



NOAA

Integrated Ocean Observing System (IOOS) Program Office

Data Integration Framework (DIF)

Project Charter

Version 1.0

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1 Purpose of the Document

1.1 Purpose

This document describes the process and roles and responsibilities of NOAA's IOOS Program Data Integration Framework Project technical and management entities and how the project will operate. Modifications may be necessary as the project evolves.

2 Background of the DIF Project

2.1 Background

In December, 2006, the NOAA Executive Council and NOAA Executive Panel approved the formation of NOAA's IOOS Program within the National Ocean Service. This included approval for the IOOS Program to develop a Data Integration Framework (DIF) project with a nominal duration of three years, from February 1, 2007 to February 1, 2010. The DIF is limited in scope and scale to the integration of data from sources of five (5) core IOOS variables to address the requirements of four (4) ocean decision-support tools that span multiple NOAA mission goals. The DIF project objectives are:

- Validate the premise that integrated data has value that can be measured. This premise will be tested using 5 IOOS core ocean variables, from NOAA and non-NOAA sources, and 4 specific NOAA decision-support tools/models.
- Utilizing the principles of IOOS Data Management and Communications (DMAC), develop a methodology to improve upon existing ocean data integration efforts that will facilitate flexibility and extensibility to other variables, systems and decision-support tools.
- Achieve improved integration of selected data sets by identifying, adopting, and adapting community-developed standards for data content, metadata, quality control, and transport and deploying these standards at selected data sources serving the 4 decision-support tools.
- Maintain the DIF for a period of three years, from project inception, to conduct adequate performance monitoring and assessment for evaluating and measuring progress.
- Provide a set of lessons learned, draft standards, and other outputs that will inform the longer-term strategic ocean data integration efforts to leverage the DIF experience for the benefit of NOAA and the Nation.

Existing internal (NOAA) and external (non-NOAA) data integration and management capabilities will be leveraged to develop a methodology that will provide enhanced data access and data management services to four designated NOAA decision-support tools. To design, build and implement the DIF, the NOAA IOOS Program will utilize existing capacity and expertise resident in NOAA. As needed, and subject to budget availability, resources will be provided to support these contributors as they help develop the DIF. Project teams and affiliated working groups composed of cross Line Office and Goal Team representatives will design, carry out, or direct the technical work and building of DIF components, and will be involved in the testing and evaluation of the DIF. The National Weather Service's System Engineering Center (SEC) is providing support to the NOAA IOOS Program, the project teams, and the working groups. Recently after a joint meeting of the NOAA Data Management Integration Team and DIF project management and staff, the DIF was proposed to be a pilot project of NOAA's Global Earth Observation Integrated Data Environment (GEO-IDE) – see http://www.nosc.noaa.gov/dmc/swg/swg_docs.html for the current GEO-IDE CONOPS that is due to be updated. Therefore, the DIF will not only be consistent with, but will support the objectives of NOAA's target architecture. The DIF will follow NOAA IT security and data management guidelines.

Throughout the duration of the project, DIF progress and plans will be shared with appropriate NOAA Councils and other relevant NOAA organizations as well as with other Federal and non-

federal IOOS partners and participants. This plan and other major project documents will be made available on the NOAA IOOS Program Office web site at <http://ioos.noaa.gov/>. The NOAA IOOS Program Office, guided by input from the project teams, will track the progress and plans of similar efforts within the ocean community to assure compatibility and contribution of the DIF to the national IOOS to the maximum extent possible. During the project period, documentation will be prepared by the NOAA IOOS Program Office, based on project results, lessons learned, best practices, etc., to support an analysis of alternatives. This analysis is expected to inform NOAA management in deciding whether at the end of the project period the DIF effort should continue and expand, should be discontinued, and if discontinued, if some other option for data integration and management should be pursued.

3 Scope of the DIF Project

3.1 Scope

The DIF is focused on the integration of data from selected sources of five core IOOS variables. The requirements of four ocean decision-support tools operated within NOAA will be used to guide the design and development of the DIF, and the value and success of the resulting integration will be measured and evaluated by its ability to enhance the efficiency and/ or effectiveness of these tools. The core IOOS variables are **seawater temperature, salinity, currents, ocean color, and sea/water level** and the decision-support tools are for **Coastal Inundation, Hurricane Intensity, Integrated Ecosystem Assessments, and Harmful Algal Blooms**. The variables were selected based on the number of readily available data sources and their anticipated relevance to the decision-support tools. The four decision-support tools were selected because they address critical environmental issues aligned with NOAA mission goals. Integration within the DIF means improving the way the selected sources of the five variables are made available to the four decision-support tools through the consistent application of community-based standards and protocols, such as for data content and transport. By adopting, adapting, or expanding existing standards and other capacities and capabilities for data management services, or as a last resort developing new ones, the DIF will formalize a standards-based common data sharing infrastructure that is expected to facilitate and improve data integration of ocean variables across NOAA Line Offices. Sources of the five core variables will be selected based on the requirements of the decision-support tools, and are expected to include a variety of NOAA and some non-NOAA observation systems and platforms. Additional variables and systems may be included, if feasible, given timelines and budget constraints. Throughout the project period, all phases of the DIF will be designed, developed, built and tested to assure that the project objectives are being addressed.

The NOAA IOOS Program Office anticipates that the standards, best practices, and other protocols that are selected to establish the DIF project will be of use to other IOOS partners. By employing existing community standards to design and build the DIF, it is expected that the common data sharing infrastructure that is developed will be extensible to not only additional variables, data sources, and systems, but to the larger IOOS community. To ensure this, the DIF will use the above noted philosophy of identifying, adopting and adapting existing community-based data standards and protocols, as outlined in the National Office for Integrated and Sustained Ocean Observations' (Ocean.US), DMAC plan published in March, 2005 (<http://dmac.ocean.us/index.jsp>). Guidance provided by the NOAA Data Management and Integration Team (DMIT) (http://www.nosc.noaa.gov/dmc/swg/swg_docs.html) concerning data management functions and standards will also be considered. An additional product of the DIF that speaks to this extensibility will be the submission of the identified DIF standards to the Ocean.US DMAC standards process (<http://ioosdmac.fedwork.org>) as well as to the NOAA standards process managed by the DMIT (https://www.nosc.noaa.gov/dmc/swg/wiki/index.php?title=NOAA_GEO-IDE_Standards_Process).

4 Project Management Organization

Management structure of the DIF project is depicted in Figure 1. The DIF project is the responsibility of and is managed by the Deputy Director, NOAA IOOS Program Office, under the oversight of the Director, NOAA IOOS Program Office. Widely accepted project management techniques and systems engineering concepts will be used by the DIF Project Manager to plan, manage and track progress of the overall DIF effort. The DIF Master Project Plan and more detailed Project Management Plan are the guiding documents used by the DIF Project Manager. Within the NOAA Line Office structure, the NOAA IOOS Program Office is located in the National Ocean Service (NOS) and within the NOAA Goal Team Structure (not depicted in Figure 1) it is located in the Modeling and Observing System Infrastructure Sub-Goal within the Mission Support Goal.

In addition to the NOAA IOOS Program Office staff and supporting contractors, the key project planning and implementation entities are two project teams - the Integrated Products Team (IPT) and the Project Review Team (PRT). Task-oriented working groups within the IPT are chartered when necessary to address specific elements of the DIF development and deployment. The IPT and working groups provide the technical expertise and in kind support to plan, design, build, test and evaluate the DIF. The efforts of the IPT will be augmented by resources provided by the NOAA IOOS Program Office, as the budget allows. The PRT provides management oversight and guidance to the DIF Project Manager throughout the project duration. Where necessary, some project tasks will be executed by contract resources that will be directed by the IPT, the working group(s), or NOAA IOOS Program Office staff. These contract resources include system engineering support from the National Weather Service Systems Engineering Center (NWS SEC) and others as appropriate.

NOAA councils such as the NOAA Ocean Council and NOAA Observing System Council, along with the Chief Information Office Council, will be kept informed of project status through formal briefings, as well as other informal opportunities. It is expected that they will provide advice and counsel to the NOAA IOOS Program Director and NOAA IOOS Program Deputy/ DIF Project Manager. Other entities that have an interest in the DIF project include the Interagency Working Group on Ocean Observations, Ocean.US, the National Federation of Regional Associations (NFRA), as well as other ocean community forums. NOAA IOOS Program management and staff will leverage every opportunity to share project updates and discuss connections with related activities with these groups. Some examples of specific venues are noted in section 2.1.3 External Interfaces and Communications.

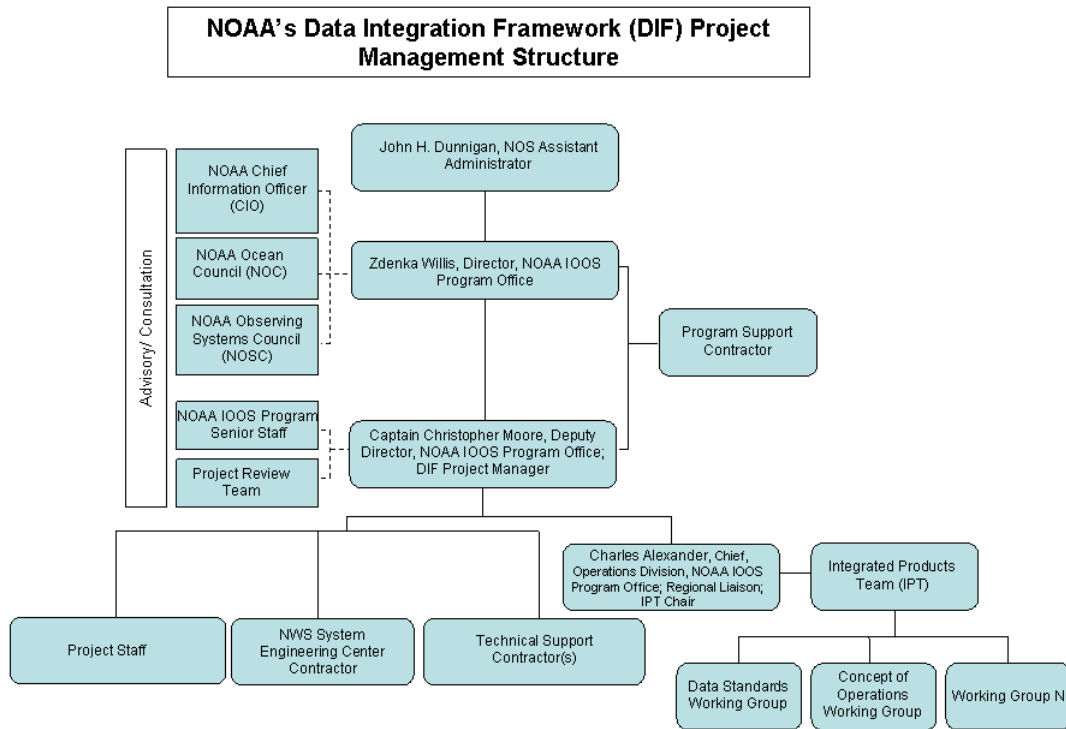


Figure 1. DIF Project Management Diagram

4.1 Roles and Responsibilities of DIF Project Participants

Roles and responsibilities of DIF project participants are found in Table 3 below:

Table 1. DIF Project Roles and Responsibilities

Role	Responsibility
NOS Assistant Administrator	Provides high-level strategic oversight, direction, guidance, and advocacy support, internally and externally, for NOAA IOOS Program
Director, NOAA IOOS Program Office	Provides ongoing strategic review and support for DIF project; communicates status to and input from NOS AA and NOAA Councils as appropriate. Approves membership of the PRT.

Role	Responsibility
Deputy Director, NOAA IOOS Program Office	Serves as DIF Project Manager; provides direction and leadership for the DIF project. Approves and/or modifies membership of IPT and working groups as appropriate. Leads the Project Review Team (PRT). Provides funding for IPT and IPT working groups subject to NOAA IOOS Program Office budget constraints. Defines DIF project goals, plans, and objectives. Manages progress towards project goals
Chief, Operations Division /Regional Association (RA) Liaison, NOAA IOOS Program Office	Forms, leads and chairs the Integrated Products Team (IPT). Forms or dissolves working groups as necessary to accomplish project tasks. Keeps DIF Project Manager informed about DIF progress through plans, technical documents or other outputs. Provides coordination and communication of DIF status to the National Federation of Regional Associations and Regional Associations.
NOAA IOOS Program Office Senior staff	Contributes strategic and policy inputs to the DIF Project Manager and chair of the IPT. Communicates DIF plans to NOAA IOOS Program Office constituencies.
DIF Project Review Team (PRT)	Provides critical review, inputs and recommendations from a policy, strategic, and organizational view to the DIF Project Manager at key decision points during the DIF project life cycle. Composed of Line Office or Goal Team senior level personnel from the NOAA IOOS Program, relevant councils, offices and data management groups within NOAA who are knowledgeable in policy and budget matters and related data management projects, or who are responsible for data management and/or data processing areas of expertise.
DIF Integrated Products Team (IPT)	Provides overall expertise and inputs for all key DIF documentation, planning and implementation steps. Through the working groups that are composed primarily of IPT members and supporting contractor support, executes the work of planning, building, testing and evaluating the DIF. Composed of line office or Goal Team personnel associated with the four decision-support tools, representatives of data sources of the five core IOOS variables, data management experts, and advisors with specialized knowledge of key aspects of data integration/management and other relevant subject matter. Reviews Working Group plans and outputs, other DIF project outputs and provide inputs and concurrence as appropriate. Members may serve on one or more working groups.

Role	Responsibility
IPT Working Groups	Technical experts who determine and execute deliverables or set of tasks as defined by working group plans, DIF Project Plan or Project Management Plan. Typically composed of IPT members but may include non-IPT expertise; typically chaired by an IPT member. Responsible for the more technical aspects of developing project documentation, technical documentation, software code or other DIF project outputs, i.e., building the DIF.
DIF Project Staff	Provides technical expertise and administrative support to the full DIF project process. Serves as the communications team that coordinates DIF project elements and provides guidance and support for the underlying infrastructure of the DIF project. Supports the DIF Project Manager, the IPT, PRT and Working Groups with preparation of materials, briefings and various administrative details. Includes the IOOS project staff, NWS SEC contractor and associated Contracting Officers Technical Representative (COTR), and technical support contractors.
NWS Systems Engineering Center Contract Support	Provides systems engineering support to the DIF Project Manager, DIF Project Staff, IPT and working groups. Includes the Contracting Officer's Technical Representative from the NWS SEC.
Program Support Contractor	Provides overall NOAA IOOS Program Office management support to the DIF Project Manager and to the NOAA IOOS Program Director
Technical Support Contractor	Provides programming, IT, and technical support to the DIF Project Staff, PRT and IPT as needed
NOAA Councils	Provide NOAA governance and policy inputs, recommendations and advice to the DIF Project Manager and Director, NOAA IOOS Program Office, as appropriate.

4.2 Operational Processes

The DIF Project Plan guides the overall efforts of all project participants. A DIF Project Management Plan will be created and managed by the DIF Project Manager to identify the key project milestones, the more detailed implementation steps and tasks associated with these milestones, and designated responsibilities. The DIF Project Manager will also utilize the IPT working group work plans and technical documents to update the DIF Project Management Plan and to provide inputs into the NOAA IOOS Program Office budget and planning processes. The IPT is formed and chaired by the Chief, Operations Division, NOAA IOOS Program Office, under the direction of the DIF Project Manager. Working Groups and associated chairpersons are formed from the IPT by the IPT Chair with inputs from the IPT to address specific project tasks or groups of tasks. Usually these tasks have a specific start and end date so working groups will

form and dissolve throughout the life of the DIF project. Typically the working groups, NOAA IOOS Project Office staff or DIF project supporting contractors will generate plans, technical documents, software code or other outputs to present to the IPT for review, evaluation and ultimately, concurrence. Once approved by the IPT, project outputs are provided to the DIF Project Manager who will brief the PRT at appropriate DIF major milestones. The PRT will provide guidance and inputs to the DIF Project Manager from a policy or management perspective. When appropriate, the DIF Project Manager and/or Director, NOAA IOOS Program Office, will provide DIF progress briefings to NOAA management, councils and other interested parties. IPT, PRT and working group membership are subject to change as conditions dictate or otherwise determined by the DIF Project Manager.

Due to their critical contributions to the DIF project, specific processes required for the IPT and PRT are described below.

IPT Operational Process

The IPT chair will convene a minimum of one standing conference call every third Thursday per month to review critical project documentation and plans developed by the IPT, IPT working groups and/or DIF project staff and contractors. Two to three times a year, and additionally as needed, the IPT chair will organize an IPT meeting at a NOAA or other convenient site. The IPT chair will coordinate and synchronize all IPT and working group activities, and will keep the DIF Project Manager apprised of DIF progress. IPT members are expected to critically review materials and solicit other reviewers as necessary to provide comments and inputs representative of their organizations.

The IPT Working Groups are formed by the IPT Chair, usually from the members of the IPT. For specific tasks, the working groups may also include members that are not necessarily on the IPT, as recommended by IPT members. IPT Working Groups will be assembled to address specific technical issues or challenges and/or develop the technical information and material needed to identify a path forward for the DIF, per the request of the IPT and/or DIF Project Manager. In addition, working group members are responsible for completing the tasks required to build, test and evaluate the DIF. Meeting of the working groups occurs by conference call or in person as resources allow, typically several times a month or more as determined by each working group chair.

Working Group chairs, appointed by the IPT Chair, are responsible for the following activities:

- Establish and lead their working group,
- Schedule meetings and conference calls
- Guide the use of a web-based collaboration tool (WebEx) to facilitate group discussion and document sharing between calls and meetings,
- Prepare and modify (as needed) work plans for the working group that include milestones, tasks, resource needs,
- Facilitate and monitor progress of the working group tasks to maintain the schedule,
- Coordinate as appropriate with other working groups,
- Report progress to the overall IPT and other DIF working groups as appropriate,
- Provide regular updates to the IPT Chair and supporting NOAA IOOS Program staff,
- Report any issues and concerns with the task, resources or other items to the IPT chair

Under the leadership of a working group chair, each work group will develop a work plan that includes a list of subtasks, milestones, responsible individuals, level of effort and additional resources required to execute the plan. Typically individual tasks will also have a Statement of Work (SOW) and deliverables prepared by a working group member. Working group plans will be presented to the IPT to solicit input and recommendations and will be modified accordingly by

the working group chair. Final plans will be briefed to the DIF Project Manager for concurrence and resourcing. Once approved by the DIF Project Manager, the task work plans become part of the Project Management Plan and will be used in NOAA IOOS Program Office budget and implementation plans. The DIF Project Manager will use the task work plans and associated documentation such as SOW's to track progress and determine accountability.

PRT Operational Process

At the request of the DIF Project Manager and typically at key project milestones, the PRT will meet as necessary to be briefed by the IPT. Briefing materials will be prepared and distributed by the IPT Chair in advance of PRT meetings. PRT members are expected to review the materials and come prepared to discuss any concerns and questions during the meeting. PRT members will provide recommendations, advice and counsel to the DIF Project Manager based on their areas of expertise and background, focusing on NOAA corporate views, policies, and procedures.