OIL SPILL EMERGENCY RESPONSE -
MONITORING THE USE OF DISPERSANTS

Characterization of Ecological Receptors – Habitats

About

Dispersants are chemical agents used to break up oil into smaller droplets throughout the water column. Dispersants are applied to surface oil floating on water, or below the surface closer to an uncontrolled release of crude oil from a well blowout source. This series of fact sheets details monitoring requirements and how to apply the collected data to inform the use of dispersants under **Subpart J of the National Contingency Plan (NCP)**.

Ecological Receptor Characterization

Ecological receptor characterization identifies potential hazards and impacts to ecological receptors, including species-specific toxicity of oil, dispersant, and dispersed oil. The goal is to answer the question "What might be affected by the oil plume and in what way?" Ecological receptors include aquatic species, wildlife, and other resources and habitats that organisms rely upon for survival, growth, and reproduction.

There are two elements to characterizing ecological receptors (1) identifying their habitats and (2) identifying toxicity concerns. This fact sheet focuses on identifying the habitats and species of concern using existing information and resources. A companion fact sheet focuses on identifying toxicity concerns (find the link under Additional Resources).

Description of the Requirement

The responsible party must characterize the ecological receptors (e.g., aquatic species, wildlife, other biological resources) that may be present in the discharge area, their habitats, and their exposure pathways. The characterization must include species that may be in sensitive life stages, transient or migratory species, breeding or breeding-related activities (e.g., embryo, larvae), and threatened or endangered species. The requirement applies to species that may be exposed to undispersed oil, the dispersed oil, and the dispersant alone. Refer to the regulatory requirement in the Code of Federal Regulations (CFR): **40 CFR 300.913(d)**.

Relevant Terminology

Ecological receptors are communities, populations, individual organisms, and their habitats that could be affected by the dispersant, oil, or dispersed oil.

Habitats are natural places where a species lives. In addition to physical shelter, habitat includes the whole area and resources that a species uses for survival. These can be both biotic (such as a species that a predator relies on as its prey) and abiotic (such as pH conditions for shell growth of marine organisms) (Figure 1).

Critical habitats contain physical or biological features that are essential to the conservation of endangered and threatened species under the Endangered Species Act, which may need special management or protection.

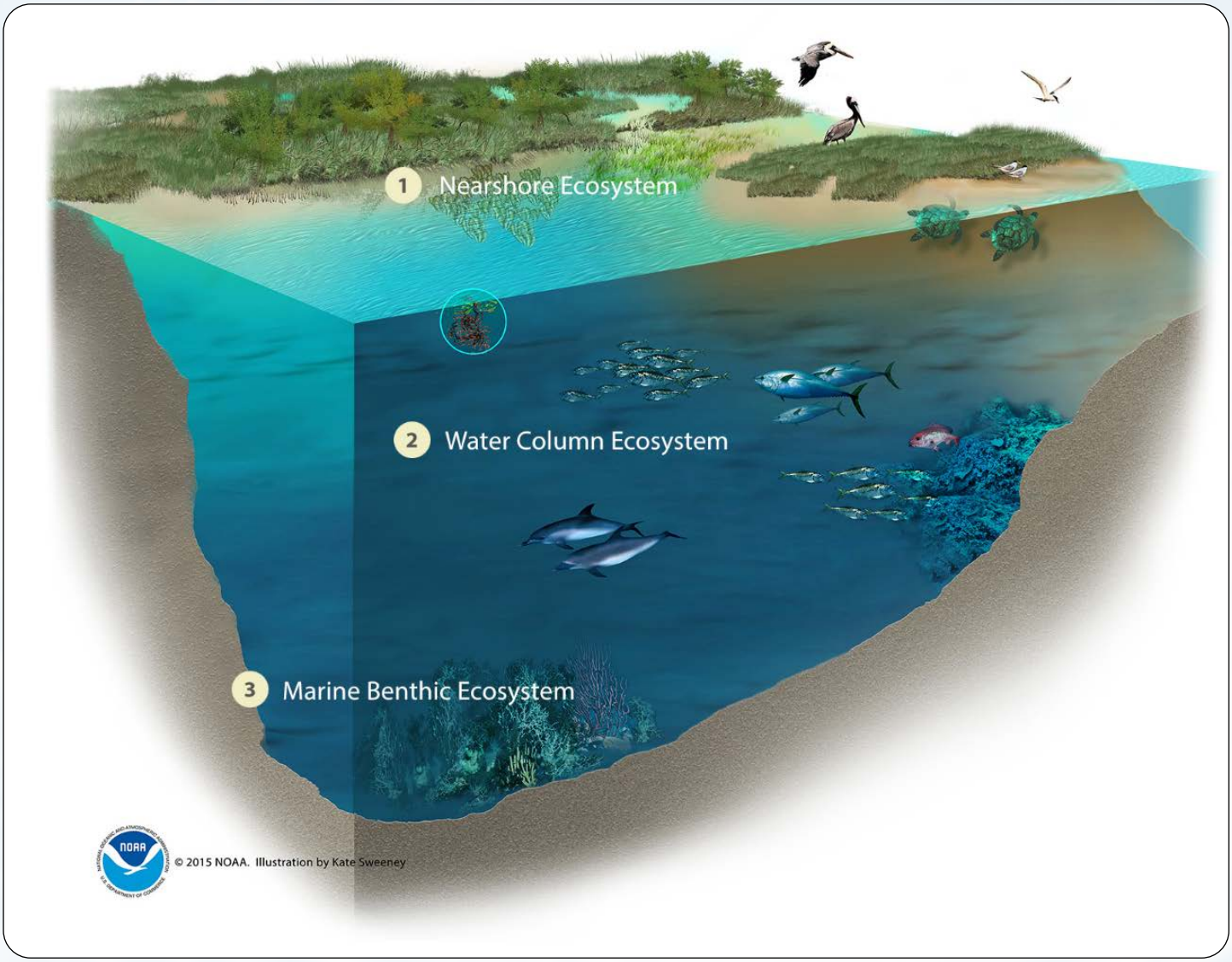
Using Ecological Receptor Data

Adverse effects on ecological receptors from exposures to dispersant use depend on the length of time and concentration of the exposure, which are dependent on the fate and transport of the dispersed oil. Effects may stem from direct exposures to the oil or indirect consequences of the oil spill. Combined with toxicity and other monitoring data, identifying habitats and species that may be impacted can help responders minimize potential adverse effects from dispersant use in a response.

Decision Points for Responders

The On-Scene Coordinator should ensure that the responsible party has appropriately identified ecological receptors at risk from the oil spill. The On-Scene Coordinator should consider all available data and information relevant to the response and consult with subject matter experts. With this information, the On-Scene Coordinator should assess whether dispersant application should begin, continue, continue with modifications, or cease.

Figure 1: Marine ecological receptor habitats.



1. **Nearshore Ecosystem:** The interconnected habitats between land and the Gulf's open water, including coastal marshes, mangroves, beaches, dunes, barrier islands, submerged aquatic vegetation, oyster reefs, shallow unvegetated areas, and mudflats. Critical for fish and shellfish life stages and home to birds, sea turtles, and mammals.
2. **Water Column Ecosystem:** Extends from nearshore to the open ocean and from the ocean surface to the ocean floor. Home to a rich community of small planktonic plants and animals, fish, crustaceans, marine mammals, and sea turtles.
3. **Marine Benthic Ecosystem:** The ocean floor, from the continental shelf to the deep sea. Consists of diverse habitats, including sand, mud, and reefs. Home to rare corals, fish, crabs, and myriad small animals and microbes.

Credit: Deepwater Horizon Natural Resource Damage Assessment Trustees

Identifying Species

Responders are most concerned about species that could be adversely affected by oil or dispersant use, including the habitats for aquatic species, wildlife, and other biological resources present in the discharge area. The following are some considerations to keep in mind when identifying potentially affected species:

- **Species' life stage** (e.g., egg, in utero, larvae, juvenile, adult) may influence their vulnerability to an oil spill. For example, zebra finch eggshells' exposure to oil can interfere with heart development, leading to worse cardiac performance for the remainder of their lives.
- **Some transient or migratory species** may be present only at certain times of the year. For example, birds migrating to or from South America are in the Gulf of Mexico only during particular windows of time.
- **Breeding or breeding-related activities** can change species' behavior or their sensitivity to exposure to oil or dispersed oil. For example, exposures to chemicals can affect embryo and larvae development; the contamination of a physical resource with oil can affect the ability to build a quality nest or interfere with mating behavior.
- **Threatened or endangered species** are federally identified as having low population levels and are at risk for extinction. The added stressor of an oil spill could worsen their condition.

Existing information resources support identifying species and ecological habitats. The Regional Response Team, National Oceanic and Atmospheric Administration (NOAA) Trustees, Department of Interior Bureau of Safety and Environmental Enforcement, affected states, and other response partners may have existing information resources to help responders identify ecological receptors and species.

Example Information Sources

- **Environmental assessments** that may be included in, for example, exploration plans, development and production plans, development operations coordination documents, and facility and vessel response plans.
- **Federal contingency plans** such as coastal Area Contingency Plans, and associated Fish and Wildlife and Sensitive Environments Annexes.
- **Federal and state environmental databases**
  - National Coastal Condition Assessment (EPA)
  - Environmental Sensitivity Indices (NOAA)
  - Chemical Aquatic Fate and Effects Database (NOAA)
  - Southeast Area Monitoring and Assessment Program

Additional Resources

NCP Product Schedule Technical Notebook

A compilation of product bulletins summarizing data requirements and test results for dispersant products listed in EPA's NCP Product Schedule. The Technical Notebook includes information on dispersant application methods, toxicity and effectiveness data, and physical properties.

Oil Spill Emergency Response – Monitoring the Use of Dispersants Fact Sheets

- Characterization of Ecological Receptors – Toxicity
- Dispersant Effectiveness and Oil Distribution

Legal Disclaimer

This guidance does not create any rights—substantive or procedural—enforceable by any party in litigation with the United States of America. It does not substitute for the Clean Water Act, Oil Pollution Act of 1990, or EPA's regulations; nor is it a regulation itself. Mention or depiction of products or devices does not imply EPA endorsement.