Oil and Hazardous Materials Response Reports

October 1994-September 1995

November 1995

National Oceanic and Atmospheric Administration
Office of Ocean Resources Conservation and Assessment
Hazardous Materials Response and Assessment Division
Seattle, Washington 98115

Contents

INTRODUCTION

Between October 1, 1994 and September 30, 1995, NOAA's Hazardous Materials Response and Assessment Division Scientific Support Coordinators and scientific staff were notified of 84 spill incidents. These 84 incidents included potential spills, false alarms, and very minor spills for which reports were not prepared. Technical and operational assistance provided to the U.S. Coast Guard for spill incidents in the Nation's coastal zone included 63 oil spills, 14 chemical spills, 1 spill of unknown material, 5 miscellaneous spills, and 1 search and rescue operation. In addition to the spills listed, NOAA assisted the U.S. Coast Guard with 37 simulation exercises.

This volume of reports follows the format established for the Oil Spill Case Histories Report prepared in 1992 by the Division with U.S. Coast Guard Research and Development Center support so that major spills meeting the criteria for inclusion may be incorporated easily into updated case histories reports.

Each report in this volume is organized as follows:

- A list of headers that summarizes the spill name; location; product; size; use of dispersants, bioremediation, and in-situ burning; other special interests; shoreline types affected; and keywords.
- A brief *incident summary* including weather conditions and description of the overall spill response.
- A description of the behavior of the spilled material including movement, evaporation, mousse formation, and dispersion.
- A discussion of countermeasures and mitigation.
- A description of other *special interest issues* such as communication problems, unusual hazards encountered, and large losses of organisms.
- A list of *references* that document the response operations.

Although the master list on the following pages includes all of the incidents for which the Division provided support, only those incidents where the pollutant actually entered the environment are reported on in this volume. These reports are abbreviated and are meant to serve only as a summary of the Division's response to requests from Federal On-Scene Coordinators for each of the events.

Additional details on any of the responses may be obtained from the appropriate Scientific Support Coordinator or U.S. Coast Guard office.

Spill Report Keys

Name of Spill:

NOAA SSC:

Date of Spill (mmddyy)**:**

Location of Spill: text description

Latitude: degrees, minutes, N or S

Longitude: degrees, minutes, E or W

Spilled Material: specific product

Spilled Material Type:

Type 1 - Very Light Oils (jet fuels, gasoline)
Type 2 - Light Oils (diesel, No. 2 fuel oil, light crudes)
Type 3 - Medium Oils (most crude oils)
Type 4 - Heavy Oils (heavy crude oils, No. 6 fuel oil, bunker c)
Type 5 - Hazardous material

Barrels (or weight in pounds if hazardous material):

Source of Spill: tank vessel, non-tank vessel, barge, facility, pipeline, platform

Resources at Risk: See A

Dispersants: Yes or No

Bioremediation: Yes or No

***In-situ* Burning:** Yes or No

Other Special Interest:

Destruction of marshes, mangroves, or tidal flats
Extraordinarily successful salvage operations
Massive habitat loss
Massive wildlife impact
Oil/ice interactions and adverse weather conditions
Unusual, experimental, or innovative cleanup techniques

Shoreline Types Impacted: See B

Keywords: See C

Incident Summary:

Date and time of incident
Location of incident
Weather at time of incident
Summary of events
Actions of responsible party and response organizations
Level of federal involvement
Duration of response

Behavior of Spilled Material:

Formation of slicks, sheen, or mousse
Movement on the water of spilled material
Movement in the air of spilled material
Areas impacted
Amount spilled; amount recovered
(land, sea, contaminated debris)
Amount not recovered
(sinking, evaporation, weathering, dissolution)

Countermeasures and Mitigation:

Control at incident site
Offloading and lightering operations; movement of vessel
Precautionary protection of sensitive areas
Open water recovery
Shoreline cleanup
Removal and disposal of spilled material or
contaminated debris

Other Special Interest Issues: See D

NOAA Activities:

Involvement in response (on-scene, by phone and fax)
Support provided
Participation in committees and special projects
Unusual responsibilities
Meetings attended/recommendations made
Duration of NOAA support

References:

Spill Report Keys

A **Resources at Risk**

Habitats
(See *shoreline types* key below), eelgrass beds, submerged aquatic vegetation (SAV), kelp, coral reefs, worm beds

Marine Mammals
Whales, dolphins, sea lions, seals, sea otters, manatees, walruses, polar bears, population concentration areas, haulouts, migration routes, seasonal use areas

Terrestrial Mammals
Mustelids, rodents, deer, bears, population concentration areas, inter-tidal feeding areas

Birds
Diving coastal birds, waterfowl, alcids, petrels, fulmars, shorebirds, wading birds, gulls, terns, raptors, rookeries, foraging areas, wintering areas, migration stopover areas, wintering concentration areas, nesting beaches, migratory routes, critical forage areas

Fish
Anadromous fish, beach spawners, kelp spawners, nursery areas, reef fish (includes fish using hard-bottom habitats) spawning streams, spawning beaches, estuarine fish, demersal fish

Mollusks
Oysters, mussels, clams, scallops, abalone, conch, whelk, squid, octo-pus, seed beds, leased beds, abundant beds, harvest areas, high concen-tration sites

Crustaceans
Shrimp, crabs, lobster, nursery areas, high concentration sites

Reptiles
Sea turtles, alligators, nesting beaches, concentration areas

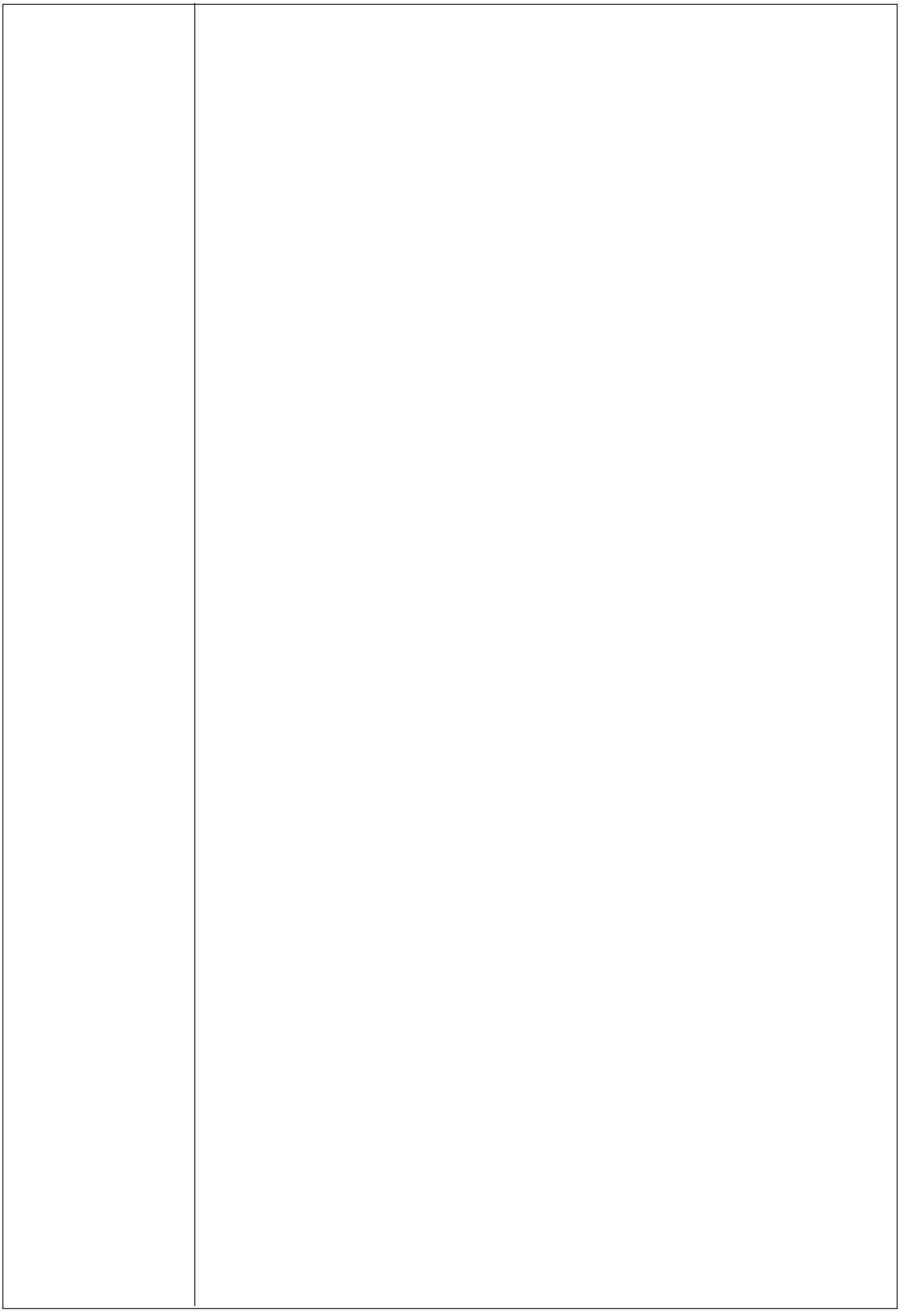
Recreation
Beaches, marinas, boat ramps, diving areas, high-use recreational boating areas, high-use recreational fishing areas, State Parks

Management Areas
Marine Sanctuaries, National Parks, Refuges, Wildlife Preserves, Reserves

	Resource Extraction Subsistence, officially designated harvest sites, commercial fisheries, power plant water intakes, drinking water intakes, industrial water intakes, intertidal and subtidal mining leases, fish/shrimp/bivalve/plant aquaculture sites, log storage areas Cultural Archaeological sites, Native American Lands
B	**Shoreline Types Impacted** brackish marshes coarse gravel beaches coarse sand beaches coastal structures consolidated seawalls consolidated shores cypress swamps developed upland eroding bluffs exposed bedrock bluffs exposed bluffs exposed fine sand beaches exposed riprap exposed rocky platforms exposed rocky shores exposed scarps exposed seawalls exposed tidal flats exposed tidal flats (low biomass) exposed tidal flats (moderate biomass) exposed unconsolidated sediment bluffs extensive intertidal marshes extensive salt marshes extensive wetlands fine sand beaches flats freshwater flat freshwater marshes freshwater swamps fringing salt marshes fringing wetlands hardwood swamps levees low banks mangroves marshes mixed sand and shell beaches

	mixed sediment beaches piers riprap salt marsh saltwater marshes sand/gravel beaches shell beaches sheltered bedrock bluffs sheltered fine-grained sand beaches sheltered impermeable banks sheltered mangroves sheltered marshes sheltered rocky shores sheltered seawalls sheltered tidal flats shelving bedrock shores spoil bank supratidal marshes swamp tidal mudflat unforested upland unvegetated steep banks and cliffs vegetated bluffs vegetated low banks vegetated riverbank vertical rocky shores wavecut platforms
C	**Key words** air activated pumps bioremediation Center for Disease Control Clean Bay Inc. containment boom Corexit 9527 dispersant endangered species evaporation exposed rocky shores filter fences Food and Drug Administration ground truth high-pressure warm-water washing hydro-blasting in-situ burning International Bird Rescue and Research Center International Tanker Owners Pollution Federation (ITOPF)

	low-pressure washing NAVSUPSALV NOAA National Marine Fisheries Laboratory Pacific flyway potential spill propane cannons remote sensing reoiling salvage seafood harvesting ban shallow water recovery siphon dams skimmers SLAR (side-looking airborne radar) smothering sorbent boom sorbent pompoms starshell-type device tourism losses vacuum trucks volunteers weed cutters weir/pump skimmer
D	**Other Special Interest Issues** Effects to tourism, recreation areas, or personal property Closure of commercial or recreational fishing areas and public lands Closure of shipping lanes and vehicle traffic routes Wildlife impacts and rehabilitation Ecological destruction and habitat loss due to spilled material impacts Ecological destruction and habitat loss due to cleanup operations Effects to human health and safety Bioremediation, dispersant, *in-situ* burning operations Unusual, experimental, or innovative cleanup techniques Complex successful salvage operations Logistical or operational problems (including adverse weather conditions) Interaction with foreign or Native authorities Media interest Volunteer response and organization Studies conducted; ongoing research



FY 95 Spills
October 1, 1994—September 30, 1995

Date of Incident	No.	Report Name/Hotline Number	Commodity Involved	USCG District	NOAA Involvement
Oct 5 94	01	Hess Pipeline Kearny, NJ	#6 fuel oil	1	telephone
Oct 8 94	02	Gum Hollow Creek/164 Corpus Christi, TX	Nueces Bay crude	8	1 on-scene
Oct 15 94	03	Buckeye Pipeline New Haven Harbor, CT	gas, jet fuel, #2 fuel	1	1 on-scene
Oct 18 94	04	*M/V *Guanoco* James River, VA	asphalt	5	phone
Oct 20 94	05	San Jacinto River fire/165 Houston, TX	gasoline	8	7 on-scene
Oct 26 94	06	**Keystone Canyon* Astoria, WA	Bunker C, lube diesel, bilge slop	13	phone
Oct 26 94	07	F/V Y*ardarm Knot* fire Seattle, WA	chlorine, ammonia	13	on-scene
October 94	08	**Wellborn* sinking Madagascar	tarballs		heads-up
Oct 27 94	09	*F/P *Bristol Enterprise* Sitka, AK	diesel	17	phone
Nov 2 94	10	Ferry *Hatteras* Morehead City, NC	diesel	5	phone
Nov 4 94	11	Mystery Moon Engineering Portsmouth, VA	diesel	5	phone
Nov 10 94	12	*west coast of Florida	SAR	7	11
Nov 14 94	13	*Jeano Express*/166 Florida Keys, FL	diesel	7	phone
Nov 14 94	14	Dredge *Clinton*/167 Charleston, SC	diesel	7	phone
Nov 21 95	15	F/V *Pathfinder* Holden, NC	diesel	5	1 on-scene

Date of Incident	No.	Report Name/Hotline Number	Commodity Involved	USCG District	NOAA Involvement
Nov 14 94	16	*Homicide investigation Astoria, WA	victim	13	phone
Nov 15 94	17	Scarbough Marsh Scarbough, ME	heating oil	1	phone/fax
Nov 16 94	18	Tangier Island Mystery Tangier Island, VA	asphalt	5	phone
Nov 16 94	19	F/V *Firat*/168 Ft. Lauderdale, FL	IFO/diesel	7	? on-scene
Nov 18 94	20	Unocal Platform Anna Upper Cook Inlet, AK	crude oil	17	phone
Nov 19 94	21	M/V *Emelia S*/169 Charleston, SC	chemical	7	phone
Nov 27 94	22	T/B *A410*/170 Bois Blanc Island, MI	asphalt	2	phone
Dec 2 94	23	M/V *Sealand Atlantic* Port Everglades, FL	fuel and diesel oil	7	phone
Dec 5 94	24	T/S *El Guanuco* Guayanilla, PR	asphalt	7	phone
Dec 5 94	25	Mazda Intracoastal Waterway Delray Beach, FL	waste oil	7	phone
Dec 6 94	26	T/B *Conuma River* Hyelbos Waterway, Tacoma, WA	sodium hydroxide	13	on-scene
Dec 13 94	27	*Fertilizer plant explosion Sioux City, IA	ammonia/nitric acid	2	phone
Dec 16 94	28	USS *Inchon* Norfolk, VA	diesel	5	1 on-scene
Dec 17 94	29	*F/V *Jupiter* Seattle, WA	diesel	13	phone
Dec 17 94	30	*M/V *Golden Craig* Pacific Ocean, Guam	lube, hydraulic oils		phone
Dec 22 94	31	T/B *LBT 62*/171 Chalmette, LA	Alabama sweet crude	8	1 on-scene
Dec 22 94	32	Santa Fe-Pacific Pipeline San Diego, CA	Aviation A fuel	11	1 on-scene

Date of Incident	No.	Report Name/Hotline Number	Commodity Involved	USCG District	NOAA Involvement
Dec 27 94	33	Vessel *MD5352* Baltimore, MD	gasoline	5	phone
Dec 31 94	34	T/B *Crowley 101*/172 Guemes Island, WA	marine diesel	13	phone/fax
Jan 4 95	35	*C/V *Cape Bover* San Francisco, CA	diesel	11	phone
Jan 7 94	36	*F/V *Coolidge III* Cape Flattery, WA	diesel	13	phone
Jan 8 95	37	*F/P *Konsomo Iskaya Smena* Unalaska Island, AK	diesel	17	phone
Jan 16 95	38	F/V *Alaskan Star* Dixon Entrance, AK	diesel`	17	phone
Jan 18 95	39	*F/P *Komsomolskaya Smena* Unalaska, AK	diesel	17	phone
Jan 20 95	40	*Tug *Pegasus*/Barge *Spirit* Holden Beach, NC	diesel	5	phone
Jan 21 95	41	*M/V *POL Americal* Hampton Roads, VA	hazardous materials	5	phone
Jan 23 95	42	Craney Island Mystery spill Portsmouth, VA	#2 fuel oil	5	phone
Feb 2 95	43	Deck Barge *MC10* Hampton Roads, VA	sunken debris	5	phone
Feb 4 95	44	M/V *Comorant II* Florida Keys, FL	diesel	7	phone
Feb 5 95	45	T/V *Berge Banker*/173 Galveston Bay, TX	Bunker C	8	phone
Feb 7 95	46	Tug *Christina* Engelhard, NC	diesel and bilge slop	5	phone
Feb 9 95	47	*T/B *Poling 23* East Rockaway Inlet, NY	#2 and kerosene	1	telephone
Feb 10 95	48	T/V *Mormac Star*/174 Sandy Hook, NJ	#2	1	1 on-scene
Feb 15 95	49	NYC Transit Authority Staten Island, NY	oil	1	phone

Date of Incident	No.	Report Name/Hotline Number	Commodity Involved	USCG District	NOAA Involvement
Feb 15 95	50	*M/V *Hermes Hope* Tacoma, WA	furfuryl alcohol	13	phone
Feb 19 95	51	Kitty Hawk Mystery Tarballs Kitty Hawk, NC	tarballs	5	1 on-scene
Feb 22 95	52	Tug *Tarus* Georgetown, SC	diesel	7	phone/fax
Feb 20 95	53	*Deck Barge *DS 17* Hampton Roads, VA	#6 fuel oil	5	phone
Feb 21 95	54	Matagorda Island Gulf of Mexico TX	tarballs	8	phone
Feb 22 95	55	*LL&E Pipeline Saraland, AL	crude oil	8	phone
Feb 23 95	56	*Mystery slick Santa Catalina/ San Clemente Isalnds, CA	unknown	11	phone
Feb 27 95	57	M/V *Florida Express*/175 Gulf of Mexico	Bunker C	8	1 on-scene
Mar 7 95	58	F/V *Red October* Oahu, Hawaii	diesel	14	phone
Mar 13 95	59	Rockeller Wildlife Refuge Chenier, LA	natural gas/ condensate	8	1 on-scene
Mar 16 95	60	*Mobil Oil pipeline release Lake Charles, LA	oil	8	phone
Mar 23 95	61	Looe Key oil spill/176 Florida Keys, FL	oil	7	phone
Apr 11 95	62	Powell Duffryn/177 Savannah, GA	gas sulfate turpentine sodium hydrosulfide	7	4 on-scene
Apr 13 95	63	*Mystery Spill Coos Bay, OR	jellyfish	13	phone
Apr 18 95	64	M/V *Sealand Innovation* Charleston, SC	allyl caproate caprylic acid	7	phone/fax
Apr 20 95	65	*Ingleside collision/178 Ingleside, TX	cumen	8	phone
Apr 20 95	66	Leaking container Charleston, SC	urethane primer	7	1 on-scene

Date of Incident	No.	Report Name/Hotline Number	Commodity Involved	USCG District	NOAA Involvement
Apr 24 95	67	Dredge Weeks Frying Pan Shoals, NC	dredge pipe	5	phone
May 02 95	68	M/V *Wealthy River*/179 Charleston, SC	# 6 fuel oil	7	1 on-scene
May 3 95	69	*F/V American *Heritage* Santa Monica Bay, CA	diesel	11	phone
May 5 95	70	*Union Pacific Railroad Snake River Walla Walla County, WA	ammonium phosphate fertilizer/sodium hydroxide	13	phone phone
May 15 95	71	Southern States Phosphate/180 Savannah, GA	hydrofluorsilicic acid	5	phone/fax
Jun 10 95	72	*M/V *Royal Majesty* Nantucket Sound, RI	marine diesel	1	heads-up
Jun 13 95	73	ferrous sulfate barge/181 Waveland, MS	ferrous sulfate	8	4 on-scene
Jun 15 95	74	F/V *Miss Doreen* Kupreanof Island, AK	diesel	17	phone
Jun 22 95	75	M/V *Star Princess* Juneau, AK	IFO-380	17	phone
Jul 01 95	76	*Alexia* and *Enis*/182 Southwest Pass, LA	oil	8	1 on-scene
Jul 15 95	77	M/V *Shamwari* Atlantic Ocean near Havana, Cuba	diesel		phone/fax
Jul 20 95	78	Los Angeles hydrochloric acid Wilmington, CA	chemical	11	phone
Jul 22 95	79	Coastal Oil Eagle/183 Deptford, NJ	Rabbi crude	1	1 on-scene
Jul 23 95	80	M/V *Northern Wind* Sequam Island, AK	diesel	17	phone
Aug 10 95	81	*Pier 91 Seattle, WA	Neosorb 60 (Sorbitol food additive)	13	phone
Aug 11 95	82	*F/V *Summer Gale* Two Headed Island, AK	diesel	17	phone

Date of Incident	No.	Report Name/Hotline Number	Commodity Involved	USCG District	NOAA Involvement
Aug 11 95	83	F/V *Anna-K* Kanagunut Island, AK	diesel	17	phone
Sep 20 95	84	*Alsea River Gasoline Spill Alsea Bay, OR	gasoline	13	phone

* indicates spills for which no report is necessary

FY 95 Drills and Scenarios

October 1, 1994—September 30, 1995

Drill Description	Area	Type	Date Requested	Date Sent
Drill	Edmonds, Washington	OSSM	10/14/94	10/21/94
Area Plan	Manchester, Washington	OSSM	10/7/94	10/24/94
Drill	Northern California	OSSM/Verbal	10/17/94	11/4/94
Drill	East Mississippi Delta	OSSM/TAT	11/1/94	11/7/94
Real-Time Drill	Honolulu, Hawaii	Verbal	11/15/94	11/15/94
Real Time Drill	Alaska	ADIOS run	11/16/94	11/16/94
Invest Scenario	Rosario Strait	OSSM	1/23/95	1/24/95
Drill	Niagara River	NaOH	11/17/94	1/25/95
Drill	Cape Fear River, North Carolina	OSSM/TAT	1/9/95	1/27/95
MSO Planning	Mississippi Sound	OSSM	1/23/95	2/2/95
MSO Planning	St. Marks River	OSSM	1/23/95	2/2/95
Joint Drill	U.S./Canadian exercise Alaska	OSSM/TAT	1/30/95	2/17/95
prep practice	North San Francisco Bay	OSSM/movie	3/2/95	3/10/95
pre-planning	San Francisco	OSSM/movie	2/10/95	3/16/95
Drill	Apra H. Guam	TAT/movie	3/13/95	3/17/95
USCG Drill	Chesapeake Bay	TAT	3/20/95	3/21/95
USCG Drill	Tampa, Florida	TAT/movie	4/6/95	4/14/95
Real-Time Drill	off Hollywood, Florida	verbal	4/25/95	4/25/95
Area Plan	Jamaica Bay	OSSM	4/21/95	4/27/95
Area Plan	Kalgin Island, Alaska	TAT	3/13/95	5/5/95
Area Plan	Nikiski, Alaska	TAT	3/13/95	5/5/95
Area Plan	Kamechak Bay, Alaska	TAT	3/13/95	5/5/95
Drill	Lake Michigan	TAT/movie	4/21/95	5/15/95
Drill	Buffalo, NY	TAT	5/4/95	5/24/95
Navy Prep	San Diego, California	TAT	5/3/95	5/31/95
Area Plan	Lower Cook Inlet, Alaska	OSSM	5/22/95	6/12/95
Drill	Bremerton, Washington	TAT/movie	5/23/95	6/26/95
Drill	Honolulu, Hawaii	verbal	7/26/95	7/26/95
Drill	Baltimore, Maryland	movie	8/4/95	8/7/95
Drill	Jacksonville, Florida`	ALOHA	8/7/95	8/17/95
CISPRI Drill	Upper Cook Inlet, Alaska	verbal	8/8/95	8/8/95
Drill	Corpus Christi, Texas	OSSM/movie	8/11/95	8/15/95
Drill	Tampa Bay, Florida	TAT/movie	8/7/95	8/21/95
Drill	Lake Michigan	TAT	8/22/95	8/22/95
Drill	Chesapeake Bay	verbal	8/30/95	8/30/95
Real-Time Drill	Hilo, Hawaii	verbal	9/15/95	9/15/95
Real-Time Drill	Willamette River, Oregon	verbal	9/20/95	9/20/95

U.S. COAST GUARD DISTRICT 1

Name of Spill:	Hess Pipeline
NOAA SSC:	Ed Levine
Coast Guard District	1
Date of Spill:	10/05/94
Location of Spill:	Kearny, New Jersey
Latitude:	40°44.8′ N
Longitude:	74°04.7′ W
Spilled Material:	#6 fuel oil
Spilled Material Type:	4
Amount:	300 gallons
Source of Spill:	pipeline
Resources at Risk:	**Terrestrial Mammals**: mustelids, rodents **Birds**: waterfowl, wading birds, gulls, terns, raptors **Habitats**: rookeries, foraging areas, wintering areas, wintering concentration areas, migratory routes, critical forage areas **Fish**: anadromous fish, nursery areas, estuarine fish **Mollusks**: oysters, mussels, clams **Recreation**: marinas, boat ramps **Management Areas**: wildlife reserves **Resource Extraction**: power plant water intakes, industrial water intakes
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	Elastol™
Shoreline Types Impacted:	coastal structures, consolidated seawalls, consolidated shores, developed upland, freshwater marshes, piers, riprap, spoil bank, supratidal marshes, swamp, unvegetated steep banks and cliffs, vegetated riverbank
Keywords:	containment boom, low-pressure washing, siphon dams, skimmers, vacuum trucks, weir/pump skimmer

Incident Summary:

At approximately 1950 on October 8, 1994, the United States Coast Guard (USCG) was notified by the New Jersey Department of Environmental Protection (NJ DEP) about a breach in the Amerada Hess pipeline in Kearny, New Jersey. About 300 gallons of oil were spilled into the Hackensack River when a valve was left partially open after a maintenance operation. Approximately 2,300 gallons of #6 fuel oil discharged from the pipeline, part of it entering a tributary to the Hackensack River.

The weather at the time was calm winds, temperature 65°F, and calm water.

The responsible party (RP) hired local contractors to boom and recover oil. The USCG dispatched a pollution response team to the scene. Most of the oil was on land around the pipeline. About 300 gallons of oil were in the tributary; but only a heavy, unrecoverable sheen was seen in the Hackensack River.

The response lasted for five days.

Behavior of Oil:

The oil adhered to the shoreline and mostly remained within the boomed area. The tributary was connected to the river by an underwater pipe that allowed the water to flow, but held the oil within the tributary. The oil did not form mousse, but did sheen.

Countermeasures and Mitigation:

The oil impacts were mainly on the mud sediments exposed at low tide, forming a "bathtub ring" along higher banks. Nearly 300 gallons were recovered by hosing down the shoreline and vacuuming water surfaces.

Other Special Interest Issues:

The RP requested use of Elastol™ to increase recovery rates. Because the spill site was located within Zone 3 (a non-preapproval area), the USCG On-Scene Coordinator (OSC) needed Regional Response Team (RRT) approval to allow the application. Within two hours of the original written request, the RRT held a conference call and preliminary approval was granted pending specific operational application and recovery plans. The RRT stipulated that the initial application contain a test component (segregated control area) for comparison purposes. If it was determined on-scene that the Elastol was actually improving the recovery efforts, the control area could then be treated. Within four hours of the original request, a specific plan was received and RRT approval gained. However, application could not begin until the following day due to tidal condition restrictions imposed by the RRT (application could only be during slack tide and daylight hours). By the following day, the on-scene representatives from New Jersey and the USCG decided that not enough oil remained to be treated and the application was canceled. The oil was recovered with traditional vacuuming techniques.

NOAA Activities:

NOAA was notified of this incident on October 5, 1994, and asked to comment on the appropriateness of Elastol use in this situation. NOAA's Scientific Support Coordinator (SSC) reported that #6 oil should be recoverable without the addition of Elastol. However, since the environment was not a sensitive area, if the RP wished to try improving recovery by applying Elastol, the SSC had no objection. The SSC participated in RRT conference calls discussing the use of Elastol and helped arrange test criteria. Support was provided for three days.

References:

Regional Response Team II Memorandum of Understanding on Chemical Countermeasures.

Name of Spill:	Buckeye Pipeline
NOAA SSC:	Ed Levine and Steve Meador
USCG District:	1
Date of Spill:	10/15/94
Location of Spill:	New Haven Harbor, Connecticut
Latitude:	41°19'18" N
Longitude:	72°53'00" W
Spilled Material:	gasoline, jet fuel, #2 fuel oil
Spilled Material Types:	1 and 2
Amount:	less than 330 barrels
Source of Spill:	pipeline
Resources at Risk:	**Birds**: waterfowl wintering concentration area **Fish**: anadromous fish runs **Mollusks**: oyster seed beds, soft-shell clam populations, leased beds
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	recovery wells
Shoreline Types Impacted:	brackish marshes, tidal mudflats, bulkhead
Keywords:	sorbent boom, containment boom, evaporation, vacuum trucks

Incident Summary:

At approximately 1600 on October 15, 1994, the USCG Captain of the Port (COTP) Long Island Sound was notified by the Connecticut (CT) DEP of a fuel leak causing sheening in the Little River, a small tributary feeding into the Quinnipiac River in New Haven Harbor. Immediately suspect was a 12-inch diameter pipeline (constructed in 1961) owned by Buckeye Corporation extending from New Haven, Connecticut to Westover Air Force Base carrying a number of petroleum products ranging from gasoline to #2 fuel oil. The pipeline runs along the base of the Conrail train bed (north side) in the area of the Little River; the leak appeared to have originated on the east side of the river. Buckeye assumed responsibility for the spill. While a pipeline failure of some kind was suspected, extensive excavation did not uncover the exact location and 1,800 feet of pipeline were abandoned in place to be filled with concrete in summer 1995. After extensive pressure-testing of the replaced section, the pipeline was reactivated on October 31, 1994.

The USCG dispatched a pollution investigation team and monitored the situation closely, as did the CT DEP.

Behavior of Oil:

Oil entered the river in the area beneath the railroad bridge and fresh product could be seen coming out of the bulkhead on the eastern bridge toe. The amount of product released was affected by the stage of the tide, with the greatest flow seen during evening low tides. Little oil appeared to move up or down Little River, and there were no obvious shoreline impacts in the river or the harbor. Although the exact composition of the oil was unknown, a large percentage was probably lost to evaporation and dissolution due to the light nature of the product and the rapid currents in the bridge area.

Countermeasures and Mitigation:

The majority of oil recovered came from six recovery wells drilled on the north side of the railroad tracks. Recovered material was pumped to fractionation (FRAC) tanks, air-stripped, passed through a carbon unit, and discharged to Little River. Although the initial release was unquantified, more than 14,200 gallons were recovered by early January 1995. It is expected that the recovery wells will continue to operate for a number of years.

Product recovery beneath the bridge was enhanced by attaching a plywood outer bulkhead about six inches from the permanent bulkhead. Oil was then captured in the area between the two bulkheads using sorbents and a vacuum truck.

The marsh areas on Little River were double-boomed with shallow-water containment boom.

Other Special Interest Issues:

Train service was initially suspended in the area due to concerns about potentially explosive concentrations of petroleum vapors. Eventually, trains were allowed to pass at greatly reduced speeds. The speed limits increased as vapors became less of a concern. The work area beneath the bridge was designated as Level C conditions for a time due to concerns about organic vapors.

Shellfish beds near the mouth of Little River were sampled for petroleum contamination soon after the discovery of the spill. These beds will be monitored as needed.

No wildlife impacts were reported.

NOAA Activities:

NOAA was notified of the incident by the USCG and asked to contact the state SSC from CT DEP. The Assistant SSC (ASSC) attended an afternoon meeting with CT DEP whose interests were primarily those of damage assessment, "how clean is clean," and shellfish monitoring. The ASSC provided information and additional contacts on damage assessment and biomonitoring, and briefed the NOAA Coastal Resource Coordinator (CRC) for U.S. Environmental Protection Agency (EPA) Region I by phone on the potential long-term remediation of the site. The ASSC went on-scene to monitor for any shoreline or wildlife impacts.

NOAA supported this incident for approximately a day and a half.

References:

Captain of the Port Long Island Sound Area Contingency Plan

State of Connecticut Oil Spill Contingency Guide

Name of Spill:	Scarborough Marsh
Date of Spill:	11/15/94
SSC:	Stephen Lehmann
Location of Spill:	Scarborough, Maine
Latitude:	43° 38′ N
Longitude:	070° 30′ W
Spilled Material:	#2 heating fuel
Spilled Material Type:	2
Amount:	< 57 barrels (2,400 gallons)
Source of Spill:	tanker truck
Resources at Risk:	periodically submerged salt/freshwater marsh
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	No, but suggested
Other Special Interest:	none
Shoreline Types Impacted:	inland marsh
Keywords:	in-situ burn

Incident Summary:

On November 15, 1994, a Dead River Fuel Company delivery truck loaded with approximately 2,400 gallons of #2 heating fuel overturned into a marsh. Dead River Fuel Company took responsibility and hired a local cleanup contractor. The contractor deployed protection and containment boom and began skimming product. A technique of digging small holes in the peat was used to collect sufficient quantities of oil to remove. In-situ burning was suggested but was denied by the Federal On-Scene Coordinator (FOSC).

Behavior of Oil:

The oil saturated the upper layer of peat in the marsh.

Countermeasures and Mitigation:

A controlled burn of the marsh was suggested by the spiller and agreed to by the State of Maine responders on-site.

NOAA Activities:

NOAA was notified of this incident on November 15, 1994, by the USCG Marine Safety Office (MSO) Portland. The FOSC requested input from NOAA prior to approving the burn. The SSC sent a memorandum to the FOSC on November 16, 1994, discouraging the use of in-situ burning in this case for the following reasons:

- ❒ The level of water covering vegetation was too low to protect the root systems from injury.
- ❒ There was relatively little remaining fuel and natural, less-intrusive options were preferred.
- ❒ This spill was in a peat bog and peat marshes do not allow free-and-easy liquid flow. The peat would act as a combustion source and maintaining a burn as pockets of fuel remain isolated and frequent re-ignition would be required. Control, particularly with the proximity of homes, was a concern.

The request for in-situ burning was denied.

Name of Spill:	T/V *Mormac Star*
NOAA SSC:	Stephen Meador
USCG District:	1
Date of Spill:	2/10/95
Location of Spill:	Sandy Hook, New Jersey
Latitude:	40°28.0′ N
Longitude:	73°57.36′ W
Spilled Material:	#2 fuel oil, Jet A fuel
Spilled Material Type:	2
Amount:	800 barrels
Source of Spill:	tank vessel
Resources at Risk:	**Birds**: waterfowl nesting, wintering, and migratory areas; shorebird nesting beaches; wading birds **Fish**: anadromous, estuarine, and demersal fish **Mollusks**: hard- and soft-shelled clams **Crustaceans**: blue and green crabs **Recreation**: Gateway National Recreation Area, recreational beaches
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	containment boom, evaporation**,** forward-looking infrared radar (FLIR)

Incident Summary:

At approximately 1930 on February 10, 1995, the USCG Group New York received a call from the Vessel Traffic Service informing them that the inbound T/V *Mormac Star* was hard aground next to Sandy Hook Channel between buoys 4 and 6 with her port side extending into the channel. The vessel was carrying 112,000 barrels of Jet A fuel and 135,000 barrels of #2 fuel oil.

Weather on-scene was 35°F, 10-knot west-southwest winds, and three-foot seas.

USCG Marine Inspection Office (MIO) and COTP personnel responded on-scene. The FOSC requested assistance from the USCG Atlantic Strike Team (AST) and two AST members responded by aircraft that had FLIR capabilities. The vessel owner took immediate responsibility and contracted services for booming and open-water recovery. Tank #6 center (22,000-barrel capacity) was sounded and found to be leaking #2 fuel oil at a rate of approximately 100 barrels per hour. Skimmers operated close to the vessel to recover what little product there was on open water. A 90,000-barrel barge was deployed to lighter the tanker enough so that the vessel would refloat naturally. Once tanks #2 center and #6 center were sufficiently emptied, the vessel refloated and was towed to general anchorage about three miles off Sandy Hook to complete lightering before going to the harbor for repairs. Although hampered by strong currents, divers discovered a two-inch hole in the #6 center tank that they patched temporarily. Weather postponed further lightering and the vessel was towed to its original destination in the Arthur Kill to complete lightering.

Federal trustees from the Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), and the Department of the Interior were briefed on the situation but only the NOAA SSC responded on-scene. Boom was deployed as a precaution at some sensitive areas identified in the Area Contingency Plan, but no shoreline or wildlife impacts were reported.

Media interest was generally light, although a well-attended press conference was held on February 11.

Behavior of Oil:

Due to the weather, the nature of the product, and the estimated release rate (100 barrels per hour), it was predicted that the oil would move away from sensitive resources and rapidly disperse and evaporate. Two members of the AST used airborne FLIR to determine the extent of oil on the water approximately five hours after the spill (in darkness). From the air, the FLIR indicated a good thermal signature but no oil on the water. Use of the FLIR from the vessel's deck indicated only a small amount of product outside the boom. A first-light overflight on February 11 confirmed little recoverable oil present on open waters. Windrows of rainbow sheen were oriented downwind to the northeast for about four miles, while a small area of recoverable oil, driven by winds and currents, was present around the vessel within Sandy Hook Channel. An afternoon overflight again showed only rainbow sheen oriented downwind and a small area of recoverable oil.

Of the 800 barrels spilled, approximately 215 barrels of an oil-and-water mixture were recovered from open water. No shoreline impacts were reported.

Countermeasures and Mitigation:

The USCG FOSC closed Sandy Hook Channel and established a safety zone around the vessel. Contractors boomed the vessel and initiated open-water recovery operations. Environmentally sensitive areas within Sandy Hook Bay were boomed; while boom was staged at other locations such as Rockaway Inlet and southern Staten Island as a precaution.

NOAA Activities:

NOAA was notified of this incident on February 2, 1995, by the USCG and asked to respond on-scene. The SSC provided tide and current information, weather forecasts, oil behavior and weathering analysis, worst-case trajectories, and resources-at-risk analysis. To reduce risk to Jamaica Bay in the event of a catastrophic loss of cargo, NOAA recommended that lightering operations not begin until the current was ebbing. The SSC participated in one overflight with the AST. The SSC supported this incident for approximately one day.

References:

COTP-New York Area Contingency Plan

NOAA. 1993. *ADIOS™ (Automated Data Inquiry for Oil Spills) User's Manual.* Seattle: Hazardous Materials Response and Assessment Division, NOAA. 50 pp.

Research Planning Institute. 1985. *Sensitivity of coastal environments and wildlife to spilled oil: New York Harbor and Hudson River*. An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 37 maps.

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide.* NOAA Technical Memorandum NOA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

Name of Spill:	New York City Transit Authority
NOAA SSC:	Ed Levine
USCG District:	1
Date of Spill:	02/15/95
Location of Spill:	Staten Island, New York
Latitude:	40°34.8′ N
Longitude:	74°11′ W
Spilled Material:	#1
Spilled Material Type:	1
Amount:	120 barrels
Source of Spill:	facility (bus depot)
Resources at Risk:	**Terrestrial Mammals**: mustelids, rodents, intertidal feeding areas **Birds**: waterfowl, alcids, gulls **Habitat**: foraging areas, wintering areas, wintering concentration areas, critical forage areas **Recreation**: city parks
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	destruction of marshes, oil/ice interactions, adverse weather
Shoreline Types Impacted:	brackish marshes, coastal structures, developed upland, freshwater marshes, marshes, piers, riprap, salt marsh, saltwater marshes, sheltered marshes, sheltered seawalls, spoil bank, vegetated riverbank
Keywords:	containment boom, evaporation, filter fences, sorbent boom, sorbent pompoms

Incident Summary:

At 0200 on February 15, 1995, the COTP New York was notified by the New York City Fire Department of a spill of 17,000 gallons of #1 oil coming from a New York City Transit Authority bus depot on Staten Island. An unknown amount of oil had been released into Richmond Creek, a tributary to the Fresh Kills and Arthur Kill.

The weather was winds 20 to 25 knots and temperature 32°F. Because a winter storm warning had been posted the evening before the incident, the National Weather Service forecasting office was contacted. The forecast was snow changing to rain for the afternoon and evening.

Oil, approximately one-quarter inch thick, was in areas of Richmond Creek not covered by ice, with an unknown amount under the ice. Cleanup contractors placed containment and deflection boom in open-water areas on Richmond Creek and Fresh Kills in case product reached those areas. Benzene tests in a drainage system produced negative results.

Behavior of Oil:

The oil formed slicks and sheens as it moved downstream.

Because ice covered the banks, the only areas impacted were a drainage ditch and the mid-channel area of the creeks.

About 5,000 gallons were spilled; probably less than 1,000 gallons reached the waterways. A minimal amount was recovered, mostly by sorbent pads and boom. The amount lost through evaporation, weathering, and dissolution and not recovered is unknown.

Countermeasures and Mitigation:

The oil was controlled at the site by hard and sorbent booms. The OSC required precautionary protection-booming of sensitive areas. Open-water recovery was not possible due to ice coverage and shoreline cleanup was not allowed in order to protect the marsh habitat.

Other Special Interest Issues:

Wildlife impacts were limited to one dead muskrat, one dead gull, and one dead owl.

NOAA Activities:

NOAA was notified by the COTP New York who requested the SSC report to the operations center. The SSC identified marsh areas upstream of the spill site, over-wintering waterfowl, and gulls as resources at risk. The SSC predicted that 12 percent of the floating oil would remain after 12 hours. Helicopter overflights of the spill scene were used to verify reports and assess needed activities. Due to icing of the creek, it was deemed unsafe for cleanup workers to approach the oil floating in mid-channel. Boats were also unable to reach the location. The only cleanup activity possible was sorbent placed where oil pooled at the juncture of the drainage ditch and Richmond Creek. NOAA was involved with this incident for one-half day; the response lasted approximately two weeks.

References:

NOAA. 1993. *ADIOS™ (Automated Data Inquiry for Oil Spills) User's Manual.* Seattle: Hazardous Materials Response and Assessment Division, NOAA. 50 pp.

Research Planning Institute. 1985. *Sensitivity of coastal environments and wildlife to spilled oil: New York Harbor and Hudson River.* An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 37 maps.

U.S. COAST GUARD DISTRICT 2/9

Name of Spill:	Tank Barge A-410
NOAA SSC:	Gary Ott and Ken Barton
USCG District	9
Date of Spill:	11/27/94
Location of Spill:	Bois Blanc Island, Lake Huron
Latitude:	45°47.8′ N
Longitude:	84°26.2′ W
Spilled Material:	heated asphalt
Spilled Material Type:	4
Amount:	41,000 barrels (potential)
Source of Spill:	barge
Resources at Risk:	habitat
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	fresh water beach
Keywords:	potential spill

Incident Summary:

On Sunday, November 27, 1994, the tank barge, A-410, grounded north of Bois Blanc Island in the Straits of Mackinac in Lake Huron. The 335-foot, double-skinned barge, built in 1955, contained 41,000 barrels of heated asphalt in five separate tanks. The asphalt was heated to 245°F.

The first opportunity to transfer the cargo was November 29 because the weather was deteriorating with gale warnings; November 28 winds were forecast to be westerly at 30 to 40 knots. The asphalt was transferred on December 1 and 2 into another barge without a release of product.

NOAA Activities:

NOAA was notified of the incident on Monday, November 28, 1994, by MSO Sault Ste. Marie and asked for an assessment of the trajectory and fate of asphalt if the asphalt was released. NOAA provided technical information on the health and safety issues of the hot asphalt if it contacted the cold water. The SSC also supplied specialized weather forecasts during salvage operations.

NOAA suggested that any oil spilled into the water would form discrete, oblong-shaped chunks ranging from football-size to larger pieces that would sink within a few yards of the source. The movement of oil along the bottom would depend upon the bottom slope and bottom currents generated by the gale.

NOAA also provided an analysis of particular hazards associated with a hot asphalt release in the cold lake waters for the OSC on November 28. NOAA reported that, if the hot asphalt came in contact with the cold water, an open-air steam explosion would be unlikely. Similarly, a confined-space steam explosion if cold water entered the barge was unlikely. The safety of emergency responders to the release of hot asphalt would be based on avoiding exposure by staying upwind of the source and using eye, skin, and respiratory protection as required.

References:

NOAA. 1994. Hotline 170. Seattle: Hazardous Materials Response and Assessment Division. 12 Reports

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide.* NOAA Technical Memorandum NOA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

U.S. COAST GUARD DISTRICT 5

Name of Spill:	Ferry *Hatteras*
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill	11/2/94
Location of Spill:	Newport River, Morehead City, North Carolina
Latitude:	34°43.7′ N
Longitude:	076°41.6′ W
Spilled Material:	diesel
Spilled Material Type:	2
Amount:	40 barrels
Source of Spill:	ferry
Resources at Risk:	habitat
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	exposed sand beaches
Keywords:	containment boom, potential spill

Incident Summary:

On November 2, 1994, MSO Wilmington was notified that a 135-foot converted North Carolina Department of Transportation ferry, *Hatteras*, was aground and taking on water over the stern. The initial estimate of oil released from the vessel was 50 gallons. The vessel's owner had initially arranged for salvage of the vessel, but MSO Wilmington was not satisfied with the owner's efforts to stop the release.

Behavior of Oil:

Oil from the vessel flowed with the tide and wind and feathered out within several hundred yards.

Countermeasures and Mitigation:

USCG Group Fort Macon deployed approximately 200 feet of containment boom around the vessel on November 2, 1994. On November 3, the vessel was refloated and MSO Wilmington's contractors removed 1,000 gallons of diesel fuel from the *Hatteras*' fuel tanks.

NOAA Activities:

NOAA was contacted by MSO Wilmington on November 3, 1994, and participated with the MSO and the staff of the North Carolina EPA in an assessment of resources that could be impacted by the release of diesel fuel in this area.

References:

Virginia Institute of Marine Science. 1980. S*ensitivity of coastal environments and wildlife to spilled oil, state of North Carolina*. Boulder, Colorado: Hazardous Materials Response and Project, NOAA. 113 maps.

MSO Hampton Roads. 1994. North Carolina Area Contingency Plan, Norfolk, VA. United States Coast Guard, Marine Safety Office, Hampton Roads.

Name of Spill:	Minor Mystery Spill Moon Engineering
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill:	11/4/94
Location of Spill:	Elizabeth River, Portsmouth, Virginia
Latitude:	36°53′ N
Longitude:	76°20.5′ W
Spilled Material:	diesel fuel
Spilled Material Type:	2
Amount:	unknown
Source of Spill:	unknown
Resources at Risk:	habitat
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	fringing salt marsh, tidal mudflat
Keywords:	sorbent boom, pompoms

Incident Summary:

A mystery spill in the Elizabeth River, the Port of Hampton Roads, was reported to MSO Hampton Roads November 3, 1994. The mystery slick was 150 feet by 10 feet in the area of Moon Engineering, Portsmouth, Virginia.

Behavior of Oil:

The westerly wind at 10 to 15 knots and the incoming tide held the oil into a relatively small area between Moon Engineering's piers 1 and 2.

Countermeasures and Mitigation:

The USCG MSO Hampton Roads contractor, Petrochem, removed most of the material along the pier using sorbent pads. One 55-gallon drum of oil and soiled sorbents was removed by the end of the day.

NOAA Activities:

NOAA was notified of this incident by MSO Hampton Roads on November 4, 1994, and participated at MSO Hampton Roads in discussions on "how clean is clean" and relayed resources at risk and weather information.

References:

Virginia Institute of Marine Science. 1980. *Sensitivity of Coastal Environments and Wildlife to Spilled Oil, State of Virginia*. Boulder, Colorado: Hazardous Materials Response Project, NOAA. 104 maps.

Name of Spill: Tangier Island Minor Mystery Spill
NOAA SSC: Gary Ott
USCG District: 5
Date of Spill: 11/16/94
Location of Spill: Calton Cut Creek, Tangier Island, Virginia
Latitude: 37°49.58′ N
Longitude: 075°58.99′ W
Spilled Material: asphalt
Spilled Material Type: 4
Amount: 1 barrel
Source of Spill: 5-gallon container
Resources at Risk: habitat
Dispersants: N
Bioremediation: N
In-situ Burning: N
Other Special Interest: none
Shoreline Types Impacted: intertidal marshes, vegetated riverbank
Keywords: sorbent boom, pompoms
Incident Summary:

At 1500, November 15, 1994, MSO Hampton Roads received a report that tar had been spilled in Calton Cut, Tangier Island, Virginia. The crew from USCG Station Crisfield was dispatched to Tangier Island and taken to Calton Cut using a Virginia Marine Resources Commission vessel. A USCG investigation traced the source of the spill from Calton Cut, across a road, and into another marsh where they found another 30- by 10-foot slick of the same material and a 5-gallon bucket of material labeled "black net set, asphalt cutback, NA-1999." This bucket was about half-full.

Behavior of Oil:

The USCG observed a thick, black slick 1/4- to 1/2-inch thick in an area 75 yards by 50 feet. The slick, spread out in small clumps, covered an area of about 15 by 15 feet. The adjacent property, approximately 50 yards of shoreline, was oiled by this heavy material.

Countermeasures and Mitigation:

The Station Crisfield crew deployed 60 feet of absorbent boom and contained the spill. The owner of the property, who denied causing the spill, eventually cleaned up 90 percent of it with his own resources. Two 55-gallon drums of product, sorbent boom, and debris were collected.

NOAA Activities:

NOAA was notified of this incident on November 16, 1994, by MSO Hampton Roads and participated in discussions on "how clean is clean" and the special environmental resources and issues on Tangier Island. The USCG MSO Hampton Roads, NOAA, and the Virginia Department of Environmental Quality (DEQ), during a conference call, decided that when oil from the heavily oiled areas was removed, natural removal and flushing would complete the cleanup.

References:

Virginia Institute of Marine Science. 1980. *Sensitivity of coastal environments and wildlife to spilled oil, State of Maryland*. Boulder, Colorado: Hazardous Materials Response Project, NOAA. 118 maps.

MSO Hampton Roads. 1994. Virginia Area Contingency Plan. Norfolk, VA. United States Coast Guard, Marine Safety Office, Hampton Roads.

Name of Spill:	F/V *Pathfinder*
NOAA SSC:	Gary Ott
Date of Spill:	11/16/94
Location of Spill:	Holden, North Carolina
Latitude:	33° 55′ N
Longitude:	078°16.7′ W
Spilled Material:	diesel
Spilled Material Type:	2
Amount:	unknown
Source of Spill:	fishing vessel
Resources at Risk:	habitat
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	abandoned vessel removed by property owner
Shoreline Types Impacted:	fringing salt marsh, tidal mudflat
Keywords:	sorbent boom, pompoms

Incident Summary:

On November 15, 1994, MSO Wilmington received a report from USCG Station Oak Island of an oil sheen approximately one-mile long in the Intracoastal Waterway (ICWW). The sheen was reportedly coming from a vessel, believed to be the F/V *Pathfinder*, that had been hauled up on the beach and was being dismantled. At the time of the release all that remained of the vessel were piles of oily debris and an oil-contaminated shoreline.

Behavior of Oil:

The oil sheen moved from the source along the shoreline and dissipated within one mile. Cleanup of the oil sheen on the water was not feasible.

Countermeasures and Mitigation:

MSO Wilmington entered into a series of meetings with the property owner and his contractors. MSO Wilmington also hired a contractor to remove the vessel's fuel tanks and the engine. This was completed November 18, 1994.

NOAA Activities:

NOAA was notified of this incident on November 21, 1994, by MSO Wilmington and participated with the MSO in detailed "how clean is clean" discussions. The complications caused by the number of parties involved in this incident (the owner of the property, the vessel owner, contractors, subcontractors, the oil spill cleanup contractor hired by the USCG, and the state and local government representatives) required a series of discussions about when the cleanup would be completed. The oil-contaminated debris was separated from non-oil-contaminated debris on November 21 and the non-contaminated debris was burned in accordance with a local permit. The oil-contaminated debris was scheduled to be removed to a state-approved disposal site at a later date.

References:

Virginia Institute of Marine Science. 1980. *Sensitivity of coastal environments and wildlife to spilled oil, State of North Carolina*. Boulder, Colorado: Hazardous Materials Response Project, NOAA. 113 maps.

Name of Spill:	*USS Inchon*
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill:	12/16/94
Location of Spill:	Norfolk Naval Base, Norfolk, Virginia
Latitude:	36°56.7′ N
Longitude:	76°20′ W
Spilled Material	diesel
Spilled Material Type:	2
Amount:	50 barrels
Source of Spill:	U.S. Navy vessel
Resources at Risk:	habitat
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	fringing salt marsh tidal mudflat
Keywords:	none

Incident Summary:

On December 16, 1994, the *USS Inchon* spilled approximately 20,000 gallons of diesel fuel while refueling at the pier at Naval Base Norfolk. The Navy conducted the cleanup and removed most of the spilled material. The USCG overflights and waterside surveys showed minimal impact.

Behavior of Oil:

The Navy's immediate response was to boom the area of the spilled fuel within the pier structures. Most of the oil remained trapped within the boom; however, a light sheen was seen coming from the boomed area that feathered out within several hundred meters of the spill site.

Countermeasures and Mitigation:

Naval Base Norfolk used boom and skimmers to capture the spilled fuel within the pier area and to remove the trapped oil.

NOAA Activities:

NOAA was notified of this incident on December 16, 1994, by MSO Hampton Roads and reported to the MSO. The SSC participated in the review of the resources at risk listed in the Area Contingency Plan and provided an analysis of the trajectory of any oil that might escape from the boomed areas. The review of the overflight videos showed that some oil escaped the booms and moved with the tide from the spill site. However, the sheen dispersed and faded within several hundred yards of the pier.

The SSC also helped train the MSO staff to survey the shoreline to determine the extent of the spilled oil and cleanup options. The shoreline survey showed little oiling of shoreline outside the immediate area of the pier.

References:

NOAA. 1992. *Shoreline countermeasures manual for Regional Response Team III.* Seattle: Hazardous Materials Response and Assessment Division, Office of Ocean Resources and Conservation. 98 pp.

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide*. NOAA Technical Memorandum NOA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

USCG. 1994. Virginia Area Contingency Plan. Norfolk, VA: MSO Hampton Roads.

Virginia Institute of Marine Science. 1980. S*ensitivity of coastal environments and wildlife to spilled oil, State of Virginia.* Boulder, Colorado: Hazardous Materials Response Project, NOAA. 104 maps.

Name of Spill:	Pleasure Vessel MD5352Z
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill:	12/27/94
Location of Spill:	Baltimore, Maryland
Latitude:	39°15.8′ N
Longitude:	76°37.5′ W
Spilled Material:	gasoline
Spilled Material Type:	2
Amount:	1 barrel
Source of Spill:	pleasure vessel
Resources at Risk:	habitat
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	fringing salt marsh, tidal mudflat
Keywords:	sorbent

Incident Summary:

On December 27, 1994, MSO Baltimore received reports that a capsized vessel, abandoned for three weeks, was leaking gas into the middle branch of the Patapsco River. The owners of the vessel stated that they were financially unable to arrange for cleanup.

Behavior of Oil:

The gasoline dissipated within 20 yards of the sunken vessel.

Countermeasures and Mitigation:

MSO Baltimore's contractor righted and dewatered the vessel by December 30, 1994.

NOAA Activities:

NOAA was notified of the incident on December 29, 1994, by MSO Baltimore and participated with the MSO staff in discussions of removal options. Two options were considered to stop the ongoing release of gasoline: righting and dewatering the vessel or removing the gasoline from the fuel tanks while the vessel was still capsized; the first option was used successfully.

References:

Virginia Institute of Marine Science. 1980. *Sensitivity of coastal environments and wildlife to spilled oil, State of Maryland.* Boulder, Colorado: Hazardous Materials Response Project, NOAA. 118 maps.

Name of Spill:	Craney Island Minor Mystery Spill
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill:	1/23/95
Location of Spill:	Elizabeth River, Portsmouth, Virginia
Latitude:	36°53′ N
Longitude:	76°20.5′ W
Spilled Material:	#2 fuel oil
Spilled Material Type:	2
Barrels:	unknown
Source of Spill:	unknown
Resources at Risk:	habitat
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	fringing saltmarsh, tidal mudflat
Keywords:	containment boom, sorbent boom, pompoms

Incident Summary:

On January 23, 1995, approximately 50 gallons of diesel fuel collected along the southern and eastern shoreline of Craney Island, within the containment boom deployed at the U.S. Navy's Craney Island Fuel Depot. The source of the release was unknown.

Behavior of Oil:

The calm northeasterly winds held the oil against the fuel depot allowing the depot staff to surround the oil with containment boom already in place.

Countermeasures and Mitigation:

MSO Hampton Roads contractor completed cleanup of piers A, B, and C and the northern shoreline of Craney Island by January 24, 1995.

NOAA Activities:

NOAA was contacted by MSO Hampton Roads on January 23, 1995, and participated with the MSO staff in discussions of cleanup strategies and priorities for protection of other environmentally sensitive resources. NOAA recommended that Craney Island Creek be boomed to protect environmentally sensitive resources that had been identified during the area contingency planning process. This protective boom was completed by the end of the first day.

The SSC helped train the MSO staff to survey the shoreline to determine the extent of the spilled oil and cleanup options. The shoreline survey was conducted using the guidelines contained in the RRT III's Shoreline Countermeasures Manual.

References:

NOAA. 1992. *Shoreline countermeasures manual for Regional Response Team III.* Seattle: Hazardous Materials Response and Assessment Division, Office of Ocean Resources and Conservation. 98 pp.

Virginia Institute of Marine Science. 1980. S*ensitivity of coastal environments and wildlife to spilled oil, State of Virginia*. Boulder, Colorado: Hazardous Materials Response Project, NOAA. 104 maps.

MSO Hampton Roads. 1994. Virginia Area Contingency Plan. Norfolk, VA: United States Coast Guard, Marine Safety Office, Hampton Roads.

Name of Spill:	Deck Barge *MC10*
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill:	2/2/95
Location of Spill:	Hampton Roads, Virginia
Latitude:	36°59.8′ N
Longitude:	76°19.4′ W
Spilled Material:	none
Spilled Material Type:	n/a
Amount:	none
Source of Spill:	n/a
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	port closure
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

On February 2, 1995, the deck barge *MC10* sank with the tug *ECCO III* aboard as cargo one-half mile southwest of Old Point Comfort, just north of the main channel. Neither vessel had fuel onboard. The main channels to Hampton Roads were closed for three and one-half hours until the exact location of the sunken barge could be determined, its status as a hazard to navigation assessed, and the wreck marked with a buoy.

Countermeasures and Mitigation:

The track of the barge *MC10* was investigated as were critical sections of the Hampton Roads' shipping channels. The U.S. Army Corps of Engineers (USACOE) successfully located the sunken barge and the channel was reopened to traffic on February 3, 1995.

NOAA Activities:

NOAA was contacted by MSO Hampton Roads and participated with the MSO staff in the response and planning for the search for the sunken barge.

References:

Virginia Institute of Marine Science. 1980. S*ensitivity of coastal environments and wildlife to spilled oil, State of Virginia*. Boulder, Colorado: Hazardous Materials Response Project, NOAA. 104 maps.

Name of Spill:	Tug *Christina*
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill :	2/7/95
Location of Spill:	Alligator River, Engelhard, North Carolina
Latitude:	35°40′ N
Longitude:	76°01′ W
Spilled Material:	diesel and bilge slops
Spilled Material Type:	2
Amount:	20 to 40 gallons
Source of Spill:	tug
Resources at Risk:	habitat
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	fringing saltmarsh, tidal mudflat
Keywords:	sorbent boom, pompoms

Incident Summary:

On February 7, 1995, MSO Hampton Roads received a report of an unknown amount of oil on the Alligator River, near Englehard, North Carolina. The source of the spill was believed to be the tug *Christina*, which had recently left the area. Approximately 20 to 40 gallons were in the water and a boom was placed around the area.

Behavior of Oil:

The sheen was initially reported around the tug *Christina* moored in the barge canal near Cargill, Inc. Winds pushed approximately 30 gallons of the product into a drainage cut running perpendicular to the shoreline.

Countermeasures and Mitigation:

Cargill Inc. personnel boomed off the affected areas of the canal and the cut. This immediate containment of oil and the subsequent use of a vacuum truck by the USCG contractor resulted in the removal of 1,200 gallons of oil-and-water mix and six drums of oiled sorbent material.

NOAA Activities:

NOAA was notified on February 8, 1995, by MSO Hampton Roads and participated with the MSO staff in the discussion of "how clean is clean" and in developing a sampling strategy for the area. The sampling strategy resulted in the USCG Central Oil Identification Laboratory in late February by the that the *Christina* was indeed the source of the spilled material.

References:

Virginia Institute of Marine Science. 1980. *Sensitivity of coastal environments and wildlife to spilled oil, State of North Carolina*. Boulder, Colorado: Hazardous Materials Response Project, NOAA. 113 maps.

Name of Spill:	Kitty Hawk Mystery Tarballs
USCG District:	5
Date of Spill:	2/19/95
Location of Spill:	Kitty Hawk, North Carolina
Latitude:	36°1′ N
Longitude:	75°40′ W
Spilled Material:	tarballs
Spilled Material Type:	4
Barrels:	unknown
Source of Spill:	unknown
Resources at Risk:	habitat
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	sandy beach
Keywords:	none

Incident Summary:

On February 19, 1995, tarballs were reported on more than four miles of beach in Kitty Hawk, North Carolina. One area of significant concentration was between mile posts 4 and 5. USCG resources responding to this report were Group Cape Hatteras and MSO Hampton Roads.

Behavior of Oil:

The tarballs, which ranged from specks to more than six inches in diameter, may have come in with the morning tide; however, no one could confirm at what time or day the tarballs actually washed ashore.

Countermeasures and Mitigation:

The local cleanup contractor used hand equipment to pick up and bag the scattered tarballs. One drum of oiled sand and tarballs was removed by the end of the day on February 19, 1995.

NOAA Activities:

NOAA was notified of this incident on February 21, 1995, by MSO Hampton Roads who asked the SSC to participate in the investigation for the source of the tarballs at the MSO. However, the weathering of the tarballs and the unknown time and day they washed ashore made this process impracticable.

NOAA helped train the MSO staff to survey the shoreline to determine the extent of the spilled oil and cleanup options.

References:

NOAA. 1992. *Shoreline Countermeasures Manual For Regional Response Team III.* Seattle: Hazardous Materials Response and Assessment Division. 98 pp.

Virginia Institute of Marine Science. 1980. *SEnsitivity Of Coastal Environments and Wildlife to Spilled Oil, State Of North Carolina*. .Boulder, Colorado: Hazardous Materials Response Project, NOAA. 113 maps

Name of Spill:	Dredge *Weeks 581*
NOAA SSC:	Gary Ott
USCG District	5
Date of Spill:	4/24/95
Location of Spill:	Frying Pan Shoals, North Carolina
Latitude:	33°41.7' N
Longitude:	77°54.1' W
Spilled Material:	dredge pipe
Spilled Material Type:	N/A
Amount:	N/A
Source of Spill:	non-tank vessel
Resources at Risk:	potential habitat damage
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	N
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

On April 24, 1995, a number of dredge pipes were lost from the dredge vessel *Weeks 581* accompanied by the tug *Catherine*. The last 800-foot pipe section was found grounded on Frying Pan Shoals, North Carolina.

Countermeasures and Mitigation:

The salvage contractor found the last pipe section grounded on Frying Plan Shoals. One of the end caps used to keep water out of the dredge pipe had come loose and one end of the pipe had sunk. The contractor proposed that this section be dragged from Frying Pan Shoals to a repair facility located at the mouth of the Cape Fear River. This procedure would have dragged a section of the pipe across 30 miles of ocean bottom.

Besides the potential damage to habitat along the ocean floor, Carolina Power and Light had a power line crossing to Bald Head Island at the mouth of the Cape Fear River. Based on these limitations, MSO Wilmington directed the contractor to repair the end cap for the pipe section and refloat the section before it was moved. The pipe section was refloated and brought into Southport and secured at 2210 on April 26, 1995.

NOAA Activities:

NOAA was notified of this incident on April 26, 1995, by MSO Charleston and helped the MSO staff notify agencies and organizations that may have an interest in the movement of the section of dredge pipe. The SSC discussed the proposal of the contractor to drag the pipe section with the NOAA National Marine Fisheries Service (NMFS) Habitat Section. They were very concerned with potential loss of habitat if the pipe was dragged the 30 miles from Frying Pan Shoals. This concern, and the buried electric cable at the mouth of the Cape Fear River, were the deciding factors in the USCG's requirement that the contractor refloat the pipe before it was moved.

References:

Virginia Institute of Marine Science. 1980. *Sensitivity of Coastal Environments and Wildlife to Spilled Oil, State of North Carolina*. Boulder, Colorado: Hazardous Materials Response Project, NOAA. 113 maps.

Name of Spill:	Coastal Oil Eagle
NOAA SSC:	Ed Levine
USCG District:	5
Date of Spill:	07/22/95
Location of Spill:	Deptford, New Jersey
Latitude:	39°52′ N
Longitude:	75°09′ W
Spilled Material:	Rabbi crude
Spilled Material Type:	2
Amount:	2,000 barrels
Source of Spill:	facility and tank vessel
Resources at Risk:	**Terrestrial Mammals**: mustelids, rodents, intertidal feeding areas **Birds**: waterfowl, shorebirds, wading birds, gulls, raptors, foraging areas **Fish**: anadromous fish, estuarine fish **Crustaceans**: crabs **Reptiles**: turtles **Recreation**: beaches, marinas, boat ramps, high-use recreational boating areas, state parks **Resource Extraction**: power plant water intakes, industrial water intakes
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	brackish marshes, coastal structures, consolidated seawalls, consolidated shores, developed upland, freshwater marshes, mixed sediment beaches, piers, riprap, sand/gravel beaches, sheltered fine-grained sand beaches, sheltered impermeable banks, sheltered marshes, sheltered seawalls, vegetated riverbank
Keywords:	Delaware Bay and River Coop, containment boom, evaporation, ground truth, low-pressure washing, skimmers, sorbent boom, Tri-State Bird Rescue, vacuum trucks, volunteers, weir/pump skimmer.

Incident Summary:

At 1645 on July 22, 1995, the T/V *Jahre Spray* parted transfer lines and manifold connections at the Coastal Eagle Point refinery in Deptford, New Jersey. The cause of the accident was reportedly strong winds during the transfer operation. Wind speeds recorded in the area were 25 knots from the east, with local tornadoes reported. Air temperature was 82° F with rain.

Approximately 2,000 barrels of Rabbi crude oil were released from the facility pipeline. It is estimated that 600 barrels spilled onto land containment areas and 1,400 barrels into the Delaware River.

The USCG COTP Philadelphia was notified and responded to the scene. The Delaware Bay and River Cooperative (DBRC) sent skimmers and boom. In following strategies pre-identified in the Area Plan, creek mouths in the area had boom deployed prior to the oil's approach. This prevented oil from entering these sensitive areas, thus reducing natural resource damages.

A Unified Command System was established for control of the situation. The designated RP (Coastal Oil) managed the cleanup, with direction from the USCG and the states (New Jersey and Pennsylvania).

USCG AST personnel and District 5 District Response Advisory Team (DRAT) and Public Affairs personnel were requested on-scene to assist local USCG staff.

Cleanup operations continued for more than six weeks.

Behavior of Oil:

The oil spread on the water's surface into slicks and eventually thinned into sheens. Oil adhered readily to sediments, harbor structures, and riprap. In areas where it was pooled or contained and not quickly skimmed, re-sheening and re-oiling were apparent. Due to the warm summer weather the oil did not form a mousse.

The oil moved upriver to the Betsy Ross Bridge and downriver to the Commodore Barry Bridge, intermittently oiling approximately 16 miles of riverbanks on both the New Jersey and Pennsylvania sides of the river. Areas of impact included the USCG station, Philadelphia Naval Ship Yard, Penns Landing (tourist area), several marinas, ferry slips, and Tinicum Wildlife Reserve. More than 600 boats were oiled and needed cleaning. Most cleanup activity was focused between the Commodore Barry and Walt Whitman bridges.

It was estimated that 35 to 40 percent of the spilled oil evaporated. Most oil was recovered by vacuum trucks at the facility and by skimmers on the river near the facility. Approximately 60,000 gallons of oil were recovered from the secondary containment area and off the water.

The original approximation of spillage was 1,000 barrels; however, due to the amount observed on the water and the amount recovered, the spill-size estimate was increased to 2,000 barrels.

Countermeasures and Mitigation:

Before beginning transfer operations, the vessel was boomed. However, the ship was pushed more than 75 feet from the pier by high winds and the boom separated at the same time as the transfer hose and manifold separated, allowing oil to escape initial containment at the source. The facility and DBRC deployed additional boom at the facility and at Big Timer, Woodbury, Cooper, and Mantua creeks to prevent oil entering marsh areas. Simultaneously, skimmers were deployed to the locations of thickest-floating oil.

Offloading operations were being completed just as the hose and manifold broke. Most of the oil flowed out of the facility piping system until a working manifold could be reached and closed. A smaller amount of oil was released from the vessel side of the hose. After nine days the pier was repaired; the piping and manifold pressure tested; the vessel cleaned, inspected, and released; and the dock was again able to receive new vessels.

Shoreline cleanup operations were conducted as mostly manual removal of oiled sediments and debris. Consolidated structures (riprap, pilings, seawalls, etc.) were power-washed with Hotsys. Absorbent boom was used to reduce re-oiling during cleanup operations. Cleanup lasted more than six weeks.

Collected oil was recycled at the refinery. Debris was sent out of state for disposal.

Other Special Interest Issues:

The Delaware River is used heavily by recreational boaters during the summer. This was a main concern of Coastal Oil and the USCG. More than 650 recreational boat hulls were cleaned; additionally, many commercial vessels and the aircraft carrier USS *John F. Kennedy* required cleaning.

Penns Landing and the New Jersey State Aquarium were oiled. These are important tourist attractions and received high priority for cleanup.

Oiled bird recovery was performed by federal and state wildlife personnel and rehabilitation was done by Tri-State Bird Rescue. Volunteers were dissuaded from attempting to recover animals. Tri-State reported 36 birds released, 15 died (euthanized) and 14 remained in house. Also, one snapping turtle was found dead.

At the onset of the incident, there was high media interest in the response and cleanup activities. There were two press conferences or briefs per day for the first three days. By the fourth day this was reduced to press releases and updates as necessary.

NOAA Activities:

The SSC was notified at 0200 on July 23, 1995, by the acting FOSC in Philadelphia. At 0700, after the first light overflight, the SSC was requested on-scene in Philadelphia.

Initially NOAA provided weather and tide data. Once on-scene, the SSC was asked to provide a situation map for an afternoon press conference. The completed map was used as a hand-out for the media and to brief the New Jersey Governor, who participated in the first press conference with the USCG, the states of New Jersey and Pennsylvania, and the SSC.

NOAA helped set response priorities and cleanup objectives at Unified Command meetings.

An oil sample was sent to Louisiana State University (LSU) for characterization. Analysis determined that the oil was a relatively light, highly paraffinic crude with a very low sulfur content. The polycyclic aromatic hydrocarbons (PAHs) generally associated with oil toxicity were very low (10% of the PAHs found in North Slope crude). At elevated temperatures (over 82°F) the oil broke any emulsion. The low aromatic hydrocarbon and low asphaltene content was expected reduce the persistence of this oil in the environment compared to similar American Petroleum Institute (API) gravity crude oils.

Due to the suspected cause of the release (high winds moving the vessel and breaking hose and manifold) Coastal claimed an "Act of God" defense. The USCG investigators were extremely interested in obtaining documented weather observations in the area of the facility. The SSC supplied information about how to proceed and contacts at the National Weather Service for additional documentation.

The SSC provided training and coordination for the sign-off process on cleaned sites. IThe same protocols were used on both sides of the river (New Jersey and Pennsylvania). This was accomplished by doing joint evaluations using the same people to maintain consistency.

NOAA supported this incident for three days.

References:

NOAA. 1993. *ADIOS™ (Automated Data Inquiry for Oil Spills) User's Manual*. Seattle: Hazardous Materials Response and Assessment Division, NOAA. 50 pp.

NOAA. 1994a. *Shoreline Countermeasures Manual. Federal Region III*. Seattle: Hazardous Materials Response and Assessment Division, NOAA. 100 pp.

NOAA. 1994b. *Shio. Tide computer program (prototype).* Seattle: Hazardous Materials Response and Assessment Division, NOAA.

Roberts, Paulene, 1995. Chemistry Report: IES/RCAT95-19, #183 Coastal Oil Eagle Incident, Rabbi Oil Characterization. July 24, 1995. Baton Rouge: Institute for Environmental Studies, Louisiana State University.

USCG. 1995, POLREPS (One through Eleven and Final) Medium Spill, Approx. 2,000 Barrels Lt Crude Oil on the Delaware River, in Vicinity of Coastal Eagle Point (CEP) Terminal, Westville, NJ, NRC #300988, PIN 05P-04209-95, FPN 95011648. Philadelphia: United States Coast Guard, Marine Safety Office.

U.S. COAST GUARD DISTRICT 7

Name of Spill:	M/V *Jeano Express*
NOAA SSC:	Bradford L. Benggio
USCG District:	7
Date of Spill:	11/14/94
Location of Spill:	Long Key, Florida
Latitude:	24°30′ N
Longitude:	80°32′ W
Spilled Material:	#2 fuel oil
Spilled Material Type:	2
Amount:	500 gallons
Source of Spill:	motor vessel
Resources at Risk:	**Fish**: fish and shellfish **Birds**: shorebirds, wading and diving birds, nesting habitats **Marine mammals**: West Indian manatee **Terrestrial mammals**: key deer **Reptiles**: American crocodile **Habitats**: shallow water seagrass beds, corals **Recreation**: recreation areas and parks, diving swimming, boating, fishing, and tourism resources **Management areas**: wildlife refuges, Florida Keys National Marine Sanctuary
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest(s):	none
Shoreline Type(s) Impacted:	none
Keywords:	none

Incident Summary:

The USCG received a report on November 14, 1994, of a 175-foot coastal freighter taking on water 20 miles southeast of Long Key, Florida. The vessel was carrying no cargo and had less than 500 gallons of diesel onboard. Tropical Storm Gordon was influencing the area with winds on-scene 35 to 40 knots and seas 15 to 20 feet in rain squalls.

Due to the weather and the threat to human life, all crew members were evacuated by U.S. Navy and USCG helicopters, leaving the vessel unattended as it continued to take on water while being pushed towards shore by the storm.

With information provided by NOAA, the USCG decided to intervene at sea and sink the vessel. Consultations were held with the Florida Keys National Marine Sanctuary and the RRT and they decided to sink the vessel outside the 300-foot isobath. The USCG launched a cutter from Key West that intercepted the *Jeano Express* and sank her by shooting holes in the hull. The vessel sank about six miles east of a reef in approximately 300 feet of water.

Behavior of Spilled Material:

A light sheen developed at the scuttle location that quickly dissipated in the storm. No impacts were reported.

Countermeasures and Mitigation:

The vessel was sunk in deep water to protect coral and other shallow-water resources.

NOAA Activities:

NOAA was notified of the incident on November 14, 1994, by the USCG who requested information on resources at risk and the probable trajectory of the vessel. The primary concern was the damage that would occur should the vessel run aground or sink on a coral reef. Trajectory analysis for the vessel indicated that grounding would most likely occur on shallow reefs in the area between Sombrero Key and Tennessee Reef.

The SSC provided resources at risk information, weather forecasts, and vessel trajectory information by phone and facsimile in support of this response.

References:

NOAA. 1995. Hotline 161. Seattle: Hazardous Materials Response and Assessment Division. 5 Reports

Research Planning Institute. 1981. S*ensitivity of coastal environments and wildlife to spilled oil: South Florida*. An atlas of coastal resources. Tallahassee: Florida Department of Veteran and Community Affairs, Division of Local Resource Management. 43 maps.

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide*. NOAA Technical Memorandum NOA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

USCG. 1995. POLREPS for FPN incident 07-501. Miami: United States Coast Guard, Marine Safety Office.

Name of Spill:	Dredge *Clinton*
NOAA SSC:	Bradford L. Benggio
Date of Spill:	11/14/94
USCG District:	7
Location of Spill:	Charleston, South Carolina
Latitude:	32°54.5′ N
Longitude:	79°57′ W
Spilled Material:	diesel
Spilled Material Type:	2
Amount:	300 to 400 gallons
Source of Spill:	sunken dredge
Resources at Risk:	**Habitats:** Spartina marsh and sheltered mud flats **Fish**: juvenile blueback herring, American shad, hickory shad, shortnose and Atlantic sturgeon, striped bass **Mollusks**: oysters, clams **Crustaceans**: blue crab, shrimp **Birds**: gulls, terns, brown pelicans, osprey, shore birds, wading birds
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest:	none
Shoreline Type Impacted:	none
Keywords:	none

Incident Summary:

A 148-foot dredge operating in the Cooper River at Ordnance Reach, sank in the turning basin on November 14, 1994, releasing about 60 gallons of diesel fuel per hour, approximately 300 to 400 gallons leaked into the river before divers were able to reduce the flow to a rate of about 12 gallons per hour. The dredge was carrying 11,000 gallons of diesel. Sheen was reported five miles downriver at Shipyard Creek. By November 15, the leak had been controlled to one or two gallons per hour and when it was stopped completely, salvage operations began. No significant resource impacts were reported.

Behavior of Spilled Material:

The diesel was moved by currents and winds downriver as sheen. It dissipated rapidly and did not persist beyond five miles from the release point.

Countermeasures and Mitigation:

No significant pollution impacts were reported from this incident. Sorbents were used to recover as much product as possible and boom was used for containment and shoreline protection.

NOAA Activities:

NOAA was notified of this incident on November 14, 1994, by the USCG. The SSC provided weather forecasts, information on resources at risk, and trajectory information. No on-scene support was requested.

References:

NOAA. 1994. Hotline 167. Seattle: Hazardous Materials Response and Assessment Division. 5 Reports

NOAA. 1994. Hotline 161, Resources at Risk Report. Seattle: Hazardous Materials Response and Assessment Division.

Research Planning Institute. 1981. *Sensitivity of coastal environments and wildlife to spilled oil: South Florida. An atlas of coastal resources*. Tallahassee: Florida Department of Veteran and Community Affairs, Division of Local Resource Management. 43 maps.

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide.* NOAA Technical Memorandum NOAA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

USCG. 1994. POLREPS for FPN incident 07-5010. Charleston: United States Coast Guard, Marine Safety Office.

Name of Spill:	M/V *Firat*
NOAA SSC:	Bradford L. Benggio
USCG District:	7
Date of Spill:	11/15/94
Location of Spill:	Fort Lauderdale, Florida
Latitude:	26°06.6′ N
Longitude:	80°05.5′ W
Spilled Material:	#2 fuel oil, IFO
Spilled Material Type:	2
Amount:	44,000 gallons diesel 170,000 gallons IFO
Source of Spill:	motor vessel
Resources at Risk:	**Habitats**: mangroves and mangrove mitigation areas **Fish**: fisheries **Birds**: wading and diving birds **Marine mammals**: manatees **Reptiles**: sea turtles **Recreation**: tourist beaches, state park
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest(s):	none
Shoreline Type(s) Impacted:	none
Keywords:	potential spill

Incident Summary:

On November 15, 1994, the USCG received notification of a grounded 506-foot Turkish freighter off Fort Lauderdale, Florida. The vessel had been blown off its anchorage by high winds and seas associated with Tropical Storm Gordon and ran aground 88 yards off the beach, one mile north of the Port Everglades entrance. The ship was carrying more than 44,000 gallons of diesel fuel, 170,000 gallons of intermediate fuel oil (IFO), and a cargo of 2,600 tons of steel.

Initially, there seemed to be little threat of pollution and the RP began planning salvage operations. Protection strategies were addressed in accordance with the Area Plan, trajectory analysis forecasts, and resources-at-risk information.

On November 18, three days after the grounding, some minor oil leakage was observed. An investigation determined that the vessel had sustained some hull damage during the grounding and concern about a potential large release increased. By November 19, the command post was operating 24 hours a day. Protection strategies and priorities were developed and implemented while salvage operations were conducted.

The salvors determined that approximately one-half of the steel cargo would have to be offloaded to refloat the vessel at high tide, The offloading was a slow process because the cargo was in the form of bulk steel rebar that was not easy to handle in the large swells nearshore. Salvors calculated that each ton of cargo offloaded would be the equivalent of about one inch in the depth of the water; making the accuracy of tide predictions critical. Determining actual tide levels on-scene was enhanced by the installation of a tide staff in Port Everglades.

Offloading the fuel and the required amount of steel cargo was completed on November 26. The ship was successfully refloated during the afternoon high tide. The vessel was towed to

an anchorage for a complete hull inspection and damage survey. Vessels with oil snare, boom, and skimmers were in place in the event of a release during the salvage operations. No leakage occurred and the vessel was towed into Port Everglades.

Behavior of Spilled Material:

A few minor spills occurred during this incident due to hairline fractures in the ship's hull releasing small quantities of oil in rough seas. This oil created a sheen that extended a few hundred yards downcurrent of the ship and then dissipated. No shoreline or other resource oiling was observed.

Countermeasures and Mitigation:

No pollution impacts were reported from this incident. Protective measures included booming at the vessel and pre-staging response equipment in case of further discharges during the lightering and refloating operations. Oil snare was tied to lines and deployed along the beach as a protective measure in the event of a release.

Other Special Interest Issues:

There was reportedly extensive damage to the nearshore coral reef as a result of the ship's grounding and continual movement in the surf zone.

NOAA Activities:

NOAA was notified of this incident on November 15, 1994, by the USCG. The SSC provided the FOSC with on-scene scientific support from November 19 through 26. The SSC provided a trajectory analysis forecast, resources-at-risk report, tides and weather information, and helped develop appropriate protection and contingency strategies. The SSC coordinated with NOAA's Tides Analysis Branch and the National Ocean Service Atlantic Operations Center to have a NOAA Tides Officefield party install a tide staff at the response location so that actual tide levels could be monitored. NOAA’s Hazardous Materials Response and Assessment Division (HAZMAT) used these actual tidal observations to predict tide heights accurately during the salvage operations. The accuracy of tidal information was crucial to the salvage operations and lightering requirements for refloating the vessel. HAZMAT analyzed the littoral processes and sediment transport near the grounding site and predicted that salvage operations could become more difficult with time due to the formation of a tombolo on the lee side of the ship. This tombolo did form and buried portions of the hull in two to three feet of sand.

NOAA supported this response for five days.

References:

NOAA. 1994. Hotline 168. Seattle: Hazardous Materials Response and Assessment Division. 21 Reports.

NOAA. 1993. *ADIOS™ (Automated Data Inquiry for Oil Spills) User's Manual.* Seattle: Hazardous Materials Response and Assessment Division, NOAA. 50 pp.

NOAA. 1994. *Shio. Tide computer program (prototype).* Seattle: Hazardous Materials Response and Assessment Division, NOAA.

National Ocean Service. 1988. Tide Tables: Atlantic Coast of the United States. Riverdale, Maryland: Distribution Division, National Ocean Service.

Research Planning Institute. 1981. *Sensitivity of coastal environments and wildlife to spilled oil: South Florida. An atlas of coastal resources.* Tallahassee: Florida Department of Veteran and Community Affairs, Division of Local Resource Management. 43 maps.

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide.* NOAA Technical Memorandum NOA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

USCG. 1994. POLREPS for FPN incident 07-5012, Fort Lauderdale: United States Coast Guard, Marine Safety Office.

Name of Spill:	*M/V Emelia S*
NOAA SSC:	Gary Ott and Bradford Benggio
USCG District	7
Date of Spill:	11/19/94
Location of Spill:	Charleston, South Carolina
Latitude:	39°39.7′ N
Longitude:	79°40.5′ W
Spilled Material:	maneb (fungicide)
Spilled Material Type:	n/a
Amount:	480 40-50 pound bags
Source of Spill:	motor vessel
Resources at Risk:	**Birds**: brown pelican, bald eagle, peregrine falcon, Bachman's warbler **Reptiles**: loggerhead turtle **Habitat**: nursery for shrimp and other commercial species
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	fungicide maneb
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

On the night of November 19, 1994, during extreme weather off Charleston, South Carolina, the M/V *Emelia S* lost two containers of the fungicide maneb. Another maneb container was damaged and nearly lost. The maneb was loaded in fiber-reinforced bags on shipping pallets and some of the chemical in this container spilled. The shipping container was lying on its roof, penetrated by a stanchion, and overhung the side of the vessel by two meters. Options available were to jettison the damaged container offshore or to bring it, as is, into the Port of Charleston for offloading.

Countermeasures and Mitigation:

The ship proceeded into the harbor and docked. The damaged container, supported by numerous timbers placed there by hazardous materials personnel, was lifted off the *Emelia S* by a container crane on November 22, placed on a flat bed trailer. In a secured work area, hazardous materials personnel unloaded the bags of maneb into undamaged shipping containers on November 23.

Other Special Interest Issues:

The fungicide maneb is a solid, yellow, practically odorless fungicide belonging to the dithiocarbamate family. It is used mostly in agriculture to control blight on potatoes, tomatoes, and a wide variety of other fruits and vegetables. Maneb is also sold for home use at concentrations around 60 percent.

The risk from this chemical leak was assessed at three levels:

- ❒ an assessment of risk to the crew,
- ❒ an assessment of risk to the cargo terminal and the surrounding neighborhood, and
- ❒ an assessment of risk to the unloading crews.

The ship's master determined that maneb was not a hazard to the crew and vessel. The risk was not from the chemical, but from the physical harm posed by the precarious nature of the damaged cargo containers on the vessel. The task of the response team was to determine the degree of risk to disposing of the damaged container at sea versus the risks to the cargo terminal, the surrounding neighborhood, and the unloading crews from removing it in port.

NOAA Activities:

NOAA was notified of the incident on November 19, 1994, by MSO Charleston and asked to support the MSO staff.

To determine the risk, if any, to the environment if the cargo container was jettisoned offshore, NOAA participated with the OSC during conference calls with the RRT IV and other federal agencies as this option was discussed. NOAA conducted a preliminary environmental risk assessment of scuttling the container. The result of this assessment was provided to the RRT so the issues could be discussed. NOAA's analysis prepared on November 20, was in four sections:

- ❒ the risk to the crew and responders at sea,
- ❒ the risk of moving the damaged cargo into the Port of Charleston and losing the container inshore,
- ❒ the risk of the release of the material into the open ocean, and
- ❒ the risk of dumping the material away from environmentally sensitive areas offshore.

This offshore preliminary fate and effect discussion speculated on the slow versus fast rate of release of the maneb into the water based on how many of the bags were damaged. NOAA recommended that when selecting disposal locations, deeper water was better than shallower because the deep water moved the material farther offshore, more removed from population centers, commercial and recreational fishing grounds, and away from the more sensitive nursery areas of the nearshore coastal zone. The Explosive Dumping Area marked on NOAA Chart 11480 at 32°18′ N and 78°42′ W was considered a potential dumping location and preliminary contacts with resource managers were initiated.

The initial evaluation of the damage to the cargo containers by the USCG Strike Team on November 20 suggested that there was a potential for serious risk to the crew and other response personnel if they attempted to lift and scuttle the damaged container while at sea. Response personnel felt that because the situation was stable enough, the damaged container secured to the vessel, and the cargo was not leaking, the vessel should go on to port where the damaged container could be safely removed.

NOAA participated with the MSO staff on-scene November 21 and 22 while the damaged container was removed. NOAA helped establish the air monitoring procedures and the site safety plan, and participated in discussions of removal procedures.

References:

Virginia Institute of Marine Science. 1980. *Sensitivity of coastal environments and wildlife to spilled oil, State of South Carolina*. Boulder, Colorado: Hazardous Materials Response Project, NOAA. 113 maps.

NOAA. 1992. *The CAMEO 4.0 Manual.* Washington, D.C.: National Safety Council. 440 pp.

NOAA. 1994. Hotline169. Seattle: Hazardous Materials Response and Assessment Division. 6 Reports.

Meister, Richard T., ed. 1986. *Farm Chemicals Handbook.* Willoughby, Ohio: Meister Publishing Co.

U.S. EPA. 1988. *Pesticide Fact Handbook, Volume 2*. Park Ridge, New Jersey: Noyes Data Corporation. 666 pp.

Name of Spill:	M/V *Sealand Atlantic*
NOAA SSC:	Bradford L. Benggio
USCG District:	7
Date of Spill:	12/2/94
Location of Spill:	Port Everglades, Florida
Latitude:	26°5.5′ N
Longitude:	080°5.7′W
Spilled Material:	1,324 metric tons fuel oil 259 tons diesel
Spilled Material Type:	2, 4
Source of Spill:	grounded vessel
Amount:	none
Resources at Risk:	**Habitats**: mangroves and mangrove mitigation areas **Fish**: fisheries **Birds**: wading and diving birds **Marine mammals**: manatees **Reptiles**: sea turtles **Recreation**: tourist beaches, state park
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest(s):	none
Shoreline Type(s) Impacted:	none
Keywords:	potential spill

Incident Summary:

The M/V *Sealand Atlantic* grounded between channel markers 3 and 5 of Port Everglades Inlet (Outer Bar Cut) on December 2, 1994. The vessel was carrying diesel and a cargo of fuel oil. The ship grounded near the location of the M/V *Firat* grounding in November. Basic trajectory information and resources at risk from the previous incident were consulted and used to develop protective booming strategies and prioritize resources. The vessel was successfully refloated on the first high tide without incident.

Behavior of Spilled Material:

This incident provided a potential for a large spill that could have impacted tourism, mangrove areas, fisheries, wading and diving birds, manatees, sea turtles, residential areas and marinas. No product was spilled.

Countermeasures and Mitigation:

Booming strategies for resource protection were identified in accordance with NOAA HAZMAT modeling recommendations and the South Florida Area Contingency Plan.

NOAA Activities:

NOAA had provided a trajectory analysis and oil fate and behavior prediction for a similar incident near the same location just a few weeks earlier. This information was consulted by the USCG and the SSC. No on-scene support was requested.

References:

NOAA. 1994. Hotline 168, November 15, 1994, M/V *Firat*. Seattle: Hazardous Materials Response and Assessment Division. 21 Reports.

Research Planning Institute. 1981. *Sensitivity of Coastal Environments and Wildlife to Spilled Oil: South Florida. An atlas of coastal resources.* Tallahassee: Florida Department of Veteran and Community Affairs, Division of Local Resource Management. 43 maps.

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide*. NOAA Technical Memorandum NOAA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

United States Coast Guard. 1994. The South Florida Area Contingency Plan,

Name of Spill:	T/S *El Guanuco*
NOAA SSC:	Bradford L. Benggio
USCG District:	7
Date of Spill:	12/5/94
Location of Spill:	Guayanilla, Puerto Rico
Latitude:	17°59′ N
Longitude:	66°45′ W
Spilled Material:	asphalt
Spilled Material Type:	4
Amount:	none
Source of Spill:	tank vessel
Resources at Risk:	**Marine mammals:** manatee habitat **Reptiles**: sea turtle **Habitat**: mangroves, seagrass beds
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest(s):	none
Shoreline Type(s) Impacted:	none
Keywords:	potential spill

Incident Summary:

On December 5, 1994, a Venezuelan tanker carrying 87,480 barrels of asphalt ran aground three miles off the coast of Guayanilla, Puerto Rico just southeast of the entrance to Guayanilla Bay. The vessel was resting on soft bottom so that the risk of a major spill was relatively small. Precautions were taken, however, due to the potential for extensive environmental impact and the difficulty in responding to this heavy product. The USCG arranged for a lightering vessel to arrive by week's end. However, by December 8, swells in the area had increased; large swell hit the ship broadside and refloated it without incident.

Behavior of Spilled Material:

No product spilled during this incident. NOAA provided information on the behavior of the product if it was to enter the water. Due to its high temperature, asphalt would most likely cool rapidly in the surrounding waters and break into solid chunks that would have a high tendency to sink.

Countermeasures and Mitigation:

Contingency planning related to a possible response included identifying options that could be used to quickly recover any spilled product. Protection priorities were developed for natural resources threatened by the potential spill.

Other Special Interest Issues:

Responders were advised to be cautious near the vessel. If the heated product leaked into the surrounding water, it could create steam and injure nearby workers.

NOAA Activities:

NOAA was notified of this incident on December 5, 1994, by the USCG MSO San Juan. The SSC provided a trajectory analysis and oil fate and behavior prediction for the incident. No on-scene support was requested; however, the SSC was placed on standby.

References:

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide.* NOAA Technical Memorandum NOAA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

USCG. 1994. POLREPS for FPN incident 07-5026, Coastal Area Contingency Plan for Puerto Rico and the U.S. Virgin Islands. San Juan: United States Coast Guard.

Name of Spill:	Mazda ICWW Spill
NOAA SSC:	Bradford L. Benggio
USCG District:	7
Date of Spill:	12/5/94
Location of Spill:	Delray Beach, Florida
Latitude:	26°26.2′ N
Longitude:	080°4.2′ W
Spilled Material:	waste oil
Spilled Material Type:	2
Amount:	unknown
Source of Spill:	storage tank
Resources at Risk:	manmade canals bounded by concrete seawalls
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest(s):	none
Shoreline Type(s) Impacted:	seawalls bordering the affected canals
Keywords:	high-pressure wash, Corexit 9580

Incident Summary:

On December 5, 1994, a Florida Marine Patrol Officer reported that a residential canal in Delray Beach had a thick oil slick and the odor of diesel fuel was present. The USCG discovered that rain water had entered a local car dealer's underground waste oil storage tank and caused the tank to overflow. The oil was immediately contained with boom. Skimming proved to be unsuccessful, so sorbents were used to collect as much of the product as possible. The oil stained seawalls lining several residential canals in the area. Several boats were also oiled. With approval from RRT IV, the OSC and RP agreed to use high-pressure washing to clean the oiled seawalls and Corexit 9580 to clean the boat hulls in-situ. Corexit 9580 was also approved for use on the seawalls if pressure-cleaning was inadequate. All cleanup was completed effectively, using only pressure-washing on the seawalls and handwashing with Corexit 9580 on the boats. No impacts to environmental resources were noted.

Behavior of Spilled Material:

The product was brown with black streaks. It spread into six residential canals. No analysis of the oil was conducted, but it did have a strong odor and was assumed to be mostly used motor oil. The oil stained seawalls and boats. It was relatively easy to contain within the impacted canals and remove with sorbents. Although attempted, skimming was not effective.

Countermeasures and Mitigation:

Product was contained with boom to prevent spreading and removed mostly with sorbents.

NOAA Activities:

NOAA provided input and consulted on cleanup recommendations. Initial cleanup products proposed by the RP were not on the U.S. EPA National Contingency Plan product schedule and were therefore rejected. NOAA provided the USCG with a report evaluating possible products based on listings on the schedule, toxicity and efficacy data, and their ability to float rather than disperse oil so that any released product could be recovered from the water.

References:

Research Planning Institute. 1981. *Sensitivity of Coastal Environments and Wildlife to Spilled Oil: South Florida. An Atlas of Coastal Resources.* Tallahassee: Florida Department of Veteran and Community Affairs, Division of Local Resource Management. 43 maps.

Research Planning Institute. 1994. Corexit 9580 as a potential cleaner. Study done for the Mazda Intracoastal Waterway Spill. Seattle: Hazardous Materials Response and Assessment Division, NOAA.

United States Coast Guard. 1994. South Florida Area Contingency Plan. Miami: United States Coast Guard, Marine Safety Office.

United States Environmental Protection Agency. 1994. National Contingency Plan Product Schedule Notebook. Washington, D.C.: Office of Emergency and Remedial Response, EPA. 2 volumes.

Name of Spill:	M/V *Comorant II*
NOAA SSC:	Bradford L. Benggio
USCG District:	7
Date of Spill:	02/04/95
Location of Spill:	Florida Keys, Florida
Latitude:	24°39.9′ N
Longitude:	081°4.9′ W
Spilled Material:	diesel
Spilled Material Type:	2
Amount:	50 gallons
Source of Spill:	motor vessel
Resources at Risk:	**Fish**: fish and shellfish **Birds**: shorebirds, wading and diving birds, nesting habitats **Marine mammals**: West Indian manatee **Terrestrial mammals**: key deer **Reptiles**: American crocodile **Habitats**: seagrass beds, coral reefs **Management areas**: wildlife refuges, Florida Keys National Marine Sanctuary **Recreation**: recreation areas, parks, diving, swimming, boating, fishing, and tourism resources
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest(s):	none
Shoreline Type(s) Impacted:	none
Keywords:	none

Incident Summary:

The USCG received a report at 0723 on February 5, 1995, that a vessel had picked up a person from marker 49 in the Florida Keys. This person said that his vessel, a 42-foot Matthews, registered as M/V *Comorant II* had sunk the afternoon of February 4 one mile south of Sisters Creek with about 50 gallons of fuel onboard; a USCG estimate of the fuel onboard was closer to 1,000 gallons. An investigation of the reported location showed a rainbow sheen covering an area about 400 by 500 yards, moving west.

Behavior of Spilled Material:

Windy and choppy conditions when the vessel sank would have quickly broken up and dispersed the spilled product. By February 5, when the USCG was notified, winds were light at four knots from the northeast and seas were one to two feet. These moderate conditions allowed the sheen to develop, but increased winds and seas later in the day broke up and dispersed it.

NOAA Activities:

NOAA was notified of the incident on February 5, 1995, by the USCG. The SSC studied the sheen's movement and the trajectory to assess potential resource impacts. NOAA estimated that there were 20 to 30 gallons of diesel fuel on the water. If wind and sea conditions increased as forecasted, the sheen would quickly break up and disperse. The SSC also reported that about half of the total amount spilled would have evaporated or dispersed by the time the sheen was noticed. No major environmental impacts were expected or observed.

References:

NOAA. 1993. *ADIOS™ (Automated Data Inquiry for Oil Spills) User's Manual.* Seattle: Hazardous Materials Response and Assessment Division, NOAA. 50 pp.

Research Planning Institute. 1981. *Sensitivity of Coastal Environments and Wildlife to Spilled Oil: South Florida. An Atlas of Coastal Resources.* Tallahassee: Florida Department of Veteran and Community Affairs, Division of Local Resource Management. 43 maps.

USCG. 1994. South Florida Area Contingency Plan. Miami: United States Coast Guard, Marine Safety Office.

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide*. NOAA Technical Memorandum NOA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

United States Coast Guard. 1995. POLREPS for case MC95001992. Miami: United States Coast Guard, Marine Safety Office.

Name of Spill:	Tug *Tarus*
NOAA SSC:	Bradford L. Benggio
USCG District:	7
Date of Spill:	02/22/95
Location of Spill:	Georgetown, South Carolina
Latitude:	33°19′ N
Longitude:	077°47′ W
Spilled Material:	diesel
Spilled Material Type:	2
Amount:	500 gallons
Source of Spill:	tug
Resources at Risk:	**Fish**: fish, shellfish **Habitat**: tidal flats, wetlands **Birds**: several species **Recreation**: recreational areas
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest(s):	none
Shoreline Type(s) Impacted:	none
Keywords:	potential spill

Incident Summary:

On February 2, 1995, the USCG reported that they were concerned about a worst-case potential spill from a tug and barge offshore. The tug *Tarus* had dumped 500 gallons of diesel fuel attempting to improve her stability. At the time of the report she was still unstable and headed toward the Charleston sea buoy with 27,000 gallons of diesel fuel onboard. The transit was to continue at 6 knots and take approximately 20 hours. The transit occurred without incident and no resource impact was reported.

Behavior of Spilled Material:

The diesel that was intentionally spilled at sea spread rapidly, dispersed and evaporated without creating significant impacts to offshore resources. No additional diesel was spilled.

NOAA Activities:

NOAA was asked to provide trajectory and oil weathering information based on a worst-case scenario of losing 27,000 gallons of diesel. Four separate reports were sent to the OSC via facsimile to address:

- ❒ trajectory analysis and weather forecast;
- ❒ potential radius of concern in the event of a total loss of product (spreading estimation);
- ❒ ADIOS fate model output; and
- ❒ resources at risk evaluation.

References:

NOAA. 1993. *ADIOS™ (Automated Data Inquiry for Oil Spills) User's Manual*. Seattle: Hazardous Materials Response and Assessment Division, NOAA. 50 pp.

Research Planning Institute. Undated. *Sensitivity of coastal environments and wildlife to spilled oil: State of South Carolina. An atlas illustrating the sensitivity of the coastal environment to spilled oil*. Seattle: Ocean Assessments Division, NOAA. 50 maps.

Torgrimson, Gary M. 1984. *The on-scene spill model: a user's guide.* NOAA Technical Memorandum NOAA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

Name of Spill:	Looe Key Mystery Slick
NOAA SSC:	Bradford L. Benggio
USCG District:	7
Date of Spill:	03/23/95
Location of Spill:	Florida Keys, Florida
Latitude:	24° 27.0'N
Longitude:	081° 26.9'W
Spilled Material:	unknown
Spilled Material Type:	4
Amount:	3 barrels
Source of Spill:	unknown
Resources at Risk:	**Fish:** species of commercially and recreationally important fish, shellfish **Birds**: various shorebirds, wading and diving birds, nesting habitats **Marine mammals**: West Indian manatee, key deer **Reptiles**: American crocodile **Habitats**: shallow water seagrass beds, shallow coral reefs **Recreation**: recreation areas and parks, diving, swimming, boating, fishing, and tourism resources **Management areas**: wildlife refuges, the Florida Keys National Marine Sanctuary
Dispersants:	No, but considered
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest(s):	none
Shoreline Type(s) Impacted:	none
Keywords:	none

Incident Summary:

An oil slick was reported on the morning of March 23, 1995, 12 miles south of Looe Key, Florida. USCG MSO Miami investigated the report and verified that heavy black oil, up to 1/4-inch thick, was in the area. The dimensions of the slick were reported to be approximately 1 mile by 200 yards. The USCG and the NOAA Florida Keys National Marine Sanctuary's primary concern was for shallow coral reefs in the Looe Key area. The OSC began exploring the possibilities of applying dispersants on the slick, but could not obtain aircraft support within a reasonable amount of time.

A forward command post was established at Marathon, Florida, The vessel *Sentinal* was dispatched from Fort Lauderdale to be on-scene by the next morning for skimming operations. Cleanup contractors were also sent on-scene to address protection strategies and cleanup should the oil threaten or impact shoreline.

The *Sentinal* collected a reported three barrels of product the following day. The product was reported as a very heavy, tar-like material that had the potential to clog the skimmer. By the morning of March 25, no recoverable oil could be found. The skimming vessel was released and the command post demobilized. No natural resource impacts were reported during the incident.

Behavior of Spilled Material:

Analysis of the Gulf Stream currents in the area provided by the NOAA National Hurricane Center indicated a small eddy near the slick, which, along with winds from the west, caused the oil to move to the east overnight at about 1.4 knots. The oil was initially reported to be fresh, thick, black oil. By the second day, it had weathered into a very thick, tar-like material that formed streamers and tarballs. By the third day, the slick had broken up significantly, so that no recoverable amounts remained.

Countermeasures and Mitigation:

The skimming vessel *Sentinal* was deployed on-scene to recover oil. Cleanup personnel and equipment were mobilized on-scene for rapid response if the slick threatened shorelines.

NOAA Activities:

NOAA was notified of this incident on March 23, 1995, by MSO Miami and asked for trajectory information on the slick. NOAA continued to provide resources at risk, oil weathering, dispersant application, and updated weather and trajectory support throughout the incident. NOAA predicted that, while serious shoreline impacts would not be likely, some tarballs could show up in the Key Largo area within a few days.

References:

NOAA. 1995. Hotline 176. Seattle: Hazardous Materials Response and Assessment Division. 6 Reports

NOAA. 1993. *ADIOS™ (Automated Data Inquiry for Oil Spills) User's Manual*. Seattle: Hazardous Materials Response and Assessment Division, NOAA. 50 pp.

Research Planning Institute. 1981. *Sensitivity of Coastal Environments and Wildlife to Spilled Oil: South Florida. An Atlas of Coastal Resources*. Tallahassee: Florida Department of Veteran and Community Affairs, Division of Local Resource Management. 43 maps.

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide*. NOAA Technical Memorandum NOAA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

United States Coast Guard. 1994. South Florida Area Contingency Plan. Miami: United States Coast Guard, Marine Safety Office.

United States Coast Guard. 1995. POLREPS for USCG case FPN 07-5052, Miami: United States Coast Guard, Marine Safety Office

Name of Spill:	Powell Duffryn Chemical Fire and Release
NOAA SSC:	Bradford L. Benggio
USCG District:	7
Date of Spill:	04/10/95
Location of Spill:	Savannah, Georgia
Latitude:	32°04.5'N
Longitude:	081°02.5' W
Spilled Material:	crude sulfate turpentine, sodium hydrosulfide (NaSH), Antiblaze, Briquest
Spilled Material Type:	5
Amount:	840,000 gallons crude sulfate turpentine 400,000 gallons NaSH 150,000 gallons of Briquest 130,000 gallons of Antiblaze
Source of Spill:	facility
Resources at Risk:	**Fish:** sheepshead minnow, mummichug, Atlantic silversides, striped bass, Atlantic sturgeon, spotted seatrout, weakfish, spot, kingfish, red drum, black drum, flounder, menhaden, bay anchovy, ladyfish, blueback herring, American shad, sheepshead, pinfish, Atlantic croaker, and striped mullet. **Crustaceans**: blue crabs, brown shrimp, white shrimp, **Mollusks:** oysters **Birds**: cormorants, gulls, wading birds, brown pelicans, snowy egrets, rails, bitterns **Reptiles**: turtles **Population areas**: apartments, single-family homes, elementary school, transportation, commerce resources
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	No planned burn was conducted but the fire caused by the initial explosion burned for two days, burning most of the turpentine.
Other Special Interest(s):	chemical reactivity potentials, actual chemical reactions, hydrogen sulfide gas generation, air monitoring, and human health and safety, sulfur dioxide
Shoreline Type(s) Impacted:	salt marshes
Keywords:	phosphine, personal protective equipment, evacuation, ATSDR

Incident Summary:

Week I (April 10-16)

On April 10, 1995, a fire and explosion occurred at the Powell Duffryn facility in Savannah, Georgia. Powell Duffryn is a tank storage facility located about two miles east of downtown Savannah and one-half mile inland from the southern bank of the Savannah River. The incident site is bordered by industrial facilities on the north, a marsh on the northeast, a residential area on the south, and the Oak Tree Apartment complex immediately adjacent to the facility.

Six storage tanks, contained within a bermed area, were involved in this incident. A combined total of 840,000 gallons of crude sulfate turpentine, a highly flammable liquid was

contained in three of the tanks. The other tanks contained 400,000 gallons of sodium hydrosulfide (NaSH), a strong basic solution that is a by-product of Kraft paper production; 150,000 gallons of Briquest, a pH2 solution used for plating; and 130,000 gallons of Antiblaze, a fire retardant.

It is believed that most of the turpentine burned during the first two days after the explosion. Much of the NaSH is believed to have spilled into the bermed area, then overflowed the berm and drained off-site into the adjacent marsh. The drainage channels from the marsh into the river were diked before contaminated liquid reached the river. It is thought that no significant amounts of Briquest or Antiblaze were initially spilled; however, the tanks were leaking at an undetermined rate into the bermed area.

The primary objectives during the first five days of this incident were assessing the hazards and risks to human health and safety. Since information and situations were constantly changing, these issues became a dynamic problem. The most important health and safety concern was the generation of hydrogen sulfide gas (H_2S) in the bermed tank area. This gas was a hazard to responders and the general public.

On April 12 the fire was extinguished and preliminary assessments within the tank area could be performed. Pumping spilled product within the berm and the NaSH tank were the first operational objectives. H_2S gas was being generated by the spilled products within the berm and response chemists felt that this was caused by reactions of the spilled NaSH with other spilled materials and water. Emptying these from the bermed area would reduce the H_2S concern and allow a more detailed assessment of the degree of damage to the tanks. On April 14, due to the potential for increased exposure to H_2S gas while the product was being pumped out and the failure of the NaSH tank, officials decided to impose a mandatory public evacuation for one-half mile around the incident site. Levels of the NaSH product from the berm area were significantly reduced and an assessment indicated that the NaSH tank was not in danger of a catastrophic failure.

The Georgia Environmental Protection Division (GEPD) and NOAA developed cleanup, sampling, monitoring, and "how clean is clean" guidelines. Disposal and decontamination considerations were addressed by GEPD, the USCG DRAT, and NOAA. The USACOE was asked to review the cleanup, sampling, monitoring, and "how clean is clean" plans. Powell Duffryn was to provide a waste disposal plan to the USCG and GEPD for approval.

Priorities identified for removal were:

- ❒ NaSH to eliminate H_2S gas production,
- ❒ turpentine to eliminate flammability hazards, and
- ❒ Briquest.

Criteria for residents to move back into the neighborhood were:

- ❒ All hazardous materials must be removed.
- ❒ All inhalation hazards must be reduced to safe levels.

Levels of concern and priorities were formalized by the Agency for Toxic Substances and Disease Registry (ATSDR). Evacuated residents were allowed to return to their homes at 1600 on April 16.

Week II (April 17-23)

Residents of apartments next to the facility remained under mandatory evacuation orders. They were allowed brief, escorted visits into their homes daily as long as H_2S gas levels were acceptable.

The initial primary focus following the fires was to pump out tanks containing materials that had a potential for reacting and creating releases of H_2S gas. This would eliminate an extremely hazardous potential exposure to responders and nearby residents from a catastrophic release.

Originally it was felt that most of the H_2S emissions were being generated from the NaSH product remaining in the main tank. By April 18, the liquid was pumped from the NaSH tank, leaving four feet of solid residue inside the tank. A four-foot blanket of water was maintained on top of the NaSH residue to suppress H_2S emissions. Additionally, a vent system was rigged for the tank to allow H_2S gases to vent into an adjacent caustic tank. By April 22, the Briquest acid tank had been pumped and flushed, thereby eliminating the potential for a catastrophic release that could create major H_2S emissions from mixing Briquest with NaSH.

An initial reactivity test of material in the bermed area indicated little reactive potential. This was later shown to be an incomplete test. Subsequent sampling and tests showed the berm "soup" to be patchy and heterogeneous, containing some areas of highly reactive material.

The majority of H_2S gas generated was believed to be coming from the berm soup, which, when agitated, emitted more gas. Wind continued to be an important factor for H_2S concerns. Light winds or winds from the north allowed H_2S odors to transit nearby populated areas, causing the number of citizen complaints to increase.

A plan to aggressively eliminate the berm material without increasing H_2S emissions was developed. The plan was to encapsulate the berm with a polyurethane tent that would contain emissions and vent them through a carbon scrubbing system. If H_2S emissions could be controlled in this way, the berm material could be mixed and vacuumed out quickly without releasing high levels of H_2S gas into the surrounding air.

Readings from pH monitoring in the marsh were dropping and reached acceptable levels (below pH nine) for all but one location. By the end of Week II, large areas of the impacted marsh vegetation had died. The brown, dead vegetation contrasted sharply with the green unaffected areas, giving a good indication of drainage patterns through the marsh.

Week III (April 24-30)

County health officials and a certified industrial hygienist completed a survey of the Oak Tree Apartments for smoke and residue impact. All recommended apartment cleaning was scheduled to be completed by April 30. Air monitoring for each apartment was conducted and levels were found to be below detection level in most cases. The highest H_2S gas level recorded was 0.08 parts per million (ppm). Reoccupation criteria required that maximum H_2S gas levels not exceed 0.05 ppm.

The Eli Whitney Elementary School had remained closed since April 24. Classes were conducted in the old Savannah airport terminal until the school re-opened.

The pH levels at all selected monitoring locations in the marsh were reported to be below nine on April 24. GEPD authorized removal of the dikes to allow the marsh to drain.

Observations of the marsh from access roads indicated that significant amounts of vegetation had died. Odors of dead animals were prevalent throughout the impacted marsh areas, though, except for one large tortoise, no dead animals were observed. Powell Duffryn contracted for color and color-infrared vertical aerial photography of the marsh. These photographs will be used to document the extent of marsh impact and help observe drainage patterns.

During Week III, some of the material from the bermed area being stored in FRAC tanks began to react. A complete inventory and pH measurements of each FRAC tank were compiled. Four FRAC tanks were found to have low pH readings of less than five and were designated "hot." They were transferred to stainless steel iso-tanks where they remained until a thorough sample analysis was performed for each tank. Once sampled, stabilization and disposal concerns were addressed. The other FRAC tanks were pumped onto barges for storage until a disposal plan could be implemented.

The death of a worker from a nearby industrial facility created some initial concern for safety and health issues on-site. Operations were suspended while the cause of death was determined and a review of the spill response safety plan was conducted. The worker's death was found to be unrelated to the spill or response, and on-site safety measures were determined adequate.

The bermed area was flushed and pumped until the remaining liquid was dilute and clear. The remaining insoluble sludge was sampled to determine how best to remove it.

The NaSH tank remained stable. Powell Duffryn re-flushed this tank to replace the water that may have been saturated with NaSH. Venting the tank's head space was planned for after the bermed area had been cleaned.

The construction of an encapsulating tent over the bermed area was progressing and scheduled to be fully operational by April 30. Once in place, the tent would contain and vent H_2S emissions through a carbon filtration scrubbing system.

During Week III, the USCG was in its final stages of emergency removal and containment operations. Once the H_2S gas sources were eliminated or controlled with adequate engineering, it was expected that the state would assume oversight of the remaining cleanup operations.

Weeks IV and V (May 1-14)

The tent, intended to encapsulate the berm, failed due to construction and engineering difficulties. On the evening of May 1, high winds ripped the tent; on May 2 the OSC discontinued tent construction and a new plan was formulated and approved.

The new plan called for air monitoring while carefully removing product from the bermed area and the NaSH tank. Operations would slow or stop if air monitoring results indicated that H_2S gas levels were getting too high. Vacuum tanks would be used to remove the remaining berm product.

This plan was successful. Due to repeated flushings of the bermed area, only a small amount of highly reactive product remained. Careful continued removal of the rest of the material proceeded relatively smoothly. Caustic material was added to the bermed area as necessary to maintain a stable situation. The vacuum tanks were not needed and the berm product was pumped directly onto a barge.

Venting the NaSH tank and removing the remaining material inside did not create H_2S gas problems. This operation was engineered so that a slight negative pressure was produced in the tank, the highest H_2S gas reading measured at the vent was 1 ppm.

During this period several incidents of overexposure due to leaking FRAC tanks or inappropriate personal protection equipment (PPE) occurred. Contractors became concerned about the possibility of phosphine gas being present and stepped up PPE requirements and safety precautions. This slowed operations considerably for a few days. No field test is available for phosphine that does not have a cross-sensitivity for H_2S, so the absence or presence of phosphine could not be quickly or easily determined. Air samples sent to a laboratory showed that phosphine was below detection limits and the mechanism for generating phosphine gas did not appear to be present. Subsequently, the heightened PPE requirements were relaxed to the level appropriate for the presence of H_2S gas.

Impacts to wildlife in the area were minimal. Early reports of a fish kill proved to be minnows from several ponds in the marsh. Although snowy egrets were observed feeding on the dead fish, no bird impacts were reported. One turtle mortality was noted. New plant growth was reported in the impacted marsh on May 22.

On May 12, the State of Georgia assumed oversight of the response. All criteria had been met for the Oak Tree Apartment residents to move back into the neighborhood. The bermed area had been cleaned and flushed, the NaSH tank had been vented and pumped out, all FRAC tanks had been cleaned and decontaminated, and no source of unsafe H_2S gas levels remained. The county health department had inspected each apartment in the area to ensure that no incident-related health concerns existed for the residents.

Behavior of Spilled Material:

Most of the contaminated area is dominated by intermediate salt marshes. The dominant plant species are *Spartina cynosuroides* and *Typha* spp. Dikes were constructed at the point where two manmade drainage canals enter the Savannah River. The marshes, which normally function as flood water retention zones, essentially acted as holding areas for the contaminated liquids running off the site. Also, the marsh is in a groundwater discharge zone, so there was little threat to groundwater resources.

It is believed that most of the turpentine burned in the fire. There was likely to be contamination on-site from the combustion by-products of turpentine. Undetermined amounts of the NaSH, Antiblaze, and Briquest mixed in the bermed area around the storage tanks along with some turpentine, fire-fighting water, and foam to create a reactive "soup. "

Nearly all the contamination on- and off-site was from the release of NaSH. This product was stored as a 45-percent solution, with a pH of 14 and a specific gravity of about 1.3. NaSH is highly water soluble; it readily mixed with the fire-fighting water and by April 15 had spread over an estimated 40 acres of marsh. Assuming an average water depth of 0.3 meters over the impacted area, it was estimated that there were 12 million gallons of contaminated water in the wetlands. Samples taken from the contaminated marsh were tested for specific gravity, which was 1.00 to 1.01, indicating that the water contained about 1 percent NaSH by weight and that it would not stratify.

The other products, presumably, were not released in significant amounts. The biggest concern about the acidic Briquest was from the potential for mixing with the basic NaSH and subsequent generation of large amounts of H_2S gas. Both products are inorganic compounds that have mostly acute toxicity associated with the high/low pH and a low potential for leaving residues with long-term impacts.

Countermeasures and Mitigation:

The mixture of mostly water and dilute NaSH that entered the marsh initially had a pH as high as 11 to 12. The State of Georgia and NOAA, in consultation with the USACOE, submitted a plan to pump liquid from the marsh at several accessible locations until pH levels dropped below nine. Once pH levels fell to within acceptable levels at all designated locations, dikes would be removed so the marsh could drain. A plan was developedto continue monitoring pH levels in the marsh as it drained. With the known acute toxicity of the contaminated water and the large volumes that would be released to the river, some localized fish kill was expected. This threat, however, was minimized by removing the most contaminated water first. The river water was brackish with good buffering capacity, so it was anticipated that the alkalinity would be quickly neutralized with very localized impacts. The plan called for pH readings to be conducted at selected sites following significant rainfall. The data would be reviewed by the state to assess the need for any further remediation. Initial core samples taken in the marsh indicated very little penetration of the chemicals into the soil. Affected marsh vegetation turned completely brown and died after the second week of exposure. The area surrounding the facility will undergo extensive soil sampling to determine what soil remediation or removal is necessary.

The apartments adjacent to the incident site were inspected by a county health official and a certified industrial hygienist. They recorded the existence or non-existence of any oily or sooty residue from the fire and sampled for H_2S gas to determine whether any pockets remained inside the apartments. The apartments were cleaned based on the results of the survey and recommendations of the inspection team before reoccupation.

Other Special Interest Issues:

Human health and safety were the primary issues of concern throughout this response. The initial fire and smoke, and the H_2S emissions that followed, presented a major challenge to response personnel who had to protect themselves and work the spill. They had to identify and use appropriate means to measure the concentration of the toxic compounds in the air, and ensure the protection of the general public. Because of the proximity to residential areas and an elementary school, the general public was directly affected by the hazards from the incident.

Fire and smoke: The explosion and fire of the turpentine tanks necessitated the immediate evacuation of the Oak Tree Apartment complex. The smoke generated by the fire raised concerns of overexposure, especially to sensitive individuals. A level of concern was set for public exposure to particulates and sulfur dioxide. Air sampling conducted to assess public exposure indicated that overexposure of the public to particulates, sulfur dioxide, H_2S, and volatile organic compounds did not occur.

Hydrogen Sulfide: After the fire had been extinguished, increasingly higher readings of H_2S released from the interaction of the NaSH with the acidic Briquest were measured. It became apparent that H_2S gas would be a major hazard to responders and possibly to the general public nearby. Safety zones were established in which PPE was required, and continuous air sampling for H_2S was conducted in various locations on and around the site. H_2S gas readings fluctuated widely, ranging from nondetectable to over 100 ppm. Response personnel at the command post were exposed to high levels of H_2S gas on several occasions.

On April 14, the circumstance of stable atmospheric conditions, wind direction forecast to be toward the adjacent neighborhoods, unknown integrity of the damaged Briquest and NaSH tanks, and the substantial generation of H_2S gas led to serious public safety concerns. These issues were presented to local authorities who then ordered mandatory evacuations for a half-mile radius from the site. ATSDR set thelevel of concern at 3 ppm for evacuation, and 0.05 ppm for reoccupation of evacuated homes. On April 16, evacuated residents, with the exception of those in the Oak Tree Apartments, were allowed to return to their homes after it was determined that the tanks were structurally stable, H_2S gas releases had been controlled, and the weather was more favorable.

H_2S continued to be a problem throughout the response until the bermed area was diluted and flushed. The presence of H_2S gas significantly slowed the response due to PPE requirements for the responders.

Monitoring for H_2S gas was conducted using portable instruments containing electro-chemical sensors. These sensors have cross-sensitivity to sulfur dioxide (SO_2) varying from 15 to 80 percent, depending on the manufacturer. A concern was raised that the compound present was mostly SO_2, not H_2S. The suggestion was that since the sampling instruments were cross-sensitive to H_2S, they showed that H_2S was present when in reality the gas present on site was SO_2, a toxic colorless gas with an odor similar to H_2S and very irritating to the respiratory tract. A thorough analysis of the chemical processes on site and the air monitoring data collected indicated that SO_2 was not present in any significant quantity.

Phosphine: Toward the end of the response, the idea that phosphine was being generated in the holding tanks into which the liquid from the bermed area was pumped became a concern. Phosphine, a colorless gas that smells like garlic, is very toxic when inhaled, and

the possibility of its formation slowed the response substantially. Lack of adequate real-time monitoring for phosphine, which would not be affected by the H_2S on site, presented sampling and verification problems. However, careful analysis of the possible chemical interactions on site did not indicate an apparent mechanism for phosphine generation. This, coupled with laboratory-analyzed sampling, indicated that phosphine levels, if present, were below detection limits.

Adherence to Safe Operating Procedures (SOP): Adherence to SOP was not always observed by personnel on site. The most serious incident happened when a worker, using inappropriate PPE, checked one of the FRAC storage tanks and was overexposed to the gases present (presumably H_2S) and had to be hospitalized for observation. This incident underscored the need to follow safe work practices by personnel on site.

NOAA Activities:

NOAA was notified of this incident on April 11, 1995. The SSC provided the FOSC with on-scene support April 11 through May 6. This support included:

- ❒ Environmental impact assessment and coordination with the state and other trustees to develop cleanup and mitigation guidelines and recommendations.
- ❒ Chemical hazards risk assessment for responders, the general public, and natural resource concerns.
- ❒ Chemical reactivity analyses and coordination with the Gulf Strike Team (GST), Powell Duffryn, and other on-scene responders.
- ❒ Evaluation of human health and safety concerns in consultation with the ATSDR.
- ❒ Daily participation at all Incident Command System (ICS) meetings and the ICS planning section.
- ❒ Daily weather forecasts.
- ❒ Daily development and/or compilation of various reports including hotlines, planning section recommendations or guidelines, and the ICS summary report used for daily ICS section summaries and OSC briefings.

NOAA trustee representatives visited the site twice during the response and coordinated input through the SSC.

NOAA provided the OSC recommendations for classification of on-site chemical wastes. These recommendations included simple preliminary pH and ambient air H_2S gas measurements, but also indicated the need for more detailed, laboratory-based protocols for the various materials in the bermed area, FRAC tanks, temporary storage tanks, iso-tanks, and barges. A detailed inventory, status report, and disposal plan was requested for each product. GEPD returned on-scene and worked with Powell Duffryn to develop detailed disposal and soil-sampling plans.

NOAA and GEPD worked to finalize plans on remaining issues before turning the response over to the state. The state worked out details with Powell Duffryn for disposal options and soil-sampling plans.

A return visit to the marsh by the state, NOAA, and Powell Duffryn on May 2 showed that pH levels were above nine in several locations. The state asked that pumping be resumed in these locations until pH levels were consistently below nine. NOAA obtained samples of each type of marsh vegetation in the impacted area for identification and cataloging for future reference.

References:

Association of American Railroads (AAR). 1991. *Emergency Materials in Surface Transportation.* Washington D.C.: Bureau of Explosives.

Budavari, S., M. J. O'Neil, A. Smith, and P. E. Heckelman. 1989. *Merck Index: An Encyclopedia of Chemicals, Drugs, and Biologicals Eleventh Edition.* ISBN 911910-28-X. Rahway, NJ: Merck & Co., Inc. 2303 pp

Environment Canada. 1984. *Environmental and Technical Information for Problem Spills. (TIPS) Hydrogen Sulphide*. Ottawa, Canada: Technical Services Branch, Environmental Protection Programs Directorate, Environmental Protection Service. 112 pp.

Environment Canada. 1985. *Environmental and Technical Information for Problem Spills. (TIPS) Sulphur Dioxide*. Ottawa, Canada: Technical Services Branch, Environmental Protection Programs Directorate, Environmental Protection Service. 110 pp.

Lewis, Sr, Richard J. 1992. *Sax's Dangerous Properties of Industrial Materials, Volume III: General Chemicals--Entries G - Z*. ISBN 0-442-01278-0. New York, NY: Van Nostrand Reinhold. pp. 1773 - 3553.

Lewis, Sr, Richard J. 1993. *Hawley's Condensed Chemical Dictionary. Twelfth Edition*. New York: Van Nostrand Reinhold. 1254 pp + appendices

NOAA. 1995. Hotline 177. Seattle: Hazardous Materials Response and Assessment Division, Office of Ocean Resources and Conservation. 105 Reports

NOAA. 1992. The ALOHA™ 5.1 Manual for the Apple Macintosh and IBM Compatibles. Washington, D.C.: National Safety Council. 350 pp.

NOAA. 1993. *The CAMEO™ 4.0 Manual*. Washington, D.C.: National Safety Council. 440 pp.

NOAA. 1994. *Shio. Tide computer program (prototype).* Seattle: Hazardous Materials Response and Assessment Division, Office of Ocean Resources and Conservation.

Research Planning Institute. 1985. *Sensitivity of Coastal Environments and Wildlife to Spilled Oil: Georgia. An Atlas of CoastalResources*. Seattle: Ocean Assessments Division, NOAA. 29 maps.

U.S. Coast Guard. 1991. *CHRIS Hazardous Chemical Data*. M16465.11. Washington, D.C.: U.S. Government Printing Office.

USCG. 1995. POLREP. Savannah: United States Coast Guard, Marine Safety Office.

U.S. Department of Health and Human Services. 1990. *National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards.* U.S. Public Health Service,

Centers for Disease Control, NIOSH. Washington, D.C., Government Printing Office. 245 pp.

Name of Spill:	M/V *Sealand Innovation*
NOAA SSC:	Gary Ott and Bradford L. Benggio
USCG District	7
Date of Spill:	4/18/95
Location of Spill:	Charleston, South Carolina
Latitude:	32°49′ N
Longitude:	79°55′ W
Spilled Material:	allyl caproate (propenyl hexanoate) and caprylic acid
Spilled Material Type:	N/A
Amount:	less than 40 gallons
Source of Spill:	drums in 35-foot container
Resources at Risk:	habitat
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	leaking shipping container
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

On April 15, 1995, while at sea on an approach to Charleston, South Carolina, a small leak from a shipping container was reported aboard the M/V *Sealand Innovation*. The vessel was scheduled to arrive in Charleston on April 20, 1995.

Behavior of Chemical:

The chemical leak from the unopened shipping container was reported to be two gallons per hour.

Countermeasures and Mitigation:

The crew reported that the leaking chemical had a particularly sweet odor. This information, combined with the details of the chemical information provided by NOAA, made it possible to identify the probable leaking chemical as allyl caproate (propenyl hexanoate) and to plan for the safe removal of the leaking chemical drums from the container. A hazardous materials contractor was hired to remove the leaking containers from the shipping container after it was removed from the vessel.

The ship continued into the harbor and docked. During unstuffing operations, a nail-sized hole was discovered in one of the drums of allyl caproate two inches from the bottom of the drum.

Other Special Interest Issues:

Assessing the risk from this chemical leak was unique because it was on a ship at sea and leaking from a container inside a container. The assessment had to be assessed at three levels.

- ❒ The first level was an assessment of risk to the crew.
- ❒ The second level was an assessment of risk to the cargo terminal and the surrounding neighborhood.

- ❒ The third level was an assessment of risk to the unloading crews.

During this incident, the ship's master determined that the leaking chemicals were not a hazard to the crew.

NOAA Activities:

NOAA was notified of this incident on April 18, 1995, by MSO Charleston who asked the SSC to help the MSO staff assess the chemical risks to the crew, the terminal personnel at Charleston, and the public. NOAA determined the nature of the two chemicals believed to be in the leaking container from published literature. There were sixteen 55-gallon drums of allyl caproate (propenyl hexanoate), a poisonous liquid with a distinctive pineapple odor, and three 55-gallon drums of a caprylic acid, a liquid corrosive to skin but not to metal. The SSC reported that these chemicals were not considered hazardous to the port or the surrounding neighborhood; they were not highly flammable or reactive; and the would not evaporate at such a rate as to be a hazard other than at the shipping container.

References:

Virginia Institute of Marine Science. 1980. *Sensitivity of Coastal Environments and Wildlife to Spilled Oil, State of South Carolina*. Boulder, Colorado: Hazardous Materials Response Project, NOAA. 113 maps.

NOAA. 1992. *The CAMEO 4.0 Manual*. Washington, D.C.: National Safety Council. 440 pp.

NOAA. 1992. *The ALOHA 5.1 Manual for the Apple Macintosh and IBM Compatibles.* Washington, D.C.: National Safety Council

NOAA. 1995. *Summary of Health and Safety Concerns, Caprylic Acid and Propenyl Hexanoate.* Charleston, South Carolina: United States Coast Guard, Marine Safety Office. April 18, 1995.

Name of Spill:	Leaking Container Urethane Primer
NOAA SSC:	Gary Ott and Bradford L. Benggio
USCG District	7
Date of Spill:	4/20/95
Location of Spill:	Charleston, South Carolina
Latitude:	32°49′ N
Longitude:	79°55′ W
Spilled Material	urethane primer
Spilled Material Type:	5
Amount:	unknown
Source of Spill:	leaking drum in shipping container
Resources at Risk:	habitat
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

On April 20, 1995, MSO Charleston received a report of an outbound shipping container leaking a chemical adhesive material onto the ground below the container at the North Charleston Terminal, Charleston, South Carolina. The shipping manifest noted that this container held numerous neoprene- and toluene-based resins, methyl ethyl ketone, and toluene diisocyanate, all listed as suspect human carcinogens.

Countermeasures and Mitigation:

The container was opened using hazardous materials protocols at 1300 on April 21 by the RP in cooperation with the North Charleston Fire Department. The container was allowed to ventilate and air monitoring was conducted with negative results. No further investigation was conducted. At 2335 on April 22, the container was opened again using hazardous materials protocols and a different contractor. A leaking, nearly empty, 55-gallon drum of urethane primer was discovered on the second pallet removed from the container. The manufacturer's representative and state chemists confirmed that the associated isocyanates in this material would be inert within one week of being blended into the product and, once the product completely dried it would no longer classify as a hazardous material. At 0215 on April 23, operations were secured.

At 1000, April 23, operations again started and the second entry was initiated using hazardous materials protocols. The spilled product was mostly dried in the shipping container close to the doors and the leaking 55-gallon drum was overpacked. By the end of the normal workday on April 23, the last of the contents was unstuffed from the shipping container without incident.

NOAA Activities:

NOAA was contacted by MSO Charleston on April 21, 1995, and asked to participate with the MSO staff in an assessment of the chemical risks during the unstuffing operations of the affected shipping container.

References:

NOAA. 1992. *The CAMEO 4.0 Manual.* Washington, D.C.: National Safety Council. 440 pp.

NOAA. 1992. *The ALOHA 5.1 Manual for the Apple Macintosh and IBM Compatibles*. Washington, D.C.: National Safety Council.

Name of Spill: M/V *Wealthy River*
NOAA SSC: Stephen Meador and Bradford L. Benggio
USCG District: 7
Date of Spill: 05/02/95
Location of Spill: Charleston, South Carolina
Latitude: 32°43.4' N
Longitude: 079°48.3' W
Spilled Material: #6 fuel oil
Spilled Material Type: 4
Amount: 18,950 barrels (796,000 gallons)
Source of Spill: container vessel
Resources at Risk: **Marine mammals**: bottlenose dolphins
Birds: diving coastal birds, waterfowl, wading birds, gulls, terns, shorebirds, raptors; nesting sites for pelicans, shorebirds, gulls, and terns
Fish: American eel, shad, striped bass, bluefish, cobia, sheepshead, spotted seatrout, weakfish, croaker, spot, black drum, red drum, striped mullet, flounder; spawning American shad, striped bass, and spotted seatrout.
Mollusks: oysters, clams (quahog)
Crustaceans: shrimp, blue crabs
Reptiles: loggerhead sea turtles
Recreation: beaches, recreational fishing areas
Dispersants: N
Bioremediation: N
In-situ Burning: N
Other Special Interest: N
Shoreline Types Impacted: fine-grained sand beaches, tidal creeks, sheltered and exposed tidal flats, salt marshes, riprap jetties
Keywords: NAVSUPSALV, potential spill

Incident Summary:

At 0450 on May 2, 1995, MSO Charleston was notified that the inbound M/V *Wealthy River*, a 670-foot container vessel, was aground on a sandy/muddy bottom in the entrance to Charleston Harbor between buoys 8 and 14, approximately 600 yards northeast of the jetties. The ship was carrying 796,000 gallons of #6 fuel oil as bunker. Weather on-scene was temperature 68°F, cloudy skies, winds southwest at 20 knots, and seas one to two feet. The vessel was of Panamanian registry, operated by China Ocean Shipping Company.

USCG personnel responded on-scene to inspect the ship and monitor attempts to refloat her. The South Carolina representative was contacted but did not respond on-scene.

Behavior of Oil:

Trajectory analysis indicated that with the stronger ebb tides near the harbor entrance and the dominating westerly winds, a release within the next 24 hours would move southerly down the coast and come ashore only if the winds turned easterly.

Countermeasures and Mitigation:

The COTP of Charleston Harbor established a safety zone around the vessel. No sheens or odors were reported by on-scene personnel. At the 1030 high tide, an unsuccessful attempt was made to move the vessel off the bottom using seven tugs. The tugs were only able to spin the vessel, leaving the stern partly in the channel. U.S. Navy Superintendent of Salvage (NAVSUPSALV) was contacted by phone to help plan the next attempt to refloat the vessel and prepare to respond on-scene. Lightering was considered but never initiated.

On May 2 at the second, higher high tide, the vessel was successfully refloated by six tugs and an offshore supply vessel. The vessel was inspected for damage and transited to Charleston Harbor.

NOAA Activities:

NOAA was notified of this incident on May 2, 1995, by MSO Charleston. The ASSC, who was in the area, provided scientific support on-scene. The NOAA Scientific Support Team provided tide and current information, weather forecasts, worst-case trajectories, and resources-at-risk analysis. NOAA supported this incident approximately one day.

References:

Charleston Area Contingency Plan

Research Planning Institute. *Sensitivity of Coastal Environments and Wildlife to Spilled Oil: State of South Carolina*. An atlas illustrating the sensitivity of the coastal environment to spilled oil. Seattle: Ocean Assessments Division, NOAA. 50 maps.

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide.* NOAA Technical Memorandum NOAA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

Name of Spill:	Southern States Phosphate Acid Spill
NOAA SSC:	Bradford L. Benggio
USCG District:	7
Date of Spill:	05/14/95
Location of Spill:	Savannah, Georgia
Latitude:	32°04' N
Longitude:	081°04' W
Spilled Material:	hydrofluorosilicic acid
Spilled Material Type:	5
Source of Spill:	facility
Amount:	60-80 tons
Resources at Risk:	**Fish:** many species **Crustaceans**: crabs, shrimp **Mollusks:** oysters **Birds:** cormorants, gulls, snowy egrets, brown pelicans **Reptiles**: alligators, turtles
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest(s):	PPE, NPDES permit
Shoreline Type(s) Impacted:	N
Keywords:	none

Incident Summary:

At approximately 1700, May 14, 1995, MSO Savannah was notified that Southern States Phosphates had a release of hydrofluorosilicic acid. This facility is located just east of downtown Savannah and about one-half mile inland on the southern shore of the Savannah River.

Initial estimates were that over 60 tons of the acid had been spilled into an adjacent canal that leads to the river. Most of the acid was contained within two large holding ponds normally used for product treatment.

GEPD and the USCG assessed the situation and monitored the response over the next several days. No additional natural resource impacts were reported.

Behavior of Spilled Material:

The acid flowed into drainage ditches leading into two holding ponds and Krayton Canal. Most of the product was contained in the holding ponds. No fumes, vapors, or other indications of a chemical reaction were reported.

Countermeasures and Mitigation:

Lime and soda were added to ditches and the holding ponds to raise the pH and neutralize the acid. Over the next several days, soda was added to the holding ponds as mixing was induced with submersible pumps to raise the pH to seven and meet requirements for legal discharge into the Savannah River.

Other Special Interest Issues:

This chemical is not listed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) list of hazardous materials. The state granted approval to

discharge the product into the Savannah River in accordance with the facility's existing National Pollution Discharge Elimination System (NPDES) permit.

The issue of appropriate PPE was raised by the USCG. With pH levels in the 4.5 to 6 range, it was thought that the acid had been neutralized enough so as not to cause concern for exposure and hence no PPE was required. Recommendations were made to the OSC to require basic PPE such as goggles, rubber boots, gloves, and protective clothing. This recommendation was made because:

- ❒ this was a potent acid,
- ❒ the environment is buffered and direct pH readings may underestimate the potential hazard, and
- ❒ pockets of stronger acid or base may be present in the pond.

No sensitive shoreline or wetland impacts were reported. The only shoreline potentially affected was along drainage ditches and the canal that were designed to carry dischargable effluent from the facility into the Savannah River.

Approximately 150 small fish in Krayton Canal were killed during the initial release.

NOAA Activities:

NOAA was notified of this incident on May 14, 1995, by MSO Savannah who asked for information related to the properties, hazards, and risks associated with hydrofluorosilicic acid and to review appropriate PPE requirements. The SSC, the NOAA HAZMAT health and safety officer, and chemists researched the chemical and provided the OSC with a comprehensive package of material. The SSC also provided an initial weather forecast and reviewed the potential for generating harmful fumes that might affect surrounding areas or populations. The potential worst-case radius of concern with respect to any airborne vapors generated was assessed. The SSC coordinated with federal resource trustees to ensure their concerns were addressed.

References:

Association of American Railroads (AAR) 1989. *Emergency Materials in Surface Transportation*. Washington, D.C.: Bureau of Explosives.

Budavari, S., M. J. O'Neil, A. Smith, and P. E. Heckelman. 1989. *Merck Index: An Encyclopedia of Chemicals, Drugs, and Biologicals Eleventh Edition.* ISBN 911910-28-X. Rahway, NJ: Merck & Co., Inc. pp 761 and 1417.

Lewis, Richard J. Sr. 1992. *Sax's Dangerous Properties of Industrial Materials, Volume III: General Chemicals--Entries G - Z*. ISBN 0-442-01278-0. New York: Van Nostrand Reinhold. pp. 1773 - 3553.

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NOAA. 1993. *The CAMEO™ 4.0 Manual*. Washington, D.C.: National Safety Council.

440 pp.

NOAA. 1994. *Shio. Tide Computer Program (Prototype).* Seattle: Hazardous Materials Response and Assessment Division, Office of Ocean Resources Conservation and Assessment.

NOAA. 1995. Hotline #180. Seattle: Hazardous Materials Response and Assessment Division, Office of Ocean Resources Conservation and Assessment. 5 Reports

Name of Spill:	M/V *Shamwari*
NOAA SSC:	Bradford L. Benggio
USCG District:	7
Date of Spill:	7/15/95
Location of Spill:	25 miles north of Havana, Cuba
Latitude:	23°25′ N
Longitude:	082°58′ W
Spilled Material:	#2 marine diesel
Spilled Material Type:	2
Amount:	4,000 gallons
Source of Spill:	motor vessel
Resources at Risk:	**Fish:** numerous species of commercially and recreationally important fish and shellfish **Birds**: various shorebirds, wading and diving birds, nesting habitats **Marine Mammals**: West Indian Manatee, American crocodile. **Mammals**: key deer **Habitat**: shallow water seagrass beds, shallow coral reefs, mangroves **Management Areas**: recreation areas, parks, wildlife refuges, the Florida Keys National Marine Sanctuary **Recreation**: diving, swimming, boating, fishing, tourism resources
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest(s):	none
Shoreline Type(s) Impacted:	none
Keywords:	potential spill, salvage

Incident Summary:

At approximately 1400 on July 15, 1995, the USCG received a report of a capsized, sinking 112-foot motor vessel located 25 miles north of Havana, Cuba. The vessel had 4,000 gallons of diesel fuel onboard.

The vessel's position was monitored via signals transmitted from an onboard Emergency Position Indicating Radio Beacon (EPIRB). The track of the vessel indicated that little northerly movement occurred throughout the day and it appeared to be moving slowly in an eddy. On-scene reports indicated that the vessel appeared to be about 80 percent underwater and sinking at a rate of about a foot per hour. It was predicted that the capsized vessel would not drift far from its position before it sank.

By the next morning, the vessel was visually located 30 miles south-southwest of Key West, Florida. The EPIRB had become detached from the vessel and had not truly been indicating the vessel's position.

A salvage company was contracted to tow the mostly submerged vessel into port. Divers plugged all tank vents and other locations where fuel might leak in preparation for this operation. Consideration was given to trying to lighter the vessel offshore before towing it into port; however, it was felt that a catastrophic release of the fuel was highly unlikely during the salvage operation. Following an inspection by the USCG, the vessel was towed into port at Miami, Florida, where it was pumped out, refloated, and readied for dry dock.

Equipment was standing by to stop any small leaks that might have occurred during the salvage operation. No pollution was reported.

NOAA Activities:

NOAA was notified of this incident on July 15, 1995, by MSO Miami and asked to provide information pertaining to resources at risk from a catastrophic release of the fuel onboard. NOAA reported that, if released, nearly all the oil would evaporate or naturally disperse within a day. A worst-case release could create a sheen that would not extend more than a few yards from the point of release.

NOAA provided information on resources at risk, weather, potential fuel trajectory, and oil-fate modeling information to support this response. No on-scene support was requested.

References:

National Hurricane Center. 1995. Gulf Stream Analysis report for July 14, 1995.

NOAA. 1993. *ADIOS™ (Automated Data Inquiry for Oil Spills) User's Manual.* Seattle: Hazardous Materials Response and Assessment Division, NOAA. 50 pp.

Research Planning Institute. 1981. *Sensitivity of Coastal Environments and Wildlife to Spilled Oil: South Florida*. An atlas of coastal resources. Tallahassee: Florida Department of Veteran and Community Affairs, Division of Local Resource Management. 43 maps.

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide.* NOAA Technical Memorandum NOA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

U.S. COAST GUARD DISTRICT 8

Name of Spill:	Gum Hollow Creek
NOAA SSC:	Ilene Byron
USCG District:	8
Date of Spill :	10/08/94
Location of Spill:	Corpus Christi, Texas
Latitude:	97°22′ N
Longitude:	27°53′ W
Spilled Material:	Nueces Bay crude
Spilled Material Type:	2
Amount:	2,000 barrels
Source of Spill:	pipeline
Resources at Risk:	**Fish**: drum, sheepshead, southern flounder, striped mullet, Gulf menhaden, catfish **Mollusks**: eastern oyster **Crustaceans**: white shrimp, brown shrimp, blue crab **Birds**: cormorants, sparrows, gulls, rails, oyster catchers, black skimmers, terns, wading birds, egrets, roseate spoonbills, herons
Dispersants:	N
Bioremediation:	N
In-situ Burning:	Y
Other Special Interest:	studies by LSU and Texas A&M
Shoreline Types Impacted:	riprap, pier, exposed tidal flats, vegetated low banks, groin
Keywords:	containment boom, in-situ burning, low-pressure washing, propane cannons, skimmers, sorbent booms, vacuum trucks, volunteers, weed cutters, drum skimmer

Incident Summary:

On October 8, 1994, lightning struck a pipeline valve, causing it to overpressurize. The pipeline failed, discharging about 2,000 barrels of crude oil into Gum Hollow Creek, a tributary of Nueces Bay. The oil flowed across Nueces Bay, impacting shoreline on islands in the bay, Indian and Rincon points, and continued across Corpus Christi Bay. On October 9, the oil began impacting the beach at Oso Fishing Pier, Oso Bay Causeway Park, and three miles of private beach-front property north of Oso Pier. Oso Bay, a highly sensitive area, had been boomed effectively. An Incident Command Post (ICP) was established with the RP, Koch Gathering; the Texas General Land Office (TGLO); and the USCG. Cleanup operations were completed on November 4 after an estimated 470 barrels were recovered.

Behavior of Spilled Material:

Heavy rains and strong (20- to 25-knot) north winds moved the oil quickly from Gum Hollow Creek to the southwest shore of Corpus Christi Bay. The strong winds caused a two- to three-foot chop in the shallow waters of Nueces Bay near the mouth of Gum Hollow Creek, dispersing oil into the water column. Some oil was trapped along the shoreline of the creek. A fish kill, estimated to be about 20 dead fish per 100 feet, extended one mile upstream from Gum Hollow Creek. Heavy rains prevented the booming of the creek and Indian Point. Oil traveled across Nueces Bay in heavy slicks impacting small islands where birds feed and nest. In some cases the oil traveled directly over the islands, becoming trapped in the center of one. A large concentration of oil was contained at Indian Point; however, most traveled across Corpus Christi Bay in heavy slicks. The groin at Rincon Point and an adjacent beach, south Nueces Bay Causeway, were also impacted; oil was

trapped between the crevices of the large granite boulders. Overflights easily tracked the movement of the oil across Corpus Christi Bay and cleanup workers were on-scene when the oil began impacting the Oso Fishing Pier area.

Countermeasures and Mitigation:

Oso Bay was immediately identified as a very sensitive area and protective booming and blocking were done at all entrances from Corpus Christi Bay. Boards were secured over culverts leading into the bay and then triple-boomed. Protective boom was strung across Oso Fishing Pier and placed at the entrance to Gum Hollow Creek; however, it was not initially effective due to heavy runoff. Boom was placed at Indian Point and was moderately effective. Boom placed around the small islands of Nueces Bay was not initially effective due to heavy chop. A total of 18,400 feet of hard boom were deployed.

Tens of thousands of birds were observed in Oso Bay every evening. Propane cannons were placed on the islands when work was not being done to harass birds out of the area. Because of effective protective strategies, no birds were adversely effected.

Cleanup of the impacted areas of the southwest shore of Corpus Christi Bay in the Oso Fishing Pier area and Rincon Point was labor-intensive, but straight forward. Oiled debris was picked up manually. Water flushing was used to move the oil out of rock crevices, riprap, and off the beach. The oil was either collected by sorbents on the rocks or held in by boom and collected by sorbent boom and vacuum trucks. High-pressure wash was used above the tide zone for aesthetic reasons when the property owners requested it.

The small islands and Gum Hollow Creek were difficult to clean and cleaning strategies were always being re-evaluated. For the small islands, low-pressure flushing and collecting oil with either a sorbent or a shallow-water skimmer proved most effective. On the island where the oil had been stranded in the middle, a channel was dug to wash the oil into the channel and then out to a skimmer placed on one end of the island.

Gum Hollow Creek was divided into three sections, the delta, upper section, and middle section. The delta was given the highest cleanup priority due to its environmental sensitivity. Access to the delta and the upper section of Gum Hollow Creek, above the northern spillway, was easily executed. Cleanup in the delta was done with water flushing and sorbent pads. Great care was taken when working in this area and a boardwalk was installed to prevent worker impact. The middle section was difficult to access because of two concrete structures built for water management that prevented boat traffic from entering by way of the delta or upper section. Original cleanup plans for the middle section consisted of flushing the oil towards collection points. The plan was complicated by the presence of dense cattails, which lined the banks and trapped the oil. Eventually, a local land owner granted permission to build an access road across fields leading to and parallel to the middle section. An earthen dam was constructed to prevent oil from escaping into the delta and reoiling habitats. Approval for burning oiled debris was given by the Texas Natural Resources Conservation Commission and the Texas Railroad Commission.

Cutting cattails, transporting them to shore, and burning them approximately 100 yards from the creek was attempted but proved very difficult, long, and labor-intensive. Because this area was routinely burned by the landowners to control boll weevils, burning the oil in-situ was considered. A burn plan was completed and submitted by the USCG FOSC to the USCG District Office, TGLO, U.S. Fish and Wildlife Service (USFWS), Texas Natural Resources Conservation Commission, Texas Railroad Commission, Texas Park and Wildlife, and the RRT for approval. This plan incorporated a burning method for the banks along the middle section of the creek, one for burning floating oil within the cattail reeds, a checklist

for open-water burning, and a letter from a land owner about annually burning for boll weevils on the surrounding crop land.

The extent of burning is more accurately described as patch burning. There were no large marsh areas remaining that required oil removal. The oiled patches along the banks of Gum Hollow Creek were in localized areas where dense cattail growth occurs and steep banks are found. These areas resisted flushing techniques and excessive erosion could result.

A creek survey was completed to assess the test site and other possible locations for the burning along the banks. The burning consisted of small-scale fires where oiled plant material was located along the bank at levels up to four feet above normal water level.

Other Special Interest Issues:

When burning operations became viable, small-scale studies were planned by LSU Environmental Studies and Texas A & M. The projected studies will include biology and petroleum chemistry assessment pre- and post-burn. Sediment samples will be collected; oil samples, plant speciation, percent cover, and documentation of the burning will be completed. Effectiveness of the burn and an on-going assessment of the native plant resilience are the projected outcomes of the studies.

The USFWS coordinated volunteers for bird rehabilitation. Twelve oiled cormorants, one oiled sparrow, four oiled seagulls, one oiled rail, and one oiled oyster catcher were collected. Three oiled herons were observed, but not captured.

NOAA Activities:

NOAA was notified of the incident on October 8, 1994, by USCG MSO Corpus Christi and asked to report on-scene. The SSC arrived on-scene October 9 and participated with the OSC's command staff and worked with public relations. NOAA helped coordinate and participated on a shoreline assessment team. NOAA was released from the spill October 15, 1994, but, the SSC was requested back on-scene October 19 when the in-situ burn option was being considered. NOAA stayed on-scene until the burn plan was approved and the burns were successfully carried out.

References:

NOAA. 1992. *Shoreline Countermeasures Manual: Temperate Coastal Environments.* Seattle: Office of Ocean Resources Conservation and Assessment, NOAA. 84 pp.

NOAA. 1993. *ADIOS™ (Automated Data Inquiry for Oil Spills) User's Manual*. Seattle: Hazardous Materials Response and Assessment Division, NOAA. 50 pp.

NOAA. 1995. Hotline #164. Seattle: Hazardous Materials Response and Assessment Division, Office of Ocean Resources Conservation and Assessment. 5 Reports

Name of Spill:	San Jacinto River Spill
NOAA SSC:	Ilene Byron and Ken Barton
USCG District:	8
Date of Spill:	10/20/94
Location of Spill:	Channelview, Texas
Latitude:	29°48.5' N
Longitude:	95°04.0' W
Spilled Material:	gasoline, home heating oil, Arabian crude, and natural gas
Spilled Material Type:	1, 2
Amount:	64,000 barrels of gasoline 196,000 barrels of crude oil 146,000 barrels fuel oil
Source of Spill:	pipeline
Resources at Risk:	**Marine Mammals**: bottlenose dolphins **Birds**: waterfowl, bald eagle **Fish**: Gulf menhaden, spotted seatrout, black drum, red drum, striped mullet, and southern flounder **Mollusks**: oysters **Crustaceans**: brown shrimp, white shrimp, and blue crabs **Recreation**: state park, marinas, boat ramps
Dispersants:	N
Bioremediation:	Y
In-situ Burning:	Y
Shoreline Types Impacted:	marshes, exposed tidal flats, sheltered fine-grained sand beaches, sheltered tidal flats, mixed sand and shell beaches, salt marsh, riprap, piers, spoil bank, grass lawns
Keywords:	bioremediation, containment boom, Corexit 9580, in-situ burning, skimmers, sorbent boom, sorbent pompoms, vacuum trucks

Incident Summary:

Between October 18 and 20, a strong low-pressure system stalled over the Houston area producing more than 30 inches of rain. The San Jacinto River rose from its normal height of 2.5 feet to 24.3 feet. The river overtopped its banks, cutoff a meandering loop, and scoured a new channel through a normally dry area containing pipelines. As a result of the flooding, Houston had been declared a National Disaster Area and the estuarine environments of Galveston Bay were stressed because of the influx of fresh floodwaters. As the flood waters began to recede, pipelines began to rupture.

It was surmised that large debris or some barges had broken free and were caught in the high-river currents and collided with the pipelines, causing four of them to rupture. It is also possible that the new channel cut by the flooded river may have undercut the pipeline supports, which were not designed for water crossing.

The ruptured pipelines contained gasoline, crude oil, heating oil, and natural gas. Within hours of the ruptures, the spilled products ignited and, already caught up in the flood waters, become a burning mass moving downstream. The fires destroyed many homes along the river banks. However, as a result of the fire much of the spilled products were consumed. After some time, the fire continued only at the source of the leaks. The natural gas leak stopped, but a combination of the remaining products continued to leak.

Behavior of Oil:

Initially, all the gasoline, diesel, and crude oil pipelines were burning and remained burning at the rupture point for seven days. The combustion was incomplete and when the flames died out, flowing bands of black oil were seen. The thick, black oil was seen at the release point and immediately downstream from the fires. The diesel diluted the crude oil between 20 and 80 percent as shown by gas chromatography-mass spectrometry (GC-MS) test results. The separate source oils were emulsified by the rapid current of the San Jacinto River and decaying organic matter absorbed much of the oil. The products flowed downstream and pooled along some shorelines and, as the water level dropped, the oil stranded on these shorelines. Because of the unusually high water, some oil was found on the lawns of private homes and in the tops of small trees along the rivers.

The reliability of calculations of mass balance in the San Jacinto River spill is questionable. While it is possible to estimate the amount recovered or evaporated, the fraction of the oil burned or dispersed in the river cannot be determined. There were 8,500 barrels of product decanted from the recovered oil-water mixture.

Countermeasures and Mitigation:

A Unified Command Center was established in Baytown, Texas at the Exxon facility. About 1,000 people were involved in the cleanup, including contract workers and Federal, state, and local government employees. A section of Interstate 10 was closed for two days to make a staging area for helicopters and equipment. There were 18 skimmers used and 40,000 feet of hard boom were deployed. The affected area was divided into five divisions, each with a field division leader and contractors. The northernmost division, at the site of the pipeline break, was particularly difficult to clean. In a heavily wooded area, the rain mixed with the sand to form a shallow quicksand. Cleanup proved easier as the water level dropped and the area began to dry out.

The uncontrolled in-situ burning of the spilled products lasted seven days and reduced the amount of product released onto the water. The Unified Command decided to let the fire burn because it was consuming some of the spilled oi,l minimizing the chance of creating an explosive atmosphere from the leaking gasoline. Dispersants were considered; however, no easily accessible freshwater dispersants were available. The shoreline cleaning agent Corexit 9580 was used at the request of land owners and was very effective on riprap.

Other Special Interest Issues:

Except for emergency operations, much of Houston was shut down because of the floods before the pipelines ruptured. Emergency operations included evacuating residences and closing the Houston Ship Canal and sections of Interstate 10. The USCG spearheaded flood rescue efforts by directly assisting and rescuing over 500 victims.

Initially all the pipelines were burning. The gasoline and crude and diesel oils were burning at the pipe source and the gasoline was pooling in the lee of shoreline where it continued to burn. Fire boom was deployed at the pooled gasoline to contain it for burning. At one point the gasoline fire at the shoreline was extinguished; however, it was re-lit to remove the threat of an explosive situation and protect life and property.

The RRT approved a proposal to use Corexit 9580 to clean the riprap along the shoreline of the Exxon facility. A test to monitor the effectiveness of the Corexit was observed and a follow-up study is planned.

RRT approval was also given to conduct a bioremediation treatment and study in Upper San Jacinto Bay. This is an ongoing study by Texas A & M University.

NOAA Activities:

NOAA was notified of the incident on October 20, 1994, by the USCG MSO Houston, who requested on-scene support. The NOAA Scientific Support Team was assembled early in the response. State of Texas biologists, RP representatives, and USFWS personnel were also members of this team. NOAA personnel conducted overflights to track the oil in the river and determined whether any oil could be seen in Galveston Bay, determined the chemical fate of the oil, and led a team considering the applicability and biological feasibility of using bioremediation products. NOAA also provided information management support to the Unified Command Planning Section and produced twice-daily overflight, sector, shoreline oiling, and cleanup status maps. NOAA personnel led the shoreline oiling assessment teams.

The SSC provided twice-daily weather and river-stage briefings and attended and spoke at daily press briefings. The SSC also attended two townhall-type meetings to address the local community's concerns as a result of the spill, fire, and flood. NOAA worked closely with state and federal trustees to facilitate the consensus of what cleanup methods were to be used and "how clean is clean." NOAA also provided guidance to the FOSC on the use of shoreline cleaning agents and facilitated a test and an RRT-approved application to help remove oil from private shorelines.

NOAA provided the FOSC with on-scene scientific support from October 20 through November 3, 1994.

References:

Genwest Systems. 1994, Information Management Report for the San Jacinto River Spill. November 14, 1994. Seattle: Genwest Systems for Hazardous Materials Response and Assessment Division, NOAA.

NOAA. 1995. Hotline 165. Seattle: Hazardous Materials Response and Assessment Division, Office of Ocean Resources Conservation and Assessment. 50 Reports

Name of Spill:	T/B *LBT 62*
NOAA SSC:	Ilene Byron
USCG District:	8
Date of Spill :	12/22/94
Location of Spill:	Chalmette, Louisiana
Latitude:	29°55.5′ N
Longitude:	089°57.9′ W
Spilled Material:	Alabama sweet crude
Spilled Material Type:	2
Amount:	911 barrels
Source of Spill:	barge
Resources at Risk:	**Fish**: shad, sunfish, crappie, largemouth bass, catfish, Gulf menhaden, spotted seatrout, red drum, flounder, sheepshead, bay anchovy, spot, black drum, Atlantic croaker **Mollusks**: oyster **Crustaceans**: crayfish, white shrimp, brown shrimp, blue crab **Birds**: bald eagles, brown pelicans, white pelicans, cormorants, loons, grebes, ospreys, glossy ibis, white faced ibis **Mammals**: river otter, muskrat, mink, nutria, raccoon **Reptiles**: American alligator **Management Areas**: Jean Lafitte Historical Park, Bohemia Wildlife Management Area, Delta National Wildlife Refuge, Pass A Loute State Waterfowl Management Area
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	developed upland, levee
Keywords:	containment boom, vacuum truck, skimmers, FLIR

Incident Summary:

At 0530 on December 22, 1994, USCG MSO New Orleans received notification of an oil spill at mile marker (MM) 88 on the Mississippi River. The wake from the M/V *Medicine Bow* forced tank barge *LBT 62* onto a piling, holing the barge on the aft starboard side of tank #5. The total cargo of *LBT 62* was 20,000 barrels of Alabama sweet crude oil, with 1,800 barrels in tank #5. The initial rate of release was estimated to be 10 barrels per minute. Shoreline impacts were reported by 0700; at 0730, the source of the spill was reported secured. An estimated 911 barrels had been released into the water. The USCG established a safety zone between MMs 89 and 75.

On-scene weather was overcast, temperature 50°F, winds north-northwest at 6 knots, and current 3 knots. An ICP was established at the MSO with members of USCG, state, and the RP. Also at the MSO were the NOAA SSC and state and Federal refuge managers.

Behavior of Oil:

The wind held most of the product against the left descending bank of the Mississippi. The shape of the river and the wind tended to pool the oil at four collection points. No pooled oil was seen south of MM 75; however, sheen was observed as far south as MM 70.

Of the estimated 911 barrels spilled, 340 evaporated and 320 were recovered.

Countermeasures and Mitigation:

Optimal weather aided the cleanup effort; the wind held the oil against the bank in a curve in the river between MMs 83 and 79. Four collection points were established using 18,000 feet of containment boom, 8 skimmers, and 15 vacuum trucks. Protective booming was done at the Bohemia State Wildlife Management area, Pass A Loutre State Waterfowl Management area, and Delta National Wildlife Refuge.

A "letter of no objection" was required from the USACOE to remove scrub brush from the levee area to provide greater access during the land-side debris removal. The RP used small bobcat tractors to remove oiled debris. The shoreline cleaning consisted of flushing the alluvial land between the river at low tide and the levee and manually removing debris with rakes and shovels as the river level dropped. The RP was required to remove all ruts on the levee caused by cleanup operations.

Other Special Interest Issues:

For workers' safety, the river was closed between MMs 89 to 75 for one day and then changed to a no-wake zone for the remainder of the cleanup period.

The only damage to resources seen was one oiled raccoon.

NOAA Activities:

NOAA was notified of this incident at 0700 on December 22, 1994, by MSO New Orleans who requested the SSC report on-scene. The SSC arrived at the MSO at 0800 and was briefed. NOAA supplied trajectories, oil fate and effects, weather forecasts, and a table predicting time of travel for the oil slick to given locations. NOAA coordinated with the refuge managers and the state to prioritize sensitive areas for protective booming strategies. The strategies were then discussed with the FOSC, RP, and the contractors before implementation.

The refuge managers saw no oil in the delta area during an overflight on December 23. Protective booming was in place and collection points were established along the left descending banks of the Mississippi. Shoreline assessments were done by the Louisiana Department of Environmental Quality and the USCG. The SSC was released from the scene at 1300, December 23, 1995.

References:

NOAA. 1993. *ADIOS™ (Automated Data Inquiry for Oil Spills) User's Manual.* Seattle: Hazardous Materials Response and Assessment Division, NOAA. 50 pp.

NOAA. 1995. Hotline 174. Seattle: Hazardous Materials Response and Assessment Division, Office of Ocean Resources Conservation and Assessment. 4 Reports

United States Coast Guard. 1994. POLREPS. New Orleans: United States Coast Guard, Marine Safety Office.

Name of Spill:	*Berge Banker*
NOAA SSC:	Ilene Byron
USCG District:	8
Date of Spill:	02/05/95
Location of Spill:	Galveston, Texas
Latitude:	28°35.0′ N
Longitude:	094°09.8′ W
Spilled Material:	Bunker C
Spilled Material Type:	4
Amount:	900 barrels
Source of Spill:	tank vessel
Resources at Risk:	**Fish**: seatrout, flounder, red drum, mullet, black drum, croaker, whiting **Crustaceans**: brown, white, and pink shrimp **Birds**: gulls, terns, pelicans **Marine Mammals**: dolphins **Reptiles**: loggerhead, possibly Kemp's Ridley turtles
Dispersants:	N
Bioremediation:	N
In situ Burning:	N
Other Special Interest:	high-use area, tourists
Shoreline Types Impacted:	sand beaches
Keywords:	satellite-transmitting buoys

Incident Summary:

On February 5, 1995, the M/V *Berge Banker* collided with the M/V *Skaubay* when preparing for lightering operations in the Galveston lightering area. The M/V *Skaubay* sustained a 25-foot gash on her port bow about 25 feet above the waterline. The *Berge Banker* sustained damage to a forward cargo tank. Based on tank soundings, the *Berge Banker* released 900 barrels of Bunker C into the water. On February 16, tarballs from this spill began coming ashore on the beaches near Corpus Christi, Texas, 140 miles away.

Behavior of Oil:

Bunker C sheens less than a crude or lighter fuel oils when it is spilled, thus making it less visible from the air. However, like other oils, Bunker C does break into droplets on the surface due to wave action. Because higher-viscosity oils such as Bunker C tend to have average droplet sizes larger than crudes, the tarballs remained buoyant around the lightering area although they were easily overwashed by waves. Once they were dispersed horizontally on the water surface, they were extremely difficult to see from aircraft; to the airborne observer, the oil seemed to have disappeared. The slick was lost from sight for several days.

Bunker C is a persistent oil and did not readily dissipate, dissolve, or evaporate. This oil causes physical coating because only a small fraction is water soluble. The Aquatic organisms were very unlikely to uptake the oil, especially since the source of the release was so far offshore; there was no shallow water to concentrate the water soluble fractions.

Tarballs from a persistent oil can travel hundreds of miles virtually unobserved. Transported by winds and currents, they may be overwashed by waves and actually spend some fraction of the time under water (typically in the upper few meters of the water column). Should the oil reach a natural collection area such as a convergence line or a beach, the tarballs can recoalesce into a contiguous slick. Such events in the past have led to

reports that oil has somehow mysteriously sunk in one area, moved subsurface as a single patch, and then refloated hundreds of miles away, which is what happened in this spill. On February 16 tarballs began hitting the beach on the Gulf side of Matagorda Island and continued to impact beaches until March 3 when small tarballs were reported on Port Isabel city beaches.

Countermeasures and Mitigation:

The Marine Spill Response Corporation (MSRC) M/V *Texas Responder* and National Response Center (NRC) M/V *Admiral* were contracted to attempt offshore skimming. Because of adverse weather, only five barrels were recovered and the ships were demobilized on February 8.

The predominant shoreline along the impacted area of the Texas coast is sand beaches. Almost no oil penetrated the sediments; the oil was stranded on the beach, then buried by sand. Recovery operations were labor-intensive with hundreds of workers contracted to manually pick up the tarballs with shovels. Some of the less contaminated sand was used to rebuild damaged dunes.

Scattered along the shoreline are inlets and overwash areas that lead to extensive salt marsh environments. These salt marshes are very sensitive to oil. Oil will heavily coat all vegetation and animals that it touches. Protective booming was put in place in these areas and around areas where sea turtles feed.

Other Special Interest Issues:

The impacted areas were high-use recreation areas with a large number of spring break vacationers. Hundreds of workers were contracted to expedite cleanup.

NOAA Activities:

NOAA was notified of the incident on February 5, 1995, by MSO Galveston who asked for dispersant and in-situ burning recommendations. The SSC went through the RRT VI FOSC Pre-approved Dispersant Use Manual Worksheet with the MSO and determined that dispersant use was not appropriate because of the heaviness of the product. Moreover, there was no plan in place for dispersant application. The option of burning was also rejected because of the product type and the weather. NOAA provided information on the resources at risk, the behavior of the oil, and a trajectory. NOAA arranged to have satellite-transmitting buoys sent to the MSO for deployment on the oil slick.

When tarballs began hitting the beach at Matagorda Island, NOAA was called to determine the source of the oil. From analyses of samples sent to LSU, it was determined that the source of the tarballs was the *Berge Banker*.

References:

NOAA. 1993. *ADIOS™ (Automated Data Inquiry for Oil Spills) User's Manual.* Seattle: Hazardous Materials Response and Assessment Division, NOAA. 50 pp.

NOAA. 1995. Hotline 173. Seattle: Hazardous Materials Response and Assessment Division, Office of Ocean Resources Conservation and Assessment. 14 Reports

Research Planning Institute. 1979. *Sensitivity of Coastal Environments and Wildlife to Spilled Oil: Galveston Bay Region, Texas*. Boulder, Colorado: Office of Marine Pollution Assessment, NOAA. 19 maps.

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide.* NOAA Technical Memorandum NOA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

Name of Spill:	T/V *Florida Express*
NOAA SSC:	Ilene Byron
USCG District:	8
Date of Spill:	02/27/95
Location of Spill:	Galveston Lightering Area, Gulf of Mexico
Latitude:	28°30.63' N
Longitude:	094°30.35' W
Spilled Material:	Bunker C
Spilled Material Type:	4
Amount:	200 barrels
Source of Spill:	tank vessel
Resources at Risk:	**Fish**: seatrout, flounder, red drum, mullet, black drum, croaker, and whiting. **Crustaceans**: brown, white, and pink shrimp. **Birds**: gulls, terns, and pelicans **Mammals**: Dolphins **Reptiles**: Loggerhead and possibly Kemp's Ridley turtles
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	A collision occurred in this approximate area three weeks prior, spilling 900 barrels of Bunker C and impacting 100 miles of shoreline.
Shoreline Types Impacted:	none
Keywords:	satellite-transmitting buoys

Incident Summary:

On February 27, 1995, a fire and a series of explosions in the #2 and #3 cargo tanks destroyed the integrity of six forward cargo tanks on the T/V *Florida Express*'s port side. The explosion created several large cracks in the vessel's side shell. Resulting damages severely threatened the vessel's structural integrity and overall stability and released approximately 200 barrels of oil into the Gulf of Mexico, with the potential to release over 8,000 barrels of oil.

Behavior of Oil:

Bunker C sheens less than a crude oil and lighter fuel oils when it is spilled. This made it less visible from the air. However, like these oils, it did break into droplets on the surface due to wave action.

Countermeasures and Mitigation:

The *Florida Express* was lightered and transited to Port Arthur for repairs. No oil was recovered.

NOAA Activities:

NOAA was notified of the incident on February 27, 1995, by MSO Galveston. The next day, the SSC was requested on-scene to help track the movement of the oil, and did so on overflights until poor weather after March 3 restricted air operations. NOAA was released from the scene on March 3 after arranging for the deployment of satellite transmitting buoys on the oil slick to help track the oil.

References:

NOAA. 1993. *ADIOS™ (Automated Data Inquiry for Oil Spills) User's Manual.* Seattle: Hazardous Materials Response and Assessment Division, NOAA. 50 pp.

NOAA. 1995. Hotline 175. Seattle: Hazardous Materials Response and Assessment Division, Office of Ocean Resources Conservation and Assessment. 8 Reports

Name of Spill:	Rockefeller Wildlife Refuge
NOAA SSC:	Ilene Byron
USCG District:	8
Date of Spill:	3/13/95
Location of Spill:	Grand Chenier, Louisiana
Latitude:	29°32′ N
Longitude:	92°5′ W
Spilled Material	natural gas and condensate
Spilled Material Type:	1
Amount:	40 barrels
Source of Spill:	pipeline
Resources at Risk:	**Fish**: redfish, garfish **Birds**: waterfowl, shorebirds **Reptiles**: alligators **Terrestrial Mammals**: deer, raccoon, muskrat **Management Areas**: Rockefeller Wildlife Refuge
Dispersants:	N
Bioremediation:	N
In-situ Burning:	**Y**
Other Special Interest:	in-situ burning operations, air monitoring, ecological and chemical monitoring studies being conducted
Shoreline Types Impacted:	brackish marsh
Keywords:	containment boom, in-situ burning, PM-10 monitoring

Incident Summary:

At 1830 on March 13, 1995, the Rockefeller Wildlife Refuge, six miles east-southeast of Grand Chenier, Louisiana, was notified of a possible leak at the Price Lake Unit. Louisiana Department of Wildlife and Fisheries and Mobil pipeline personnel surveyed the area and identified the leak on March 14. The pipeline was shut down at that time and the pipeline finished bleeding down on March 17. Approximately 40 barrels of residual condensate oil contaminated approximately 55 acres of difficult-access marsh lands. An in-situ marsh burn was initiated on March 17 to remove the condensate on the marsh and facilitate repair of the pipeline.

Behavior of Oil:

Because of dikes and water-level control structures, a break in the pipeline allowed the oil spread to over 55 acres of normally nontidal marsh,

Countermeasures and Mitigation:

Because of the sensitive marsh habitat, the spilled oil could not be mechanically removed. On March 17 an in-situ burn was initiate, using lines of hay laid across the site as a wicking material. The oiled marsh readily ignited and burned the heavily oiled area only.

Other Special Interest Issues:

Although no air monitoring was required by state law or the RRT, limited air monitoring was conducted prior to and during the burn by the USCG GST. Also, LSU, in cooperation with the Rockefeller Wildlife Refuge, the Louisiana Oil Spill Coordinator, and NOAA began ecological and chemical monitoring studies to assess the recovery of the unburned and burned marsh.

NOAA Activities:

NOAA was notified of this incident on March 16, 1995, and was asked to come on-scene to help evaluate the feasibility of a marsh burn. NOAA helped develop a burn plan. The SSC also coordinated air monitoring with the GST on-scene and ecological and chemical monitoring with LSU.

References:

Hess, T. Rockefeller Refuge Preliminary Spill Assessment, Louisiana Department of Wildlife and Fisheries. Unpublished report.

Louisiand State University. 1995. *Rockefeller Refuge In-Situ Burn: Preliminary Report.* Seattle: Hazardous Materials Response and Assessment Division, National Oceanic and Atmospheric Administration.

Name of Spill:	Ferrous Sulfate Barges
NOAA SSC:	Kenneth Barton and James Illg
USCG District:	8
Date of Spill:	06/16/95
Location of Spill:	Waveland, Mississippi
Latitude:	30°15' N
Longitude:	89° 33' W
Spilled Material:	ferrous sulfate (dry cargo)
Spilled Material Type:	5
Amount:	unknown, potential for 1,500 tons.
Source of Spill:	hopper barges
Resources at Risk:	**Habitat**: freshwater marsh, submerged aquatic vegetation **Fish**: estuarine fish
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	incident-specific on-site convening of RRT IV, possible chronic releases of ferrous sulfate
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

The exact date and time of this release is uncertain but USCG and NOAA involvement began June 16, 1995. It is possible that the release was gradual over the course of weeks or months until the material released reached a level that caused a visible reaction in the waters of the barge canal. The spill site is actually two water bodies; an industrial barge canal in Bienville Industrial Park and a freshwater riverine/marsh habitat in the adjacent Mulatto Bayou. Mulatto Bayou runs somewhat parallel to the barge canal with several bank cuts allowing water interchange between the two.

Hopper barges RL-224 and RL-229 had been alongside the industrial park at the dead end of the barge canal for several weeks and several months, respectively. Their cargo of dry ferrous sulfate was destined for Eaglebrook Inc. but was rejected because it was out of specification for their needs. Ferrous sulfate is reacted in a controlled situation by Eaglebrook to make a flocculating agent used in wastewater treatment. As the barges waited at the industrial park pending final disposition, it is believed that water entered the barges through holes in their wing tanks and then, through free communication with the hoppers themselves, made contact with the cargo. During the response the contaminated water in the hoppers was found to have a pH of approximately 2.0. The contaminated water in the wing tanks was found to have a pH of approximately 3.0. This water, carrying unreacted product, is thought to have escaped the barge and entered the barge canal.

It is believed that the contamination, at first localized near the barges, was eventually carried by tidal movement through primarily one bank cut into Mulatto Bayou. It moved up the two forks of the bayou one and a half to two miles. Fish kills were reported in the bayou, but shoreline and floating vegetation seemed only marginally affected. The pH levels, measured in the ship canal and the bayou early in the response, ranged between 3.0 and 3.5. Dissolved oxygen levels were near zero.

The RP, under the guidance of the USCG FOSC, immediately began preparations to stabilize the barges. This involved pumping the free liquid from the wing tanks and hoppers into a liquid cargo barge brought alongside. Following inspection by a marine chemist, the wing

tanks were entered and holes in the hull repaired. The remaining product in the hoppers was transferred to a dry-cargo barge brought alongside. Approximately two weeks after the response began, FOSC's approval was received to tow the two barges to a drydock in New Orleans.

The State of Mississippi OSC, concerned about the perceived slow pace of salvage and removal operations and the general level of response to the incident, requested an RRT IV conference call. The call was held on the morning of June 16 and resulted in agreement by members to convene the RRT on-site later that day. The intent of the meeting was to consider chemical treatment of the contaminated waters with dry sodium hydroxide to raise the pH from the ambient levels of 3.0 and 3.5. This countermeasure was almost immediately dismissed for its impracticality as well as the danger of accidentally raising the pH to an alkaline state.

It was decided at a multi-agency meeting that time and natural flushing were the only available methods to restore the water bodies to their estimated pre-spill condition. A water sampling and monitoring program was implemented on June 17. Sampling stations in both water bodies were designated and monitoring for pH, dissolved oxygen, and conductivity was undertaken. The state OSC determined that when pH levels reached a minimum of 5, along with rising dissolved oxygen, the site would be on par with pre-spill conditions. Monitoring the barge canal and bayou showed a steady trend of slowly rising pH and dissolved oxygen levels. Levels fluctuated with the tidal cycle but the trend was gradually upward indicating the effectiveness of natural flushing in restoring water quality.

RRT members requested that the program be extended to include sediment samples near the barge. Their intent was to characterize the site and fully assess the likelihood of chronic releases of this product and other pollutants there. The FOSC and the RP's representative questioned this request, determining that this was not within the scope of the removal operations and asked for further justification for the additional sampling. NOAA prepared an assessment of the RRT's biological/sediment sampling and analysis plan at the FOSC's request. Each issue raised by the state and the RRT members was addressed and it was determined that, for this response, a more modest sampling scheme was all that was required. Further site assessment for other chronic problems was justified but not for this particular response. As a result of this decision, the USCG FOSC remained in charge of the actual removal operation and the U.S. EPA assumed responsibility for the site assessment.

Behavior of Spilled Material:

The spilled ferrous sulfate underwent a reaction with the available oxygen in the water, producing ferric sulfate, which adheres to sediment and detrital matter in the water column and forms flocs. When the flocs reach sufficient size they settle on the bottom. The flocs that remain suspended give the water an orange hue. The initial reaction depletes the dissolved oxygen in the water. This indirect effect, rather than chemical toxicity, kills organisms living in the water column and bottom sediments. As part of the conversion of ferrous sulfate to ferric sulfate, hydrogen ions are liberated. These ions are responsible for the lowering of the pH in affected water bodies.

Countermeasures and Mitigation:

No safe, practical, and effective countermeasures could be identified for treating the contaminated water bodies. Chemical neutralization of the affected areas was initially considered but later dismissed. Only natural flushing through the tidal cycle could be relied upon for site remediation. After two days of water sampling, it became apparent that the residual spilled material on the bottom of barge canal was acting as a continuous source of

contamination to Mulatto Bayou. Since the bayou was the priority water body to be protected, the state recommended that a physical barrier be erected to eliminate water movement between the bayou and barge canal. The RP erected a sheet pile barrier at the first bank cut between the two water bodies.

Other Special Interest Issues:

An unprecedented, incident-specific, on-site convening of RRT IV was arranged to consider chemical neutralization of affected waters. This spill is most likely an acute event indicative of chronic releases of this product at this location.

NOAA Activities:

NOAA was notified of this incident on June 16, 1995, by the USCG FOSC and asked to report on-scene. The NOAA team arrived on-scene at 1330, June 16 and remained involved with this incident until released by the FOSC at 1500, June 20. In addition to providing scientific coordination of the monitoring program, the SSC team provided weather forecasts, tidal predictions, resources-at-risk assessments, and chemistry support. Chemistry support was extremely valuable given the nature of the spilled material, the uncertainty of its reaction with water, and its anticipated effect upon the environment.

References:

Barton, K. 1995. Memorandum from LCDR Kenneth Barton, NOAA to CDR Doug Lentsch, USCG; Response and Monitoring Concerns for the Ferrous Sulfate Release, Port Bienville, MS, 19 June 1995. New Orleans: Hazardous Materials Response and Assessment Division, National Oceanic and Atmospheric Administration.

NOAA. 1993. *The CAMEO™ 4.0 Manual.* Washington, D.C.: National Safety Council. 440 pp.

NOAA. 1994. *Shio. Tides computer program*. Seattle: Hazardous Materials Response and Assessment Division, National Oceanic and Atmospheric Administration.

NOAA. 1995. Hotline 181. Seattle: Hazardous Materials Response and Assessment Division, Office of Ocean Resources Conservation and Assessment. 6 Reports

Name of Spill:	M/V *Alexia* and M/V *Enif*
NOAA SSC:	Ilene Byron
USCG District:	8
Date of Spill:	07/01/95
Location of Spill:	Southwest Pass, Louisiana
Latitude:	28°47′ N
Longitude:	089°19′ W
Spilled Material:	diesel, IFO 180
Spilled Material Type:	2, 4
Amount:	900 barrels
Source of Spill:	non-tank vessel
Resources at Risk:	**Fish**; shad, sunfish, crappie, largemouth bass, catfish, Gulf menhaden, spotted seatrout, red drum, flounder, sheepshead, bay anchovy, spot, black drum, Atlantic croaker
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	Corexit 9527, salvage, potential spill

Incident Summary:

On July 1, 1995, at 0030, the 754-foot Greek-flagged cargo ship *Alexia* collided with the 514-foot Singapore-flagged ship *Enif* approximately six miles south of Southwest Pass, Louisiana, near the entrance of the Mississippi River into the Gulf of Mexico. The *Alexia's* bow was imbedded in the *Enif*, just aft of amidships and approximately halfway through her beam. The weather at the time of the accident was seven-knot winds from the north, one-foot seas, and ten-mile visibility. The *Enif* spilled approximately 50,000 gallons of mixed diesel and IFO 180 at the time of the collision. The *Alexia* reported a 12-foot gash below the waterline, but no spills. On the morning of July 4 the ships were separated with only sheens reported around the *Enif*. The ships were surveyed, lightered, and allowed to enter Mobile for repairs.

Behavior of Oil:

Overflights followed the slick from the collision for three days before losing sight of it.

Countermeasures and Mitigation:

No recovery operations were successful, although a plan for using dispersants was in place and approved by the RRT in the event of a catastrophic release. Before separating the ships, they were towed to deep water 25 miles off Southwest Pass. Grounding or sinking the ships was considered but ruled out. The separation of the ships was successful and the high threat of a catastrophic release of the fuel oil was reduced.

NOAA Activities:

NOAA was notified of this incident on July 1, 1995, by MSO New Orleans and requested at the command center. The SSC supplied weather and actual and potential trajectories for the movement of the oil. NOAA also secured a sample of the spilled product and determined that it was dispersible with Corexit 9527. NOAA participated in the RRT conference calls in support of dispersants and discussions of options for removing the oil pollution threat. The SSC was released from the command center on July 4 after the ships were successfully separated.

References:

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide.* NOAA Technical Memorandum NOAA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

U.S. COAST GUARD DISTRICT 11

Name of Spill:	Santa Fe Pacific Pipeline
NOAA SSC:	Jim Morris
USCG District:	11
Date of Spill:	12/22/94
Location of Spill:	San Diego, California
Latitude:	32°47.0' N
Longitude:	117°06.5' W
Spilled Material:	Aviation-A fuel
Spilled Material Type:	1
Amount:	950 barrels
Source of Spill:	facility
Resources at Risk:	**Habitats**: extensive wetlands, freshwater marshes, freshwater swamps, vegetated riverbank **Birds**: diving coastal birds, waterfowl, alcids, wading birds, gulls, foraging areas, wintering areas, migration stopover areas, migratory routes
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Keywords:	containment boom, endangered species, evaporation, low-pressure washing, shallow water recovery, siphon dams, skimmers, sorbent boom, sorbent pompoms, vacuum trucks

Incident Summary:

During the early afternoon of December 22, 1994, Santa Fe Pacific Pipeline (SFPP) reported that their facility in San Diego, California accidentally spilled Aviation-A fuel into San Diego Creek. The creek empties into the San Diego River at the southeast corner of the parking lot next to Jack Murphy Stadium (between interstates 15 and 805). Originally, it had been reported that 500 to 1,000 gallons of product had bypassed an oily-waste treatment facility at the tank farm, been pumped directly to a charcoal filtration system, and then discharged into the creek.

As the spill response progressed, the SFPP reported that approximately 60,000 gallons of Aviation-A fuel may have been pumped to the charcoal filtration system. The filter had been secured once the spill had been discovered, but as much as 40,000 gallons of product may have been discharged into the creek. The holding capacity of the filtration system is about 20,000 gallons.

Responders acted quickly and were able to keep oil from reaching Mission Bay about six miles away. A series of nine booming sites was established along the river to contain and absorb any product as it traversed the river. The sites were composed of a combination of harbor and sorbent booms. In the upper reaches of the river, which experienced most of the impact, disc skimmers were deployed to recover free-floating product. By the time the skimmers were demobilized, more than 12,000 gallons of fuel had been recovered.

San Diego Creek is approximately 10 yards wide and the distance from the point of the discharge to the confluence of the San Diego River is roughly 1,000 yards. The creek bed is composed of pebbles and cobbles and is not vegetated. The bank is composed of mud and vegetated with various types of grasses and weeds. The impact to the creek was moderate. The light oil soaked a few inches into the mud bank as it moved downstream. Sediment samples taken from the bank easily produced a sheen when placed into the creek. A

meeting was held in the field with EPA, NOAA, USFWS, California Fish and Game, and representatives from SFPP to discuss the contaminated creek bank. The options that were discussed included;

- ❒ No action
- ❒ Build dams along the river to raise the water level in the river to allow for increased flushing.
- ❒ Till the creek bed and bank.
- ❒ Bioremediate.

SFPP produced an options paper for the trustee agencies' review describing how they intended to remove the oil from the creek bank.

The area of the confluence of the creek and the river received the greatest amount of residual contamination. Apparently, the flow of oil was so great at the outset of the spill that the oil did not readily flow down the river, most likely because of the river's limited carrying capacity. The oil pooled at the confluence and penetrated into the sediment. Holes dug into the sediment at this point showed that there was considerable contamination from the surface down one to one and a half feet to the water table.

Behavior of Spilled Material:

The light aviation fuel evaporated rapidly. At some locations along the river, where the vegetation was thick, small concentrations of product were noted; however, the free-floating fuel mainly produced sheens in the creek. Trenches dug in the creek bed produced a dark-brown material that pooled at the bottom of the trench. This material was most likely an oil-sediment mixture.

Countermeasures and Mitigation:

The recoverable fuel was picked up using sorbents, rope mops, and disc skimmers. Some of the product became entrapped in the vegetation and had to be flushed out using moderate pressure, ambient-temperature water, and sorbents. No vegetation was cut. At the confluence of the river where there was penetration of the product into the riverbed, trenches were dug to collect the oil with sorbents.

NOAA Activities:

NOAA was notified of this incident on December 22, 1994, by MSO San Diego. The FOSC requested that the SSC be on-scene December 27. The spill occurred in EPA's zone but the USCG initiated the response. On the evening of December 27, the duties of the FOSC were transferred to EPA.

The SSC was asked to provide a series of reports for various products and amounts because the amount and type of product spilled were initially not known. The SSC went on-scene December 27.

The SSC represented the FOSC at the daily planning meetings and conducted field surveys of the impacted areas. Additionally, the SSC received daily forecasts from the local National Weather Service Office and passed them along to the responders.

NOAA provided information on the pros and cons of various cleanup operations in and around river vegetation and cleanup options for the contaminated vegetation, including vegetation cutting.

References:

NOAA. 1993. *ADIOS™ Automated Data Inquiry for Oil Spills) User's Manual*. Seattle: Hazardous Materials Response and Assessment Division, NOAA. 50 pp.

Name of Spill: Port of Los Angeles Hydrochloric Acid Release
NOAA SSC: Jim Morris
USCG District: 11
Date of Spill 07/20/95
Location of Spill: Wilmington, California
Latitude: 33°49.6' N
Longitude: 118°14.7' W
Spilled Material: hydrochloric acid
Spilled Material Type: 5
Amount: 2,700 gallons
Source of Spill: facility
Resources at Risk: none
Dispersants: N
Bioremediation: N
In-situ Burning: N
Other Special Interest: N
Shoreline Types Impacted: none
Keywords: none

Incident Summary:

On July 20, 1995, the Wilmington, California Department of Water and Power facility experienced a release of hydrochloric acid from a ruptured 2,700-gallon holding tank. The acid ran into a bermed containment area. The local fire department was on-scene and evacuated about 300 people from a ten-block area. Another tank, holding ammonium fluoride, was in the area and caused some concerns about a reaction if the two chemicals mixed.

Vacuum trucks were brought on-scene to remove the hydrochloric acid from the containment area. The second tank remained intact and the incident was closed July 21.

NOAA Activities:

NOAA was notified of this incident on July 20, 1995, by MSO Los Angeles/Long Beach. The MSO needed information about the reaction of the spilled chemical and the reaction mixing the two chemicals would cause.

NOAA told MSO that hydrochloric acid could be neutralized by using sodium bicarbonate, soda ash, limestone, calcium, or quick lime. Any reaction between hydrochloric acid and ammonium fluoride would be mildly exothermic and yield relatively safe, water-soluble compounds, unless hydrogen fluoride formed. Hydrogen fluoride is highly corrosive and can evaporate to cause a toxic gas but this product would only be produced in small amounts.

U.S. COAST GUARD DISTRICT 13

Name of Spill:	F/V *Yardarm Knot* Fire/Chlorine Release
NOAA SSC:	Sharon K. Christopherson
USCG District:	13
Date of Spill:	10/26/94
Location of Spill:	Seattle, Washington
Latitude:	45˚32.9' N
Longitude:	122˚42.0' W
Spilled Material:	chlorine, ammonia
Spilled Material Type:	5
Amount:	1,200 pounds chlorine unknown amount of ammonia; 3,000 pounds potential
Source of Spill:	non-tank vessel
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	containment boom

Incident Summary:

The USCG MSO Puget Sound received a report of a fire on the F/V *Yardarm Knot* at 0830 on November 8, 1994. The vessel was moored at the Coastal Transport dock on the ship canal in Ballard, a suburb of Seattle, Washington. At the time of the fire, there were 70,000 gallons of #2 fuel oil in the double-bottom fuel tanks, one 3,000 pound tank of anhydrous ammonia, various cans of paint products, and eight 150-pound cylinders of chlorine onboard. An unknown amount of chlorine was released during the fire and 15 firefighters suffered respiratory distress and minor skin irritation. The USCG MSO dispatched a USCG Fire Fighting Coordinator, hazardous material team, and a 41-foot patrol boat to assist the Seattle Fire Department Incident Commander.

The fire started in the forward part of the processing area of the vessel when a welding spark fell on combustible material. The fire spread to the lower deck and forward to the forecastle, causing extensive damage to the factory processing area. Smoke from the fire necessitated closing the Ballard Bridge to traffic. The main fire was extinguished at 1130, but the vessel contained hot spots and continued to have small flare ups through the night and into the next day. Chlorine levels continued to be detected on the vessel and on the dock alongside, but, due to the threat of re-flash, the Seattle Fire Department suspended efforts to mitigate the potential chlorine release until November 10. A USCG hazardous material team member remained on-scene with the Seattle Fire Department overnight fire watch. A unified command was set up among the USCG, State of Washington, vessel owner, and the Seattle Fire Department to address the continuing threat of a chlorine and/or ammonia release from the vessel. The unified command met several times November 9 and 10 to review plans for site safety, the proposed repair and removal of the chlorine cylinders, ventilation of lower compartments, and vessel salvage.

The chlorine threat was mitigated, the fire completely extinguished, and the vessel declared safe for entry by the morning of November 10. The vessel was towed to Northlake Shipyard for repairs.

Behavior of Spilled Material:

Neither the 70,000 gallons of diesel in the double-hull nor the four 55-gallon drums of gasoline on the forecastle were involved in the fire.

The Ballard Bridge, located approximately 250 yards downwind of the fire, was enveloped in smoke and closed to traffic until the fire was extinguished. After the fire was out, air monitoring by the marine chemist on the dock alongside the vessel indicated chlorine readings of 2 to 5 ppm. Several times in the afternoon after the main fire was extinguished, responders vacated the field command post located on the dock beneath the vessel's bow because of high levels of chlorine.

There was a small flare-up of the fire at approximately 2000 on November 8 and increased chlorine levels were detected. A strong chlorine smell at the Seattle Maritime Training Center directly across the ship canal from the *Yardarm Knot* resulted in the cancellation of classes and building evacuation.

Air monitoring on the vessel's port and starboard factory decks by the hazardous material team found chlorine readings between 7 and 16 ppm during the early morning hours of November 9. The Seattle Fire Department hazardous material team located eight 150-pound bottles of chlorine, all showing signs of release (frost around the bottom of the cylinder and/or greenish yellow vapor). Repetitive surveys by the hazardous material team were required to locate all eight cylinders due to the dark, the large quantity of burn debris, the threat of re-flash, and the vessel master's inability to identify the exact number and location of the cylinders onboard. Intermittent air monitoring through the morning of November 9 found steadily decreasing levels of chlorine until, at 1300, it was no longer detectable. No ammonia was detected at any time during this monitoring.

Countermeasures and Mitigation:

This incident caused no oil pollution. The USCG put 1,000 feet of containment boom and a pollution response vessel in stand-by on-scene during the early stages of the fire, but did not deploy them.

On November 9 the vessel owner hired a commercial company to assess the leaking chlorine cylinders and make them safe to remove. A survey at 1100 determined that all eight tanks were empty. Through discussions with the unified command, it was determined that since the chlorine cylinders appeared to be empty, it would be adequate to replace the fusible plugs on each of the tanks before removing them from the vessel. This was completed at 1450. Ventilation of the lower compartments of the vessel was initiated by the Seattle Fire Department at 1630. The USCG COTP instituted a safety zone November 9 until the survey of the leaking chlorine cylinders and the initiation of the ventilation by the Seattle Fire Department to rid the lower deck compartments of any remaining chlorine, ammonia, or toxic by-products from the fire could be completed.

The fire was declared completely extinguished the morning of November 10. During an initial boarding by the marine chemist November 10, an ammonia leak was detected at a level of 300 ppm in one of the lower deck compartments. A refrigeration team secured the valves and stopped the discharge. The chemist declared the vessel safe for entry with the exception of this one compartment, which was secured.

Other Special Interest Issues:

The USCG icebreaker *Polar Star* thermal sensor, Naval Fire Fighting Thermal Imager (NFFTI) was used by the Seattle Fire Department hazardous material team to identify hot spots for the fire fighters.

NOAA Activities:

NOAA was notified of the incident at 1600 on November 8, 1994, by MSO Puget Sound who asked the SSC to help develop a COTP Safety Zone for response operations. NOAA provided hard copy of the CAMEO™ response information and data sheets for chlorine and ammonia. In addition, NOAA provided site-specific weather forecasts for response and salvage operations.

NOAA contacted Chemtrec and worked with a local industry chemist to ascertain the most probable chlorine release scenarios during the fire and future response activities (including re-flash) to assess risk to the public from exposure and recommend a safety zone boundary to the COTP. Each chlorine cylinder was equipped with a .25- to .75-inch diameter fusible safety plug, designed to melt if exposed to 155°- to 165°-F temperatures to prevent over pressurization. During the initial fire, the fusible safety plugs of any cylinder exposed to the fire would have melted and released most of the tank's contents. NOAA estimated that a plume of chlorine at concentrations that would be irritating (3 ppm) could travel up to three-quarters of a mile downwind in the absence of a fire. However, since the fire (depending on the temperature reached) would cause the plume to rise, it could disperse well above ground level. Depending on how hot the tank got, a small residual amount of chlorine could remain in the tank after the fire was extinguished and continue venting. In this event, the tank would need to be capped by a hazardous material team using an "A Kit." If local expertise was not available, CHLOREP teams had been identified in Bellingham and Tacoma.

If cylinder or valve integrity was lost due to handling or reignition of the fire, a significant release of chlorine could again be possible. Depending on the quantity of chlorine in the cylinder, a plume at the Emergency Response Planning Guideline dangerous concentration (20 ppm) could travel as far as one-quarter mile downwind. This plume could travel as far as one-half mile before dispersing to a point where it would no longer be strongly irritating (3 ppm).

The SSC also responded on-scene to participate in unified command meetings and provide technical assistance to the COTP when the site safety plans for chlorine mitigation and ventilation operations were reviewed.

References:

NOAA. 1992. *The ALOHA™ 5.1 Manual for the Apple Macintosh and IBM Compatibles*. Washington, D.C.: National Safety Council. 350 pp.

NOAA. 1993. *The CAMEO™ 4.0 Manual.* Washington, D.C.: National Safety Council. 440 pp.

United States Coast Guard. 1994. POLREP (One through Five and Final) Potential Medium, Vessel Fire, F/V *Yardarm Knot*, Lake Union Ship Canal, MC 94023015, FPN 13-5008, November 9, 1994. Seattle: United States Coast Guard, Marine Safety Office, Puget Sound.

Name of Spill:	T/B *Conuma River*
NOAA SSC:	Sharon K. Christopherson
USCG District:	13
Date of Spill:	12/6/94
Location of Spill:	Hyelbos Waterway, Tacoma, Washington
Latitude:	46°16.3'N
Longitude:	122°23.0''W
Spilled Material:	sodium hydroxide
Spilled Material Type:	5
Amount:	12,600 pounds contained on deck 1,260 pounds spilled into waterway
Source of Spill:	chemical tank barge
Resources at Risk:	salmonid fry
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	N
Shoreline Types Impacted:	riprap
Keywords:	none

Incident Summary:

At 1340 on December 6, 1994, MSO Puget Sound received a report that the barge *Conuma River* spilled 2,000 gallons of sodium hydroxide at the ATOCHEM facility in Tacoma, Washington. The spill occurred after the cargo transfer to the barge had been completed. Air forced into the lines to purge them, resulted in the product being pushed back into the barge and overflowing the tank vents. A total of 200 gallons of sodium hydroxide entered the water. The remaining 1,800 gallons was contained on the deck and cleaned up.

Behavior of Spilled Material:

The product spilled was a 50 percent by weight solution of sodium hydroxide. This solution is a strong corrosive, soluble in water, and has a specific gravity of 1.25. The spill occurred at slack tide with minimal water movement near the barge. The material spilled into the water had a tendency to sink and dilute within 100 to 200 yards of the barge. The pH was easily buffered by the salts in the seawater.

Countermeasures and Mitigation:

Product discharged into the water dissipated. Material spilled on the deck was recovered by vacuum truck, neutralized, and disposed of.

NOAA Activities:

NOAA was notified of this incident on December 6, 1994, and provided information on the behavior of spilled sodium hydroxide and its likely dilution zone. The SSC also made recommendations for cleanup and neutralization of spilled material on deck. Although there was the potential for a localized fish kill, none was observed.

References:

Hawley, Gessner G. 1993. *The Condensed Chemical Dictionary, Twelfth Edition*, New York: Van Nostrand Reinhold Company. pp 1058-1059

NOAA. 1993. *The CAMEO™ 4.0 Manual.* Washington, D.C.: National Safety Council. 440 pp.

NOAA. 1994. *Shio. Tide computer program (prototype).* Seattle: Hazardous Materials Response and Assessment Division, NOAA.

United States Coast Guard. 1994. DTG P 0701358 DEC 94 Z. POLREP One and Final, Minor, 200 Gal sodium hydroxide, barge *Conuma River*, Hyelbos Waterway, MC940347663. Seattle: United States Coast Guard, Marine Safety Office, Puget Sound.

Name of Spill:	Crowley Marine Services Barge 101
NOAA SSC:	Sharon K. Christopherson
USCG District:	13
Date of Spill:	12/31/94
Location of Spill:	Guemes Island, Puget Sound, Washington
Latitude:	48˚35.0'N
Longitude:	122˚37.0'W
Spilled Material:	marine diesel
Spilled Material Type:	2
Amount:	620 barrels spilled 63,000 barrels (potential)
Source of Spill:	tank barge (non-self-propelled)
Resources at Risk:	waterfowl, harbor seals, kelp beds, shellfish
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	cause of the damage to the barge is unknown
Shoreline Types Impacted:	none
Keywords:	portable disk and skimpac skimmers, International Bird Rescue and Research Center

Incident Summary:

The Crowley Marine Services Barge 101 under tow by the tug *Mercury* from Vancouver, British Columbia to Guemes Island, Washington for bunkering operations, lost approximately 26,000 gallons of marine diesel somewhere en route. The barge and tow departed Vancouver at 1500 on December 30 and the spill was detected by personnel on the tug as they moored alongside the barge upon reaching Guemes Island at 0100 on December 31. Sheen was seen bubbling up from the bottom of the barge near the #6 starboard tank. Crowley deployed boom around the barge and started recovery operations within the boom using portable disk skimmers. Divers surveyed the vessel and discovered a 4-foot by 4-inch gash in the #6 starboard tank 18 feet below the water line, and a 6-inch long crack in the #4 starboard tank; no oil was seen leaking from either damaged tank. The #5 starboard tank showed signs of damage but had not been holed. Divers patched the holes in both damaged tanks and operations to lighter the entire 63,000 barrels of cargo before moving the damaged barge were begun. Lightering took place in three separate off-loading operations using a second tug and tank barge that subsequently off-loaded to the T/V *Ocean Spirit* anchored nearby. Lightering was completed at 1300 on January 1, 1995, and Barge 101 was towed by tug *Mercury* to Terminal 115 in the Duwamish Waterway, Seattle, Washington, to await inspection in a dry dock.

Behavior of Oil:

The product was a Chevron marine diesel The NOAA ADIOS model predicted evaporation of 49 percent of the spilled oil in the first 12 hours and 76 percent by the end of 24 hours. The initial overflight at first light on December 31 showed areas of heavy sheen between Guemes and Vendovi islands, with lighter sheens just off the east side of Guemes Island. The Canadian Coast Guard reported no oil in Canadian waters, but did report seeing unrecoverable streamers of sheen or oil in the vessel traffic lanes between Point Robert and the entrance to Rosario Straits. There was no confirmation of this sighting in later overflights. No recoverable concentrations of oil were observed outside the booms surrounding Barge 101. Under the influence of minimal tidal actions and light northeast winds, the spill very slowly spread out until by early afternoon on December 31 there was discontinuous coverage of silver sheen between Vendovi Island, Laurence Point on Orcas

Island, and the southern tip of Guemes Island; heavier concentrations of silver and rainbow sheen were observed in Bellingham Channel between Guemes and Cypress islands. A stronger ebb tide in the late afternoon and continuing northeast winds finally began to move the sheen south through Rosario Strait. No signs of oil or sheen were seen on an overflight the morning of January 1.

Although sheen was observed in contact with the shorelines at Guemes, Cypress, and Orcas islands, shoreline surveys failed to detect any evidence of shoreline impacts.

Countermeasures and Mitigation:

Open-water recovery of oil trapped in the boom surrounding Barge 101 was conducted using portable disk and skimpac skimmers. No recoverable oil was found outside the boom and no shoreline impacts were reported.

The booming protection strategy in the San Juan Islands/North Puget Sound Geographic Response Plan, was deployed in Doe Bay December 31 to protect sensitive seabird foraging and bait-fish habitat. The strategy was somewhat modified to use a shorter 1,000-foot deflection boom (vice 2,000-foot exclusion boom) to take advantage of the action of tidal current. Observers on the afternoon overflight reported that the modified strategy had effectively kept oil out of Doe Harbor.

The Washington State Oiled Wildlife Coalition was placed on standby in the event large numbers of oiled birds were found, but was not activated. One oiled loon and one oiled buffalohead duck were recovered for rehabilitation. Volunteers from the Island Oil Spill Association in conjunction with the International Bird Rescue and Research Center checking beaches on the east side of Orcas Island and the west side of Guemes Island observed several small groups of birds (six to eight per group) swimming in the sheen. None of these birds was captured.

Other Special Interest Issues:

Investigations by Washington State and the USCG were unable to identify where the damage to the barge had occurred. The crew of the tug *Mercury* reported no incidents during the cruise that would indicate that the barge struck or grounded on some hard object capable of inflicting the observed structural damage. The cause of the incident is still under investigation.

NOAA Activities:

NOAA was notified at 0350 on December 31, 1994, by the USCG MSO Puget Sound who requested an initial trajectory, resources at risk, and weather forecast for spill response operations. The SSC responded on-scene at the Unified Command Post, providing technical support to the planning group trying to determine protection priorities.

At the FOSC's request, the SSC acted as the point of contact for coordinating with federal, state, and tribal resource trustees. The SSC coordinated with the Washington Department of Health concerning possible contamination of shellfish beds near the spill. The LumMi, Tulalip, and Point No Point Treaty Council tribal biologists were also notified. A small amount of sheen was observed in some private fish pens located in Deep Bay on the southeast side of Cypress Island. The owners were identified and notified.

Following the response, NOAA provided a hindcast trajectory to a USCG investigation team trying to determine where damage to the barge was most likely to have occurred, based on

observed behavior of the oil, tidal currents, and wind. While the evidence supports the possibility that damage to the barge and the initial release of oil probably occurred somewhere around Sinclair or Vendovi islands, rather than farther north, other scenarios could not be conclusively ruled out.

References:

NOAA. 1993. *ADIOS™ (Automated Data Inquiry for Oil Spills) User''s Manual.* Seattle: Hazardous Materials Response and Assessment Division, NOAA. 50 pp.

NOAA. 1994. *Shio. Tide computer program (prototype).* Seattle: Hazardous Materials Response and Assessment Division, NOAA.

NOAA. 1995. Hotline #172. Seattle: Hazardous Materials Response and Assessment Division, Office of Ocean Resources Conservation and Assessment. 8 Reports

Research Planning Institute. 1986. *Sensitivity of coastal environments and wildlife to spilled oil: Strait of Juan de Fuca and Northern Puget Sound.* An atlas of coastal resources. Seattle: Ocean Assessments Division, NOAA. 36 maps.

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide.* NOAA Technical Memorandum NOA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

United States Coast Guard. 1994. POLREPS One through Five and Final, Minor Crowley Marine Services Barge #101 Diesel Spill, North of Anacortes, WA, MC9426379, December 31, 1994. Seattle: United States Coast Guard Marine Safety Office, Puget Sound.

Washington State Department of Ecology. 1994. San Juan Islands/North Puget Sound Geographic Response Plan (GRP). Olympia: Washington State Department of Ecology.

U.S. COAST GUARD DISTRICT 14

Name of Spill:	F/V *Red October*
NOAA SSC:	Jim Morris
USCG District:	14
Date of Spill:	03/07/95
Location of Spill:	Oahu, Hawaii.
Latitude:	22°46′ N
Longitude:	158°32′W
Spilled Material:	diesel fuel
Spilled Material Type:	2
Amount:	200 barrels
Source of Spill:	non-tank vessel
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

On March 7, 1995, MSO Honolulu was notified that a 72-fishing vessel, *Red October*, was sinking in open water 74 miles northwest of Oahu in the Kauai Channel. The incident began on March 5 when the vessel started taking on water. By the afternoon of March 7 all the vessel's personnel had been safely removed and the vessel was still afloat. On-scene weather indicated that Kona conditions prevailed (winds contrary to the usual westerly tradewinds

MSO Honolulu's main concern was the impact of oil to the islands of Kauai and Niihau. On March 7, *Red October* was far enough from any sensitive areas that a catastrophic release of her fuel would be relatively harmless. A worst-case scenario would be if the vessel were to remain afloat long enough to get near an environmentally sensitive area and then have a catastrophic release.

NOAA Activities:

NOAA was notified of this incident on March 5, 1995, by MSO Honolulu who requested weather information. On March 8, the SSC contacted MSO Honolulu and was informed that *Red October* was still afloat, had not discharged any oil, and a tugboat was underway to tow her back to port. Owing to the Kona conditions the vessel had moved to the east and was located 70 miles north of Kahuku Point Oahu. The vessel was towed to port without incident. NOAA's involvement was entirely by telephone.

U.S. COAST GUARD DISTRICT 17

Name of Spill:	UNOCAL Platform Anna
NOAA SSC:	David Kruth and John W. Whitney
USCG District:	17
Date of Spill:	11/18/94
Location of Spill:	Granite Point oil field in Upper Cook Inlet, Alaska
Latitude:	60°58.37′ N
Longitude:	151°18.46′ W
Spilled Material:	Granite Point crude oil
Spilled Material Type:	2
Amount:	15 barrels
Source of Release:	platform
Resources at Risk:	N
Dispersants:	N
Bioremediation:	N
In situ burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

While conducting drilling operations, UNOCAL platform Anna pumped drill mud through an open valve into a skim tank. The tank overflowed onto the deck and into the platform deck drains, filling the deck drain tank with mud, displacing the water and oil. Approximately 125 barrels of mud were pumped into the half-full tank and about 60 barrels of a water and mud mixture, containing an estimated 15 barrels of crude oil, spilled into Cook Inlet. Cook Inlet Spill Prevention and Response Inc. (CISPRI) deployed its offshore recovery vessel, the *Banda Seahorse*, to the area. Cleanup and oil sightings were hampered by darkness; the release into Cook Inlet occurred at about midnight. An overflight at mid-morning sighted an intermittent dissipating silvery sheen approximately 4 miles long by 20 yards wide. UNOCAL activated an ICS at the CISPRI command center in Nikiski. The oil naturally dispersed and diluted by noon with no observable shoreline impact. Throughout the incident the weather was clear and winds were northeast 10 to 20 knots, producing choppy seas.

Behavior of Oil:

Granite Point crude is a very light oil with an API of 42.8; this, combined with the natural energy of the Cook Inlet system, caused the oil to disperse and dissipate very quickly. None of the spilled oil was recovered.

Countermeasures and Mitigation:

Open-water recovery was attempted but was largely unsuccessful because the oil sheen dispersed so rapidly.

NOAA Activities:

NOAA was notified of the incident at 0730 on November 18, 1995, by MSO Anchorage who requested a trajectory and oil fate prediction. A trajectory forecast showed that the water at the platform site was ebbing, which meant that the oil sheen would be found several miles northeast of platform Anna because a flood cycle had occurred since the release. NOAA faxed this information to the MSO.

References:

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide*. NOAA Technical Memorandum NOA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

Name of Spill:	F/V *Alaskan Star*
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill	01/16/95
Location of Spill:	Dixon Entrance, southeast Alaska
Latitude:	54°5.6′ N
Longitude:	133°46.2′ W
Spilled Material	diesel
Spilled Material Type:	2
Amount:	24,000 gallons
Source of Release:	non-tank vessel
Resources at Risk:	sea lions, harbor seals, sea otters, and birds
Dispersants:	N
Bioremediation:	N
In situ burning:	N
Other Special Interest:	N
Shoreline Types Impacted:	Forrester Island National Wildlife Refuge
Keywords:	potential spill

Incident Summary:

On the afternoon of January 15, 1995, the Canadian Coast Guard received a report that the F/V *Alaskan Star*, a 73-foot, steel-hulled vessel had capsized and the four-man crew was abandoning the vessel; the crew was picked up by nearby fishing boats. The next day, winds and currents carried the hull north into American waters where approximately two feet of the inverted hull could still be seen. A USCG helicopter searched the area, noting three red 55-gallon drums, paint cans, life buoys, and wood floating near the site of the capsizing. A helicopter search on January 17 revealed no vessel, debris, or pollution. Weather throughout the incident was southeast winds 15 to 25 knots, relatively calm seas, and broken cloud cover. Response and search were discontinued on January 17.

Behavior of Oil:

It is not known whether any diesel was actually released; however, the vessel sank with 24,000 gallons of diesel onboard in approximately 1,000 feet of water.

NOAA Activities:

NOAA was notified of this incident on January 16, 1995, by MSO Juneau who requested information on trajectories, resources at risk, and weather. After calling the National Weather Service and the USFWS, NOAA reported that the inverted hull would drift northwesterly with the Alaskan gyre and southeast winds. The Forrester Island National Wildlife Refuge with sea otters, birds, sea lions, and harbor seals is located 20 to 25 miles to the north. NOAA reported that the wind and currents should carry the hull and any possible pollution 20 miles to the west of this island. The NOAA response lasted for two days and was entirely by telephone.

References:

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide*. NOAA Technical Memorandum NOA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

Name of Spill:	F/V *Miss Doreen*
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	06/15/95
Location of Spill:	Kupreanof Island, Alaska
Latitude:	57°00′ N
Longitude:	133°19′ W
Spilled Material:	diesel
Spilled Material Type:	2
Amount:	260 gallons
Source of Release:	non-tank vessel
Resources at Risk:	sheltered and exposed tidal flats and intertidal marches
Dispersants:	N
Bioremediation:	N
In-situ burning:	N
Other Special Interest:	N
Shoreline Types Impacted:	none
Other Special Interest:	none
Keywords:	none

Incident Summary:

On June 15, 1995, the F/V *Miss Doreen* capsized, for reasons unknown, in Portage Bay on the north side of Kupreanof Island in southeast Alaska. Two adults were rescued, but a ten-year old girl was trapped in the vessel when it sank. The USCG MSO Juneau sent personnel to the scene to investigate. Later that day, divers recovered the body of the young girl and confirmed that 260 gallons of diesel had been released from the fuel tanks. A sheen one to two miles long extended into Frederick Sound where it naturally dispersed. Weather throughout the incident was overcast with light drizzle and light winds.

Behavior of Oil:

The small quantity of diesel thinned and naturally dispersed within a few hours.

NOAA Activities:

NOAA was notified of this incident on June 15, 1995, by MSO Juneau who asked for weather and resource information. NOAA contacted the USFWS and the Alaska Department of Fish and Game (ADF&G) in Juneau and Anchorage and reported that no salmon were running and no waterfowl were migrating, but shore birds might be foraging in the intertidal zones exposed by the spring low tide. The SSC also told the MSO that there might be bears along the shoreline. NOAA provided MSO Juneau with tidal current and height curves and predicted that the diesel would naturally dissipate within a few days.

References:

NOAA. 1993. *ADIOS™ (Automated Data Inquiry for Oil Spills) User's Manual*. Seattle: Hazardous Materials Response and Assessment Division, NOAA. 50 pp.

Name of Spill:	M/V *Star Princess*
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	06/23/95
Location of Spill:	Juneau, Alaska
Latitude:	58°23.1′ N
Longitude:	134°38.9′ W
Spilled Material:	IFO-380
Spilled Material Type:	4
Amount:	<100 gallons
Source of Release:	non-tank vessel
Resources at Risk:	**Marine Mammals**: sea lion haulout near Poundstone Rock **Birds**: several eagle nests along the shoreline
Dispersants:	N
Bioremediation:	N
In situ burning:	N
Other Special Interest:	N
Shoreline Types Impacted:	none
Other Special Interest:	none
Keywords:	salvage

Incident Summary:

On June 23, 1995, en route from Skagway to Juneau, the 800-foot cruise vessel, M/V *Star Princess*, owned by Princess Cruises, Inc., grounded on Poundstone Rock, 25 miles northwest of Juneau. The 800-foot cruise vessel had 271,000 gallons of IFO-380 and 2,000 passengers onboard. Several gashes in the hull causef breaching of several fuel and non-fuel tanks; however, less than 100 gallons of fuel were lost, and the vessel made it 15 miles farther south to Auke Bay with no further fuel release. In Auke Bay, the vessel dropped anchor and was surrounded with boom to catch additional releases. None occurred. A sheen extended south of Poundstone Rock for a few miles amid conflicting reports of whether it contained any recoverable oil. Brisk winds and choppy seas at the grounding site combined to rapidly disperse the oil slick and no recovery was attempted. At Auke Bay the weather was calm with overcast skies. Most of the IFO was lightered from damaged tanks into undamaged tanks. After temporarily plugging the holes in the hull with wood plugs and epoxy, the vessel was allowed to sail south to Portland for repairs. Media interest throughout the incident was high.

Behavior of Oil:

A diesel sheen was reported and it is uncertain whether any IFO was lost. Nevertheless, the high energy state of the seas dispersed and dissipated the slick completely within 12 hours with no shoreline impacts.

Other Special Interest Issues:

There were no effects to wildlife or habitats, but the tourism business was dealt a serious blow because the remaining voyages of the *Star Princess* into southeast Alaska were cancelled.

NOAA Activities:

NOAA was notified of this incident on June 23, 1995, by the NOAA HAZMAT office in Seattle because the NRC received the initial report. By the time MSO Juneau was contacted, the M/V *Star Princess* was at anchor in Auke Bay and the situation was fairly stable. Nevertheless, the resource agencies and the National Weather Service were contacted to provide additional information. The ADF&G reported that there were no particularly sensitive resources in Favorite Channel, where Poundstone Rock was located, and that Auke Bay was sensitive from a human-use rather than a biological point of view at this time of year. NMFS and USFWS indicated the same and representatives from all three organizations made themselves available, if necessary, for further consultation on-scene with the USCG.

The next day NOAA was contacted for advice on the RP's request to move the vessel to Portland for repairs without first emptying the fuel tanks that were open to the sea. The SSC told the USCG that essentially that was an unthinkable proposition as there are too unknowns and sensitivities in southeast Alaska to allow the transit of a vessel south to Portland with fuel tanks open to the sea. NOAA's advice was ignored, but the vessel transited to Portland with no further release.

Name of Spill:	M/V *Northern Wind*
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	07/23/95
Location of Spill:	Sequam Island, Aleutian Island chain, Alaska
Latitude:	52°22.7′ N
Longitude:	172°26.0′ W
Spilled Material:	diesel
Spilled Material Type:	2
Amount:	20,000 to 25,000 gallons
Source of Release:	non-tank vessel
Resources at Risk:	**Marine Mammals**: Steller sea lion rookery
Dispersants:	N
Bioremediation:	N
In-situ burning:	N
Other Special Interest:	N
Shoreline Types Impacted:	none
Other Special Interest:	none
Keywords:	none

Incident Summary:

The M/V *Northern Wind*, a 178-foot fish-processing vessel, ran aground on the northeastern side of Seguam Island, holing the #1 port and starboard fuel tanks, which contained approximately 60,000 gallons of diesel fuel. The vessel owner, Arctic Alaska Seafoods in Dutch Harbor, sent a spill response team with equipment to the grounding site. Within 12 hours the vessel floated free from the rocks and anchored one-half mile from the grounding site. An estimated 25,000 gallons of diesel were lost, and the response vessel, *American Enterprise*, pumped another 25,000 gallons from the two damaged tanks. An additional 75,000 gallons of diesel remained in the undamaged stern tanks. The USCG Cutter *Morgenthau* was on-scene throughout the incident. USCG permission was granted to move the vessel 70 miles west to a sheltered bay on the east side of Atka Island for temporary repairs. Initially the winds were northwest to 20 knots but diminished to light and variable for the duration of the incident. The response lasted for approximately five days.

Behavior of Oil:

Aerial observations by the USCG after the fuel release indicated a maximum slick of three miles by three miles rapidly dissipating and breaking up because of wind and wave action. Pilots further reported that roughly four miles of beach were lightly affected by the oil. A beach survey conducted by the vessel owner four days after the release indicated no shoreline effects or accumulations.

Countermeasures and Mitigation:

As soon as boom arrived on-scene the vessel was boomed off. The remaining 20,000 to 25,000 gallons of diesel in the damaged tanks were lightered to a response vessel and the *Northern Wind* was moved to Nasan Bay on Atka Island for temporary repairs.

NOAA Activities:

NOAA was notified of this incident on July 24, 1995, after the release had occurred and the situation was stable. There is a sea lion haulout six miles to the west of the grounding site. NOAA stressed the need to heed the three mile buffer zone around this haulout because of

the threatened status of the Steller sea lion. Oil fate analysis and modeling indicated that most of the diesel would disperse and evaporate within 12 hours. This fact alleviated NMFS concerns over the probability of interaction between the diesel and the sea lions. Another concern was for safely moving the vessel to a sheltered bay on Atka Island for temporary repairs. For this proposed effort, weather and resources-at-risk information were provided to the USCG. The weather outlook called for light and variable winds with few resources in the area. The USFWS R/V *Tiglax* transited from Shumagin Island to Seguam to check for impacts and reported that no evidence of oil was seen on the beaches or on any of the sea lions present. NOAA support continued intermittently for three days.

References:

Torgrimson, Gary M. 1984. *The On-Scene Spill Model: A User's Guide.* NOAA Technical Memorandum NOA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

Name of Spill:	F/V *Anna-K*
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	08/10/95
Location of Spill:	Kanagunut Island, Alaska
Latitude:	54°42.2′ N
Longitude:	130°43.3′ W
Spilled Material:	diesel and lubricating oil
Spilled Material Type:	2
Amount:	2,500 gallons of diesel 100 gallons of lube oil
Source of Release:	non-tank vessel
Resources at Risk:	**Marine Mammals**: harbor seals **Resource Extraction**: commercial fishing tanner and king crab operations
Dispersants:	N
Bioremediation:	N
In-situ burning:	N
Other Special Interest:	N
Shoreline Types Impacted:	none
Other Special Interest:	none
Keywords:	none

Incident Summary:

The 90-foot F/V *Anna-K* was bound for Prince Rupert, British Columbia, when it issued a mayday because of a fire that broke out Wednesday night, August 9, 1995, in Dixon Entrance, 50 miles southeast of Ketchikan. The USCG Cutter *Anacapa*, with a 41-foot utility boat and a Canadian Coast Guard vessel, responded to the fire. It was brought under control but began burning again while a firefighting crew was aboard inspecting the damage. The vessel suddenly sank Thursday morning in 50 fathoms of water with approximately 2,500 gallons of diesel and 150 gallons of lubrication oil onboard. No salvage or pollution response was attempted. The vessel's four-member crew was safely transferred to another vessel. The seas were calm during this response.

Behavior of Oil:

Light sheens were noted around the vessel as the diesel slowly escaped.

NOAA Activities:

The NOAA HAZMAT Duty Officer was notified of this incident in Seattle on Thursday morning, August 10, 1995. Resources-at-risk assessment and a weather report were sent to MSO Ketchikan. The Duty Officer contacted the Alaska SSC. When the SSC contacted the MSO, he learned that the vessel had sunk. The incident terminated as rapidly as it had begun.

References:

Research Planning Institute. 1983. *Volume 1. Sensitivity of Coastal Environments and Wildlife to Spilled Oil: Southeast Alaska: An Atlas of Coastal Resources*. Supplemented 1995. Seattle: Office of Oceanography and Marine Assessment, NOAA. 79 pp, 69 maps.

Acronyms

ADF&G	Alaska Department of Fish and Game
ADIOS™	Automated Data Inquiry for Oil Spills
API	American Petroleum Institute
ASSC	Assistant Scientific Support Coordinator (NOAA)
AST	Atlantic Strike Team
ATSDR	Agency for Toxic Substances and Disease Registry
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CISPRI	Cook Inlet Spill Prevention and Response Inc.
COTP	Captain of the Port (USCG)
CRC	Coastal Resource Coordinator (NOAA)
CT	Connecticut
C/V	cargo vessel
DEQ	Department of Environmental Quality
DBRC	Delaware Bay and River Cooperative
DRAT	District Response Advisory Team (USCG)
EDC	ethylene dichloride
EPA	Environmental Protection Agency
EPIRB	Emergency Position Indicating Radio Beacon
FLIR	forward-looking infrared radar
FOSC	Federal On-Scene Coordinator
FRAC	fractionation tank
F/V	fishing vessel
GC-MS	gas chromatography-mass spectrometry
GEPD	Georgia Environmental Protection Division
GST	Gulf Strike Team
H_2S	hydrogen sulfide gas
HAZMAT	Hazardous Materials Response and Assessment Division (NOAA)
HDPE	high density polyethylene
ICP	Incident Command Post
ICS	Incident Command System
ICWW	Intracoastal Waterway
IFO	intermediate fuel oil
LSU	Louisiana State University
MARAD	Maritime Administration
MIO	Marine Inspection Office (USCG)
MM	mile marker
MSO	Marine Safety Office (USCG)
MSRC	Marine Spill Response Corporation
M/V	motor vessel

NaSH	hydrogen sulfide
NAVSUPSAL	Navy Supervisor of Salvage
NFFTI	Naval Fire Fighting Thermal Imager
NIOSH	National Institute for Occupational Safety and Health
NJDEP	New Jersey Department of Environmental Protection
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmosphere Administration
NPDES	National Pollutant Discharge Elimination System
NRC	National Response Center
OHEPA	Ohio Environmental Protection Agency
OSC	On-Scene Coordinator
PAH	polynuclear aromatic hydrocarbons
PPE	personal protection equipment
ppm	parts per million
RP	responsible party
RRT	Regional Response Team
SFPP	Santa Fe Pacific Pipeline
SO_2	sulfur dioxide
SOP	safe operating procedures
SSC	Scientific Support Coordinator (NOAA)
T/B	tank barge
TGLO	Texas General Land Office
T/V	tank vessel
USACOE	U.S. Army Corps of Engineers
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service