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**GUIDE TO NOAA RESPONSE AND COMMUNICATION PROTOCOLS  
FOR HUMAN CAUSED AND NATURAL DISASTERS IN THE GREAT  
LAKES**

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NOAA's Mission – To understand and predict changes in Earth's environment and conserve and manage coastal and marine resources to meet our nation's economic, social, and environmental needs

NOAA's Mission Goals:

- Protect, restore and manage the use of coastal and ocean resources through an ecosystem approach to management
- Understand climate variability and change to enhance society's ability to plan and respond
- Serve society's needs for weather and water information
- Support the Nation's commerce with information for safe, efficient, and environmentally sound transportation
- Provide critical support for NOAA's Mission

## Acknowledgements

This Guide is the product of many hours of research, meetings, and reviews by individuals from across NOAA's offices, programs, and regions. We greatly appreciate the time and energy invested in this process of writing and revising the Guide and hope that it will facilitate communication and collaboration during those essential early hours and days of emergency response.

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## Preface

This *Guide* is designed to enhance coordination of NOAA's diverse expertise, services, and resources when responding to a Great Lakes natural or anthropogenic emergency that involves a threat or damage to human health or life, to property, or to the environment. This *Guide* addresses the following emergencies: 1) an oil spill, hazardous chemical release, or maritime accident; 2) a large-scale fire event; 3) a large-scale or high-impact weather event; or 4) a radiological release. For many emergencies, only one NOAA Line Office is needed to provide an effective response. When two or more NOAA Line Offices are involved in a large-scale event, however, clear and efficient communication and coordination are needed to simultaneously provide a high level of service and efficiently utilize NOAA's *own* expertise and resources.

The focus of this *Guide* is on communication and collaboration among NOAA's Line Offices and programs. Although effective communication among federal, state, and local agencies and within each NOAA Line Office is critical to response outcomes, it is beyond the scope of this document. The ultimate objective of the *Guide* is to advance communication and better integrate line office capabilities to support a "OneNOAA" response to emergency events; it is *not* to challenge existing mandates.

The *Guide* was created in response to findings and recommendations reported in the National Weather Service (NWS) Central Region's Service Assessment of the 2010 Enbridge Oil Spill in Marshall, Michigan.<sup>1</sup> Based on interviews with multiple participants in the response, the NWS Service Assessment team determined that while "NOAA Line Offices were aware in a rudimentary way of each other's roles and responsibilities with respect to environmental disaster response...initial attempts at notification and collaboration were disorganized due to a lack of existing protocols." As a result, the team recommended that a "set of NOAA response protocols and exercises should be established to organize a collaborated NOAA response to natural and man-made disasters in the Great Lakes. This protocol should be championed by the NOAA Great Lakes and Central Regional Collaboration Teams and its structure should utilize [Incident Command Structure] principles." To be sure, the Enbridge oil spill was a single and unique event. However, all emergency response events that involve more than one NOAA Line Office can benefit from greater knowledge of NOAA's resources and more established communication protocols.

The process of developing the *Guide* was itself collaborative. Contributions from the National Weather Service (NWS), National Ocean Service (NOS), National Marine Fisheries Service (NMFS), and Office of Oceanic and Atmospheric Research (OAR) were incorporated into the text. A one-day workshop at the Great Lakes Environmental Research Laboratory (GLERL) in June 2012 also contributed to communication across line offices and fostered discussions that were incorporated into the *Guide*.

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<sup>1</sup> The Service Assessment can be downloaded at <http://www.crh.noaa.gov/images/crh/assessments/EnbridgeOilSpillRegionalServiceAssessment.pdf>.

The document is divided into two sections. Section 1 addresses operational frameworks for emergency response, NOAA Line Office deployment and engagement protocols, and specific emergency events that could occur in the Great Lakes region. Section 2 provides background and contextual information on individual NOAA Line Office or program capabilities and resources that can be leveraged during an emergency response. This section also documents the legal mandates and authorities that govern NOAA participation in a response, as well as communication and coordination options.

## Acronyms

ARD	Assessment and Restoration Division (within OR&R in NOS Line Office)
ARL	NOAA Air Resource Laboratory
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIMSS	Cooperative Institute for Meteorological Satellite Studies
CMAQ	Congestion Mitigation and Air Quality
CONOPS	Concept of Operations
COO	Chief Operations Officer
CO-OPS	NOS Center for Operational Oceanographic Products and Services
CR-ROC	NWS Central Region Operations Center
DARRP	Damage Assessment, Remediation, and Restoration Program
DHS	Department of Homeland Security
DOD	Department of Defense
EOC	Emergency Operations Center
ERD	Emergency Response Division (within OR&R in NOS Line Office)
ERS	Emergency Response Specialist
ERM	Emergency Response Meteorologist
ESF	Emergency Support Function
ESRL	NOAA Earth Systems Research Laboratory
FEMA	Federal Emergency Management Administration
FOSC	Federal On-Scene Coordinator
FRMAC	Federal Radiological Monitoring and Assessment Center
GCNR	General Counsel for National Resources
GLCFS	Great Lakes Coastal Forecasting System
GLERL	Great Lakes Environmental Research Laboratory
GLOFS	Great Lakes Operational Forecast System

GLRCT	Great Lakes Regional Collaboration Team
GOES	Geostationary Operational Environmental Satellite Imager
HSPO	Homeland Security Program Office
HYSPLIT	Hybrid Single Particle Lagrangian Integrated Trajectory (Model)
ICS	Incident Command System
IMAAC	Interagency Modeling and Atmospheric Assessment Center
IMET	Incident Meteorologist
JIC	Joint Information Center
MDD	NOAA Marine Debris Division
MIC	Meteorologist In Charge
NAQFC	National Air Quality Forecast Capability
NDBC	National Data Buoy Center
NDFD	NWS National Digital Forecast Database
NESDIS	National Environmental Satellite, Data, and Information Service
NIFC	National Interagency Fire Center
NIMS	National Incident Management System
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NPFC	National Pollution Funds Center
NRC	Nuclear Regulatory Commission
NRDA	Natural Resource Damage Assessment
NRF	National Response Framework
NRT	National Response Team
NSSL	National Severe Storms Laboratory
NWS	National Weather Service
OAR	Office of Oceanic and Atmospheric Research

OPA	Oil Pollution Act
OR&R	Office of Response & Restoration (within NOS Line Office)
OSLTF	Oil Spill Liability Trust Fund
PIO	Public Information Officer
PRFA	Pollution Removal Funding Authorization
QPF	Quantitative Precipitation Forecast
RISA	Regional Integrated Sciences and Assessments (Program)
RRC	Regional Resource Coordinator
RRT	Regional Response Team
RC	Restoration Center
RFC	River Forecast Centers
SSC	Scientific Support Coordinator
SST	Scientific Support Team
SOP	Standard Operating Procedure
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USCG	United States Coast Guard
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WFO	Weather Forecast Office

## SECTION 1

Section 1 includes three components. The first is an overview of federal command structures that dictate NOAA's engagement in large-scale emergency response, extending from initial deployment to follow-up assessments. The second addresses NOAA Line Office protocols for engagement and deployment. The third details events requiring integrated response: an oil spill, hazardous chemical release, and/or maritime accident; a large-scale fire event, a large-scale and/or high-impact weather event; or a radiological release. Most event-specific protocols fall within federal response command structures. Contact directories, which include the names of all positions that might need to be notified for each emergency event, are included in Appendix A.

### 1.1 Federal Response Command Structures

In the event of an emergency response, NOAA Line Offices adhere to the National Response Framework (NRF), the National Incident Management System (NIMS), NOAA's All-Hazards Concept of Operations (CONOPS), and regulations relating to Natural Resource Damage Assessment (NRDA) under the Oil Pollution Act of 1990 and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 as amended. Each is discussed below.

#### 1.1.1 National Response Framework (NRF) and Emergency Support Functions (ESF)<sup>1</sup>

The National Response Framework (NRF) establishes principles that enable all responding entities (federal, state, local, tribal, private-sector, and other nongovernmental) to prepare for and provide a unified national response to domestic disasters and emergencies. It works hand-in-hand with the National Incident Management System (NIMS), described in Section 1.1.2.

The NRF identifies key response principles, as well as the roles and structures that organize national response. It describes how communities, states, federal agencies, and private sector and nongovernmental partners apply these principles for a coordinated, effective national response. The NRF is designed to be flexible and can be partially or fully implemented, depending on the threat or response circumstances.

NRF development was mandated by the Homeland Security Act of 2002 and Homeland Security Presidential Directive-5 (HSPD-5), "Management of Domestic Incidents." NOAA's Homeland Security Program Office (HSPO) is responsible for ensuring NOAA's compliance with the NRF during a response.

Emergency Support Functions (ESFs) are mechanisms at the operational level of NRF used to organize responding parties and provide assistance during an emergency response. ESFs that would likely require operational participation by NOAA include, but are not limited to, ESF#4 (Firefighting Annex), ESF#9 (Search and Rescue Annex), and ESF#10 (Oil and Hazardous Materials Response Annex). Detailed descriptions of these ESFs are included in Appendix B.

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<sup>1</sup> More information on the NRF is available at <http://www.fema.gov/national-responseframework>.

### ***1.1.2 National Incident Management System (NIMS)<sup>2</sup>***

While the NRF describes federal roles, policies, and structures in emergency response, the National Incident Management System (NIMS) provides the template for actual incident management. Like NRF, NIMS was developed in response to HSPD-5. The NIMS model is applicable in response protocols regardless of the cause, size, location, or complexity of the emergency. It is also applicable at all jurisdictional levels, across functional disciplines, and across sectors, drawing upon the assets of public, private, and nongovernmental agencies.

The most widely known component of NIMS is the Incident Command System (ICS).<sup>3</sup> ICS is used to organize on-scene operations for a broad range of emergencies. It is normally structured to facilitate activities across five functional areas: Incident Command, Operations, Planning, Finance/Administration, and Logistics. Incident Command for significant and/or large events may be assumed by a Federal On-Scene Coordinator (FOSC). In general, this position is assumed by the Captain of the Port of the United States Coast Guard (USCG) for pollution incidents in Great Lakes waters or navigable waterways, and by an assigned On-Scene Coordinator for the United States Environmental Protection Agency (US EPA) for other pollution incidents.<sup>4</sup> The ICS additionally stipulates establishment of a Public Information Officer (PIO), a Command Staff position responsible for developing and releasing information about an incident to the news media.

During large or multi-level pollution incidents, ICS may be expanded into a Unified Command. A Joint Information Center and/or Joint Operations Center might also be engaged. In addition, during large events, it is not unusual for NOAA employees to be deployed in multiple ICS functional disciplines, thus emphasizing the importance of line office coordination.

### ***1.1.3 NOAA All-Hazards Concept of Operations***

The NOAA All-Hazards Concept of Operations (CONOPS) establishes a comprehensive, agency-wide framework for management of incidents that require support from NOAA Line Offices. The CONOPS integrates agency activities to ensure that mission-essential functions are executed in an organized and consistent manner through the Incident Command System. The NOAA CONOPS does not change the specific authorities and responsibilities of line offices or their specific program offices. Each line office maintains Standard Operating Procedures (SOPs) to address specific incidents, ensuring a consistent and thorough response and level of incident support. The CONOPS functions in a layered incident support structure depending on the severity or complexity of the incident.

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<sup>2</sup> More information on NIMS can be found at <http://www.fema.gov/national-incidentmanagement-system>.

<sup>3</sup> ICS trainings are available at beginning, intermediate, and advanced levels of sophistication, progressing from ICS-100: “Introduction to ICS,” to ICS-400: “Advanced ICS Command and General Staff-Complex Incidents.” See <http://training.fema.gov/IS/> for additional information.

<sup>4</sup> The exact jurisdictional boundaries can be found in Section 1.4 of the US EPA Region 5 Regional Contingency Plan, available at <http://www.rrt5.org/acp/>.

NOAA's Homeland Security Program Office (HSPO) is responsible for NOAA Headquarters' plans, programs, and policies for execution of incident management. Specifically, the HSPO is responsible for maintaining NOAA CONOPS for all incident management and ensuring the agency's compliance with the NRF. During a significant response effort the HSPO generally serves in an advisory capacity. Under certain circumstances, however, the HSPO can coordinate NOAA's efforts to respond to and recover from hazardous incidents.

#### **1.1.4 Natural Resource Damage Assessment**

The Oil Pollution Act of 1990 established the Natural Resource Damage Assessment (NRDA) process for oil spills.<sup>5</sup> (See Section 2.1.3 for further details.) NRDA regulations describe three phases for this process: pre-assessment, injury assessment and restoration planning, and restoration implementation. Additionally, for hazardous substance releases, separate regulations describe the natural resource damage assessment process (43 Code of Federal Regulations Part 11.3). The Damage Assessment Remediation and Restoration Program (DARRP), which is a partnership of NOAA's National Ocean Service (NOS), National Marine Fisheries Service (NMFS), and Office of General Counsel of Natural Resources (GCNR), implements natural resource damage assessment authorities in partnership with other federal, state, and tribal agencies.

## **1.2 NOAA Line Office Roles and Notification Protocols**

Protocols for deployment and more general involvement in emergency response vary by line office and the nature of the emergency event. Emergency event-specific recommendations are discussed in the following section. More general protocols are discussed below.

In general, the National Ocean Service (NOS) and National Weather Service (NWS) are the primary line offices involved in FOSC-requested operational response and decision support activities. NWS is also frequently called upon for support by local or state agencies, which work with Weather Forecast Offices (WFOs) on a day-to-day basis. In most cases, notifications of significant events flow through these two line offices, and they are responsible for initiating notifications within their line offices and other parts of NOAA on an as-needed basis. Other line offices, such as OAR and NESDIS, most often serve in an advisory capacity to NOS or NWS by request. NMFS and GCNR may join NOS to carry out natural resource trustee responsibilities.

The NOAA Great Lakes Regional Collaboration Team (GLRCT) Coordinator can play a vital role in facilitating an integrated response during emergencies. Located at the NOAA Great Lakes Environmental Research Laboratory (GLERL) in Ann Arbor, Michigan, the GLRCT Regional Coordinator position was established to provide continuity across NOAA Line Offices and stakeholders in the Great Lakes region.

During time-sensitive emergency response, each NOAA Line Office has established procedures to quickly facilitate notification within their own Line Office structure. However, for cross-line

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<sup>5</sup> OPA NRDA regulations can be found in the *Restoration Planning Guidance Document for Natural Resource Damage Assessment Under the Oil Pollution Act of 1990*, available for download at [http://www.darrp.noaa.gov/library/pdf/IAD\\_AP-A.PDF](http://www.darrp.noaa.gov/library/pdf/IAD_AP-A.PDF).

office coordination, the GLRCT Regional Coordinator may serve as a “notification hub.” This is a simple, fast, and efficient way of initiating an integrated NOAA response without burdening front-line personnel involved in time-sensitive emergencies.

### **1.3 NOAA Line Office and Program Engagement in Emergency Response Events**

This section details five emergency events that could occur in the Great Lakes region.<sup>6</sup> When appropriate, brief attention is also given to involvement of non-NOAA agencies in the response. All NOAA Line Offices and programs are described in detail in Section 2.

#### ***1.3.1 Oil spills, Hazardous Chemical Releases, and/or Maritime Accidents***

Per National Incident Management System (NIMS) protocols, a Federal On-Scene Coordinator (FOSC) is assigned to a significant spill response. For coastal spills, the US Coast Guard (USCG) is responsible for designating an FOSC, whereas for inland spills, the USEPA is responsible. For coastal operational areas, the Captain of the Port of the US Coast Guard is generally assigned as the FOSC. The coastal operational area in the Great Lakes region consists of the open waters of the Great Lakes, including Lake St. Clair, the interconnecting rivers, major bays, ports, and harbors plus the land surface, land substrata, ground water, and ambient air proximal to those waters. The inland operational area includes all other land territory, including inland lakes and rivers. Numerous Native American reservations and treaty rights areas are also delineated.<sup>7</sup>

For significant maritime accidents, the National Transportation Safety Board (NTSB) investigates and coordinates with supporting agencies as needed. It is incumbent upon responding NOAA Line Offices and programs to work with these and other agencies as necessary and appropriate.

#### **NOAA’s National Ocean Service Office of Response and Restoration (NOS/OR&R)**

Emergency Response Division (ERD) advises the FOSC on spill response. In the event of an oil or hazardous chemical spill, ERD should be the first NOAA division contacted. The ERD Great Lakes representative in such an event is the NOAA Scientific Support Coordinator (SSC), who is co-located with USCG District 9 Headquarters in Cleveland. The NOAA SSC (or OR&R HAZMAT Duty Officer) is responsible for appropriate notifications required by OR&R, and may also contact the GLRCT Coordinator. The GLRCT Coordinator is then responsible for notifying other supporting line office representatives about the event (Figure 1).

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<sup>6</sup> Oil spills, hazardous chemical releases, and maritime accidents are classified together. NOAA’s engagement in response would likely be similar for these emergencies, as its predominant role in a maritime accident would be to respond to the associated spill of oil or other hazardous chemicals.

<sup>7</sup> Additional information on jurisdictional boundaries can be found in Section 1, subsection 1.4 of the USEPA Region 5 Regional Contingency Plan: <http://www.rrt5.org/acp/>. The Regional Contingency Plan defines boundaries based on delineations found in the US Code of Federal Regulations (Ninth Coast Guard District), 33 CFR 3.45 1-50, available at <http://www.gpo.gov/fdsys/pkg/CFR-2005-title33-vol1/pdf/CFR-2005-title33-vol1-part3-subpart3-45.pdf>.

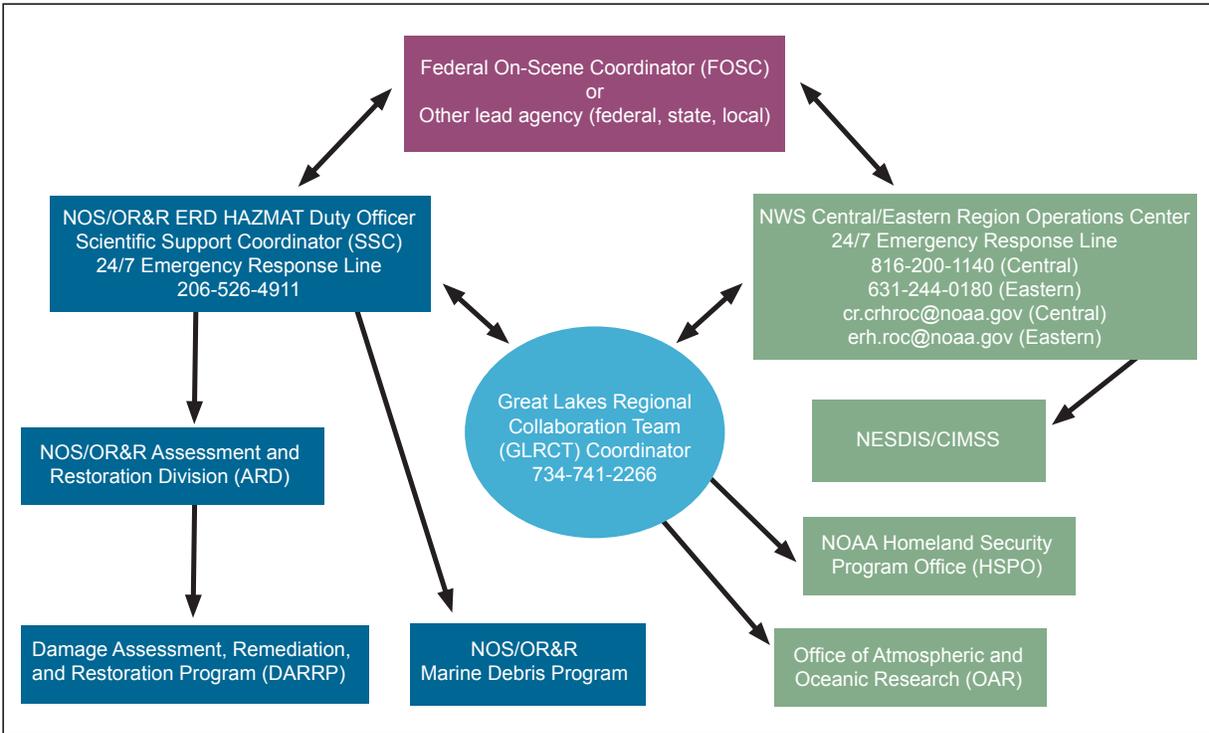


Figure 1. Notification Protocols.

The SSC may assemble a Scientific Support Team (SST) consisting of members from the OR&R Emergency Response Division (ERD), Assessment and Restoration Division (ARD), Marine Debris Division, and others.

NOAA’s **Damage Assessment, Remediation, and Restoration Program (DARRP)** is a cross-line office program that conducts the Natural Resource Damage Assessment (NRDA) process. Deployment of the DARRP team, consisting of members from OR&R ARD, the National Marine Fisheries Service Restoration Center (RC), and the Office of General Counsel for Natural Resources (GCNR), is at the discretion of the Regional Managers from ARD, RC, and GCNR. For purposes of conducting the NRDA, DARRP members do not need to be requested by the FOSC due to the fact that they are deploying under a separate legal mandate. There can be overlap between the individuals who are part of DARRP and the individuals who make up the NOAA SST.

NOAA’s **National Marine Fisheries Service (NMFS)** participates in the NRDA process as part of DARRP and provides expertise on restoration planning and implementation. In addition, NMFS is the NOAA service consulted for issues pertaining to the Endangered Species Act (Section 7), protected habitats, and essential fish habitat (for federally managed species).

NOAA’s **Office of Oceanic and Atmospheric Research (OAR)** provides technical expertise and support as requested by other NOAA Line Offices, and specifically the SSC. In the Great Lakes, OAR is represented by GLERL in Ann Arbor.

NOAA's **National Weather Service (NWS)** provides decision-support weather services for response efforts to oil and hazardous chemical spills upon SSC or FOSC request. NWS also provides services in response to state or local government requests. Weather-based decision support services for the majority of the Great Lakes are coordinated by the NWS Central Region Operations Center (CR-ROC) in Kansas City, which maintains a 24/7 operation. Actual weather support for emergency response is generally provided by one or more of the region's Weather Forecast Offices (WFOs) adjacent to the Great Lakes, or by the River Forecast Centers (RFCs) based near Minneapolis, Minnesota and Cincinnati, Ohio.

NOAA's **Office of General Counsel for Natural Resources (GCNR)** participates in the NRDA process as part of DARRP and provides legal support for injury assessment, restoration planning, and resolution of legal liability.

### ***1.3.2 Large-Scale Fire Event***

The **National Weather Service (NWS)** is the primary NOAA Line Office to provide decision-support services for large-scale wildland fire events. In the Great Lakes region, large swaths of wildlands may be federally or state-owned; they may also be owned by private entities. The land ownership status impacts which agency or entity takes on an Incident Command role for a fire response. In the event of a particularly large or challenging fire, it is likely that an NWS Incident Meteorologist (IMET) will be called and deployed for on-site support services. In this scenario, NOAA would be more involved, and more communication between NOAA Line Offices would be warranted.

NWS responsibilities in fire response are detailed in the *Interagency Agreement for Meteorological and Other Technical Services*.<sup>8</sup> In short, upon request from a state or federal lead agency, NWS is required to provide weather forecasts, consultation, and technical advice; provide IMETs in support of the fire weather program; provide short-range fire weather outlooks; and provide and participate in fire weather and wildland fire response training.

Although IMETs work out of WFOs, they are trained for regional- and national-scale fire weather response. IMET deployment decisions fall to the National Fire Weather Operations Coordinator (NFWOC) located at the National Interagency Fire Center (NIFC). Both the IMET and WFOs coordinate with the appropriate NWS Regional Operations Center (ROC), and the latter works with the National Fire Weather Operations Coordinator to ensure sufficient on-site NWS capability.

Depending on the circumstances, the resources and expertise of other line offices may be employed. During this event, the appropriate ROC serves as the primary point of contact for NWS in the Great Lakes region and should contact the NOAA Great Lakes Regional Collaboration Team (GLRCT) Coordinator to notify other appropriate line offices.

The **Office of Oceanic and Atmospheric Research (OAR)** houses the Regional Integrated Sciences and Assessments (RISA) Program, which is working to develop a national map for fire

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<sup>8</sup> The *Interagency Agreement for Meteorological and Other Technical Services* can be accessed at [http://www.srh.noaa.gov/ridge2/fire/docs/2008\\_National\\_Agreement.pdf](http://www.srh.noaa.gov/ridge2/fire/docs/2008_National_Agreement.pdf).

risk and management. OAR may also provide expertise via atmospheric chemical transport and dispersion models (CMAQ and HYSPLIT) in the National Air Quality Forecast Capability (NAQFC). The HYSPLIT plume dispersion model has been used by NWS for requested support from federal, state, and local agencies conducting prescribed burns.

The **National Environmental Satellite, Data, and Information Service (NESDIS)** offers multiple operational and developmental fire and smoke products. Operational products show hot spots and smoke plumes indicating possible fire locations, provide aerosol optical depth, and detect and monitor fires using high-resolution satellite data and the Geostationary Operational Environmental Satellite (GOES) Imager.

### ***1.3.3 Large-Scale or High-Impact Weather Events***

A large-scale significant weather event in the Great Lakes is most likely to be a major flood, winter storm, large tornado, or tornado outbreak. Event response may involve multiple agencies, including the Federal Emergency Management Agency (FEMA), US Environmental Protection Agency (USEPA), US Army Corps of Engineers (USACE), US Geological Survey (USGS), National Guard, US Bureau of Reclamation (USBR), US Department of Transportation (USDOT), and US Coast Guard (USCG) at the federal level, plus state and local emergency management officials, engineers, and water managers. In the aftermath of any large-scale and/or high-impact weather event, FEMA is normally the primary federal agency to manage disaster recovery. NOAA's weather forecasting role in the lead-in to a major weather event is clear-cut. In the event aftermath, however, NOAA has significant capacity to provide decision support to agencies involved in rescue, clean-up, and recovery operations. This is particularly true of weather support, but may also include other activities to address injury to public trust resources in the event of a release of oil or hazardous materials.

The **National Weather Service (NWS)** is the NOAA Line Office primarily involved in significant weather event response efforts. The local Weather Forecast Offices (WFOs) are the primary responders from within NWS; they are responsible for forecasting weather and water conditions that influence recovery and response efforts (e.g., sandbagging, debris removal, and snow removal). River Forecast Centers (RFCs) also provide streamflow and river stage forecasts during and following large-scale flood events. The National Data Buoy Center (NDBC) can offer data that facilitates effective monitoring and forecasting.

During and after large-scale/high-impact weather events, NWS personnel can provide on-site decision support at Emergency Operations Centers (EOCs) for extended periods. These personnel are often provided from affected WFOs, but may also include Emergency Response personnel from other offices. This is coordinated through the region's ROC. In the event involvement from other NOAA Line Offices is required, the ROC will contact the GLRCT Coordinator to notify and/or solicit his or her services.

The **National Ocean Service OR&R/ERD** should be contacted during a significant weather event when there is occurrence or risk of oil or hazardous substance releases to coastal or inland waterways. The contact point for ERD is the Scientific Support Coordinator (when major flooding occurs, the US EPA is responsible for ensuring that chemicals have not entered waterways and is expected to contact the SSC). ARD may also become involved if hazardous

substances released as a result of the significant weather event cause injury to public trust resources.

**National Marine Fisheries Service** may become involved via DARRP if hazardous substances released as a result of the significant weather event cause injury to public trust resources.

**Oceanic and Atmospheric Research (OAR)** may become involved in a response in a consultant role, applying resources and technologies to support National Weather Service response and recovery needs. These can be in the form of hydrologic support from the Great Lakes Environmental Research Laboratory, or of weather science support from the National Severe Storms Lab (NSSL) in Norman, Oklahoma, or the Earth System Research Laboratory (ESRL) in Boulder, Colorado.

**National Environmental Satellite, Data, and Information Services (NESDIS)** offers, as needed, high resolution satellite support services that can be used to pinpoint areal flood extent, tornado tracks, and rainfall estimates, among other services.

#### ***1.3.4 Radiological Release***

For the purposes of this document, this section refers only to radiologic releases (either accidental or deliberate) from non-Department of Defense (DOD) facilities. Response to a domestic radiological release involves a large number of federal agencies and resources, with leadership varying according to the circumstances of the release. In general, incidents are managed via Unified/Area Command, and a designated coordinating entity may be a federal, state, or local government agency. For a federal response in the Great Lakes, this would most likely be Department of Homeland Security/US Coast Guard or the Nuclear Regulatory Commission (NRC).

Response to a radiological release requires extensive communication among the multiple federal agencies involved. Upon request from the coordinating agency, the Federal Radiological Monitoring and Assessment Center (FRMAC), an interagency organization, is available to respond to a radiological incident. NOAA is a member of the Interagency Modeling and Atmospheric Assessment Center (IMAAC), which coordinates federal production and dissemination of model predictions of airborne hazardous material concentrations. In addition, various state-level agencies support local response and recovery with atmospheric trajectory (plume) and dispersion models. It is advised that NOAA participants neither provide nor disseminate airborne trajectory or waterborne dispersion forecasts unless first coordinated with other federal (via IMAAC) or state participants.

**National Weather Service (NWS)** is likely to be the first NOAA Line Office notified by either state or local Emergency Management following a radiological release. Upon notification of the need for on-site decision support services, the WFO will notify the appropriate ROC. The ROC, in turn, will coordinate deployment of on-site NWS Emergency Response personnel. In the event that additional involvement is needed from other line offices, the ROC will contact the GLRCT Coordinator to notify other line offices.

**Office of Oceanic and Atmospheric Research (OAR)** could offer scientific expertise in the event of radiological release and use of the Hybrid Single Particle Lagrangian Integrated Trajectory (HYSPLIT) Model to compute the atmospheric transport, dispersion, and deposition of radioactive material. Specific expertise/consultation would be provided by the NOAA Air Resources Laboratory (ARL). The Great Lakes Environmental Research Laboratory is also equipped to provide water plume transport modeling.

**NOS OR&R and National Marine Fisheries Services** are involved in radiological release response, via DARRP, if hazardous substances released as a result of the significant weather event cause injury to public trust resources. NOAA's SSC will likely be informed of the incident via USEPA and may be asked to assume a coordination role, but would not likely have a primary role in the response.

## 1.4 QUICK REFERENCE GUIDE TO NOAA EMERGENCY RESPONSE ROLES IN THE GREAT LAKES

### National Ocean Service (NOS) / Office of Response & Restoration (OR&R)

#### Line Office Responsibilities and Capabilities

- Expertise spans oceanography, biology, chemistry, and geology.
- Capabilities include spill trajectories, chemical hazard analysis, and habitat risk assessment.
- National Resource Damage Assessment (NRDA) co-trustee for NOAA.

#### Key Contacts and Responsibilities

Principal Contact	Principal Role
Scientific Support Coordinator (SSC) – Emergency Response Division (ERD)	<ul style="list-style-type: none"> <li>• Serves as the NOAA/DOC principal scientific advisor to the FOSC; leads ERD SST.</li> <li>• Provides resources and recommends tactics and strategies that mitigate ongoing environmental damage from a chemical or oil spill.</li> </ul>
Hazmat Duty Officer – ERD	<ul style="list-style-type: none"> <li>• Provides resources, including SST personnel, during emergency response.</li> </ul>
Regional Resource Coordinator – Assessment & Restoration Division (ARD)	<ul style="list-style-type: none"> <li>• Conducts NRDA.</li> <li>• Advises emergency responders on potential impacts to natural resources from oil or chemical spills and spill response activities.</li> </ul>

### National Weather Service (NWS) and National Environmental Satellite, Data, & Information Service (NESDIS)

#### Line Offices' Responsibilities and Capabilities

- Expertise spans meteorology, hydrology, climate, and environmental satellite observations.
- Capabilities include observations and forecasts of severe weather, winter storms, floods, droughts, marine hazards, etc.

#### Key Contacts and Responsibilities

Principal Contact	Principal Role
Central and Eastern Regions Operations Center – National Weather Service (NWS)	<ul style="list-style-type: none"> <li>• Primary support coordinator for NWS Central and Eastern Regions.</li> <li>• Facilitates coordination/ and collaboration between national NWS centers, WFOs, and other NOAA resources.</li> </ul>
Weather Forecast Offices (WFOs) – National Weather Service (NWS)	<ul style="list-style-type: none"> <li>• Issue warnings to ensure safety of ER personnel and protection of equipment and assets.</li> <li>• Provide specific forecasts to support response planning.</li> <li>• Ensure availability of on-scene resources as requested by the FOSC, SSC, or Emergency Management officials.</li> </ul>

### National Marine Fisheries Service (NMFS)

#### Line Office Responsibilities and Capabilities

- Expertise on issues relating to aquatic biology and assessment of injuries to fish and aquatic wildlife.
- Participates in NRDA for restoration planning and implementation.

### Office of General Counsel for Natural Resources (GCNR)

#### Responsibilities and Capabilities

- Participates in the NRDA process as part of DARRP.
- Provides legal support for injury assessment, restoration planning, and resolution of legal liability.

### Oceanic and Atmospheric Research (OAR)

#### Line Office Responsibilities and Capabilities

- Leads cutting-edge research in support of NOAA's operational objectives.

#### Key Contacts and Responsibilities

Principal Contact	Principal Role
Great Lakes Environmental Research Laboratory (GLERL)	<ul style="list-style-type: none"> <li>• Conducts Great Lakes-specific research.</li> <li>• Conducts modeling, ecosystem dynamics, observing systems, and vessel operations.</li> </ul>

### Homeland Security Program Office (HSPO)

#### Line Office Responsibilities and Capabilities

- Responsible for NOAA HQ plans, programs, and policies for homeland security and execution of incident management.
- Supports NOAA's continuity of operations planning and execution.

### Great Lakes Regional Collaboration Team (GLRCT)

#### Program Responsibilities and Capabilities

- Promotes collaboration, communication, and "best practices" across Line Offices and among regional stakeholders.

#### Key Contacts and Responsibilities

Principal Contact	Principal Role
Regional Coordinator – Great Lakes Regional Collaboration Team	<ul style="list-style-type: none"> <li>• Serves as "notification hub" for cross-Line Office communication during emergency response.</li> </ul>

## SECTION 2

Section 2 offers contextual information that pertains to NOAA's role in emergency response, and particularly to the actions and engagement of specific NOAA Line Offices and programs. The section begins with legal mandates and authorities that govern the participation and actions of NOAA Line Offices in a response. Individual NOAA Line Office capabilities and resources are subsequently addressed, followed by a discussion of the myriad communication mechanisms available to NOAA employees.

### 2.1 Mandates and Authorities

The National Response Framework (NRF), National Incident Management System (NIMS)/Incident Command System (ICS), and NOAA All-Hazards CONOPS dictate NOAA's role in an emergency response. In addition, multiple directives, statutes, and agreements shape the way in which NOAA Line Offices and programs contribute to interagency responses.

#### 2.1.1 *Robert T. Stafford Disaster Assistance and Emergency Relief Act, as amended, 42 U.S.C. 5121.*

The Stafford Act provides an orderly and continuing means of federal assistance to help state and local governments carry out their responsibility to alleviate suffering and damage resulting from disasters. Titles that relate to the NOAA mission areas include:

- Establishment of Emergency Support Teams of federal personnel to be deployed in an area affected by a major disaster or emergency. These emergency support teams assist the federal coordinating officer in carrying out his/her responsibilities;
- Assistance with emergency preparedness activities; and
- Readiness of federal agencies to issue warnings to state and local officials, including technical and advisory assistance for the performance of essential community services, issuance of warnings of risks or hazards, dissemination of public health and safety information, provision of health and safety measures, and management and reduction of immediate threats to public health and safety.

#### 2.1.2 *National Oil and Hazardous Substances Pollution Contingency Plan*

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) provides the organizational structure and procedures used by the federal government to prepare for and respond to discharges of oil and releases of hazardous substances, pollutants, and contaminants.<sup>9</sup> The plan names the Department of Commerce (DOC) as a trustee for ocean and coastal natural resources. Within the DOC, this authority has been delegated to NOAA. The NCP also tasks NOAA with providing scientific support to the FOSC through the SSC program.

The NCP was first published in 1968. This plan provided the first comprehensive system of accident reporting, spill containment, and cleanup. It also established a response headquarters, a national reaction team, and regional reactions teams—precursors to the current National Response Team (NRT) and Regional Response Teams (RRTs). In the years since 1968,

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<sup>9</sup> Complete details of the National Contingency Plan are available at [http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title40/40cfr300\\_main\\_02.tpl](http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=/ecfrbrowse/Title40/40cfr300_main_02.tpl).

Congress has expanded the scope of the NCP. The latest revisions to the NCP were finalized in 1994 to reflect the oil spill provisions of the Oil Pollution Act of 1990 (OPA). (See below for additional information on OPA.)<sup>10</sup>

### **2.1.3 Oil Pollution Act (OPA)/Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)<sup>11</sup>**

The Oil Pollution Act (OPA) of 1990 and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 together specify NOAA's legal authorities for restoring coastal resources, including the Great Lakes waters and shorelines, from injury caused by oil (OPA) and hazardous substances (CERCLA).

The OPA was passed in the wake of the *Exxon Valdez* spill in 1989. Among other functions, OPA establishes liability for damages resulting from oil pollution. It also establishes a fund for compensation for such damages. CERCLA, meanwhile, is the principal statute governing the cleanup of sites contaminated with hazardous substances. CERCLA was amended by the Superfund Amendment and Reauthorization Act (SARA) in 1986.

Both OPA and CERCLA are products of the public trust doctrine. The public trust doctrine establishes the right of public benefits over private interests and means that public lands, waters, and living resources are held in trust for the benefit of all people and future generations. Responsibility for acting on behalf of the public to assess these injuries and restore the injured resources lies with designated federal, state, tribal, and foreign natural resource trustees. OPA and CERCLA designate NOAA, acting through the agency's Damage Assessment, Remediation, and Restoration Program (DARRP), as the DOC trustee for natural resources held in trust.<sup>12</sup> The Department of Interior, represented by the US Fish and Wildlife Service and Bureau of Indian Affairs, is also a federal trustee.

### **2.1.4 Natural Resource Damage Assessment (NRDA)<sup>13</sup>**

In the event of an oil or hazardous chemical spill, DARRP is responsible (per OPA or CERCLA, respectively) for collaborating with other agencies and industry to resolve natural resource liability while protecting coastal and offshore resources. Through the Natural Resource Damage Assessment (NRDA), DARRP and co-trustees work with response agencies and responsible parties to:

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<sup>10</sup> For a more detailed overview of the National Contingency Plan, see the "National Oil and Hazardous Substances Pollution Contingency Plan Overview" (<http://www.epa.gov/oem/content/lawsregs/ncpover.htm>).

<sup>11</sup> For additional details about OPA and CERCLA, as well as other relevant laws regarding NOAA's legal authorities for restoring coastal resources, see <http://www.darrp.noaa.gov/about/laws.html#OilPollution>.

<sup>12</sup> Specific Natural Resource Trustee authorities under OPA are available at <http://www.darrp.noaa.gov/about/opalegis.html>. Specific Natural Resource Trustee authorities under CERCLA are available at <http://www.darrp.noaa.gov/about/cerclalegis.html>.

<sup>13</sup> Comprehensive details on Natural Resource Damage Assessments are in §990.10 within Title 15: Commerce and Foreign Trade for Oil Pollution Act regulations. Available at [http://www.darrp.noaa.gov/library/pdf/PPD\\_AP-A.PDF](http://www.darrp.noaa.gov/library/pdf/PPD_AP-A.PDF).

- Identify and quantify injury to natural resources and lost services;
- Ensure protection of trust resources during a spill response and cleanup (i.e., advise response agencies to minimize or mitigate harm to trust resources);
- Implement projects to restore injured resources and their associated services to their baseline condition (primary restoration); and
- Implement additional projects to compensate the public for interim losses (compensatory restoration).<sup>14</sup>

Funding for NRDA comes from the responsible party (the polluter), agency base funds, the Damage Assessment and Restoration Revolving Fund, or, for oil spills, from the National Pollution Fund Center (NPFC, managed by the US Coast Guard). Funds expended by trustees for damage assessment (whether from trustee funds or from the NPFC) are eligible for reimbursement by the responsible party.

OPA directs trustees to work cooperatively with the responsible party to assess injuries and achieve restoration. The result of the NRDA process is a legal claim for damage to natural resources. This claim can be resolved through settlement or judicial process. The outcome of either process is a consent decree documenting the terms for resolving the claim. The potential for litigation in NRDA cases requires that trustees maintain detailed administrative records of data and analysis that explain and support trustee decisions. Legal chain of custody and thorough quality assurance documentation are also required. In addition, preparations for settlement or litigation may include confidential negotiations among trustees or between trustees and the responsible party. Consequently, NOAA staff involved in this work are required to maintain confidentiality.

### ***2.1.5 Marine Protection, Research, and Sanctuaries Act of 1972.***<sup>15</sup>

Under section 1443, the Secretary of Commerce (i.e., NOAA) may undertake or authorize all necessary actions to prevent or minimize the destruction or loss of, or injury to, sanctuary resources, or to minimize the imminent risk of such destruction, loss, or injury.

### ***2.1.6 Interagency Agreement for Meteorological and Other Technical Services***

Cooperation and coordination among multiple federal agencies is critical to the success of fire management, suppression, and safety. *The Interagency Agreement for Meteorological and Other Technical Services* between NOAA/NWS, the US Department of Interior (Bureau of Land Management, Bureau of Indian Affairs, Fish and Wildlife Service, National Park Service), and the US Department of Agriculture (Forest Service) establishes the responsibilities of and reimbursement provided to NWS in wildlands fire management. In addition, it identifies the responsibilities and roles of other federal “Wildland Fire Agencies.”

The *Interagency Agreement* lays out that NWS is legally mandated to issue weather forecasts and warnings for the protection of life and property. Services provided by NWS, per the

<sup>14</sup> See <http://www.darrp.noaa.gov/about/index.html> for additional information about work conducted by DARRP as part of NRDA.

<sup>15</sup> Public Law 92-532; October 23, 1972; 86 Stat. 1052 and 1061. Titles I and II are codified at 33 U.S.C. 1401-1445, as amended.

*Interagency Agreement*, include basic meteorological services, non-routine services (including, but not limited to, on-site meteorological support consultations and technical advice), wildland fire suppression-related support activities, additional fire management services, and additional responsibilities shared jointly with other Wildland Fire Agencies.<sup>16</sup>

### **2.1.7 National Weather Service Organic Act (15 U.S.C. § 313)**

The Organic Act authorizes the National Weather Service as the US Government entity responsible for providing flood and weather forecasting services, issuing storm warnings, gauging and reporting of rivers, collecting and transmitting marine intelligence for the benefit of commerce and navigation, distributing meteorological information in the interests of agriculture and commerce, and taking meteorological observations as necessary to establish and record the climatic conditions of the United States.

## **2.2 Line Office/Programs Overview, Resources, and Capabilities**

Each line office has distinct resources and capabilities for responding to emergency events. Beyond providing a brief background of relevant offices and programs, this section details relevant services and expertise that each can bring to an emergency response, including and in addition to the event-specific capabilities listed in Section 1.3, “NOAA Line Office and Program Engagement in Emergency Response Events.”

### **2.2.1 National Ocean Service (NOS)**

The National Ocean Service (NOS) consists of multiple divisions and responsibilities that are key to emergency response events. Within NOAA, the Office of Response & Restoration (OR&R) assumes the largest direct role in emergency response. OR&R consists of three divisions: Emergency Response (ERD), Assessment and Restoration (ARD), and Marine Debris. OR&R also has several specific positions and teams essential to emergency response: Scientific Support Coordinator (SSC), the Scientific Support Team (SST), and the Regional Resource Coordinator (RRC). Each of these positions is housed in one of the aforementioned divisions. OR&R’s expertise spans oceanography, biology, chemistry, geology, and natural resource economics, allowing the response team to estimate oil and chemical trajectories, analyze chemical hazards, and assess risks and injuries to coastal wildlife and habitats.

**Emergency Response Division (ERD).** OR&R’s ERD facilitates spill prevention, preparedness, and response at national and local levels. ERD represents NOAA and the Department of Commerce (DOC) on the National Response Team (NRT) and Regional Response Teams (RRT), and ERD employees are part of the SST led by the SSC (see below for details on this position).

As DOC/NOAA’s RRT representative, ERD will most likely be NOAA’s primary initial contact for oil and hazardous substance spills in the Great Lakes.

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<sup>16</sup> The *Interagency Agreement for Meteorological and Other Technical Services (FY 2008-12)* can be accessed at [http://www.srh.noaa.gov/ridge2/fire/docs/2008\\_National\\_Agreement.pdf](http://www.srh.noaa.gov/ridge2/fire/docs/2008_National_Agreement.pdf) Additional details about NWS and IMET responsibilities are cited in *IMET Services to Support Fire and Other Incidents*, available at <http://www.nws.noaa.gov/directives/sym/pd01004002curr.pdf>.

ERD employees, including SSCs, offer extensive scientific expertise in regard to oil and chemical spills. Specific capabilities include:

- Supporting emergency response and, in coordination with DARRP, remediation activities;
- Developing contingency plans in conjunction with other offices;
- Developing tools and providing training; and
- Providing expertise on such issues as dispersant use, alternate response technologies, and response countermeasures.

While oil and chemical spills are ERD's primary focus, the Division also provides support for incidents such as downed aircraft, search and rescue, and tracking of floating objects.

**Scientific Support Coordinator (SSC).** NOAA SSCs are housed within OR&R's ERD and are regionally associated with US Coast Guard Districts. The National Oil and Hazardous Substances Pollution Contingency Plan, described in Section 2.1.2, stipulates the NOAA SSC as the principal science advisor to the FOSC for spill response.

During a response, the SSC may be designated by the FOSC to assume the following responsibilities:

- Serve as the principal advisor for scientific issues: chemical hazards, environmental and weather conditions, field observations, trajectory analysis, resources at risk, chemical hazards analyses, assessments of the sensitivity of biological and human-use resources, and environmental tradeoffs of countermeasures and cleanup methods;
- Seek consensus on scientific issues impacting the response, communicate differing opinions, and resolve conflicting scientific information within the scientific community;
- Coordinate required emergency consultations for protected resources (e.g., threatened and endangered species, cultural resources, and sensitive habitats);
- Communicate with and coordinate the federal, state, and academic scientific community and trustee agencies;
- Coordinate requests for assistance from federal and state organizations; and
- Integrate expertise from governmental agencies, universities, community representatives, and industry to assist the FOSC in evaluating the hazards and potential effects of releases and in developing response strategies.<sup>17</sup>

In addition to undertaking these aforementioned responsibilities, the NOAA SSC, along with the DOC/NOAA representative to the RRT, makes it possible for the FOSC to quickly access the extensive resources available throughout NOAA when responding to a variety of incidents, including natural disasters, ship groundings, significant national events, terrorist incidents, or vessel salvage operations.

**\*Note:** Although the SSC for coastal zone response is from NOAA, that SSC does not represent only NOAA during the response process. The SSC is the lead NOAA representative

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<sup>17</sup> For additional information, see *An FOSC's Guide to NOAA Scientific Support*, Chapter 2, [http://response.restoration.noaa.gov/sites/default/files/FOSC\\_Booklet.pdf](http://response.restoration.noaa.gov/sites/default/files/FOSC_Booklet.pdf).

to the Unified Command (per NIMS, described in Section 1.1.2) during the emergency phase of the response, but the SSC is responsible for obtaining the best science available from all sources. In the event of a spill, the DOC/NOAA representative to the RRT is the designated NOAA representative and advocate for NOAA-specific issues.

**Scientific Support Team (SST).** In a spill response, each SSC is supported by a Scientific Support Team (SST). The SST is composed primarily of staff from OR&R's ERD and ARD (described below). The SST's expertise includes:

- Oil slick trajectory forecasting and monitoring;
- Pollutant transport modeling;
- Environmental chemistry;
- Chemical hazard assessment;
- Health and safety;
- Information management;
- Resources at risk;
- Biological assessments; and
- Environmental tradeoffs of cleanup strategies.

**Assessment and Restoration Division (ARD).** OR&R's ARD is comprised of biologists, toxicologists, ecologists, policy analysts, information specialists, attorneys, geologists, environmental engineers, and natural resource economists. Like ERD, ARD assesses and restores coastal habitats and resources affected by the release of hazardous materials or ship groundings. The division has particular expertise in aquatic risk assessment techniques, contaminated sediment, and data interpretation, and may be called upon by the USEPA to assist with these issues. In such circumstances, ARD might work with the USEPA to:

- Coordinate NOAA technical support provided to USEPA during removal or remedial actions;
- Determine the severity of risk posed to natural resources from site releases;
- Review and recommend approaches to minimize coastal resource impacts as part of remedial investigation and feasibility studies;
- Act as technical liaison between NOAA and USEPA, or other federal, state, or local agencies on coastal resource issues of common interest;
- Estimate pollutant fate and transport in water and sediments to allow prediction of concentration gradients resulting from a pollutant release or hazardous waste site;
- Evaluate clean-up strategies and their potential effects on natural resources;
- Incorporate mitigation and restoration recommendations into cleanup decisions; and
- Develop guidelines on implementation of cleanup of contaminated water and sediments to protect resources and minimize the risk of human exposure through the marine food chain.
- As part of the Damage Assessment, Remediation, and Restoration Program (DARRP), described in Section 2.2.3, ARD, in coordination with co-trustee agencies, assesses injury to and restores natural resources.

**Regional Resource Coordinator (RRC).** RRCs are housed within ARD. RRCs work with USEPA regional offices to provide technical support to evaluate natural resource concerns at

hazardous waste release sites and improve coordination with federal and state natural resource trustee agencies. As environmental scientists, RRCs assist the EPA in identifying and assessing risks to coastal resources from hazardous waste sites, as well as in developing cost-effective strategies to minimize or mitigate those risks. Early notification of potential natural resource injuries allows federal and state resource trustees to carry out responsibilities in a manner consistent with EPA requirements and schedules for remedial actions and cost recovery negotiations with responsible parties.

**Marine Debris Division.** OR&R's Marine Debris Division (MDD) supports national and international efforts to research, prevent, and reduce the impacts of marine debris. Marine debris is any persistent solid material that is manufactured or processed and directly or indirectly, intentionally or unintentionally, disposed of or abandoned into the marine environment or the Great Lakes. The MDD serves as a centralized capability within NOAA, coordinating and supporting activities within NOAA and with other federal agencies, as well as using partnerships to support projects carried out by state and local agencies, tribes, nongovernmental organizations, academia, and industry.

**Center for Operational Oceanographic Products and Services (CO-OPS).** NOS CO-OPS provides the NOAA infrastructure for monitoring and accessing a wide variety of observational oceanographic data across the Great Lakes, including water level, water current, and water temperatures. CO-OPS also operates the Great Lakes Operational Forecast System (GLOFS), which is an automated model-based prediction system which produces forecasts of water levels, water currents, and water temperatures for each of the Great Lakes in conjunction with the NWS National Digital Forecast Database (NDFD). These forecasts are produced for the commercial, recreation, and emergency response communities – and maximize safety and efficient maritime commerce across the Great Lakes and associated waterways.

### ***2.2.2 National Marine Fisheries Service (NMFS)***

The National Marine Fisheries Service (NMFS) houses the Restoration Center (RC), one of three DARRP offices. The RC provides technical expertise in assessing injuries to fish and wildlife, as mandated by OPA and CERCLA, and is also NOAA's expert on endangered species issues. The RC also plans, implements, and funds coastal habitat restoration throughout the Great Lakes Region, oftentimes doing so through regional partnerships. In addition to providing financial and technical assistance to remove dams and barriers, construct fish passage, and remove invasive species, the RC also provides resources to clean up marine debris and restore coastal wetlands.

### ***2.2.3 Damage Assessment, Remediation, and Restoration Program (DARRP)***

The Damage Assessment, Remediation, and Restoration Program (DARRP) is a cross-line office program within NOAA that acts on behalf of the public as a trustee to manage, protect, and restore coastal and marine resources. DARRP was established to provide permanent scientific, economic, and legal expertise within NOAA to assess and restore injured natural resources and prepare a legal claim for damages. DARRP carries out NRDA trustee responsibilities. DARRP is comprised of three NOAA offices: NOS's OR&R Assessment and Restoration Division (ARD), NMFS's Restoration Center (RC), and the Office of General Counsel for Natural Resources (GCNR).

#### 2.2.4 National Weather Service (NWS)

The National Weather Service (NWS) organizationally consists of a mix of local, regional and national forecast centers across the country. These include nine national centers that provide expertise in environmental modeling and severe storm, tropical, aviation, hydrometeorological, climate, space weather, and ocean forecasting.<sup>18</sup> In addition to regional-level headquarters and national centers, the Great Lakes states are served by three River Forecast Centers (responsible for forecasting river and flood conditions), three Center Weather Service Units (a support service for air traffic management), and Weather Forecast Offices (WFOs).

The large number of WFOs—122 across the nation, and 17 in the Great Lakes region—makes NWS the most community-based NOAA Line Office. WFOs in particular communicate regularly with state and local agencies, media, and local Emergency Managers, which means that during a large emergency event they are likely to be contacted before other NOAA Line Offices. A 24/7 operation and presence throughout the region also allows NWS personnel to quickly deploy to almost any Emergency Operations Center (EOC) or Incident Command Post (ICP). NWS also maintains a cadre of trained Incident Meteorologists (IMETs) or Emergency Response Specialists/Meteorologists (ERS/ERM) specifically for emergency response purposes.<sup>19</sup> While these positions were originally intended to deploy to fires, personnel are equipped to respond to other natural or man-made emergencies as well.

Two NWS geographic regions span the Great Lakes. NWS's Central Region Headquarters, located in Kansas City, Missouri, manages most NWS activities around the Great Lakes. The NWS Eastern Region Headquarters, located in Bohemia, New York, services Ohio, New York, and Pennsylvania, and their associated Great Lakes waters. The Central Region and Eastern Region each contains a Regional Operations Center (ROC), which is responsible for overseeing and coordinating NWS emergency response efforts during high-impact events. ROCs serve an Emergency Operations Center (EOC) function when any NWS office is involved in an ICS deployment.

Together, national, regional, and local NWS resources provide diverse support services during an emergency response. NWS capabilities include general seven-day forecasts for temperature; dew point temperature; relative humidity; quantitative precipitation for rain, snow and ice (QPF); wind speed and direction; weather type; precipitation probability; sky cover; wave height; apparent temperature; and river stage. These forecasts are updated on a 24/7 basis. Additionally, NWS provides warning services for a wide variety of Great Lakes hazards,

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<sup>18</sup> See <http://www.weather.gov/organization> for a list of national and regional centers and offices, plus a high-level organization chart. River Forecast Center locations and geographic coverage are available at <http://water.weather.gov/ahps/rfc/rfc.php>. Central Weather Service Unit Product locations and geographic coverage are available at <http://aviationweather.gov/products/cwsu/>. Weather Forecast Office regions and locations are available at <http://www.nws.noaa.gov/organization.php>.

<sup>19</sup> In the future, the IMET position and title will be replaced by Emergency Response Specialists and Emergency Response Meteorologists. Both positions will become more focused on fire-weather.

including tornadoes, severe thunderstorms, river floods, flash floods, heavy snow, blizzards, ice storms, dense fog, marine gales/storms, extreme heat and cold, rip currents, and coastal inundation. All of these forecasts and warnings are available to the general public on NWS web pages and graphically and digitally through the NWS National Digital Forecast Database (NDFD). More specifically to the Great Lakes, NWS operates a marine forecast and observation portal, which provides official monitoring and forecasts for wind speed and direction, wave height, weather conditions, etc.<sup>20</sup>

More importantly, in addition to extensive public forecast and warning information, NWS has capacity to forecast the aforementioned pertinent weather elements, plus others, at a level of detail and sophistication far beyond that available to the general public. These capacities are reserved mostly for emergency situations involving local, state, and federal government response. These situations include oil spills, rangeland and forest fires, urban fires, airborne chemical releases, radiological releases, and search and rescue efforts. Examples of advanced decision-support products and services include hourly snowfall rate probabilities for road and runway crews; high resolution wave spectra (max waves) and return frequency for marine operations; hourly probabilistic winds, mixing height and plume forecasts for fires, airborne releases and aviation operations; detailed river stage and streamflow forecasts for flood operations and inland river spills; and extreme heat/cold and thunderstorm forecasts for outdoor recovery operations. Typically, these are provided by request through an in-person briefing, a webinar or telephone briefing, or web delivery.

In the event that NOAA personnel outside NWS, including the SSC, are asked to provide weather information, they are encouraged to consult with NWS. NWS has extensive forecast datasets that are not automatically posted. NWS employees can readily access, interpret, and disseminate this higher-level information to the SSC and emergency responders, with the likely outcome of improved response decision-making and actions.

### ***2.2.5 Office of Oceanic and Atmospheric Research (OAR)***

NOAA's Office of Oceanic and Atmospheric Research (OAR) consists of research laboratories, field data collection assets, and several programs with a presence in the Great Lakes, including Sea Grant. OAR operates the Great Lakes Environmental Research Laboratory (GLERL), which conducts integrated, interdisciplinary environmental research focusing on the Great Lakes and is the regional node for NOAA's CoastWatch program. The three science themes of GLERL research are modeling and forecasting, ecosystem dynamics, and observing systems and technology. OAR offers various expertise and support services in response to requests from NOAA Line Offices and programs, as well as agencies and organizations outside NOAA. Additionally, GLERL maintains the Great Lakes Coastal Forecast System (GLCFS), a developmental portal that provides oceanographic and meteorological data and modeling information in support of NWS and NOS CO-OPS/GLOFS operational products and services.<sup>21</sup>

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<sup>20</sup> Additional information can be found at <http://www.weather.gov/greatlakes>.

<sup>21</sup> Additional information about GLCFS can be obtained at <http://www.glerl.noaa.gov/res/glcfs/>.

### **2.2.6 NOAA Homeland Security Program Office**

The NOAA Homeland Security Program Office (HSPO) is responsible for NOAA Headquarters' plans, programs, and policies for homeland security and execution of incident management. The HSPO strengthens NOAA's ability to prepare for, respond to, and recover from terrorist attacks, major disasters, and other emergencies by unifying efforts (i.e., "One NOAA") and serving as the point of contact for NOAA leadership, the Department of Commerce (DOC), the White House Homeland Security Council, the Department of Homeland Security (DHS), and other interagency partners. HSPO is responsible for:

- Maintaining the NOAA CONOPS for all hazards incident management and all supplemental guidance ensuring NOAA's compliance with the NRF;
- Ensuring that all NOAA programs adhere to the policies and protocols in the CONOPS;
- Coordinating NOAA's efforts to prevent, prepare for, respond to, and recover from incidents of all hazards and all origins;
- Acting as NOAA liaison with the Department of Homeland Security and other federal agencies;
- Serving as the Under Secretary's principal advisor on issues relating to intelligence matters, terrorism, and homeland security-related emergencies; and
- Evaluating NOAA's response operations on behalf of the Under Secretary.

### **2.2.7 National Environmental Satellite, Data, and Information Service (NESDIS)**

In the Great Lakes region, NOAA's National Environmental Satellite, Data, and Information Service (NESDIS) is represented by the Cooperative Institute for Meteorological Satellite Studies (CIMSS) at the University of Wisconsin-Madison. While most members of CIMSS are affiliated with the university, the Cooperative Institute also employs a small group of federal employees from the NESDIS Advanced Satellite Products Branch. Through CIMSS, NESDIS provides a wide variety of real-time, high-resolution satellite imagery and derived products for the Great Lakes that may be useful in any emergency response situation (e.g., fire monitoring).<sup>22</sup>

### **2.2.8 Great Lakes Regional Collaboration Team (GLRCT)**

The Great Lakes Regional Collaboration Team (GLRCT) includes members from multiple NOAA Line Offices and many staff offices and core partner agencies. The GLRCT is led by a Regional Team Lead, who focuses GLRCT activities, and a Regional Coordinator, who provides regional continuity. The member composition of the GLRCT makes it an important resource for communication and collaboration across NOAA, particularly during a time-sensitive emergency response. As mentioned previously, the Regional Coordinator is in an optimal position to convey information across line offices during an emergency event.

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<sup>22</sup> Additional information about CIMSS can be obtained at <http://cimss.ssec.wisc.edu/>.

## **2.3 Communication Mechanisms within NOAA**

### ***2.3.1 Standard Formats for Communication: Situation Reports (SitReps) and Status Updates***

NWS Situation Reports (SitReps) and SSC status updates are key mechanisms to inform line offices and senior NOAA leadership about emergency response activities. They are for internal use. Existing protocols call for NWS to issue SitReps during emergency responses in which it is involved. The SSC coordinates the status updates most often for spill events or maritime accidents. The SSC status updates cover scientific issues, ecosystem conditions, operation updates, planned activities, weather consideration, on-scene mapping, photo-documentation, site assessments, and more. The NWS SitRep has a broader purview, which often covers external event impacts, internal operational functions, and agency performance. If multiple line offices are involved, the SSC may seek input from each discipline (including, but not limited to, weather, modeling, and life sciences) to compile into a report. If requested, responding line office personnel may consolidate information from all line offices into a single report for senior NOAA leadership.

During an emergency event response, public and/or media inquiries should be directed to the Public Information Officer (PIO) and the Joint Information Center (JIC) for the event, per NIMS (see Section 1.1.2). Dissemination of information is at the sole discretion of the FOSC.

### ***2.3.2 Technology for communication within NOAA and between NOAA and responding agencies***

Conference calls, e-mails, and text messaging can be effective communication mechanisms; an internal assessment of the 2011 Missouri and Souris River flood response found that mass e-mail was an excellent way to share information among partners, and some NWS Decision Support Services employees found that text messaging was the most effective technology for communicating quickly.

These technologies can have varying limitations, however. Dissemination of information using e-mail has been found to be cumbersome in past responses, as necessary recipients change regularly. Responders have also criticized the need to constantly monitor e-mail in an operational setting, as well as the large volume of e-mail sent to persons who do not have an immediate need to know the information. It also cannot be assumed that all NOAA employees have text messaging capabilities on their phones.

Given these aforementioned limitations, NOAA/NWS Service Assessments have recommended that while conference calls and e-mail lists can be effective collaboration tools, all NOAA entities involved in a disaster response effort should use a shared data repository for internal information and real-time shared communication tools.<sup>23</sup>

Multiple additional technologies are available to support communication among NOAA Line Offices, between NOAA Line Offices and other responding agencies, and between NOAA and the media and public. Several options are described below. The technology chosen for

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<sup>23</sup> Per NWS Service Assessment.

communication will likely rest with the specific details and needs of the event, as well as with the NOAA Line Office to respond first.

**ResponseLINK.** ResponseLINK is an online emergency response communication system that can facilitate communication and coordination within NOAA and is controlled by ERD through the SSC of record.

*Capabilities and strengths:*

- Designed to inform emergency response personnel about incident status and updates.
- Can store and archive response-related materials and documents (e.g., reports, photos, and maps), thus creating a central location for storing information for operational and legal documentation purposes.
- Initial notification can be tailored by the SSC to include persons s/he deems necessary to the particular response.
- Assists with keeping track of who is on site responding to emergency event.
- Does not require training or spin-up time.
- E-mailed notifications are short and concise.
- Does not require special software (it is web-browser based).
- Accessible only to authorized users (password-protected); however, it is possible to access using a shared password.
- Proved to be an excellent repository of information from all NOAA parties involved in the Enbridge oil spill response and restoration effort.
- Able to input information to and obtain information from the repository, which is more efficient than using email.

*Limitations:*

- ResponseLINK is not designed to be a broad notifications tool, because it goes only to persons designated as NOAA leadership, persons within the immediate NOAA response community, and persons who have opted to receive messages. This potential limitation can be overcome if the SSC adds recipients to the notification list for a particular response, and/or if the Great Lakes Regional Coordinator is designated as being responsible for disseminating ResponseLINK information to a broader audience, as appropriate.
- Designed for events in which OR&R has a role; it is not designed for agency-wide use.

**NWSChat.** NWSChat is an instant messaging program that facilitates communication and coordination within NWS and between NWS, its partners, the media, and the emergency response community.

*Capabilities and strengths:*

- Designed to facilitate collaboration both within and outside NWS; permits real-time exchange of information with the media and emergency responders.
- Can establish chat room-specific levels of security and accessibility.
- Has been used in multiple responses to facilitate collaboration within NWS (between, e.g., WFOs and RFCs to review forecasts prior to release) and between NWS and partner line offices and agencies.

*Limitations:*

- Does not permit documents to be uploaded (but does allow links to external documents).
- Limited benefit for persons without consistent Internet access.
- NWSChat is only effective when personnel with whom you are collaborating are logged into and monitoring NWSChat. This is not always possible during an emergency response.
- Each NWS office has its own NWSChat room. NWSChat can be ineffective when multiple NWSChat rooms are used to communicate with a single partner during an event.

**Google Groups.** Google Groups is a free service from Google, Inc.

*Capabilities and strengths:*

- Secure online communication system.
- Can limit participants to invited persons.
- Can be used for online discussions and archival of information, including attachments.
- Can be customized.
- Members can organize with favorites and folders, choose to follow discussion via e-mail or through the Google Groups site, and quickly find unread posts.
- Members can select the frequency with which they want to receive Group updates (e.g., no e-mail, individual e-mails, abridged e-mails, or daily digests).
- Can be accessed on Android or Apple iOS devices.

*Limitations:*

- Requires some spin-up time to create the Google Group and invite people to join.
- Cannot vary levels of access/security by discussion or topic within a given Google Group. Increasing or decreasing access would require creating a new group.
- Use of Google Groups requires an @noaa.gov or @gmail.com e-mail.

### **2.3.3 Social media**

Social media, namely Facebook and Twitter, has been a highly effective tool for communication during some emergency response events. Following the Missouri/Souris River floods of 2011, many responding offices praised Facebook for its role in both internal and external communications. They felt that Facebook had significant value in terms of public outreach and information sharing; public feedback helped NWS gain a more complete understanding of the scope and magnitude of the event, particularly in data-sparse areas, thereby allowing the Emergency Management community to maintain situational awareness of the event.<sup>24</sup> Twitter has been praised for aiding responders during several emergency events, as it is a fast way to share information with large networks of people and can reduce the burden on

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<sup>24</sup> See the Missouri/Souris River Floods Service Assessment at [http://www.nws.noaa.gov/om/assessments/pdfs/Missouri\\_floods11.pdf](http://www.nws.noaa.gov/om/assessments/pdfs/Missouri_floods11.pdf).

emergency responders.<sup>25</sup> Twitter has also been known to function even when cell phone service does not.<sup>26</sup> Common sense must be used when employing social media to ensure that confidential information is not released. However, in certain circumstances and for certain purposes, it is a tool worth considering.

## **2.4 Funding and Reimbursement**

Several mandates and protocols determine reimbursement for emergency response.

### ***2.4.1 Pollution Removal Funding Authorization (PRFA)***

A Pollution Removal Funding Authorization (PRFA) is a tool available to the FOSC to quickly obtain needed services and assistance from other government agencies when responding to the release of oil or other hazardous materials. It is also a guarantee of reimbursement to NOAA Line Offices and other responding agencies for certain activities, services, and equipment provision. Reimbursement comes from the Oil Spill Liability Trust Fund (OSLTF).

There are strict policies surrounding reimbursement of costs via the PRFA. With exception of the Lead SSC's deployment to a response, NOAA personnel, activities, and services must receive advance FOSC approval in order to be eligible for reimbursement. The FOSC determines if a line office or program is included on the PRFA, and the FOSC has ultimate authority to accept or deny rates proposed by NOAA Line Offices or programs. At the FOSC's discretion, reimbursement can be provided for work on scene or off-site (e.g., at the employee's home office).

### ***2.4.2 Natural Resource Damage Assessment (NRDA)***

Reimbursement for NRDA activities is expected to come from the party (or parties) responsible for the spill. If needed, up-front funding for NRDA may come from a PRFA between the Coast Guard and one or more NRDA trustees. The Coast Guard would later recover that money from the responsible party.

OPA regulations provide that responsible parties must pay the trustees' "reasonable assessment costs" as defined in the regulations. Reasonable assessment costs must be directed at assessing the injury to natural resources as a result of the spill, or else must fit the regulatory criteria for allowable administrative and legal costs. Other costs incurred by NOAA (for example, scientific studies in the vicinity of the oil spill that are not part of the NRDA) are not eligible for recovery from the responsible party under OPA NRDA regulations. ARD tracks NOAA's recoverable NRDA costs and presents cost documentation to the responsible party for reimbursement.

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<sup>25</sup> See Emergency Communications Network.

<http://emergencycommunicationsnetwork.wordpress.com/2011/08/25/emergency-management-taking-twitter-seriously-2/>.

<sup>26</sup> See Government Computer News. <http://gcn.com/articles/2010/09/06/social-media-emergency-management.aspx>.

### **2.4.3 Reimbursement for NWS Services**

NWS is legally mandated to issue weather forecasts and warnings for the protection of life and property and is not reimbursed for providing this service. NWS has a practice of providing emergency decision support services beyond weather forecasts and warnings at the request of a responding federal, state, or local agency, even if there is no guarantee of those services being reimbursed. A long-term goal is to include NWS in the National Disaster Response Framework such that by 2020, NWS will have obligations to provide weather, water, and climate services within certain ESFs. This will encourage/guarantee reimbursement for NWS services.

At present, a fire-related incident is the only emergency event with a formal process for reimbursing NWS for its services. When an NWS IMET is dispatched to a fire-related incident, the requesting agency generates a Resource Order. This Order is required for reimbursement to NWS for IMET services. Most IMET requests for *non*-fire incidents (e.g., disaster recovery) come from the Federal Emergency Management Agency FEMA, which provides a Mission Assignment document in lieu of a Resource Order.

It is policy for NWS to make available IMET or other on-site decision support services for an emergency response even when there is no clear method of reimbursement. In such instances, IMET dispatches can sometimes be reimbursed through FEMA (because the incident has generated a federal disaster declaration and the jurisdiction is being reimbursed by FEMA/DHS). Alternatively, pay will come out of base funding.

**APPENDIX A:  
NOAA Great Lakes Directories for Emergency Events**

**Directory for an oil spill, hazardous chemical release, and/or maritime accident  
(updated October 1, 2012)**

<b>Position</b>	<b>Current employee</b>	<b>Phone</b>	<b>E-mail</b>
ERD: HAZMAT Duty Officer (24/7 Emergency Response Line)	Rotating	206-526-4911	N/A
NOS/OR&R: Scientific Support Coordinator	John Lomnicky	216-522-7760	<a href="mailto:John.Lomnicky@noaa.gov">John.Lomnicky@noaa.gov</a>
GLERL: Director	Marie Colton	734-741-2244	<a href="mailto:Marie.Colton@noaa.gov">Marie.Colton@noaa.gov</a>
GLRCT: Great Lakes Regional Coordinator	Jennifer Day	734-741-2266	<a href="mailto:Jennifer.Day@noaa.gov">Jennifer.Day@noaa.gov</a>
NOS/OR&R/ARD: Regional Manager, ARD Northwest-Great Lakes	Mary Baker	206-526-6315	<a href="mailto:Mary.Baker@noaa.gov">Mary.Baker@noaa.gov</a>
NWS: COO, NWS Central Region Headquarters	Michael Hudson	816-268-3132	<a href="mailto:Michael.Hudson@noaa.gov">Michael.Hudson@noaa.gov</a>
NWS: NWS Central Region Operations Center (MI, IN, IL, WI, MN)	ROC Duty Officer	816-200-1140	<a href="mailto:cr.crhroc@noaa.gov">cr.crhroc@noaa.gov</a>
NWS: NWS Eastern Region Operations Center (OH, PA, NY)	ROC Duty Officer	631-244-0180, 800-888-0892@skytel.com (pager)	<a href="mailto:erh.roc@noaa.gov">erh.roc@noaa.gov</a>
NMFS/Restoration Center: Habitat Restoration Specialist	Terry Heatlie	734-741-2211	<a href="mailto:Terry.Heatlie@noaa.gov">Terry.Heatlie@noaa.gov</a>
NMFS/Restoration Center: NMFS Regional Coordinator	Julie Sims	734-741-2385	<a href="mailto:Julie.Sims@noaa.gov">Julie.Sims@noaa.gov</a>
NOS/OR&R/ARD: Regional Resource Coordinator	Paula Bizot	734-741-2272	<a href="mailto:Paula.Bizot@noaa.gov">Paula.Bizot@noaa.gov</a>

GLERL: Chief of Information Services	Margaret Lansing	734-641-2210	<a href="mailto:Margaret.Lansing@noaa.gov">Margaret.Lansing@noaa.gov</a>
NOS/OR&R/ARD: Regional Resource Coordinator	Todd Goeks	312-886-7527	<a href="mailto:Todd.Goeks@noaa.gov">Todd.Goeks@noaa.gov</a>
NOS/OR&R/ARD: Regional Resource Coordinator	Jessica Winter	206-526-4540	<a href="mailto:Jessica.Winter@noaa.gov">Jessica.Winter@noaa.gov</a>
NOS/Marine Debris: Great Lakes Regional Coordinator	Sarah Opfer	419-898-3631	<a href="mailto:Sarah.Opfer@noaa.gov">Sarah.Opfer@noaa.gov</a>
OAR: Research Fishery Biologist	Ed Rutherford	734-741-2118	<a href="mailto:Ed.Rutherford@noaa.gov">Ed.Rutherford@noaa.gov</a>
OAR: Hydrologist, Physical Scientist	Drew Gronewold	734-741-2444	<a href="mailto:Drew.Gronewold@noaa.gov">Drew.Gronewold@noaa.gov</a>

**Directory for a large-scale fire event  
(updated October 1, 2012)**

<b>Line Office/Program and Position</b>	<b>Current employee</b>	<b>Phone</b>	<b>E-mail</b>
NWS: NWS Central Region Operations Center (MI, IN, IL, WI, MN)	ROC Duty Officer	816-200-1140	<a href="mailto:cr.crhroc@noaa.gov">cr.crhroc@noaa.gov</a>
NWS: NWS Eastern Region Operations Center (OH, PA, NY)	ROC Duty Officer	631-244-0180 or 800-888-0892@skytel.com	<a href="mailto:erh.roc@noaa.gov">erh.roc@noaa.gov</a>
GLERL: Director	Marie Colton	734-741-2244	<a href="mailto:Marie.Colton@noaa.gov">Marie.Colton@noaa.gov</a>
GLRCT: Great Lakes Regional Coordinator	Jennifer Day	734-741-2266	<a href="mailto:Jennifer.Day@noaa.gov">Jennifer.Day@noaa.gov</a>
NWS/National Interagency Fire Center: National Fire Weather Operations Coordinator	Larry Van Bussum	208-334-9824	<a href="mailto:Larry.VanBussum@noaa.gov">Larry.VanBussum@noaa.gov</a>
NESDIS: Branch Chief, Advanced Satellite Products Branch, Center for Satellite Applications and Research	Jeff Key	608-263-2605	<a href="mailto:Jkey@ssec.wisc.edu">Jkey@ssec.wisc.edu</a>
GLERL: Chief of Information Services	Margaret Lansing	734-641-2210	<a href="mailto:Margaret.Lansing@noaa.gov">Margaret.Lansing@noaa.gov</a>

**Directory for a large-scale and/or high-impact weather event  
(updated October 1, 2012)**

<b>Position</b>	<b>Current employee</b>	<b>Phone</b>	<b>E-mail</b>
NOS: Scientific Support Coordinator, OR&R	John Lomnicky	216-522-7760	<a href="mailto:John.Lomnicky@noaa.gov">John.Lomnicky@noaa.gov</a>
GLERL: Director	Marie Colton	734-741-2244	<a href="mailto:Marie.Colton@noaa.gov">Marie.Colton@noaa.gov</a>
GLRCT: Great Lakes Regional Coordinator	Jennifer Day	734-741-2266	<a href="mailto:Jennifer.Day@noaa.gov">Jennifer.Day@noaa.gov</a>
NOS: Regional Manager, OR&R Northwest-Great Lakes	Mary Baker	206-526-6315	<a href="mailto:Mary.Baker@noaa.gov">Mary.Baker@noaa.gov</a>
NWS: NWS Central Region Operations Center (MI, IN, IL, WI, MN)	ROC Duty Officer	816-200-1140	<a href="mailto:cr.crhroc@noaa.gov">cr.crhroc@noaa.gov</a>
NWS: NWS Eastern Region Operations Center (OH, PA, NY)	ROC Duty Officer	631-244-0180 or 800-888-0892@skytel.com	<a href="mailto:erh.roc@noaa.gov">erh.roc@noaa.gov</a>
Hydrologist, Physical Scientist, OAR	Drew Gronewold	734-741-2444	<a href="mailto:Drew.Gronewold@noaa.gov">Drew.Gronewold@noaa.gov</a>

**Directory for a radiological release  
(updated October 1, 2012)**

<b>Position</b>	<b>Current employee</b>	<b>Phone</b>	<b>E-mail</b>
GLERL: Director	Marie Colton	734-741-2244	<a href="mailto:Marie.Colton@noaa.gov">Marie.Colton@noaa.gov</a>
GLRCT: Great Lakes Regional Coordinator	Jennifer Day	734-741-2266	<a href="mailto:Jennifer.Day@noaa.gov">Jennifer.Day@noaa.gov</a>
NOS/OR&R: Regional Manager, OR&R Northwest-Great Lakes	Mary Baker	206-526-6315	<a href="mailto:Mary.Baker@noaa.gov">Mary.Baker@noaa.gov</a>
NWS: NWS Central Region Operations Center (MI, IN, IL, WI, MN)	ROC Duty Officer	816-200-1140	<a href="mailto:cr.crhroc@noaa.gov">cr.crhroc@noaa.gov</a>
NWS: NWS Eastern Region Operations Center (OH, PA, NY)	ROC Duty Officer	631-244-0180 or 800-888-0892@skytel.com	<a href="mailto:erh.roc@noaa.gov">erh.roc@noaa.gov</a>
GLERL: Chief of Information Services	Margaret Lansing	734-641-2210	<a href="mailto:Margaret.Lansing@noaa.gov">Margaret.Lansing@noaa.gov</a>
OAR: Hydrologist, Physical Scientist	Drew Gronewold	734-741-2444	<a href="mailto:Drew.Gronewold@noaa.gov">Drew.Gronewold@noaa.gov</a>
NESDIS: Branch Chief, Advanced Satellite Products Branch, Center for Satellite Applications and Research	Jeff Key	608-263-2605	<a href="mailto:Jkey@ssec.wisc.edu">Jkey@ssec.wisc.edu</a>
NOS/OR&R: Scientific Support Coordinator	John Lomnicky	216-522-7760	<a href="mailto:John.Lomnicky@noaa.gov">John.Lomnicky@noaa.gov</a>

**APPENDIX B:**  
**National Response Framework (NRF) Emergency Support Functions (ESF)**

**ESF#4 (Firefighting Annex):** ESF#4 manages and coordinates federal firefighting activities, including the detection and suppression of fires on federal lands. This function is accomplished by mobilizing firefighting resources in support of state, tribal, and local wildland, rural, and urban firefighting agencies. The Department of Agriculture/Forest Service coordinates this ESF. Further details are available at <http://www.fema.gov/pdf/emergency/nrf/nrf-esf-04.pdf>.

**ESF#9 (Search and Rescue Annex):** Search and Rescue deploys federal search and rescue resources to provide lifesaving assistance to State, tribal, and local authorities when there is an actual or anticipated need for a unified search and rescue response. The three primary search and rescue categories are an (urban) structural collapse search and rescue; maritime, coastal, and/or waterborne search and rescue; and land-based search and rescue. The Department of Homeland Security/Federal Emergency Management Agency coordinates this ESF. The Department of Homeland Security and US Coast Guard are the primary agencies involved in maritime, coastal, and/or waterborne search and rescue. Further details are available at [www.fema.gov/pdf/emergency/nrf/nrf-esf-09.pdf](http://www.fema.gov/pdf/emergency/nrf/nrf-esf-09.pdf).

**ESF#10 (Oil and Hazardous Materials Response Annex):** This ESF provides federal support in response to an actual or potential discharge and/or uncontrolled release of oil or hazardous materials (chemical, biological, and radiological substances, whether accidentally or intentionally released). ESF#10 covers appropriate actions to prepare for, respond to, and recover from a threat to public health, welfare, or the environment caused by actual or potential oil and hazardous materials incidents. In general, EPA is the lead for incidents in the inland zone and the Department of Homeland Security (DHS) or the US Coast Guard (USCG) leads the response to coastal incidents. Further details are available at <http://www.fema.gov/pdf/emergency/nrf/nrf-esf-10.pdf>.