements for information for coastal and marine spatial planning the National Research Board recommendations on management of environmental data in NOAA[6].

| **Deliverable** | **Due Date** |
|---|---|
| Draft Implementation Plans due to FIMAC | One month after NMFS Data Stewardship Workshop |
| Reviews of Draft Implementation Plans completed by FIMAC | One month after submission |
| Final Implementation Plans Due to FIMAC | One month after FIMAC comments received |
| Complete Inventory | ASAP |
| Complete documentation for all on-going or funded collections | One year after implementation plans finalized |
| Publish Documentation for all on-going or funded collections | One month after completion |
| Update documentation of all on-going or funded collections | As needed or at least annually |
| Documentation of historic data collections | Within two years for completed collections |

# VI. Implementation Plan

Implementation plans to be submitted by each Regional Office, Science Center, and HQ office are discussed in the Appendix 4 , Implementation Plan Template.

# VII. Procedural Directive Review and Revision

This procedure directive shall be reviewed annually by the NMFS Information Architect and updated if necessary by the FIMAC or subcommittee thereof. Significant changes shall be presented to the Leadership Council for review and approval.

[6] National Academy of Sciences, 2008. Environmental Data Management at NOAA: Archiving, Stewardship, and Access. Available at http://www.nap.edu/catalog.php?record_id=12017

# Appendix 1. Definition of Terms[7]

- **Attribute** – A defined characteristic of an entity type (e.g. acres).
- **Clearinghouse** – A facility for advertising and distributing datasets. Metadata describing available datasets is made available to a chosen audience (i.e., the general public, partner agencies, etc.). Packaged datasets (i.e., diskettes, CDs, etc.) or online retrieval of selected subsets of data are distributed within security guidelines. There may be a charge for obtaining datasets.
- **Data** – A value or set of values representing a specific concept or concepts. The meaning of data can vary according to context. In this policy, the term "data" refers specifically to the alphanumeric values that are recorded as a result of a collection program or experiment, and to derived data that are the result of analysis or other synthesis. Data may be collected by NMFS staff, through contracts or grants, or in cooperation with the states and other partners. Data are not limited to recorded observations and measurements of the physical, chemical, biological, geological, or geophysical properties or conditions of the environment. Data may also be correlative data with related documentation or metadata, audio recordings, images, maps, photographs, or reports, and may include fishery-dependent and fishery-independent data, regulatory data, and other non-environmental types of data. (from NMFS Data and Information Policy Directive)
- **Data Management** – Data Management is the function of taking responsibility for data and the processes that support it. It focuses on the strategic planning and data methodologies for meeting program delivery goals. In particular, data management aims at managing data as a corporate asset
- **Data Asset** – Any entity that makes data usable. For example, a database is a data asset that includes data records. A data asset may be a system or application output file, database, document, or web page. A data asset also includes a service that may be provided to access data from an application. For example, a service that returns individual records from a database would be a data asset. Similarly, a website that returns data in response to specific queries (e.g., www.weather.com) would be a data asset. A human, system, or application may create a data asset. (from NMFS Data and Information Policy Directive)
- **Data Steward** – The individual who is responsible for establishing and maintaining the quality, integrity, documentation, and preservation of the data asset (from NMFS Data and Information Policy Directive). The data steward establishes business rules, defines data elements, identifies valid data values, establishes certification standards, and ensures the completeness and availability of the data. The steward ensures that geospatial data are documented according to agency and federal metadata standards.
- **Documentation –** The entirety of information describing the characteristics of data, the instrumentation used to collect it, and methods use to process and assess quality, and results derived from it. Documentation can be metadata, scientific papers and reports,

[7] *U.S. Department of Agriculture 2003. Draft Policy Geospatial Metadata. http://www.itc.nrcs.usda.gov/scdm/docs/SPG-GeospatialMetadata1.pdf*

information about data, and descriptive information about an entity's data, data activities, systems, and holdings. Common uses for documentation include providing the context of the data resource, managing its lifecycle, and extending it to new uses.

- **Federal Geographic Data Committee (FGDC) Full Compliance Metadata** – Metadata containing all mandatory, mandatory-if applicable, and optional elements that may apply to a dataset. Optional metadata elements are to be determined by the data steward or data producer and included if the element is recognized as applicable.
- **Metadata** - Information describing the characteristics of data. Metadata can be data, information about data, descriptive information about an entity's data, data activities, systems, and holdings. Common uses for metadata include providing the context of the data resource, managing its lifecycle, and extending it to new uses. An example of metadata is the external description of an audio file specifying the artist that created it, when it was created, the length of playtime, and its genre of music. The purpose of metadata is to manage and improve the use of data and thereby turn it into a strategic asset.(from NMFS Data and Information Policy Directive .
- **NMFS Metadata Catalog** – the repository for documentation of data assets, NMFS metadata repository is the InPort Oracle database. This is distinct from the InPort web interface to the repository which may or may not be used for to enter and update metadata in the catalog.
- **Publish** – To change the status of documentation in the NMFS metadata catalog from unpublished to published. Documentation in the repository may be unpublished, published internal to NMFS, or published publically. If it is published as public, it is available to the public and can be accessed through InPort to non-registered InPort Users.

# Appendix 2. Metadata Standards

The purpose of data documentation is to ensure that users can discover, use, and understand data and information. Achieving this goal across a diverse community of data producers and users is difficult and data comparisons are essentially impossible if documentation for each dataset is written and organized in different ways. Many communities address this problem by developing conventions and standards that enable transparent access to comprehensible documentation. These standards exist at two levels: content standards describe what elements and structures users can expect to find in documentation and the meaning of those elements; and representation standards control how that content is arranged, formatted, and read by users and machines. This Directive outlines a specific content standard and a general representation approach for NMFS documentation.

A variety of standards exist that provide detailed content models for the documentation required to answer these questions. The most comprehensive and broadly applicable are the ISO standards following the ISO 19139 Geographic information – Metadata – XML schema implementation. This includes the ISO 19115 Geographic information – Metadata as well as the ISO 19115-2 Geographic information – Metadata Part 2: Extensions for imagery and gridded data. The NOAA Metadata Transform Working group is currently working on products to transition from the FGDC Standards (such as the CSDGM, RSE, and Bio) to the ISO Standards, including the North American Profile (NAP) of ISO. These products include transforms to automate the creation of ISO compliant metadata from existing FGDC metadata, ISO training materials, and recommended Best Practices. Once this process is completed, the new set of standards will be adopted as the official standard for NMFS metadata.

Extensible Markup Language **(**XML) has become the universal language for organizing and representing metadata content. NMFS metadata must be available in well-formed XML documents that are valid with respect to a published and openly available XML schema. The ISO 19139 standard provides an open and available XML representation for the content included in ISO 19115. It is the preferred XML representation for NMFS metadata. If a different schema is used for some documentation, an XSL style sheet must be provided that translates between that schema and 19139. If elements exist in NMFS metadata that are outside of the 19115 standards, they must be described using the 19115 extension mechanism.

# Appendix 3. Authorities

**Spatial Data Infrastructure**: President Clinton signed Executive Order 12906, Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure dated April 11, 1994. Section 3, Development of a National Geospatial Data Clearinghouse, paragraph (b) requires that: " ... each agency shall document all new geospatial data it collects or produces, either directly or indirectly, using the standard under development by the FGDC, and make that standardized documentation electronically accessible to the Clearinghouse network." http://govinfo.library.unt.edu/npr/library/direct/orders/20fa.html

**Obama Memorandum on Open Government** – This memorandum was issued on January 21, 2009 and addressed the need for transparency, public participation, and collaboration government (http://www.gwu.edu/~nsarchiv/news/20090121/2009_transparency_memo.pdf). In a follow up memorandum dated December 8, 2009, the Director of Management and Budget expanded on the administration's requirements for meeting the goal of creating a more open government in memorandum to all heads of executive departments and agencies (http://www.whitehouse.gov/sites/default/files/omb/assets/memoranda_2010/m10-06.pdf)

**OMB Circular A-130** – Management of Federal Information Resources establishes policy for the management of Federal information resources. "Information resources" includes both government information and information technology.

**Executive Order 12906** – This Executive Order was signed in 1994 by President Clinton, and states that "All Federal agencies must document all Geospatial data that they collect or produce, either directly or indirectly, using the FGDC CSDGM, and to make that standardized documentation electronically accessible to the FGDC Clearinghouse network."

**OMB Circular No. A-16** – This Circular provides direction for federal agencies that produce, maintain or use spatial data either directly or indirectly in the fulfillment of their mission. This Circular establishes a coordinated approach to electronically develop the National Spatial Data Infrastructure and establishes the Federal Geographic Data Committee (FGDC).

**Data Quality Act (Section 515)** – Section 515 directs OMB to issue government-wide guidelines that "provide policy and procedural guidance to Federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by Federal agencies."

**NOAA Information Quality Guidelines** – In Fiscal Year 2001, Section 515 of Public Law 106-554 was enacted to ensure Federal information quality. The "*NOAA Information Quality Guidelines*" document implements Section 515 and fulfills the OMB and DOC information quality guidelines. It may be revised periodically, based on experience, evolving requirements of the National Oceanic and Atmospheric Administration (NOAA) and concerns expressed by the public.

Covered information disseminated by NOAA will comply with all applicable OMB, DOC, and (these) NOAA Information Quality Guidelines.

**FGDC Content Standard for Digital Geospatial Metadata (CSDGM)** – The objectives of the FGDC CSDGM are to provide a common set of terminology and definitions for the documentation of digital geospatial data as required by OMB and the FGDC.

**Geospatial One-Stop** – Geospatial One-Stop (GOS) is a geographic information portal, also known as geodata.gov, that serves as a public gateway for improving access to geospatial information and data under the Geospatial One-Stop E-Government initiative.

## Appendix 4. Implementation Plan Template

# Implementation Plan

# For Documentation of NMFS Data Assets

# Document Control

## Document History

| Version | Issue Date | Changes |
|---|---|---|
| *1.0* | *xx, yy, 2011* | *Template* |
| | | |
| | | |
| | | |

## Document Approvals

| Role | Name | Signature | Date |
|---|---|---|---|
| Project Sponsor | | | |
| Project Review Group | | | |
| Project Manager | | | |
| Project Office Manager<br><br>*(if applicable)* | | | |

# Table of Contents

# I. Template Guide

**What is an Implementation Plan?**

The Implementation Plan is the central document by which each FMC describes how the FMC will meet the requirements of the Data Documentation Procedural Directive. The Implementation Plan may include a more detailed Project Plan that lists the activities, tasks and resources required to complete the project. A typical Project Plan includes:

- A description of the major phases undertaken to meet the Directive's requirements
- A schedule of the activities, tasks, durations, dependencies, resources and timeframes
- A listing of the assumptions and constraints identified during the planning process.

**How to use this template**

This document provides a guide on the topics usually included in an Implementation Plan and supporting Project Plans. Sections may be added, removed or redefined to meet the particular circumstances at each FMC. Example tables, diagrams and charts have been added (where suitable) to provide further guidance on how to complete each relevant section.

# I. Scope

The scope of this plan is to identify the milestones, resources, staffing needs and shortcomings for implementing the *Data Documentation Procedural Directive* for all data assets.

# II. Milestones

A *milestone* is "a major event in the project" and represents the completion of a set of activities. Milestones should be aligned with the schedule in the Procedural Directive. Intermediate milestones may be useful in measuring progress towards meeting the delivery schedule.

Please include a detailed schedule of milestones for implementation and maintenance including the following components

- Completion of implementation plan
- Completion of data collection inventory
- Prioritized list of data collections
- Modification of Performance Plans

List and describe the key project milestones within the following table:

| Milestone | Description | Delivery Date |
|---|---|---|
| | | |
| | | |

# III. Approach

## A. Activities & Tasks

Provide a detailed work breakdown structure or schedule of activities and tasks that will ensure that the schedule in the Procedure Directive is met.

## B. Staffing Plan

What are the staffing resources required to implement the data document PD?

i. How many InPort librarians?
ii. How will you identify an InPort librarian, metadata author, and a data steward?
iii. How will you train the librarians, metadata author, data stewards?
iv. How will you train the people providing the documentation?

## C. Resource Requirements

For each task identified, list the resources required to complete the task.

## D. Schedules

Provide a detailed schedule for meeting the requirements of the Procedural Directive.

List any key project dependencies identified by completing the following table:

| Activity | Predecessor | Duration |
|---|---|---|
| | | |
| | | |
| | | |

## E. Assumptions

List any planning assumptions made. For example:

It is assumed that:

- The project will not change in scope
- The resources identified will be available upon request

- Approved funding will be available upon request.

### F. Constraints

List any planning constraints identified. For example:

- The project must operate within the funding and resource allocations approved
- The project team must deliver the software with no requirement for additional hardware
- Staff must complete the project within normal working hours.

## III. Risks and Mitigation Plan

This section provides suggested guidance for addressing risks in implementing the plan.

Risks that are identified will be communicated during weekly meetings and documented in the risk management log.

Risks are assessed to determine the severity level. The severity is determined using two factors: the probability of occurrence and the impact of occurrence. These two factors are combined to define an overall severity level for the risk. Risks are rated as High, Medium, or Low Severity.

After risks have been assessed, plans must be made to mitigate the risks in order to prevent the issue from occurring or minimizing the impact of the risk. The following criteria and activities will be considered when creating the mitigation plans:

- What action(s) can we take to minimize the risk?
- Whom or what is contributing to this risk?
- Who or at can minimize the risk?
- Is action required now or later?
- When will this risk no longer be valid?

The mitigation strategy will be documented in monthly status reports sent to NOAA Fisheries. Once mitigation strategies are documented and agreed upon, the Project Manager will monitor risks as follows:

- Low Severity Risks – monitor and assess risk monthly. Communicate any change to risk status in monthly status reports.
- Medium Severity Risks – monitor bi-weekly risk and assess monthly. Communicate any change to risk status in monthly status reports.
- High Severity Risks – monitor risk weekly and assess monthly. Communicate any change to risk status in weekly status meetings and monthly status reports.

## A. Potential Obstacles to Implementation

Please consider the following categories

i. Resources
ii. Knowledge
iii. Getting information from scientists
iv. Internal processes
v. Total data life cycle

## B. Mitigation of Obstacles

Please identify mitigation strategies to minimize the potential impact of the above obstacles

## Consequences

Please identify the consequences of not meeting the above milestones

## C. Example of a Risk Mitigation Plan

| | | | | |
|---|---|---|---|---|
| Strategic | Loss of corporate commitment in regions | High | Low | Develop strong support by NMFS Leadership |
| Schedule | Slippage of schedule due to delays in funding | High | High | Use internal staff resources to gather regional information for use by contract staff in developing final Plan |
| Scope | Discovery process reveals additional collection programs that need to be documented and included in Plan | High | Medium | Develop a flexible implementation plan that could add collection programs as they are identified and the need to provide e-reporting capabilities arise. |
| Scope | Requirements increase as a result of changing Agency needs | High | High | Develop a phased approach to overall project and get agreement to approach by all participants |
| Costs | Costs increase due … | Medium | Medium | Seek alternatives to … |
| Project Resources | Budget reductions/cuts beyond FY 10 | High | Medium | Reduce or eliminate activities |
| Staff Resources | Agency staff cannot participate due to over commitments | Medium | High | Provide resources to reduce routine work burden or conduct work via contract |

## D. Incentives

Please describe the incentives that will be used to encourage compliance with the Procedural Directive to ensure data documentation success.