Oil and Hazardous Materials Response Reports

October 1996-September 1997

January 1998

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, 1996 and September 30, 1997, NOAA's Hazardous Materials Response and Assessment Division Scientific Support Coordinators and scientific staff were notified of 132 spill incidents. These 132 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 90 oil spills, 27 chemical spills, 9 spills of unknown material, and 6 miscellaneous spills. In addition to the spills listed, NOAA assisted the U.S. Coast Guard with 53 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

Amount (Barrels, gallons, 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** Abandoned Barge Act air-activated pumps ARTES bioremediation Centers for Disease Control Clean Bay Inc. containment boom Corexit 9527 DBRC dispersant endangered species evaporation exposed rocky shores filter fences Food and Drug Administration ground truth high-pressure, warm-water washing hydro-blasting

FY 97 Spills
October 1, 1996—September 30, 1997

Date of Incident	No.	Report Name/Hotline Number (* indicates no written report)	Commodity Involved	USCG District	NOAA Involvement
27 Sep 96	1	Tanker *Julie N*/201 Portland, ME	IFO 380/ #2	1	5 on-scene
01 Oct 96	2	*Tug *Scandia*/barge Point Judith, RI	#2 fuel oil	1	3 on-scene
01 Oct 96	3	M/V *Rita C** Neuse River, NC	diesel	5	phone/fax
02 Oct 96	4	Chromic Acid* Erie, PA	acid	9	phone
10 Oct 96	5	Mystery drums* Washington, D.C.	unknown chemical	5	phone/fax
10 Oct 96	7	Barge *ND No. 12** Norfolk, VA	diesel	5	1 at MSO
10 Oct 96	8	Honey Creek Milwaukee, WI	#2 heating oil	2/9	phone
16 Oct 96	9	T/S *Syabes Singapore* (SN)* Penguin Banks, HI	diesel	14	phone/fax
18 Oct 96	10	Mystery Drum* Essex, Maryland	unknown chemical	5	phone
19 Oct 96	11	Barge *Maryland* New York Harbor, NY	salt	1	1 on-scene
21 Oct 96	12	M/V *Ewa** Pacific Ocean	isopropyl alcohol	13	phone
22 Oct 96	13	Ketchikan Pulp Mill Ward Cove, Ketchikan, AK	hazardous material	17	phone/fax
24 Oct 96	14	F/V *Rebecca B* Tanaga Island Aleutian Island Chain, AK	diesel	17	phone/fax
25 Oct 96	15	Crane Barge* Norfolk, VA	diesel	5	1 at MSO
28 Oct 96	16	M/V *Cape Mohican*/202 San Francisco Bay, CA	IFO 180	11	7 on-scene
26 Oct 96	17	F/V *Chelsea** Coos Bay, OR	diesel	13	phone/fax

Date of Incident	No.	Report Name/Hotline Number (* indicates no written report)	Commodity Involved	USCG District	NOAA Involvement
31 Oct 96	18	Mystery Spill* Alenuihaha Channel, HI	unknown oil	14	phone/fax
02 Nov 96	19	Simpson Tacoma Kraft* Tacoma, WA	black liquid	13	phone
02 Nov 96	20	S/V *Clipper City** Smith Island, MD	diesel	5	phone
06 Nov 96	21	T/V *Iglo Moon*/203 Cape Florida, Biscayne Bay National Park	butadiene #6 diesel	7	2 on-scene
07 Nov 96	22	Mystery spill* Virginia Beach, VA	diesel	5	phone
08 Nov 96	23	Northwest Hardwood* Tillamook Bay, OR	unknown	13	phone
09 Nov 96	24	Sunken Fishing Vessel* Warrenton, OR	diesel/lube	13	phone/fax
09 Nov 96	25	T/B *LMI-150*/204 Tarpon Springs, FL	#2	7	phone/fax
09 Nov 96	26	C/B *Ponce Trader*/205* New Orleans, LA	transmission oil hazardous materials	8	1 on-scene
10 Nov 96	27	Tub *D.D. 51** New Bern, NC	diesel	5	phone
11 Nov 96	28	Cape Prince of Wales* Naval Field Station Wales, AK	diesel	17	phone/fax
13 Nov 96	29	M/V *Tanya* Florida Keys	marine diesel	7	phone
13 Nov 96	30	Burlington Northern/Santa Fe* Deschutes River, OR	diesel	13	phone/fax
15 Nov 96	31	Consolidated Edison East River, NY	#6 fuel	1	phone
15 Nov 96	32	F/V *Maria Angela* Nantucket Island, MA	diesel	1	phone
15 Nov 96	33	M/V *Elizabeth Beesecker* Hastings, MN	#2 diesel fuel	2	phone
17 Nov 96	34	Cape Prince of Wales * Naval Field Station, Bering Straits, AK	diesel	17	phone/fax

Date of Incident	No.	Report Name/Hotline Number (* indicates no written report)	Commodity Involved	USCG District	NOAA Involvement
18 Nov 96	35	Clinton Concrete Clinton, MD	waste oil	5	phone
19 Nov 96	36	M/V *Inscription** Cape Blanco, OR	bunker	13	phone
19 Nov 96	37	M/V *Jo Beth* Rosedale, MS	diesel	8	phone
26 Nov 96	38	Furnace Brook Mystery Spill Quincy, MA	#4 oil	1	phone
27 Nov 96	39	Barge *Lube Quest** Pacific Ocean	lube oil	13	phone/fax
28 Nov 96	40	F/V *Ida E** Astoria, OR	diesel	13	phone/fax
30 Nov 96	41	GOA Explosives Barge* Gulf of Alaska, AK	ammonium nitrate	17	phone/fax
03 Dec 96	42	NOAA R/V *Halcyon*/206 Muskegon Lake, MI	diesel fuel	2	2 on-scene
06 Dec 96	43	Tub *Coastal Pride** Norfolk, VA	diesel	5	1 on-scene
10 Dec 96	44	F/V *Brittany Diane** Poquoson, VA	diesel	5phone	
10 Dec 96	45	F/V *Gladys Loraine* Newport News, VA	diesel	5phone	
11 Dec 96	46	Tosco Bayway Refinery Elizabeth, NJ	gas oil	1	phone
12 Dec 96	47	LILCO/207 Long Island, NY	dodecylbenzene	1	1 on-scene
16 Dec 96	48	F/V *Cathy** Grays Harbor, WA	diesel	13	phone
17 Dec 96	49	Mystery drum* Baltimore, MD	unknown chemical	5	phone
19 Dec 96	50	*F/V *Sea Warrior* Laconnor, WA	diesel	13	phone
19 Dec 96	51	Train Derailment/208 Louisville, KY	styrene	9	phone/fax
22 Dec 96	52	F/V*Green Arrow*/209 Block Island, RI	diesel	1	phone

Date of Incident	No.	Report Name/Hotline Number (* indicates no written report)	Commodity Involved	USCG District	NOAA Involvement
25 Dec 96	53	M/V *Baneasa*/210 Aleutian Islands, AK	bunker C, diesel	17	phone/fax
26 Dec 96	54	M/V *Baneasa*/210 Atka Island, AK	fuel oil, diesel	17	phone
07 Jan 97	55	Oil well pipeline New Harmony, IN	crude oil	2	phone
12 Jan 97	56	C/V *Almeria Lykes* Atlantic Ocean inbound Hampton Roads, VA	dimethyl malonate	5	phone
14 Jan 97	57	Getty Oil Tank Truck Albany, NY	gasoline	1	phone
15 Jan 97	58	Burlington NorthernTrain Derailment/211 Edmonds, WA	hazardous materials	13	1 on-scene
15 Jan 97	59	M/V *Shirley L. Stapp*/212 Robinsville, MS	gas	8	phone
15 Jan 97	60	Mystery slick/213* San Juan Harbor, PR	unknown		1 on-scene
17 Jan 97	61	M/V *Bronwynne Brent*/215* Memphis, TN	potential chloroform styrene	8	phone
19 Jan 97	62	M/V *Stolt Spray*/214 Wallace, LA	pyrolysis gas	8	phone
22 Jan 97	63	Mystery Spill Lake Charles, LA	PCB	8	phone
26 Jan 97	64	Barge *Oregon*/216 Ninilchik, AK	urea/diesel/ lube/hydraulic oil	17	phone
27 Jan 97	65	*Weyerhaeuser Longview, WA	crude sulfate turpentine	13	phone/fax
31 Jan 97	66	Cape Cod Mystery Spill Truro, MA	#6 oil	1	phone
02 Feb 97	67	M/V *Handy Gunner*/218 Willamette River Portland, OR	IFO 380	13	1 on-scene
03 Feb 97	68	Container ship *Houston*/217 Maryland Shoal, Florida Keys National Marine Sanctuary	heavy oil, diesel, lube oil	7	phone

Date of Incident	No.	Report Name/Hotline Number (* indicates no written report)	Commodity Involved	USCG District	NOAA Involvement
07 Feb 97	69	F/V Harbor Queen* Boca Grand Pass, FL	diesel	7	phone
12 Feb 97	70	Drill mud spill/219 Atchafalaya River Berwick, LA	diesel oil-based drilling mud	8	2 on-scene
17 Feb 97	71	Mystery sheen* Baltimore, MD	unknown oil	5	phone
19 Feb 97	72	F/V *Lisa Jo** Akun Bay, Akun Island Aleutian Island Chain, AK	diesel	17	phone
01 Mar 97	73	F/V *V.J. O'Neil** Back Creek, Seaford, VA	diesel	5	1 on-scene
03 Mar 97	74	UNOCAL Steelhead Platform* Upper Cook Inlet, AK	diesel	17	phone/fax
05 Mar 97	75	Mystery sheen* Chesapeake Light	light oil	5	phone
11 Mar 97	76	Tug *Bay Prince** Norfolk, VA	diesel	5	phone
17 Mar 97	77	T/B *IB-960*/220 Baton Rouge, LA	pyrolysis gasoline	8	1 on-scene
18 Mar 97	78	Abandoned Tank* Neah Bay Marina Neah Bay, WA	waste oil	13	1 on-scene
19 Mar 97	79	T/Z *Stolt Topaz** Savannah River hexocyclane	diesel, fuel oil static acid, caustic,	7	phone
20 Mar 97	80	*Vessel name unknown Pacific Ocean	shipping containers	13	phone
25 Mar 97	81	Mystery Spill (oiled birds)* Seaside, OR	unknown oil	13	phone
02 Apr 97	82	C/V *Pol America* Nantucket Island, MA	containers	1	phone
11 Apr 97	83	Brown Water Marine *Barge 66*/221 Houston Ship Channel, TX	zinc bromide caustic soda	8	phone
12 Apr 97	84	T/V *Formosa Six*/222 Southwest Pass Mississippi River	ethylene dichloride	8	3 on-scene

Date of Incident	No.	Report Name/Hotline Number (* indicates no written report)	Commodity Involved	USCG District	NOAA Involvement
15 Apr 97	84	River Raisin Area of Concern River Raisin, MI	PCB	9	phone/fax
16 Apr 97	85	M/V Pomparo* north coast of Cuba	fuel oil	7	phone
21 Apr 97	86	*M/V *Queen of the West*/223 Hood River, OR	hydraulic fluid	13	phone/fax
21 Apr 97	87	Conrail Train Derailment./224 Sandusky, OH	sodium hydroxide chlorine	9	phone
21 Apr 97	88	Lake Michigan Log Spill Lake Michigan	pine logs	2/9	phone
01 May 97	89	CSX Railcar Derailment/225 Baltimore, MD	hydrochloric acid	5	phone
03 May 97	90	F/V *Viking** Cape Flattery, WA	diesel/lube	13	phone/fax
06 May 97	91	Tug *Mollie Belle** Oriental, NC	diesel	5	phone
08 May 97	92	Pesticide Fire* Helena, AR	Azinphosmethyl	8	phone
10 May 97	93	George Inlet Cannery Ketchikan, AK	Bunker C	17	phone/fax
12 May 97	94	Virginia Pilot Station* Virginia Beach, VA	diesel	5	phone
15 May 97	95	Barge *RTC 380*/226 GATX Facility Carteret, NJ	#2 fuel oil	1	phone
15 May 97	96	*USCG Cutter *Cowslip*/227 Astoria, OR	#2 fuel oil	13	phone
16 May 97	97	Pipeline Spill/228 Lake Barre Terrebone Bay, Houma, LA	crude oil	8	phone
17 Ma7 97	98	T/B Boxer Anchor Point Togiak Bay, AK	potential diesel	17	phone
23 May 97	99	Bravo Anchorage Mystery Spill Norfolk, VA	light oil	5	phone

Date of Incident	No.	Report Name/Hotline Number (* indicates no written report)	Commodity Involved	USCG District	NOAA Involvement
28 May 97	100	Mantoloking Beach Anchor Point Mantoloking , NJ	paraffin	5	phone
30 May 97	101	Mystery Spill/229 Assateague Island National Wildlife Refuge, VA	tarballs	5	1 on-scene
04 Jun 97	102	Cedar Island Ferry Breakwater Cedar Island, Pamlico Sound, NC	bunker fuels	5	phone
04 Jun 97	103	*F/V *Lucky Buck* fire Seattle, WA	diesel/ammonia chlorine	13	phone/fax
10 Jun 97	104	Barge *Bell 157*/230 San Pablo Bay, CA	diesel, hydraulic oil	11	phone/fax
12 Jun 97	105	*Dredge ICW 108 Scotts Hill, NC	diesel	5	phone
13 Jun 97	106	Barge *PVS 103*/231* Baton Rouge, LA	hydrochloric acid	8	phone
18 Jun 97	107	Newport News Small* Boat Harbor Newport News, VA	diesel	5	phone
21 Jun 97	108	Vermillion 16/232 Freshwater City, LA	light condensate oil	8	phone
27 Jun 97	109	Sewage Spill Westchester Creek, NY	raw sewage	1	phone
03 Jul 97	110	Tug *Marie M*/233* Westport, WA	diesel/lube	13	phone
18 Jul 97	111	C/V*Clorinda*/234 Wilmington, NC	benzoyl chloride	5	phone
24 Jul 97	112	M/V *Fortuna Reefer*/235 Mona Island, Puerto Rico	IFO 180 fuel oil		3 on-scene
24 Jul 97	113	T/S *Providence* Yorktown, VA	crude oil	5	1 on-scene
29 Jul 97	114	Dundalk Marine Terminal Baltimore, MD	chlorpyrifos	5	phone
05 Aug 97	115	Tosco Refinery/236 Ferndale, WA	bunker fuel	13	2 on-scene

Date of Incident	No.	Report Name/Hotline Number (* indicates no written report)	Commodity Involved	USCG District	NOAA Involvement
12 Aug 97	116	Hydraulic oil spill* Mobile, AL	hydraulic oil	8	phone
13 Aug 97	117	Mystery Spill/238* Astoria, OR	diesel	13	phone/fax
14 Aug 97	118	Texaco Pipeline/239 South Timbvalier Block 270 Louisiana	unknown oil	8	phone
21 Aug 97	119	Dredge *Alaska*/240 Moriches Inlet, NY	diesel	1	phone
22 Aug 97	120	Sinking Fishing Vessel* Pacific Ocean	diesel	14	phone
28 Aug 97	121	Jackson Oil Company* John Day River, OR	diesel	13	phone
28 Aug 97	122	Pago Pago Harbor Salvage* American Samoa	waste oil on abandoned long liners	14	phone
04 Sep 97	123	F/V *Manolani* fire* Seattle, WA	hazardous combustible products	13	phone/fax
05 Sep 97	124	Sinking Fishing Vessel* Pacific Ocean	diesel	13	phone/fax
05 Sep 97	125	Ammonia leak/241* Morgan City, LA	anhydrous ammonia	8	phone
14 Sep 97	126	Mystery Spill* Ilwaco, WA	unknown	13	phone
16 Sep 97	127	Sulfur Spill/243 Ninilchik River, AK	sulfur	17	phone
18 Sep 97	128	M/V *Mystras*/242* Delaware Bay	crude oil	1	2 on-scene
28 Sep 97	129	Crystal Ocean Cold Storage Astoria, OR	ammonia	13	phone/fax
29 Sep 97	130	Irene Platform/244 Vandenberg AFB, CA	crude oil	11	1 on-scene
29 Sep 97	131	Mystery Spill/245 Gulf of Mexico	unknown	8	phone
30 Sep 97	132	Mystery Spill/246* Florida Keys	unknown	7	phone

FY 97Drills and Scenarios

October 1, 1996—September 30, 1997

Type	Area	Description	Date Queeud	Date Sent
Report	Honolulu	Area Plan rev	10/7/96	10/9/96
verbal	Portland, Ore	chem drill	10/23/96	10/23/96
verbal	Portland, Ore	MSO drill	10/24/96	10/24/96
TAT	East River	Indus Drill	10/24/96	11/1/96
TAT	Drift Ri. Ter	U. Cook In.	11/1/96	11/15/96
TAT	Anacortes,Wa	Indus. Drill	11/12/96	11/12/96
TAT	Upper Cook	area plan	11/15/96	11/22/96
TAT	St. Mary's R	area plan	11/20/96	11/15/96
TAT	Long I. Sound	planning	11/22/96	2/7/96
TAT	Navy Station	drill	12/4/96	1/10/97
TAT	Puerto Rico	Drill	12/4/96	1/30/97
TAT	Edmonds, Wa	Drill	1/16/97	2/3/97
TAT	E. St. Juan De	Drill	1/16/97	1/27/97
TAT	Clarence St	Contin. Plan	1/27/97	1/28/97
TAT	The Sisters	Contin. Plan	1/27/97	2/6/97
TAT	Petersberg	Contin. Plan	1/27/97	2/7/97
TAT	Saipan	Drill	1/21/97	1/21/97
TAT	Juan de Fuca	Drill	1/17/97	1/27/97
TAT	Padilla Bay	Drill	1/28/97	2/20/97
TAT	Duluth Mi	Drill	2/20/97	4/21/97
TAT	Grenada	Drill	3/5/97	3/17/97
TAT	Cook Inlet	Drill?	3/5/97	3/24/97
TAT	San Diego Bay	Area Cont. Pl	3/7/97	3/17/97
TAT	Hampton Roads	Drill	3/18/97	4/1/97
TAT	Portland Maine	Drill	3/19/97	3/26/97
TAT	Black Rock	Drill	4/3/97	4/10/97
Verbal	Wake Island	planning	4/7/97	4/9/97
TAT	B. Sandy R.	Drill	4/16/97	4/29/97
TAT	Jacksonville	Drill	4/21/97	5/23/97
Verbal	MSO S.St.Marie	chem scenario	4/30/97	4/30/97
Movie	2 scenarios	Drills	5/28/97	8/29/97
TAT				
Verbal				
TAT	MSO Juneau	Drill	5/28/97	7/31/97
verbal	St. Croix	Unann. Drill	6/24/97	6/24/97
TAT	Ore-Ca border	Drill	6/16/97	7/1/97
TAT	Yaquina Head	Drill	6/26/97	8/5/97
TAT	Honolulu	planning	7/7/97	8/1/97
TAT	Monterrey	planning	7/21/97	8/6/97
TAT	Alaska	planning	7/15/97	8/29/97
TAT	Detroit River	Drill	7/28/97	9/29/97
TAT	Anacapa Island	Drill	7/29/97	9/22/97
Movie	Off Humboldt	Drill	8/20/97	8/22/97
TAT	Fort Lauderdale	Drill	8/18/97	9/12/97
TAT	Lower Miss.R	Drill	8/25/97	
TAT	Pago Pago Hr	Salv. plan	8/29/97	9/10/97
TAT	Charleston	Drill	9/9/97	10/7/97
TAT	Beaufort SC	Drill	9/9/97	9/26/97
TAT	Elliot Bay	Drill	9/15/97	10/2/97
TAT	Portland Main	Drill	9/25/97	9/25/97
TAT	Outside San Francisco	Drill	9/26/97	

U.S. Coast Guard District 1

Name of Spill:	M/T *Julie N*
SSC:	Stephen Lehmann
USCG District:	1
Date of Spill:	09/27/96
Location of Spill:	Portland, Maine
Spilled Material:	#2 fuel/home heating fuel intermediate fuel oil 380
Spilled Material Type:	2, 3
Amount:	2,100 (88,200 gallons) 2,225 (93,450 gallons)
Source of Spill:	tank vessel
Resources at Risk:	**Fish**: pelagics, American eel (juvenile) **Crustaceans**: American lobster **Mollusks**: gastropods, marine worms, **Birds**: shorebirds (piping plover), wading and diving birds, waterfowl **Marine Mammals**: harbor seal **Habitats**: sheltered tidal flats, sheltered salt marsh, fringe salt marsh, riprap/*manmade* seawall, riverine, estuarine **Management area**: Audubon Society Refuge
Dispersants:	Y
Bioremediation:	N
In-Situ Burning:	N
Special Interest:	State fishery closure, fish tainting, experimental marsh cutting, experimental shoreline cleaning agent use, individual property ownership to mean low-water line, high pressure/hot water wash
Shoreline Types :	sheltered tidal flats, sheltered salt marsh, fringe salt marsh, gravel (pebble) beach, rocky headlands, riprap/*manmade* seawall
Keywords:	Clean Casco Bay, Inc., Corexit 9580, high pressure/hot water wash, State fishery closure, vacuum trucks

Summary:

On the afternoon of September 27, 1996, the motor tanker, *Julie N*, owned and operated by Maritime Overseas Corporation, entered Portland Harbor under pilotage carrying a cargo of #2 home heating fuel (HHF). The pilot prepared for passage through the "Million Dollar Bridge," an extremely narrow draw bridge, affording less than five feet of clearance on either side of the vessel's mid-section. Accounting for a rising tide and southwesterly winds, the pilot approached the opening from the northern portion of the Fore River and misspoke the helm command. By the time the order could be corrected, less than a minute later, the vessel was committed and allision (a moving object hitting a stationary one) imminent.

The *Julie N* struck the southern side of the bridge, a sharp buttress damaged her just below the waterline The exposed part of the bridge opened a 15-foot hole into the forward port bunker tank, the forward void space, and the number one port cargo tank. The gash in the cargo tank was small by comparison to that of the bunker tank, less than a foot wide and approximately three feet high. The bunker tanks were carrying intermediate fuel oil (IFO) 380.

The vessel reported the allision immediately to the U.S. Coast Guard (USCG) and asked permission to proceed to the Sprague Terminal, some 1,000 yards downriver. Permission was granted. The *Julie N* headed for the terminal, leaking oil as she went. The local oil spill cooperative, Clean Casco Bay, Inc., was notified as were state and federal authorities. As the ship was tying up to the Sprague pier, state and spill cooperative personnel were deploying a variety of booms around the injured vessel. During that time, USCG personnel on-scene, estimated that the vessel was leaking at a rate of 500 to 700 gallons per minute. Over the course of the next 12 hours, the *Julie N* would lose a total of 180,000 gallons of oil, 88,200 gallons of HHF and 93,450 gallons of IFO 380. At times during the night, oil was estimated to be seven inches deep inside the boom.

Impacts to the shoreline from the *Julie N* were primarily in the upper Fore River area, upstream of the "Million Dollar Bridge." Shoreline types included, salt marsh (*Spartina alterniflora* and *Spartina paton*), sheltered and exposed tidal flats, pebble/cobble beach, medium-grain sand beach, and manmade structures (including rumble riprap, granite block riprap, piers, pilings and construction materials). The manmade shoreline type represented most of the shoreline.

At the most inland end of the spill zone, the river narrows to only a few yards and is navigable by canoe only. At this point, both sides are lush *Spartina* marsh and the area is managed by the local Audubon Society as a bird sanctuary. This area received very little oiling.

Behavior of Spilled Material:

The spill occurred during the spring ebb tides with south to southwest winds. Initially, winds kept the oil within the inner harbor, threatening the upper river sensitive area. Oil impacted the northern side of the inner harbor (mostly manmade, commercial shoreline) on the first day. However, the following night heavier winds forced the oil through protection booming at the upriver side of the inner harbor. The result was significant oiling of the fringing and sheltered marshes in the Upper Fore River area. During the days to follow, oil moved out of the inner harbor and impacted the shorelines to the north and south of the harbor entrance and the harbor islands. However, this oiling was minimal, mostly sheens, and required no significant cleanup effort.

In mid-October, the area experienced record rainfall, resulting in coastal flooding. Following the flooding, the marsh areas and gravel beaches appeared to have been cleaned dramatically. While the impact on the oil of this flooding from a visual perspective is qualitative, oil analysis confirmed that the oil on the vegetation (Thompson Marsh) had weathered by as much as 75 percent, compared to fresh samples. It is assumed that much of this weathering can be attributed to the heavy rains and flooding.

Countermeasures and Mitigation:

Overall, the greatest success concerning oil removal was achieved in the first night and following day by skimming from inside the boom immediately around the vessel. Vac-trucks, small floating skimmers, and the Marine Spill Response Corporation (MSRC) Maine responders recovered half the total amount spilled.

The response to the spill continued in a traditional manner. Oil was removed by skimmer and vac-truck from within the Fore River for more than a week. At the end of that time, surface oil was considered to be light and to thin to make skimming effective. Shoreline cleanup then became the focus of the response effort.

In several areas, the poorly sorted rumble riprap proved problematic in that it contained disposal material including concrete slabs with reinforcing rods and slabs of asphalt pavement. On the northern side of the harbor entrance several structures extend well out from the land, making access difficult. The spaces under these structures are considered confined spaces.

Although two oils were spilled (#2 HHF and IFO 380) in almost equal amounts, most of the shoreline impacts and, consequently the brunt of the cleanup efforts, can be attributed to the IFO 380. It is presumed that much of the #2 HHF was contained in the boom deployed around the vessel within moments of her arrival at the Sprague Energy terminal. The oil that was not contained, evaporated within a day or two of the spill. The heavier oil that remained in the river impacted high into the marshes because the area was experiencing the highest tides of the month (+11.2 feet at high tide). As the tides receded, the oil was drawn across the vegetation and the lower intertidal substrate. While the oil did not adhere to the substrate in any significant way, it stuck to the vegetation, often covering the *Spartina* entirely.

Along the manmade shorelines, particularly the rumble riprap, the oil penetrated and coated completely. Because of the porosity of this riprap, cleanup efforts were never completely effective despite the use of high pressure, heated water.

Other Special Interest Issues:

Two noteworthy cleanup techniques were employed at the *Julie N* oil spill:

Corexit 9580 Test:

> A small area of Thompson Marsh was used to test the effectiveness of the Exxon-produced Corexit 9580, a de-aromitized, kerosene shoreline cleaning agent with an added surfactant. This particular agent was chosen for its non-dispersant qualities. The product is designed to "lift and float" the oil from the substrate or vegetation, rather than lift and disperse. Therefore, the oil could be recovered by traditional means. The test was conducted on October 4, 1996, with observers from the USCG, various Maine agencies, United States Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA), and the Responsible Party (RP). The plan was to apply the chemical, allow time for it to lift the oil and flush the area with ambient water. While there was some limited improvement in the level of oil on the vegetation (*Spartina alternaflora*), there were significant operational difficulties experienced in an area considered to be one of the most operationally favorable. Therefore, given the marginal success versus operational problems, the added risk of using the Corexit 9580 in an already stressed environment could not be justified. The test did not go on to its next phase, biological monitoring.

Vegetation Cutting Test:

> Both the USFWS and Maine Inland Fisheries and Wildlife expressed concern over the expected incoming migratory shorebirds and waterfowl who forage in the now heavily oiled, marsh areas of the Fore River. They were concerned over the possibility of the birds becoming oiled (and consequently preening and ingesting oil) and foraging in oiled areas. As a result, they wanted to remove much of the oiled vegetation by cutting.
>
> Much of the Scientific Support Team (SST) was opposed to cutting the marsh areas for historic reasons. In many past attempts to cut, marshes have been badly damaged due to contamination at the root level. The preference to risk the incoming population in

favor of maintaining the habitat was agreed upon; however, it was also agreed that two test cuts would be performed.

Test parameters: Two test plots were in Thompson Marsh, each 50-feet wide, marked by steel stakes. The first plot was in an exposed area and the second in a sheltered area. The cutting was performed from boats, using "weed-whackers" on a rising tide. The contractors cut as the water depth increased and they pushed farther into the marsh with paddles or pole. The cutting was limited to one foot off the substrate. Transects for pre-cutting and future observations were established by the SST.

NOAA Activities:

NOAA was notified of this incident September 27, 1996, and a NOAA SST was on-scene within six hours of notification. On-scene personnel included from NOAA: Scientific Support Coordniator (SSC), Deputy SSC, Modeling and Simulations Studies Branch (MASS) personnel, Research Planning Institute (RPI), Genwest Systems, and Louisiana State University (LSU).

Fate Modeling:

NOAA provided initial and on-going trajectory analysis and overflight spill tracking. In addition, through the MASS, oil weathering predictions and general weather forecasting was provided.

Resources at Risk, Priority Areas, Shoreline Assessment and Cleanup:

The initial priority protection strategies were developed using the NOAA resources at risk document, the MOSIS maps, and discussions between state officials and the SSC. The NOAA SST was responsible for developing the shoreline assessment program and developing and coordinating the assessments in the field. The SST participated in all the field assessments and developed or reviewed cleanup recommendations. A coordinated effort among the SST, the unified command, and the damage assessment personnel resulted in low-level, high resolution aerial photography of the impact area. These were digitized and the upper Fore River area was printed into a photographic mosaic. The degree of oiling was ground-truthed by field teams resulting in accurate estimates about the amount of oil within the marsh areas.

The NOAA SST had a major role in discussing and recommending cleanup techniques, including the test cutting area and Corexit 9580 tests. The SST worked with state and RP officials to determine the active cleanup termination point.

Information Management

SST Information Management personnel provided overflight maps, base maps, general information maps, and working maps for the response. They also produced a "digital overflight" presentation for the Federal On-Scene Coordinator (FOSC) that was used to brief the state governor, U.S. senators from Maine, the Commandant of the USCG, and the Secretary of Transportation. The digital overflight was a series of computer generated maps, interspersed with digital photographs taken from overflights. The result was a detailed overview of the spill site, condensed into less than ten minutes.

The information management personnel also helped the state in provide maps showing the fisheries closure areas.

Chemistry:

NOAA contracted chemists performed analyses on oil samples at various times and locations. These analyses helped determine the speed at which the oil was weathering or decomposing.

Public Affairs:

NOAA participated in all the press conferences and public meetings, often being called upon to speak on scientific or environmental issues. Members of the SST were also interviewed separately on several occasions. NOAA participated in a Maine Public Broadcasting one-hour documentary on the oil spill that aired six months after the spill.

Command Post Organization:

The NOAA SSC established a "Science and Environment Unit" within the Planning Section of the Incident Command Structure. This unit encompassed state and federal science assets and was designed to provide a single, coordinated location for discussion and cross-discipline information sharing. The SSC was also a part of the FOSC Command Staff within the Unified Command.

References:

Research Planning Institute. 1983. *Sensitivity of coastal environments and wildlife to spilled oil: Southern Maine and New Hampshire. An atlas of coastal resources.* Seattle: Ocean Assessments Division, NOAA. 25 maps.

Research Planning Institute. 1985. *Sensitivity of coastal environments and wildlife to spilled oil: Downeast Maine. An atlas of coastal resources.* Seattle: Ocean Assessments Division, NOAA. 41 maps.

Name of Spill:	Barge *Maryland*
NOAA SSC:	Ed Levine
USCG District:	1
Date of Spill:	10/19/96
Location of Spill:	New York Harbor
Latitude:	40°37.5″N
Longitude:	74°04′ W
Spilled Material:	salt
Spilled Material Type:	N/A
Amount:	17,000 tons
Source of Spill:	barge
Resources at Risk:	**Fish**: anadromous, estuarine, and demersal fish **Mollusks**: mussels and clams **Crustaceans**: shrimp and crabs
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	salvage

Incident Summary:

At approximately 1819 on October 19, 1996, the 515-foot open-hopper barge *Maryland* broke her back while loading salt from the M/V *Atlantic Way*. The bow and stern were afloat, but the midsection was below the water embedded in approximately four feet of mud. The barge was in the Stapleton Federal Anchorage approximately 1,000 yards off Staten Island, New York.

A northeaster was passing through the area making the weather stormy during the first day of this response.

The barge's cargo of salt was sitting on the bottom and the USCG and owner discussed salvage requirements. The EPA became involved because of the Ocean Dumping Permit requirements.

NOAA Activities:

NOAA was notified of this incident October 19, 1996, by USCG Activities (ACT) New York who asked the SSC to participate in a salvage operations conference call October 22. The SSC was tasked to discuss the environmental consequences of leaving the remaining salt on the bottom versus removing it. The SSC contacted two of NOAA's contractors, LSU, and RPI as well as NOAA's Biological Assessment Team (BAT) to discuss the options. All agreed that there would most likely be no long-term impacts if the remaining salt was left on the bottom, although, it would be better to remove it if possible. The increase in hypersalinity would definitely have short-term impacts on bottom-dwelling organisms that would not be able to avoid the hypersalinity. NOAA recommended that unless there were operational considerations preventing the salvor from removing the salt, it should be removed to minimize environmental impacts.

The duration of this response was two weeks. NOAA was peripherally involved for several days.

Name of Spill:	Consolidated Edison
NOAA SSC:	Ed Levine
USCG District:	1
Date of Spill:	11/15/96
Location of Spill:	East River, New York
Latitude:	40°44.5′ N
Longitude:	73°58.8′ W
Spilled Material:	#6 fuel oil
Spilled Material Type:	4
Amount:	4,000 gallons
Source of Spill:	pipeline
Resources at Risk:	**Birds**: waterfowl, shorebirds, gulls, pigeons **Fish**: anadromous, estuarine, and demersal
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	consolidated shores, mixed sediment beaches, piers, riprap, sheltered seawalls
Keywords:	disk skimmer, pre-booming, vacuum trucks

Incident Summary:

At 1630 on November 15, 1996, the USCG was notified of a #6 oil spill from a 20-inch underground pipeline being pressurized while attempting to empty its contents. The pipeline was taken out of service approximately one year ago due to its deteriorated condition. Consolidated Edison (ConEd) pre-boomed approximately one mile of seawall next to southern Manhattan before working on the pipeline. The majority of the spilled oil remained inside the boom, but about 3,000 gallons of product was collected from the soil by vacuum trucks. Approximately 1,000 gallons of oil escaped into the river.

Weather at the time of the incident was winds from the northwest at 10 knots, air temperature 40° F, water temperature 50°F, and calm seas.

Chesapeake Wildlife was brought on-scene because four ducks were found oiled. No rehabilitation was undertaken and no other oiled birds were observed.

ACT NY monitored this incident which lasted about a week.

Behavior of Spilled Material:

Personnel on an overflight observed oil extending about 2.5 miles in the East River (from Roosevelt Island to Jackson Avenue). Most of the areas of impact were seawalls and pier pilings. High-pressure steam cleaning units (hotsies) were used to remove this oil.

Approximately 300 gallons of liquid waste and large amounts of solid waste were recovered.

Countermeasures and Mitigation:

ConEd hired cleanup contractors who deployed about 6,000 feet of boom. Several recovery sites were located and collection was made using disk skimmers. The cooperatives' JBF and Marco skimmers collected free-floating oil.

NOAA Activities:

NOAA was notified of this incident on November 16, 1996, by the USCG ACT NY. This was just an informational briefing in case the situation became worse. No tasking was requested, although the SSC gave ACT NY trajectory and weather information.

References:

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

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

Name of Spill:	F/V *Maria Angela*
SSC:	Stephen Lehmann
USCG District:	1
Date of Spill:	11/15/96
Location of Spill:	Nantucket Island, Massachusetts
Latitude:	41°17′.70′ N
Longitude:	07° 07.00′ W
Spilled Material:	diesel
Spilled Material Type:	2
Amount:	190 to 214 barrels
Source of Spill:	fishing vessel
Resources at Risk:	mud flats, salt marshes
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none: (no release)
Keywords:	potential

Incident Summary:

The 75-foot, steel-hull fishing vessel *Maria Angela* ran hard aground one mile off the entrance to Nantucket Harbor.

NOAA Activities:

NOAA was notified of this potential spill on November 15, 1996, by the Port Operations officer from USCG Marine Safety Office (MSO) Providence who requested information regarding the expected fate of the oil (if spilled) and the resources that would be at risk. The SSC provided fate information using NOAA's computer program ADIOS and consulted the National Weather Service (NWS) to help predict where the oil might impact. The SSC also identified sensitive areas within the potential impact area and suggested protection priorities.

The fishing vessel was refloated at the next high tide without releasing any oil.

References:

Research Planning Institute. 1980. *Sensitivity of coastal environments and wildlife to spilled oil: Massachusetts. An atlas of coastal resources.* Seattle: Office of Oceanography and Marine Assessment, NOAA

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:	Furnace Brook: Mystery Spill
NOAA SSC:	Stephen Lehmann
USCG District:	1
Date of Spill:	11/26/96
Location of Spill:	Quincy, Massachusetts
Spilled Material:	#4 oil
Spilled Material Type:	3
Amount:	12 barrels, 500 gallons
Source of Spill:	hospital heating fuel tank: (suspected)
Resources at Risk:	bird foraging areas
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	vegetated riverbank
Keywords:	sorbent boom

Incident Summary:

On November 26, 1996, MSO Boston was contacted by Massachusetts Department of Environmental Protection (DEP) personnel to report oil contamination in Furnace Brook; the suspected source was a nearby hospital. Approximately one-quarter mile of marsh was impacted.

State officials were interested in cutting the marsh and conducting more intrusive cleaning techniques.

NOAA Activities:

NOAA was notified of this incident on November 26, 1996, by MSO Boston. The FOSC asked the SSC to actively participate in discussions with the State. The SSC suggested that cleanup workers refrain from active cleanup within the marsh. In addition, following discussions that included State wildlife officials, it was decided that the marsh should not be cut, but allowed to recover naturally. Sorbent boom would be placed downstream to control sheening. This method was agreed upon and State and Federal On-Scene Coordinators (OSCs) monitored the area until the sheening had ceased.

References:

Research Planning Institute. 1980. *Sensitivity of coastal environments and wildlife to spilled oil: Massachusetts. An atlas of coastal resources.* Seattle: Ocean Assessments Division, NOAA. 49 maps.

Name of Spill:	Tosco Bayway Refinery
Date of Spill:	12/11/96
Coast Guard District:	1
S.S.C.:	Ed Levine
Location of Spill:	Elizabeth, New Jersey
Latitude:	40°38′ N
Longitude:	074° 12.3′ W
Spilled Material:	gas oil
Spilled Material Type:	4
Amount:	25 gallons
Source of Spill:	facility
Resources at Risk:	water fowl
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	mixed sand and gravel beach, manmade structures, and marsh vegetation

Incident Summary:

The heat exchanger at the Tosco Bayway Refinery ruptured and injected gas-oil into the cooling water that leads into Morses Creek. Once the oil was in the water it went under a series of pre-staged boom into the Arthur Kill. When the hot oil reached the cold waters of the Kill, it resurfaced and impacted the west shore of Staten Island, Pralls Island, and the marsh at Sawmill Creek. Cleanup crews removed what oil they could.

NOAA Activities:

NOAA was notified of this incident on December 11, 1996. The SSC was requested to provide a weather forecast for that day and for the next 36 hours to help determine the level of cleanup response necessary.

Name of Spill:	Long Island Lighting Company
NOAA SSC:	Ed Levine
USCG District:	1
Date of Spill:	12/12/96
Location of Spill:	Long Island Sound, New York
Latitude:	40°57.4′ N
Longitude:	73°20.7′ W
Spilled Material:	dielectric fluid (dodecylbenzene)
Spilled Material Type:	2
Amount:	190 barrels (>7,900 gallons)
Source of Spill:	underwater electric transmission cables
Resources at Risk:	**Fish**: rainbow smelt, flounder, American eel, striped bass, herring, cunner, tautog, tomcod **Shellfish**: hard clams, soft-shell clams, American oysters, bay scallops, blue crabs **Birds**: shorebirds, waterfowl, wading birds. **Management Areas**: marinas, boat ramps, water intakes
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	public's confusion about material spilled
Shoreline Impacted:	Northport Bay, Duck Island, Huntington Bay, Lloyd, Huntington, and Centerport harbors, Long Island Sound, Eatons Neck, and Lloyd Neck
Shoreline Resources at Risk:	exposed bluffs; rocky shores; coarse-grained sand, mixed sand and gravel, and gravel beaches; fringing marshes; sheltered tidal flats; manmade structures; and riprap.
Keywords:	none

Incident Summary:

On the morning of December 6, 1996, the T/B *Texas* broke loose from her mooring at the Long Island Lighting Company (LILCO), Northport Platform, 2.4 nautical miles east of Eaton's Neck Point, offshore of Northport, Long Island, New York. The barge dragged her anchor across seven powerline cables that run from Connecticut to Long Island. Of the seven cables, four were damaged and two were severed releasing the coolant oil dielectric fluid, DCL 45 (chemical name dodecylbenzene [DOB)

The cable, through which the dielectric fluid DOB is pumped, is approximately four inches in diameter with a hollow copper core. The core has some space through it to allow the fluid to soak into and saturate a surrounding paper wrapping. This is then surrounded by a lead layer and several plastic covers, then a hemp layer, and finally a braided aluminum cable all wrapped in another plastic coating. The seven cables run from the LILCO powerplant in Hicksville, New York across the bottom of Long Island Sound to Connecticut; each can carry 138,000 volts of electricity. The cables are used to transfer power between Connecticut and Long Island during peak-usage, usually summer, to make up any shortfalls due to energy consumption. All the cables were affected.

Approximately 5,700 gallons were lost by December 11. On that afternoon, two of the cables were successfully capped by divers, thus reducing the flow of DCL 45 from 20 gallons per hour to about 2 gallons per hour.

The linear alkylbenzene is not a petroleum distillate, but a synthetically produced product used to insulate the copper core from moisture. It is pumped into the cable from both sides of the sound. DOB is constantly pumped into the core, because water cannot be allowed to enter it. There is a contingency plan in place to shut down the pump rooms, but with the leak rate reduced to about 7 gallons per hour (5 gallons from the Connecticut side and 2 gallons from the New York side) the impacts were expected to be minimal, there was no need to implement the shutdown. However, the RP put together a monitoring/sampling plan to measure any levels of DOB in the surrounding sediments and shellfish.

When this incident occurred, the weather was winds from the north at 25 knots with an air temperature of 38°F.

Duration of response was about two weeks.

Behavior of Spilled Material:

DOB is a colorless liquid with a weak oily odor. It has low density and viscosity that will cause it to rise quickly to the surface where it will spread rapidly. The rising droplets will appear to blossom and spread quickly to a transparent sheen. From the source it is expected to form a transparent sheen that may extend several hundred yards under relatively calm conditions, and be nearly invisible under strong winds or breaking waves. The sheen will tear and dissipate into thin streamers and individual droplets and spread at very low concentrations. Due to the material's low viscosity, it will evaporate very slowly. The material is a skin and eye irritant, moderately toxic by ingestion, and may present an inhalation hazard. Personal protection equipment (PPE) should include rubber gloves and eye protection.

Light oily fouling or staining of the shoreline and biological resources at or on the water surface is likely. Because the material is colorless and relatively light, it may be difficult to detect on the shoreline. The effects of low concentrations of DOB on aquatic life are not well known; however, in the immediate vicinity of the spill site and any shallow waters with restricted circulation, water column toxicity may occur. The 96-hour aquatic median tolerance limit (TLm) for DOB is 10 to 100 parts per million (ppm). The TLm toxicity measure is similar to an EC_{50} (effective concentration), although the reference source defines the TLm as the concentration that will kill 50 percent of the test organisms in 96 hours. The reported toxicity range could be described as slightly to moderately toxic.

Countermeasures and Mitigation:

Hard-hat divers went to the bottom (45 to 55 feet) to locate the leaks visually This process was slow because it was weather-dependent and visibility in the sound is less than one foot. When a leak was located, the diver determined whether the cable was only damaged or completely severed, and a temporary clamp was attached to stop the leak at the damaged area. If it was severed, a cap was placed on each end. The clamp or cap will be replaced by a more permanent repair or splice in the summer using a crane and barge to hoist the cable out of the water and splice in new sections.

On December 12, the USCG reported that LILCO contract divers had completed clamping all leaking cables. No visible sheens were evident at that time.

LILCO was still working out details for final repairs and possible replacement for some or all the cables. This work will most likely occur in the summer.

Other Special Interest Issues:

The RP was concerned that the public's perception of the product leaking was being confused with benzene (a known carcinogen) and DOB that is not designated as a hazardous substance. NOAA and the RP developed an easy-to-read fact sheet for the product was included in a press package.

No shellfish areas were closed as a result of this leak, although monitoring activities were implemented.

NOAA Activities:

NOAA was notified of this incident on December 12, 1996, by MSO Long Island Sound who requested trajectory forecasts, resources at risk and toxicity information, and weather forecasts.

The SSC attended a unified command meeting and reported on anticipated resources at risk from the spill. This report was distributed to the states and RP. However, due to the diminished rate of release and its depth, minimal impacts are anticipated.

NOAA provided a customized weather forecast for the dive site to aid in planning the search and repair.

The SSC also reported:

> The spilled material will likely form a band (film or stain) along the high-tide swash line of exposed bluffs or rocky shores. Waves reflecting off these places may hold some of the spilled material offshore. Tide-pool organisms may be killed.
>
> The spilled material will be deposited primarily along the high-tide swash zone of any beaches that become impacted. The spilled material may become deeply buried, percolate, or seep into the sediments comprising the beaches. Penetration will be deeper on beaches with greater grain size.
>
> The spilled material will likely form a band (film or stain) along the high-water mark of vertical seawalls and may penetrate cracks or crevices in these structures. Along shores armored by riprap, the spilled material will probably adhere to the rough surfaces of the blocks and percolate into the interstitial spaces between the blocks comprising the structure.
>
> This material will likely adhere to marsh vegetation forming a stain or film on the plants. Impacts can be expected from the outer fringe of the marsh to the wrack line (high-water line) depending on the amount of material coming ashore. Resident biota (including birds) may be impacted. The material will not adhere to the surface of the sheltered flats but will be pushed across the flats by the tide, accumulating at the water line. Heavy accumulations may cover the flat during low water. The material should not penetrate the water saturated sediments of the marshes or flats. Care should be taken to avoid mixing the spilled material into marsh and flat sediments through foot or equipment traffic. If sediments become contaminated, there may be longer-term persistence of the spilled material and more severe biological impacts.

NOAA supported this incident for about one week.

References:

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

NOAA Hotline #207, 16 Reports

USCG MSO Long Island Sound, POLREPS (1 through 6 and Final) Minor, 5,000 Gal. Dielectric fluid, Potential-Medium, Long Island Lighting Co. (Long Island LCO), Northport, New York, MC96017871, FPN 01-7100, December 6, 1996.

Name of Spill:	F/V *Green Arrow*
NOAA SSC:	Stephen Lehmann
USCG District:	1
Date of Spill:	12/22/96
Location of Spill:	Block Island, Rhode Island
Latitude:	41°09' N
Longitude:	071°33' W
Spilled Material:	diesel, lube oil
Spilled Material Type:	2
Amount:	167 barrels (7,000 gallons)
Source of Spill:	fishing vessel
Resources at Risk:	shorebirds, pinnipeds, lobster, mollusks
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted	rocky headlands, wave-cut platform, exposed mixed sand and gravel beaches

Incident Summary:

On the morning of December 22, 1996, the 75-foot, steel-hull F/V *Green Arrow* ran aground on the southeast shore of Block Island, Rhode Island. Of primary concern were the sheltered salt marshes of the Great Salt Pond on the northwest side of the island and the lobster population in the immediate area. The winds were from the southwest, blowing oil out to sea and away from sensitive areas. Over the next 48 hours, small craft advisories and gale warnings with 6- to 12-foot seas were forecast from the southwest, endangering the vessel's position. Attempts to bring an offloading vessel alongside were hampered by the heavy weather and shallow water.

On December 23, 1996, overflight observers saw rainbow sheens from the vessel extending northeasterly for approximately one mile. It was believed that the starboard tank was holed and leaking.

The heaviest weather passed through on December 24, 1996. The following day the vessel was intact, but it was believed that more fuel had been released and the starboard tank was holed. The FOSC suspended operations over the holiday.

On December 26 a USCG dedicated pollution overflight observed very little sheening. The USCG and salvors began offloading operations. By December 27 it was estimated that more than 3,100 gallons of fuel had been removed and approximately 4,000 gallons had been lost.

USCG and Rhode Island Department of Environmental Management (RIDEM) shoreline surveys did not indicate shoreline oiling or wildlife impacts.

NOAA Activities:

NOAA was notified of this incident on December 22, 1996, by MSO Providence who requested weather forecasts, natural resources at risk information, and trajectory estimates.

The FOSC proposed putting gelling agents in the port tank in case of a release. The NOAA SST advised the FOSC that:

- ❒ adding this agent would be of no environmental benefit,

- ❒ recovery of the gelled fuel would be difficult, if not impossible,
- ❒ the gelled particles might be more available to lobsters, and
- ❒ operationally, there was not enough room in the tank (which was full) to add the agent and get sufficient mixing (the gel is added at 1-to-5 parts, requiring at least 20 percent of the tank to be empty).

The idea was rejected by the FOSC.

References:

Research Planning Institute. 1983. *Sensitivity of coastal environments and wildlife to spilled oil: Rhode Island. An atlas of coastal resources*. Seattle: Ocean Assessments Division, NOAA. 21 maps.

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 Hotline #209, 4 Reports

Name of Spill:	Getty Oil Tank Truck
NOAA SSC:	Ed Levine
USCG District:	1
Date of Spill:	01/14/97
Location of Spill:	Albany, New York
Latitude:	73°40′ W
Longitude:	42°39′ N
Spilled Material:	gasoline
Spilled Material Type:	1
Amount:	262 barrels (11,004 gallons)
Source of Spill:	fishing vessel
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted	gravel beaches, unranked man-made features

Incident Summary:

A tractor-trailer tanker overturned on the Dunn Memorial Bridge, connecting Albany and Rennesselaer, New York over the Hudson River. Approximately 11,000 gallons of unleaded gasoline spilled from the tanker into the river. The incident occurred at 1630 on January 14, 1997. The weather at the time was water temperature about 35°F, air temperature about 15° F, and the winds were 5 to 15 knots from the southwest. About 20 percent the river was covered with ice.

NOAA Activities:

NOAA was notified of this incident on January 14, 1997, by the USCG who requested trajectory, weather, and resources-at-risk information. The SSC provided tidal excursion for the product, estimating the movement to be about 1.5 miles north and 4 miles south. NOAA also told the USCG that 90 percent of the oil should evaporate during the next 12 hours and the ice may confound the evaporation by trapping some of the oil for longer periods. The SSC referred the duty officer to the Area Plan for the sensitive area locations, as this region was recently surveyed.

The RP hired a cleanup contractor who used vacuum trucks to remove oil trapped by ice. Approximately 3,200 gallons were recovered.

Name of Spill:	Cape Cod Mystery Spill
NOAA SSC:	Stephen Lehmann
USCG District:	1
Date of Spill:	01/31/97
Location of Spill:	Truro, Massachusetts
Spilled Material:	#6 oil or crude
Spilled Material Type:	4
Amount:	1 barrel, 50 gallons
Source of Spill:	unknown
Resources at Risk:	**Birds:** bird nesting beaches, bird wintering areas, and pelagic birds **Management Areas:** national parks **Marine Mammals**: whales
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	N
Shoreline Types Impacted:	coarse-sand beaches
Keywords:	none

Incident Summary:

Tarballs were reported coming ashore on the outer edge of the Cape Cod National Seashore near Truro, Massachusetts. The source was unknown. The line of tarballs, about the size of quarters, extended for approximately nine miles in varying densities. National Park Service (NPS) personnel responded and contacted the USCG MSO Providence.

NOAA Activities:

NOAA was notified of this incident on January 31, 1997, by MSO Providence.

At the request of the FOSC, the SSC provided resources at risk and hindcast information. The hindcast suggested that the oil could have come from as far away as Canada and been blown ashore by westerly winds. No other oil was found at sea by overflights. The FOSC used manual cleanup on the beach and by the evening of February 1 the cleanup was completed.

References:

Research Planning Institute. 1980. *Sensitivity of coastal environments and wildlife to spilled oil: Massachusetts. An atlas of coastal resources.* Seattle: Ocean Assessments Division, NOAA. 49 maps.

Name of Spill:	C/V *Pol America*
NOAA SSC:	Stephen Lehmann
USCG District:	1
Date of Spill:	04/2/97
Location of Spill:	Nantucket Island, Massachusetts
Latitude:	41°48.25' N
Longitude:	69°42..0' W
Spilled Material:	containers
Spilled Material Type:	unknown
Amount:	unknown
Source of Spill:	container vessel
Resources at Risk:	none
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	This vessel was formerly the MST *Chiara*, which ran aground in Narragansett Bay in 1992 requiring a substantial response.
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

The container vessel (C/V) *Pol America* lost ten containers over the side on the night of March 31, 1997, 10 miles off Nausett Beach in Massachusetts The contents were not immediately available, with the exception of bags of candy that were washing ashore on Nantucket Island and Cape Cod.

NOAA Activities:

NOAA was notified of this incident on March 31, 1997, by USCG MSO Providence who needed input on possible beaching sites of the containers and to put NOAA on standby. The SSC told the FOSC that if the containers or contents floated, they would remain offshore for several days and follow north-to-south currents. Impacts would be seen as far south as Long Island, but not before about two days.

None of the lost containers carried dangerous cargo.

References:

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

Name of Spill:	*RTC 380*
NOAA SSC:	Ed Levine
USCG District:	1
Date of Spill:	05/15/97
Location of Spill:	Carteret, New Jersey
Latitude:	40°35.17′ N
Longitude:	074°12.33′ W
Spilled Material:	#2 fuel oil
Spilled Material Type:	2
Amount:	1,014 barrels. (42,588 gallons)
Source of Spill:	barge
Resources at Risk:	**Terrestrial Mammals**: mustelids, rodents, deer, bears, population concentration areas, intertidal feeding areas **Birds**: waterfowl, shorebirds, wading birds, gulls, terns, rookeries, migratory routes, critical forage areas **Fish**: anadromous fish, estuarine fish **Recreation**: marinas, boat ramps **Resource Extraction**: powerplant 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, marshes, mixed sediment beaches, piers, riprap, salt marsh, sand/gravel beaches, sheltered marshes, sheltered seawalls, tidal mudflat
Keywords:	containment boom, evaporation, skimmers, vacuum trucks, weir/pump skimmer

Incident Summary:

At 0040 on May 15, 1997, the USCG ACT NY was notified of an oil spill at the GATX facility in Carteret, New Jersey. The discharge was the result of a tankerman falling asleep and overfilling the barge *RTC 380*.

The weather was overcast and temperature was 50°F.

An estimated 1,000 barrels of #2 fuel oil spilled into the water of the Arthur Kill. At the time of loading, the barge was surrounded by containment boom. The majority of the oil was held within the boom. Within 24 hours most of the oil was skimmed from within the boom.

ACT NY acted as FOSC, Reinhauer Transportation, Inc. was the designated RP, and New Jersey and New York spill response agencies responded to form the Unified Command. Two cleanup contractor companies were hired to deploy boom and remove the oil.

Behavior of Spilled Material:

The majority of the oil spilled remained in the containment boom pre-deployed around the barge during transfer operations. Approximately 32,000 gallons of oil were recovered from within the boom. Light sheens were reported over a seven-mile area within the Arthur Kill. Since the winds were from the west, the New Jersey shore remained relatively unaffected However, there were small pockets of oil seen on the Staten Island, New York side of the Kill.

Countermeasures and Mitigation:

Because the facility was pre-boomed a limited amount of oil escaped into the Kill. Boom was deployed to protect the pre-identified sensitive areas within the Arthur Kill. Oil was also vacuumed off the deck of the barge. Shoreline surveys found oil emanating from a bulkhead. Sorbent sweep was deployed and the contractor flushed the area with water.

Other Special Interest Issues:

There was high media interest in this incident. The governors of New York and New Jersey each made press statements and the New Jersey Governor made an overflight and visited the site.

NOAA Activities:

The SSC was paged and requested to provide trajectory and weather information as well as oil weathering predictions. NOAA described the movement of oil with the tides approximately 1.5 miles south and 3 miles north of the spill site within the first two tidal excursions. Weather, tide, and current information were also provided. The SSC predicted 90 percent evaporation/dispersion within 12 hours. The SSC responded to this spill by phone and fax for about an hour.

References:

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

NOAA Hotline #226, 3 Reports

Name of Spill:	Sewage Spill
NOAA SSC:	Ed Levine
USCG District:	1
Date of Spill:	06/27/97
Location of Spill:	Westchester Creek, New York
Latitude:	73° 50.34′ W
Longitude:	40° 49.13′ N
Spilled Material:	raw sewage
Spilled Material Type:	
Amount:	369,000 barrels, 15,498,000 gallons
Source of Spill:	sewage treatment plant
Resources at Risk:	recreational beaches
Chemical Countermeasures:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	bathing beaches
Shoreline Types Impacted:	coarse-sand beaches
Keywords:	none

Incident Summary:

At approximately 1700 on June 28, 1997, a 15.5 million-gallon raw sewage spill was discovered at a sewage treatment plant. The sewage was spilling into Westchester Creek, which empties into Long Island Sound. The spilled material began leaving the treatment plant at 1730 on June 27 and was not shut off until 0930 on June 28. ACT NY was contacted by Westchester County (New York) Health Department officials and requested to provide assistance.

NOAA Activities:

NOAA was notified of this incident on June 28, 1997, by the USCG ACT NY. The USCG asked the SSC to provide the county officials with probable trajectory implications from the release so they could devise a sampling and monitoring plan. The SSC reported that the plume could extend about five miles towards the east from the point of entry into Long Island Sound. This information was passed to the ACT NY and then to the county officials on-scene.

No further response was requested from NOAA

Name of Spill:	Dredge *Alaska*
NOAA SSC:	Ed Levine
USCG District:	1
Date of Spill:	08/21/97
Location of Spill:	Moriches Inlet, New York
Latitude:	40°45.0′ N
Longitude:	72°45.0′ W
Spilled Material:	diesel fuel
Spilled Material Type:	2
Amount:	2,785 barrels (117,000 gallons)
Source of Spill:	dredge
Resources at Risk:	Habitats: Submerged aquatic vegetation Birds: diving coastal birds, waterfowl, 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: demersal fish **Mollusks**: oysters, mussels, clams, harvest areas Recreation: beaches, marinas, boat ramps, diving areas, high-use recreational boating areas, high-use recreational fishing areas, state parks Management Areas: national park, refuge
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	extraordinarily successful salvage operations
Shoreline Types Impacted:	medium- to coarse-gravel beaches, coarse-sand beaches, coastal structures, exposed riprap, exposed seawalls, exposed tidal flat, extensive intertidal marshes, extensive salt marshes, extensive wetlands, marshes, mixed-sediment beaches, piers, riprap, salt marsh, saltwater marshes
Keywords:	containment boom, evaporation, salvage, potential spill

Incident Summary:

At 0824 on August 21, 1997, the USCG Group Moriches was notified that the 220-foot dredge *Alaska* had broken her mooring lines and might run aground off the coast of Long Island, New York. There were 22 people onboard. The *Alaska* was approximately 1,500 feet offshore of Moriches, New York. The dredge had about 117,000 gallons of diesel aboard. The crew was airlifted off the dredge because of the high seas.

It was raining at the time of the incident, the air temperature 65°, water temperature 68°, wind easterly at 20 to 25 knots, greater than 10-foot waves, and one-mile visibility.

Summary of events

The tender tug, *Hoosier State*, and dredge were evacuated due to weather and sea conditions. The tug was towed into Moriches Inlet by the tug, *Miss Nellie*. The *Alaska* held her position because her dredge cutter head (ladder) became impaled in the sediment when the cabling broke.

Great Lakes Dredging Co. (RP) hired a cleanup contractor to stand ready to deploy containment and sorbent boom for oil recovery. The RP employed DonJon Marine to perform salvage operations. When the weather subsided, an underwater survey showed no damage to the *Alaska*'s hull. Her cutter head was lifted and the dredge moved by the salvor to a drydock for further inspections and repairs. No product was discharged or lost.

The USCG and New York State Department of Environmental Conservation (DEC) established a command post at Group Moriches. The State On-Scene Coordinator (SOSC) and FOSC prepared sensitive area protection plans and approved lightering operation plans. A safety zone was established around the dredge.

Countermeasures and Mitigation:

Sensitive areas were boomed and recovery equipment placed at identified areas as precautionary protection.

Control at the incident site was provided by USCG Safety Zone Broadcast.

Other Special Interest Issues:

There was high local media interest in this incident. The south shore of Long Island is a very popular summer tourist spot. Hundreds of thousand of people use the beaches for recreation. This incident posed a substantial threat to those beaches.

The salvage operation was complicated by the weather and proximity to the beach.

NOAA Activities:

NOAA was notified of this incident on August 21, 1997, by USCG Group Moriches, New York who requested information on resources at risk, shorelines at risk, behavior of spilled material, and forecasted weather. NOAA responded with the following information covering Moriches Bay and the outer coast 10 miles either side of the inlet. This area does not necessarily correspond to actual or potential oil locations.

A worst-case spill from the grounding would likely rupture several tanks, releasing 10,000 to 20,000 gallons of diesel. Diesel is a relatively light oil and may result in impacts to organisms and resources in intertidal areas and on the water's surface as well as to water column and bottom organisms. Under the predicted strong southwest winds and high wave conditions, any release is expected to move downwind and into the surf zone and inside the inlet where rapid mixing will take place. Silver and rainbow sheens will move east along the coast and could remain visible for several miles. The currents through Moriches Inlet are strong, but tidal volumes are low so it is unlikely that large amounts of product will enter the bay. Some streamers of sheen could appear inside the inlet if the potential release occurred just before a flood tide.

The ADIOS ™ oil budget table based on 20-knot winds and an instantaneous spill of 117,000 gallons of diesel with an assumed API of 39 predicted 45 percent of the oil evaporating, 42 percent naturally dispersing, and 13 percent floating after 12 hours.

Weather updates customized for the incident site were provided throughout the duration of the response and salvage.

Shoreline Resources at Risk

The outer shoreline is all medium- to coarse-grained sand beaches with numerous breakwaters. In Moriches Bay the shoreline is predominantly marshes. There are sections of the bay that have medium- to coarse-grained sand beaches. There are also several tidal flats just north of the inlet. In the developed areas shorelines are mostly seawalls. On the outer beach the oil may penetrate the beach sediments as much as 50 centimeters. There is also a risk of the oil getting buried fairly quickly. The beaches have a steep slope and are constantly reworked. The breakwaters are usually constructed of riprap, which will tend to collect oil in pools in the interstitial spaces. Inside the bay the oil may penetrate into the sand beaches, but there is less chance of burial since it is a relatively sheltered environment. The seawalls may be stained by the oil at the high-tide line, but there should not be any significant accumulation on those structures. The marshes may be heavily impacted. The oil will especially damage the marsh vegetation if it penetrates into the marsh sediments. Heavy foot traffic in the marsh will exacerbate the problem. The marsh grasses are very sensitive to the toxic effects of this oil.

Biological Resources at Risk

Fish - There are numerous species of fish, both in the bay and in the ocean, including summer flounder, striped bass, tautog, Atlantic menhaden, spot, weakfish, and scup. The offshore fish at greatest risk are those that are in the surf zone, which usually includes many juveniles. The diesel can mix into the water column in the surf zone resulting in the surf zone fish being exposed to toxic levels of diesel fuel. Inside the bay there may be less wave energy, but the bay is extremely shallow. If fresh oil accumulates in any areas of the bay, it is possible for the water column concentrations under the slick to reach lethal levels.

Shellfish - Present throughout the bay are blue crabs and hard clams. Surf clams are found throughout the coastal area. The blue crabs and hard clams may be exposed to toxic levels of oil in areas of the bay where the oil accumulates. Since the bay is very shallow, it is possible that the hard clams throughout the bay may be exposed to concentrations of oil high enough to at least taint the flesh. In the surf zone, the surf clams may also be exposed to oil concentrations high enough to cause mortality, or sublethal effects such as tainting.

Birds - There are numerous species of wading birds, gulls, and terns present throughout this area. In addition, species of gulls and terns nest on shorelines within the bay. Common terns nest on New Made Island. Herring gull, common terns, great black-backed gulls, roseate terns (federally listed), and black skimmers (State listed) nest on the islands just inside the inlet. It is near the end of the nesting season but there may still be some juveniles on the nests. Contaminated adult birds can carry oil back to the nest, contaminating the juveniles.

Wading birds primarily become oiled on the legs while wading for prey. They may also become oiled on the upper body and feathers by coming in contact with oiled vegetation. Gulls and terns may be at risk because they are often attracted to and will prey on sick or injured prey. This behavior may result in oiling of feathers and the ingestion of oil.

Insulation for birds is provided by their feathers and oiling reduces their buoyancy and water repellency, and may result in death by drowning or hypothermia. Preening of oiled feathers may also result in ingestion of oil causing irritation,

sickness, or death. Bird oiling, particularly wading birds, may continue even after the floating oil slicks have been removed, depending on the extent of oiled vegetation.

Human-Use Resources at Risk

The beaches along this section of coast are all recreational beaches. On the west side of the inlet is Fire Island National Seashore. Inside the bay are numerous marinas located on small tidal creeks near most of the towns around the bay.

NOAA supported this incident until the lifting operation was completed on August 25, 1997.

References:

Captain of the Port (COTP) Long Island Sound Area Plan

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 Hotline #240, 21 Reports.

Research Planning Institute. 1985. *Sensitivity of coastal environments and wildlife to spilled oil: Long Island. An atlas of coastal resources*. Seattle: Ocean Assessments Division, NOAA. 41 maps.

USCG POLREPS. 1997. Long Island Sound Area Contingency Plan. USCG Marine Safety Office Long Island Sound.

U.S. Coast Guard Districts 2/9

Name of Spill:	Honey Creek
NOAA SSC:	Stephen Lehmann
USCG District:	2/9
Date of Spill:	10/10/96
Location of Spill:	Milwaukee, Wisconsin
Spilled Material:	#2 heating fuel
Spilled Material Type:	2
Amount:	71 barrels, 3,000 gallons
Source of Spill:	truck
Resources at Risk:	spawning streams
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	river/creek, vegetated riverbank
Keywords:	

Incident Summary:

On the night of October 1, 1996, a truck carrying 7,500 gallons of #2 fuel overturned and caught fire. An estimated 3,000 gallons of #2 oil spilled into Honey Creek, unburned. Wisconsin officials managed the cleanup for nine days, with assistance from the USCG MSO Milwaukee.

NOAA Activities:

NOAA was notified of this incident on October 10, 1996, by MSO Milwaukee. They discussed the State's plan to remove residual contamination by removing sediment and vegetation along a half-mile stretch of the creek.

The SSC recommended that wholesale removal of sediment and vegetation not be conducted, because the oil could be driven deeper, increasing erosion along the creek banks. Also recommended was that cleanup workers resurvey the impact area and manually remove dead vegetation that was likely trapping oil. If a pocket of heavier oil contamination was found, it could be removed selectively. The coming winter snows and spring melts would very effectively clean the area prior to fish spawning.

Name of Spill:	M/V *Elizabeth Beesecker*
NOAA SSC:	Bill Sites
USCG District:	9
Date of Spill:	11/15/96
Location of Spill:	Hastings, Minnesota
Latitude:	44°45′ N
Longitude:	92°52.′5″ W
Spilled Material:	#2 diesel
Spilled Material Type	2
Amount:	47,000 gallons
Source of Spill:	tow vessel
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	sorbent boom, vacuum trucks

Incident Summary:

On November 15, 1996, the engine of the 123-foot M/V *Elizabeth Beesecker* caught fire on the upper Mississippi River south of St. Paul, Minnesota. She was carrying 47,000 gallons of #2 diesel and was pushing 13 barges downriver; one was empty, the other 12 carried grain. The burning vessel was intentionally grounded for the safety of the crew and vessel, and to help control the vessel during the incident. On November 15 three of the loaded barges were removed; the remaining nine barges helped keep the tug solidly grounded.

The inside of the superstructure of the towboat was almost completely burned. There were concerns that the fire could cause the vessel's fuel tanks to breakup, catch fire, and possibly release a significant amount of oil. Boom was placed around the vessel to help prevent oil from being transported downriver. Drinking water managers downriver were notified. A small oil sheen was observed in the river.

There was ice on the river during this response.

The locks and dams in the path of any spilled material were of the flow-through (or underflow) type. They could help contain any spilled oil.

Countermeasures and Mitigation:

The FOSC, USCG MSD St. Paul, USCG Gulf Strike Team (GST), Minnesota Pollution Control Agency, and the local fire department were on-scene and established a Unified Command.

The majority of the diesel (39,000 gallons) was safely offloaded by vacuum trucks. Approximately 700 gallons of diesel was released from the *Beesecker*; approximately 200 gallons were dispersed or evaporated, and 500 gallons were recovered with sorbents. The remaining 7,300 gallons most likely burned during the fire that generated temperatures as high as 5,000°F.

The *Elizabeth Beesecker* was towed to St. Louis after the fire was extinguished and fuel offloaded. The vessel will be gas-freed and sent to a scrap yard.

NOAA Activities:

NOAA was notified of this incident on November 15, 1996, by MSD St. Paul who requested telephone support to MSO St. Louis. The SSC notified the National Response Center (NRC) and supplied weather, resources at risk, and river-flow information to the FOSC.

Name of Spill:	R/V *Halcyon*
NOAA SSC:	Bill Sites
USCG District:	9
Date of Spill:	12/3/96
Location of Spill:	Muskegon, Michigan
Latitude:	43°14'20" N
Longitude:	86°15'30" W
Spilled Material:	diesel
Spilled Material Type:	2
Amount:	2,400 gallons
Source of Spill:	research vessel
Resources at Risk:	**Fish**: walleye, trout, muskellunge **Management Area**: Muskegon State Park, Muskegon water intake
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	RP was also the FOSC
Shoreline Types Impacted:	sand beaches, marshes, man-made structures, riprap
Keywords:	containment boom, potential**,** sorbent boom

Incident Summary:

On December 2, 1996, the NOAA research vessel (R/V) *Halcyon* sank at the West Michigan Dock and Market Pier in Muskegon, Michigan in approximately 30 feet of water. The 60-foot *Halcyon,* owned and operated by the NOAA Great Lakes Environmental Research Laboratory (GLERL), had 2,400 gallons of diesel and four 55-gallon drums of antifreeze and waste oil onboard when she sank. The drums floated off the vessel, remained in the slip area, and were recovered. It was presumed that fuel was leaking out of the fuel-tank vents because silver and rainbow sheens were observed in the area. Containment boom was deployed around the vessel on December 3. No sheens were observed beyond the immediate slip area throughout the incident.

After a thorough investigation, NOAA determined that the sinking of R/V *Halcyon* was apparently caused by a combination of events rather than one single event. The winterizing process underway before the sinking compromised the watertight integrity of the bilge pumping systems. This, coupled with an unusual amount of vessel trim aft that allowed water to enter the bilge pump discharges normally above the waterline, were the direct causes of the sinking.

The weather during the defueling and lifting operations was temperatures in the 20s and 30s, mostly cloudy skies with occasional snow showers, with winds averaging 5 to 15 knots.

Behavior of Spilled Material:

The diesel spread out into rainbow and silver sheens and then dissipated. There were some very minor mousse formations in a few downwind recovery areas. No shoreline was impacted by the oil.

Countermeasures and Mitigation:

At a December 4 meeting with representatives of the USCG MSD Grand Haven, Michigan; the cleanup contractors; Muskegon County Hazardous Materials (HAZMAT) Team; and NOAA GLERL a Unified Command was activated. The Unified Command, after observing

the floating drums and extent of sheening, and receiving an unofficial report of a dead bird, decided to step up the incident response.

The Unified Command decided to handle the incident in two stages: first, eliminate the potential oil pollution problem and second, salvage the vessel.

The Unified Command then called in two members of the USCG AST; the Muskegon County HAZMAT Team; cleanup contractors Marine Pollution Control (MPC)—Detroit; Andrie (West Michigan); and Young's Environment (West Michigan); a ship's engineer from NOAA's Office of NOAA Corps Operations Fleet Replacement and Modernization Program; and a NOAA contract naval architect to help with defueling and salvaging operations. On December 4, the Unified Command deployed additional containment and sorbent boom around the vessel and at the entrance to Muskegon Lake to prevent any sheens from escaping the slip area. On December 4 and 5 the drums were removed from the slip and secured ashore and the vessel's fuel vents were plugged, eliminating the leak and subsequent sheening.

The defueling operation was completed on December 6. Approximately 2,400 gallons of diesel were recovered from the *Halcyon*. The oil was pumped out through the fuel tank vents. The contents of five fuel tanks were pumped into an MPC tank truck, then taken off-site for disposal. Sheens either dissipated or were recovered in sorbent boom, sweep, and pads. Roll-off boxes containing oiled boom, pads, sweep, and other contaminated materials were taken off-site for disposal by MPC. The remainder of the response was devoted to lifting the vessel out of the water and placing her on a barge on her cradles.

The lifting operation began on December 8 and was completed on December 12. The lift operation used a 165-ton crane on the seawall with four strategically placed cables and load sensors on the starboard bow of the vessel and two 100-ton cranes, one on the seawall, another on a barge on the vessel's port side, with cables and sensors connected at lift points on the stern. The load sensors monitored the distribution of the load continuously. Hard boom was deployed around the vessel and at the entrance to the slip for the duration of the defueling and lifting operations.

Other Special Interest Issues:

NOAA was designated the FOSC early in the response until the USCG Marine Safety Division (MSD) Grand Haven reviewed the National Contingency Plan (NCP) and assumed the role. This incident was remarkable in that the RP was, for a short time, the FOSC.

NOAA Activities:

NOAA was notified of this incident on December 3, 1996, by NOAA GLERL who requested assistance on the issue of whether to offload the diesel fuel before lifting (refloating) the vessel. The SSC for USCG Districts 2/9 reported to the scene on December 3 and acted as Site Safety Officer during the lifting operation. The NOAA SSC for USCG District 1 arrived on-scene December 5 to represent the RP. There were representatives from NOAA HAZMAT on-scene from December 3 through December 14.

References:

NOAA and American Petroleum Institute. 1994. *Options for minimizing environmental impacts of freshwater spill response.* Seattle: Hazardous Materials Response and Assessment Division, NOAA. 131 pp.

NOAA Hotline #206, 26 Reports.

USCG Ninth District Command Center Operations Summaries, December 3 to 13, 1996. USCG POLREPs - 021954z DEC 96 through 13 DEC 96 from COGARD MSD GRAND HAVEN MI.

Name of Spill:	Train Derailment
NOAA SSC:	Bill Sites
USCG District:	2
Date of Spill:	12/19/96
Location of Spill:	Louisville, Kentucky
Latitude:	N/A
Longitude:	N/A
Spilled Material:	styrene
Spilled Material Type:	5
Amount:	15,000 gallons
Source of Spill:	railroad cars
Resources at Risk:	Ohio River, fish, shellfish
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Shoreline Types Impacted:	none
Keywords:	vacuum trucks

Incident Summary:

A Norfolk Southern Railroad train derailed near Louisville, Kentucky on December 19, 1996, approximately one mile from the Ohio River. The incident involved the derailing of ten railcars, three of which were tank cars containing a hazardous chemical. The tank cars of concern, with a capacity of 30,000 gallons each, contained styrene, butadiene, and chloroprene. Approximately 15,000 gallons of styrene leaked out of a tank car and into a ditch leading into the Ohio River. The styrene was contained in a natural containment area and ditch and did not reach the Ohio. The tank cars of butadiene and chloroprene did not leak any product despite being turned over on their sides.

The FOSC was USCG MSO Louisville. Kentucky DEP assumed the lead OSC responsibility during the afternoon of the incident.

The weather during this incident was temperature 25° to 32°F, mostly cloudy skies with light snow, and winds 7 to 10 knots.

Behavior of Spilled Material:

The styrene had a melting point of -23°F. The ambient temperature was approximately 30°F. USCG observers at the scene indicated that the styrene was slowly oozing out of the tank car. The suspected reasons for this behavior included polymerization and the effects of the cold ambient temperatures. No indications of polymerization (no temperature rise and no color change to milky white) were observed.

Countermeasures and Mitigation:

The hole in the styrene tank car was plugged in the afternoon. Styrene in the tank and contained in the ditch and pond was recovered by vacuum trucks.

NOAA Activities:

NOAA was notified of this incident on December 19, 1996, by MSO Louisville who requested resources at risk information for the Ohio River, a toxicity assessment, information on airborne hazards, health and safety information, and recommendations for containment and recovery for each of the three chemicals. The SSC reported that each of the

chemicals was extremely flammable and explosive and protection of the on-scene personnel should be emphasized.

The SSC provided information during two conference calls on the December 19. NOAA supported this incident for several hours.

References:

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

NOAA Hotline #208, 4 Reports

Unified Incident Command Log from USCG MSO Louisville, December 19, 1996.

Name of Spill:	Oil Well Pipeline
SSC:	Bill Sites
USCG District:	2
Date of Spill:	1/7/97
Location of Spill:	New Harmony, Indiana
Latitude:	38°07'0" N
Longitude:	87°54'0" W
Spilled Material:	crude oil
Spilled Material Type:	2
Amount	10,000 gallons
Source of Spill:	pipeline
Resources at Risk:	**Fish**: bass, bluegill, crappie, spottail darter **Terrestrial Mammals**: mink, raccoon **Mollusks**: mussels **Management Area**: New Harmony State Park
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	small river and stream
Keywords:	boom, sorbent boom, vacuum truck

Incident Summary:

On January 7, 1997, approximately 10,000 gallons of crude oil from a two-inch oil well pipeline spilled into Long Run in southwestern Indiana. Long Run flows into Rush Creek and then into the Wabash River.

Behavior of Spilled Material:

The oil was contained in the Long Run and Rush Creek area using two underflow dams and boom. Oil was herded into recovery areas with shovels and leaf blowers, then recovered with vacuum trucks and sorbent booms and pads.

NOAA Activities:

NOAA was notified of this incident on January 7, 1997, by the Indiana Department of Environmental Management (IDEM) Emergency Response Branch who requested a resources at risk summary and assessment of potential long-term effects, if any, from the spilled oil.

The SSC told IDEM that a 10,000-gallon spill of light crude oil into a small waterway could impact birds, mammals, fish, and shellfish. Many fish and shellfish could be killed, but the impact to birds and mammals would be lower.

The long-term effects would be highly variable depending on the amount of waterflow through the channel. If the flow is low, residual oil in the sediments could last for several years. However, if there is abundant natural flushing, the recovery could be much shorter. Visible evidence of oil could be gone in six months, although, recovery could begin sooner.

NOAA supported this incident for one day by telephone.

References:

NOAA. 1994. *Inland oil spills. Options for minimizing environmental impacts of freshwater spill response*. Seattle: NOAA, Hazardous Materials Response and Assessment Division. 126 pp + Appendix.

Name of Spill:	M/V *Shirley L. Stapp*
NOAA SSC:	Bill Sites
USCG District:	9
Date of Spill:	01/15/97
Location of Spill:	Robinsville, Mississippi
Spilled Material:	gasoline
Spilled Material Type:	1
Amount:	200,000- to 300,000-gallon potential
Source of Spill:	barge
Resources at Risk:	**Shoreline**: large riverine environment **Fish**: pallid sturgeon, paddlefish **Mollusks:** mussels and clams **Birds**: wintering or migratory waterfowl, bald eagles, least terns **Mammals**: river otters
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Shoreline Types Impacted:	none
Keywords:	potential

Incident Summary:

On January 15, 1997, the USCG MSO Memphis received a report from the M/V *Shirley L. Stapp* that her forward of four barges being pushed ahead was aground on a dike (on the Arkansas side) at River Mile 717.2 on the Lower Mississippi River. The barge contained approximately 1.1 million gallons of gasoline in ten tanks. Initial observations indicated that the forward two tanks were holed. Total potential from these two tanks was about 200,000 gallons. It was later confirmed that four forward tanks were holed.

Behavior of Spilled Material:

The released gasoline quickly dissipated due to evaporation and dispersion, high winds, and 3- to 6-knot river currents. No recovery was attempted.

Countermeasures and Mitigation:

On the morning of January 16 initial lightering operations began. These initial attempts at lightering were unsuccessful because water was the only thing being removed from the damaged tanks. The RP began using more powerful pumps but was still unable to remove the gasoline cargo. The USCG GST began rigging their lightering pumps when strong winds refloated the barges and towboat during the early afternoon. The Unified Command decided to move the towboat and barges 12 miles north to a gasoline transfer facility and lighter the damaged barge there using the GST's more powerful pumps.

The four forward tanks (port and starboard) of the most forward barge had been holed. By mid-afternoon on January 16, an estimated 20,000 to 30,000 gallons had leaked out of the holed tanks. Very minimal sheens were observed through the rest of the incident. On-scene personnel suspected that the holes were still leaking as the unit was being moved northward; however, no sheens were visible and no gasoline odor was detected. It was assumed that the gasoline was quickly being evaporated and mixed into the water column. No gasoline recovery was attempted due to the wind and current conditions and the rapid dissipation of the product.

The towboat and her barges were moved to the transfer facility on January 17. Lightering was completed on January 18 and the barges were taken to a dry dock facility for repairs.

NOAA Activities:

NOAA was notified of this incident on January 15, 1997, by MSO Memphis who requested information on resources at risk, the expected fate and behavior of the gasoline, any precautions that should be taken for responders' safety in case of an explosion, and short-term weather forecasts.

The SSC estimated that evaporation and dispersion would limit surface slicks to a relatively short distance downriver given the existing weather, with 12- to 15-knot winds, 3- to 6-knot river currents, and a potential release of 200,000 gallons of gasoline. The sheens were expected to dissipate within 12 hours of release; however, gasoline odors might be detected as far as 20 miles downwind. Also, because of solubility and high dispersion, the SSC advised of possible water intake hazards downriver.

NOAA supported this incident by telephone for one day.

References:

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

NOAA and American Petroleum Institute. 1994. *Options for minimizing environmental impacts of freshwater spill response.* Seattle: Hazardous Materials Response and Assessment Division, NOAA. 131 pp.

NOAA Hotline #212, 5 Reports

Name of Spill:	M/V *Bronwynne Brent*
NOAA SSC:	Bill Sites
USCG District:	8
Date of Spill:	1/17/97
Location of Spill:	Memphis, Tennessee
Spilled Material:	potential chloroform and styrene
Spilled Material Type:	5
Source of Spill:	barges
Resources at Risk:	**Fish**: pallid sturgeon, paddlefish **Mollusks**: mussels and clams **Birds**: wintering or migratory waterfowl, bald eagles **Marine Mammals**: river otters **Resource Extraction**: water intakes
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	potential

Incident summary:

On January 17, 1997, the towboat M/V *Bronwynne Brent*, pushing 12 barges, ran aground on a levee on the Lower Mississippi River approximately 24 miles north of Memphis, Tennessee. The forward two barges contained chloroform; the third barge in the tow contained styrene.

Weather on-scene January 17 and 18 was temperature 26° to 30°F, west-southwest winds 8 knots, mostly cloudy with some sun breaks. The river currents were estimated at 3 to 6 knots.

Behavior of Spilled Material:

No chloroform or styrene was spilled during this incident.

NOAA Activities:

NOAA was notified of this incident on January 17, 1997, by MSO Memphis who requested information on the fate and behavior of chloroform in a riverine environment and potential health and safety concerns.

The SSC provided the following information to MSO Memphis:

Chloroform is a clear, heavy liquid that is heavier than water and slightly soluble. The chloroform will sink and slowly move along the bottom with the current, pool in deep holes, and slowly dilute out. A fish kill is probable. Chloroform is also a suspected human carcinogen so on-scene personal should wear air purifying respirators or other appropriate PPE. Nearby water intakes should be shut down until the risk of contamination is passed.

A potential resources at risk summary for chloroform was delivered to MSO Memphis on the morning of January 18.

MSO Memphis and the RP inspected the barges and notified NOAA that no holes or leaks were located in the chloroform barges.

MSO Memphis notified the SSC on January 18 that they suspected the styrene barge had also run aground during the incident and sustained some damages. MSO Memphis requested a resources at risk summary and information on fate and effect for styrene, and health and safety concerns. NOAA gave the following information to MSO Memphis:

Styrene is flammable, fairly reactive, explosive, and can polymerize; it also floats. One of its most significant hazards is that its vapors can travel a long distance to an ignition source and then flash back to the source and explode. Styrene is also an irritant to eyes and skin so appropriate PPE should be worn. Styrene can polymerize when exposed to air, especially in sunshine, and will solidify into a plastic-like substance. It can have the appearance of white soap flakes when floating on the water surface. Nearby water intakes should be shut down until the risk of contamination is passed.

On January 21 MSO Memphis informed NOAA that an inspection of the barges revealed no leaks. The marine inspector issued a permit allowing the barges to proceed to Huntington, West Virginia and Pittsburgh, Pennsylvania to offload cargo.

NOAA supported this response by telephone, fax, and e-mail for two days.

References:

CAMEO™ Response Information Data Sheets (RIDS).

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

NOAA and American Petroleum Institute. 1994. *Options for minimizing environmental impacts of freshwater spill response.* Seattle: Hazardous Materials Response and Assessment Division, NOAA. 131 pp.

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

NOAA Hotline #215, 4 Reports

Name of Spill: Northern Lake Michigan Log Spill
NOAA SSC: Bill Sites
USCG District: 9
Date of Spill: 04/21/97
Location of Spill: Northern Lake Michigan
Latitude: 45°N
Longitude: 086'5° W
Spilled Material: pine logs
Amount: approximately 2,000 logs
Source of Spill: tug and barge
Resources at Risk: recreational boaters
Dispersants: N
Bioremediation: N
In-situ Burning: N

Incident Summary:

On April 21, 1997, approximately 2,000 pine logs, with bark intact, 8 to 10 feet long, 8 to 10 inches in diameter were spilled from a tug and barge unit in the northern half of Lake Michigan.

Behavior of Spilled Material:

The movement of the logs was influenced by weak lake currents that are driven by the local winds. Winds on Lake Michigan in April are primarily from the northwest; the secondary wind direction is southwest. Under northwest winds the logs would move counterclockwise south of Sturgeon Bay, Wisconsin and clockwise north of Sturgeon Bay. Currents were expected to be very weak in the middle of the lake.

Countermeasures and Mitigation:

The logs were manually removed.

NOAA Activities:

NOAA was notified of this incident on April 25, 1997, by USCG District 9 who requested help to focus their helicopter search for the logs. They requested a lake-current analysis for the next two weeks. Using local meteorological data from the previous week and climatological average winds, NOAA developed the requested lake-current forecast. The SSC reported on-scene and delivered the requested information to District 9 on April 25. NOAA support included averaging wind speeds and directions for the past week and statistical averaging for the next two weeks. A lake-current analysis for northwest winds and southwest winds was also developed.

Name of Spill:	Conrail Train Derailment
NOAA SSC:	Bill Sites
USCG District:	9
Date of Spill:	04/21/97
Location of Spill:	Sandusky Bay, Ohio
Latitude:	41°29.9′ N
Longitude:	082°50.1′ W
Spilled Material:	chlorine, sodium hydroxide solution, sodium carbonate powder
Spilled Material Type :	5
Source of Spill:	derailed train cars
Resources at Risk:	**Fish**: brown trout, brook trout, northern pike, bluegill, yellow perch, bass, crappie, channel catfish, brown bullhead, carp, green sunfish, freshwater drum, lake sturgeon, bigmouth buffalo, minnows, shad, western banded killifish (State endangered), muskellunge (State species of interest), and walleye. **Shellfish**: eastern pond mussel (State endangered), three-horned warty bag (State threatened), deer toe (State species of interest) **Birds**: killdeer, sandpipers, yellow legs, dunlin, herons, rails, egrets, bitterns, gulls, terns, waterfowl, peregrine falcons, bald eagles. **Mammals**: muskrat, mink, raccoon **Plants**: wapato, smooth rose (State threatened or endangered) **Human Use**: recreational fishing. water intake to gypsum plant in Sandusky Bay
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Shoreline Types Impacted:	none
Keywords:	vacuum truck, endangered species, threatened species

Incident Summary:

On April 21, 1997, a Conrail train was eastbound from Elkhart, Indiana to New York with 144 cars. At approximately 1130, 31 cars derailed near Danbury, Ohio adjacent to Sandusky Bay. Of the 31 derailed cars, 12 contained hazardous substances: 1 chlorine, 7 sodium hydroxide solution, and 4 sodium carbonate powder. The cars reportedly contained residual amounts, typically two to three percent of capacity. A tank car of sodium hydroxide came to rest in a retention pond connected to Sandusky Bay through a 10-foot culvert. No leaks of sodium hydroxide were observed. A hopper car of sodium carbonate also came to rest partially submerged in the pond. The hopper car was damaged and sodium carbonate powder spilled into the retention pond raising the pH in the water to as high as 12 within 100 yards of the car. The chlorine tank car was located in the middle of the pile of derailed cars and was the primary human health and safety concern.

The weather on April 21 and 22 was partly cloudy with temperatures ranging from 55° to 65°, northeast winds of 5 to 15 knots, and occasional sprinkles during the overnight hours.

The FOSC for the response was USCG MSO Toledo. The SOSC was Ohio EPA, the RP was Conrail, and the Local Incident Commander was the Ottawa County Fire Department. Others involved in the response included, Ohio State Highway Patrol, Ottawa County Police, Ottawa County Emergency Management, Ohio Department of Natural Resources Division of Wildlife, American Red Cross, USCG Air Station Detroit, USCG Station

Marblehead, USCG District 9 Public Affairs and Marine Response Operations, U.S. EPA, Conrail Derailment Team and response contractors, and NOAA.

Initial information about the chlorine risks was based on an instantaneous release of 2,000 gallons and a level of concern of 10 ppm. These inputs yielded a recommended home evacuation and no-fly zone radius of four miles. The unified command considered this excessive and requested a re-run of the ALOHA™ model based on a 500-gallon release over six to eight hours, and a level of concern of three ppm. These inputs yielded a recommended evacuation radius of one-half mile and a no-fly zone of one mile. The one-half-mile home evacuation zone caused the evacuation of approximately 140 people. The evacuated residents were allowed to return to their homes after midnight on April 22 when the chlorine tank was removed from the pile and secured. Route 2, which had been closed since the derailment, was also reopened. On April 22 all remaining derailed cars were safely moved from the railroad track (and adjacent pond) to nearby locations for later salvage. Conrail repaired the damaged track on April 22 and by 0930 a train was able to test the new track.

Behavior of Spilled Material:

The sodium carbonate powder was heavier than water and sank to the bottom of the pond. It raised the pH of the retention pond, culvert, and adjacent Sandusky Bay to as high as 12. The plume extended about 75 yards into the pond, through the culvert, and approximately 100 yards into Sandusky Bay. The highest pH readings were on the bottom.

Water monitoring on April 22 indicated that pH levels were returning to normal in the areas tested the day before. The pH levels ranged from 8 to 11 and were highest on the bottom of the water and normal at the surface. A plan was developed that called for monitoring for pH once or twice a day until readings go below 10 and again after the next significant rain storm. There appeared to be no significant impact to fish or wildlife in the pond or Sandusky Bay. It was believed that fish in the area were sufficiently sensitive to pH levels to flee to clean water when pH levels began to rise.

The chlorine tank car and sodium hydroxide tank cars showed no indications of leakage throughout the incident.

Countermeasures and Mitigation:

Residual sodium hydroxide solution and sodium carbonate were removed by vacuum truck. The sodium carbonate powder on land while waiting to be recovered was covered with visqueen keeping the powder from blowing away with the wind or mixing with the rain and flowing away. The sodium carbonate in the water was left to naturally dilute. The chlorine tank was secured, gas-freed, and taken away for salvage.

NOAA Activities:

NOAA was notified of this incident on April 21, 1997, by MSO Toledo at approximately 1300 and requested on-scene. The SSC arrived on-scene at approximately 1430. MSO requested assessment of the chemical hazards (chlorine, sodium hydroxide, and sodium carbonate); expected behavior of the chemicals and potential impacts to humans, fish, and wildlife; weather forecasts; resources at risk; NOAA's input on the radius of the no-fly and home-evacuation zones; and suggestions for the water monitoring plan.

NOAA felt that the primary concern was the chlorine, which if released, can be fatal to humans. Air monitoring was conducted throughout the response to detect any releases of

chlorine. Sodium hydroxide and sodium carbonate are strong bases with pH 12 or 13. They are heavier than water and would sink to the bottom, move slowly with any current, and pool in deep pockets. Both products could generate localized fish and shellfish kills. Only one or two dead fish were observed on April 22. No other impacts to natural resources were observed.

The NOAA SSC was on-scene April 21 and April 22.

References:

Lewis, Richard J. Sr. 1992. *Hawley's Condensed Chemical Dictionary* Twelfth Edition. ISBN 0-442-01131-8. New York: Van Nostrand Reinhold Company. 1275 pp.

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 and American Petroleum Institute. 1994. *Options for minimizing environmental impacts of freshwater spill response.* Seattle: Hazardous Materials Response and Assessment Division, NOAA. 131 pp.

NOAA Hotline #224, 6 Reports.

Name of Spill:	River Raisin Area of Concern
SSC:	Bill Sites
Date of Spill:	chronic condition
USCG District:	9
Location of Spill:	River Raisin, Michigan
Latitude:	41°54'1" N
Longitude:	083°21'30" W
Spilled Material:	PCBs
Spilled Material Type:	5
Amount:	unknown
Source of Spill:	municipal and industrial discharges
Resources at Risk:	fish, shellfish, birds, mammals, plants
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none

Incident/Response Summary:

Primarily, the problems in the River Raisin, Michigan Area of Concern (AOC) are heavy metals and PCBs. These pollutants have contaminated sediments, water, and fish. Heavy metals found in sediment include copper, zinc, and chromium. Oil and grease have also been found in river and harbor sediment. Planning for the cleanup of the AOC has been underway since 1987.

Industrial and municipal discharges of these substances in the past have left a legacy of problems in the AOC. Several potential nonpoint sources of contaminants are the result of historic discharges. Potential sources include Port of Monroe landfill, industrial landfills, waste piles, City of Monroe landfill, and contaminated sediment in the harbor and river.

Ford is the voluntary RP and the EPA is the remedial project manager.

NOAA Activities:

NOAA was contacted by USCG MSO Toledo on April 15, 1997, who requested a resources at risk summary for the River Raisin AOC. The draft remedial action plan called for closing down the navigable waters of the river. This proposed action, the proposed dredge plan, and potential impacts to the natural resources concerned the USCG in their area of responsibility. NOAA developed a short- and long-term resources at risk summary for the area. The fairly extensive resources at risk summary was provided to MSO Toledo on May 16, 1997. MSO Toledo, in concert with EPA, will use the resources at risk summary for the cleanup plan they are working on.

References:

Research Planning Institute. 1985. *Sensitivity of coastal environments and wildlife to spilled oil: Lake Michigan Eastern Shore An atlas of coastal resources.* Seattle: Ocean Assessments Division, NOAA. 23 maps.

U.S. Coast Guard District 5

Name of Spill:	Mystery Drums, Potomac River
NOAA SSC:	Gary Ott
USCG District	5
Date of Spill :	10/10/96
Location of Spill:	Washington, D.C.
Latitude:	38°52' N
Longitude:	077°03' W
Spilled Material:	unknown chemical
Spilled Material Type:	5
Amount:	two drums
Source of Spill:	drums
Resources at Risk:	habitat, recreation
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	categorizing contents of drums
Shoreline Types Impacted:	tidal mudflat, vegetated riverbank
Keywords:	potential

Incident Summary:

On October 10 USCG ACT Baltimore received notification form the NPS that they had recovered two 55-gallon drums in the Potomac River near James Creek Marina. ACT Baltimore notified Maryland State agencies. The Maryland Department of Environmental Quality (DEQ) conducted tests on the drums and found a high pH in one of them. The State of Maryland requested Federal funds to remove the drums.

Countermeasures and Mitigation:

ACT Baltimore contracted with A&A Environmental Services for the removal and disposal of the drums.

Other Special Interest Issues:

Abandoned drums can be categorized "waste oil" and removed at reasonable expense and effort, while abandoned drums categorized "unknown" require considerable additional effort and expense to determine the categorization for their contents to a particular waste stream. In this case, with the DEQ assessment of pH, the experienced HAZMAT contractor was able to use professional experience and basic field tests to appropriately categorize the waste stream for these abandoned drums.

NOAA Activities:

NOAA was contacted on October 10, 1996, by ACT Baltimore and participated by telephone in discussions with the Baltimore staff in the procedures for handling and sampling 55-gallon drums and abandoned tanks with unknown contents. These discussions and preplanning efforts with the USCG staff helped select an appropriate contractor who was able to conduct the sampling, transportation, and disposal of the drums based on an on-scene categorization of the appropriate waste stream.

References:

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

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:	Clinton Concrete waste oil tank
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill:	11/18/96
Location of Spill:	Clinton, Maryland
Spilled Material:	waste oil
Spilled Material Type:	2 barrels
Amount:	60
Source of Spill:	facility
Resources at Risk:	habitat
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	fringing saltmarsh, tidal mudflat, vegetated riverbank
Keywords:	containment boom, sorbent pads

Incident Summary:

ACT Baltimore received notification that approximately 2,500 gallons of waste oil had been discharged into Tinker Creek, a tributary of the Potomac River. The source was a broken line on a 20,000-gallon tank located at Clinton Concrete.

Behavior of Spilled Material:

Waste oil flowed approximately one mile down Tinker Creek towards the Potomac River.

Countermeasures and Mitigation:

The RP, identified as Clean Habits, reported that they were financially unable to take responsibility for cleanup efforts. The USCG's contractor placed filter fences, boom, sorbent pads, and dams in Tinker Creek. Approximately 25,000 gallons of waste oil from eight separate tanks on the facility were also removed.

NOAA Activities:

NOAA was notified of this incident on November 18, 1996, by ACT Baltimore and participated with the Baltimore staff in detailed "how clean is clean" discussions. NOAA support was not needed on-scene as the waste oil was contained and the cleanup of Tinker Creek proceeded without incident. ACT Baltimore conducted the entire cleanup effort and problems concerning how clean is clean were not complicated by a number of interested parties or conflicting interests. NOAA's support to the Baltimore staff during the how clean is clean discussions was provided by phone and facsimile.

References:

NOAA. 1992. *Shoreline countermeasures manual for Regional Response Team III.* Seattle: Hazardous Materials Response and Assessment Division. 110 pp.

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:	F/V *Gladys Loraine*
NOAA SSC:	Gary Ott
USCG District	5
Date of Spill:	12/10/96
Location of Spill:	Newport News, Virginia
Latitude:	36°58' N
Longitude:	076°24.8' W
Spilled Material:	diesel
Spilled Material Type:	2
Amount:	12 barrels
Source of Spill:	non-tank vessel
Resources at Risk:	habitat, recreation
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	fringing salt marsh, tidal mudflat
Keywords:	potential

Incident Summary:

On December 10, 1996, the Newport News Fire and Rescue rescued seven people from the capsized F/V *Gladys Loraine*. The vessel was listing 90 degrees to starboard with 4 feet of the port side exposed in 13 feet of water.

Countermeasures and Mitigation:

The initial attempt to lift the vessel on December 11 failed when the lifting cable slipped. Salvage operations the next day succeeded in righting the vessel but she remained unstable and stayed afloat only with the crane attached. It was not until December 13, after removal of the outriggers, that the vessel was considered stable enough to remove the fuel onboard.

NOAA Activities:

NOAA was notified of this incident on December 10, 1996, by MSO Hampton Roads who asked for a trajectory. NOAA support was not needed on-scene as the vessel's situation was stable within the small boat harbor. NOAA's support to the MSO staff during the response planning process (resources at risk, weather updates, and trajectories) was provided by phone and facsimile.

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: C/V *Almeria Lykes*
NOAA SSC: Gary Ott
USCG District: 5
Date of Spill: 1/12/97
Location of Spill: Atlantic Ocean inbound Hampton Roads
Latitude: 36°55' N
Longitude: 075°55' W
Spilled Material: dimethyl malonate , malonate di-methyl ester
Spilled Material Type: 5
Amount: unknown
Source of Spill: intermodal tank
Resources at Risk: habitat
Dispersants: N
Bioremediation: N
In-situ Burning: N
Other Special Interest: assess risk on container vessels
Shoreline Types Impacted: sand beaches
Keywords: none

Incident Summary:

On January 12, 1997, MSO Hampton Roads received a report from the C/V *Almeria Lykes* that the crew had detected a chemical odor coming from the cargo hold #4 vent. The vessel was scheduled to arrive at the Norfolk International Terminal, Norfolk,Virginia on January 19.

Countermeasures and Mitigation:

MSO Hampton Roads requested that the agent provide the dangerous cargo manifest (DCM). There were four separate hazardous materials listed on the manifest:

- ❒ sodium methylate
- ❒ tributyltin chloride
- ❒ tributyltin diacetate
- ❒ 5-ethylidene-2-norbornene

Lykes Lines initially believed the material that caused the reported odor was tributyltin chloride. Later the owners reported that they believed the potential chemical was the sodium methylate.

On January 16, cargo hold #4 was tested while the *Almeria Lykes* was at the pier. A marine chemist conducted the routine tests for alcohol, hydrocarbons, acetic acid, toluene, explosive vapors exceeding the lower explosive limits, low oxygen, and toxic vapors of the potential hazardous materials in the hold. The marine chemist reported that the tests were negative and that upon entering the cargo hold #4 , there were no detectable odors. Based on this information, the hatch cover was removed and offloading the cargo hold continued. The top three levels of containers were removed, the area re-tested by a marine chemist, and then the next levels of containers were removed.

On January 17, all the containers suspected of leaking had been removed and inspected. On one of the portable tanks containing malonate di-methyl ester there could be detected a trace odor that was similar to the odor identified from the vessel's exhaust vent while it was at sea. There was no indication of a release or damage to this tank. Malonate di-methyl ester, a pharmaceutical additive, was described as non-hazardous and a nonirritant. The

shipment was destined for a DuPont facility in Bell, West Virginia. The shipper confirmed the product's odor was consistent with the odor described by the crew and the investigating marine chemists.

Other Special Interest Activities

There are at least three locations where an assessment of potential chemical hazards on a container vessel should be made: at sea, at a safe haven, and at a pier. This assessment should answer the following questions:

1. Can the crew safely remain onboard and bring the ship to a safe haven?

2. Can the vessel be safely brought to a pier where the hazardous cargo can be removed?

3. Can the hazardous cargo be removed from the vessel while ensuring the safety of the facility's employees and the public?

The first risk assessment can weigh the danger to crew members against the hazard of an unmanned vessel. At sea, with few analytical tools to measure potential chemical exposure, this first assessment must be based on the experiences of the crew to the potential hazards.

At a safe haven, such as a protected location or a safe anchorage, the assessment of risk can be completed using additional remote sensing equipment brought onboard the vessel by trained operators. Their task is to gather more information such as levels of toxic gas, level of explosive vapors, or damage to containment systems. Based on this additional information, an assessment can be made by a technical team to determine if the vessel can proceed to the pier without compromising the safety of the facility's employees or the public.

At the pier, the safety of the unloading crews and the public requires the development of a safety plan with at least four parts:

1. Opening the hatch.

2. Inspecting the stowed cargo.

3. Monitoring the container as it is removed from the vessel.

4. Monitoring the container as it is moved to a safe area and as the cargo is removed and placed into a secure container.

NOAA Activities:

NOAA was notified of this incident on January 12, 1997, by MSO Hampton Roads. The SSC participated with the MSO in incident response planning. NOAA and the MSO staff analyzed the risk from the cargoes identified on the DCM. The vessel was allowed to go to Hampton Roads where she was boarded by an assessment team at the CBJ buoy. The assessment team reported that their tests for toxic vapors were negative; however, they were able to detect the antiseptic odor that had been reported by the crew. The *Almeria Lykes* was allowed to proceed to the pier and discharge the cargo.

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

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:	CSX Railcar Derailment
NOAA SSC:	Gary Ott
USCG District	5
Date of Spill :	5/1/97
Location of Spill:	Baltimore, Maryland
Latitude:	39°16' N
Longitude:	076°34' W
Spilled Material:	hydrochloric acid
Spilled Material Type:	5
Amount:	13,500 gallons
Source of Spill:	railcar
Resources at Risk:	**Fish**: white and channel catfish, white and yellow perch, silversides, anchovy, blueback herring, alewife, menhaden, killifish, striped bass, and gobies **Shellfish**: blue crab **Birds**: various species of waterfowl, double-crested cormorant, gulls, terns, and least bittern (a species of concern)
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	extensive media and Government interest
Shoreline Types Impacted:	fringing salt marsh, tidal mudflat, freshwater marsh
Keywords:	potential

Incident Summary:

Early on May 1, 1997, USCG ACT Baltimore received a radio report of a hydrochloric acid spill from a railcar in the Bayview Railyard in Baltimore almost under Route 895. Around 0445 a railcar containing hydrochloric acid had derailed and been punctured with a coupler. The potential was for 20,000 gallons of hydrochloric acid to spill in the railyard switching area.

The initial spill rate was estimated at 50 gallons per minute. An estimated 13,500 gallons of 27-percent strength hydrochloric acid was released onto the ground. The fire department and police conducted a local evacuation of the spill area. The puncture of the railcar was one-third of the way up the car. Route 895 and Polasky Highway were closed, the harbor tunnel was closed in one direction, and Amtrak operations through the area were secured. The total contamination from the hydrochloric acid spill was described as up to two football fields in area.

Behavior of Spilled Material:

Most stormwater in Baltimore drains into the harbor. The closest water to the scene of the accident was Moores Run, which drains into Back River. The Maryland DEQ reported that a small amount of hydrochloric acid moved one-third mile across a parking lot, down a bank, and into Moores Run during an outgoing tide.

Countermeasures and Mitigation:

A 1400 press conference demonstrated greatly diminished public health concerns and a stable situation. The location of the railyard was almost under the interstate. The interstate and tunnel was to be opened within the half hour and Amtrack traffic was continued. Very little product was observed in puddles in the railyard because most of the hydrochloric acid

sank into the over five-foot limestone gravel bed of the railroad switching yard. The initial reports of a vapor cloud from the spill in the early morning hours may well have been the product's reaction with the limestone gravel. It was not possible to determine what quantity of product actually reached Moores Run.

By 1700, the remaining hydrochloric acid had been removed from the damaged railcar (estimated at 5,000 gallons), and five tons of potash had been used to neutralize the spilled hydrochloric acid (estimated at 13,500 gallons). The damaged railcar was moved from the scene. All major highways were reopened. The RP was directed to monitor runoff into tidal waters from rain. One report from the USCG's Atlantic Strike Team (AST) was of "total fatalities limited to four fish and one rat." Someone quoted in the USCG's pollution report estimated that two gallons of hydrochloric acid had entered Moores Run.

Other Special Interest Issues:

The industrial area where the incident occurred did not require the evacuation of many homes and families. However, the rush-hour closure of Route 895 and Polasky Highway, the harbor tunnel, and Amtrak rail service greatly increased public concern and media exposure to the incident. Within a very short time the Secretary of Transportation and other government officials were briefed on the status of the event.

NOAA Activities:

NOAA was notified of this incident on May 1, 1997, by ACT Baltimore who requested information about hydrochloric acid. NOAA provided ACT Baltimore and the Regional Response Team (RRT) III Coordinator a synopsis of the incident, a focused response hazard characterization, and specific resources at risk for a hydrochloric acid spill at this location.

NOAA advised that hydrochloric acid is slightly heavier than water with a specific gravity of 1.19, and is completely soluble in water. If the spill was to reach surface-water bodies, the effects would be short-term toxic impacts to any aquatic species in the contaminated area. The freshwater system that this product may flow into does not have the buffering capacity of a saltwater environment; therefore, more water will be required to neutralize the acid.

NOAA also advised that the shorelines at risk were wetland environments. The impacts of the acid on the vegetation would be uncertain. It would be likely that very low pH waters would cause die-offs along the flow path of the acid to the stream, and along the stream banks close to the spill source.

The NOAA report also provided a summary of the biological resources.

There are predominantly freshwater fish in this area. They are tolerant to pH levels as low as five. These levels or lower could be expected in Moores Run, Herring Run, and the upper section of Back River. Lower pH values could result in significant fish kills.

The impacts to the crabs and other shellfish would probably be similar to the fish.

The impacts to the birds would most likely be restricted to irritation of the skin. There may also be irritation of the nasal passages if the product is fuming. Ingestion of fish from heavily contaminated areas may result in irritation of the mouth and throat. This product does not accumulate in animals and is not passed up the food chain.

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. 350 pp.

NOAA Hotline #225, 7 Reports

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:	Bravo Anchorage Mystery Spill
NOAA SSC:	Gary Ott
USCG District	5
Date of Spill :	5/23/97
Location of Spill:	Norfolk, Virginia
Latitude:	36°56.02' N
Longitude:	076°03.46' W
Spilled Material:	diesel
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, sand beaches
Keywords:	none

Incident Summary:

On May 23, 1997, MSO Hampton Roads received a report of a mystery spill. A USCG 41-foot patrol boat reported a heavy brown substance with the smell of diesel coming from the southeast corner of the Bravo Anchorage where three vessels were anchored. The anchorage is off Lynnhaven Inlet, just west of Cape Henry in the Port of Hampton Roads.

Behavior of Spilled Material:

The material appeared to be a light sheen, dissipating on the outgoing tide.

NOAA Activities:

NOAA was notified of this incident on May 23, 1997, by MSO Hampton Roads who requested weather and trajectory forecasts. NOAA told MSO that the tide was incoming at the time of the initial 0900 report. The next slack time would be at 1315 and the tide would be outgoing until the next slack at 1915 . The first slack of May 24 would be at 0819 and that would be the time for the next morning overflight, if scheduled. NOAA also noted that if the oil was a diesel as described, the optimum location for the overflight would be off Cape Henry and down the northern section of the Virginia Beach shoreline. However, based on the USCG's Friday morning overflight, NOAA advised that whatever oil remains would be difficult to observe from the air.

NOAA advised that the winds were forecast to continue north-northeast at 10 to 15 knots for the remainder of the day. On the night of May 23, the winds were forecast to be light and variable. On May 24 the morning winds would be coming from the south at 10 knots.

NOAA also advised that this material could come ashore at Cape Henry soon and could perhaps move around the bend onto the northern sections of Virginia Beach on the afternoon outgoing tide and northerly winds. If the spill was a light diesel spill as described, the oil might be difficult to observe as it comes ashore in the surf zone. The light diesel would remain at the high-tide line and could be detected, perhaps, by an oily feel and odor.

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:	Assateague Island Mystery Spill
NOAA SSC:	Gary Ott
USCG District	5
Date of Spill:	5/30/97
Location of Spill:	Assateague Island National Wildlife Refuge,Virginia
Latitude:	37°52' N
Longitude:	075°25' W
Spilled Material:	tarballs
Spilled Material Type:	4
Amount:	unknown
Source of Spill:	unknown
Resources at Risk:	**Birds**: bird nesting beach, diving coastal bird, bird rookeries **Management Areas**: national wildlife refuge, endangered species habitat, recreation areas
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	endangered species, characterization of unknown oil by laboratory analysis
Shoreline Types Impacted:	coarse sand beaches
Keywords:	

Incident Summary:

About 1000 on May 30, 1997, Rangers from Chincoteague National Park reported that tarballs were washing ashore on the southern end of Assateague Island. The initial beach assessment was that the tarballs covered one to two percent of the beach at the high-water mark and stretched more than four nautical miles at the south end of Assateague Island. An afternoon overflight noted a light patchy sheen with scattered tarballs extending northeast more than eight nautical miles from the southern tip of Assateague Island.

Behavior of Spilled Material:

In the fog and rain and 60°F temperatures on May 31 the oil looked like weathered tarballs at the high-tide line. In those conditions the oil was easily picked up by hand and was not sticky. On some sections of the beach the tarballs were reported to be up to one foot in diameter, but there was little sheening.

NOAA's analysis of recent past and future trajectory of the beached unknown oil noted that winds had been consistently from the northeast since May 26. These consistent winds had set up currents that could have moved oil as much as 20 nautical miles down the coast in a day. Predicted onshore winds through the weekend would move remaining nearshore oil south and into the Atlantic Ocean beaches south of Assateague Island.

Countermeasures and Mitigation:

Industrial Marine Services was contracted by MSO Hampton Roads to remove tarballs using rakes and shovels. Cleanup operations began on May 30 and continued though June 1. Cleanup priorities were decided during extensive discussion with USFWS and NPS wildlife experts on-scene. Priority was placed on cleanup of bird nesting areas on Assateague, Wallops, and Assawoman islands, then to shift focus to public beaches. Heavy fog and rain on May 31 and June 1 prevented much use of the public beaches and swimming areas. On June 2 an additional 10 contractor employees were requested to complete cleanup of

Assateague and Wallops islands, to begin cleanup of Assawoman Island, and assess the situation on Metompkin Island.

Other Special Interest Issues.

USFWS and NPS wildlife experts were interested in characterizing the oil as either crude or tank washings in an attempt to guess at the potential toxicity of the material. During the weekend some shorebirds were reported to have oiled their breast feathers on the beached tarballs.

NOAA Activities:

NOAA was notified of this incident on May 30, 1997, by MSO Hampton Roads. NOAA conducted a trajectory analysis of the beached tarballs based on historical and forecasted weather. The consistent northeast winds of the last week suggested that the oil source could move up to 20 nautical miles per day from an impacted beach. Similarly, the Atlantic Ocean beaches south of Assateague Island were predicted to be impacted by the remaining nearshore oil. On May 31, the SSC met with USFWS and NPS wildlife experts at the public beach on Assateague Island. The USCG focused cleanup efforts on the priority areas designated by USFWS and NPS wildlife experts on Assateague, Wallops, and Assawoman islands.

USFWS wildlife experts were especially interested in NOAA's effort to characterize the heavy oil. Samples of the oil were collected by the USCG and USFWS and sent to LSU for laboratory analysis. The LSU report characterized the samples as probably a residual fuel oil such as a Bunker C. The LSU report also noted that the low initial aromatic hydrocarbon concentration combined with the weathering had resulted in an oil that could be classified as relatively low in toxicity when compared to other residual fuel oils.

References:

Louisiana State University. June 3, 1997. Chemistry Report IES/RCAT97-25. Baton Rouge: LSU, Institute for Environmental Studies.

NOAA. 1992. *Shoreline countermeasures manual for Regional Response Team III.* Seattle: Hazardous Materials Response and Assessment Division. 110 pp.

NOAA Hotline #229, 2 Reports

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:	Cedar Island Ferry Breakwater
NOAA SSC:	Gary Ott
USCG District	5
Date of Spill:	6/4/97
Location of Spill:	Cedar Island, Pamlico Sound, North Carolina
Latitude:	35°08' N
Longitude:	076°30' W
Spilled Material:	bunker fuel oil
Spilled Material Type:	4
Amount:	357 barrels
Source of Spill:	non-tank vessel
Resources at Risk:	habitat, management area
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	diving safety in oil polluted waters
Shoreline Types Impacted:	fringing salt marsh, tidal mudflat, sheltered marshes
Keywords:	none

Incident Summary:

A concrete vessel, the *Robert A. Waterman*, served as a breakwater for the North Carolina Department of Transportation (NCDOT) Ferry Terminal at Cedar Island, North Carolina. The *Robert A. Waterman* was partially submerged and placed near the ferry landing by NCDOT in the 1970s. On the afternoon of June 3, 1997, approximately 40 gallons of diesel fuel created a sheen in Pamlico Sound. The sheen originated from a fuel tank of the *Robert A. Waterman*, punctured by a clam dredge during sand and silt removal operations in the cargo hold near the Cedar Island Ferry Landing. When the leak was discovered the construction barge operator dropped a load of sand onto the damaged tank to slow the oil leak. The vessel was lying on a sandy bottom in approximately 12 feet of water.

Countermeasures and Mitigation:

During June and July 1997 the oil was removed from the tanks and piping, the contaminated sand and sediments were removed, and the hulls of the *Robert A Waterman* and the *Allen H. Knowles* were removed from the site. Over 13,000 gallons of fuel oil were recovered during this process. In addition, several hundred tons of sand were dredged from the tops of the fuel tanks and dumped into a shoreside pit.

By the end of December 1997, the contaminated sand that was removed from the tops of the tanks and contaminated sand from the footprint of the concrete ships was taken for disposal by the RP.

NOAA Activities:

NOAA was notified of this incident on June 4, 1997, by MSO Wilmington who requested assistance during the initial assessment of the spill and then during sampling and diving operations in the cleanup phase. NOAA reviewed the analysis of the oil taken from the concrete vessel and reported that the report showed no unusual chlorinated compounds or other compounds (like PCBs). The oil sludge from the bottom of the tank contained a number of light oil compounds (benzene, toluene, xylene) in amounts similar to that of much fresher oil. The continuation of light ends in oil held in tanks for a long time has been observed in other cement ships. Under these conditions the surface of the oil forms a crust and the oil under the crust remains more fluid and retains the light fractions.

NOAA helped MSO Wilmington determine whether bioremediation would be an appropriate technique for the removal of residual heavy (Bunker C) fuel oil contaminating the concrete vessels sunk as breakwaters. NOAA reported that bioremediation would not be an effective approach for the removal of this type of oil under these conditions for several reasons:

- First, bioremediation is not ordinarily considered as a primary cleanup method for oil spills, but rather as a "finishing tool." Increasing the exposed surface area of the oil increases the rate and efficiency of biodegradation. However, under these conditions with an intact reservoir of oil, surface areas are minimized and biodegradation would be a low if not negligible process.

- Second, bunker oil, particularly bunker oil that has been in the environment for an extended period, is less amenable to both natural and induced biodegradation because the more easily degraded compounds are more likely to be gone.

- Third, a submerged coastal environment would not be appropriate for bioremediation because it would be very difficult to keep the bioremediation agent in place in proximity to the oil. Similarly, the amount of oxygen available in a submerged area would be drastically reduced over that of an intertidal or land-based system.

NOAA researched the safety considerations for divers who dive in oil-contaminated waters and diving operations safety standards were provided to MSO Wilmington. The responsibility for enforcing the Occupational Safety and Health Administration's regulations (OSHA)(29 CFR 1910.401) are normally those of the contractor or the RP, in this case the NCDOT. The USCG standards for divers (46 CFR part 197, subpart B) focused on USCG diving operations on the outer continental shelf and ship husbanding and not on diving in polluted waters. The Navy's Superintendent of Salvage (SUPSALV) was in the process of preparing a "Contaminated Water Dive Plan" that might be helpful when developing diving plans. Similarly, NOAA's established standards for divers in polluted waters were made available to MSO Wilmington as background information. NOAA also put MSO Wilmington in contact with the USCG coordinator of diving operations and the contractor in charge of diving operations at the *Morris J. Berman* oil spill (NOAA Hotline #144) where sunken oil was removed by divers. Finally, NOAA discussed the oil contamination issues with the USCG AST who offered to help supervise diving operations at the Cedar Island site if MSO Wilmington deemed it necessary.

References:

NOAA. 1992. *Shoreline countermeasures manual for Regional Response Team III*. Seattle: Hazardous Materials Response and Assessment Division. 110 pp.

NOAA Hotline #144, 98 Reports.

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:	Mantoloking Beach
NOAA SSC:	Ed Levine
USCG District:	5
Date of Spill:	05/28/97
Location of Spill:	Mantoloking, New Jersey
Latitude:	40°02.5' N
Longitude:	74°02.5' W
Spilled Material:	paraffin
Spilled Material Type:	nontoxic
Amount	unknown
Source of Spill:	unknown
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	sandy beach
Keywords:	none

Incident Summary:

On May 28, 1997, the USCG Captain of the Port (COTP) Philadelphia was notified of an unidentified substance washing up on approximately six miles of beaches near Mantoloking, New Jersey. Weather was temperature 73°F with cloudy skies.

The USCG and New Jersey DEP responded to the scene but could not positively identify the substance. The EPA's Environmental Response Team (ERT) was requested on-scene to perform hazard categorization tests on the material, which was eventually identified as paraffin. The USCG opened the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) fund to perform emergency removal of the material from the beach. It took three days to complete the cleanup. The USCG is investigating the source of the material.

Behavior of Spilled Material:

The material was described as circular discs about the size of a half-dollar, white, crystalline, and floating. It had no odor.

Countermeasures and Mitigation:

Shoreline cleanup consisted of manual removal of the material from the sandy beaches.

Other Special Interest Issues:

The incident occurred on the Wednesday following the Memorial Day weekend (the "official" beginning of the bathing season). Due to this proximity to the holiday weekend there was high media and local interest. No beach closures were issued, since the material was identified as paraffin wax, and deemed nontoxic. There were no wildlife impacts associated with this incident.

NOAA Activities:

NOAA was notified of this incident at approximately 2300 on the May 28, 1997, by USCG Philadelphia who asked the SSC to identify the material. The first assumption was a natural

jellyfish bloom that periodically appears in the area. However, when it was emphasized that the material was not a natural substance the SSC contacted other experts and several theories were discussed, none of which was the material being deposited on the beach. NOAA's response lasted several hours .

Name of Spill:	C/V *MSC Clorinda*
NOAA SSC:	Gary Ott
USCG District	5
Date of Spill:	7/18/97
Location of Spill:	Wilmington, North Carolina
Latitude:	33°49' N
Longitude:	078°03' W
Spilled Material:	benzoyl chloride
Spilled Material Type:	5
Barrels:	1,718 gallons
Source of Spill:	intermodal tanks
Resources at Risk:	habitat
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	sand beaches
Keywords:	potential

Incident Summary:

On July 18, 1997, the inbound C/V *MSC Clorinda* reported to MSO Wilmington a "drip" leak of benzoyl chloride (CAS #98884) from one of two chemical tanks. The manifest noted 859 gallons of benzoyl chloride in each tank. The tanks were stacked one on the other on the deck three rows up. MSO Wilmington's impression was that the safety valve had released some of the material as the vessel arrived in warmer climates. Based on this assumption, the drip discharge of the chemical would be expected to stop when the temperature and quantity of chemical in the tank become stable. The vessel was scheduled into Wilmington, North Carolina on July 21. The safety of the vessel's crew was not an issue.

MSO Wilmington planned to conduct an underway inspection of the *MSC Clorinda* using additional remote sensing equipment and trained operators. The pilots normally board the vessels inbound to Wilmington at the entrance to the Cape Fear River.

Countermeasures and Mitigation:

On July 21, the survey at sea of the intermodal tanks on the *MSC Clorinda* showed that the upper tank had a yellowish-white solid material on the forward and starboard sides. A 16-foot diameter pool of clear liquid was on the deck below the tanks. Air monitoring of the area indicated no hydrochloric acid present in the air. However, swabs taken of the clear liquid under the tanks indicated a pH reading of 0, highly acidic, but pH swabs taken one foot away indicated pH values of 6 and 7, neutral. No active venting or leaking of the intermodal tanks was observed.

Based on this underway assessment, the *MSC Clorinda* was allowed to proceed and moored at Wilmington's Berth #9 at 1300 July 21. The containers identified as non-contaminated could not be immediately removed because of a lack of sufficient laborers at the pier. Consequently, the contaminated benzoyl chloride tanks could not be removed.

On July 22, the HAZMAT contractor successfully removed surrounding non-contaminated containers and was able to remove the contaminated intermodal tanks from the vessel by afternoon. During the afternoon, stainless steel hoses were attached to the leaking tank and the transfer of the benzoyl chlorine to another tank could begin; however, the appropriate stainless steel pump was not available to begin the transfer.

On July 23, the appropriate stainless steel pump arrived on-scene and the cargo was transferred to another tank.

NOAA Activities:

NOAA was notified of this incident on July 18, 1997, by MSO Wilmington who requested information about the chemical benzoyl chloride with attention to identifying actions that should be taken if there was a release under three conditions; at sea, in the Cape Fear, and at the dock.

NOAA provided detailed information for three worst-case scenarios.

- A large spill at or before the sea buoy

  In this case the ship would be still at sea, near the sea buoy 2CF. The chemical would be assumed to have spilled on the containers underneath the tanks and on the deck. The benzoyl chloride would react with water vapors in the air or water on deck to form hydrochloric acid. Despite the low vapor pressure of benzoyl chloride, exposure to personnel downwind should be avoided. The chemical may be flushed overboard with copious amounts of water. Upon contact with sea water, benzoyl chloride will likely form hydrochloric acid and benzoic acid, which should be buffered by the sea and quickly dissipate. The environmental impact is expected to be minimal, local, and short-term.

- Spill on Cape Fear River

  For this scenario, NOAA's assumption was that there would be an inspection of the tanks at the sea buoy to determine the stability of the tank. If it has been determined that the leak was small, the situation was stable, and that a larger spill of the remaining content would not occur while in transit on the river, the ship will be permitted to proceed. Considering the large size of the river and the relatively small potential total spill, even in the unlikely event that such a spill was to occur, the environmental damage is expected to be local, minimal, and short-term. If a spill were to occur on the deck of the ship, neutralizing the chemical is recommended with fly ash, lime, sodium bicarbonate, dry earth, or dry sand, which should then be covered with plastic sheets to minimize contact with rain and water. The neutralizing material should be collected later and disposed of appropriately.

- Spill on dock

  In this scenario NOAA recommended that the benzoyl chloride tank be unloaded into a containment system (e.g., a larger tank able to contain all the liquid). If a spill was to occur into that containment tank it should be pumped and treated as needed. If such a spill occurred the area should be isolated for at least 150 feet. Fly ash, lime, sodium bicarbonate, dry earth, or dry sand may be used for a spill on dock.

The NOAA report also outlined several other warnings:

- Benzoyl chloride is a combustible liquid.

- Keep sources of ignition away.

- ❒ Containers and cargo suspected of coming in contact with the spilled material should be inspected carefully.

- ❒ Be aware of any accumulation of vapors in confined spaces.

- ❒ Acid can form hydrogen gas when reacting with metals. If benzoyl chloride has leaked into confined metal containers where moisture is present, there is a chance that hydrogen gas could build up.

- ❒ Monitor for the presence of explosive gases when handling such containers.

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. 350 pp.

NOAA Hotline #234, 5 Reports

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:	T/S *Providence*
NOAA SSC:	Gary Ott
USCG District	5
Date of Spill:	7/24/97
Location of Spill:	Yorktown, Virginia
Latitude:	37°13.7' N
Longitude:	076°26.3' W
Spilled Material:	crude oil
Spilled Material Type:	3
Amount:	unknown
Source of Spill:	tank vessel
Resources at Risk:	habitat, management area
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	fringing salt marsh, tidal mudflat
Keywords:	potential spill

Incident Summary:

On July 23, 1997, MSO Hampton Roads received a report that a sheen had been sighted near the *Providence*, moored at the AMOCO dock. The USCG observed small drops of heavy black oil surfacing in the water near the starboard side of the vessel, but were unable to determine the source. AMOCO reported that there was no water in the crude oil that was being transferred from the ship to the facility. On July 24, a hull survey was completed with no sign of an oil leak. No sheen could be seen, but heavy weather was a factor to be considered.

Samples of the vessel's fuel and cargo oils taken and analyzed did not a match the spilled oil. The *Providence* departed Yorktown early on the morning of July 25.

NOAA Activities:

NOAA was notified of this incident on July 24, 1997, by MSO Hampton Roads who asked NOAA to prepare a trajectory if there was a release from the *Providence*. The SSC was not needed on-scene as the potential for a further release was minimal and the light sheen could no longer be observed due to severe weather. NOAA's support to the MSO staff during the response planning process (resources at risk in the area that includes the York River National Estuarine Reserve) was provided by phone.

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:	Dundalk Marine Terminal
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill:	7/29/97
Location of Spill:	Baltimore, Maryland
Latitude:	39°15' N
Longitude:	076°32.2' W
Spilled Material:	chlorpyrifos
Spilled Material Type:	5
Amount:	five drums
Source of Spill:	facility, drums
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:	ATSDR

Incident Summary:

Late in the day on July 28, 1997, ACT Baltimore received notification of a leak from two containers on the Dundalk Marine Terminal packed by a company called Dowelanco. Shipping papers identified the material as chlorpyrifos, UN 2783 (one of the synonyms for this chemical is dursban). Each container held 61 drums of the chemical.

Countermeasures and Mitigation:

On July 29, contractors removed and decontaminated the contents of the two containers. However, additional containers of the material were discovered to be leaking. On July 31, a total of 13 containers were on hold, 4 of which contained leaking drums. In total, five drums leaked and two were damaged but not leaking. The damage was believed to be caused by improper loading and handling. All damaged drums were on the lower tier and apparently dragged or pushed into the container. Drums were damaged either by screw heads on the bottom of the container or by other container floor debris.

Contaminated containers were sent back empty to Dowelanco to dispose or replace contaminated floorboards.

On August 8, one container out of a seven-container shipment from Dowelanco, each container containing 72 drums of 2,4-d butyl esters, was reported leaking some product at the South Locust Point Marine Terminal. By August 11, all the packages in this container were devanned and repacked.

NOAA Activities:

NOAA was notified of this incident on July 29, 1997, by the USCG AST. NOAA participated with the AST and the Agency for Toxic Substances and Disease Registry (ATSDR) to assess methods that would measure chlorpyrifos. ATSDR and the manufacture, Dow Chemical, advised that there were no air sampling direct reading instruments for dursban. However, dursban was reported to have a disagreeable odor and this warning could be used during on-site work.

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. 350 pp.

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:	T/V *Mystra*
NOAA SSC:	Ed Levine
USCG District:	5
Date of Spill:	09/18/97
Location of Spill:	Delaware Bay
Latitude:	38°58.6' N
Longitude:	75°12.1' W
Spilled Material:	crude
Spilled Material Type:	3
Amount:	240 barrels. (10,000 gallons)
Source of Spill:	tank vessel
Resources at Risk:	**Marine Mammals**: dolphins, seasonal use areas **Birds**: diving coastal birds, waterfowl, shorebirds, wading birds, gulls, terns, raptors, migration stopover areas, wintering concentration areas, nesting beaches, migratory routes **Fish**: anadromous fish, estuarine fish, demersal fish **Mollusks**: oysters, mussels, clams, seed beds, harvest areas **Crustaceans**: shrimp, crabs, nursery areas, high concentration sites **Recreation**: beaches, marinas, boat ramps, diving areas, high-use recreational boating areas, high-use recreational fishing areas, state parks **Management Areas**: refuges, wildlife preserves, reserves **Resource Extraction**: commercial fisheries, fish, shrimp, bivalve, and plant aquaculture sites
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	SONS exercise was being held in Philadelphia during this response Dispersant use was discussed
Shoreline Types Impacted:	none
Keywords:	containment boom, skimmers, Tri-State Bird Rescue

Incident Summary:

At approximately 0100 on September 18, 1997, the T/V *Mystra* reported that she had oil around her at the Big Stone Anchorage in Delaware Bay. The oil was believed to have come from the sea chest while the ship was lightering. The source was identified as a faulty valve.

Weather at the time of the incident was winds from the south-southwest at 10 to 15 knots, temperature 74° F, with 1- to 3-foot seas.

Once the leak was detected the USCG COTP Philadelphia was notified and dispatched a Pollution Response Team.

The Federal Government's involvement in this response focused on monitoring the RP's activities, conducting overflights, and initiating shoreline surveys to document impacts; none were observed.

This response lasted for four days.

Behavior of Spilled Material:

Brent crude is a North Sea oil of moderate wax content. It tends to form meso-stable emulsions when spilled, thus increasing the spill's volume and viscosity. The oil formed a slick of dark oil first reported to be about eight miles long and 200 yards wide. After the first day the slick broke into several streamers of emulsified oil. By the afternoon of the second day the oil was beginning to form tarballs.

ADIOS™ computer software predicted under these circumstances that 50 percent of the oil would evaporate after 36 hours from the initial release. It also predicted that the oil would remain burnable and dispersible for 24 hours and would maintain its buoyancy. A 70 percent emulsification was predicted for the first day and a half.

It was estimated that 10,000 gallons of oil were released. The contractors reported recovering 16,000 gallons in varying degrees of emulsification by skimming. The 70 percent emulsification rate would add an extra 7,000 gallons by volume to the amount spilled.

Countermeasures and Mitigation:

Spill contractors were dispatched and boomed the barge with containment boom. Precautionary protection boom was dispatched to sensitive areas identified in the Area Contingency Plan and staged on the shoreline.

Open-water recovery was conducted by six skimmers. None of the oil made landfall so shoreline cleanup was not necessary.

Other Special Interest Issues:

Closure of commercial or recreational fishing areas and public lands was not necessary, but fishing vessels were required to stay out of the response area.

Shipping lanes and vehicle traffic routes were not closed, but there was a safety zone around the oil and cleanup vessels.

Wildlife rehabilitation efforts were provided by Tri-State Bird Rescue on a stand-by basis. No animals were oiled.

Dispersant use was considered for this incident because the spill occurred within a pre-approved use area (Big Stone Anchorage). Although the oil would have been amenable to dispersion within the first 24 hours, the FOSC, NOAA, and the RP agreed that conditions were ideal for mechanical recovery. Therefore, dispersant options were not pursued. Most of the oil was recovered by conventional methods.

One interesting aspect of this response was that it occurred during the PREP/SONS exercise. Many responders were in Philadelphia at the time of the spill, the oil spilled was one used for the PREP and the spill was about 12 miles from the PREP spill drill site.

Media interest was moderate to high. The vessel's captain met with a Federal Senator and Congressman from New Jersey in Cape May to discuss the spill.

NOAA Activities:

NOAA was notified of this incident at 0600 on the September 18, 1997, by MSO Philadelphia who requested on-scene support at the MSO. The SSC and an Away-Team member from Seattle reported on-scene.

NOAA personnel worked as aerial observers to spot and record oil locations for recovery efforts and to help initialize the trajectory model. The trajectory model (OSSM) was very accurate. NOAA contacted the local NWS forecast office and provided the USCG with two weather updates daily throughout the response.

NOAA reported that the slick's movement was expected to be dominated by the tides. By the end of the current flood at 1100 Eastern Daylight Time (EDT), the slick was expected to be seven or eight miles upstream of the overflight position. This would place the northern most extent of the oil at about 39°10' N. By the end of the subsequent ebb at 1700 EDT, the slick would have moved back downstream and the southern most extent of the oil should be near Cape Henlopen.

The SSC and RP representative performed an overflight on September 19 and observed that the oil had reduced sheening almost completely. There were three distinct locations of mousse bands. The bands were about 10 to 20 feet across. The northern most one was approximately four nautical miles long, the second extended approximately eight nautical miles, and the third band was about two nautical miles due east of the T/V *Mystra* extending about three-quarters of a nautical mile. On close inspection from the helicopter, the oil was seen to be forming tarballs. The tarballs were flat and floating. There was no evidence that the oil was going subsurface. Skimming operations were being very effective. The Oil Observation Job Aid was used to brief the Unified Command as to the changes of the oil over the last two days and its current appearance.

NOAA supported this response for 2 days on-scene and 3 days of weather forecasts.

References:

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

NOAA Hotline #242, 21 Reports

Research Planning Institute. 1995. *Sensitivity of coastal environments and wildlife to spilled oil: Delaware, New Jersey, and Pennsylvania An atlas of coastal resources*. Seattle: Ocean Assessments Division, NOAA. 59 maps.

Research Planning Institute. 1989. *Summary environmental sensitivity index maps: Delaware Bay*. Seattle: Ocean Assessments Division, NOAA. 4 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 COTP Philadelphia Area Contingency Plan

U.S. Coast Guard District 7

Name of Incident:	M/T *Igloo Moon*
NOAA SSC:	Bradford L. Benggio
USCG District:	7
Date of Incident:	11/06/96
Location of Incident:	Key Biscayne, Florida
Latitude:	25°38′ N
Longitude:	080°06′ W
Spilled Material:	butadiene, IFO 380, marine diesel, lube oil
Spilled Material Type:	5, 4
Source of Spill:	tank ship
Resources at Risk:	**Shoreline:** mangroves, exposed and sheltered seawalls, sand beaches. **Birds**: brown pelican, loons, cormorants, peregrine falcons, piping plovers, herons, egrets **Marine mammals**: river otters, West Indian manatee **Reptiles:** American crocodile, green hawksbill, Kemp Ridleys and loggerhead turtles **Shellfish:** crabs, shrimp, lobster **Habitat:** seagrass beds, hard-bottom communities, living coral reef. **Management Areas:** Biscayne National Park, Biscayne Bay State Aquatic Preserve, marinas, recreational boating, sport diving, fishing
Dispersants:	N
Bioremediation:	N
In Situ Burning:	N
Other Special Interest(s):	public and responder health and safety issues, potential for catastrophic release or explosion, exposure to a carcinogenic chemical, respiratory problems
Shoreline Type(s) Impacted:	none
Keywords:	endangered species

Incident Summary:

The M/T *Igloo Moon*, a liquid propane gas (LPG) tank vessel carrying a full cargo (6,589 metric tons) of butadiene to Houston, Texas, ran aground November 6, 1996, on a sand bottom, in 25 feet of water, within the Biscayne National Park boundary. The vessel was reportedly carrying 57,000 gallons of IFO 380, a heavy fuel oil similar to #6; 30,000 gallons of marine diesel; and 6,000 gallons of lube oil.

The USCG immediately began its incident command and by early that morning established a Unified Command at MSO Miami. A primary concern was the stability of the butadiene cargo and potential for evacuations. Butadiene is a colorless gas with a mild gasoline-like odor. It is flammable, reactive, and mildly toxic by inhalation, causing eye and respiratory tract irritation at high concentrations. Butadiene is a suspected human carcinogen. It was shipped as a liquefied compressed gas under refrigeration. Chemical inhibitor was added to it to prevent polymerization.

As salvors began calculating priorities, limitations, and concerns related to the structural integrity and stability of the vessel and the cargo tanks, NOAA, the USCG, State representatives and NPS representatives began evaluating chemical hazard information, resources at risk, protection priorities, and strategies.

By early afternoon of November 8, lightering of fuel from the *Igloo Moon* was completed, and the response shifted from an Oil Pollution Act of 1990 (OPA) response to a response governed by CERCLA regulations.

The State Emergency Management Team, Dade County Emergency Operations Center, Dade County Metropolitan hazardous materials teams, NOAA, ATSDR, and the USCG Safety Officer discussed and evaluated various scenarios related to concerns for the health and safety of responders and the general public. These evaluations led to the development of contingencies for responder and public evacuations if the situation began to destabilize. A salvage option that included some method of controlled venting of the cargo was evaluated, but determined to be unsafe and unfeasible.

The stability of the cargo was of utmost importance. One important issue was related to the certification date of the chemical inhibitor that was mixed into the cargo The certificate for the inhibitor was due to expire on November 9. The OSC demanded that the RP either add fresh inhibitor or have the cargo tested and re-certified so that the continued stability of the cargo was ensured. Fresh inhibitor was sent on-scene to be added, but the RP opted to have the cargo tested as opposed to potentially ruining it by adding more inhibitor. Samples were sent to a local laboratory and analyzed for the inhibitor's effectiveness. A new certification was issued by the laboratory certifying the inhibitor until December 1.

Due to the complexity of the planned salvage operations, which required bringing another LPG tanker alongside the *Igloo Moon* for cargo lightering, a complete hydrographic survey had to be performed around the grounding site to ensure bottom clearances for both vessels during the salvage operations. The survey was used to identify bottom structures of concern, identify and mark the best entry/exit channel, and to mark any shallow areas to avoid within the channel.

The salvage operations also required that seas be no greater than three feet while the ships were moored together and cargo was being transferred. A gale passed through the area delaying the completion of the hydrographic survey and subsequent salvage operations for several days.

The salvage operations required lightering a portion of the *Igloo Moon'*s cargo and deballasting ballast tanks to get the ship light enough to refloat. The NPS was concerned that the release of ballast water into the park might introduce some exotic invasive species into the nearby waters. The ballast records of the vessel were examined and it was determined that there was a potential for an invasive species to exist in the water or residual sediment of the vessel's ballast tanks. This issue was evaluated by the NPS with assistance from NOAA and a contracted expert from the University of Miami. The recommendation was to treat the tanks with 50 ppm of calcium hypochlorite before releasing the ballast water. It was felt that this treatment would ensure that any exotic species were killed and calculations indicated that the chlorine would become relatively benign in the tanks after a minimum six-hour soak, thus presenting no risk to nearby natural resources in the water column upon release.

At 0935 on November 20, 1996, the lightering vessel *Selma Kosan* made her way along side the *Igloo Moon*. Approximately 1,000 tons of butadiene were transferred and the *Selma Kosan* left the grounding site at 1730. The *Igloo Moon* then discharged ballast tanks and was refloated during the flood tide on November 21 without incident and proceeded to the Miami anchorage for a hull inspection.

Behavior of Spilled Material:

No material was spilled during this incident. The primary concern was for the explosive potential of the butadiene. Contingencies were in place for evacuation if the situation became unstable. It is likely that if butadiene had been released catastrophically, without igniting, it would have exceeded the odor threshold for the product for several miles downwind. Since it is heavier than air, it would have been expected to remain near the ground for some distance downwind and possibly collect in low-lying areas.

Trajectory analysis provided by NOAA indicated that if there was a release of oil into the water, the oil would probably move to the north into north Biscayne Bay and the outer beaches of several northern islands. The protection strategy was to divert as much oil as possible to the outer sand beaches where it could be quickly recovered.

The marine diesel would have caused acute localized impacts to water column resources but would have quickly dispersed and evaporated. The IFO would have been more persistent and probably would have caused chronic impacts by getting into mangroves and sediments in the shallow, nearshore areas of the bay where it could effect resources for much longer.

Countermeasures and Mitigation:

The *Igloo Moon* remained boomed while the risk of spilling oil existed and a skimming vessel remained on-site and ready to respond if there were a spill. Contingencies were developed for shoreline booming and resource protection prioritization in case of a spill.

Other Special Interest Issues:

There was a special public and responder health and safety issue related to this incident because of the butadiene being transported. The potential existed for a catastrophic release or explosion, putting anyone near the vessel or within several miles downwind at risk to injury from the blast and exposure to the carcinogenic chemical. NOAA developed several scenario-based models for releases of the butadiene. The models were based on small-to-large releases that helped bracket the potential health and safety considerations associated with exposure to the butadiene.

NOAA Activities:

NOAA was notified of this incident on November 6, 1996, by MSO Miami who requested on-scene support. The SSC and Assistant SSC coordinated scientific and technical input used for the response from NOAA resources, state agencies, other federal agencies, local academia, salvors, and the Incident Command System (ICS).

NOAA HAZMAT's MASS provided oil trajectories, chemical hazard evaluations, air dispersion models, and explosive potentials of the butadiene cargo. The SSC provided on-scene weather forecasts with the assistance of the NWS and the Tropical Storm Forecast Center in Miami, Florida. Tide levels were provided daily by MASS and NOAA's Atlantic Operation Division, Tides Analysis Group and compared with observed water levels near the grounding site daily.

NOAA HAZMAT's health and safety officer conducted extensive research, plan reviews, and coordinated with the ATSDR, the USCG, and other health and safety experts to evaluate health and safety risks and develop recommendations to ensure the continuing health and safety of the public and responders throughout the response.

NOAA provided resources at risk information for the response and produced various site pictures, maps, and operational timelines used for information management.

NOAA provided documentation assistance during the response and will provide the OSC a final documentation record of the incident on CD-ROM.

References:

American Conference of Governmental Industrial Hygienist: Threshold Limit Values, 1996. TLVs and BEIs. *Threshold Limit Values for Chemical Substances and Physical Agents Biological Exposure Indices, 1996*. Second Printing. Cincinnati: ACGIH. 139 pp.

American Industrial Hygiene Association. 1988. Emergency Response Planning Guidelines (ERPG), Set 1. Akron: American Industrial Hygiene Association. 222 pp.

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

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

NOAA. Computer Program developed for the USCG. Spill Planning, Evaluation, and Response System (SPEARS).

NOAA Hotline #203, 65 Reports.

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

OSHA Federal Register on occupational exposure to 1,3-butadiene, ATSDR Toxicological Profile for butadiene.

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.

South Florida Area Contingency Plan.

USCG POLREPS for the *Igloo Moon* Incident

Name of Incident:	T/B *LMI-150*
NOAA SSC:	Bradford L. Benggio
USCG District:`	7
Date of Incident:	11/09/96
Location of Incident:	**Off** Tarpon Springs, Florida
Latitude:	Start: 29 °1 ' N End: 28°7 ' N 1800, 11/8/96
Longitude:	Start**:** 083°46' W End: 083 °20' W 0600. 11/9/96
Spilled Material:	#2 diesel
Spilled Material Type:	2
Amount:	1,332 barrels
Source of Spill:	tank barge
Resources at Risk:	fish, shrimp, crabs
Dispersants:	N
Bioremediation:	N
In Situ Burning:	N
Other Special Interest(s):	none
Shoreline Type(s) Impacted:	none
Keywords:	none

Incident Summary:

The tank barge *LMI-150* lost a 14- to 18-inch deck fitting while en route from Pascagoula, Mississippi to Tampa, Florida spilling approximately 1,332 barrels of #2 diesel fuel. The deck fitting was discovered missing at 0600 on November 9; it was last seen in place at 1800 on November 8. The vessel had traveled 60 nautical miles when the spill was discovered; the release could have happened anywhere along this track. Water depths along the track were between 60 and 70 feet. Three separate USCG overflights were conducted to search for oil on the surface. Forward-looking infrared radar (FLIR) was used on two night flights. A visual overflight was conducted on the morning of November 9; no oil was observed during any of the overflights.

The weather was winds from the north at 20 to 25 knots and the seas were 5 to 7 feet.

Behavior of Spilled Material:

It is assumed that the oil was released at such a slow rate that a cohesive slick or sheen large enough to observe did not form. It could be that mixing, dispersion, and evaporation of the oil was so rapid that observable amounts of oil did not persist for very long.

NOAA Activities:

NOAA was notified of this incident on November 9, 1996, by the USCG. NOAA provided the USCG with weather, trajectory, and oil fate information.

The SSC expected localized acute impacts to fish, shrimp, and crabs exposed to the spilled diesel. Due to the heavy sea at the time of the spill and characteristics of the oil, rapid evaporation, mixing, and dispersion were expected. NOAA ran an ALOHA™ oil fate model that indicated only 15 percent of the product would remain floating after 15 hours.

References:

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

NOAA Hotline #204, 3 Reports

NOAA nautical charts

Name of Spill:	M/V *Tanya*
NOAA SSC:	Bradford L. Benggio
USCG District:	7
Date of Incident:	11/13/96
Location of Incident:	Florida Keys
Latitude:	25°10.60′ N
Longitude:	080°09.96′ W
Spilled Material:	marine diesel
Spilled Material Type:	3
Source of Spill:	motor vessel
Resources at Risk:	**Habitats**: coral reef community, shallow coral reefs; shallow seagrass beds; benthic infuana and epifuana **Crustaceans**: lobster, crabs, and shrimp
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest(s):	N
Shoreline Type(s) Impacted:	N
Keywords:	none

Incident Summary:

The M/V *Tanya* lost steering capability off the reef line between Carysfort and Elbow reefs in the Florida Keys on November 13, 1996, when a gale was influencing conditions in the area. Northeast winds at 25 to 30 knots were predicted, increasing to 35 knots. The seas were predicted to be 15 feet. The *Tanya*, unable to steer, was quickly driven towards the reef line at the Elbow Reef. The Florida Keys National Marine Sanctuary was notified through the Upper Keys Manager out of Key Largo. A sanctuary representative arrived at the USCG MSO at about 1900. By that time, the *Tanya*'s anchor was holding the vessel at position 25°11.02′ N and 080°10.08′ W. The USCG and a contracted tug unable to attach a line to the *Tanya* for towing, left the vessel at anchorage until morning. The anchor reportedly dragged overnight, bringing the vessel within one-half mile of the reef line before a larger tug was able to arrive on-scene and begin towing the vessel to Tampa.

NOAA Activities:

The NOAA SSC, already at the MSO for another incident, was notified of this incident and provided weather forecasts, oil and vessel trajectory and fate information. Resource concerns and issues were coordinated with the Florida Keys National Marine Sanctuary representative on-scene.

References:

The South Florida Area Contingency Plan.

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.

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:	C/V *Houston*
NOAA SSC:	Bradford Benggio
USCG District:	7
Date of Spill:	2/03/97
Location of Spill:	Maryland Shoal, Florida Keys National Marine Sanctuary
Latitude:	24°30.5' N
Longitude:	081°34.3' W
Spilled Material:	Bunker, diesel, lube
Spilled Material Type:	4, 2, 3
Amount:	19,048 barrels
Source of Spill:	container ship aground
Resources at Risk:	**Fish**: angelfish, barracuda, damselfish, menhaden, sea bass, snapper, snook, tarpon, **Crustaceans**: blue crab, pink shrimp, spiny lobster, stone crab **Birds**: brown pelican, common loon, double crested cormorant, gulls, peregrine falcon, piping plover, red breasted merganser, terns, white crowned pigeon **Reptiles**: green, hawksbill, Kemp, and Ridley turtles **Terrestrial Mammals**: key deer, marsh rabbit, silver rice rat **Habitats**: coral reef, seagrass beds **Management Areas**: Florida Keys National Marine Sanctuary, Great White Heron National Wildlife Refuge, National Key Deer Refuge **Recreation**: recreational diving and fishing areas
Bioremediation:	n/a
In-situ Burning:	n/a
Other Special Interest:	none
Shoreline Types Impacted:	exposed mangroves, mixed-sand beaches, riprap, seawalls

Incident Summary:

During the night of February 3, 1997, the C/V *Houston* ran hard aground while en route from New Orleans to Spain. Most of the approximately 2,700 tons of fuel carried by the ship was a heavy fuel oil. The ship also carried marine diesel and lube oil. The ship was loaded with containers, nine of which contained hazardous materials, but the risk of damage to these containers or their cargo was low.

Fuel was lightered from the vessel on February 8 and the ship was refloated and pulled free of the reef that evening during high tide. The *Houston* proceeded to the Port of Miami for damage inspection.

NOAA Involvement:

NOAA was notified of this incident on February 3, 1997, by MSO Miami who requested scientific support. The SSC provided daily weather forecasts, predicted tides and currents, trajectory, oil fate and behavior, hazardous materials, resources at risk analysis, and resource protection information. NOAA also coordinated efforts with NOAA's Tides Analysis Group with the Atlantic Operations Section in Norfolk, Virginia to provide estimated correctors to predicted tide levels.

NOAA supported this through February 9, 1997, by phone and fax.

References:

Coastal 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.

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

NOAA Hotline #217, 26 Reports

Name of Incident:	Freighter *Fortuna Reefer*
NOAA SSC:	Bradford L. Benggio
USCG District:	7
Date of Incident:	07/24/97
Location of Incident:	Mona Island, Puerto Rico
Latitude:	18°3.3′ N
Longitude:	067°52′ W
Spilled Material:	IFO 180 and marine diesel
Spilled Material Type:	2
Source of Spill:	fishing vessel
Resources at Risk:	**Habitats**: living coral reefs, turtle nesting habitat **Birds**: shorebirds **Reptiles**: hawksbill sea turtles **Management Areas**: Mona Island Natural Reserve, Federally designated critical turtle nesting habitats
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest(s):	Grounding occurred nearshore on coral that is part of the Mona Island Commonwealth of Puerto Rico Natural Reserve.
Shoreline Type(s) Impacted:	pockets of narrow porous coralline sand, vertical rocky terrain, natural beach, rock outcrops
Keywords:	boom, Corexit 9527, Corexit 9500, endangered species, rare species, salvage, skimmers, sorbents, SUPSALV, threatened species,

Incident Summary:

On July 24, 1997, the USCG MSO in San Juan, Puerto Rico was notified that the freighter *Fortuna Reefer* had run aground just 300 yards southeast of Mona Island. The island is a Commonwealth of Puerto Rico natural reserve with numerous endangered, threatened, and rare species and federally designated critical habitats.

The vessel had departed Mayaguez, Puerto Rico en route to the western Pacific with no cargo. Fuel onboard consisted of 100,000 gallons of heavy fuel oil, IFO 180, and 33,000 gallons of marine diesel. All fuel was distributed in several double-bottom tanks.

Physical damage to the reef was the only known impact to the environment. While there was no oil released from the ship, the Unified Command prepared contingencies in the event of an unexpected release. Boom, sorbents, skimmers, storage devices, and other response support equipment were prestaged onshore and on a work barge on-scene to rapidly respond to a spill. Representatives from the USCG, NOAA, USFWS, Puerto Rico Department of Natural and Environmental Resources (DNER), and the RP made site visits to Mona Island to assess the threat to natural resources and develop recommendations for protection priorities and strategies. Effective response options were significantly restricted due to;

1. limited access to the grounding site because of shallow water and coral rock at or near the surface, as well as limited access to the shoreline due to vertical rocky cliffs,

2. limited ability to stage equipment, supplies, and personnel on-scene because of the remoteness of the location and,

3. limited ability to boom, contain, and recover oil mechanically due to seas and unpredictable nearshore eddy and rip currents.

The U.S. Navy Superintendent of Salvage (SUPSALV) assisted on-scene and worked closely with a representative from the RP to develop a safe and effective salvage plan. A first attempt to extract the vessel was made on July 29, but failed when tow lines parted. A second extraction attempt was planned after additional fuel was removed from the vessel. The additional lightering was conducted to reduce risk to the environment during the salvage operations in the event of a spill and to help lighten the vessel for refloating. Since all the fuel could not be offloaded from the ship, the USCG decided to require that dispersant capability be on-scene. The second extraction attempt was made on July 31 and was successful. Once the vessel was refloated, divers conducted a hull inspection before it was towed to Mayaguez for repair assessments.

Behavior of Spilled Material:

No material was spilled during this incident. The primary concern was for the impacts that would occur to nearshore coral and aquatic resources, as well as to federally designated critical shoreline turtle nesting habitats.

IFO 180 is a heavy fuel oil and would likely weather into persistent tarballs. Because this oil type is a heavy fuel oil, it could incorporate sediment and form mats or rollers on the bottom. It could coat coral and other benthic resources. Recovery of subsurface oil may have been extremely limited or impossible. The marine diesel would be less persistent and would tend to evaporate and disperse fairly quickly, but could be expected to cause localized water column impacts nearshore due to its more soluble toxic fractions.

Trajectory analyses indicated that any spilled product would likely move to the west with prevailing winds and currents. Due to the proximity of the vessel to shore, shoreline impacts would be likely if a release occurred at or near the grounding site. It was predicted that tarball impacts to the Dominican Republic could occur three to four days following a spill.

Countermeasures and Mitigation:

Boom was deployed forward of the vessel to capture oil in the event of a small release. Additional boom, sorbents, and skimming equipment was on standby. Some equipment was pre-positioned for a more rapid response and contingencies were developed for shoreline booming and resource protection prioritization in the event of a spill.

The USCG ordered the deployment of Corexit 9527 on standby to be used should a spill take place during salvage operations.

Other Special Interest Issues:

The NOAA SSC was asked to help evaluate alternative countermeasures for a spill of the oil onboard. Response alternatives evaluated included use of dispersants, in-situ burning, bioremediation, and chemical shoreline cleaning agents. Due to sea states in the area at risk, effective mechanical removal or in-situ burning would not be feasible with present techniques and equipment.

Preliminary dispersant testing and gas chromatography-mass spectrometry (GC/MS) analyses were conducted by NOAA for the IFO 180, a blend of a diesel fuel and a heavy fuel oil. The cargo oil was tested using Corexit 9527 and Corexit 9500. Both chemical

formulations demonstrated observable dispersion, but the oil was not highly or easily dispersed. Analysis indicated that under actual conditions, multiple applications and ample surface mixing may be required for dispersant application to be effective. This test was essentially a screening method modified from the swirling flask test and scored visually as either positive or negative relative to two controls, the test oil alone and South Louisiana crude. For this IFO 180, the residual fuel oil fraction was essentially a reduced crude. It was expected that the oil would weather, if spilled, much like a weathered mid- to heavy-crude oil. Although dispersant effectiveness was estimated to be somewhat limited for this oil, the identification of dispersants as a response method was made by the OSC to minimize the risk of serious environmental damage.

A plan was developed to implement dispersant application in accordance with guidelines from all interested parties. The USCG contracted a DC-4 aircraft with dispersant application capability to arrive at Rafael Hernandez Airfield at the USCG Air Station, Borinquen, Puerto Rico. The aircraft was scheduled to arrive on July 31, 1997, with 1,500 gallons of Corexit 9527 onboard. An additional 5,000 gallons of Corexit 9527 were scheduled to arrive by air cargo. The additional Corexit was a precaution in the event a significant amount of oil spilled during vessel salvage and extraction operations.

On the morning of July 31, 1997, the Caribbean Regional Response Team (CRRT) was activated by telephonic conference to discuss the contingent dispersant plan and determine what distance from shore and coral, the dispersants should be applied to maximize the environmental benefit. Resources of concern and tradeoff issues were discussed, especially hawksbill turtles and living coral. Also present on-scene were a USFWS representative and the SSC. All CRRT representatives agreed that the gross oil would likely be more harmful to resources of concern than effects caused by adding dispersant. Trajectory, weather, and oil behavior information indicated that dispersing the oil would likely reduce shoreline impacts by removing some portion of the slick into the water column where wind effects would not drive it shoreward. The CRRT therefore approved the use of dispersants in accordance with the Caribbean Dispersant Usage Plan up to the shore with no limitations of water depth or distance from living coral.

Although approval was given to use the dispersant, the plan emphasized that effectiveness would depend in part on adequate mixing energy. Since the mixing energy in the lagoon inside the reef line is significantly reduced, it was recommended that dispersant use in this area be carefully considered.

NOAA Activities:

NOAA was notified of this incident on July 24, 1997, by MSO San Juan who requested on-scene support. The SSC coordinated scientific and technical input used for the response from NOAA HAZMAT, other NOAA resources, state agencies, other Federal agencies, local academia, salvors, and the ICS.

The SSC served as planning section chief for the USCG within the ICS. HAZMAT's information specialist filled the role of situation unit leader. NOAA also filled the role of technical specialists within the ICS with the members of the SST including a BAT member and a Chemical Assessment Team member.

NOAA provided potential oil trajectories that were updated as on-scene weather dictated. NOAA provided on-scene weather forecasts for the area with the assistance of the NWS Predicted tides were provided daily.

NOAA HAZMAT's health and safety officer provided health and safety information related to PPE requirements and exposure concerns for the oil involved in this incident.

NOAA provided information for local resources at risk and coordinated with other local trustees and stakeholders to ensure all resource concerns were identified. The BAT conducted biological resource evaluations on-scene to help establish protection recommendations and priorities. Additionally, pre-Shoreline Cleanup Assessment Team (SCAT) assessments were conducted to identify areas of turtle nesting and other response or shoreline cleanup issues. These surveys were conducted jointly with representatives from USFWS, Puerto Rico DNER, the RP, and the Environmental Equality Board.

NOAA conducted chemical analyses of the IFO 180 fuel oil for general characterization and to provide a screening test for dispersant applicability. NOAA provided an oil chemistry specialist on-scene to assist with dispersant application and monitoring issues in the event a spill occurred.

NOAA provided information management, distribution, and documentation assistance during the response and will provide the OSC a final documentation record of the incident on CD-Rom.

NOAA provided on-scene support from July 26 through August 1, 1997.

References:

Coastal Area Contingency Plan for Puerto Rico and U.S. Virgin Island

Corexit 9527 Technical Data Bulletin

CRRT Dispersant Use Plan and Letters of Agreement for Puerto Rico

Dispersant Application Observer Job Aid

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 Hotline #235, 36 Reports

Research Planning Institute. 1984. *Sensitivity of coastal environments and wildlife to spilled oil: Puerto Rico. A coastal atlas*. San Juan: Puerto Rico Department of Natural Resources. 35 maps.

SROMP Dispersant Monitoring Plan

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 POLREPS for the *Fortuna Reefer* Hotline #235 Incident

U.S. Coast Guard District 8

Name of Spill:	M/V *Jo Beth*
NOAA SSC:	Bill Sites
USCG District:	8
Date of Spill:	11/19/96
Location of Spill:	Rosedale, Mississippi
Spilled Material:	diesel
Spilled Material Type:	2
Amount:	27,000 gallons
Source of Spill:	motor 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:

On November 18, 1996, the 118-foot towboat M/V *Jo Beth*, owned and operated by Jantran, Inc. of Rosedale, Mississippi, experienced an engine room fire. The vessel was intentionally grounded stern first into the shore at mile 588 near Rosedale and barges containing ammonium nitrate were moved to a calm area. The tug was carrying 27,000 gallons of diesel at the time of the fire. On-scene personnel believed that a fuel line ruptured and fed the fire.

The fire was extinguished on November 19 and the vessel was cooled with water during the day on November 20. A salvage team was on-scene to survey the vessel and develop a salvage plan.

Countermeasures and Mitigation:

Containment boom was deployed around the vessel to prevent oil from escaping the area. Rainbow sheen was observed in the river 10 yards wide by 1,000 yards long.

An ICS was formed. MSO Memphis assumed the FOSC role. Also on-scene were Wild Well Control of Houston USCG GST, William's Fire Hazard Control, and the City of Cleveland, Mississippi Fire Department to battle the fire. Other organizations responding included Jantran, Maritime Response Syndicate, Ferguson Harbor, USS Environmental, and Drexler Chemical

An estimated 24,000 gallons of the diesel were burned, 2,500 gallons remained onboard after the fire, and 500 gallons spilled into the river. Of the 500 gallons spilled, 210 gallons were recovered with sorbents and 290 gallons evaporated or dispersed.

NOAA Activities:

NOAA was notified of this incident on November 19, 1996, by MSO Memphis who requested an oil spill trajectory.

NOAA reported that if the water is slack, it may be possible to boom the diesel and recover a portion of it. Generally diesel will produce silver or rainbow sheens but not much more than that. The slick could extend downriver for 10 to 15 miles. The nature of the slick will likely be streaks and streamers of scattered to light oil (silver or rainbow sheens), none of which will likely be recoverable. There will likely be streaks and streamers over the width

of the river, but not a slick that extends from side to side. Any wind will tend to push the oil to the downwind side of the river. Under calm conditions, the oil will likely remain on the surface so will not mix into the water column. The risk to water intakes and organisms in the water column or on the bottom is low. Most of the diesel should burn and/or evaporate.

NOAA supported this incident by phone for one day.

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 MSO Memphis POLREPs 182345z NOV 96 and 201955Z NOV 96.

Name of Spill:	M/*V Stolt Spray*
NOAA SSC:	Ilene Byron
USCG District:	8
Date of Spill:	1/19/97
Location of Spill:	Wallace, Louisiana
Spilled Material:	pyrolysis gas
Spilled Material Type:	1
Amount:	4,400 gallons
Source of Spill:	motor vessel
Resources at Risk:	
Countermeasures:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	100 people were evacuated from the area
Shoreline Types Impacted:	none
Keywords:	evacuation

Incident Summary:

On January 19, 1997, at 0107, USCG Group New Orleans notified MSO New Orleans of the collision and grounding of M/V *Stolt Spray*. The vessel reported a steering problem before the collision with a grain barge. The vessel was hard aground at Mile 143 in the lower Mississippi River along the right descending bank near Wallace, Louisiana. The initial report indicated that #1 port tank was holed one meter above the waterline and 100,000 gallons of a pyrolysis gas were in the water. A generic MSDS of the product indicated a benzene content of 27 to 52 percent.

Local officials evacuated 100 people from the town of Wallace.

NOAA Activities:

NOAA was notified of this incident on January 19, 1997, by MSO New Orleans and asked to provide a trajectory analysis, air plume model, and to estimate the fate and effect of the product. Additionally, the SSC was asked to estimate the possible amount of product lost after leaking for two and one-half hours based on a three-foot by one-half inch crack, one meter above the water line. The distance above the crack to the top of the tank was not known and the tank was being transferred to other tanks at an unknown rate while it was leaking. Assuming five meters above the tank and product was not being transferred a worst case scenario showed 80,000 gallons in the water.

NOAA reported that 90 percent of the product evaporated the first hour and would be completely gone within four hours. The MSO was advised of possible water intake problems. NOAA told MSO that the product was being carried down the river at the same speed as the river, three knots.

By 0900, after the tanks had been transferred and sounded it was found 4,400 gallons of the product were lost. At 0500 State Police and the cleanup contractor's air monitoring teams showed zero readings of benzene and evacuees were able to return to their homes. The case was closed.

References:

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

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

NOAA Hotline #214, 1 Report

Name of Spill:	Mystery Spill
NOAA SSC:	Todd A. Bridgeman
USCG District:	8
Date of Spill:	1/22/97
Location of Spill:	Lake Charles, Louisiana
Latitude:	30°2′ N
Longitude:	93°3′ W
Spilled Material:	lube oil
Spilled Material Type:	2
Amount:	unknown
Source of Spill:	unknown
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	suspected PCBs
Shoreline Types Impacted:	freshwater bayou
Keywords:	none

Incident Summary:

An unidentified quantity of a light-colored oil was discovered in a bayou in the Lake Charles, Louisiana area. After much investigation by MSO Lake Charles, the source of the product could not be found. The previous weeks had seen extremely cold temperatures around Lake Charles and the MSO reported that several electrical transformers had blown during the cold snap. The MSO was concerned that the product may contain high levels of PCBs because it is commonly used with transformer oil.

NOAA Activities:

NOAA was notified of this incident on January 22, 1997, by MSO Lake Charles. NOAA and the MSO agreed that there was reasonable suspicion to analyze the product for PCBs. The MSO contacted the Central Oil Identification Laboratory (COIL) who reported that they could not run routine samples for analysis so NOAA offered the assistance of our chemical support team at LSU. MSO Lake Charles was informed that the analysis would be "uncertified" but otherwise complete. NOAA shipped the sample to LSU. LSU received the sample for analysis on January 29, 1997, and returned their analysis on January 30, 1997.

The analysis of the product showed no PCBs at or above a detection level of 25 ppm. The product was characterized as a typical middle distillate lubricating oil.

LSU notified MSO of the results both verbally and in writing. As of February 5, 1997, NOAA's SSC in New Orleans had not been told if the source of the product had been discovered.

No further NOAA assistance was requested.

Name of Spill:	Drill Mud Spill
NOAA SSC:	Todd A. Bridgeman
USCG District:	8
Date of Spill:	2/12/97
Location of Spill:	Berwick, Louisiana
Latitude:	29°41.6' W
Longitude:	091°13.4' W.
Spilled Material:	diesel based drill mud
Spilled Material Type:	**2**
Amount:	320 barrels, 13440 gallons
Source of Spill:	fractionization tanks
Resources at Risk:	**Fish**: flounder, catfish **Shellfish**: blue crab, brown shrimp, white shrimp **Birds**: wading birds, water fowl (ducks, geese) **Mammals**: river otter, mink, raccoon **Reptiles**: alligators
Chemical Countermeasures:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

At approximately 0240 on February 10, 1997, two fractionating (frac) tanks containing a total of 42,000 gallons (500 barrels each) of diesel-based drilling mud (diesel content approximately 50%) fell from a barge and sank along the right descending bank of the Atchafalaya River in Berwick, Louisiana, near Morgan City. The tanks fell off the barge *RG 106* at the Baroid Dock, mile marker 116 and sank in approximately 25 feet of water. Denbury Management Inc. was the RP and initiated immediate cleanup actions. During initial salvage operations 90 barrels of mud/water were recovered from the first tank, 30 barrels were product; approximately 320 barrels were lost. The first tank was successfully raised from the bottom of the river on February 11, 1997. The second tank, which still contained the majority of its original product, remained on the bottom until it was pumped out and then recovered on February 14, 1997.

Behavior of Spilled Material

The drilling mud was 45 percent diesel fuel and the diesel remained bonded to the mud. The product sank and remained on the bottom, threatening bottom-dwelling organisms through smothering or ingestion of toxic compounds.

Countermeasures and Mitigation:

A bottom sampling plan was developed to sample the river bottom near the spill to determine if there were detectable levels of product remaining on the bottom, the extent of product spreading/transport, and degree of recoverability. On February 16, 21 bottom samples were collected by a diver and analyzed for oil and greases dry weight by an independent laboratory. The results were returned on February 19, 1997, showing that all samples from this highly industrialized area showed some level of grease and oil contamination, which could be related to this release and/or past spills. The levels of contamination detected did not warrant further cleanup. The USCG recommended discontinuing cleanup actions.

NOAA Activities:

NOAA was notified of this incident on February 12, 1997, by MSO Morgan City who requested information about the behavior of this oil, shorelines at risk, and resources at risk in the vicinity of the spill. The NOAA SSC, the RP, and the Louisiana DEQ developed a bottom sampling plan for the river bottom near the spill. NOAA based the reports on the assumption that a spill of 310 barrels of drilling mud occurred on the Atchafalaya River at river mile 116.

The SSC told MSO that there was little likelihood of any shorelines along the river banks being oiled; the most likely chance of shoreline oiling would be in the bay. The mud may collect on the tidal flats at the mouth of the river and could impact animals associated with the mudflats, including wading birds and waterfowl that feed on the flats.

NOAA reported that the drilling mud is likely to remain mostly benthic; however, with strong currents (four knots) reported for the river, some of the drilling mud could become suspended in the water column. The impacts to the fish in the water column are likely to be low, because of the low concentration of the petroleum hydrocarbons. The greatest risks are likely to be to the benthic fish such as flounder and catfish. These fish live and feed on the river bottom and are likely to come into direct contact with the drilling mud. The concentrations may be high enough to cause mortality as well as sublethal effects.

Blue crab, brown shrimp, and white shrimp were in the area. These bottom-dwellers typically feed on organisms in the sediments and may suffer sublethal impacts such as tainting and reduced reproductive success, or death. In the open-water area they are also brackish-water clams. These animals are at risk from smothering and, since they filter feed, they also bioaccumulate the oil. Even if exposed to relatively small amounts of oil, the clams can accumulate enough to taint the flesh and cause sublethal effects. At higher concentrations this may result in mortality.

The shorebirds and wading birds that feed on the flats are primarily at risk. These birds feed on organisms found on the flats, including crabs and shrimp. The birds may ingest oil-contaminated prey. There is very little chance of birds becoming oiled directly.

Of the small terrestrial mammals in the area, the river otter, mink, and raccoon are the most likely to be impacted. These animals may eat fish and shellfish that may have been exposed to the oiled mud, but death is unlikely.

Alligators are found throughout the area. Little is known about the impacts of oil on these animals. It is likely that they may consume oiled prey, but no lethal effects are expected. The alligators may also be exposed directly to the drilling mud in shallow-water areas. It is possible that oil fraction may cause some irritation of the membranes around the eyes and nostrils, but mortality is not expected.

NOAA supported this incident until February 19, 1997. Any further action on this release will most likely be pursued by the state.

References:

Coastal Sensitivity Atlas

NOAA Hotline #219, 6 Reports

USCG POLREPS for Drill Mud Spill

Name of Spill:	Tank Barge *IB 960*
NOAA SSC:	Todd A. Bridgeman, Bill Sites
USCG District:	8
Date of Spill:	3/17/97
Location of Spill:	Baton Rouge, Louisiana
Latitude:	N/A
Longitude:	N/A
Spilled Material:	pyrolysis gas
Spilled Material Type:	1
Amount:	1,462 barrels (6,1400 gallons)
Source of Spill:	tank barge
Resources at Risk:	**Fish**: gizzard shad, bass, crappie, bluegill, catfish, sunfish, freshwater drum, Atlantic sturgeon (endangered), seatrout, drum, flounder, anchovy, mullet, mackerel, menhaden, and kingfish **Crustaceans**: crayfish, blue crab, shrimp **Mollusks**: brackish-water clams **Birds**: shorebirds, wading birds, bald eagle, peregrine falcon (endangered), osprey, American kestrel, loons, grebes, cormorants, anhingas, and species of waterfowl. **Terrestrial Mammals**: river otter, beaver, muskrat, mink, nutria, and raccoon **Human-Use Areas**: water intakes
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	evacuation of Louisiana Southern University and 17 homes, Bonnet Carre Spillway opening, high benzene content of product, high public concern
Shoreline Types Impacted:	none
Keywords:	endangered species, Naval Superintendent of Shipbuilding (NAVSUPSHIP)

Incident Summary:

On March 17, 1997, MSO New Orleans received a report from the Louisiana State Police that a 25-barge tow broke away from the tug *F.R. Bigelow* and struck the Highway 190 bridge over the Mississippi River near Baton Rouge, Louisiana. The barge of concern, tank barge *IB 960,* overturned and spilled a portion of its cargo, 9,528 barrels of pyrolysis gasoline, which can contain 20 to 70 percent benzene. The barge was located 800 feet south of the Highway 190 bridge. The barge was held along the river bank by a tug until the remaining cargo was lightered on March 24.

The amount spilled was estimated at 61,400 gallons; none was recovered.

Behavior of Spilled Material:

Pyrolysis gas has a composition and behavior similar to gasoline, but with higher concentrations of benzene (20 to 70%) and other aromatic compounds. The majority of the product will evaporate quickly with a small fraction dissolving in the water. With a river flow rate exceeding one million cubic feet per second, the dissolved fraction was expected to be diluted to the point where it would be difficult to detect by the time it reaches the Bonnet Carre Spillway. Since only a fraction of the water in the river is diverted to Lake Pontchartrain, chemical contamination of the lake was not expected.

The barge was secured to the river bank until the remaining product could be lightered. The product that leaked into the river was not recoverable due to its light nature and the five- to six-knot currents. There was no shoreline contamination and no fish kills were observed.

Countermeasures and Mitigation:

Air monitoring began on March 18 and benzene levels were detected as high as 15 ppm with several readings of 3 to 5 ppm. The State Police evacuated 17 homes and the campus of Louisiana Southern University and the USCG closed the Mississippi River from mile marker 233 to 235.

On March 19, divers were deployed and secured vents and other leaks in the barge. The divers attached pump lines on March 20 to lighter off the remaining product. On the March 19, 14 teams of air sampling personnel did not record any readings of benzene over a 14-hour period. Therefore, evacuated residents were allowed to return to their homes and the river was reopened to vessel traffic at the discretion of USCG personnel on-scene.

NOAA Activities:

NOAA was notified of this incident on March 17, 1997, by MSO New Orleans who requested an evaluation of the potential threat of this spill to the air and water. On March 18 MSO New Orleans requested NOAA's on-scene assistance with trajectory planning and product analysis. Of particular concern was the effect of the pyrolysis gas on Lake Pontchartrain through the Bonnet Carre Spillway. The SSC told MSO New Orleans that due to the high volatility of the product and the high river flow, levels of contamination in the water would decrease rapidly downstream from the spill site and not impact the spillway. A plan was developed to sample the river just upstream from New Orleans to ensure that no contamination was reaching Lake Pontchartrain through the spillway.

The RP's contractor, Woodward-Clyde, obtained eight water samples at various points along the river between March 19 and 20. These samples were collected next to the upriver section of the Bonnet Carre Spillway, on top of the spillway itself, and two miles up river from the spillway. All the samples were tested for benzene, toluene, ethylbenzene, xylene (BTEX). The samples collected from mid-channel and mid-spillway sites were also subjected to a complete semi-volatile and volatile organic compound (VOC) analysis. The samples showed no indications of contamination from this incident.

Stationary and roving air monitoring personnel were divided into 14 teams. These teams were active throughout the incident and detected no hazardous levels of benzene.

The final salvage plan called for cutting small vent holes into the inverted cargo tanks and removing the product via the barge's vapor header piping system. The NAVSUPSHIP assisted with the lightering of the product. The lightering operation was completed on March 24 and the barge was finally righted on March 28. The barge was moved downriver to the T&T barge facility for residual product removal and repair.

NOAA was involved in this response by on-scene support, phone, fax, and e-mail from March 17 through 21.

References:

Coastal Area Contingency Plan

Coastal Sensitivity Atlas

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

NOAA Hotline #220, 7 Reports

USCG POLREPS

Name of Spill:	*Formosa Six*
NOAA SSC:	Todd A. Bridgeman
USCG District:	8
Date of Spill:	4/11/97
Location of Spill:	Southwest Pass, Mississippi River
Latitude:	28°51'20" N
Longitude:	89°26'08" W
Spilled Material:	1,2-dichloroethane
Spilled Material Type:	5
Amount:	8,063 barrels (338,646 gallons)
Source of Spill:	chemical tanker
Resources at Risk:	**Fish**: bay anchovy, black drum, sheepshead **Shellfish**: brown shrimp, white shrimp **Birds**: gulls
Chemical Countermeasures:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	adverse weather
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

The chemical tanker *Formosa Six* was outbound from the Mississippi River on April 11, 1997, when, at approximately 2025, she collided with the freighter M/V *Flora*, resulting in a gash approximately 25 feet long, extending down to 10 feet below the waterline, releasing at least 125,000 gallons of ethylene dichloride (EDC). The *Formosa Six*'s #6 port cargo tank was holed and the surrounding ballast tanks damaged. The high specific gravity of the product (1.253) caused it to quickly sink in 43 meters of water.

After the collision, the *Formosa Six* moved approximately three miles to the east and anchored. Logistical constraints, the fact that product was trapped in the ballast tanks, foul weather, and the unavailability of a lightering vessel forced the *Formosa Six* to remain offshore until May 14.

After lightering, repairs, and tank cleaning operations were completed, the vessel was allowed into Louisiana to transit to a shipyard for more extensive repair.

Behavior of Spilled Material:

EDC is heavier than and soluble in water. Any impacts from this substance will be primarily in the water column. EDC does not degrade easily, making evaporation the primary mechanism for removal from the water column.

The final fate of the product is uncertain. The EDC could pool in any sort of depression on the bottom. The USCG's request for an answer to this question led to the development of a bottom sampling plan used to determine the presence or absence of product near the collision site.

Countermeasures and Mitigation:

Foul weather caused the cancellation of the first scheduled sampling trip on April 26, 1997; the trip was rescheduled for May 2. The sampling crew consisted of representatives from the RP's environmental consulting firm Beak Inc.; an IH from CET Inc., who was in charge

of safety; a sampling team of three persons from Barry Vittor & Associates, Inc.; and NOAA, who represented the USCG. The sampling team boarded the Louisiana Marine Consortium's (LUMCON) vessel R/V *Pelican* in Cocodrie, Louisiana the evening of May 2 and traveled to the incident site. The sampling trip was successful and the vessel returned to the pier in Cocodrie on May 4 after collecting 18 sediment samples.

Chemically EDC was detected in 15 of the samples and visually detected in one sample. Levels of contamination for samples testing positive ranged from a high of 26,400 ppm to a low of 0.136 ppm. Initial levels of concern were established at 40 to 100 ppm. Recovery was not recommended due to the relatively small area affected, the lack of highly sensitive resources in the vicinity, and the lack of efficient and safe recovery methods. State and Federal trustees were notified of the decision. Some long-term monitoring may be in order for this site; as of July 31, evaluation of the situation was continuing.

NOAA Activities:

NOAA was notified of this incident on April 11, 1997, by MSO New Orleans and was asked to review the bottom-sampling plan for the USCG. The Assistant SSC was asked to act as quality inspector for the USCG during the sampling trip. The NOAA SST also provided information about resources at risk, trajectory, product characterization, health and safety concerns, and weather throughout the incident.

NOAA reported that the EDC released should not impact shorelines. Fish are the most likely to be impacted by this substance. There are numerous species of fish present in this area. Black drum, bay anchovy, and sheepshead are spawning. The spawning areas are likely to be near the shoreline and should not be exposed to high concentrations of the product. The fish will concentrate the substance in their fatty tissues and may bioaccumulate in tissue concentration further up the food chain. It may increase to almost 10 times the original concentration higher in the food chain. Therefore, fish that are not directly exposed to the substance may still be contaminated by eating fish that have been exposed.

Shellfish in the area include brown shrimp, white shrimp, blue crab, and oysters. They are distributed throughout the area, but only the oysters are spawning at this time. The oysters and crabs will be closer to the shoreline and further from the source of the spill than the shrimp. Impacts to the oysters and blue crabs may be minimal. The toxicity to the shrimp is about 300 ppm, well below the solubility levels of the substance. Oysters may concentrate low levels of the substance if they are exposed to it.

Birds, marine mammals, and alligators are not at much risk of exposure to the EDC. It is unlikely that they will be directly exposed to the substance, but may ingest contaminated prey. There is little information on the effects of EDC on these animals.

New information received on April 15, 1997, about the volume of the spilled material, location of the vessel, and trajectory caused the FOSC to request another resources at risk report. The most significant change in the spill conditions was a tripling of the volume, from the initial estimate of 544 cubic meters to the current estimate of 1,800 metric tons. With this size of release, it is anticipated that the area affected and the duration of toxic levels in the water column will be increased. The greatest impacts would be expected for bottom-associated organisms that cannot quickly escape exposure to toxic levels, such as bivalves, shrimp, and small benthic invertebrates such as amphipods. Most fish would be expected to swim out of the areas of highest concentrations. If killed, the bottom-associated organisms will not float, so we do not expect to see evidence of fish kills or shellfish mortality. It will be very difficult to determine the extent of any impacts to bottom

organisms because of their variable distribution, variable exposure as the chemical spread, and strong river currents that will disperse dead organisms.

The lightering of the *Formosa Six* was completed on May 14, 1997. The vessel will remain at sea to conduct tank cleaning operations and to evaluate/execute the pumping plan to remove any product or contaminated water remaining in the #6 port ballast tank and then return to the South West Pass anchorage area to conduct a formal damage survey and to ensure that no chemical hazards remain. Louisiana DEQ will inspect and sample the vessel before granting clearance for the *Formosa Six* to enter state waters. Once cleared the vessel will go up the Mississippi River to a shipyard where repairs can be made.

Contaminated water and contaminated EDC will be disposed of at a proper disposal facility. Wet EDC (largely uncontaminated product that has come into limited contact with water) will be reprocessed at the Borden Chemical Plant.

The results of the bottom sampling plan continue to be evaluated by responders and trustee agencies. At this time it appears that recovery is not a viable option, however, some longer-term monitoring may be in order. The situation continues to be evaluated.

References:

Coastal Area Contingency Plan

Coastal Sensitivity Atlas

MSDS

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

NOAA Hotline #222, 51 Reports

USCG POLREPS

Name of Spill: Brown Water Marine *Barge 66*
NOAA SSC: Tim Steele
USCG District: 8
Date of Spill: 4/11/97
Location of Spill: Redfish Island, Texas
Latitude: 29°30.8' N
Longitude: 094°45.0' W
Spilled Material: zinc bromide
Spilled Material Type: 5
Amount: 1,285 barrels
Source of Spill: barge
Resources at Risk: seatrout, black drum
Bioremediation: N
In-situ Burning: N
Other Special Interest: none
Shoreline Types Impacted: none
Keywords: none

Incident Summary:

At approximately 1000 on April 10, 1997, Brown Water Marine (BWM) *Barge 66* overturned in the Houston Ship Channel, between Buoys 52 and 54, by Redfish Island, Texas. The overturned barge was carrying various chemicals on deck and two large frac tanks of zinc bromide. All items were lost overboard. The Houston Ship Channel was closed to all traffic. T&T Marine Salvage was hired to remove the tanks and other debris. Dive teams from the contractor located the lost tanks near light 54.

On April 12, a safety zone was established in the Channel between lights 52 and 56 to allow one-way traffic.

Behavior of Spilled Material:

The spilled products dissolved quickly in the water. They are high-specific gravity products and remained near the bottom exposing benthic species to the greatest amount of contamination. Animals on the water surface and nearshore were minimally exposed.

NOAA Activities:

NOAA was notified of this incident on April 11, 1997, by MSO Houston. NOAA provided information on the weather and resources at risk. There were no signs of environmental damage and environmental risk was considered localized and low.

The Channel was reopened on April 18 after the contractor completed removing debris and the Army Corps of Engineers conducted a final side-scan sonar bottom survey.

References:

NOAA Hotline #221, 5 Reports

USCG POLREPS

Name of Spill:	Lake Barre, Pipeline Spill
NOAA SSC:	Tim Steele
USCG District:	8
Date of Spill:	05/16/97
Location of Spill:	Houma, Louisiana
Latitude:	29°14.49' N
Longitude:	090°27.30' W
Spilled Material:	Eugene Island crude
Spilled Material Type:	3
Amount:	5,000 to 7,500 barrels
Source of Spill:	pipeline
Resources at Risk:	**Habitats:** coastal salt marsh **Terrestrial Mammals:** river otter, muskrat, mink, and nutria **Birds:** gulls, terns, bald eagle, osprey, peregrine falcon, reddish egret, brown pelicans, and white pelicans **Fish:** seatrout, red and black drum, flounder, kingfish (whiting), sheepshead, Gulf menhaden, striped mullet **Mollusks:** oysters **Crustaceans:** white shrimp, brown shrimp, blue crab **Reptiles:** American alligator **Management Areas:** commercial fisheries, shrimping and oystering
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	Non-intrusive methods of cleanup were used because of the sensitivity of the Louisiana eroding coastal marshes to physical disruption.
Shoreline Types Impacted:	eroding coastal marshes, coffee ground beaches
Keywords:	boom, saltwater marsh, skimmers, sorbent

Incident Summary:

At 1542 on May 16, 1997, a 16-inch Texaco pipeline released crude oil into Lake Barre, Louisiana. The pipeline was located approximately 6 miles from shore, 27 miles southeast of Houma, Louisiana. At 1740 a slick was observed by a Texaco observer during an overflight. The leak was secured at approximately 1800. The slick was estimated to be 1 mile long by 900 feet wide. From the color of the oil, observers assumed a 0.1-millimeter (mm) thickness and estimated that 277 barrels had been released. Later estimates of the spill volume were between 5,000 and 7,500 barrels.

The oil spilled was a south Louisiana crude with an API gravity of 30.6. NOAA calculated that approximately 36 percent of the oil would naturally evaporate or disperse within the first 48 hours.

Resource concerns were primarily focused on the saltwater marsh habitat, birds, and shellfish.

Behavior of Spilled Material:

Winds at the time of the release were from the east at 10 knots and pushed the slick toward the west. By May 16, 1997, winds had shifted to the south-southeast and pushed the oil north onto several offshore islands. These islands acted as natural catchments for large

amounts of oil. The southerly winds also pushed the oil beyond the offshore islands into coastal marsh.

Countermeasures and Mitigation:

Skimming proved effective on the heaviest oil especially along the windward side of the offshore islands.

Marshes in this coastal area are eroding and subject to natural flushing from normal cyclic and wind-driven tidal influences. In this environment a non-intrusive approach to oil recovery was considered appropriate to protect the marshes from response damage. A rule was instituted, and strictly enforced that responders were to remain in boats while in the marsh.

Protective booming of sensitive areas was dynamic and conducted in accordance with local resource information. Protective booming was used to keep the oil out of the marsh and, where that failed, hard and sorbent booms and boom-tending boats were used to collect oil of opportunity as it was flushed from the marsh. This natural flushing and collection technique continued until oil migration ceased.

The "coffee-ground" beaches were very porous and had oil as deep as 0.8-inch. As a cleanup measure, removing the organic material from these beaches would hasten erosion. Therefore, these beaches were trenched and sorbent material was used to collect migrating oil.

Other Special Interest Issues:

During this spill two special teams were used by the Unified Command to increase the operations responsiveness to problem areas and recovery opportunities.

The Command used an Aerial Observation Team consisting of State, Federal, and RP representatives, empowered to make operational decisions. The Aerial Observation Team used direct communications with the on-water responders and flew over the spill area to guide them to problem areas or areas with recovery opportunities. A float plane was employed to allow the team to land and speak directly with operational supervisors.

A Marsh Assessment Team, using air boats, assessed marsh condition from ground level in areas not accessible by deeper draft vessels. This team also verified information received from the Aerial Observation Team.

These teams were an adaptation of the more traditional SCAT process. The more traditional assessment process was used on the beaches of the offshore islands. This adaptive approach proved effective in this environment.

Within the spill area were extensive oyster leases, numerous crab pots, and shrimp. The shrimping season was to open on May 19, 1997, three days after the spill. Commercial shrimpers were kept out of the area during the response. The Louisiana Department of Health and Hospitals (DHH) implemented a precautionary closure of oyster harvesting on May 20, 1997. The closure covered a 94-square-mile area. The oyster fishery was reopened on August 1, 1997.

NOAA Activities:

NOAA was notified of the this incident at 2300, May 16, 1997, by MSO Morgan City. NOAA supplied initial weather, trajectory, oil budget (based upon the 277-barrel estimate), and resources at risk information.

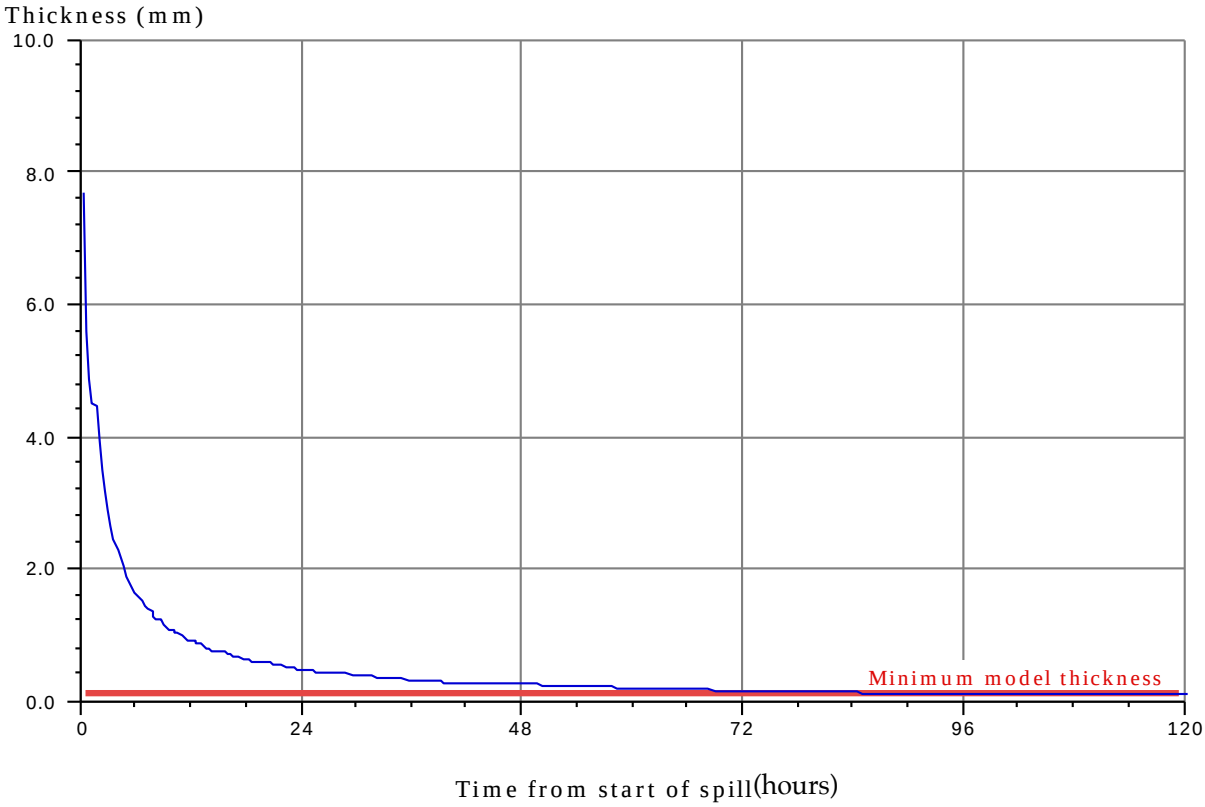
MSO Morgan City requested on-scene support on May 17, 1997; three NOAA SST members arrived on May 18, 1997. The FOSC briefed the SST and accompanied them on an overflight. Immediate assistance was requested on three specific issues: spill volume and oil budget, oyster closure, and Natural Resource Damage Assessment (NRDA) initiation.

Spill volume and oil budget:

Texaco Pipeline, Inc. operators noted a pressure drop at 1542 and immediately started notifying the platforms pumping into the pipeline to shut down. The pipeline valve was closed at 1750. As soon as the valve was closed, the terminal started a vacuum on the pipeline. The release was stopped at approximately 1800. The first estimate of the spill volume was 5,000 barrels, based on pipeline meter data.

Using NOAA's Spill Tools program, the SSC was able to duplicate the calculation based on the field estimates of aerial coverage and a thickness of 0.1 mm. Spill volume is highly sensitive to slick thickness and the estimator curves for slick thickness are shown on standard plots at order-of-magnitude intervals. A thickness of 0.1 mm is commonly applied for black slicks that have completed spreading. However, the observations were made only two hours after the initial release was identified and before the flow had been completely stopped or slick spreading had been completed.

Using a spill volume of 5,000 barrels and the observed dimensions, the slick thickness would be about 2 mm; using a spill volume of 7,500 barrels would make the slick about 3 mm thick. Thickness-area-volume plots show curves for thick, black slicks estimated to be 1.0 mm and slicks near the source of a large spill to be 10 mm. The NOAA ADIOS™ model was used to estimate the thickness of a slick from a 5,000-barrel spill of south Louisiana crude oil with a 10-knot wind. The figure shows the thickness of the slick over time. Therefore, the slick observed within the first hours after the release could easily be in the range of 2 to 3 mm, rather than the equilibrium thickness of 0.1 mm. This analysis explained the original spill volume estimates and confirmed the revised estimate of 5,000-7,500 barrels.



Oyster closure:

The Louisiana DHH announced a "precautionary closure" of oyster fishing in an area bounded on the north by Timbalier Bay, on the east by Bayou St. Jean Charles, on the west by Bayou Terrebone, and on the south by the southern most area of Lake Barre. The timing of this closure was fortunate since little harvest of oysters was taking place in this area.

Anticipating concern about the issue of resource safety, the USCG requested that NOAA take the lead and coordinate discussions about closures, alternatives to closures, and reopening protocols. Meetings were held with representatives from DHH, Louisiana DEQ, Louisiana Oil Spill Coordination Office, a representative of the local Oystermen Association, NOAA, and Texaco to develop the protocols and sampling plans.

DHH decided to issue a precautionary closure. The original plan was to initiate collection of oysters for testing on May 20, sampling ten sites and establishing two panels to test five stations each. This protocol was based on experience on previous tainting assessments (not oil) whereby one panel of five members could effectively test five samples.

DHH and Louisiana Department of Wildlife and Fisheries (LDWF) were prepared to provide staff and resources to collect the samples, but toward late afternoon, logistical realities and other factors caused DHH management to wait until the on-water response had wrapped up. Another reason to postpone the sampling was deteriorating weather. A front was forecast to pass through the area on May 21, with northeast winds and gusts of 35 to 40 miles per hour.

In addition to the decision to postpone sample collection DHH also decided that their staff would perform the organoleptic testing, rather than an outside panel. It was still agreed that the ten selected stations would be sampled, and enough samples would be collected for both organoleptic testing and chemical analysis should they be needed.

The details of the chemical analysis methods to be used by DHH and how the chemical results would be interpreted and used in rescinding the closure were yet to be determined.

Ultimately, outside panels were used for organoleptic testing of samples and the oyster fishery was reopened on August 1, 1997.

NRDA initiation

The FOSC asked the SSC to help organize and facilitate the initial Natural Resource Trustee meeting to begin a cooperative natural resource damage assessment process. The SSC organized a NRDA meeting on May 21, 1997.

Natural resource trustee representatives from the State of Louisiana (DNR, DEQ, the LDWF, and the Louisiana Oil Spill Coordinator's Office), the NWS, and NOAA's Damage Assessment Center arrived on-scene May 21, 1997. They were given an overview of the incident and an overflight of the area. Afterwards, there were discussions about the resources potentially injured, and information needed to assess damage.

The State of Louisiana Oil Spill Coordinator's Office assumed the role of lead administrative trustee. The NOAA SSC backed out of the facilitation process after this initial meeting. Meetings continued with Texaco representatives and a cooperative assessment process was begun.

The SST also worked on oil recovery estimation issues, shoreline assessment and counseled with the Unified Command on other response issues.

NOAA supported this response on-scene until May 21, 1997.

References:

NOAA Hotline #229, 13 Reports

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:	Vermillion 16
NOAA SSC:	Tim Steele
USCG District:	8
Date of Spill:	6/21/97
Location of Spill:	Freshwater City, Louisiana
Latitude:	29°33.7' N
Longitude:	092°21.3' W
Spilled Material:	light condensate
Spilled Material Type:	1
Amount:	500 barrels
Source of Spill:	pipeline
Resources at Risk:	habitat
Bioremediation:	N
In-situ Burning:	Y
Other Special Interest:	on-going study
Shoreline Types Impacted:	brackish coastal marsh
Keywords:	evaporation

Incident Summary:

On June 21, 1997, the Vermillion 16 oil line, a six-inch line owned by Apache Oil of Houston, Texas began leaking product approximately three miles west of Freshwater City, Louisiana. The spilled material was a weathered light condensate leaking from a pencil-sized hole. Apache Oil reported that no more than two barrels were spilled, but after measuring the affected area, which was 400 by 700 feet and about 0.125 inches thick, the amount spilled was increased to at least 500 barrels. The product was contained on eight to ten acres of privately owned coastal marsh. The oil had been leaking for sometime, perhaps as long as four months. The spill had not yet been reported to the NRC or any Federal agency.

The freestanding product thickness in the affected area was 25 inches and, using an evaporation rate of 50 percent, the amount of product spilled was estimated to be more than 2,000 barrels. The marsh vegetation was saturated with product.

Other Special Interest:

On July 3, 1997, LSU conducted the first phase of a small field study in conjunction with the in-situ burn. The goal of this study is to continue NOAA/LSU investigations into in-situ burning as a viable response tool. Study objectives at the Vermilion Parish site included

1. Establishing pre-burn monitoring sites for photo-documentation, sediment sampling, and vegetative assessment.

2. Collecting pre-burn oil to assess oil weathering and emulsification.

3. Collecting pre-burn sediment samples as a baseline.

4. Collecting post-burn oil residue.

5. Collecting post-burn sediment cores to assess potential for oil penetration and burn effectiveness.

6. Taking photographs for post-burn photo documentation of vegetative quadrants (study sites).

NOAA Activities:

NOAA was notified of this incident on July 2, 1997, by the Louisiana DEQ who requested help completing an in-situ burn application.

The RP, assisted by NOAA, prepared an application for in-situ burn and submitted it to EPA Region VI RRT. The application was approved and the burn was conducted on July 3, 1997, less than 24 hours after the initial notification to NOAA and the USCG.

The spill occurred in a brackish coastal marsh dominated by two species of *Scripus* (leafy three-square and three-corner grass), *Spartina patens* (wiregrass), and *Distichlis spicata* (spike grass). Pre-burn water levels ranged between two and four inches. The site is burned annually as part of local land management practice.

The burn was ignited at 0958 on July 3 and lasted for approximately 45 minutes. Post-burn sampling begin at 1056. The burned area was still fully hydrated with two to four inches of standing water. The burn appeared highly effective in removing the surface oil. No significant burn residue was observed in the study area. Small pockets of adjacent marsh contained oiled, but vegetation was unburned. These sites were patchy and not suitable as oiled/unburned study sites. Future plans discussed with the USCG, land manager, and RP include a revisit and sampling survey at the end of the growing season in September and a one-year site visit and sampling survey. Each sampling survey will include vegetative monitoring and photo documentation.

References:

NOAA Hotline #232, 2 Reports

USCG POLREPS

Name of Spill:	T/V *Vanadis*
NOAA SSC:	Tim Steele
USCG District:	8
Date of Spill:	7/24/97
Location of Spill:	Galveston, Texas
Latitude:	28°47'N
Longitude:	094°29'W
Spilled Material:	Arabian crude
Spilled Material Type:	3
Amount:	160,000 barrels, at risk
Source of Spill:	Suspected crack in hull
Resources at Risk:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	N
Shoreline Types Impacted:	none
Keywords:	**none**

Incident Summary:

On July 24, 1997, observers on the T/V *Vanadis*, anchored at 2847' N, 94°29’ W, reported a sheen. The vessel was conducting lightering operations and carrying 160,000 barrels of medium Arabian crude. Observers estimated that about five gallons were lost and there was a light sheen.

This vessel had been involved in a collision earlier and there was concern that a crack in the hull might have gone unnoticed and was now leaking. The USCG halted lightering operations until divers could inspect the hull at first light.

NOAA Activities:

NOAA was notified of this incident on July 24, 1997, by MSD Galveston who requested weather and trajectory implications should the remainder of the cargo be lost.

NOAA reported that the winds were expected from the south at 10 knots for the next 36 hours with occasional isolated showers.

A trajectory analysis based on the current measurement data provided by the Texas Automated Buoy System and the forecast winds indicated that any spilled oil from the present site of the vessel would drift upcoast at about one-third knot. Superimposed on this net drift is an oscillatory motion that would move the oil back and forth a distance of about four nautical miles. Based on current and forecasted conditions, landfall is not expected for the next two days. Arabian medium crude emulsifies quickly, and we would expect any spilled oil to rapidly form tarmats, eventually breaking down into tarball fields.

At first light the T/V *Vanadis* was inspected and cleared to continue lightering operations. No further indications of lost product was observed. The incident was closed on July 25, 1997.

Name of Spill:	Hydraulic Oil Spill
NOAA SSC:	Tim Steele
USCG District:	8
Date of Spill:	8/12/97
Location of Spill:	Mobile, Alabama
Latitude:	29°14' N
Longitude:	087°52' W
Spilled Material:	hydraulic oil
Spilled Material Type:	1
Amount:	unknown
Source of Spill:	broken hydraulic line
Resources at Risk:	none
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

On August 12, 1997, a pile-driving vessel located approximately 70 miles south of Mobile, Alabama reported a hydraulic line rupture. An estimated 5,000 gallons of Mobil product EAL-224H, a vegetable-based hydraulic oil, was released at a depth of 600 feet.

The weather on-scene was north winds, 10 to 15 knots, current approximately 1 knot toward the southwest.

An on-scene work boat reported a 500- by 100-yard gray film. A USCG overflight reported a sheen around the work boat but observed no collectable product .

NOAA Activities:

NOAA was notified of this incident on August 12, 1997, by USCG MSO Mobile who requested information on the toxicity of the product, resources as risk, trajectory, and weather.

NOAA reported that the product is non-toxic. Injury to potential resources at risk was considered minimal.

The SSC provided weather and trajectory information. Because of the non-toxic nature of the product, the observed non-collectability of the sheen, the windy conditions, and the low potential negative impact to resources at risk, no further action was taken.

References:

MSDS

NOAA Hotline #237, 1 Report

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:	Texaco Pipeline
NOAA SSC:	Tim Steele
USCG District:	8
Date of Spill:	8/14/97
Location of Spill:	South Timbalier Block 270
Latitude:	28°14.6' N and 28°14.6'N
Longitude:	090°41.5' W and 090°44.0' W
Spilled Material:	crude oil
Spilled Material Type:	3
Amount:	3,000 barrels
Source of Spill:	pipeline
Resources at Risk:	sea turtles
Countermeasures:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	infrared (IR), side-looking airborne radar (SLAR)

Incident Summary:

On August 14, 1997, a routine USCG training flight reported two slicks one to three miles by .5 miles, with heavy brown mousse and heavy rainbow sheen (70% rainbow sheen and 30% black oil). As a result of this report, a significant response and search for the source of the spill began.

Three potential RPs were identified; Shell Oil, Texaco Pipeline, and Forest Gas-Pipeline Company. All pipelines were shut-in. Although none of the companies had noticed a reduction in pressure, Texaco tentatively assumed the responsibility, opened a Command Post in Houma, Louisiana and called out their contracted responders.

NOAA Activities:

NOAA SST provided weather and trajectory information and experienced opinions on the possible source and nature of the product.

A second overflight by a potential RP reported a slick 5 miles by .25 miles and made no comment about the composition of the slick. The response continued and NOAA provided weather and trajectory information.

At last light a USCG flight conducted with an experienced GST observer reported a light sheen approximately one mile by five miles. At this time the response was scaled down.

At approximately 2200, a USCG Falcon Aireye overflight, using IR and SLAR observed no signs of a slick. At first light on August 15, a USCG visual overflight saw no sign of the spill.

On August 15 the three pipelines were brought on line one at a time. The reopenings were performed with the *Louisiana Responder* standing by and observers in the air to spot any additional release. No further release was observed.

For the next two days three overflights per day were conducted with negative results. The source of the spill is currently unknown.

References:

NOAA Hotline #239, 5 Reports

USCG POLREPS

Name of Spill:	Mystery Spill
NOAA SSC:	Tim Steele
USCG District:	8
Date of Spill:	9/30/97
Location of Spill:	Gulf of Mexico
Latitude:	27°52' N
Longitude:	091°9' W
Spilled Material:	synthetic drilling mud
Spilled Material Type:	
Amount:	unknown
Source of Spill:	platform construction operation
Resources at Risk:	
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	Is this a reportable product?
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

At approximately 1130 on September 30, 1997, a USCG overflight reported an 8-mile long by 0.5-mile wide black oil slick 100 miles offshore Louisiana near a platform construction site in the Gulf of Mexico. At approximately 1500 a second overflight saw a small sheen approximately 50 by 1,000 feet near the same platform construction site.

Drilling operations are being conducted at this platform and it is speculated that a drilling mud sheen may have accounted for the reported spill.

Pictures taken during the initial overflight will be processed and reviewed. At this point no further action is contemplated.

Other Special Interest:

Synthetic drilling fluid is an issue under review by an industry and government working group. It is non-toxic but is still a reportable product. This is the second significant report of spilled synthetic drilling fluid within the last two months.

NOAA Activities:

NOAA was notified of this incident on September 30, 1997, by MSO New Orleans who requested weather information.

The SSC reported that winds were expected to be light and variable at less than 10 knots, with 2-to 3-foot seas, clear skies with unlimited visibility, and no precipitation.

A review of the pictures taken during the initial USCG overflight revealed that the reported slick was a subsurface plume caused by the release of synthetic drilling fluid.

The SSC remained on alert until the USCG closed this response on October 1, 1997.

References:

NOAA Hotline #245, 4 Reports

U.S. Coast Guard District 11

Name of Spill:	Platform Irene
NOAA SSC:	Scott Stolz
USCG District:	11
Date of Spill:	09/29/97
Location of Spill:	Vandenberg Air Force Base, California
Latitude:	34°39.0' N
Longitude:	120°39.0 W
Spilled Material:	Monterey Crude
Spilled Material Type:	3
Amount:	between 200 and 500 barrels
Source of Spill:	Platform pipeline
Resources at Risk:	Marine Mammals: sea lions, seals, haulouts Birds: diving coastal birds, waterfowl, shorebirds, wading birds, gulls, terns, raptors, rookeries, foraging areas, nesting beaches Crustaceans: crabs Recreation: beaches
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	coarse-sand beaches, exposed fine-sand beaches, exposed rocky platforms, exposed rocky shores, fine-sand beaches, mixed sand and shell beaches, sand/gravel beaches, sheltered fine-grained sand beaches, wavecut platforms
Keywords:	Clean Seas Cooperative

Incident Summary:

At approximately 2330 on September 9, 1997, Platform Irene, offshore near Point Arguello, California, reported a spill from its 20-inch pipeline. This pipeline connects the platform to the shoreline terminal at Point Arguello. Platform Irene is operated by the Torch Operating Company for Nueva Energy (Houston). The release was caused by a fracture in a weld near a flange at a depth of about 33 fathoms. The amount released was originally reported as 2,900 barrels, which was the potential amount in the pipeline at the time the weld broke. This amount was revised after overflights and other observations were conducted to between 200 and 500 barrels. The oil was Monterey crude mixed with the drilling and pumping waters. Skimming vessels from the Clean Seas Cooperative, MSRC and from the Fisherman's Oilspill Response Team were contracted for on-water collection. The RP also alerted dispersant aircraft, but they were not used.

The RP assumed the major role in the response, with Federal agencies providing assistance and oversight. Other federal participation included, USFWS for bird impacts, NOAA National Marine Santuaries provided air and on-water observation platforms, and Vandenberg Air Force Base (AFB), the landowners of the impacted areas.

Manual and mechanical cleanup was done on several high-use beaches on Vandenberg AFB, as was on-water collection.

Behavior of Spilled Material:

The oil released from the pipeline moved north from the release site and came ashore the second day. The oil impacted the beaches and some rocky headland primarily in the form of tarballs, tar patties, and large tarmats mixed with vegetation. Impacts were reported

between Lions Head to the north and Rocky Point to the south. Amounts recovered were estimated as 375 barrels liquid and 168 cubic yards of solid oil waste.

NOAA Activities:

NOAA was notified of this incident on September 29, 1997. The SST provided trajectory and weather support. The SSC provided on-scene support in the areas of shoreline assessment team management, and participated on assessment teams, cleanup recommendations, and how clean is clean, and final signoff procedures.

Reference:

NOAA Hotline #244, 23 Reports

Name of Spill:	M/V *Cape Mohican*
NOAA SSC:	Scott Stolz
USCG District:	11
Date of Spill	10/28/96
Location of Spill:	San Francisco, California
Latitude:	37°45.8′ N
Longitude:	122°22.9′ W
Spilled Material:	IFO 180
Spilled Material Type:	4
Amount:	1,950 released, estimated 200 barrels in water
Source of Spill:	non-tank vessel
Resources at Risk:	Habitats: eelgrass beds Marine Mammals: sea lions, seals, haulouts Birds: diving coastal birds, waterfowl, shorebirds, wading birds, gulls, terns, nesting beaches Recreation: beaches, marinas, boat ramps, high-use recreational boating areas, state parks Management Areas: marine sanctuaries, national parks, refuges, wildlife preserves, reserves Resource Extraction: commercial fisheries Cultural: archaeological sites, Native American lands
Dispersants:	N
Bioremediation:	No, but considered
In-situ Burning:	N
Other Special Interest:	Some interest in the requirements of public vessels to have response plans, and in the responsibility for the incident between the vessel operator, the vessel owner (MARAD), and the shipyard.
Shoreline Types Impacted:	coarse-gravel beaches, coarse-sand beaches, coastal structures,consolidated seawalls, consolidated shores, exposed fine-sand beaches, exposed rocky platforms, exposed rocky shores, fine-sand beaches, mixed sand and shell beaches, mixed sediment beaches, piers, riprap, sand/gravel beaches, sheltered seawalls
Keywords:	containment boom

Incident Summary:

At about 1530, October 28, 1996, the M/V *Cape Mohican*, a 725-foot Maritime Administration (MORAD) vessel, discharged an estimated 1,950 barrels (about 81,000 gallons) of IFO 180. The discharge occurred while the vessel was in Drydock #2 of the San Francisco Drydock Shipyard at pier 70, San Francisco Bay. Most of the oil was retained within the drydock, with an estimated 200 barrels (about 8,000 gallons) released into the waters of San Francisco Bay. The discharge is believed to have resulted from transfer from a stabilization tank, where an open valve discharged stored fuel through a seachest. Weather at the time of release was winds south-southwest at about 14 knots and getting dark. The weather changed soon after, with winds increasing up to 25-knot gusts and heavy rain.

Drydock and USCG personnel deployed containment boom; however, the efficiency of the containment and the initial on-water collection were impaired by darkness and the storm. Oil impacted numerous public areas, marinas, piers, seawalls, and other areas of the City of San Francisco. The shipyard did not have an established contingency plan and was not a member of any of the local response cooperative organizations, so the USCG and State took the lead in the hiring and management of cleanup contractors, with minimal input from the

RP. Numerous cleanup crews were deployed throughout the inside of San Francisco Bay and to many beaches outside of the bay. On-water collection was performed inside the bay.

The response was primarily conducted by Federal and State agencies. The determination of who, ultimately, was the RP became a matter of litigation, among the vessel operator, the vessel owner (MARAD), and the shipyard. The shipyard took responsibility for the cleanup while the decision was being made, but had minimal assets to apply. Due to the areas impacted, there were a variety of Federal agencies involved, including USCG, the Maritime Administration, the USFWS, NPS, NOAA National Marine Sanctuaries, and NOAA National Marine Fisheries Service (NMFS).

Behavior of Spilled Material:

Directly after the spill, the oil was in the form of floating black oil and heavy sheens. The initial containment was not as efficient as first expected. Much of the oil was suspected to have been under the many piers in the area, and later transported out by tidal and current actions. The oil initially moved north along the western shore of the bay and eventually, caught in the bay's tidal cycle, was moved farther north, to the east, and outside of the bay. Extensive sheening was seen in the bay, along with concentrations of oil and oiled debris in the bay's natural convergence zones. Tarball impacts were reported outside of the bay as far north as Stinson and as far south as Thorton Beach. Numerous areas inside of the bay were also impacted. The amount released into the bay remained estimated as 200 barrels.

NOAA Activities:

NOAA was notified of this incident on October 28, 1996. NOAA provided weather forecasts, trajectory information, and information management. The SSC conducted overflights and, with the assistance of RPI, SSCAT management, cleanup recommendations, and sign-off procedures. The SSC was on-scene from the day of notification through November 8, 1996; however, the SSC provided support for sign-off and other meetings, including public forums until the end of November.

References:

NOAA HAZMAT Scientific Support Team Information Management Report, *Cape Mohican* Oil Spill, San Francisco, California, 28 Oct 96

NOAA Hotline #202, 73 Reports

Name of Spill:	Barge *Bell 157*
NOAA SSC:	Scott Stolz
USCG District:	11
Date of Spill:	06/10/97
Location of Spill:	San Pablo Bay, California
Latitude:	38°01.0' N
Longitude:	122°21.0' W
Spilled Material:	none
Spilled Material Type:	2
Amount:	1,200 gallons
Source of Spill:	barge
Resources at Risk:	none
Dispersants:	No
Bioremediation:	No
In-situ Burning:	No
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

On June 10, 1997, the tug *William Tindale* was pushing the hopper barge *Bell 157* when it overturned and sank between buoys 8 and 10, just outside the channel in San Pablo Bay, California. The barge was loaded with sand, but there were also 600 gallons of diesel fuel, 450 gallons of hydraulic oil, 80 gallons of lube oil, and various 55-gallon drums onboard. Two personnel onboard drowned when the barge capsized. Containment and salvage operations were initiated. The area around the barge was boomed and divers looked for the missing personnel. The barge was eventually righted, the bodies recovered, and the oils pumped off.

NOAA Activities:

NOAA was notified of this incident on June 10, 1997, by MSO San Francisco who requested the SSC provide trajectory analysis, overflight participation, and weather support. Most support was done from the phone and fax, with on-scene support limited to overflights.

Reference:

NOAA Hotline #230, 15 Reports

U.S. Coast Guard District 13

Name of Spill:	Burlington Northern Train Derailment
NOAA SSC:	Sharon K. Christopherson
USCG District:	13
Date of Spill:	1/15/97
Location of Spill:	Edmonds, Washington
Latitude:	47°47.4'N
Longitude:	122°24.8'W
Spilled Material:	unknown
Spilled Material Type:	diesel, unknown hazardous material
Amount:	unknown
Source of Spill:	train derailed by mudslide
Resources at Risk:	N
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	potential

Incident Summary:

USCG MSO in Seattle, Washington was notified at 2250 on January 15, 1997, that a Burlington Northern Railroad train was derailed by a mudslide just south of Edmonds, Washington. No one was hurt but 5 cars with approximately 12 freight containers were reported in the water 150 feet out into Puget Sound. USCG pollution investigators, patrol boat, and helicopter with FLIR were dispatched to monitor the scene. Shoreline Fire Department was the incident commander and established a command post at the Woodway townhall.

Countermeasures and Mitigation:

The 5 railcars and 12 freight containers were partially submerged in the shallow water. The USCG helicopter overflight found no FLIR heat signatures that would indicate oil or hazardous material in the water. Between 0200 and 0500, Burlington Northern personnel confirmed by visual inventory of the cars against the DCM that none of the cars in the water or buried under the mud contained hazardous materials. Most of the floating cargo turned out to be U. S. Postal Service third-class mail. The hillside mud was saturated as a result of earlier heavy rains and continued to slide, complicating response activities and threatening several homes on the cliff above. Cleanup contractors deployed a boom around the slide area as a precautionary measure to contain any floating debris from the derailed cars. The two locomotives and remaining cars north and south of the slide were pulled from the scene by additional locomotives brought in by Burlington Northern.

NOAA Activities:

The SSC was notified at 0135, January 15, 1997, and was requested to report to the MSO to assist in potential hazard assessment analysis. Upon arriving at the MSO, the SSC provided weather, current, and tide information and reviewed the DCM for potential hazardous material hazards. CAMEO™ printouts were provided for specific threats. The SSC was released at 0500 when it had been determined that there was no hazardous material or oil in the water.

References:

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

NOAA Hotline #211, 1 Report

Name of Spill:	Weyerhaeuser Turpentine Spill
NOAA SSC:	Sharon K. Christopherson
USCG District:	13
Date of Spill:	01/27/97
Location of Spill:	Longview, Washington
Latitude:	46˚07.4' N
Longitude:	122˚59.0' W
Spilled Material:	crude sulfate turpentine
Spilled Material Type:	5
Amount:	8700 gallons
Source of Spill:	facility
Resources at Risk:	N
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	public health concerns
Shoreline Types Impacted:	facility settling pond
Keywords:	vacuum trucks

Incident Summary:

At approximately 1300, January 27, 1997, an accident at the Weyerhaeuser Plant in Longview, Washington resulted in 8,700 gallons of crude sulfate turpentine being discharged into a drainage ditch that emptied into a large settling pond. The spill was contained and cleanup activities initiated by Weyerhaeuser. The following morning, sites downstream from the Longview facility as far as Astoria, Oregon reported the presence of a strong odor.

Behavior of Oil:

An unknown quantity of the crude sulfate turpentine material apparently escaped containment and flowed into the Columbia River. Easterly winds 10 to 15 knots carried the material downriver.

Countermeasures and Mitigation:

The material was recovered by vacuum trucks from the settling pond.

Other Special Interest Issues:

There was considerable level of health concern due to the low odor threshold of the product spilled. NOAA coordinated with public health officials and drafted a Health and Safety Advisory Fact Sheet for them to use when communicating the actual risks to the local population.

NOAA Activities:

NOAA was notified of this incident on January 27, 1997, by the USCG MSO Portland, Oregon. The MSO requested the SSC to help analyze the potential human health effects of the spill and provide estimates of downwind distances over which effects might be noticed. Since sulfate turpentine is not in ALOHA's database, NOAA used a surrogate chemical that would be expected to behave in a similar fashion (m-xylene). NOAA's estimates were based on the worst-case scenario of the initial release of 8,700 gallons of product into a settling pond with a surface area less than 9,000 square feet. As the material evaporates and/or is

removed, the surface area of the contaminant on the pond surface, and therefore the source strength, will decrease. Estimates of downwind concentrations were determined for three wind speeds (2, 5, and 10 miles per hour). The concentrations used included the Immediately Dangerous to Life and Health (IDLH) (800 ppm), the time weighted average-threshold limit value concentration (TWA/TLV) of 100 ppm, and odor threshold range of 0.1 ppm to 1 ppm. The concentration levels fell below IDLH and TWA/TLV for all three winds in under 50 yards. The odor threshold concentration where people could smell the product extended at much as two miles downwind, but there was no health threat. How far downriver the odor could be detected would depend on how far the material released into the Columbia River was carried before it completely evaporated. At the USCC's request, NOAA drafted a Turpentine Health and Safety Advisory Fact Sheet for the FOSC's use in explaining the potential hazards to the local population.

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.

Name of Spill:	M/V *Handy Gunner*
NOAA SSC:	Sharon K. Christopherson
USCG District:	13
Date of Spill:	02/02/97
Location of Spill:	Portland, Oregon
Latitude:	45˚32.3'N
Longitude:	122˚40.8'W
Spilled Material:	IFO 380
Spilled Material Type:	3
Amount:	12 barrels (500 gallons)
Source of Spill:	vessel
Resources at Risk:	water fowl
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	large quantities of oiled woody flood debris
Shoreline Types Impacted:	riprap, manmade structures, vegetated river bank
Keywords:	boom, International Bird Rescue and Research Corporation, riprap, sorbent

Incident Summary:

At 0843, February 1, 1997, the USCG MSO in Portland, Oregon received a report of a ship discharging an oily residue into the Willamette River. The USCG identified approximately 500 gallons of heavy oil in the water downstream from the M/V *Handy Gunner*. The vessel did not initially accept responsibility for the spill. Coast Guard personnel collected samples for fingerprinting by COIL and hired a contractor to begin cleanup activities. Based on initial sample analyses identifying the spilled material as IFO 380, the vessel owner accepted responsibility for the spill on February 2 and continued with the same cleanup contractor. The initial unified incident command consisted of the USCG and the Oregon DEQ to direct the spill response until the vessel owner's representative arrived the evening of February 3.

Behavior of Spilled Material:

The oil lost from the vessel moved downstream along the shoreline between river miles 10 and 11 to a natural collection point behind a snag at the Ash Grove Cement facility. A large quantity of flood-generated debris trapped in this collection point acted as an initial barrier/sorbent preventing farther downstream migration of the original spill.

Countermeasures and Mitigation:

A large, shore-based crane equipped with a clamshell bucket was brought in to pull large pieces of oiled debris trapped at the Ash Grove Cement facility onto the shore where it was lifted out of the water by a track hoe. The oiled material was temporarily stored in visqueen-lined dumpsters. Boat crews manually removed smaller pockets of trapped oiled debris found along the river bank. At the recommendation of the joint shoreline survey team, low-pressure flushing of specific areas of the vegetated river bank was conducted. Small quantities of trapped oil and debris were then prop-washed into a collection boom and removed. Most of the cleanup was completed by February 5.

Other Special Interest Issues:

Media interest in the response was relatively high on February 2 and 3. A USCG patrol boat helped the media film cleanup activities from the water. Representatives of the USCG, Oregon DEQ, and the NOAA SSC accompanied the media on these filming tours to answer questions and provide interviews.

NOAA Activities:

The NOAA SSC was notified of the incident at 1930 on February 2, 1997, by MSO Portland and was requested to come on-scene. The USCG, SSC, and Oregon DEQ conducted multiple joint boat surveys of the shoreline between the Sacrete and Ash Grove Cement facility docks once the trapped oiled debris had been removed. Intermittent narrow bands of oiled riprap and overhanging oiled vegetation (primarily blackberry bushes) were observed. The position of the oil band indicated the river level had dropped approximately one foot since the spill occurred. Limited areas of silver and rainbow sheen were associated with the oiled debris patches and oiled riverbank vegetation. While no visual evidence of oil pockets along the shore was found during the survey, the survey team members recommended limited low-pressure flushing into a containment boom at specifically flagged spots to minimize any potential remobilization of oil into sensitive habitat farther down stream. In addition to shoreline cleanup recommendations, the joint survey team developed how clean is clean guidelines and criteria for the response. Consultation with Oregon Department of Fish and Game confirmed there were no sensitive habitats in the area of impact. Although no oiled wildlife was seen, the vessel owner arranged to transport any oiled wildlife found to a local veterinarian under contract to the International Bird Rescue and Research Corporation.

References:

Research Planning Institute. 1991. *The sensitivity of coastal environments and wildlife to spilled oil in the Columbia River. An atlas of coastal resources*. Seattle: Ocean Assessments Division, NOAA. 26 maps.

NOAA Hotline #218, 4 Reports

Name of Spill:	Neah Bay Waste Oil Spill
NOAA SSC:	Sharon K. Christopherson
USCG District:	13
Date of Spill :	03/18/97
Location of Spill:	Neah Bay, Washington
Latitude:	48°22' N
Longitude:	124°37' W
Spilled Material:	waste oil
Spilled Material Type:	unknown
Amount:	3.6 barrels (150 gallons)
Source of Spill:	abandoned tank
Resources at Risk:	sheltered mudflats, shell fish beds, waterfowl
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	riprap, mudflat
Keywords:	boom, riprap, sorbent

Incident Summary:

On March 14, 1997, a heavy oil sheen was observed in Neah Bay. Neah Bay is part of the Makah Tribal Reservation at Cape Flattery, Washington. An abandoned tank on the shoreline was the apparent source of the spill. Up to 150 gallons of waste oil appeared to have leaked slowly over time through a defective seal in the tank's valve. The defective tank valve was sealed and the tank removed. A boom was placed along the shoreline to contain the sheen and the site was monitored over the weekend. Oil was still observed to be leaching from the riprap four days later. On March 18 the USCG MSO requested the NOAA SSC to report on-scene to help assess the environmental threat posed by the continuing release and develop recommendations for any additional cleanup and/or remediation.

Behavior of Spilled Material:

Upon arriving on scene, the NOAA SSC observed that the soil, surrounding the area where the tank had stood was heavily stained. A sample of oil from the tank appeared to be black waste oil with relatively low viscosity. Surface samples of stained soil were collected from the bottom of two pits 10 to 12 inches deep. The soil appeared heavily contaminated, and when a small quantity was placed in a container of water, it released heavy sheen and small clumps of oiled sediment that floated to the surface. Visual inspection of the riprap did not identify any obvious pooling of oil in any of the cracks or crevices. With the exception of a crevice at the top of the riprap, no obvious staining of the rock was noted, although a strong petroleum odor was present. Heavy rainbow, bronze, and silver sheens were observed discharging from a localized point at the base of the riprap immediately below the stained soil. No black oil was present and no sheen was observed outside the boomed area. However, the viewing conditions were very poor with heavy rainfall and surface chop. Personnel on-scene reported that the greatest amount of sheen was observed on a falling tide, indicating that the falling water table was enhancing the mobilization of oil out of the soil. The porosity of the soil and heavy rainfall were also contributing to the mobilization of the sheen.

Countermeasures and Mitigation:

The boom appeared to be effectively containing the sheen leaching out of the riprap. Given the quantity of release observed, a localized impact to sheltered mudflat immediately next to the riprap within the boomed area was the most probable, especially if the release was allowed to continue for any length of time. This mudflat was covered by water during observations, but the nearshore portion of the mudflat would be directly exposed to the sheen during low tides. Unless mechanically disturbed, any contamination that occurred would probably be restricted to the mud surface. Clam bed locations identified several hundred yards to the left and right of the spill site were unlikely to be affected by the level of sheen observed. If the volume of sheen were to significantly increase and spread that far, the shellfish beds could potentially become tainted. The observed level of sheening should pose minimal threat to birds unless the quantity significantly increased and spread.

NOAA Activities:

NOAA was notified of this incident on March 18, by USCG MSO Puget Sound who asked the SSC to report on-scene. The NOAA SSC arrived on-scene at 1700, March 18 and jointly assessed the impacted area with the Makah Tribal biologist and pollution investigators from MSO Puget Sound. After characterizing the site, the SSC recommended excavating the visually stained soil area. Once the visibly stained soil was removed, samples from the bottom and edges of the pit should be collected and analyzed for total petroleum hydrocarbons (TPH) and compared to the Washington State standard for TPH in soils (100 mg/kg.) Once verified that the contaminated material had been removed, the area should be restored with clean fill material. The SSC did not recommend removing the riprap. There was no visible evidence of trapped oil and destabilization of the shoreline would adversely impact the adjacent mudflat. If the riprap continued to leach significant sheen after the contaminated soil was removed, low-pressure ambient water flushing of the riprap could be used as long as efforts were made to minimize the flushing of sediment into the bay. The SSC also recommended hard boom and sorbent material be maintained around the site until the contaminated soil was removed.

Name of Spill:	Tosco Refinery
NOAA SSC:	Sharon K. Christopherson
USCG District:	13
Date of Spill:	08/05/97
Location of Spill:	Ferndale, Washington
Latitude:	48˚50.0' N
Longitude:	125˚40.0' W
Spilled Material:	Jet A fuel, heavy fuel oil
Spilled Material Type:	1, 4
Amount:	50 barrels
Source of Spill:	facility pipeline
Resources at Risk:	**Marine Mammals:** killer whales, harbor seals **Mollusks:** clams **Birds:** various **Crustaceans**: Dungeness crab **Recreation**: reef fishing (salmon)
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Impacted:	sand/gravel beaches, sheltered rocky shores, tidal mudflats
Shoreline Resources at Risk:	Lummi tribal subsistence areas, harbor seal haulout
Keywords:	boom

Incident Summary:

At approximately 2200, August 5, 1997, an unknown quantity of heavy fuel oil and jet fuel was spilled from the Tosco Refinery in Ferndale, Washington. The spill occurred during operations in which a mixture of Jet A fuel and water was being pumped through a series of eight heavy fuel cargo lines to clean them. The mixture is normally recirculated and reclaimed but, because of a misaligned valve, the mixture was released into a bermed sump area on the dock. The oil mixture overflowed the berm and entered Puget Sound. Boom was deployed around the spill site and geographical response plan protection strategies were implemented ahead of the expected path of the oil. The highest priority for protection was determined to be Lummi Bay with its large areas of protected mud flats and eelgrass beds. Overflights conducted on August 6 also reported the presence of killer whales and harbor seals feeding on migrating salmon near the oil slick. These areas were closely monitored by Washington Department of Fish and Wildlife overflights with no impacts to whales or seals observed.

Open-water operations begun on August 6 consisted of skimming free- floating oil from the containment area next to the Tosco dock and enhanced skimming along convergence zones where primarily oiled seaweed and tarballs were collected. By the end of the first day, only light sheen and tarballs in the kelp off the northeast and east shoreline of Vendovi Island were observed. The following day, smaller quantities of oiled kelp were collected in convergence zones in Bellingham Bay and stranded oiled kelp was removed from Vendovi Island. Active cleanup was completed on August 8.

Behavior of Spilled Material:

A mixture of heavy fuel oil, Jet A, and water spilled over the berm and flowed into the ocean from the Tosco dock during an ebb tide (flowing to the south) on the evening of August 5. The oil spread out into large areas of rainbow and silver sheen with streamers

and patches of darker oil. This mixture readily mixed with floating kelp and eelgrass on the water surface. The oil was carried down Rosario Strait past Lummi and Orcas islands, between Vendovi and Sinclair islands, through Bellingham Channel, and out the south end of Rosario Strait. The oil mixed with floating algal debris accumulated in convergence zones created by tidal rips off the south end of Lummi Island and in Bellingham Channel. The only significant shoreline impacts occurred when oiled debris (detached eelgrass and kelp) stranded on the north and east side of Vendovi Island.

Trajectory analysis was very difficult for this spill. The oil was lost during an ebb tide and a small flood tide began around 0400. Visual observations on August 5 showed the oil moving at least a knot faster than predicted. The exact cause for this is unclear, although some of it was due to the unseasonably high Frasier River outflow, which was caused by an extremely large snow pack. Weather forecasts were also extremely problematical. Winds forecasted to shift to southwest 20 knots following the passage of a front through the area would have resulted in the oil being brought on shore. However, the meteorologist found it difficult to predict the exact time of this shift, making it hard to predict where the shore impacts would occur. Fortunately, the shift did not develop and shoreline impacts were minimal. During the shoreline surveys, it was observed that there was a strong tendency for stranded algae thrown up on the beach to be buried by up to eight inches of loose sand and gravel by wave action. If oil had been stranded on these beaches as a result of the spill, burial would have greatly complicated the task of locating and cleaning up the oil. This potential needs to be addressed in the Geographical Response Plan for this area.

Countermeasures and Mitigation:

Skimmers worked the first day to pick up floating oil, but were only minimally successful. Most of the oil recovered was collected from within the containment area next to the dock. Shore and boat crews also manually bagged oiled kelp collected in convergence lines and stranded on Vendovi Island.

Other Special Interest Issues:

NOAA coordinated with two biologists from the Lummi Tribe to survey tribal lands next to the initial spill site. Sheen had been reported in water immediately off tribal land during the morning of August 6. Tribal members participated in joint shoreline surveys conducted on August 7. No oil was seen on tribal lands during these surveys.

NOAA Activities:

NOAA SSC was notified at 0100 on August 6, 1997, by MSO Puget Sound who requested the SSC on-scene. The SSC provided trajectories, weather forecasts, a summary of potential resources at risk, and recommended protection strategies. NOAA participated in two joint-agency overflights tracking the oil. On August 7, the SSC participated in a joint overflight with the Tosco Operations Chief. Only minimal sheen was seen on the water, but significant quantities of algae were observed stranded on a number of the beaches. It was impossible to tell from the air whether the algae was oiled. The SSC, USCG, Washington Department of Ecology, Lummi tribe, and Tosco conducted a series of joint shoreline assessments of the impacted area. During the survey, partial burial of large quantities of stranded algae up to 8 inches deep were seen on a number of sand and gravel pocket beaches. The decaying algae was black and had to be hand checked by survey crews to determine whether it was oiled. The only significant quantities of oiled algae were found on the north and east side of Vendovi Island. Personnel conducting reef fishing activities for salmon off the west coast of Lummi Island, interviewed by the shoreline assessment teams, did not report any oiling of their gear. Following the surveys the shoreline assessment team

recommend cleanup strategies and developed criteria for how clean is clean. The SSC was released at 1900 on August 7.

References:

NOAA Hotline #236, 11 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 NOAA OMA-12. Seattle: Office of Oceanography and Marine Assessment. 87 pp.

USCG POLREPS, Hotline #236

Name of Spill:	Crystal Ocean Cold Storage
NOAA SSC:	Sharon K. Christopherson
USCG District:	13
Date of Spill:	09/28/97
Location of Spill:	Astoria, Oregon
Latitude:	46˚11.5' N
Longitude:	123˚49.0' W
Spilled Material:	anhydrous ammonia
Spilled Material Type:	5
Amount:	1,600 gallons
Source of Spill:	facility
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	human health concerns
Shoreline Types Impacted:	none
Keywords:	

Incident Summary:

At approximately 2255, September 28, 1997, the USCG MSO in Portland, Oregon was notified of an ammonia release from the Crystal Ocean Cold Storage facility in Astoria, Oregon (River Mile 15 on the Columbia River). The release occurred when an estimated 50-by 100-foot section of the wharf supporting the cold storage plant collapsed. The Astoria Fire Boat reported sighting an ammonia plume on the Columbia River near the plant. At 2310 the MSO was notified that the main ammonia storage tanks had been secured by the Astoria Fire Department. An estimated 1,600 gallons of anhydrous ammonia were released from a high-pressure line in the refrigeration system. It was initially reported that an additional 7,000 to 10,000 gallons of anhydrous ammonia were believed to still be in the plant storage tanks. It was later determined that the ammonia storage was not in the part of the plant building impacted by the collapsing wharf.

Weather on-scene was calm with 62˚F air temperature and intermittent mist on the water surface. Later, light east-northeast winds of 5 knots developed and started moving the ammonia plume downwind.

Countermeasures and Mitigation:

The Astoria Fire Boat tracked the plume on the river near the plant. At midnight, a light breeze came up and began moving the ammonia downriver. The Fire Department OSC decided to use high-velocity fog generated from the fire boat to help dissipate the ammonia cloud. The ammonia cloud was reported successfully dissipated by 0045.

NOAA Activities:

NOAA was notified of this incident on September 28, 1997, by MSO Portland, Oregon. The MSO requested an ALOHA™ trajectory and human health risk analysis for the initial release of ammonia. The SSC provided (by phone) a trajectory of 1.5 mile radius for outdoor ammonia concentrations of 300 ppm (IDLH) and 5 miles for ammonia concentration of 25 ppm. This assumed an instantaneous release of 1,600 gallons and provided a conservative estimate since the ammonia was probably lost over a short period. At 300 ppm, hazards included severe eye, skin, and respiratory irritation. This would be especially true if fog is present for the ammonia vapor to react with. At 25 ppm, the ammonia would be detectable,

but would probably not pose significant health problems except to sensitive populations such as asthmatics.

References:

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

U.S. Coast Guard District 17

Name of Spill:	Ketchikan Pulp Mill Chemical Release
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	10/22/96
Location of Spill:	Ward Cove, Ketchikan, Alaska
Latitude:	55°36′ N
Longitude:	132°12′ W
Spilled Material:	optimer 7128 cation flocculant, or ethyl oxylated alcohol
Spilled Material Type:	5
Amount:	3,000 gallons
Source of Release:	facility
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning	N
Other Special Interest:	none
Keywords:	none

Incident Summary:

On October 21, 1996, about 3,000 gallons of a water-treatment chemical, optical, optimer 7128 cation (a flocculant used in the water treatment process), overflowed from its tank at Ketchikan Pulp Corporation (KPC) with an undetermined amount flowing into Ward Cove. Some of the material was recovered but, once in the water, it congealed into white, jelly-like globs, some as large as golf balls. This substance has a density similar to water so the globs dispersed through various depths down to about eight feet. Because the chemical did not stay at the surface, using a water-skimming boom to recover the chemical was not feasible. The substance was still visible the next day in Ward Cove, but seemed to dissipate by that evening. Optimer 7128 is a non-regulated substance, is not listed by the Federal Government as a marine pollutant, and does not pose a hazard to navigation. KPC employees maintained a visual watch over the area and sampled water quality at sites specified by State and Federal agencies. In addition, a monitoring plan is being developed to better understand the full effects of this substance on the environment. The USCG MSD along with MSO Juneau and Alaska Department of Environmental Conservation (ADEC) and Alaska Department of Fish and Game (ADFG) worked together to resolve this situation.

Behavior of Spilled Material:

The chemical acted as expected when it met water; it formed globs and emulsified before naturally dissipating.

Countermeasures and Mitigation:

The substance was monitored until it naturally dissipated. No attempt was made to pick up the globs because it was a visual problem as opposed to a toxic one.

NOAA Activities:

NOAA was notified of this incident on October 22, 1996, by MSO Juneau who requested that a copy of the MSDS be sent to NOAA's contractor LSU for evaluating. LSU reported that the material was acting exactly as expected and was not a hazardous waste. NOAA supported this incident by phone and fax.

Name of Spill:	F/V *Rebecca B*
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill):	10/24/96
Location of Spill:	Tanaga Island, Aleutian Island chain, Alaska
Latitude:	51°36′ N
Longitude:	177°57′ W
Spilled Material:	diesel
Spilled Material Type:	2
Amount:	1,000 gallons
Source of Release:	fishing vessel
Resources at Risk:	**Marine Mammals**: stellar sea lions **Management Area**: National Wildlife Refuge
Dispersants:	N
Bioremediation:	N
In-situ Burning	N
Shoreline Types Impacted:	none
Other Special Interest:	none
Keywords:	salvage, threatened species

Incident Summary:

In inclement weather, on October 24, 1996, the 77-foot F/V *Rebecca B* fetched on a shoal 50 feet off the beach in a protected cove on the south side of Tanaga Island. The vessel had 1,500 gallons of diesel onboard. The onboard vents were plugged before the crew evacuated the vessel. The crew was rescued by a U.S. Navy tug and taken to Adak. Magone Marine out of Dutch Harbor was hired for salvage. Initially the hull was intact and there was no pollution. It wasn't until October 30 that the weather improved enough to allow an overflight by the owner's representative and Magone. The vessel was reported to be hard aground, decks awash, with a starboard list, but no pollution was visible. Magone was unable to get a salvage vessel on-scene until November 23, at which time the remaining diesel, about 425 gallons, were removed. The starboard tanks had been destroyed by the weather and the wave action releasing roughly 1,000 gallons into the environment. The salvor cut up the vessel for removal from the beach. Winds during the incident ranged up to 50 to 60 knots. MSD Unalaska monitored the situation throughout the incident.

Behavior of Spilled Material:

About 1,000 gallons of diesel were released and dispersed in the high winds leaving no observable evidence.

NOAA Activities:

NOAA was notified of the incident on October 25, 1996. Weather forecast support was provided to the USCG. Since Tanaga Island is part of Aleutian Islands Subunit of the Alaska Maritime National Wildlife Refuge, resource trustees from both the USFWS and the NMFS were notified. No birds were present and the only concern was a stellar sea lion haulout on the north side of Tanaga Island five to seven miles away from the grounding. The sea lions are a threatened species in Alaska. NOAA supported this incident for about a month by phone and fax with periodic updates and status reports to the NMFS.

Name of Spill:	M/V *Baneasa*
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Incident:	12/25/96
Location of Incident:	Aleutian Island chain, Alaska
Latitude:	51°00′ N
Longitude:	174°00′ W
Spilled Material:	bunker C, diesel fuel
Spilled Material Type:	2, 4
Amount:	4,200 barrels of bunker fuel 800 barrels of diesel
Source of Release:	non-tank vessel
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Shoreline Types:	none
Other Special Interest:	none
Keywords:	NAVSUPSALV

Incident Summary:

On Christmas morning 1996, the M/V *Baneasa*, an 833-foot unladen freighter, reported that her rudder was stuck hard to starboard and she was drifting at the mercy of the winds and seas. She was roughly 70 miles south of Amilia Island in the Aleutian Chain with southeast winds. The USCG determined that she would probably go aground sometime during the morning of December 26. The USCG mobilized part of the Pacific Strike Team (PST), NOAA was notified, NAVSUPSALV was activated, and State and Federal resource agencies were put on high alert. The first vessel on-scene was the USCG Cutter *Midget* who put a line to the *Baneasa*, providing a small measure of control. The RP arranged for a small tug to arrive on-scene by midnight of December 26 with a much larger one, the *Agnes Foss*, due to arrive the next day. An incident command post (ICP) was established at the new ADES Emergency Operations Center on Fort Richardson in Anchorage, a forward command post was established at Atka Island, a USCG-130 overflight occurred, NAVSUPSALV spill equipment was mobilized to Elmendorf Air Force Base for possible transfer to the scene, and PST personnel were en route to Adak with pumps and dewatering gear.

Detailed weather forecasts, done especially for this area and incident, indicated that winds were going to be more favorable than originally forecast and that there would be little danger of the vessel running aground for several more days. As planned, the tugs reached the *Baneasa* and took her under tow, reaching Adak Navy Base on December 29.

Incident Summary:

NOAA was notified of this incident on December 25, 1996, by the USCG who requested weather forecasts for the area of the expected grounding. NOAA arranged for detailed NWS forecasts for a specific area. Ordinarily, weather forecasts are done for much larger areas. The SSC also established an Environmental Section in the ICS, identifying general resources at risk and arranging for specific contacts in NMFS, USFWS and ADFG if a grounding appeared imminent. NOAA was told to stand down on the morning of December 27 after the *Baneasa* was under tow.

Reference:

NOAA Hotline #210, 4 Reports

USCG POLREPS

Name of Spill:	Barge *Oregon*
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	01/25/97
Location of Spill:	Ninilchik, Alaska
Latitude:	60°06′ N
Longitude:	151°52′ W
Spilled Material:	urea granules
Spilled Material Type:	5
Amount:	12,.500 tons
Source of Release:	barge
Resources at Risk:	Kachemak Bay, Alaska critical habitat area aquaculture sites
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Shoreline Types:	none
Other Special Interest:	bioremediation, biostimulation
Keywords:	none

Incident Summary:

On January 25, 1997, the tug *Sea Valor*, attempting to change the tow cable on the Crowley barge *Oregon*, punctured the #5 starboard tank of the barge. The tank flooded, causing the barge to roll upside down, releasing most of her 12,500 tons of bulk granular urea six miles west of Ninilchik, Alaska in Lower Cook Inlet at a water depth of approximately 120 feet. The COTP ordered the barge towed upside down into Kachema Bay for salvage. Once there, high winds forced the vessel to circle around before finally being anchored and boomed off just off the end of Homer spit. Of equal concern were fuel tanks with 1,000 gallons of diesel and roughly 250 gallons of other general oils. No sheen was noticed and these tanks appeared intact. Diver inspection of the overturned hull reported that all doors and hatches were closed and sealed, except for a port aft cargo door that was buckled in about two feet leaving a one-foot opening to the cargo hold. Initially, divers were unable to determine how much cargo remained onboard. Subsequent diving provided evidence that probably all the urea had been washed out. The upside-down barge was rigged with towing and other safety gear and towed in that configuration to Seattle for further salvage.

The barge was owned by Crowley; UNOCAL owned the urea. Both become very involved in the response. Crowley brought a second tug to Kachemak Bay for standby; provided sea-curtain boom; and mobilized Chadux, the non-persistent fuels spill coop, to deal with any possible petroleum release. Meanwhile, UNOCAL had an environmental scientist from California on-scene to answer questions about the massive urea release, and to conduct a water-sampling program to assure officials and citizens the urea levels were low around the anchored barge in Kachemak Bay and at the initial release site.

Behavior of Spilled Material:

NOAA issued the following statement regarding the fate and effect of the spilled urea. "The urea, stored in bulk onboard the *Oregon* barge, is believed to have spilled into Cook Inlet. The peak tidal currents in this location are three to four knots. After the barge capsized and the urea dispersed into the water, it slowly sank toward the ocean floor, while at the same time dissolving in the water column. The currents facilitated the dissolution process in the same way that stirring a cup of coffee helps dissolve the sugar faster. Since the urea was

stored in bulk, the granules were dispersed as a "cloud" of fertilizer, each granule sinking independently. NOAA estimates that the whole cargo dissolved quickly.

Countermeasures and Mitigation:

Crowley boomed off the barge at her anchorage in Kachemak Bay to contain possible petroleum leaks. Meanwhile, UNOCAL conducted water sampling around and under the barge to determine levels of urea. The highest level measured (125 ppm) occurred inside one of the barge ports.

Other Special Interest Issues:

Bioremediation: A spike of biostimulation to the environment was caused by the release of the urea.

NOAA Activities:

NOAA was notified of this incident on January 25, 1997, by the USCG who needed information about the urea and the effect it could have on the environment in Lower Cook Inlet. NOAA and the UNOCAL environmental scientist developed a public statement addressing the fate and effect of the spilled urea, its effect on pH, and its effect on the environment. This information proved a major factor in persuading the State to consent to the USCG's request to allow the barge significant anchoring time in Kachemak Bay. NOAA and UNOCAL arrived at a "safe" background level of urea against which the results of the monitoring program could be compared. NOAA proposed a 10-meter mixing zone around the barge, the edge of which should not exceed a concentration of 100 ppm urea during any release. Tidal current information at the time the barge flipped was provided to UNOCAL to help guide their water-monitoring program at the initial release site. At the request of the USCG, charts and reports showing and discussing the water circulation in Kachemak Bay were sent to the command post in Homer. The NOAA SSC did not go on-scene, but continually maintained contact with UNOCAL, the SOSC, and the FOSC. NOAA supported this incident for about four days.

References:

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

NOAA Hotline #216, 12 Reports

USCG POLREPS

Name of Spill:	F/V *Lisa Jo*
NOAA SSC:	John W. Whitney
Date of Spill :	02/19/97
Location of Spill:	Akun Island, Aleutian Island Chain, Alaska
Latitude:	54°12.7′ N
Longitude:	165°28.9′,W
Spilled Material:	diesel
Spilled Material Type:	2
Amount:	1200 gallons
Source of Spill:	fishing vessel
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	exposed bedrock cliffs
Keywords:	none

Incident Summary:

The F/V *Lisa Jo,* a 77-foot craft, ran hard aground in Akun Bay on the north side of Akun Island in the early morning of February 19, 1997. The vessel had roughly 1,200 gallons of diesel onboard. The craft maintained her integrity for less that a day. The strong north winds caused her to breakup and disgorge all her diesel. The vessel was considered a total loss. The Coast Guard Cutter *Mellon* stood by offshore and helped rescue the captain. Overflights on the second day revealed considerable sheen around the vessel and no birds or marine mammals were noted in the immediate vicinity. No response was possible or necessary. Throughout the incident strong winds from the northern quadrant pounded the craft.

Behavior of Spilled Material:

High winds caused the diesel to rapidly disperse and evaporate.

NOAA Activities:

The NOAA SSC was notified of this incident on the morning of February 19, 1997, by MSD Unalaska who asked the SSC to track the incident for the benefit of the resource agencies, particularly the NMFS, the trustee for the threatened sea lions that frequent this area. The diesel release did not threaten the two sea lion rookeries on the very northern edge of Akun Island. Communications between MSD Unalaska and the NMFS were maintained to provide an open information flow.

Name of Spill:	George Inlet Cannery
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	05/10/97
Location of Spill:	George Inlet, Ketchikan, Alaska
Latitude:	55°22.5' N
Longitude:	131°28.3' W
Spilled Material:	Bunker C
Spilled Material Type:	4
Amount:	approximately 100 gallons
Source of Release:	facility
Resources at Risk:	anadromous fish
Other Special Interest:	PES-51
Shoreline Types Impacted:	mostly exposed sloping bedrock
Keywords:	log boom, PES-51, sausage boom, sorbents

Incident Summary:

On May 10, 1997, a caretaker at the old abandoned George Inlet Cannery ten miles east of Ketchikan, Alaska discovered that a storage tank had fallen off its platform onto the beach, ruptured, and was spilling Bunker C oil onto the beach and into the water. Approximately 100 gallons of oil had discharged, creating a sheen approximately 2,000 by 300 yards in George Inlet impacting approximately 1,200 feet of shoreline. The Cape Fox Native Corporation was the RP and, using sorbents, attempted to remove as much oil as possible from the rocky cobble, mostly sheer rock, and hard shale shoreline. A log and a sorbent sausage boom were deployed around the oiled-beach area. The oil had been in the tank for so many years that it was tarlike, was not spreading, and resembled a creosoted piling, even after using sorbents on it. The oiled shoreline had very little bioactivity, only some seaweed and barnacles. In the end, nothing was done, nothing was apparently affected, and only a hard tar coating on the bottoms of some of the rocks could be found to show that anything had happened.

Behavior of Spilled Material:

The released Bunker C was so old that it was practically inert. Minimal sheening resulted, and the most common description of the oil on the rocks was like a coating on a creosoted piling. As a result the oil did not move out of its initial area of impact. Sorbents were only minimally effective on this oil.

Countermeasures and Mitigation:

The USCG considered using the chemical cleaner PES-51, on the oil that reached shore, but this effort was never organized well enough to achieve fruition. Only sorbents were used for shoreline cleaning and no open-water recovery was necessary. The entire impacted area was boomed with log and sorbent booms.

Other Special Interest Issues:

Consideration was given to using PES-51 to remove the heavy oil stains on the rocky shoreline. Being a rather small, isolated shoreline impact, it was thought that the use of PES-51 might produce some beneficial results and provide some needed experience in using this product. However, this response tool was not used.

NOAA Activities:

NOAA was notified of this incident on May 10, 1997, by MSO Juneau who requested information on possible shoreline cleanup techniques. Water flush was suggested but never pursued due to the lack of equipment and the extreme tenacity and tar-like state of the oil coating the rocks. Instead, the local spill coop, SEAPRO, was asked to evaluate the situation. They suggested using PES-51 that might help mobilize the oil from the substrate and NOAA concurred because this was a relatively small incident and a very localized area affected. The major concern was being sure that the tarry oil, in fact, floated. In this instance, concurrence was necessary from the State of Alaska and EPA RRT representatives along with consultation with the U.S. Department of the Interior, the U.S. Department of Commerce (DOC), and Alaska Regional Response Team (ARRT) representative. The NMFS Juneau office told NOAA that this small oiled area provided no immediate threat to sea lions, harbor seals, or other NOAA trustee resources. This information was transmitted to the DOC ARRT representative The USCG application to the ARRT to use PES-51 was withdrawn, even though both the State and EPA supported its use on this very small area to gain more knowledge and familiarity with the chemical NOAA MSO Juneau discussed shoreline cleanup techniques and protocols. NOAA supported this effort by phone and fax.

Name of Spill:	T/B *Boxer* fuel/cargo barge
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	05/17/97
Location of Spill:	Anchor Point, Alaska
Latitude:	58°57.6′ N
Longitude:	160°19.0′ W
Spilled Material:	diesel
Spilled Material Type:	2
Amount:	50,000 gallons potential
Source of Release:	tank barge
Resources at Risk:	**Fish**: herring kelp spawners
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	salvage

Incident Summary:

On May 16, 1997, the 130-foot barge, T/B *Boxer*, ferrying 50,000 gallons of diesel fuel through rough seas ran hard aground on the rocky eastern shores of Togiak Bay in southwestern Alaska. The center hold, where no fuel was stored was holed; the diesel was in the fore and aft compartments. No oil was released. The owner, Northcoast Fisheries Seafood Processors Inc. of Seattle, hired a lightering company from Dillingham, who was unable to reach the barge until the evening of May 18. High winds and seas prevented significant lightering for the first couple of days, but then the winds calmed some and the full lightering of the fuel tanks was accomplished by May 22. During this removal, a crack in one of the tanks did allow roughly 30 gallons of fuel to escape. CHADUX, the non-persistent oils coop for Alaska, also was on-scene and assisted in the lightering, booming, and planning for a possible release. The USCG was represented on-scene to oversee removal activities.

Behavior of Spilled Material:

The 30 gallons of diesel released into the environment dispersed rapidly in the wind and wave conditions.

Countermeasures and Mitigation:

CHADUX placed a boom around the vessel as it was being lightered

NOAA Activities:

NOAA was notified of this incident on May 17, 1997, by MSO Anchorage. NOAA consulted the NWS who reported that conditions were very windy, expected to get worse over the weekend, but should improve at the beginning of the next week. Weather updates were supplied by NOAA for five days into the incident. NOAA consulted the area ADFG biologist for Togiak Bay who was very familiar with the area and told NOAA that the biological activity in the area was not diverse, but that the barge was next to a kelp bed where herring roe were harvested. This was a regrowth year for the herring after a harvest last year, and it would be devastated if significant amounts of diesel got into the kelp beds. NOAA maintained telephone contact with the ADFG biologists throughout the incident.

NOAA consulted the NMFS who confirmed that there were no marine mammal haulouts or rookeries in the immediate vicinity. NOAA's response to this incident by was by phone and direct contact at MSO Anchorage.

Name of Spill:	Haines Dock Asphalt Spill
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	08/19/97
Location of Spill:	Haines, Alaska
Latitude:	59°15′ N
Longitude:	135°25′ W
Spilled Material:	asphalt emulsion
Spilled Material Type:	4
Amount:	1,000 gallons
Source of Release:	barge
Resources at Risk:	kelp and unidentified shell community
Other Special Interest:	none
Shoreline Types Impacted:	gravel/pebble beach
Keywords:	boom, sorbent pads

Incident Summary:

On the evening of August 18, 1997, a 2,000-gallon tank of asphalt emulsion was being unloaded from a barge at the Haines, Alaska dock when approximately 1,000 gallons of the material spilled into the water just off the dock face. The release received considerable local press coverage that often emphasized its alleged negative impacts. The spill's actual impact was minimal. Throughout the incident the weather was mild.

Behavior of Spilled Material:

When it entered the water, the asphalt emulsion rapidly changed from the consistency of light syrup to viscous blobs. Some tarballs attached to kelp and floated away and some came ashore. On the bottom, the material was so viscous that divers hired for the cleanup just scooped it up into nets and buckets.

Countermeasures and Mitigation:

Boom and sorbent pads were immediately deployed by the RP; however, the material would not adhere to sorbent pads and went under the booms and sank to the 30- to 35-foot deep sandy bottom. Divers were hired from Ketchikan for the cleanup. About 800 gallons were recovered leaving the rest finely distributed over the bottom and unrecoverable.

NOAA Activities:

NOAA was notified of this incident on the morning of August 19, 1997, by MSO Juneau who asked for information concerning the fate and effects of asphalt emulsion and cleanup suggestions. The product was determined to be a water-in-asphalt emulsion used as road underlay or a sealer to put over old asphalt driveways. NOAA told the USCG that product would form pancakes and blobs and collect in depressions on the bottom. Because the water in Southeast Alaska is so cold, the material was expected to be stiff and chunky, but divers would have to make a first-hand assessment of its condition on the bottom. If thick and heavy, the asphalt could just be scooped up from the bottom; however, it might have to be pumped if it was less viscous. There were strong opinions reported by the local press concerning the possible negative effects of the spill. To allay public fears, the USCG asked NOAA to provide a fact sheet regarding the fate, persistence, effects, and toxicity of this material. Such a sheet was prepared saying that the chemical toxicity of the asphalt was very low, it would form a persistent asphalt pavement, and that any adverse effects would

occur by smothering the benthic community. Since most of the asphalt was removed from the mostly sandy bottom, negative effects of this spill were minimal.

Name of Spill:	Ninilchik River Sulfur Spill
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill :	09/16/97
Location of Spill:	Southwest Kenai Peninsula
Latitude:	60°00' N
Longitude:	151°40' W
Spilled Material:	elemental sulfur
Spilled Material Type:	5
Amount:	34,000 pounds
Source of Release:	container on semi trailer truck rig
Resources at Risk:	**Fish**: rainbow trout, king salmon fry, adult silver salmon **Mollusks**: possibly clams
Other Special Interest:	none
Keywords:	vacuum trucks

Incident Summary:

Elemental sulfur that accumulates from the refining of North Slope crude at the Tesoro Nikiski refinery is periodically transported to a disposal area. A semi trailer truck, transporting the sulfur on September 16, 1997, lost a 17-ton container of sulfur on a particularly bad curve on the Sterling Highway over the Ninilchik River. The accident sparked a brief sulfur fire that sent a plume of yellowish-green smoke into the old Ninilchik village. Authorities evacuated the eight or so occupied homes there for several hours. The Kenai Peninsula School District also canceled classes for the 240 students at the Ninilchik School. The trucking company, Lynden Transport, hired a cleanup contractor who used vacuum trucks and manual tools to pick up the sulfur. No fish kills or wildlife impacts were observed, and ADFG performed laboratory analysis on benthic invertebrate samples. The cleanup continued for approximately one week.

Behavior of Spilled Material:

Elemental sulfur is not soluble in water and generally is not considered toxic. Sulfur powder spread down the bank of the river and across the entire span of the river in a 10-foot wide band. Additionally, the sulfur was intermittently dispersed for approximately 200 feet downstream. As the sulfur entered the water a suspended cloud of sulfur was temporarily formed, although most of the sulfur formed a thick blanket on the stream bottom. Much of the 34,000 pounds of spilled sulfur was picked up on land and in the water. Up to one-half inch of sulfur was allowed to remain on the river bottom rather than try to remove it to ensure that the river bottom habitat was not disturbed. The fire was extinguished and the evacuation order was dismissed.

Countermeasures and Mitigation:

A silt screen was installed in the river to reduce migration of the product downstream. Crews used pitchforks to remove the larger pieces of sulfur from the river, and submerged sulfur "dust" was removed by vacuuming the product using suction wands. Following vacuuming, the mix was allowed to settle. Water was pumped to holding tanks and allowed additional settling time to remove any remaining sulfur. The water was then decanted from the tanks and discharged at a former United States Army Corps of Engineers dredge disposal site above high water in Cook Inlet near the mouth of the Ninilchik River. The water was then allowed to drain into the upper intertidal berm. The recovered sulfur was transported back to the Tesoro Refinery in Nikiski.

NOAA Activities:

NOAA was notified of this incident on September 16, 1997, by the ADEC who was the prime overseer of this incident. ADEC requested considerable information and scientific analysis of the situation.

NOAA provided a copy of the NOAA CAMEO™ RIDS sheet was immediately the SSC began the research regarding the behavior and possible toxicity of sulfur necessary to satisfy the requests made. ADEC was informed that sulfur will not mix with water and, when spilled onto soil, it cannot be transported downward into the groundwater table and when spilled into a water body, it is likely to thicken and sink to the bottom, not dissolve into the water. Sulfur is a natural component of river- and sea-water, and it does not bioaccumulate or build up in fish, clams, or oysters. Extremely high concentrations of suspended sulfur in the water column may be dangerous to aquatic life; however, the low level of sulfur that settled into the sediment does not appear to be dangerous to the aquatic environment.

References:

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

Acronyms

ACT	Activities (USCG)
ADEC	Alaska Department of Environmental Conservation
ADFG	Alaska Department of Fish and Game
ADIOS™	Automated Data Inquiry for Oil Spills
AFB	air force base
ALOHA™	Areal Locations of Hazardous Atmospheres
AOC	area of concern
ARRT	Alaska Regional Response Team
AST	Atlantic Strike Team (USCG)
ATSDR	Agency for Toxic Substances and Disease Registry
BAT	Biological Assessment Team (NOAA)
BTEX	benzene, toluene, ethylbenzine, xylene
BWM	Brown Water Marine
CAMEO™	Computer-Aided Management of Emergency Operations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COIL	Central Oil Identification Laboratory (USCG)
C/V	container vessel
ConEd	Consolidated Edison
COTP	Captain of the Port (USCG)
CRRT	Caribbean Regional Response Team
DCL 45	dielectric fluid
DCM	dangerous cargo manifest
DEC	Department of Environmental Conservation
DEP	Department of Environmental Protection
DEQ	Department of Environmental Quality
DBRC	Delaware Bay and River Coop
DHH	Department of Health and Hospitals (Louisiana)
DNER	Department of Natural and Environmental Resources (PR)
DOB	dodecylbenzene
DOC	Department of Commerce (USA)
EDC	1,2-dichloroethane
EDT	Eastern Daylight Time
EPA	Environmental Protection Agency
ERT	Environmental Response Team (EPA)
FLIR	forward-looking infrared radar
FOSC	Federal On-Scene Coordinator
frac	fractionating
F/V	fishing vessel

GLERL	Great Lakes Environmental Research Laboratory
GC-MS	gas chromatography-mass spectrometry
GST	Gulf Strike Team (USCG)
HAZMAT	Hazardous Materials Response and Assessment Division (NOAA)
HHF	home heating fuel
hotsies	high-pressure steam cleaning units
ICP	Incident Command Post
ICS	Incident Command System
IDEM	Indiana Department of Environmental Management
IDLH	immediately dangerous to life and health
IFO	intermediate fuel oil
IMS	Industrial Marine Service
IR	infrared
KPC	Ketchikan Pulp Corporation
LDWF	Louisiana Department of Wildlife and Fisheries
LILCO	Long Island Lighting Company
LPG	liquid propane gas
LSU	Louisiana State University (NOAA Contractor)
MASS	Modeling and Simulation Studies Branch (HAZMAT, NOAA)
mg	milligram
MORAD	Maritime Administration
mm	millimeter
MPC	Marine Pollution Control
MSD	Marine Safety Division (USCG)
MSDS	Material Safety Data Sheets
MSO	Marine Safety Office (USCG)
MSRC	Marine Spill Response Corporation
M/V	motor vessel
NAVSUPSALV	Naval Superintendent of Shipsalvage
NAVSUPSHIP	Naval Superintendent of Shipbuilding
NCDOT	North Carolina Department of Transportation
NCP	National Contingency Plan
NIT	Norfolk International Terminal
NJDEP	New Jersey Department of Environmental Protection
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRC	National Response Corporation
NRDA	Natural Resource Damage Assessment
NWS	National Weather Service
NY	New York

OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
OPA	Oil Pollution Act
PCB	polychlorinated biphenyls
PPE	personal protection equipment
ppm	parts per million
PST	Pacific Strike Team (USCG)
RIDEM	Rhode Island Department of Environmental Management
RP	responsible party
RPI	Research Planning Inc. (NOAA Contractor)
RRT	Regional Response Team
R/V	research vessel
SCAT	Shoreline Cleanup Assessment Team
SLAR	side-looking airborne radar
SOSC	State On-Scene Coordinator
SSC	Scientific Support Coordinator (NOAA)
SST	Scientific Support Team (NOAA)
T/B	tank barge
TLm	medium tolerance level
TLV/TWA	threshold limit values time-weighted averages for airborne concentrations of substances
TPH	total petroleum hydrocarbons
T/V	tank vessel
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service