U.S. EPA Region 5
Inland Sensitivity Atlas

GIS Data Themes

A. Natural Resource Area Data

1. Managed Natural Resource Areas

Many local, regional, state, and federal managed areas are high-priority sensitive natural resources that offer habitats for a wide range of plant and animal species, and may support high levels of recreational use. An inventory of state and federal managed lands serves as a starting point in compiling databases and preliminary maps of sensitive managed resource areas. Participants from private, local, state, and federal resource management organizations review preliminary maps depicting the initial inventory of managed areas and identify additional sites known to have sensitive resources. These additional sites may include public lands managed by regional or local governments, as well as private lands known to contain sensitive resources that merit protection. Map products may not show all publicly managed areas, but do show the areas identified by resource managers by virtue of their proximity to potential spill sources and intrinsic sensitivity to oil. Sensitivity was considered in the context of response operations as well as seasonal variability.

Examples of state managed areas include parks, forests, trails, and wildlife management areas. Federal managed lands in the atlas typically consist of forests, parks, recreation lands, and wildlife refuges. Regional managed lands may consist of reserves, forests, and parks managed by cities, counties, or regional entities.

2. Special Designated Areas

Natural resource areas of particular significance have been classed together as special designated areas. These areas are not necessarily owned or directly managed by public agencies, but have received a special designation status from public resource agencies and multi-organization commissions. This designation status accords formal recognition of resource sensitivity and may also carry with it a high level of legal protection. Designated areas can include trout streams, wild and scenic rivers, and habitat restoration projects.

3. Other Environmentally Sensitive Areas

Other areas of natural resource significance may be documented. These additional areas generally are not publicly managed nor do they have any special designation, but they have been identified as special places meriting spill protection. These resource areas are mapped because they are valued for natural qualities, such as habitats supporting large numbers of non-listed species. Examples include migratory waterfowl resting areas, important fishery areas, and natural communities.

B. Tribal Lands and Interests Data

This atlas identifies the location and provides descriptive and contact information for tribal lands. Tribes are the designated natural resource trustees for Indian communities. Reservations and other tribally owned areas may have significant cultural, environmental, and economic resources that are vulnerable to oil spill damage.

C. Cultural Resource Data

Historic sites, including standing structures and archeological sites, are vulnerable to the effects of spilled oil and clean-up efforts. While these sites are not presented in paper and PDF atlases, digital map data on CD-ROM includes historic standing structures and selected archeological sites to the extent this information is available from State Historic Preservation Officers (SHPO). Historic structure data includes sites that are listed or eligible for listing on the National Register. Only archeological sites listed on the National Register of Historic Places are included in the digital map data. Archeological sites are presented with buffered locations, in recognition of their sensitivity to disturbance. Because it is not practicable to provide complete archeological site information, planners and responders are strongly urged to consult with the historic preservation agency staff located in their states

D. Other Sensitive Resource Data

1. Surface Water Intakes

Surface water intakes are sensitive because of their significance to public health and the economy. All intakes for public water supplies and power plants have been mapped, as have intakes for industries estimated to use one million gallons or more per day. Response procedures may involve temporary shutdown of these facilities. Since contamination of potable water supplies constitutes a serious threat to public health and safety, drinking water intake symbols appear with a red outline in the paper and PDF atlases to highlight their importance. Intakes used only for intermittent purposes, such as irrigation, are not mapped.

2. Marinas

Marinas are typically high-use recreational areas and may include picnicking, camping, and fueling facilities, as well as boat lifts, ramps, and slips. Due to the economic value of boats and other equipment located at marinas, these areas may be relatively high priorities for protection in the event they are threatened by a spill. Marinas may also serve as response staging areas and provide goods, services, and water access for the response effort.

3. Navigation Locks and Dams

Locks and dams on commercially navigable waterways are vulnerable economic resources that could be adversely affected by an oil spill upstream. These facilities are also essential to the flow of commercial shipping and recreational boat traffic. Closure of lock chambers for spill containment, diversion of oil to collection sites, or spill clean-up could temporarily halt navigation. These sites are also potentially useful as access sites in response situations. Since oil emulsifies after passing over a dam or through its gates and becomes increasingly difficult to recover, it is also important that containment efforts concentrate on areas above dams.

4. Shoreline Sensitivity

For the portions of U.S. EPA Region 5 that border the Great Lakes, Environmental Sensitivity Index (ESI) data sets were obtained from the National Oceanic and Atmospheric Administration (NOAA) to display shoreline sensitivity. The ESI shoreline data were mapped and ranked based on their potential sensitivity to an oil spill. The elements used to determine the relative sensitivity of shoreline habitats include shoreline type (e.g., substrate, grain size, elevation, and origin), exposure to wave and current energy, biological productivity and sensitivity, and ease of cleanup.

The original classification developed by NOAA has been grouped into four intrinsic oil spill sensitivity rankings for use and display in the Inland Sensitivity Atlas series. The four shoreline rankings and representative habitats include:

1. Low sensitivity (urban or developed areas, rocky shores, riprap, and concrete barriers),
2. Low-medium sensitivity (sand and gravel beaches),
3. Medium-high sensitivity (vegetated low to steep banks and mud flats), and
4. High sensitivity (marshes and scrub-shrub wetlands).

These four categories convey general information about the character of a shoreline. Because shoreline sensitivities and types also change over time, responders should perform on-site confirmations of sensitivity levels at the time of a spill.

It should be noted that the ESI data sets may not be available for all Great Lakes shorelines.

E. Oil Storage and Transportation Data

This atlas documents the location of potential sources of oil, including fixed facilities and pipeline systems. For the purposes of this publication, the term oil includes crude and refined petroleum products as well as vegetable oils and animal fats. Although roads and railroads that may be used for oil transport are not part of the GIS data layers, they are visible as part of the base map imagery.

1. Oil Storage Facilities

Fixed facilities store quantities of oil in above- or below-ground storage tanks. This atlas documents facilities with above-ground storage capacity of 42,000 gallons or more, whether the product is stored in a single tank or a series of tanks.

While documenting all facilities that meet the 42,000-gallon threshold, the atlas highlights two special types of fixed storage facilities. Facilities that transfer oil products over water have been differentiated from the other types of potential spill sources, and are referred to as Marine Transfer Related Facilities (MTRs). Their proximity to major rivers or the Great Lakes, as well as the potential spill risk posed by loading and off-loading vessels, merits this distinction. MTR facilities that handle 42,000 gallons or more of oil are required to prepare Facility Response Plans for submission to the Coast Guard. The required elements of such plans include documentation of potential harm from accidental spills, response contingency protocols, and training documentation.

The other special case includes facilities known to handle very high volumes of oil, generally one million gallons or more. Such facilities are required to complete Facility Response Plans (FRPs) under OPA, for submission to the U.S. EPA. These facilities are highlighted in paper and PDF atlases as having FRPs. As with MTRs, the required elements of these plans include documentation of potential harm from accidental spills, response contingency protocols, and training documentation.

2. Pipelines

Due to the volume of oil pumped through major pipelines, the potential impact of a rupture is significant. The atlas documents major oil handling pipeline routes throughout the mapped area. A route is defined in the atlas as an individual operator's pipeline corridor through one mapping area: routes may contain more than one pipeline. The atlas also documents the route name, the number of pipes in the route, the diameter of each pipe, and the type of product

carried in the pipes. While all transmission lines are documented, the much smaller and more numerous gathering lines are not included in the atlas.

Since several pipeline routes operated by different companies may lie in close proximity, the number of routes in a given area may not always be clear at the scales typically used for paper atlases. For that reason, paper atlases may include a special pipeline inset series prepared at 1:12,500-scale to document closely spaced pipeline routes. Pipeline insets are enlargements covering one-quarter of the area shown on a 1:25,000-scale inset. As with 1:25,000-scale insets, the pipeline insets are prepared only as needed for areas of high feature density.

F. Response Considerations Data

1. Boat Access Ramps

Sites with concrete or gravel boat ramps may be useful for providing access to the water during a spill response. Access facilities typically lack the range and variety of services found at the majority of marinas. These sites are usually owned and managed by government agencies including state and federal land management agencies, city and village public works departments, and county governments. Boat ramps are not individually identified by name or further described in the atlas products.

2. Non-Navigation Dams

As available, locations are provided for dams not associated with commercial navigation. These dams may be used for a variety of purposes, including public water supply, power generation, flood control, irrigation, and recreation. Responders must be aware of dam locations because oil recovery becomes more difficult after passage over a dam spillway, even with dams that may be considerably smaller than commercial navigation structures. Individual identities and descriptive attributes are not provided for non-navigation dams.