Promoting Unity of Effort Regarding the Use of Science to Inform Decision-making during Crises

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Abstract:

Following a disaster, decisions are often made under conditions that are volatile and uncertain. Decision-makers have sometimes taken actions during responses that may not adequately reflect scientific or technical input. This may result in longer term harm to people and the environment. This paper will describe the work of a diverse project team that attended Harvard University's National Preparedness Leadership Initiative Program, which promotes the concept of using meta-leadership principles to improve response to crises. For its meta-leadership project, the team investigated the role of science in informing decision-making through the lens of the DWH response and other natural and man-made disasters. In simple terms, the team recommends a wide, "meta" view to better assess problems, applying a better informed scientific basis for decision making during times of crisis. Furthermore, the team

believes that solutions derived from such a "meta" view would better track to the situation at hand. The conclusion was that leaders assuming this perspective are better equipped to do just that.

The goal of the project was to utilize meta-leadership principles to:

- Identify means to better acquire, incorporate and apply scientific input including relative risks and rewards into crisis decision-making.
- Ensure that decision making protocols regarding response tactics, techniques and procedures include sound science that will lead to outcomes that minimize overall harm to human health and the environment in both the short and longer term.
- Effectively lead up, down, across and beyond by creating suggestions on how to appropriately create connectivity and communicate the basis for science-based decisions to key stakeholders, partners, and constituencies - including the public.

The team conducted extensive document reviews and over two dozen interviews with response officials. Project results and conclusions were reviewed with government officials prior to development of a team report. The report and its finding were presented to program faculty and participants at Harvard.

This paper summarizes the study and provides:

- Information needed for continued development of evidence-based best practices to respond to large scale events that have impact to environmental quality, natural/economic resources and population health.
- Insight that may promote better decision-making resulting in minimizing harm to people and the environment.

- Recommendations to help improve response capability within the existing unified command structures.
- Advice on improving engagement/coordination with key stakeholders and constituencies impacted by complex emergencies.

Large disaster responses are complex events with numerous stakeholders each likely possessing a different set of objectives or agenda. Such events will continue to present a meta-leadership challenge. The formation of consensus around "what the science suggests is the best course of action" can and should provide an expedited pathway to timely decision-making. Implementation of the recommendations from the study will lead to improved unity of effort regarding the use of scientific information in informing response decision-making.

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Issue Identification/Problem Statement

Following a disaster, on-scene coordinators, elected officials, property owners and corporate officers often need to make decisions or direct actions in order to prevent or mitigate an imminent and substantial danger to the public health or welfare of the surrounding communities. These decisions often need to be made under conditions that are volatile, uncertain, complex and ambiguous. They have competing objectives ranging from short term concerns of response workers safety to long term natural resources protection. They also require coordination with multiple stakeholders including members of the local community to remote non-government advocacy organizations. The policies, tactics, techniques and procedures to identify, analyze and support these decisions are lengthy, bureaucratic and incomplete while the decision process is time limited and almost always includes the media and now, input from multiple social media channels. As a result, emergency response leaders/decision-makers have taken actions during responses that did not appropriately reflect scientific or technical input, had suboptimal long term effects and failed to recognize potential or actual human health issues beyond the immediate protection of health and safety.

The Project team assessed this challenge in the context of the 3 dimensions of meta-leadership developed by Harvard University's National Preparedness Leadership Initiative or NPLI. Figure 1 provides a summary of meta-leadership.

Figure 1

Meta-Leadership in Practice

Meta-Leadership is a guide for solving complex problems involving numerous stakeholders. The "Meta" prefix describes an overarching grasp of problems as well as a broad perspective on potential solutions. Organizations are now less hierarchical and more oriented toward inter-dependence with other entities: an enterprise view of what they do. Therefore, successful leaders must expand their thinking, influence and activity beyond the formal bounds of their authority. The definition and metric of Meta-Leadership is "People Follow You." Those people include a boss, peers, outsiders as well as subordinates.

There are three dimensions of Meta-Leadership, which combine when put into practice:

The Person of the Meta-Leader

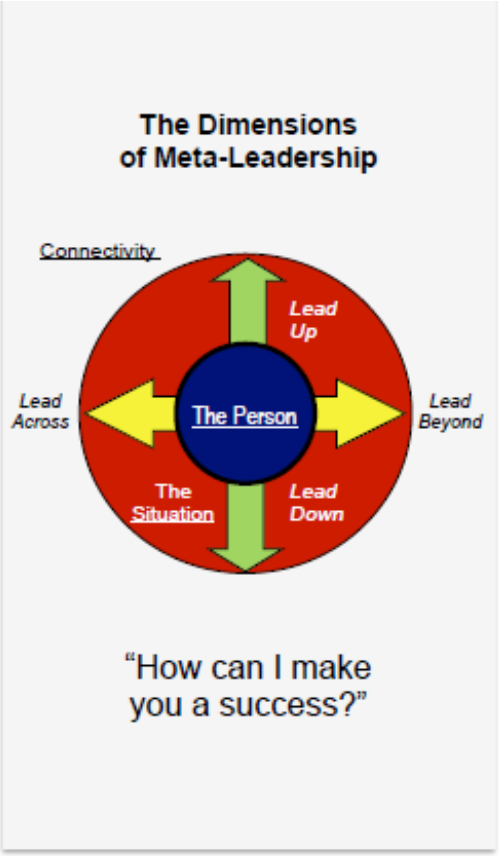
Meta-Leaders are grounded in *who* they are and *why* they are leading. Exhibiting emotional intelligence—self-awareness, self-regulation, motivation, empathy and social skills—their authenticity rallies those who follow. In stressful times, they are able to get up and out of the "basement," the primal survival fear instincts of their brain that otherwise overcome rational decisions and actions. They foster this discipline and balance in themselves and others.

The Situation

Step one in solving a problem is in understanding it. What is happening? The "Meta" view encourages a far-reaching analytic lens, recognizing the different experiences and motives of the many involved stakeholders. Building solutions requires development of options, engagement of key parties and negotiation of mutually acceptable and feasible solutions. The Meta-Leader guides strategic integration of differing perspectives, recognizing that by their very nature, situations continuously evolve.

Connectivity

Meta-Leaders intentionally link and leverage the efforts of many different organizations and people. By proactively galvanizing knowledge, motivations, and capabilities, they forge invaluable unity of effort and initiative. This connectivity includes leading *DOWN* to subordinates; leading *UP* to bosses or reporting authorities; leading ACROSS within one's organization; and leading *BEYOND* to those outside the organization. The result is a collaboration that coalesces key stakeholders who are together able to accomplish outcomes that none could reach alone.



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The goal of this project was to promote better decisions during a crisis that may ultimately result in minimizing harm to people and the environment, while balancing, or at least not ignoring other interests. This project used an oil spill response, leveraging the 2010 Deepwater Horizon (DWH) spill, as the base case. While this incident and the response were unique in their scale and complexity, it contained the major elements of any complex disaster in terms of the competing objectives, scientific uncertainties, variety and number of stakeholders and public and media interest. We anticipate that the output from this project will have applicability to other crises, both natural and technological of all scales.

This project will utilize meta-leadership principles to: 1) identify means to better acquire, incorporate and apply scientific input including relative risks and rewards into crisis decision-making, and 2) promote effective leadership by offering suggestions on how to foster connectivity and communicate the basis for science-based decisions to key stakeholders, partners, and constituencies, including the public.

The project objective is to ensure that decision making protocols regarding response tactics, techniques and procedures include sound scientific evidence that will lead to outcomes that minimize the overall harm to human health and the environment in both the short and longer term. Specifically, the project is intended to support improved unity of effort regarding the use of scientific evidence in:

- Formulating operational decisions about response techniques and approaches (e.g. dispersants, in-situ burning, and removal) and long term effects.
- Effectively communicating the basis for decisions to elected political officials, responders and the public.

Impacted Stakeholders

Emergency response is one of the most important and complicated actions a society can take, primarily because it affects all aspects of society ranging from elected officials at all levels; government employees from almost all agencies; corporations; local and remote non-governmental organizations; the general public and almost always, the media and now observers from social media. Often times the "cone in the cube" (which is a term used for only seeing it from one perspective and not the entire perspective) develops where these different organizations view the problem and solution from different perspectives because of differing organizational philosophies, different or non-harmonized risk assessment methodologies, economic interests, political affiliations, academic research priorities, or other competing agendas. Each will defend its self-interest by reference to scientific or other evidenced-based data, even when these references can only support a single position. It is understandable that with different responsibilities and constituencies, these diverse organizations and roles would focus on what is in their best interest is while trying to support the greater good. The response community includes not only local, state and federal responders, but also corporate responders. In our litigious society and in the court of public opinion, there is pressure to be protective of one's interest which sometimes leads to defensiveness instead of thorough analysis. Local responders handle a myriad of smaller emergency incidents on a daily basis, often with the support of industry. During larger incidents, though complex response construct which involves federal leadership is often required, it is local, tribal, state, or territorial governments that are still ultimately responsible for the safety and well-being of their residents. The media, to be fair, tries in most emergencies to deliver the right message particularly with respect to protective measures

but they are in competition to be first with a new perspective. Certain advocacy groups are extremely vocal in what they perceive as errors, or misjudgments. This has been exacerbated with the advent of social media channels which allow anyone to proffer a position, regardless of their situational awareness, expertise, or involvement. The people in the disaster affected area are the ones most concerned as the impacts can affect their lives, health, income, etc.

The target audience for this project was Federal, state, and local agencies as well as companies, voluntary (non-governmental) organizations, and academia that may be involved in responding to emergencies. These stakeholders are expected to collectively and collaboratively reach decisions during a response under a unified "whole community" response. More narrowly, this project is targeted toward several of the key Federal agencies that provide or coordinate scientific and technical input including the EPA, NOAA, FEMA, and HHS. Given that these agencies are expected to coordinate during certain emergencies under the National Response Team (NRT) and its Regional Response Teams (RRTs), the NRT was viewed as one of the primary audiences for this study.

Methods

After drafting an initial project work plan, the team met by teleconference and agreed to conduct a series of reference reviews and interviews to investigate the role of science in decision-making. While the initial focus of the interviews and reference reviews was on the DWH response, we quickly expanded to other crises. During the course of the Project, the team reviewed over 40 substantive reference documents and completed approximately two dozen interviews. A complete list of interviews and review is shown in Appendix 1.

We capitalized on our diverse team make-up and collective experience with oil spills, chemical incidents, major disasters with environmental and public health issues. We were able to utilize connections with the oil industry; the response community; public health professionals; toxicology experts; emergency managers; and federal, state and local officials. It was important to get different perspectives from those in a variety of positions with different authorities and responsibilities for a relevant incident. This holistic approach enabled us to test assumptions and pre-conceived ideas that we or a specific individual might make about what happened or how well a process functioned. We explored the DWH response through interviews from a variety of perspectives such as: a deputy to the National Incident Commander; a state health official; a FEMA Federal Resource Coordinator working with a Governor and his staff.

These efforts culminated in the development of findings and recommendations presented in Sections 4 and 5 of this report. Following the development of our preliminary findings and recommendations, we shared them with an number of key stakeholders within our home organizations and other external stakeholders to ensure our findings and recommendation were clear and reasonable, including: 1) a former USCG Type 1 Incident Management Team Leader and FEMA National IMAT Leader/ FCO; 2) EPA's Deputy Administrator for the Office of Solid Waste and Emergency Response; and 3) The Chair of the NRT's Science and Technology Committee.

Report Findings

Presented below are the major findings from our research, discussion and collaboration. The findings are divided in two categories. Next to each finding is a reference to a corresponding recommendation(s) contained in the next session.

Response Capability within the Existing Unified Command Structure:

- The Scientific Support Coordinator (SSC) is the key role outlined in the National Contingency Plan (NCP) and is intended to be a coordinator of scientific input for decision-makers. This is less apparent in the National Response Framework or ESF 10 annex. (Recommendations 3, 9)
- Interviews with SSCs suggested that the processes established under the NCP for gathering, evaluating and communicating technical and scientific information (including informal access to scientific networks in industry and academia) is essentially sound for all, but the largest most complex events (e.g. SONS). For such large events, access to additional scientific input could be improved. (Recommendations 3, 4, 11)
- Engagement of the wider academic community and the subsequent ability to reach scientific consensus during a response is challenging in part due to the differing incentives that scientists from academia may possess (e.g. longer term focus, desire to obtain funding for research, unfamiliarity with the ICS planning cycle and time constraints often faced by response decision-makers). There is a degree of knowledge asymmetry, where some in the academic community may not have the same level of familiarity with oil spill response (as scientists in the response), including extensive research on the benefits of oil spill response countermeasures. There are a number of initiatives investigating ways to improve the interface between response scientists (e.g. NOAA SSCs, industry scientists) and academics and their combined effectiveness during a response. (Recommendations 4, 11).
- In large scale emergency response there is a degree of risk aversion toward recommending a course of action inherent in the current process that inhibits the

formation and ultimately the acceptance of science-based recommendations. There may be instances where (given limited evidence) using judgment based on available information or forming recommendations based on concepts such as plurality of opinion, composite risk management, least environmental (or societal) damage, or weight of evidence is warranted and appropriate. This is especially notable in the public health and healthcare sector where practitioners and leaders are comfortable with providing guidance and recommendations after careful deliberation and consensus building. (Recommendations 1, 2, 8)

- Risk literacy at the leadership/decision-maker level and risk communication at the technical/scientific level is vitally important for the success of the response in large scale emergencies. Technical/scientific experts may not fully comprehend the time factors and other considerations under which response decision makers must operate. (Recommendations 1, 8)
- Clear and effective use of risk communication strategies is critically important in emergency response events. Messages should be conveyed in simple and easy-to-understand terms for response workers, government officials, media and the general public. (Recommendations 1, 8)
- Science must also play a key role in informing the exit strategy, i.e. when to transition from active response to recovery phase, including the selection of end points and determination as to whether/when they have been met. (Recommendations 1, 2, 4, 7)
- While immediate healthcare and public safety issues are adequately addressed in response plans (especially as relates to response workers and those immediately exposed), consideration of longer term chronic exposures and behavioral or mental health

considerations impacting larger populations may not be sufficiently contemplated in emergency decision-making under NCP responses or in the Chemical /Oil annex to the National Response Framework. Specifically, though public health stakeholders may be involved in planning and operations functions as well as in the coordinated guidance that effects the course of response efforts, public health executives/senior leaders are not consistently visible, present, and active as part of a unified command structure. During DWH, public health issues were greater than anticipated based on prior spills and exercises. As such, the role of the US department of Health and Human Services (HHS) was somewhat undefined. In fact, a Senior Health Official (SHO) was not designated until the middle of the incident response period and even then, there were questions about the responsibilities and authorities of that position. There is a need for additional guidance on how Federal agency statutory authorities under the National Response Framework (NRF) and National Disaster Recovery Framework (NDRF) are coordinated when executed outside of the UC organization. This observation becomes significant when a Federal agency's authority does not match up with the UC's objectives or an agency is not part of the command staff. The agency retains and may exercise its authorities in a UC but, in the execution of its authorities, could potentially impact response operations. (Recommendation 5)

- Mutual aid agreements and existing capabilities already available for population health preparedness, response and recovery can be effective tools to assist U.S., state and local governments, and tribes, in sharing information, data, supplies, resources, equipment, or personnel to protect the public's health. (Recommendation 6)

- The NCP primarily addresses response considerations and does not always sufficiently address recovery considerations. (Recommendation 7)

Engagement/Coordination with Other Key Stakeholders:

- Representatives at the local level either political (elected) or staff (appointed), have a good understanding of the National Response Framework and Stafford Act. Representatives at the Federal level involved in environmental response are very familiar with the NCP. These two perspectives collided on the DWH Oil Spill to create a misunderstanding regarding process. (Recommendations 8, 9)
- State/local elected officials and emergency managers may not be sufficiently familiar with NCP response concepts/model. This may exist because there is a gap in baseline awareness, familiarity/representation with the NRT and exercise involvement/participation. (Recommendations 2, 8, 9)
- Strategic communication requires the synchronization of crucial themes, messages, images, and activities in support of the response. (Recommendations 1, 10)
- When the emergency is large in scope and has a lot of media attention, the response tends to turn political. Media and therefore, the public by extension, focus on photogenic and emotionally compelling aspects vs. other aspects that may be more important decision drivers. Even with the best science, there will be conflicting information that gets picked up by the media, especially with social media. When that happens, politicians contact officials outside of the command process. This tends to amplify the emergency and adds pressure to command. Decisions can tend to be based on political pressure and not because of science, a process or a plan. (Recommendations 1, 8, 10)

Recommendations

Improving Response Capability within the Existing Unified Command Structure

1. Improve the interface between technical/scientific resources.
    - Provide risk literacy training to key decision-makers (e.g. FOSCs, senior government officials).
    - Provide risk communication training to technical/scientific resources (e.g. SSCs) and FOSCs to improve risk communication capabilities.
        - Communication of technical/scientific recommendations should reflect appropriate tradeoffs and risk communication principles; address pro's and con's; convey degree of certainty/confidence based on available information.
    - Consider embedding communication specialist with the SSC or in the environmental unit to:
        - Help synthesize/distill scientific inputs (e.g. risk communication) for decision-makers.
        - Help ensure that SSC has a role in providing info to the Joint Information Center (JIC)/Public Information Officer (PIO) for use in public and media communications.
        - Educate response professionals on decision-makers and politicians needs/perspectives/criteria (e.g. provide primer to technical/scientific personnel on the time factors and other criteria that influence response decision-making so they understand all considerations).
        - Create an internal (up line) communications strategy.
        - Contribute to a briefing book or FAQ document for use by spokespersons.

2. Encourage plan holders (public and private) to include multi-jurisdictional scenarios in contingency plans and exercises and to utilize the "red team" concept (independent group that introduces game changers/what ifs into the drill scenario) to challenge response teams to consider potentially unanticipated outcomes during exercises.
3. Support and reinforce role of the SSC as coordinator of scientific input.
4. For response scenarios that have the potential to overwhelm SSC capabilities/capacity, develop/formalize a mechanism to gain access to supplemental scientific resources (e.g. Academia, Interagency Solutions Group, Science Action Network).
5. Represent Public health considerations (including longer term consequences) in contingency planning, exercises, and actual responses as appropriate. The following steps should be considered:
    - Train SSCs to better factor health aspects into decision rationale.
    - Create role for Assistant Safety Officer for Public Heath in NCP oil or hazardous substance spill response actions.
    - Create NRT and RRT level subcommittees for Public Health and otherwise encourage better use of all available NRT/RRT talent.
    - Strengthen oil/chemical annex to the NRF to better reflect public health considerations
    - Develop additional guidance on how Federal agency authorities should be executed under ICS)/NIMS when the agency in question is not part of the UC. The NRT should look at means to further integrate other agencies' authorities that are broader in scope than the NCP. This issue could possibly be addressed in the National Disaster Recovery Framework (NDRF) that is currently being developed by FEMA and could provide a

potential solution for NCP responses to SONS or other events where public health concerns are significant drivers of response decision-making.

- Create from the beginning of a SONS incident, the position of Senior Health Office (SHO). This person should have public health hazardous material experience in order to support the NIC as soon as it is stood up.
- The NRT, in consultation with HHS, OSHA, EPA, and USCG should determine the appropriate roles, responsibilities, and scope of authority of the SHO which should include both worker health and safety as well as broader public health matters.
- The NRT, with HHS and OSHA support, should include increased public health, medical, and worker health and safety play in future SONS exercises.

6. Align and include existing Federal and State/Local and Tribal public health resources into the response and recovery framework already a part of NCP. Examples include HHS National Disaster Medical Services (NDMS) assets, HHS/USPHS Deployable Public Health Teams; mental health teams, DoD Support of Civil authority public health assets, Federal, State and local Public health and clinical laboratory networks, Federal public health professional staff already embedded and working within State/local/territorial health department organizational infrastructure, and State Environmental Health Services Teams.

7. Involve Federal and State disaster recovery coordinators earlier in a response and develop guidelines on when NCP response actions should transition to a recovery framework.

Improving Engagement/Coordination with Other Key Stakeholders

8. Improve liaison/relationship between the Incident Command and Federal, State and Local officials and politicians that may not be familiar with oil/chemical responses under the NCP

- Train Federal, State and Local leaders (or key staff/advisors) on key concepts including: the NCP; basic environmental and health aspects associated with emergency response to oil and chemicals spills; risk literacy awareness (e.g. NEBA).
    - Could be similar to the NRF training FEMA provides online.
    - Consider linking to accreditation (allowing for reimbursement) or make training a requirement.
- Develop a high level primer on same concepts that could be used in lieu of or in addition to such training.
- Encourage greater participation in drills/exercises by Federal, State, and Local officials.
- Encourage politicians to come to a spill event and meet with the FOSC before formulating conclusions/strategies.
- Consider use of Federal Resource Coordinators from FEMA's FCO cadre as official liaison between Incident Command and State governors.

9. Identify opportunities for greater alignment between Stafford Act/NRF and NCP response models (e.g. consider use of FEMA Incident Management Assistance Team as an additional coordination resource).
10. Involve members of the media in drills/exercises to improve their risk literacy thus allowing improved understanding of key decision drivers.
11. Support concept of scalable Science Action Networks at local, area, regional and national level with initial focus/involvement during the planning and preparedness phase. This will eventually allow for more seamless incorporation of academics into the response enterprise during future spill events.

Conclusion

Large responses are complex events with numerous stakeholders each likely possessing a different set of objectives or agenda. Such events will continue to present a meta-leadership challenge. Sound science or more accurately the formation of consensus around "what the scientific evidence suggests is the best course of action" can and should provide an expedited pathway to timely decision-making.

We believe that even partial implementation of the recommendations will lead to improved unity of effort regarding the use of scientific information in:

- Formulating operational decisions about response techniques, approaches (e.g. dispersants, in-situ burning, removal) and long term effects; and
- Effectively communicating the basis for decisions to political officials, responders and the public.

Though this report focused on the DWH oil release and impacts, it also reviewed several events including a train derailment and vinyl chloride Spill in Paulsboro New Jersey (2012), the MHCM spill into the Elk River in West Virginia (2014), as well as the 2015 Refugio Pipeline Spill off the coast of Santa Barbara county in California and Gold King Mine waste spill into the Animas River (Colorado). These events provide ongoing evidence for the need for improved use of science in crisis decision-making and continued development of best practice models to respond to large scale events that have impact to environmental quality, natural/economic resources and public health. Though adverse event detection, response capacity, and community resilience/recovery capability has improved through advances in science and technology, processes and practices still need to be reviewed and a greater cross section of stakeholders routinely engaged to better protect the physical environment and community well-being. To

create a better meta leadership framework for “enlightened partner interests” there is a need to: 1) ensure everyone has the same information / “playbook” 2) define strategic goals of scientific readiness and create a scheme for a ‘balanced system of protection’ to be applied no matter what or where the “undesirable event occurs”3) establish performance metrics (i.e. timelines) for community prioritized resilience functions 4) ensure scientific/ health program and process efforts are resourced (includes economic and people) in a sustainable, balanced and equitable fashion, and 5) document, communicate, and share successes freely to improve the art and science of emergency management practice.

Appendix 1 – List of Interviews and References Reviewed

Interviews

- Congressman Garret Graves (LA)
- NOAA – Dave Westerholm, Charlie Henry, Ed Levine, Brad Benggio, Scott Lundgren
- USCG - Admiral Peter Gauthier, Admiral Peter Neffenger
- EPA - Greg Powell, Mike Nalipinski, Nitin Natarajan
- FEMA - Kevin Hannes, Mike Sharon (Maryland Department of Environment/ EPLO to FEMA), Dennis Moffett (FEMA PA Officer)
- Lindley Mease (SPERR/SAN)
- Bill Lokey (FEMA FCO)
- Jimmy Gianato WV HSEMA
- Alan Williams (Maryland Department of Environment)
- Texas General Land Office – Greg Pollock, Steve Buschang
- Ryan Rockabrand, County of Santa Barbara Emergency Management
- RADM/Dr. Scott Deitchman- Associate Director CDC/National Center for Env. Health-ATSDR
- Jim Craig - Mississippi Department of Health.
- CAPT/Dr. Marc Safran – USPHS Medical Officer detailed to USCG Base Alameda
- Dr. Terri Rowles- Coordinator, Marine Mammal Health and Stranding Program (MMHSRP)
- CAPT/Dr. Aubrey Miller, Director, NIH Disaster Response Research (DR2) Project
- Dr. John Bucher, Deputy Director, NIH, National Toxicology Program

References Reviewed

- FOSC report to the National Response Team
- FDA-NOAA-EPA testing protocol to re-open seafood harvest areas post DWH (2014 update)
- The archived post DWH gulf states mental illness surveillance web page
- The 2014 edition of the USCG Incident Management Handbook
- Health Hazard Evaluation of Deepwater Horizon Response Workers
- National Oil and Hazardous Substances Pollution Contingency Plan (NCP)
- National Response Team Overview
- Toxicity Clearance approach used by the U.S. Army
- National Toxicology Program - Charleston WV spill
- National Environmental Policy Act
- National Response Framework - Emergency Support Function 10 Hazardous Materials Response
- UK's Science Advisory Group for Emergencies (SAGE)
- CDC Initial Response to 2009 H1N1
- Deep Water Horizon – Meta leadership in action with Admiral Thad Allen
- Evaluation of the Interagency Approach to Setting Protective Action Guidance Under the National Response Plan , Elective 5361, Domestic Emergency Response Operations
- A Plan for Federal Science Research Response to Public Health Emergencies Associated With Chemical Accidents or Environmental Health Disasters
- Science Action Network Overview and Fact Sheet
- NAS Science and Decisions Advancing Risk Assessment
- NAS Healthy, Resilient, and Sustainable Communities After Disasters

- Political Leadership in the Time of Crisis (Article)
- Reducing the Risk of Disaster Related Mortality, Keim – National Center for Environmental Health
- Oil-Chem Annex to Federal Interagency Operational Plan (FIOP)
- DWH National Commission Working Paper "Decision making within the Unified Command"
- E0684 FEMA Course Student Manual (Integrating Science into Emergency Management Policy and Decisions) Tackling Wicked Government Problems: A Practical Guide for Developing Enterprise Leaders (Nickerson and Sanders- editors. Brookings Institution Press. Original and revised editions
- Leading Through Hurricane Katrina. Book by Gov Haley Barbour with Jere Nash
- NRT Assessment Report on DWH Oil Spill (May 31, 2011)