Interdepartmental Committee for Meteorological Services
and Supporting Research (ICMSSR)

Working Group for Disaster Impact Assessments and Plans: Weather and Water Data
(WG/DIAP)

NATIONAL PLAN FOR DISASTER IMPACT ASSESSMENTS: WEATHER AND WATER DATA

Office of the Federal Coordinator for
Meteorological Services and Supporting Research

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FOREWORD

The *National Plan for Disaster Impact Assessments: Weather and Water Data* (NPDIA) describes collaborative mechanisms and procedures for coordinating disaster impact assessment and planning activities for significant storm events among participating Federal agencies and their affiliated partner organizations. This plan supersedes the NPDIA (November 2010). It is primarily a restructure and update of that plan.

The NPDIA represents the collaborative efforts of members of the Working Group for Disaster Impact Assessments and Plans: Weather and Water Data (WG/DIAP), which was previously named the Working Group for Natural Disaster Reduction and Post-Storm Data Acquisition. The WG/DIAP consists of representatives from applicable Federal agencies and partner organizations on items of mutual interest and concern related to the acquisition, dissemination, preservation, and exchange of perishable environmental data during and following a significant weather or water event.

The intent of the NPDIA is to describe the types of data required or desired by the participating entities and the means these entities will use to coordinate data acquisition and data management activities. It is not the goal of this plan to prescribe the data acquisition activities of participating agencies, but instead to coordinate those activities already required by existing agency mission directives or federal legislation. The procedures outlined herein will routinely be revised and refined as experience is gained from their application or new, event specific, data collection protocols evolve.

The effectiveness of this plan begins with the participation and cooperation of the agency representatives assigned as members of the working group, along with the participation of the group's affiliates. The disaster impact assessment activities described in this plan will enable better decision-making, preparations for future disaster events, and will help mitigate the impacts.

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EXECUTIVE SUMMARY

The types of environmental events covered by this National Plan for Disaster Impact Assessments: Weather and Water Data (NPDIA) include landfalling tropical cyclones (usually called "hurricanes" or "typhoons), dangerous extra-tropical coastal storms (for example, the "Nor'easters that affect the East Coast), tornadoes and other severe convective outbreaks ("windstorms"), river floods and flash floods, tsunamis, and unusually strong coastal and lake wind waves.

The motivation for agreeing on a national plan is threefold: to minimize or eliminate the duplication of effort by Federal agencies performing data acquisition on severe environmental events, to ensure that the data on these events are indeed collected in conformance with the requirements of the various agencies, and to define the coordination procedures, or protocols, of the agencies participating in data collection activities. But the reasons why agencies need to collect data on these events are even more basic and vital to national well-being. They include: (1) aiding in the societal response to these events before, during, and after their occurrence; (2) enabling reasoned planning for similar events in the future; (3) understanding the natural phenomena that cause, constitute, and result from events like these; and (4) meeting statutory requirements for collecting data on high-impact environmental events.

The focus of the NPDIA is to provide guidance for coordinated actions when a disastrous event is imminent or has occurred. For all such events, time is of the essence; rapid and effective action is critical. For this reason, the body of the NPDIA has been kept concise and targeted on guiding immediate activity. A set of appendices to the main plan provides background and context for the data collection protocols and procedures, including fuller descriptions of the missions, capabilities, and data collection requirements of participants in the Working Group for Disaster Impact Assessments and Plans: Weather and Water Data (WG/DIAP) and links to event impact databases and additional web-based information.

For some event types—notably landfalling hurricanes, tornadoes, and tsunamis for this release of the NPDIA—Federal agencies with data collection responsibilities have agreed to a coordination plan incorporated in a formal Data Collection Protocol. These protocols are included with the NPDIA as Data Protocol Annexes. For all other event types, the NPDIA includes a generic Data Collection Protocol (Annex 1). The emphasis in the generic protocol is on criteria for activating coordination among WG/DIAP participants and the initial actions that will be taken under the auspices of the interagency WG/DIAP to plan for coordinating data collection relevant to the particular event. Whether covered by an event-specific Data Collection Protocol or the Generic Data Protocol, any agency action as part of coordinated disaster impact assessment under this plan is determined by the individual agency's authority and mission requirements and shall be at the discretion and within the mission authority and resources of that agency.

1: INTRODUCTION

1.1 PURPOSE AND GOALS FOR A NATIONAL PLAN

There are four major reasons for government agencies to assess the impact of a natural disaster. First, impact data are needed to aid in the societal ***response*** to the event before, during, and after it occurs. Second, these data are important for ***planning*** for similar future events, whether they occur near the same location or elsewhere. Third, impact data are important for ***understanding*** the natural phenomena that cause, constitute, or result from the event. Fourth, ***laws*** such as the COASTAL Act of 2012 and the National Windstorm Impact Reduction Act Reauthorization of 2015 ***require*** that agencies produce information about disaster events, and providing a scientific basis for that information requires collecting impact data.

Given these reasons for collecting disaster impact data, the motives for developing and following a ***national plan*** for data collection are threefold. The first motive is to minimize or eliminate the duplication of effort by agencies performing data acquisition, thereby making the best use of the limited resources available to perform these surveys. The second is to ensure that these highly perishable data are indeed collected and that they are collected in conformance with the requirements (e.g., degree of accuracy) of all participating data users. It is generally acknowledged that the acquisition of these data is urgent, for the physical effects that fully characterize a storm event are transient and can begin to change or be obliterated immediately after the event. The third motive is to define the coordination procedures of the agencies participating in the acquisition of storm event environmental data and to collaborate on data sharing and on ensuring that means for data archival and future retrieval are established.

Disasters can be informative. When powerful storms or major floods damage or destroy our communities and infrastructure, we can learn from the experience. That learning can lead to more accurate forecasts; better designed building, transportation, and communication systems; more robust response (e.g., timely evacuations) and recovery mechanisms; and more effective land use planning. But a key piece of such learning involves close technical observation and measurement of the factors that characterize the event and its impacts on communities, infrastructure, and environment. Making those observations and measurements during the event requires a timely and well-coordinated deployment of engineers, scientists, technicians, and equipment into affected areas. The National Plan for Disaster Impact Assessments and Plans: Weather and Water Data (NPDIA) provides procedural templates that address this need, as well as the other reasons for collecting data and the motives for agencies to work together.

The first release of the NPDIA in 2010 superseded the 2003 National Post-Storm Data Acquisition Plan. The 2010 NPDIA expanded event-specific data collection to include categories of events beyond the earlier focus on atmospheric storm events. It also expanded the scope of the earlier plan to include pre-deployment of mobile observing systems prior to an event, new types of observing technologies, and new techniques and systems for disseminating data in real time or near-real time.

The addition of real-time data collection capabilities enables the NPDIA to support all the Emergency Support Functions (ESFs) in the National Response Framework in either a real-time or long-term application. Real-time and long-term data collection help characterize the storm for

those who forecast the events and manage Federal, State, and local response and recovery. Improved scientific understanding and modeling capabilities will require new and different observation strategies as scientific and societal needs change. Appendix C lists the current ESFs and describes the support provided to them by the NPDIA and its Data Collection Protocols.

1.2 Scope of the NPDIA Data Collection Protocols

1.2.1 Priority of Federal Authorities and Mission Requirements

The role each Federal entity assumes during a storm event period is determined by the individual agency's authority and mission requirements. Any response by a Federal entity to an event deemed to be covered by this plan and its annexed Data Collection Protocols shall be at the discretion and within the mission authority and resources of that entity.

1.2.2 Disaster Impact Data Collection Planning and Assessments Depend on Event Type

Among the environmental events addressed in this plan are landfalling tropical cyclones (hurricanes/typhoons and tropical storms), dangerous coastal extra-tropical storms (e.g., "Nor'easters"), severe convective outbreaks (tornadoes and windstorms), riverine and flash flooding (including glacier lake dam and riverine ice dam flooding hazards), tsunamis, and coastal and lake wind waves. The plan's appendices provide information on data requirements and acquisition capabilities of the participating agencies (with hyperlinks to agency websites for further information), event response initiation criteria, coordination procedures, and data deposition procedures.

The annexes to the NPDIA are a set of Data Collection Protocols that cover environmental event categories defined for purposes of disaster impact data collection (see Table 2.1 in Chapter 2). Each annex is a protocol for event-related data collection approved by and applicable to the agencies specified in that protocol. These protocols are free-standing documents. Statutory/regulatory authorities, where applicable, and agency responsibilities are specified in each protocol, as are the criteria for activation of that protocol. Annex 1, the Generic Data Protocol, is intended to guide coordination of data collections by participants in the Working Group for Disaster Impact Assessments and Plans: Weather and Water Data (WG/DIAP) for events that do not come under one of the category-specific data protocols.

Each Data Collection Protocol covers coordinating procedures and respective roles of the agencies participating in the acquisition of event-specific environmental data. When only a single agency is involved in data collection for an event, that agency will typically follow procedures specified in its internal documents, but those practices should be consistent with the guidance in this plan. The WG/DIAP recognizes that many Federal missions are undertaken in the overall response and recovery process that follows a significant disaster event. The intent of this guidance is to address an important, though limited, aspect of the overall response process: collecting data to record and assess the immediate and longer-term impacts of the event.

1.3 Working Group for Disaster Impact Assessment and Planning: Weather and Water Data

Participants in data collections under the NPDIA may include Federal agencies, agencies of state and local governments, and affiliated nongovernmental entities. The Federal participants can be further divided between agencies with data collection responsibilities and/or requirements for collected data and the Office of the Federal Coordinator for Meteorology and Meteorological Services (OFCM), which performs coordinating functions for all other participants. In particular, the WG/DIAP is chartered through and receives staff support from the OFCM. Through the WG/DIAP, the OFCM, which organizationally is located within NOAA, facilitates Federal agency coordination for data collections covered by the Generic Data Protocol (Annex 1) or collections not being coordinated by an agency/office under one of the event-specific data protocols. (Some protocols stipulate the lead agency for data collection under that protocol). OFCM also assumes overall responsibility for preparation and revision of the NPDIA, working with the WG/DIAP participants.

The current Terms of Reference under which the WG/DIAP operates can be found in Appendix A. In general, the Terms of Reference assign the WG/DIAP responsibilities for coordinating the interagency acquisition, dissemination, and exchange of weather and water data, especially highly perishable data, for weather- and water-related environmental disasters. These data may be used for the assessment of impacts to national resources and infrastructure, for scientific and engineering research, and to supplement emergency response operations. (See Appendix A for a list of illustrative uses for collected data.).

The Terms of Reference also lists the participants in the WG/DIAP in two categories, Federal entity members and affiliate members. As of May 2016, the following are the Federal participants:

- Department of the Interior (DOI)/U.S. Geological Survey (USGS)
- Department of Defense (DOD)/U.S. Army Corps of Engineers (USACE)
- Department of Agriculture (USDA)/Natural Resources Conservation Service (NRCS)
- Department of Homeland Security (DHS)/Federal Emergency Management Agency (FEMA)
- Department of Commerce (DOC)/ National Oceanic and Atmospheric Administration (NOAA)/National Weather Service (NWS)
- DOC/NOAA/National Ocean Service (NOS)
- DOC/National Institute of Standards and Technology (NIST)

The following organizations were affiliate members as of May 2016:

- The American Association for Wind Engineering (AAWE)
- Coasts, Oceans, Ports and Rivers Institute (COPRI) of the American Society of Civil Engineers
- The Digital Hurricane Consortium (DHC)

Appendix B contains detailed authority and mission statements for the Federal members of the NPDIA, along with capability descriptions relevant to NPDIA activities for both the Federal entity members and the affiliate members.

2: DISASTER IMPACT ASSESSMENT AND PLANNING GUIDANCE

2.1 Event Categories for Determining the Relevant Data Collection Protocol

Different types of environmental events pose weather- and water-related hazards at different scales, both spatially and temporally. They develop and produce their impacts on different timelines that must be considered when planning for data collection. And they differ with respect to their primary risks to safety and to property. These pragmatic considerations for disaster impact assessment, including planning for an assessment, are the basis for the categorization of event types shown Table 2.1.

For each event category, the second column of Table 2.1 specifies the Data Collection Protocol that covers the category. The Generic Data Protocol (Annex 1) is used by the WG/DIAP for disaster impact assessment and planning not covered by a more specific Data Collection Protocol. Over time, both the event categories and the set of event-specific data protocols will evolve as the WG/DIAP works toward more efficient and effective interagency and multi-organizational response to data collection requirements and capabilities.

Event response depends on the type of event and the specifics for a particular event. Setting out and agreeing on these specifics is a key role of the initial and subsequent coordination teleconferences. Individual WG/DIAP member agencies/organizations will typically have their own internal procedures and requirements. This chapter and the Generic Data Protocol (Annex 1) therefore provide only general guidelines for WG/DIAP coordinated activities.

2.2 Stages in Planning and Implementing Coordinated Data Collections

In general, there are four stages in planning and implementing a coordinated data collection to document and assess disaster impact:

- Activation of multiagency coordination
- Notification and initial response coordination
- Data collection and continuing coordination/communication
- Data archiving and retrieval

The stages may overlap although they begin in the order listed. For example, data archiving may begin while data collection and response/followup coordination teleconferences are still occurring. Or some participants may already be collecting relevant impact data, particularly from in situ real-time observing systems, during the interval between notification and initial response coordination.

Table 2.1 Disaster Event Categories and Associated Impact Assessment Protocol

Event Category	Protocol
Hurricane/tropical cyclone, landfalling	Annex 2: COASTAL Act Data
Hurricane/tropical cyclone not forecast to make landfall; coastal extra-tropical storm ("Nor'easter)	Annex 1: Generic
Tornado or Windstorm (severe convective outbreak)	Annex 3: Tornado/Windstorm Data (TBD)
Winter storm precipitation	Annex 1: Generic
Flooding, riverine (main stem flooding)	Annex 1: Generic
Flooding, flash	Annex 1: Generic
High waves, coastal or lake	Annex 1: Generic
Tsunami	Annex 4: Draft Tsunami Warning Protocol (under development)
Glacier-dammed lake	Annex 5: Glacier Dammed Lakes Reconnaissance
Riverine ice dams (spring melt ice-dam lake)	Annex 1: Generic
Dam or levee failure/potential failure	Annex 1: Generic
Other weather-water events	Annex 1: Generic

The Generic Data Protocol (Annex 1) uses these stages as major section headings. Other Data Collection Protocols cover more or less the same sequence of activities, even if they do not use the same terminology as this general discussion and the Generic Data Protocol.

Criteria for Activating the Coordination Process. The first stage involves activating the coordination process. Each Data Collection Protocol should either stipulate the criteria required for activating the protocol or give illustrative examples of relevant criteria that would justify activation.

Notification and Initial Response Coordination. When one or more of the activation criteria are met, a Data Collection Protocol should specify the lead agency, how the domain of potential participants in data collection activities are to be notified, and who will do the notification. Prior to the time that any activation is needed, a list of those to be notified should be compiled and maintained by the OFCM or the lead agency.

For example, the list of participants for the Generic Data Protocol starts with all participants in the WG/DIAP. For particular event types, the appropriate lead agency representative may have a list of potential participants to notify that includes all or a subset of the WG/DIAP plus other relevant participants. In some Data Collection Protocols (for example, the COASTAL Act Data Protocol for landfalling hurricanes/tropical cyclones), the list of participants to be notified may reflect statutory requirements.

Given the critical importance of timely planning, preparation, and response for collecting comprehensive data on disaster events, the usual initial coordination meeting is likely to be an audio or audiovisual teleconference, rather than a face-to-face meeting or even a series of one-on-one interactions among the potential participants. For example, the Generic Data Protocol

uses a telephone-based Initial Response Coordination Teleconference, which can be supplemented by an Internet-based "web sharing" capability.

Data Collection and Continuing Coordination/Communication. This stage of coordinated data collection includes the data-collecting activities by participants and any additional communications to maintain and revise the agreed-upon collecting activities as they unfold. The Data Collection Protocol may include a list of the potential participants' data collection capabilities and/or their data collection responsibilities. It should also specify the process for setting up and conducting participant communications during this stage.

The Data Collection Protocol may include a list or table of the data types and quantities to be collected and the procedure or collection capability to be used. It may also include references (hyperlinks to web pages) to the details of participants' internal procedures for data collection activities. For example, the COASTAL Act Data Protocol (Annex 2) references a number of NWS standard procedures that apply.

Data Archiving and Retrieval. This final general stage of coordinated data collection enables all participants to access data collected under the protocol for approved uses. A protocol may specify a common archival format and data store, but more typically there will be distributed data stores maintained by multiple participants and probably stored in a variety of formats. The protocol may either incorporate the details for accessing these stores and the format specifications for the stored data types or it may provide hyperlinks to the most current location of this information on a website maintained by the participant responsible for a given data store.

2.3 Civil Air Patrol Aerial Surveys

Through a Memorandum of Understanding between the DOD and the OFCM, the Civil Air Patrol (CAP) can provide light aircraft, aircrews, and communications in support of disaster impact assessment flights. The NWS frequently uses CAP flights to survey ice damming, glacier-dammed lakes, weak levees, remote reservoirs, and tornado tracks. The services that CAP provides are more cost-effective than other available aerial capabilities. The CAP National Operations Center often is able to provide a flight within 24 hours of the request. For general procedures to request, plan, and carry out a CAP aerial survey, see Appendix E.

2.4 Funding for Coordinated Data Collection

A Data Collection Protocol may or may not include information on funding for coordinated activities. If the protocol does include such information, that takes precedence over the general guidance provided below.

2.4 1 Funding Prior to a Federal Disaster Declaration

Leading up to an event, and before the President has declared the area a Federal disaster, funding for disaster impact assessment activities will be more difficult to obtain. FEMA uses a document called a Pre-Scripted Mission Assignment (PSMA), which allows funding for actions before declaration of disaster. During national emergencies, FEMA Federal Coordinating Officers (FCOs) must make a large number of important operations decisions in a short time under stressful conditions. The PSMAs aid the FCO by providing a prepackaged set of actions that can

be executed easily and quickly. PSMAs must be validated at FEMA long before a disaster strikes to simplify the tasking and funding process. By instruction, only those actions that prevent loss of life or property can be funded by a PSMA. PSMAs may be a potential funding source for disaster impact assessment data collection activities. Appendix D shows the PSMA form used by DHS and includes an example of a PSMA covering WG/DIAP activities under its Section IV, Statement of Work.

2.4.2 Funding after a Federal Disaster Declaration

After the President declares an event location a Federal disaster area, FEMA can more readily release funding using Inter-Agency Agreements (IAAs). IAAs are contract agreements between two Federal agencies to exchange fees for a service. All participating agencies should consider building IAAs with DHS/FEMA to help facilitate funding. IAAs should be drafted, approved, and signed long before any disaster event requiring them.

2.4.3 Agency Funding

For many smaller disaster events, it will be up to individual agencies to fund their disaster impact assessment activities. For example, the NWS funds the Quick Response Team in response to a tornado event. For some unusual riverine events, USGS will fund special sensing missions. For some agencies, such as NOAA, the funding for any operation must be available at the agency before work begins. This is true even if it is fairly certain that the operation will be funded at a later date from outside the agency.