

## 2014 INTERNATIONAL OIL SPILL CONFERENCE

**Development of the NOAA Scientific Support Coordinator  
Training Guidebook**

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**ABSTRACT 298977:**

This paper provides an overview of the *Scientific Support Coordinator (SSC) Training Guidebook* and describes the knowledge and skills necessary for the SSC position.

This *Guidebook* provides a principal set of knowledge and skills that a well-rounded SSC needs to successfully perform their duties. It describes technical skills and indicates opportunities for employees to acquire them. The *Guidebook* does not replace informal strategies, such as mentoring or on-the-job training, but incorporates all such informal strategies with more organized methods into a single document.

We have included an introduction and background to the National Oceanic and Atmospheric Administration (NOAA), the Office of Response and Restoration (OR&R), and the role of the Scientific Support Coordinator (SSC). We identify the SSC mandates, missions, and duties; establish the need for the *Guidebook* by describing the complexities of the job, anticipated turnover due to retirements, need for consistency across the country, increased need for bench depth, and NOAA Corps rotational assignments.

The process employed to design and implement the *Guidebook* is explained, along with the rationale for the design elements and content. Included are relevant examples from the *Guidebook*. A discussion on the use and implementation for new SSCs and the anticipated outcome from implementing this type of formalized and documented indoctrination process and training program are offered.

This new *Guidebook* is more than a simple checklist. One goal of this revision is to be engaging for new SSCs. To achieve that goal, SSCs themselves wrote this *Guidebook* from the perspective of the new SSC, explaining the benefits of the *Guidebook's* elements specifically for a new SSC. Workgroup members analyzed the previous versions to identify the assumptions about knowledge and skills of the new SSC when they are hired, and the expected improvements in knowledge and skills that will be gained once they have been completed.

**INTRODUCTION:**

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) mandates that the National Oceanic and Atmospheric Administration (NOAA) provide scientific and technical support to the Federal On-Scene Coordinator (FOSC) during oil spills and hazardous

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materials releases in the coastal zone. The Emergency Response Division (ERD) of NOAA's Office of Response and Restoration (OR&R) supports this mandate through Scientific Support Coordinators (SSCs) who are assigned to US Coast Guard (USCG) Districts. The SSCs are supported by a scientific support team comprised of experts in environmental chemistry, oil slick tracking, pollutant transport modeling, resources at risk, environmental tradeoffs of countermeasures and cleanup, and information management.

The NCP describes the responsibilities of an SSC during response as serving on the federal On Scene Commander's (OSC's) or Remedial Project Manager's (RPM's) staff. He or she may, at the request of the OSC/RPM, lead the scientific team and be responsible for providing scientific support for operational decisions and for coordinating on-scene scientific activity. Depending on the nature and location of the incident, the SSC integrates expertise from governmental agencies, universities, community representatives, and industry to assist the OSC/RPM in evaluating the hazards and potential effects of releases and in developing response strategies (NCP - 40 CFR 300.145.c.2).

In the coastal zone, the NOAA SSC specifically supports the USCG. The role of the SSC during response is further defined in the USCG Incident Management Handbook (IMH). The IMH is designed to assist USCG personnel in the use of the National Incident Management System (NIMS) Incident Command System (ICS) during multi-contingency response operations and planned events. The IMH is a job aid for responders. It is not a policy document, but rather guidance for response personnel.

The IMH further defines the role of the SSC during response as: "The Scientific Support Coordinator (SSC) is a technical specialist and is defined in the NCP as the principal advisor to the FOSC for scientific issues. The SSC is responsible for providing expertise on chemical hazards, field observations, trajectory analysis, resources at risk, environmental tradeoffs of countermeasures and cleanup methods, and information management. The SSC is also charged with gaining consensus on scientific issues affecting the response, but also ensuring that differing opinions within the scientific community are communicated to the incident command. Additionally, the SSC is responsible for providing data on weather, tides, currents, and other applicable environmental conditions. The SSC can serve as the Environmental Unit Leader."

Between spills the SSC supports the USCG and enhances regional and national preparedness by participating in contingency planning updates, drills, conducting training, serving the needs of the Regional Response Teams and Joint Response Teams with Canada and Mexico, and overall coordination of scientific issues that develop within their USCG District or area of operation. The SSCs also serve as the designated Department of Commerce (DOC) / NOAA representatives on RRTs around the nation.

The duties and responsibilities of the NOAA SSC are undoubtedly complex and unique in the response community. As such, maintaining a cadre of SSCs across the nation who are stationed independently or with USCG units, requires a clear mission, objectives, training and frequent communication to provide consistent scientific support across the nation. Over the years, NOAA SSCs have evolved from being contractors, to NOAA Corps officers, to full-time federal employees. Today, we have a combination of federal employees (11) and NOAA Corps officers

(3). While most SSCs are now full-time employees, NOAA Corps officers rotate duty stations every three years and often had minimal overlap or training with their predecessors. In 2013, ERD was fortunate to add two additional SSC positions. Also, as with many organizations in the U.S., ERD is looking at several retirements in the coming years. Our need for succession planning and employee training are critical to maintaining a consistently high degree of scientific support across the nation to protect people and the environment from harm during emergencies. The *Scientific Support Coordinator Training Guidebook* was designed with these needs in mind.

The *Scientific Support Coordinator Training Guidebook* (from this point on referred to as “*Guidebook*”) has been developed to aid in the professional development of new SSCs and to help prepare them for their challenging work. The *Guidebook* will assist new SSCs in acquiring the knowledge and skills necessary, as quickly as possible, to excel at their job. This *Guidebook* supports NOAA’s requirement to provide support by:

- 1) Implementing a consistent framework for training new SSCs
- 2) Establishing a baseline of knowledge and skills for all SSCs
- 3) Improving NOAA’s ability to support large-scale or long-term incidents

## **METHODS:**

The *Guidebook* outlines a flexible and self-paced approach, which includes SSC mentors to ensure successful completion of the *Guidebook*, and overall professional development. It is the responsibility of each new SSC to dedicate time and effort toward developing their skills, abilities, and knowledge in order to meet the challenges of being a SSC; the challenge being to provide excellent support, coordination, and science under both normal and extreme circumstances.

ERD recognizes that people hired as SSCs are professionals with significant experience in environmental issues, who possess numerous professional skills. Therefore, new SSCs are not required to complete the entire *Guidebook* before assuming their duties. A new SSC, however, is expected to complete all elements in the *Guidebook* within a year. Because of the experience and expertise that a new SSC comes to the position with, it was a challenge to design a training manual that was detailed and comprehensive enough to cover the many facets of the SSC job, yet be flexible enough for users of different backgrounds. The *Guidebook* needed to be more than a simple checklist and also engaging for new SSCs.

## **Process**

To create the *Guidebook* in a fashion to best enable new SSCs, we engaged with the International Tanker Owners Pollution Federation (ITOPF), London, England, and NOAA’s Coastal Services Center (CSC), Charleston, SC. Additionally, we reviewed the USCG National Strike Force Sector Training Guide: Federal On Scene Coordinator Representative (FOSCR) Performance Qualification Standards, (PQS) booklet. The ITOPF provides similar type services internationally as ERD. We discussed with them their training program and were able to gain insights that were helpful to build our own in-house training program. Likewise, the CSC provided their expertise on learning aptitudes and outreach using a human dimensions focus. They gave us insight to motivating a student and steered us away from a limited checklist approach.

With these insights, we capitalized on the learning experiences of the newest SSCs as they came to the position. Workgroup members analyzed the previous version of the *Guidebook* (a draft, written more as a training manual) to identify the assumptions about knowledge and skills of the new SSC when they are hired, and the expected improvements in knowledge and skills that will be gained once they have completed the training. This revision was significantly reformatted into job-related functional components rather than subject matter components.

### Design

The *Guidebook* is organized into four basic components:

- 1) Orientation
- 2) Response Science
- 3) Response Operations
- 4) Legal Framework

The *Guidebook* provides the range of the knowledge and skills that a well-rounded SSC needs to successfully perform their duties. The *Guidebook* describes technical and “soft” skills and indicates opportunities for employees to acquire them. The *Guidebook* does not replace informal strategies, such as conversation with other ERD employees or on-the-job training, but incorporates all such informal strategies with more organized methods into a single document.

### Content

The *Guidebook* was designed to be “user friendly” and emphasize both the hard science knowledge and soft skills that are necessary to perform the tasks and responsibilities that come with the position. The cover of the *Guidebook* (Fig. 1) was meant to capture the idea that the SSC as a coordinator lies at the heart of an incident. We tiled several types of responses we have been involved in and joined them together with a photograph of the current corps of SSCs.

#### Scientific Support Coordinator Training Guidebook



September 2013

DEPARTMENT OF COMMERCE • National Oceanic and Atmospheric Administration (NOAA)  
National Ocean Service • Office of Response and Restoration

**Figure 1.** Cover of the *Scientific Support Coordinator Training Guidebook*

In Chapter 1 - Orientation, many of the soft skills – sociological and theoretical - are discussed. The chapter also includes background on the SSC program, history of ERD and OR&R, and instructions on how to use the *Guidebook*. The following sections are representative of the types of soft skills information and guidance that is contained in the Guidebook.

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### **Attitude and Philosophy of the SSC Position**

Personality types vary greatly among the SSCs. However, several traits are shared by all, including:

- Ambition – a desire to provide to best possible assistance during a response.
- Dedication – a willingness to provide support 24/7.
- Versatility – an ability to provide support across multiple disciplines for all hazards.
- Technical Flexibility – a capacity for working with evolving technology.
- Optimism – the belief that NOAA can have a positive impact on response planning and operations through sound and reliable science.
- Credibility – the ability to build trust and confidence in NOAA through professionalism with our clients and stakeholders.
- Proactive – the ability to anticipate the needs of our customers and provide solutions early.

SSCs work as a team to support each other. Generally, SSCs assist each other by:

- Providing backup during leave
- Aiding with training in other areas of responsibility (AORs)
- Relieving each other during extended responses
- Providing both remote and on-scene assistance during responses
- Sharing information about past responses or experiences

A wealth of knowledge lies within the SSC cadre and should be drawn from without hesitation. The SSCs are there to support not only the FOSC, but also each other.

### **Interpersonal & Coordination/Collaboration Skills**

ERD spends extensive time and effort training SSCs on “hard” technical subjects such as chemistry, biology, physical processes, and health and safety. To provide needed technical services, SSCs must also use “soft” skills to enable successful interaction with clients and the response community. The most common of these traits are listed below, but this list certainly does not include all the soft skills and abilities SSCs need to bring to bear during responses, planning sessions, meetings, and their many other activities.

**“Soft” skills and abilities of SSCs include:**

Problem solving	Coordinating	Negotiating	Organizing
Anticipating	Planning	Questioning	Leading
Training	Writing	Demonstrating	Advocating
Mentoring	Communicating	Navigating	Being a confidant
Interpretation	Correlation	Cooperation	Compassion
Being a “watchdog”	Advising	Disseminating	Teaching
Institutional knowledge			

**SSC Group Norms**

The SSC Group Norms are guidelines for self-governance (i.e., ground rules) that constitute the core principles by which all members of the SSC group agree to stand and to treat each other. The group norms also articulate the actions and behaviors to which every member commits, in order to hold her/himself and the rest of the group accountable.

The group norms are not “chiseled in stone,” but instead represent a living document that can be amended at any time to better reflect the group’s expectations. Within ERD, these group norms apply to every gathering of SSCs.

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Additional sections in the Orientation cover general guidelines gathered over the years to assist in preparing for: Remote Responses, On-Scene Responses, Drills and Exercises, Response Planning activities, and providing Training.

Chapters 2 and 3 cover the hard science knowledge (i.e., chemistry, physics, mathematics, and biology), technical skills and operational components of the job (i.e., duties during a response, health and safety issues, natural resource trustee issues and consultation responsibilities, operational training). Within each of these chapters are more detailed topics. For each such topic, an opening paragraph describes the overall **Skill/Knowledge** that applies to each section and why they are important. The **Goal** of the particular skill or knowledge to be acquired is identified with a list of specific activities to gain that skill or knowledge. To assist the SSC in acquiring the skill and knowledge, a list of **Subject Matter Experts (SME)** and particularly helpful **Resources** (documents, websites, and references) are also included. The following is an example taken from the *Guidebook*:

**A. Oceanography**

**Skill/Knowledge:** Nearly every spill incident engages ERD’s oceanographers, because the answer to the question of “where is the product going?” is so critical to the success of a response. An SSC who is aware of the environmental factors that affect pollution transport, and also understands ERD’s extensive suite of response software, can effectively collect needed inputs and communicate outputs to responders who need them.

**SMEs:** Glen “Bushy” Watabayashi, Chris Barker, Amy MacFadyen

**Resources:** SHIO, GNOME, GOODS, ADIOS2 Software

**1. Goal:** Understand tidal action and learn to use SHIO software.

**1.a. Activity:** Through discussions with SMEs and further reading, learn the environmental factors that influence tidal excursion, and why tidal ranges differ among locations.

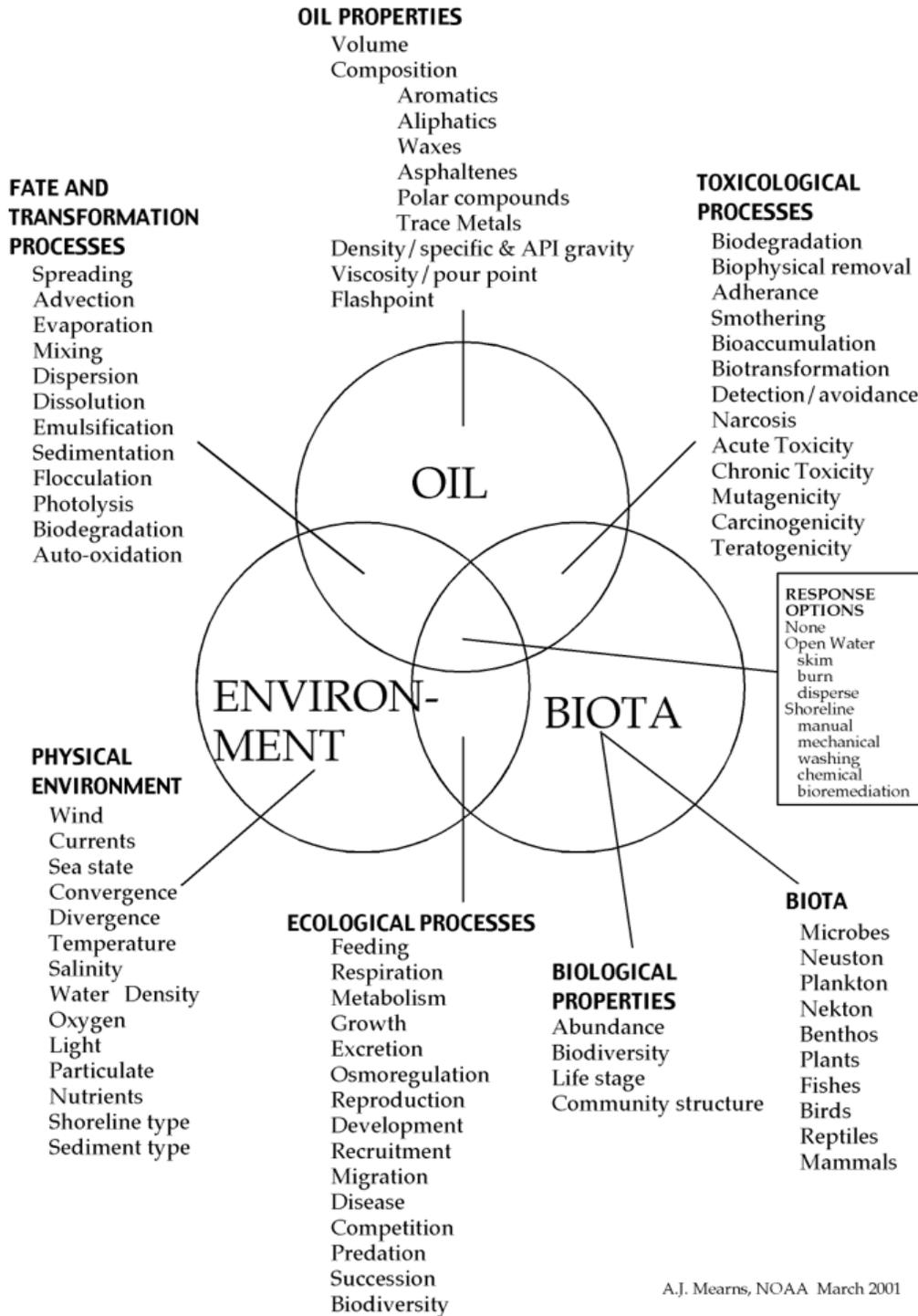
**1.b. Activity:** Install SHIO on your work laptop. Work with SMEs as needed to learn the basic operation of the program, how to interpret its output, and how it can be used during a response.

**1.c. Activity:** Through discussions with SMEs and further reading, learn how tidal action influences surface currents and transportation of pollutants.

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To aid in understanding the complicated interactions of oil spills with the environment and biota, we reference the *Transport, Fate, Transformation, Effects and Management of Oil Spills* Venn diagram prepared by Dr. Alan Mearns (Fig. 2). This rather simplistic diagram captures the intricate interactions that most influence the effects and outcome after oil spills into the environment. This diagram represents the hard science that SSCs must be familiar with to do their jobs effectively.

## Transport, Fate, Transformation, Effects and Management of Oil Spills



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Figure 2: Transport, Fate, Transformation, Effects and Management of Oil Spills (Prepared by Dr. Alan Mearns, NOAA, 2001).

Chapter 4 - Legal Framework, covers the components of the National Response System, laws and mandates that direct our mission and the SSCs duties, case studies, obtaining practical experience, and continuing education.

### **Implementation**

During the first month on the job, a SSC attends an orientation week at the ERD office in Seattle. During that week, the SSC will receive initial training on NOAA's role during a response, meetings with all Scientific Support Team members, and introductory training on NOAA response tools and software, as well as on administrative topics necessary for field personnel (e.g., travel, purchasing, IT support, etc...).

Training methods include a combination of mentoring, self-study, formal classroom and on-line courses, attendance at seminars and conferences, exercises, and a lot of direct experience on the job. New SSCs are encouraged to check in with their mentor as needed. They are encouraged to complete all of this training, and will be supported by ERD management within the limits of available time and funding.

A critical component to the success of training a new SSC is mentoring. A mentor is assigned to new SSCs to assist in the process of becoming a SSC. The mentor guides the new SSC through the training period, provides an experienced sounding board to aid in navigating unusual or difficult issues, and, as needed, may provide backup in the Area of Responsibility (AOR). The mentor is a senior SSC who may not be located in the AOR, but with whom regular and frequent communication is critical.

The mentor is a vital resource whom the new SSC should be comfortable contacting at any time. To enable the new SSC to benefit from the varied backgrounds and areas of specialized expertise of the various SSCs, they will be given the opportunity to work on focused topics with several different SSC mentors throughout their training. They are encouraged to interact with as many other SSCs as possible to gain a broad understanding of their varied experiences, regional differences, and the many possible solutions to issues.

If clarification is needed by the new SSC at any time for the tasks required in this *Guidebook*, they may talk with their SSC mentor(s) or the ERD Regional Operations Branch Chief (ROBC) to identify a method for completing the item. The ERD ROBC serves as the final arbiter as to what qualifies as completion of a task, and completion of this *Guidebook* as a whole.

### **CONCLUSIONS:**

For over 30 years and thousands of incidents, NOAA has supported the USCG with SSCs for environmental responses ranging from oil and chemical releases, search and rescue missions, law enforcement cases, natural disasters, and the strange and unusual events. Throughout this time, the methodology employed when bringing on new SSCs to these duties was primarily OJT (on the job training). Usually there was little to no overlap with the departing SSC. New personnel were given the opportunity to visit our contractor support locations for familiarization, but in general it was through work with other SSCs at meetings and spills where mentoring occurred.

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In an effort to improve the consistency with which we bring on new SSCs, and to ease the transition into the position, an effort was made over 15 years ago to codify the training required for the job. That effort resulted in a long checklist with some reference materials to guide the new SSC along the path of discovery. To more clearly state the expectations, to standardize the process, and enable consistency among the program, a new *SSC Training Guidebook* was developed. The process took over one year to complete with a small dedicated core workgroup.

Due to the efforts of the workgroup, and with the advice from outside consultations, NOAA ERD is in a much better position to continue to nurture and groom new SSCs as they come on the job. At this point in OR&R's history many of the SSCs are approaching retirement age. With this indoctrination process in place NOAA is better positioned to fill anticipated (planned retirements) and unanticipated surge (DWH-type) events. We will be able to grow the organization methodically and rapidly if necessary, with capable, well-trained individuals.

The *SSC Training Guidebook* has become a model for other branches of OR&R and NOAA to develop their own employee position-specific guide to filling the job-at-hand. We recommend that other agencies and organizations take a similar approach to preparing their organization for eventual employee turnover.

**ACKNOWLEDGMENTS:**

In 1982 Ann Hayward-Walker, SSC for the USCG Fifth District at the time, envisioned SSCs being hired, going through a training program, and then being turned loose to minimize injury to the environment from oil spills. Over the years (mid-1980's, 1991, 2009) different documents and procedures were created for training new SSCs with varying implementation and results. An early workgroup included current and former SSCs Jay Rodstein, Gary Ott, Ed Levine, and CDR Tom Callahan. The 2009 edition was substantially revised and more formally implemented. That workgroup included SSCs Jim Jeansonne, Ed Levine, John Whitney, LCDR Elizabeth Jones, Jordan Stout, Carl Childs (biologist), and John Tarpley (SSC Branch Chief). With the hiring of a new cadre of SSCs in 2013, the ROBC decided that the *Training Guide* should be updated and more formally implemented. The Training Workgroup that accepted this task included LTJG Alice Drury, LT Kyle Jellison, LCDR John Lomnick, Ed Levine and John Tarpley. Mary Evans and Kristina Worthington contributed editorial assistance. In all cases, other SSCs, scientific support team members and the OR&R Safety Officer at that time played significant roles providing input and reviewing the documents. Additionally, each of our response support contractors— Genwest Systems Inc., Research Planning Inc., and Louisiana State University— reviewed and commented on their respective sections. With the latest release of the *SSC Training Guidebook* and implementation of it for our newest SSCs - Paige Doelling, Adam Davis, and Catherine Berg - we continue part of Ann Hayward-Walker's vision.

**DISCLAIMER:**

The *Scientific Support Coordinator (SSC) Training Guidebook* and any internal procedures adopted for its implementation are intended solely as guidance. They do not constitute rulemaking by any agency and may not be relied upon to create a right or benefit, substantive or

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procedural, enforceable by law or in equity, by any person. Any agency or person may take action at variance with this manual or its internal implementing procedures.

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