

**Briefing Paper on Galveston Bay Plan Action Items
Spills and Dumping**

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Overview

Goals of the Galveston Bay Plan

- Obtain compensation for environmental injuries.
- Reduce the impact from spills on the natural environment

The Galveston Bay Plan identifies issues related to spills of oil and hazardous chemicals and illegal dumping of hazardous and solid waste as a priority problem. Given the highly urbanized and industrialized nature of much of the Lower Galveston Bay watershed, the potential for environmental harm caused by spills and dumping is always present. This type of environmental contamination comes from a variety of sources including municipal solid waste, industrial spills, spills related to the shipping industry, and derelict structures such as abandoned boats and crab traps.

Spills related to industry and shipping are often considered the most common and most dangerous type of spill. However, sensitive habitats and wildlife populations can be just as susceptible to the improper disposal of solid waste in area bayous and bays as they are to oil and chemical spills. In addition to causing environmental harm, spills and illegal dumping can affect the human population by contaminating seafood, and diminishing aesthetic values and quality of life. The Galveston Bay Estuary Program supports ongoing activities related to solid waste reduction and hazardous materials spill prevention and response through natural resource damage assessments, spill management, and trash control.

Historical Trends and Current Status

Petroleum is highly toxic to some estuarine organisms, particularly the larval stages. When spilled in water the lightest components evaporate and become air contamination. Heavier components may float and combine into tar balls. The heaviest components sink to the sediment where they may damage benthic organisms, such as oysters. Petroleum compounds from a spill can be degraded by microbes present in the environment, but may remain at harmful levels for many years before complete degradation.

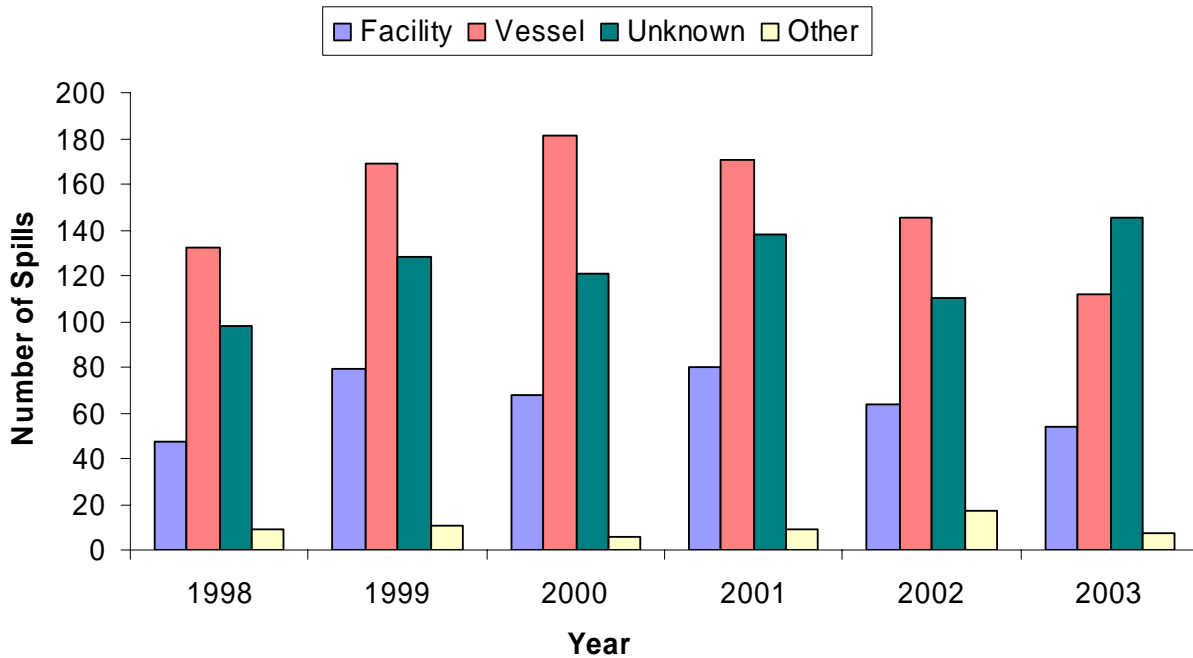
Of the eleven types of petroleum product spills tracked by the Texas General Land Office (GLO), “waste oil and oily mixtures” and diesel comprise the most common spill type reported in the Galveston Bay. For the years 1998 through 2003, “waste oil and oily mixtures” and diesel comprise on average, 37% and 30% of the petrochemical spills in Galveston Bay, respectively (see Table 1).

Table 1. Average total spills by petroleum product type for the years 1998-2003 in Galveston Bay and surrounding counties. Table created by the Galveston Bay Status and Trends Project, Houston Advanced Research Center. Data source: Texas General Land Office.

Product Spilled	Average Percent of Total Spills 1998-2003
Waste Oil and Oily Water Mixtures	37%
Diesel	30%
Bunker C and Other Heavy Fuel Oils	7%
Hydraulic Oil	7%
Other	7%
Lubricating Oils	4%
Gasoline	3%
Crude Oil	2%
Condensate	1%
Jet Fuel/Kerosene	1%
Non-petroleum Oils	1%

Petrochemical spills are identified by the GLO as coming from four general source categories: vessel, facility, unknown, and other. As seen in Figure 1, for the period 1998 through 2003, vessel spills are generally the most common spill source. An exception is the year 2003, in which spills from unknown sources were the most common.

Figure 1. Number of oil spills categorized by source of spill in the Lower Galveston Bay watershed during the period 1998-2003. Data for Liberty County were not available. Figure created by the Galveston Bay Status and Trends Project, Houston Advanced Research Center. Data source: Texas General Land Office.



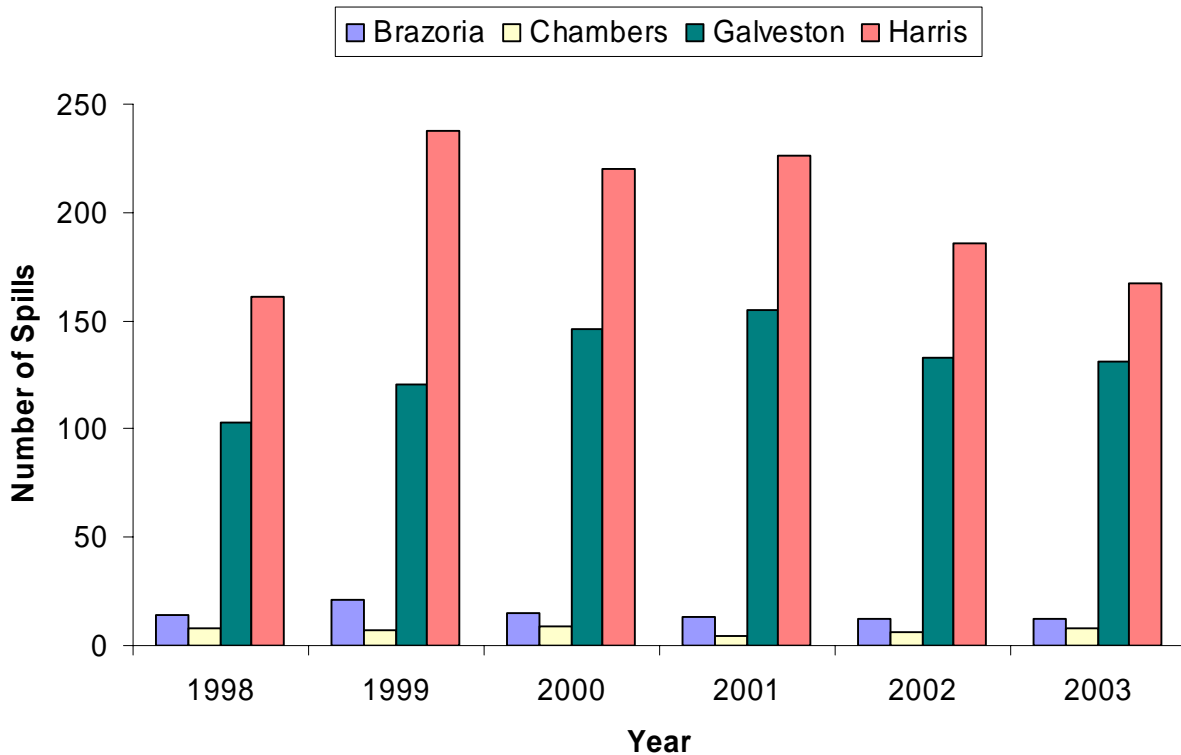
The Galveston Bay Indicators Project compared the number of vessel spills and incidents to vessel traffic entering through the regional ports of Houston, Galveston, and Texas City. Vessel spills and incidents are low when compared to the total number of vessels moving in and out of the Galveston Bay system each year. Vessel incidents and spills are on the decline as the number of vessels decreases. While vessel numbers decreased over the period of review, tonnage increased. This indicates a general change in operations of the shipping industry as fewer, larger ships carrying greater amounts of cargo enter the bay through the Houston, Texas City, and Galveston Ship Channels.

Table 2. Indicator describing vessel traffic, volume and number of spills, and number of incidents. Table created by the Galveston Bay Indicators Project, Houston Advanced Research Center. Data source: Texas General Land Office, Port of Houston, Port of Texas City, Port of Galveston, and the US Coast Guard.

Year	Number of Vessels	Tonnage (in Millions of Tons)	Number of Vessel Spills	Volume of Vessel Spills (Gallons)	# of Vessel Incidents
1998	16,438	238.4	132	10,087	220
1999	16,520	231.8	169	3,330	200
2000	17,329	260.8	181	12,949	191
2001	15,943	257.3	171	83,493	196
2002	15,071	242.2	145	8,232	156
2003	14,514	257.1	112	9,465	153

Of the five counties surrounding Galveston Bay (i.e. Brazoria, Chambers, Galveston, Harris, and Liberty), Harris and Galveston counties are responsible for the majority of petrochemical spills. This makes sense because these are the two most populated counties bordering the bay as well as the centers for most of the region's shipping and industry. Data for Liberty County were not available.

Figure 2. Number of oil spills for the years 1998-2003 categorized by county. Data for Liberty County were not available. Figure created by the Galveston Bay Status and Trends Project, Houston Advanced Research Center. Data source: Texas General Land Office.



The numbers collected since 1998 document a record of few small oil spills in recent years. However, in the period from 1970 to 1990, there were five spills of more than 10,000 barrels in or near Galveston Bay. Three of these occurred in the Houston Ship Channel: the Bayou Lafourche in March 1973 spilled 10,000 barrels, the Chevron Hawaii in September 1979 spilled 20,000 barrels near Deer Park; and the Olympic Glory in January 1981 spilled 20,000 barrels. The most recent large spill occurred when several Apex barges ruptured in a collision in mid Galveston Bay and 16,476 barrels of oil escaped. The largest spill in the region occurred in November 1979 when the tanker *Burmah Agate* was involved in a collision that ruptured its tanks and 254,761 barrels of crude oil leaked in the Gulf at the entrance to the Galveston Jetties. Only a small amount of oil was transported into the bay and polluted the area around Smith Point (NOAA, 1992).

Twenty-nine active Superfund sites are found in four of the five counties that surround Galveston Bay: Brazoria County has three sites, Galveston County has five sites, Harris County has 19 sites, and Liberty County has two sites. Superfund sites are inactive or abandoned industrial facilities identified by the Texas Commission on Environmental Quality (TCEQ) as posing a significant risk to human health or the environment due to the presence of hazardous substances. Cleanup actions at eight additional sites (two in Brazoria, five in Harris, and one in Liberty) have

resulted in their removal from the State Superfund Registry (TCEQ, 2004). See the Management Section below for more information.

In addition to chemical spills and dumping, solid waste poses a problem in the Lower Galveston Bay watershed when it is not disposed properly. Litter originates from streets and parking lots and enters Galveston Bay and the surrounding bayous directly or through the system of storm sewers. Waste that enters the storm sewers historically has not been treated or captured in any way. Solid waste can harm wildlife through accidental ingestion, and can reduce quality of life and the aesthetic or scenic quality of wild places.

Marine debris (e.g. abandoned vessels and crab traps) is also a problem in the Lower Galveston Bay watershed. In addition to being navigation hazards, abandoned vessels can leak fuel and oil and are a nuisance and eyesore to the public. Abandoned crab traps can be lost in storms or forgotten by the person who originally deployed them. Abandoned traps or “ghost traps” also pose as navigation hazards, but more importantly, they continue to capture commercially and recreational important species as long as they remain submerged. On land abandoned tires are another form of dangerous solid waste; they pose a fire hazard and serve as a breeding ground for mosquitoes and mosquito-born pathogens.

Management

Regulatory

A number of federal and state laws promote the reduction of waste at its source, proper waste disposal, recycling or reuse of waste, and remediation of contaminated sites. At the federal level the Resource Conservation and Recovery Act of 1976 (RCRA) manages municipal solid waste, hazardous waste, and underground storage tanks. RCRA establishes criteria for municipal solid waste landfills and prohibits the open dumping of solid waste. RCRA also requires that hazardous waste be managed from “cradle to grave” meaning that a regulated waste must be tracked from the time of waste generation, through transport, and final disposal.

The federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, commonly known as Superfund, empowered the EPA to remediate inactive or abandoned sites that pose a risk to human health or the environment due to the presence of hazardous substances. CERCLA permitted the government to hold responsible parties liable for cleanup and instituted a trust fund to pay for cleanup when no responsible parties could be identified. The Oil Pollution Act (OPA) of 1990 streamlined and strengthened EPA’s ability to prevent and respond to catastrophic oil spills. Both CERCLA and OPA allowed for the Natural Resource Damage Assessment (NRDA). The NRDA is a process that assesses damage to natural resources resulting from releases of hazardous substances or discharges of oil.

The Oil Spill Prevention and Response Act (OSPRE) of 1991 designated the GLO as the state agency responsible for maritime oil spill prevention and response. The GLO employs 35 oil spill response officers statewide, maintains response equipment along the Texas coast, manages a state oil spills database, and maintains a vessel response plan database.

The Texas Waste Reduction Policy Act of 1991 requires that large and small generators of hazardous waste and facilities reporting under the Toxic Release Inventory reduce pollution by preparing a five-year pollution-prevention (P2) plan and reporting annually on their progress. The TCEQ is the state agency responsible for implementing hazardous and solid waste rules, as well as waste permitting and compliance programs.

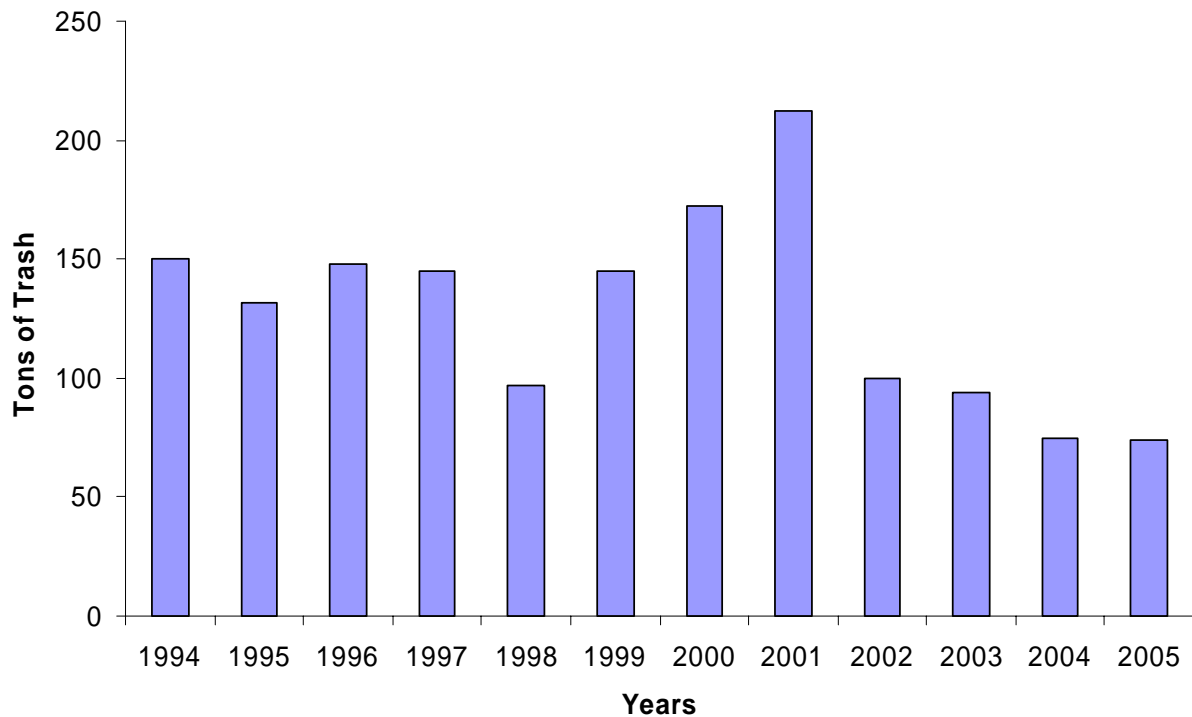
The Clean Water Act of 1972 (CWA) is the principle regulatory instrument used to restore and/or maintain water quality that supports “fishable” and “swimmable” conditions. At the national level, the EPA is the primary water quality regulatory agency. However, at the state level the EPA has given regulatory authority to the TCEQ. The TCEQ manages nonpoint sources (i.e. runoff from roads and land) and point sources of pollution (i.e. discharges from pipes) through a permitting and reporting system known as the Texas Pollutant Discharge Elimination System (TPDES). The TPDES sets standards for industrial, municipal, and agricultural wastewater dischargers and for the management of sewage sludge. Discharges associated with oil and gas exploration and development activities are regulated by the Texas Railroad Commission. The TPDES also manages nonpoint source pollution through its stormwater permitting system for industrial facilities, municipalities, and land developers. Even so, nonpoint source pollutants such as fertilizers from lawns and landscaping and eroding soil from construction sites remain among the most difficult substances to control in the waters fed by the Lower Galveston Bay Watershed.

Non Regulatory

Hazardous household waste (e.g. batteries, automotive fluids, acids, pesticides, paints, solvents, etc.) is one of the most dangerous types of municipal waste. Very often municipal trash companies will not accept the hazardous waste and people resort to dumping the substances down drains, storm sewers, or in empty lots rather than let them accumulate in their homes. When disposed improperly, the substances directly enter the environment. To combat the problem, the City of Houston and other municipalities operate a number of household hazardous waste collection facilities for city residents. For those living outside a city with such facilities, household hazardous waste collection events are held at public locations such as universities. More information is available on the TCEQ website.

Since 1994, citizens have gathered once a year to participate in Trash Bash, an environmental stewardship event in which volunteers gather at locations throughout the Lower Galveston Bay watershed to collect solid waste. The program has won numerous awards and has collected more than 1,500 tons of solid waste and 4,100 tires to date.

Figure 3. Tons of trash collected by volunteers at the annual Trash bash event during the period 1994-2005. Figure created by the Galveston Bay Status and Trends Project, Houston Advanced Research Center. Data source: www.trashbash.org.



The Buffalo Bayou Partnership operates a unique and popular trash skimmer known as the “Mighty Tidy”. The skimmer is a boat that uses a system of conveyor belts to remove floating trash and debris from Buffalo Bayou upstream of the Houston Ship Channel. The “Mighty Tidy” has been in operation since summer 2003 and has collected more than 650 cubic yards of litter.

The Galveston Bay Foundation (GBF) is a local nonprofit organization working to remove sunken and abandoned vessels from area waterways. The GBF received funds from the GLO’s Coastal Impact Assistance Program to remove derelict vessels from Moses Lake, Dickinson Bay, Dickinson Bayou, and West Bay.

In 2001, the Texas Legislature voted to authorize an abandoned crab trap removal program. Prior to that legislation, crab traps could only be removed from state waters by the trap’s owner or a Texas Parks and Wildlife Department (TPWD) game warden. As a result of the legislation, the TPWD Commission instituted an annual ten-day closure to harvest using crab traps. During the closure, in February of each year, the TPWD sponsors a volunteer cleanup event to remove abandoned crab traps. Since the first crab trap removal event, more than 15,000 abandoned traps have been removed from Texas’ coastal waters; of that most have been removed from Galveston and San Antonio Bays.

Conclusion

Spills and dumping of hazardous and solid waste pose a threat to the Galveston Bay System. The time period prior to 1990 saw a number of large oil spills in and near the bay. Oil spill data for the period 1998-2003 show that waste oil, oily water mixtures, and diesel fuel constitute most of the spills reported in the Lower Galveston Bay watershed. Waterborne vessels and land-based facilities are a primary source and Harris and Galveston counties are the prime locations for the spills in Galveston Bay. Still, compared to the amount of vessel traffic moving in and out of Galveston Bay each year, the number of vessel spills remains fairly low. In addition to oil spills, solid waste including marine debris and hazardous household waste also constitute management issues.

Twenty-nine active Superfund sites are found in four of the five counties that surround Galveston Bay. Superfund sites are inactive or abandoned industrial facilities identified by the TCEQ as posing a significant risk to human health or the environment due to the presence of hazardous substances. Eight additional sites were remediated to the point that they could be removed from the State Superfund Registry.

While federal and state laws mandate oil spill prevention and response, hazardous waste tracking, and waste reduction, a number of nonregulatory programs do much to reduce solid waste. Notable programs include hazardous household waste collection facilities and events sponsored by local municipalities and organizations, waste cleanup events such as Trash Bash and the TPWD crab trap removal event, and local nonprofit efforts to remove derelict vessels and solid waste from area bayous.

Reference

NOAA Hazardous Materials Response and Assessment Division. 1992. Oil Spill Case Histories 1967-1991: Summaries of Significant U.S. and International Spills. Report No. HMRAD 92-11. Seattle, WA.

[TCEQ] Texas Commission on Environmental Quality. 2004. Texas Superfund Program. <http://www.tnrcc.state.tx.us/permitting/remed/superfund/index.html>