

Oil or Chemical Spill Notification

call the National Response Center at
800-424-8802

Oil Spill Response

in the Region IV Coastal Zone,
contact the U.S. Coast Guard
Marine Safety Office (MSO):

MSO Wilmington, NC 910-792-8408	MSO Charleston, SC 843-724-7616
MSO Savannah, GA 912-652-4353	MSO Jacksonville, FL 904-247-7310
MSO Miami, FL 305-732-0160	MSO Tampa, FL 813-228-2189
MSO Mobile, AL 334-441-5121	

In the Region IV Inland Zone,
contact the U.S. Environmental
Protection Agency:
404-562-8700

Inland Zone U.S. Coast Guard Offices are:

MSO Huntington, WV 800-253-7465	MSO Louisville, KY 800-253-7465
MSO Paducah, KY 502-442-1621	MSO Memphis, TN 901-544-3912

State Pollution Response Contacts are:

North Carolina 919-733-3867	South Carolina Spill: 888-481-0125 Office: 803-896-4000
Georgia 404-656-4300	Florida 850-413-9911
Alabama 334-242-4378	Mississippi 601-352-9100
Tennessee 800-258-3300	Kentucky 800-928-2380

Suggested References:

Oil in the Sea
National Academy Press 1985

*Introduction to Coastal Habitats and
Biological Resources for Oil Spill
Response*
NOAA / Hazmat

*Introduction to Oil Spill Physical and
Chemical Processes and Information
Management*
NOAA / Hazmat

EPA's Oil Program Web site
www.epa.gov/oilspill/

*United States Coast Guard's
Marine Safety and Environmental
Protection web site.*
www.uscg.mil/hq/g-m/gmhome.htm

National Response Team
www.nrt.org/

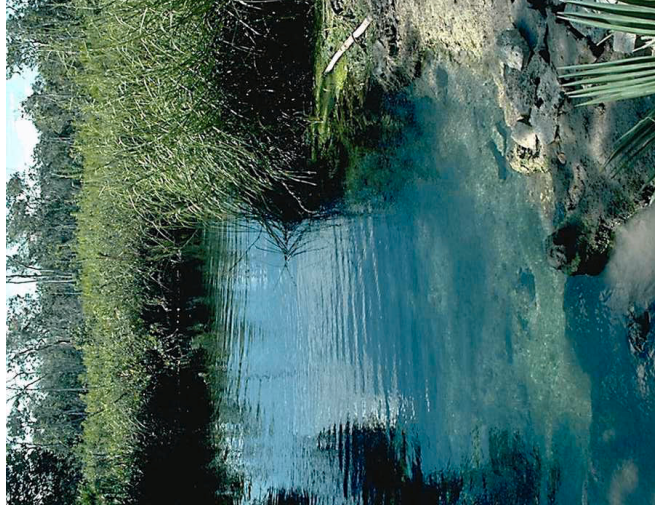
*NOAA Hazardous Materials Response
and Assessment Division*
<http://response.restoration.noaa.gov>

*Oil Spill Intelligence Report's Oil Spill
Basics: A Primer for Students*
www.cutter.com/osir/primer.htm

Document prepared by:
Region IV
Regional Response Team

RRT IV Co-Chairs:
U.S. Coast Guard 305-536-5651
U.S. EPA 404-562-8721

What are the Effects of Oil on Mangroves?



What are Mangroves?

Mangroves are shrubs and trees that dominate the coastal and estuarine shorelines in subtropical and tropical areas worldwide. They are usually associated with low energy coastlines. In Region IV mangroves are comprised of 3 species: red, black, and white mangroves.

Red mangroves usually occur seaward of the other two species, and are most severely affected by oil spills. Red mangroves can be easily identified by their curving prop roots. Black mangroves occur in the high inter-tidal area, and can be identified by their pneumatophores, or thin, finger-like exposed roots which are 3-6 inches tall. The prop roots and pneumatophores allow the red and black mangroves to exchange gases in sediment that is water saturated. White mangroves inhabit higher elevations, and are rarely impacted by marine oil spills.

The Importance of Mangroves:

Mangroves are very important to the ecology and the economy of the regions where they occur. Mangroves provide a buffer to inland areas from devastating hurricane winds and deadly storm surges. Mangroves also trap and stabilize sediment. Many birds use mangrove areas as roosting and nesting locations. Finally, many important commercial and recreation species depend on mangroves for some aspect of their life cycle, as a nursery, shelter, and foraging.

How Oil Effects Mangrove Environments:

Oil impacts to the mangrove community can vary depending on the type of oil, the amount of oil, and the duration of weathering.

Light, refined oils such as gasoline, jet fuel, and No. 2 fuel oil contain relatively high amounts of the most water soluble and toxic compounds in oils. The rich assemblages of plants and animals that

are attached to the underwater portion of the prop roots are especially vulnerable. These oils generally evaporate rapidly and thus impacts occur mostly when large spills rapidly strand onshore. No. 2 fuel oil tends to be more persistent, particularly if it penetrates the substrate through animal burrows or trampling by responders.

Light fuels are also absorbed by the tree roots and can cause mortality in 24-48 hours in red mangroves and black mangroves.

Crude oils and heavy refined products such as Bunker C can coat the prop roots and pneumatophores, reducing the ability of the tree to exchange gases. These heavy oils will have long-term persistence, especially with heavy accumulations. This long term persistence may cause leaf loss and possibly death to heavily oiled trees. Recruitment of seedlings into the oiled area may also be affected.

Clean Up Options for Mangrove Environments:

Mangroves are the most sensitive shore-line habitat to oil spill effects. They are slow growing, sensitive to oil, and difficult to clean. They usually grow in low energy environments where oil can persist for years. These areas should receive the highest protection priority during a spill. Every effort should be made to minimize the amount of oil that is allowed to enter a mangrove area, without causing greater harm.

Booming:

Booms are often deployed to protect the most sheltered areas, where the greatest persistence is likely. Booms should be placed at an angle to the current, and divert the oil to a location where collection is possible. Booms should be placed so as not to contact the bottom or the mangrove roots. Sorbents placed along the mangrove fringe may reduce the quantity of stranded oil. Sorbents can

also be used to collect sheens coming from oil that has already stranded. Snare booms are more effective in collecting heavier oils. Sorbents must be changed periodically as they become saturated with oil. Sorbents may also be used to wipe heavy accumulations of oil from prop roots in areas of firm substrate.

Flushing:

Heavy accumulations of liquid oil can be flushed with low pressure (<10psi) flooding. Flushing should be only used on an ebbing tide, with the appropriate collection devices in place. Often there is no access, limiting the use of flushing. This technique should not be used if there is sediment disturbance or mixing of oil into the substrate.

Oiled Debris Removal:

Mangrove environments often have a wrack line along the high tide and storm lines. If this wrack becomes oiled it can be a source of chronic sheening and should be removed. Care must be taken not to disturb the substrate. Vegetation should never be cut or removed.

Natural Recovery:

When cleanup activity causes more environmental damage than the oil, natural recovery should be considered. It is the preferred method for lighter fuels such as gasoline and jet fuel. Natural recovery should also be considered when heavy products are located deep in the mangrove forest or when removal causes mixing with sediments. The placement of sorbents is often used to recover sheens released during natural removal. Any cleanup activity that disturbs nesting birds should be postponed until the young have fledged.