



Oil and Hazardous Materials Response Reports

October 1992-September 1993

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

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INTRODUCTION

Between October 1, 1992 and September 30, 1993, NOAA's Hazardous Materials Response and Assessment Division Scientific Support Coordinators and scientific staff were notified of 91 spill incidents. These 91 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 50 spill incidents in the Nation's coastal zone included 40 oil spills, 8 chemical spills, and 1 spill of unknown material. In addition to the spills listed, NOAA assisted the U.S. Coast Guard with 59 simulation exercises.

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

Each report in this volume is organized as follows:

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

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

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

Spill Report Keys

Name of Spill:

NOAA SSC:

Date of Spill (mmddyy):

Location of Spill: text description

Latitude: degrees, minutes, N or S

Longitude: degrees, minutes, E or W

Spilled Material: specific product

Spilled Material Type:

Type 1 - Very Light Oils (jet fuels, gasoline)

Type 2 - Light Oils (diesel, No. 2 fuel oil, light crudes)

Type 3 - Medium Oils (most crude oils)

Type 4 - Heavy Oils (heavy crude oils, No. 6 fuel oil, bunker c)

Type 5 - Hazardous material

Barrels (or weight in pounds if hazardous material):

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

Resources at Risk: See A

Dispersants: Yes or No

Bioremediation: Yes or No

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

Other Special Interest:

Destruction of marshes, mangroves, or tidal flats

Extraordinarily successful salvage operations

Massive habitat loss

Massive wildlife impact

Oil/ice interactions and adverse weather conditions

Unusual, experimental, or innovative cleanup techniques

Shoreline Types Impacted: See B

Keywords: See C

Incident Summary:

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

Behavior of Spilled Material:

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

Countermeasures and Mitigation:

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

Other Special Interest Issues: See D

NOAA Activities:

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

References:

Spill Report Keys

A Resources at Risk

Habitats

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

Marine Mammals

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

Terrestrial Mammals

Mustelids, rodents, deer, bears, population concentration areas, intertidal 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, octopus, seed beds, leased beds, abundant beds, harvest areas, high concentration sites

Crustaceans

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

Reptiles

Sea turtles, alligators, nesting beaches, concentration areas

Recreation

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

Management Areas

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

Resource Extraction

Subsistence, officially designated harvest sites, commercial fisheries, power plant water intakes, drinking water intakes, industrial water intakes, intertidal and subtidal mining leases, fish/shrimp/bivalve/plant aquaculture sites, log storage areas

Cultural

Archaeological sites, Native American Lands

B Shoreline Types Impacted

brackish marshes
coarse gravel beaches
coarse sand beaches
coastal structures
consolidated seawalls
consolidated shores
cypress swamps
developed upland
eroding bluffs
exposed bedrock bluffs
exposed bluffs
exposed fine sand beaches
exposed riprap
exposed rocky platforms
exposed rocky shores
exposed scarps
exposed seawalls
exposed tidal flats
exposed tidal flats (low biomass)
exposed tidal flats (moderate biomass)
exposed unconsolidated sediment bluffs
extensive intertidal marshes
extensive salt marshes
extensive wetlands
fine sand beaches
flats
freshwater flat
freshwater marshes
freshwater swamps
fringing salt marshes
fringing wetlands
hardwood swamps
levees
low banks
mangroves
marshes
mixed sand and shell beaches

mixed sediment beaches
piers
riprap
salt marsh
saltwater marshes
sand/gravel beaches
shell beaches
sheltered bedrock bluffs
sheltered fine-grained sand beaches
sheltered impermeable banks
sheltered mangroves
sheltered marshes
sheltered rocky shores
sheltered seawalls
sheltered tidal flats
shelving bedrock shores
spoil bank
supratidal marshes
swamp
tidal mudflat
unforested upland
unvegetated steep banks and cliffs
vegetated bluffs
vegetated low banks
vegetated riverbank
vertical rocky shores
wavecut platforms

C

Key words

air activated pumps
bioremediation
Center for Disease Control
Clean Bay Inc.
containment boom
Corexit 9527
dispersant
endangered species
evaporation
exposed rocky shores
filter fences
Food and Drug Administration
ground truth
high-pressure warm-water washing
hydro-blasting
in-situ burning
International Bird Rescue and Research Center
International Tanker Owners Pollution Federation (ITOPF)

low-pressure washing
NAVSUPSALV
NOAA National Marine Fisheries Laboratory
Pacific flyway
potential spill
propane cannons
remote sensing
recoiling
salvage
seafood harvesting ban
shallow water recovery
siphon dams
skimmers
SLAR (side-looking airborne radar)
smothering
sorbent boom
sorbent pompoms
starshell-type device
tourism losses
vacuum trucks
volunteers
weed cutters
weir/pump skimmer

D Other Special Interest Issues

Effects to tourism, recreation areas, or personal property
Closure of commercial or recreational fishing areas and public lands
Closure of shipping lanes and vehicle traffic routes
Wildlife impacts and rehabilitation
Ecological destruction and habitat loss due to spilled material impacts
Ecological destruction and habitat loss due to cleanup operations
Effects to human health and safety
Bioremediation, dispersant, *in-situ* burning operations
Unusual, experimental, or innovative cleanup techniques
Complex successful salvage operations
Logistical or operational problems
(including adverse weather conditions)
Interaction with foreign or Native authorities
Media interest
Volunteer response and organization
Studies conducted; ongoing research

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FY 93 Spills

October 1, 1992—September 30, 1993

Date of Incident	No.	Report Name/Hotline Number	Commodity Involved	USCG District	NOAA Involvement
Nov 91-present	1	City Gas & Transmission Corp. Wilmington, NC	oil	5	1 onscene
01 Oct 92	2	ALCOA Spec. Chemical/104 Cumberland River, TN	sodium aluminate	2	phone
01 Oct 92	3	*sinking boat western FL	diesel	7	potential
04 Oct 92	4	*loose barge Charleston, SC	oil	7	potential
9 Oct 92	5	*Jean Turecoma Block Island, RI	oil	1	potential
13 Oct 92	6	Mystery spill Virginia Beach, VA	oil	5	phone
15 Oct 92	7	Asphalt Barge Grounding/105 St. Ignace, MI	asphalt	9	1 onscene
10 Oct 92	8	*Russian Trawler Fire/106 Dutch Harbor, AK	diesel/ammonia	17	potential
20 Oct 92	9	*Chlorine spill Port Angeles, WA	chlorine	13	heads up
23 Oct 92	10	*floating barrel Los Angeles/Long Beach CA	unknown	11	potential
30 Oct 92	11	Pirate Well Platform/107 Southwest Pass, LA	unknown	8	phone
17 Nov 92	12	*Rockaway Barge grounding NY	oil	1	potential
22 Nov 92	13	T/V <i>May</i> Frederick Sound, AK	diesel	17	phone
23 Nov 92	14	Dolly Varden Platform Cook Inlet, AK	crude/hydraulic	17	phone
02 Dec 92	15	*grounded barge Long Island Sound, NY	unknown	1	potential

FY93 Spills

Date of Incident	No.	Report Name/Hotline Number	Commodity Involved	USCG District	NOAA Involvement
04 Dec 92	16	King Cove Lagoon King Cove, AK	unknown petroleum	17	phone
11 Dec 92	17	M/V Cape Hudson/108 Virginia coast	IFO 180/lube oil	5	1 onscene
11 Dec 92	18	M/V MSC Chiara/109 Buzzards Bay, MA	chemical	1	1 onscene
11 Dec 92	19	*mystery slick Puerto Rico	unknown	8	false alarm
12 Dec 92	20	Automatic Die Casting Removal Project St. Clair Shores, MI	alkaline solutions	9	phone
21 Dec 93	21	Barge <i>RTC 380</i> /110 New London, CT	#2 diesel	1	1 onscene
23 Dec 92	22	*T/B <i>New York</i> /111 Savannah River	gasoline	5	potential
26 Dec 92	23	ARCO Blowout South Pass, Block 60 LA	oil	8	2 onscene
02 Jan 93	24	Steuart Petroleum/113 Jacksonville, FL	gasoline	7	1 onscene
05 Jan 93	25	Mystery spill/114 Depot Bay, OR	tarballs	13	1 onscene
16 Jan 93	26	F/V <i>Massacre Bay</i> Alitak Bay, AK	diesel	17	phone
22 Jan 93	27	*Port Townsend Paper Corp. Port Townsend, WA	#6	13	phone
26 Jan 93	28	M/V <i>Lyra</i> Frying Pan Shoals, NC	#6	5	phone
29 Jan 93	29	F/V <i>Elizabeth C</i> Chesapeake Bay bridge-tunnel	diesel	5	1 onscene
18 Feb 93	30	*lost container Breton Sound, LA	styrene	8	potential

Date of Incident	No.	Report Name/Hotline Number	Commodity Involved	USCG District	NOAA Involvement
13 Mar 93	31	<i>Miss Beholden</i> Key West, FL	diesel/lube oil	7	phone
14 Mar 93	32	*ship collision Saba Island, Carribean	gas/oil	7	potential
14 Mar 93	33	*T/V <i>Potomic Trader</i> East River Hell Gate, NY	#6	1	potential
15 Mar 93	34	T/V <i>Anthony J</i> East Rockaway Inlet, NY	unleaded gasoline	1	phone
17 Mar 93	35	*tug fire Miami, FL	diesel	7	potential
23 Mar 93	36	*F/V <i>Eagle B</i> Admiralty Inlet, WA	diesel/ammonia	13	potential
23 Mar 93	37	*Tug <i>Falcon</i> Lake Worth, FL	oil	7	potential
24 Mar 93	38	F/V <i>Yukon</i> Womens Bay, Kodiak, AK	diesel	17	phone
29 Mar 93	39	*Colonial Pipeline Herndon, VA	oil	5	phone
29 Mar 93	40	*Naval Air Station Brunswick Brunswick, ME	JP-5 fuel oil	1	potential
30 Mar 93	41	*T/V <i>Fridrechlung</i> New York, NY	diesel	1	phone
31 Mar 93	42	M/V <i>Ellen Knutsen</i> Philadelphia, PA	cumeme	5	2 onscene
31 Mar 93	43	Ketchikan Pulp Mill Ketchikan, AK	magnesium bisulfite sulfur dioxide	17	phone
09 Apr 93	44	Barge IB-2629 Sunshine Bridge, LA	#6	8	4 onscene
10 Apr 93	45	Alden Leeds Warehouse Kearny, NJ	chlorine	1	phone
12 Apr 93	46	F/V <i>Phoenix</i> Aleutian Islands, AK	diesel	17	phonw

FY93 Spills

Date of Incident	No.	Report Name/Hotline Number	Commodity Involved	USCG District	NOAA Involvement
20 Apr 93	47	UNOCAL, Neches River Port Arthur, TX	crude oil	8	1 onscene
20 Apr 93	48	*train derailment Columbia River, OR	diesel	13	phone
21 Apr 93	49	*mystery oil slick St Croix, VI	unknown	7	phone
21 Apr 93	50	UNOCAL Cook Inlet, AK	diesel	17	phone
21 Apr 93	51	*T/V <i>Knock Davie</i> Delaware River	unknown	1	potential
22 Apr 93	52	M/V <i>Nosac Forest</i> Blair Waterway Tacoma, WA	bunker C	13	1 onscene
06 May 93	53	*ship accident Miami, FL	boric acid	7	potential
10 May 93	54	*Ambrose Gasoline NY	gasoline	1	potential
19 May 93	55	T/V <i>Prime Trader</i> Jacksonville, FL	#6	7	phone
25 May	56	Amtrak Bronx, NY	PCB	1	phone
01 June 93	57	*mystery slick Farallon Islands, CA	oil	11	potential
01 Jun 93	58	Baltimore Gas and Electric Baltimore, MD	crude, bunker C	5	1 onscene
03 Jun 93	59	M/V <i>Central</i> Longview, WA	IFO 180	13	2 onscene
06 Jun 93	60	* <i>Golden Venture</i> Rockaway Beach, NY	#2	1	phone
11 Jun 93	61	*T/V with crack Timblier Island, LA	unknown	8	heads up
13 Jun 93	62	search and rescue Charleston SC		7	phone

Date of Incident	No.	Report Name/Hotline Number	Commodity Involved	USCG District	NOAA Involvement
14 Jun 93	63	medium oil spill Kauai, HI	oil	14	1 onscene
16 Jun 93	64	diesel truck spill Cubo Rojo, Puerto Rico	diesel		phone
18 Jun 93	65	mystery spill Hampton Roads, VA	weathered bilge oil	5	1 onscene
18 Jun 93	66	*U.S. Navy spill San Clemente, CA	diesel	11	potential
22 Jun 93	67	CELOTEX Facility Schuylkill River, PA	mixed heavy oils	5	1 onscene
23 Jun 93	68	*freighter grounding Sabine Pass, LA	#6 and #12	8	phone
25 Jun 93	69	*gas well blowout Morgan City, LA	gas	8	phone
02 Jul 93	70	*mystery spill Seattle, WA	diesel	13	notified
19 Jul 93	71	*Central U.S. floods		2	advisory
20 Jul 93	72	*storm drain East Hartford, CN	unknown	1	notified
23 Jul 93	73	F/V <i>Francis Lee</i> Kodiak Island, AK	diesel	17	phone
26 Jul 93	74	*facility Richmond, CA	oleum	11	notified
26 Jul 93`	75	Shannon Point Seafoods Anacortes, WA	ammonia	13	1 onscene
03 Aug 93	76	*Freighter <i>Marine Sky</i> Gulf of Mexico	bunker C	7	phone
04 Aug 93	77	*tank vessel Ocean City, DE	diesel	5	phone
04 Aug 93	78	*M/V <i>Betula</i> grounding west coast of Mexico	sulfuric acid	11	potential

FY93 Spills

Date of Incident	No.	Report Name/Hotline Number	Commodity Involved	USCG District	NOAA Involvement
4 Aug 93	79	*Great Lakes Lake Superior, MN	PCB	9	potential
5 Aug 93	80	*tank overflow Harbor Island, Seattle	diesel	13	notified
10 Aug 93	81	<i>Bouchard 155/155</i> Tampa Bay, FL	#6	7	3 onscene
11 Aug 93	82	<i>C/V Newark Bay</i> Charleston, SC	chloroacetic acid	7	phone
13 Aug 93	83	*fishing boat sank Lopez Island, WA	diesel	13	phone
14 Aug 93	84	*leaking tanker Ambrose diesel, NY	diesel	1	phone
19 Aug 93	85	<i>Yorktown Clipper/135</i> Glacier Bay National Park, AK	diesel	17	phone
21 Aug 93	86	<i>F/V Billy and I</i> San Fernando Island, AK	diesel	17	phone
23 Aug 93	87	<i>M/V Sun Tide</i> Cook Inlet, AK	diesel	17	phone
02 Sep 93	88	* <i>T/V Red Sea Gull/136</i> Galveston, TX	Kuwait crude	8	crude
03 Sep 93	89	Hurricane Emily /137 Cape Hatteras, NC	gas/kerosene aminobenzene/diesel	5	1 onscene
03 Sep 93	90	*Mystery Spill Misquamicut Beach, RI	oil	1	potential
18 Sep 93	91	<i>T/B New Jersey/138</i> Chesapeake Bay, VA	#6	5	1 onscene

FY 93 Drills and Scenarios

October 1, 1992—September 30, 1993

Drill Name	Area	Type	Date sent
Biscayne Bay, Florida	Biscayne Bay	Verbal Drill	1/13/93
Northeast Gulf of Mexico	Florida, Mississippi, Louisiana	OSSM/plot drill	1/14/93
Florida Department of Natural Resources	Northwest Florida	OSSM/plot permitting	1/28/93
USCG Mobile Drill	Pascagula, Mississippi	OSSM plot drill	2/3/93
Puerto Rico planning	San Juan Harbor, Puerto Rico	OSSM/ area plan	2/22/93
Port of Valdez	Anchorage, Alaska	ADIOS/permitting	2/23/93
Lynn Canal, Alaska	Southeast Alaska	OSSM/area plan	2/26/93
Peril Strait	Southeast Alaska	verbal/area plan	3/1/93
Santa Barbara, California	West Santa Barbara Channel, California	OSSM/area plan	3/8/93
St. Eustatius planning	St Eustatius Island	OSSM/area plan	3/15/93
Northern Oregon Coast	Oregon outer coast	OSSM/drill	3/19/93
USCG Philadelphia Drill	Philadelphia, Pennsylvania	OSSM/drill	3/25/93
Los Angeles/Long Beach, California 1	Los Angeles/Long Beach	OSSM/area plan	3/26/93
Los Angeles/Long Beach, California 2	Los Angeles/Long Beach	OSSM/area plan	3/30/93
Charleston, SC planning	Cooper River	OSSM/area plan	Mar 93
Prince William Sound	Alaska	practice drill	4/1/93
Puerto Rico planning	Tallaboa, Puerto Rico	Verbal /area plan	4/2/93
Virgin Islands planning	Krum Bay, Virgin Islands	Verbal/area plan	4/2/93
Coos Bay, Oregon Drill	Coos Bay, Oregon	Verbal/drill	4/1/93
Orange County, California	Southern California coast	OSSM/area plan	4/5/93
Alyeska, Alaska Drill	Prince William Sound, Alaska	OSSM/realtime	4/7-8/93
Santa Barbara Channel	California coast	OSSM/area plan	4/13/93
Point Loma, San Diego, California 1	San Diego, California	OSSM/area plan	4/20/93
Point Loma, San Diego, California 2	San Diego, California	OSSM/area plan	4/20/93
Cook Inlet (Kennedy Entrance)	Alaska	Exxon Valdez hindcast/ area plan	4/26/93
Port Angeles ARCO Drill	Washington	OSSM/drill	4/26/93
Savannah River	Georgia	OSSM/area plan	4/28/93
Humboldt Bay, California	Northern California	OSSM/area plan	5/5/93
Drill Name	Area	Type	Date sent

FY93 Drills

Port Everglades (MSRC Drill)	Florida	OSSM/ drill	5/6/93
Cape Mendocino	Northern California	OSSM/ area plan	5/10/93
Port Angeles ARCO Drill	Washington	OSSM/ drill	5/11/93
Crescent City Harbor, California	Northern California	Verbal/ area plan	5/17/93
USCG Boston Drill	Boston Harbor	OSSM/ drill	5/19/93
Farallon Island	Northern California	OSSM/ area plan	5/20/93
Carquinez Strait	Northern California	OSSM/ area plan	5/25/93
Corpus Christi, Texas 1	Texas	OSSM/ area plan	6/2/93
Corpus Christi, Texas 2	Texas	OSSM/ area plan	6/14/93
Brownsville, Texas 1	Texas	OSSM/ area plan	6/17/93
Zaikof Point Montague Island, Alaska	Alaska	OSSM/ area plan	6/18/93
Brownsville, Texas 2	Texas	OSSM/ area plan	6/24/93
St. Mary's River, Michigan	Michigan	ROSS/ area plan	6/24/93
Samoa Inner Harbor	American Samoa	Verbal/ pict/ area plan	6/29/93
Samoa Outer Harbor	American Samoa	Verbal/ pict/ area plan	6/29/93
Samoa Outer Bank	American Samoa	Verbal/ pict/ area plan	6/29/93
Portland, Maine	Maine	OSSM/ drill	6/30/93
Corpus Christi, Texas 3	Texas	OSSM/ area plan	7/6/93
San Diego Bay Pier 6	Southern California	OSSM/ area plan	7/7/93
Moss Landing Harbor, California	Northern California	OSSM/ area plan	7/8/93
Estero Bay, California	Northern California	OSSM/ area plan	7/12/93
Portland, Maine revisited	Maine	pict/ drill	7/12/93
Southeast San Diego Bay	Southern California	OSSM/ area plan	7/13/93
Point Wells, Edmonds, Washington	Puget Sound	OSSM/ drill	7/21/93
Portland, Oregon	Oregon	OSSM/ drill	7/29/93
Rosario Strait Drill, Washington	Washington	OSSM/ drill	7/30/93
AMOCO Drill	Yorktown, Virginia	OSSM/ drill	8/10/93
Elizabeth City Alaska Drill	Lower Cook Inlet	OSSM	9/9/93
Midway Island 1	Wake Island	Area Plan	9/13/93

Drill Name	Area	Type	Date sent
Midway Island 2	Wake Island	Area Plan	9/13/93
Big Pine Key, Florida	southeast Florida	Area Plan	9/13/93
Government Cut, Florida	southeast Florida	Area Plan	9/13/93
MSRC Drill	Outer New York Harbor	LE file	9/14/93

U.S. Coast Guard District 1

MSC <i>Chiara</i>	3
Barge <i>RTC 380</i>	5
Naval Air Station, Brunswick.....	9
Alden Leeds Inc. Warehouse.....	13
Amtrak	15

Name of Spill:	MSC <i>Chiara</i>
NOAA SSC:	Stephen Lehmann
USCG District:	1
Date of Spill:	12/11/92
Location of Spill:	Buzzards Bay, Massachusetts
Latitude:	41°38.6' N
Longitude:	070°41.4' W
Spilled Material:	Bunker C and diesel
Spilled Material Type:	4 and 2
Amount:	5,300 barrels Bunker C 1,500 barrels diesel
Source of Spill:	container vessel
Resources at Risk:	wintering ducks, lobster, quohogs, clams, scallops, oysters, and sheltered tidal flats
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	dangerous cargo, extreme weather conditions
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

At approximately 2030, December 10, 1992, the MSC *Chiara*, a Panamanian-flagged, Swiss-owned container vessel, struck a submerged object after exiting the Cape Cod Canal into Buzzards Bay, Massachusetts. The vessel's Master, fearing for the stability of his vessel, put her aground east of Cleveland Light. She reported to the U.S. Coast Guard (USCG) Marine Safety Office (MSO) Providence that she had been holed and was listing 14 degrees to starboard. A command post was established at the Massachusetts Maritime Academy in Bourne, Massachusetts.

The vessel was carrying 200 metric tons (mt) of diesel fuel and 800 mt of Bunker C oil. She was nearly fully loaded with containers of various products, including several chemicals of concern that were listed on the Dangerous Cargo Manifest (DCM). The *Chiara* was carrying methyl bromide, maleic anhydride, hydrogen peroxide, dimethyl ethanolmine, and para cresols.

The weather was severe. Tides were particularly strong and storm-force winds were being formed by an upcoming low-pressure system that was stationary over New England. Winds were predicted at 45 to 55 knots from the northeast through December 13.

The USCG Atlantic Strike Team (AST), Massachusetts Department of Environmental Protection (DEP), USCG District Response and Advisement Team (DRAT), and the NOAA Scientific Support Coordinator (SSC) reported onscene.

On Saturday, December 12 the USCG National Strike Force (NSF) helped stabilize the *Chiara* and determined that the cargo was secure; no release of oil or hazardous materials had taken place.

By the night of December 12, the vessel was afloat and two small tugs were onscene with two more expected the next morning. After the winds subsided to 15 to 20 knots on December 14, the *Chiara* was pulled free and escorted to the west side of Woods Hole where a diver's survey outlined the damage sustained. The USCG Captain of the Port (COTP)

authorized the vessel to transit to New York for dry dock repairs. No pollution was reported.

Countermeasures and Mitigation:

Preemptive boom was pre-staged to protect critical marshes and shellfish harvesting areas on the west side of the bay.

NOAA Activities:

NOAA was notified of the incident at 0340 December 11, 1992, by USCG MSO Providence who requested the SSC report onscene. The SSC was onscene by 0600 and provided trajectory estimates and resources-at-risk information. The SSC gave MSO specific recommendations on human health and aquatic hazards from the cargo listed on the DCM and periodic weather updates.

References:

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

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

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: Barge *RTC 380*
NOAA SSC: Ed Levine
Coast Guard District: 1
Date of Spill: 12/21/92
Location of Spill: Avery Point, Connecticut
Latitude: 41°18.2' N
Longitude: 072° 04.3' W
Spilled Material: diesel
Spilled Material Type: 2
Amount: 22,000 gallons
Source of Spill: non-tank vessel
Resources at Risk: Mammals—gray seals
 Birds—waterfowl (Brant and Canadian geese), swans, shorebirds, wading birds
 Shellfish—oyster, mussel, clam, and seed beds, abundant beds, harvest areas, and high concentration sites
 Crustacea—lobster nursery areas and high concentration sites
 Fish—recreational fishing, commercial fisheries, and high-use recreational fishing areas
Dispersants: N
Bioremediation: N
In-Situ Burning: N
Other Special Interest: Shoreline Survey Evaluation Form from NOAA's Shoreline Countermeasures Manual for Temperate Coastal Areas
Shoreline Types Impacted: beaches, marinas, boat ramps, high-use recreational boating areas, state parks, power plant water intakes
Keywords: evaporation, exposed rocky shores, ground truth, salvage, skimmers, sorbent boom, and sorbent pompoms

Incident Summary:

On December 21, 1992, the barge *RTC 380*, in tow by the 82-foot tug *Janice Ann Reinauer* ran aground on Black Ledge just east of the entrance to the Thames River, near Avery Point, Connecticut. At 0525, the tug reported the incident to the USCG and by 0600 a USCG 41-foot patrol boat was on scene and reported an oil sheen on the water. The barge's #1 starboard tank had been holed and approximately 22,000 gallons of #2 diesel was in the water. The starboard hold contained 39,000 gallons; the barge carried about 1 million gallons.

The temperature was 31°F; water temperature was 59°F. There were mostly sunny skies with a chance of snow flurries. Winds at the scene were 10 to 15 knots from the northwest, but were expected to shift to the southwest 12 to 18 knots later in the day. The seas were two to four feet and expected to remain in that range.

The COTP Long Island Sound was the Federal On-Scene Coordinator (FOSC) and established a local command post at USCG Station New London. A field command post was established at Avery Point, Connecticut. The Regional Response Team (RRT) agencies were notified. The barge was inspected by USCG Marine Inspection Office New York and deemed structurally sound enough to transit to a drydock in Staten Island, New York to undergo repairs. She departed her anchorage at 1615 on Tuesday, December 23.

Overflight personnel reported a two and one-half mile sheen extending to the east. A later overflight revealed that most of the sheen had moved back to the west. Protective booming was in place at Baker Cove and the Poquonock River.

The barge came off the rock and was anchored to await further lightering. A diver's survey revealed that the grounding had caused a 3- by 10-foot hole in the #1 starboard tank and three 30-foot fractures. The remaining oil was lightered before the barge was moved to New York for repairs.

Behavior of Spilled Material:

The release of about 22,000 gallons of diesel fuel from Barge *RTC 380* resulted in the spread of sheen ranging in appearance from rainbow colors to silver to gray over the area from the eastern shore of Fisher Island to the Connecticut River. Most of the shoreline directly impacted by the sheen was composed of rocky shores, manmade structures, and sand beaches. Sheens were observed in very few wetland areas. The spilled diesel persisted as sheen on the water's surface for three days because of the cold temperatures and light winds that slowed evaporation and dispersion.

Diesel is acutely toxic to animals living in the intertidal zone, but minimal long-term impacts to natural resources are expected from this incident. Studies of the *World Prodigy* spill at the mouth of Narragansett Bay in 1989 show that when heavy slicks come ashore, intertidal animals are killed, but algae survive and only short-term impacts to algae reproduction occur. Significant shoreline contamination did not take place during this incident.

Countermeasures and Mitigation:

The barge was boomed by the USCG by 0715, refloated at 1400, and totally offloaded by 0430 on December 22. The responsible party hired Clean Harbors to perform cleanup activities. Sorbent booms were deployed in areas of oil concentration in Niantic Harbor. Exclusionary boom was deployed in the Bushy Point area to ensure oil did not reach the marshes. Shoreline Assessment Teams consisting of USCG, responsible party and State representatives walked impacted areas and documented oiling.

Other Special Interests:

The Shoreline Survey Evaluation Form from NOAA's *Shoreline Countermeasures Manual for Temperate Coastal Areas* was used successfully during the shoreline assessment to document impacted areas. Suggestions for improvements to the form were made.

Connecticut shellfish areas were closed until they could be tested by the State Department of Agriculture. Tri-State Bird Rescue and Rehabilitation were on standby in the event that large numbers of oiled birds were encountered. Only four dead and about a dozen oiled birds were found.

Detectable oil vapors were reported on Fishers Island; however, no additional precautions were recommended because the vapors did not threaten human health.

The media was very interested in the spill the first day. The SSC participated in one press meeting and was interviewed several times.

NOAA Activities:

NOAA was notified of this incident at 0915 on December 21, 1992, and reported onscene at 1300 after receiving an initial briefing by telephone. The SSC provided trajectory assessments, tide information, and daily weather forecasts. The SSC advised that priority protection should be given to areas of restricted flow and low energy if the oil moves toward them. NOAA also reported the long-term impacts to natural resources that might be expected. The SSC participated in two overflights, produced several overflight maps, and provided graphics representing oil fate and weather effects (evaporation).

NOAA told responders that the cold air and water temperatures could cause the spilled diesel to persist longer on the water's surface resulting in a higher potential for dissolution and dispersion of lighter fractions into the water column. Should a plume of dispersed/dissolved oil enter shallow embayments and river mouths, it could penetrate sediment and damage salt-marsh vegetation.

NOAA was onscene for three days.

References:

Cobb, D. J., S. J. Fluck, and J. L. Lake. 1989. Chemical monitoring of the *World Prodigy* oil spill, *Proceedings of the Conference on Oil Spills: Management and Legislative Implications*, May 15-18, 1990, Newport, RI, pp. 313-324.

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

NOAA. 1992. *Shoreline Countermeasures Manual for Temperate Coastal Environments*. Seattle: Hazardous Materials Response and Assessment Division. 89 pp.

NOAA Hotline 110, 13 reports

Pilson, M. E. 1990. Chemical and biological observations after the *World Prodigy* oil spill, *Proceedings of the Conference on Oil Spills: Management and Legislative Implications*, May 15-18, 1990, Newport, RI.

Research Planning Institute. 1984. *Sensitivity of coastal environments and wildlife to spilled oil: Connecticut. An atlas of coastal resources*. Seattle: Ocean Assessments Division, NOAA. 17 maps.

Thursby, G., R. Steele, M. Tagliabue, and C. Sheehan. 1990. Sexual damage and recovery from the *World Prodigy* oil spill, *Proceedings of the Conference on Oil Spills: Management and Legislative Implications*, May 15-18, 1990, Newport, RI, pp. 291-301.

Name of Spill: Naval Air Station, Brunswick (NASB)
NOAA SSC: Stephen Lehmann
USCG District: 1
Date of Spill: 3/28/93
Location of Spill: Brunswick, Maine
Spilled Material: jet petroleum #5 (JP-5)
Spilled Material Type: 1
Amount: 1,500 barrels
Source of Spill: tank farm
Resources at Risk: Vegetation: cattail marsh
Fish: rainbow smelt, shortnose and Atlantic sturgeon, striped bass, American shad, Atlantic salmon, smallmouth bass, common sucker, white and yellow perch,
Birds: kingfishers, wood ducks, and local song birds
Dispersants: N
Bioremediation: N
In-situ Burning: Y
Other Special Interest: unique command structure, Native American burial ground
Shoreline Types Impacted: freshwater, cattail marsh, and riverine shoreline
Keywords: in-situ burning, sorbent boom, vacuum trucks

Incident Summary:

On March 27 or 28, 1993, it is speculated that a large mass of snow fell from the roof of a NASB fuel storage tank, activating a lever that opened a valve. With the valve open, some 63,000 gallons of jet petroleum #5, commonly known as JP-5, poured into the bermed area around the tank into an open-water drain. This drain led to a stream off site, eventually running into the Androscoggin River through a small cattail marsh. The open valve went undetected until passing motorists contacted local officials because of the strong petroleum odor. Local officials tracked the fuel to the NASB tank and secured it, then notified the responsible state and federal agencies.

The U.S. Navy (USN) immediately installed two underflow dams, one at the head of the marsh to trap oil in the upper marsh, and two at the main outfall of the marsh into the Androscoggin River. Sorbent boom, hard boom, and hay bales were installed at various locations.

The weather at the time of the release was 65° to 70°F and sunny with snow on the ground. There was an ice cover on the river and substantial snow in the marsh. By March 31 the weather had turned cold and a winter storm watch was in effect. The marsh was mostly frozen; only the main channels remained open. The area received 18 inches of snow from the storm.

Cleanup continued for several days using vacuum trucks and personnel using snow shoes; while deeper in the marsh waters, boats were used. An estimated 45,000 gallons of JP-5 were recovered.

As the thickness of the floating product decreased, so did the effectiveness of the vacuum trucks. Response agencies began to discuss other options; burning in place seemed to be a good potential solution.

The oil caused the death of two female woodducks. No other casualties or injuries to wildlife were reported.

Behavior of Spilled Material:

By March 30 the JP-5 had emulsified and it was estimated that 70 percent of the recovered liquid was an emulsified oil-water mix. The JP-5 volatilized slower than expected for a light oil. Navy jet fuel is specially formulated to lessen the risk of explosion because it is often stored aboard ships.

Countermeasures and Mitigation:

Planning for the in-situ burn included a small test burn; notifying local officials; putting the Brunswick, Maine and NASB fire departments on stand-by onscene with charged fire hoses; identifying minimum weather conditions; establishing safety zones and safety procedures; building a coffer dam to restrict the upstream burn; and closing the NASB runways during the main burn. It was decided that two state DEP responders would start the burn, each wearing fire-retarding turnout gear.

The media was informed and the story of the upcoming in-situ burn was broadcast so the population would not become alarmed if a large dark cloud appeared.

The burn began late morning on April 6, 1993. The state DEP representatives used sorbent pads soaked in JP-5 to light the marsh. The floating fuel ignited easier than was expected and burned remarkably well. The initial burn lasted almost two hours without needing to be re-ignited. The smoke was seen in Portland, 30 miles south and Augusta, 40 miles north, and was recorded by NASB aircraft to be between 2,000 and 6,000 feet high. The burn was videotaped from a fixed-wing, single-engine USN aircraft by the U.S. Environmental Protection Agency (EPA).

During the first day of burning, EPA technical assistance teams conducted air monitoring in the area. They sampled for volatile organic compounds and particulate (PM-10).

As the initial burn began to subside, additional pools of JP-5 were ignited. The marsh was burned in various locations for eight hours. The cattail stalks that remained in the marsh acted as wicks in some areas, pulling the fuel from under the ice.

Responders continued the burn on April 7 in the ice of the Androscoggin River. Channels and openings were cut to allow fuel to seep in and a sorbent pad was used as a wicking agent. Responders returned the following day and burned the marsh for an additional four hours. These fires were considerably smaller than earlier ones, but continued to remove fuel. After three days of burning it was felt that the marsh should begin to flush naturally.

DEP crews returned to the original burn site on April 14 and re-ignited product remaining from the earlier burn and new product that had accumulated.

Other Special Interest:

The responsible party was the Department of Defense (DOD). Although the USCG remains the pre-designated FOSC for spills coming from a DOD facility, the DOD also acts as the On-Scene Coordinator (OSC). Cooperation between the USCG and the USN during this spill was outstanding.

A Native American burial ground was near the staging area. Archaeologists for the State of Maine speculate that the remains could be as much as 9,000 years old. Special care was taken not to unduly disturb the site.

NOAA Activities:

The NOAA SSC was notified of the incident on March 29, 1993, by MSO Portland while attending the International Oil Spill Conference in Tampa, Florida. Also attending the conference were the FOOSC, the State OSC, and the Department of the Interior and NOAA trustee representatives. The SSC provided resources-at-risk information and warned against cleanup workers walking in the oil marsh. The SSC worked on the spill from Florida until he went onscene April 2.

The FOOSC asked the SSC to help gather and coordinate information to help make a decision on in-situ burning, and to obtain approval from the concurrence network of trustee agencies (as defined by the National Contingency Plan).

The International Oil Spill Conference proved to be an excellent forum to discuss in-situ burning because most of the key experts on that subject and on oiled wetlands were present. After discussing the situation, it was felt that burning over a frozen marsh would not put undue stress on the environment and would eliminate a large amount of oil before the return of many of the marsh's seasonal inhabitants.

On April 15 the SSC met with the USN OSC, FOOSC, and state representatives to review conditions caused by heavy rains. The rains raised the water level enough to overflow the underflow dam and render it useless. A beaver dam at the southeast of the marsh continued to hold water and some product. It was decided to remove the beaver dam to take advantage of the high water level to allow the marsh to flush naturally.

References:

NOAA Hotline 121, 12 reports

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: Alden Leeds Inc. Warehouse
NOAA SSC: Ed Levine
USCG District: 1
Date of Spill : 04/10/93
Location of Spill: Kearny, New Jersey
Latitude: 40°43.5 ' N
Longitude: 74°07' W
Spilled Material: chlorine
Spilled Material Type: 5
Amount : 2 million pounds
Source of Spill: facility
Resources at Risk: rodents, population concentration areas, waterfowl, shorebirds, gulls, terns, anadromous fish, estuarine fish, boat ramps, high-use commercial shipping area
Dispersants: N
Bioremediation: N
In-situ Burning: Yes
Other Special Interest: none
Shoreline Types Impacted: coastal structures, consolidated seawalls, consolidated shores, piers, riprap
Keywords: none

Incident Summary:

On April 10, 1993, the Alden Leeds Inc. warehouse caught fire in Kearny, New Jersey. The facility is located near Newark Bay, the Passaic River, and several major highways. The on-scene weather was 47°F, with eight-knot winds from the southeast, calm seas, and overcast skies.

The USCG was notified of the incident at 1305 by the Kearny Police Department, who told them the warehouse reportedly contained two million pounds of chlorine. The police evacuated all areas west of the facility.

The AST and a USCG boat crew went to the scene and made Level B entries into the warehouse to assess the situation.

Behavior of Spilled Material:

The water used to fight the fire mixed with the chlorine and entered the Passaic River. The AST sampled the runoff and found low levels of chlorine. Only areas near the warehouse were impacted, but the smoke-plume traveled several hundred meters downwind.

The amounts spilled and recovered were not determined. Approximately 57 to 75 tons of chlorine in pellet form remained in the warehouse after the fire. The facility used a water cascade system to neutralize the remaining chlorine. The New Jersey Department of Environmental Protection and Energy (DEPE) monitored the process continuously to ensure the chlorine/water mixture did not exceed three parts per million (ppm).

Other Special Interest Issues:

Shipping lanes and vehicle traffic routes were closed.

NOAA Activities:

NOAA was notified of the incident on April 10, 1993, by the USCG COTP New York. The SSC was unable to reach the scene, because of the closed traffic routes, so NOAA responded by phone and fax.

NOAA discussed the health and safety hazards associated with chlorine exposure and told the MSO that chlorine is a highly toxic gas, which causes severe eye and respiratory tract irritation upon contact. Sensitive individuals (the very young and very old and people with respiratory disease) are particularly susceptible to chlorine exposure. NOAA recommended minimizing exposure of the general population and using appropriate protection measures for emergency responders.

NOAA provided an air plume dispersion trajectory while supporting this incident for one afternoon.

References:

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

Name of Spill:	Amtrak
NOAA SSC:	Ed Levine
USCG District:	1
Date of Spill:	05/25/93
Location of Spill:	Bronx, New York
Latitude:	40°59' N
Longitude:	73°56' W
Spilled Material:	PCB
Spilled Material Type:	5
Amount:	100 gallons
Source of Spill:	commuter train
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
<i>In-situ</i> Burning:	N
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

At about 1130 on May 25, 1993, a southbound commuter train passing through the Bronx, New York ruptured a transformer and sprayed approximately 100 gallons of polychlorinated biphenyls (PCBs) over two miles of Track 4.

At the time of the incident it was sunny with air temperature in the 70s, but showers were forecast for the evening.

A cleanup contractor was hired to remove the spilled PCBs and AST personnel were sent to oversee the cleanup. Areas of obvious contamination were removed.

Behavior of Spilled Material:

The impacted area was composed of gravel, railroad ties, and cement sidings. Most of the released chemical was removed.

Countermeasures and Mitigation:

Removal and disposal of spilled material or contaminated debris was performed by cleanup contractors in protective clothing using respiratory protection.

NOAA Activities:

NOAA was notified of the incident on May 25, 1993, by the USCG COTP New York. The SSC did not report to the scene, but reported by phone that the material would not dissipate rapidly and would disperse, but not dissolve, in a rain shower. The SSC also advised that PCBs are not water soluble so storm drains should be protected and all responders should avoid skin and/or eye contact.

NOAA supported this incident for one afternoon.

References:

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

U.S. Coast Guard District 2/9

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Name of Spill: ALCOA Specialty Chemicals
NOAA SSC: Jay Rodstein
USCG District: 2
Date of Spill: 10/01/92
Location of Spill: Nashville, Tennessee
Latitude: 36°09' N
Longitude: 86°47' W
Spilled Material: sodium aluminate
Spilled Material Type: 5
Amount: 130,000 pounds
Source of Spill: transfer from tank to railcar
Resources at Risk: fisheries
Dispersants: N
Bioremediation: N
In-situ Burning: N
Other Special Interest: none
Shoreline Types Impacted: riprap and unvegetated steep banks and cliffs
Keywords: none

Incident Summary:

At 0930, on October 1, 1992, approximately 130,000 pounds of sodium aluminate was spilled at the ALCOA Specialty Chemicals facility on the Cumberland River, Nashville, Tennessee. The manifold of a four-inch pipe at the railcar loading area had been left open after a transfer on the night of September 30. Weather at the time of the incident was sunny and clear, winds at 5 miles per hour out of the east, and air temperature 67°F.

The U.S. Coast Guard (USCG) Marine Safety Detachment Nashville was notified by ALCOA and acted as First Federal Official On Scene until the representative from the U.S. Environmental Protection Agency (EPA) Region IV arrived. The USCG Captain of the Port (COTP) Paducah closed the river until a site assessment could be performed. ALCOA hired a cleanup contractor to remove the sodium aluminate from the area and prevent additional product from entering the river. The river was reopened at 1230.

EPA arrived at 1345 and coordinated a monitoring plan to measure pH along the river. Cleanup was conducted without incident or further release into the river, and was completed on October 2.

Behavior of Spilled Material:

The material was liquid and totally soluble in water. Measurements of pH taken approximately four hours after the spill revealed no above-background concentrations and no impacts to flora or fauna were observed. Of the estimated 130,000 pounds spilled, 3,000 pounds entered the water, none of which was recovered. Most of the spilled material remained on land and was removed and reprocessed at the facility.

Countermeasures and Mitigation:

Berms and dikes at the facility contained most of the released material. Because of the total solubility of sodium aluminate, recovery from the water was impossible, so emphasis was placed on containing the material on land. Recovery from land was feasible and neutralization of soils, in place, reduced the need to remove contaminated materials for disposal. Most of the material spilled on land was recovered by vacuum trucks and was reprocessed at the facility.

NOAA Activities:

NOAA was notified of the incident at 1030 October 1, 1992, by USCG COTP Paducah who asked for advice regarding fate and effects of sodium aluminate in the river and for monitoring recommendations.

The NOAA Scientific Support Coordinator (SSC) provided an assessment of the spill and recommendations to the OSC. The SSC reported that the only environmental effect would be acute (i.e., fish kill) because the soluble product would fully dissolve and become less concentrated over time and distance from the source. NOAA also reported that based on a quantity of 30,000 pounds and river flow data received from the U.S. Army Corps of Engineers the pH should return to background levels within several miles of the source. The SSC advised that water users should be notified so that they could monitor their water or shutdown until monitoring could be provided. Monitoring at several levels (i.e., surface, mid-water, and bottom) should be undertaken to ensure the plume is clearly defined.

Cleanup was completed by the responsible party with EPA oversight on October 2, 1992.

References:

NOAA Hotline 104, 3 reports

Name of Spill:	<i>Automatic Die Casting Removal Project</i>
NOAA SSC:	Jay Rodstein
USCG District:	9
Date of Spill:	12/07/92
Location of Spill:	St. Clair Shores, Michigan
Latitude:	42°23.0' N
Longitude:	82°55.0' W
Spilled Material:	alkaline solutions
Spilled Material Type:	5
Amount:	476 barrels
Source of Spill:	facility
Resources at Risk:	human health
Dispersants:	N
Bioremediation:	N
<i>In-situ</i> Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

On November 4, 1992, EPA Region V initiated a removal action of alkaline solutions containing high concentrations of copper, total cyanide, amenable cyanide, and other corrosive and acidic solutions with high concentrations of nickel, copper, and hexavalent chromium at the Automatic Die Casting facility, St. Clair Shore, Michigan. The responsible party had started the removal action but was unable to complete it because of financial hardship. A contingency plan for the potential release of cyanide was developed, and the cyanide-bearing liquids were removed December 9 through 11. Additional actions at the site included removing other hazardous solids and liquids, evaluating and treating standing water at the facility, and cleaning the plating equipment. These actions were completed in February 1993.

Countermeasures and Mitigation:

Air monitoring, both real-time and for subsequent analytical evaluation, was conducted during the liquid bulking and removal operations. No cyanide releases were observed. The cyanide-bearing liquids were removed to three facilities: Dynacol, Detroit, Michigan (16,000 gallons); Cyanokem, Detroit, Michigan (13,000 gallons); and Eticam, Warwick, Rhode Island (1700 gallons).

NOAA Activities:

NOAA was notified of the incident on December 7, 1992, by the EPA OSC who asked NOAA to provide air dispersion estimates for several potential cyanide release scenarios to be included in the contingency plan. NOAA provided the requested information to the OSC on December 7. No further support was requested.

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 5

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Name of Spill:	Mystery Spill off Virginia Beach
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill :	10/13/93
Location of Spill:	Virginia Beach, Virginia
Spilled Material:	heavy black oil
Spilled Material Type:	4
Amount:	unknown
Source of Spill:	unknown vessel
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

On Wednesday, October 13, 1993, the U.S. Coast Guard (USCG) Marine Safety Office (MSO) Hampton Roads received a report of black oil five miles off the coast of Virginia Beach. On Thursday, October 14, the oil landed at Sandbridge, Virginia.

NOAA Activities:

NOAA was notified of the incident on October 13, 1993, by MSO Hampton Roads who requested a trajectory analysis for the unknown amount of oil. Based on the information provided, NOAA suggested that the size of the slick suggested a spill between 1 and 300 barrels from an area near the outbound lane of the channel. Landfall of the material was forecast based on current and forecasted winds and currents north of Wash Flats, an area ten miles south of Virginia Beach. Actual landfall was in this area on the morning of October 14.

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 Virginia*. Boulder Colorado: Hazardous Materials Response Project, NOAA. 104 maps.

Name of Spill:	City Gas and Transmission Corporation
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill:	Seepage Case, November 1991- present
Location of Spill:	Wilmington, North Carolina
Latitude:	34°05'N
Longitude:	79°55'W
Spilled Material:	weathered oil
Spilled Material Type:	unknown
Amount:	unknown
Source of Spill:	facility
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	innovative cleanup techniques
Shoreline Types Impacted:	none
Keywords:	bioremediation, sorbent booms, sorbent pads , chemical characterization, Atlantic Strike Team (AST), groundwater contamination, monitoring wells, French drain, COIL, remediation, information management

Incident Summary:

The City Gas and Transmission Corporation (CG&T) is an abandoned refinery located on the east bank of the Cape Fear River just south of the Cape Fear Memorial Bridge in Wilmington, North Carolina. The refinery was designed to process and store heavy heating oil and light distillates, but ceased operations in 1986. Since it has no dock, CG&T is not a designated waterfront facility. A 20-foot wide drainage canal on the property runs about 200 feet perpendicular to the river, then connects to a city storm drain outlet to the Cape Fear River. The storm drain is fed by a 16-square city-block area and at high tide, water fills the canal to its banks; at low tide, it only produces a 6-foot wide stream.

Behavior of Spilled Material:

In March 1991, USCG MSO Wilmington personnel saw oily black material leaching into the water from the north bank of the drainage canal. The canal drains directly to the Cape Fear River constituting discharge of oil into U.S. waters. Monitoring wells were placed near the site of the leaching to determine the extent and source of the plume. Analysis of the groundwater monitoring data revealed a plume of oil that stretched from the site of leaching upslope below a nearby pump pit and below the nearest storage tank (tank 13).

Countermeasures and Mitigation:

When the leaching oil was discovered, Wyandotte Tribal Petroleum immediately began actions to prevent oil from reaching the river. Specialized Marine Inc. (SMI) was contracted to place sorbent booms and pads in the drainage canal in an attempt to contain the product. A terminal boom was placed at the mouth of the canal. SMI subcontracted Clark Environmental to provide professional geologic and hydrogeologic services. Initial site characterization was accomplished by installing 23 monitoring wells, identifying free product, and evaluating hydrogeologic data. Subsurface free product removal was initiated by installing a recovery well. The recovery well was pumped continuously and other wells were pumped intermittently when product began to accumulate.

Initial plume delineation and groundwater contour suggested that tank 13 was a potential source. Operating on this assumption, the tank was emptied and cleaned for inspection. The floating top of the tank had collapsed and it was considered likely that the tank's bottom had been damaged too. An inspection of the tank's bottom revealed no structural failure, confirming that tank 13 was not the source of the release.

The plume area was excavated to locate the source of the release. Contaminated soil removed from the area was stored onsite in compliance with state and federal guidelines. The excavated area was backfilled with local construction debris. During the excavation a pipe and valve were discovered leading from the adjacent pump pit, which the USCG Central Oil Identification Laboratory (COIL) later confirmed to be the source of the leak. These results were supported by separate analysis by NOAA's chemical consultant at the Louisiana State University (LSU) Department of Environmental Studies.

Once the source was determined (a "French drain" type arrangement), steps were taken to remove the contaminated soil and design a recovery system. The North Carolina State requirement that all water pumped from any recovery well must receive extensive water treatment would have required installation and maintenance of an expensive water treatment system. Consequently, a passive recovery system was designed and implemented. The passive recovery system consists of a trench and impervious barrier that runs parallel to the canal to prevent further discharge of product into the water. Since the width of the plume at the discharge point was relatively narrow, oil would temporarily accumulate against the barrier for recovery. A series of perforated 55-gallon drums was placed in the trench to provide a large surface area for recovering the oil. Sorbents were placed in the drums and periodically replaced when no longer effective. This method was a low-cost alternative to an active recovery system and stopped the discharge of oil into the canal.

Special Interest Issues:

Although this incident may be best characterized as a remediation project, the USCG took responsibility for cleanup of the site because of the discharge to U.S. waters. Several spills on or near the facility that were not related to the CG&T oil seepage event and numerous barrels and containers of unknown material requiring a hazard evaluation by the USCG Strike Team added more difficulty to the response.

NOAA Activities:

NOAA became involved in this incident on November 5, 1991, when MSO Wilmington requested that the Scientific Support Coordinator (SSC) participate in an initial site survey with the USCG District 5 Safety and Health Coordinator.

With the aid of site records and test results, the SSC helped the AST and Captain of the Port (COTP) Wilmington develop solution options, goal definitions, and range-of-action options for the facility. The initial outline of the recommendations was forwarded to a NOAA contractor for further evaluation. The contractor made an on-site visit in November 1991 and reported observations to the COTP Wilmington.

The SSC, COTP, and the State of North Carolina met in July 1992 to develop options for installing a recovery well. North Carolina required that water taken from wells be treated before discharge and ruled that an injection well would not be permitted. The cost and permit processing needed to develop a groundwater treatment system was prohibitive. A passive collection system that requires no pumping of groundwater was initiated.

The SSC and COTP Wilmington returned to the site in November 1992 to review the ongoing investigation and assess the need for additional actions to stop the discharge. In September, excavations had uncovered a drainage pipe and valve leading from the pump pit. It was theorized that this pipe was the source of the discharge because it was located at the head of a well-defined plume and wide fluctuations in product thickness had been reported from the nearest monitoring well. The pipe was secured and a passive oil recovery system was recommended to eliminate further leaching.

The SSC provided the COTP with an information management system. The system included an index of common files, a database for the incident, and an outline of events and all related actions. The COTP was provided an LSU analysis of samples received from COIL showing a strong correlation between the oil found in the pump pit drain and that found in the drainage canal.

The SSC concluded the response in December 1992 after an on-site visit.

Name of Spill:	M/V <i>Cape Hudson</i>
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill:	12/11/92
Location of Spill:	Chincoteague Inlet, Chincoteague Shoals, Virginia
Latitude:	037°27' N
Longitude:	075°09' W
Spilled Material:	bunker oils and #2 diesel
Spilled Material Type:	2 and 4
Amount:	potentially 9,100 barrels
Source of Spill:	container vessel
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none

Incident Summary:

The M/V *Cape Hudson* was under tow by the tug *Elsbeth II* from Rhode Island to Newport News, Virginia in a "dead ship" status (i.e., the vessel was without power and carried no personnel). The tow line parted because of heavy weather and the tug was unable to obtain the emergency hawser cable. The *Cape Hudson* drifted downwind with the potential to go aground on Chincoteague Shoals, Virginia. On December 12 a USCG helicopter placed emergency ship's personnel on the *Cape Hudson* who released the emergency towing hawser. The tug *Elsbeth II* recovered the emergency towline and took the *Cape Hudson* in tow to Norfolk with no further incidents.

The weather at the time of the incident was very heavy with an offshore wind.

NOAA Activities:

NOAA was notified of the incident on December 11, 1992, by MSO Hampton Roads who requested that the SSC report to the MSO offices in Norfolk, Virginia to participate in the response planning. NOAA provided a trajectory that showed that the *Cape Hudson's* drift trajectory was directly towards Chincoteague Inlet; however, the shoaling waters at that location should ground the vessel more than a mile from the shoreline. NOAA suggested that, because of the heavy weather at the time of the spill, the vessel would not run aground on the Virginia shoreline.

References:

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

NOAA Hotline 108, 4 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:	M/V <i>Lyra</i>
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill:	01/26/93
Location of Spill:	Frying Pan Shoals, North Carolina
Latitude:	034° 09' N
Longitude:	076°30' W
Spilled Material:	bunker oil and #2 diesel
Spilled Material Type:	2 and 4
Amount:	8,070 barrels
Source of Spill:	container vessel
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none

Incident Summary:

On January 26, 1993, the M/V *Lyra* was under tow by the tug *Mark McAllister* from New York to Charleston, South Carolina in a "dead ship" status (i.e., the vessel had no power and no personnel) when the tow line parted causing the *Lyra* to drift downwind at three knots with the potential to ground on Frying Pan Shoals, North Carolina. Winds 35 to 40 knots and seas running 16 to 18 feet made retrieving the emergency towing hawser impossible for the tug's crew. The McAllister Tug Company and Lykes Shipping arranged to have four persons flown out to the vessel by a U.S. Marine helicopter. The helicopter successfully placed emergency ship's personnel on the M/V *Lyra* who were able to drop the vessel's port anchor. On January 31 the M/V *Lyra*'s crew connected appropriate towing hawsers and continued the tow without further incident.

NOAA Activities:

NOAA was notified of the incident on January 26, 1993, by MSO Hampton Roads. The SSC was asked to participate in the response planning at the MSO offices in Norfolk, Virginia. NOAA's trajectory analysis of the *Lyra* projected that, at her current rate of drift, she would miss the Frying Pan Shoals area.

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 North Carolina*. Boulder, Colorado: Hazardous Materials Response Project, NOAA. 113 maps.

Name of Spill:	F/V <i>Elizabeth C</i>
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill :	01/29/93
Location of Spill:	Chesapeake Bay Bridge-Tunnel, Virginia
Latitude:	36°58' N
Longitude:	76°07' W
Spilled Material:	#2 diesel fuel
Spilled Material Type:	1
Amount:	83 barrels
Source of Spill:	fishing vessel
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none

Incident Summary:

The F/V *Elizabeth C*, a 72-foot trawler, ran aground January 29, 1993. The vessel was carrying about 10 tons of ice and 3,500 gallons of fuel when it hit the rocks near the south end of the Chesapeake Bay Bridge-Tunnel. Crew members were uninjured. MSO Hampton Roads arranged for the fuel onboard to be removed by International Marine Services (IMS), the local oil spill response contractor. The vessel was towed off the rocks to a Hampton repair facility on January 31, 1993.

NOAA Activities:

NOAA was notified of the incident on January 30, 1993, by MSO Hampton Roads. The NOAA SSC participated with the MSO staff and the representatives of Virginia in an overflight of the spill scene. Although the threat to environmental resources was not a problem during this response, NOAA provided an assessment of potential environmental resources that could be potentially at risk if the spill turned out to be larger than originally estimated.

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 Virginia*. Boulder, Colorado: Hazardous Materials Response Project, NOAA. 104 maps.

Name of Spill: M/V *Ellen Knutsen*
NOAA SSC: Ed Levine
USCG District: 5
Date of Spill: 03/31/93
Location of Spill: Philadelphia, Pennsylvania
Latitude: 40°00' N
Longitude: 75°04' W
Spilled Material: cumene
Spilled Material Type: 5
Amount: 40 barrels
Source of Spill: tank vessel
Resources at Risk: waterfowl, shorebirds, wading birds, gulls, terns, raptors, anadromous fish, spawning streams, estuarine fish, demersal fish, industrial water intakes
Dispersants: N
Bioremediation: N
In-situ Burning: N
Other Special Interest: perceived human health threats
Shoreline Types Impacted: coarse-gravel beaches, coarse-sand beaches, coastal structures, consolidated seawalls, developed upland, freshwater flat, freshwater marshes, fringing salt marshes, mixed-sediment beaches, piers, riprap, sand/gravel beaches, sheltered seawalls, sheltered tidal flats, tidal mudflat, vegetated riverbank
Keywords: CDC, evaporation, Tri-State Bird Rescue Research Center

Incident Summary:

At 0003 March 31, 1993, the USCG MSO Philadelphia was notified by Tioga Marine Terminal of an acetone-like odor in the area. At the time of the incident there were partly cloudy skies, winds east 5 to 10 knots, and a temperature of 60°F.

MSO personnel estimated that between 32,000 to 600,000 gallons of cumene had been released from the M/V *Ellen Knutsen* into the Delaware River. The 442-foot *Ellen Knutsen* was docked at the GATX terminal in Port Richmond, Pennsylvania just south of the Betsy Ross Bridge on the Delaware River. The source of the release was a two-inch crack between the #5 starboard segregated ballast tank and the #10 starboard cargo tank. This crack permitted cargo to leak into the adjacent ballast tank. The ballast-cumene mixture discharged into the river during deballasting. The spill spread downstream as far as Camden, New Jersey and upstream to near the Tacony-Palmyra Bridge. GATX personnel stopped transfer operations as soon as the spill was discovered. The total estimated release was 16,000 gallons.

The Philadelphia Fire Department Hazardous Materials (HAZMAT) Team, New Jersey Department of Environmental Protection and Energy, U.S. Environmental Protection Agency (EPA) for regions II and III, Pennsylvania Department of Environmental Resources, and USCG AST were onscene. Air monitoring revealed levels below two ppm at the dock and zero on the water.

Behavior of Spilled Material:

The product was a colorless, alkylated benzene liquid that produced a sheen in areas of heavy concentrations. The cumene moved with the flow of the river and tide and the odor of the material was detected several miles from the source. Although cumene is not very soluble in water and only a localized fish kill might be expected, it is highly toxic to birds. The spill's proximity to downtown Philadelphia also caused concerns about public health.

The Agency for Toxic Substances and Disease Registry (ATSDR) indicated that this material was used as a motor fuel additive; was not immediately dangerous to life; was not very volatile; was combustible, but not flammable; was an irritant to eyes and the upper respiratory tract; and, depending on the concentration and duration of exposure, symptoms could include irritation, dermatitis, narcosis, and coma. The agency could not comment on specific public health concerns without knowing the exact concentrations in the air surrounding the source of the spill. The air monitoring devices HNU Systems Inc. Photoionization Detector or Organic Vapor Analyzer would be able to measure those concentrations in air.

Due to the behavior of the product (similar to diesel fuel) and the possible health hazards involved from exposure to the chemical, the material was allowed to evaporate naturally and was washed out from under dock areas by fire hoses. None of the cumene spilled was recovered.

Countermeasures and Mitigation:

The Philadelphia Fire Department HAZMAT Team took control of the response at the incident site. Offloading and lightering operations were discontinued and the vessel remained at the GATX terminal until April 1 when it was moved to anchorage in the Delaware River to facilitate removing the product trapped under the piers.

Commercial and public lands were closed until air monitoring revealed safe levels, and shipping lane and vehicle traffic route closures were in effect for the first few hours of the response.

Diversions and protective booms were placed at creek mouths and water intakes as precautionary protection for these sensitive areas. Open-water recovery or shoreline cleanup were not undertaken.

Other Special Interest Issues:

Because of the hazardous nature of the product, Tri-State Bird Rescue Research Center decided not to jeopardize the health of their volunteers by undertaking wildlife rehabilitation. No reports of injured animals were received.

NOAA Activities:

NOAA was notified of the incident on March 31, 1993, by MSO Philadelphia who requested the SSC report on scene. The SSC notified the Chemical Transportation Emergency Center (CHEMTREC), an industry-sponsored chemical information hotline; Centers for Disease Control (CDC); ATSDR; Tri-State Bird Rescue; and NOAA's Damage Assessment Center.

NOAA indicated that the spill site was above tidal influence and the product would flow mainly downriver and recommended flushing areas of collected product out from under docks and piers with fire hoses to speed evaporation.

The SSC informed MSO that cumene is not a carcinogen at the reported odor threshold of 0.05 to 2 parts per million (ppm), but recommended that workers wear Level B protective clothing and use self-contained breathing apparatus at concentrations greater than 500 ppm and Level B for workers. Below 500 ppm, respirators and level C should suffice.

NOAA supported this spill for one day.

References:

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

NOAA Hotline 122, 5 reports

Name of Spill: Baltimore Gas and Electric
NOAA SSC: Gary Ott
USCG District: 5
Date of Spill 06/01/93
Location of Spill: Patapsco River, Baltimore, Maryland
Latitude: 39°10' N
Longitude: 76°29' W
Spilled Material: #6 fuel oil
Spilled Material Type: 4
Amount: 12 barrels
Source of Spill: transfer line
Resources at Risk: marsh grass, benthic organisms, sand beaches.
Dispersants: N
Bioremediation: N
In-situ Burning: N
Other Special Interest: none
Shoreline Types Impacted: sheltered marsh grasses, seawalls and piers, sand beaches.
Keywords: vacuum trucks

Incident Summary:

The USCG MSO Baltimore received notification from Baltimore Gas and Electric (BG&E) that they had spilled between 300 and 500 gallons of #6 fuel oil into the Patapsco River off Baltimore while hydrotesting a transfer line. The BG&E contractors had installed containment boom at the facility and were removing the oil using vacuum trucks. Approximately one mile of shoreline was impacted with scattered patches of oil. The most impacted shoreline was located on the west side of Rock Point, at Fort Smallwood State Park. BG&E contractors removed oil using shovels and rakes from the sandy shoreline, but did not attempt cleanup of oiled marsh grasses. A combined field survey of the oiled areas by Federal, state, and local officials on June 4 concluded that the marsh grasses would be least impacted if no aggressive cleanup effort was conducted.

Behavior of Oil:

An estimated 300 to 500 gallons of oil were reported lost from the transfer line; much of this was contained near the BG&E facility. However, oil that escaped initial containment moved with the tide towards the mouth of the Patapsco River and coated approximately one mile of shoreline with scattered patches of oil. Of specific concern to the MSO was approximately 1,000 yards of marsh grasses in two locations that were coated with a band of oil 12 inches wide.

Countermeasures and Mitigation:

Oil spill response contractors from two local companies used hard boom near the facility to contain spilled oil, which was removed using vacuum trucks. The contractor used sorbents to remove floating oil that had escaped containment. Oil that had impacted sand beaches was put in plastic bags using rakes and shovels. A gentle flush of the marsh grasses using low-pressure high-volume pumps was attempted under the careful supervision of MSO Baltimore, but was terminated when very little oil was removed and there was a great potential for damage to the grasses.

NOAA Activities:

NOAA was notified of the incident on June 3, 1993, by the USCG MSO Baltimore. The MSO requested assistance evaluating the cleanup of the shoreline with special emphasis on the oiled marsh grasses. On June 4 the SSC coordinated on-scene evaluations with the State of Maryland, the U.S. Army Corps of Engineers, and the U.S. Fish and Wildlife Service. The team members concurred that additional efforts to clean the marsh grasses would result in more damage to the marsh than would discontinuing cleanup efforts.

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:	Mystery Spill Hampton Roads
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill:	06/18/93
Location of Spill:	Norfolk, Virginia
Latitude:	36°58' N
Longitude:	76°23' W
Spilled Material:	weathered bilge oils, waste oil
Spilled Material Type:	4
Amount:	unknown
Source of Spill:	unknown vessel bilge
Resources at Risk:	recreational vessels
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	cleanup of recreational vessels
Shoreline Types Impacted:	seawalls and piers
Keywords:	none

Incident Summary:

On Friday, June 18, 1993, a mystery oil spill was reported trailing from the Port of Hampton Roads in the Elizabeth River past the Harbor Tunnel and into Chesapeake Bay. The oil was reported as a mixture of heavy oils and oil and water emulsions that looked like bilge slops. The hot summer weather caused the oil to immediately adhere to numerous recreational vessels moored in the Port of Hampton Roads. While widespread, the spill was not considered major, either in volume or in environmental impact. Boat owners were advised that they would be eligible for reimbursement through the Oil Spill Liability Trust Fund. The USCG's contractor, IMS of Hampton Roads, completed on-the-water cleanup of the oil by June 20, 1993.

Behavior of Oil:

The slick appeared to be a mixture of waste oils that probably originated from a vessel's bilge. The amount of oil released was never estimated. No shoreline impacts were reported, although the thin sheet of oil spread in streaks over a 22-mile area of the Elizabeth River and the Port of Hampton Roads. The heavy oil was recovered using sorbents and snares.

Countermeasures and Mitigation:

IMS removed the mixture of heavy and emulsified oil using sorbent materials where possible but did not try to remove oil from harbor piers and riprap. A U.S. Navy skimmer stationed at Little Creek was dispatched to a reported concentration of oil outside the Chesapeake Bay Harbor-Tunnel; however, the skimmer was unable to recover any oil. No shoreline cleanup was conducted.

Other Special Interest Issues:

A large number of recreational boaters were angered by the black oil that placed a film of black oil on their vessels. The boaters were instructed to call the MSO for information on reimbursement eligibility. The MSO received more than 100 calls.

NOAA Activities:

NOAA was notified of the incident on June 18, 1993, by MSO Hampton Roads. The SSC, along with the MSO staff and representatives of Virginia, participated in a survey of the spill scene in a small boat. Although the threat to environmental resources was not a problem during this response, NOAA provided an assessment of environmental resources that could potentially be placed at risk if the spill became larger than originally estimated.

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 Virginia*. Boulder, Colorado: Hazardous Materials Response Project, NOAA. 104 maps.

Name of Spill: CELOTEX
NOAA SSC: Ed Levine
USCG District: 5
Date of Spill: 06/21/93
Location of Spill: Philadelphia, Pennsylvania
Latitude: 39°56.5' N
Longitude: 75°12.2' W
Spilled Material: mixed heavy oils
Spilled Material Type: 4
Amount: 25 barrels
Source of Spill: facility
Resources at Risk: rodents, anadromous fish, spawning stream, State Park
Dispersants: N
Bioremediation: Y
In-situ Burning: N
Other Special Interest: Level C protection, heat exhaustion, air monitoring
Shoreline Types Impacted: coastal structures, consolidated seawalls, consolidated shores, developed upland, piers, riprap, vegetated riverbanks
Keywords: bioremediation, ground-truth, high-pressure warm-water washing, reoiling, sorbent boom, sorbent pompoms

Incident Summary:

On June 21, 1993, the USCG MSO Philadelphia received a report from a tug boat captain through the National Response Center (NRC) of an oil sheen in the Schuylkill River. The sheen size was reportedly 200 feet by 1/2 mile. At the time of the report the air temperature was 85°F, skies were overcast, and winds were southwest at 10 to 15 knots.

A Marine Environmental Protection Team went to the scene and traced the source of the sheen to the former CELOTEX facility. The MSO hired cleanup contractors for this federally funded cleanup; the facility owner refused to take responsibility. Contractors placed boom in the water and began steam-cleaning bulkheads, riprap, and pilings. Oil-soaked soil leaking through a bulkhead proved to be the source of the slick.

In addition to three unmarked drums, bags of asbestos waste, hundreds of bales of shredded paper and other garbage, and two 5-inch artillery shells, twenty-three tanks containing unknown product and sludge were found. Two tanks were unstable and many were without tops or had holes cut in them. The USCG contacted the Philadelphia Bomb Squad to remove the artillery shells and was contacted by the Philadelphia Environmental Crimes Unit concerning other possible legal infractions at the site. An incident-specific Regional Responst Team was convened. It took two months to stabilize the site for possible hand-off to the State or Federal EPA for long-term site remediation.

Behavior of Oil:

An estimated 1,000 gallons of mixed heavy oil was spilled on the facility when a valve was removed from a tank. None was recovered, but all impacted shorelines were cleaned. The oil moved approximately one-half mile up- and downstream from the source facility. No mousse formation was observed.

Countermeasures and Mitigation:

Areas impacted included rocky riprap, bulkheads, overhanging river vegetation, and coarse-gravel riverine shoreline. Approximately 50,000 gallons of oil were pumped and about 1,000 cubic yards of sludge and contaminated oil were removed from the tanks. Contaminated soil was removed by track hoe and placed in lined containers. Oil that remained in other tanks was heated and pumped out into temporary storage containers awaiting test results on suspected contamination. Vactor (also called the Super Sucker) was used to remove heavy viscous oil.

Shoreline cleanup was conducted by vacuum trucks and high-pressure steam washing of rocks and bulkheads. Recovered oil, oily debris, and sediment were sent to a landfill as nonhazardous waste.

Other Special Interest Issues:

Health and safety issues required personnel to wear Level C personal protection equipment during cleanup operations due to dust and power-washing operations. High temperatures caused heat exhaustion and slowed cleanup operations.

Strike Team personnel onscene continued monitoring the air for benzene, carbon monoxide, hydrogen sulfide, oxygen, lower explosion limit, and organic vapor. The EPA's Technical Assist Team sampled products and analyzed for contaminants. All samples analyzed were within normal limits for asphalt and coal tars.

The National Pollution Fund Center was keenly interested and involved in this case. Also, due to the protracted nature of the cleanup, the distinction between response and remediation had to be determined. Bioremediation is being considered as a long-term site remediation.

NOAA Activities:

NOAA was notified of the incident on June 21, 1993, and the SSC was requested onscene to assess shoreline cleanup countermeasures. The USCG District 5 Marine Occupational Health Officer and the SSC decided to discontinue shoreline power cleaning until the laboratory tests were completed. The possibility of unknown contamination of the oil, the chance for volatilizing any contaminant present, and the extended exposure to workers were considered too risky until more was known about the composition of the spill. The oil was not expected to refloat and coat other areas because it was so thick and sticky. Once the test results came back negative, the shoreline cleanup was completed.

NOAA supported the response for several weeks.

Reference:

NOAA Hotline 131, 21 reports

Name of Spill: C/V *Newark Bay*
NOAA SSC: Ed Levine
USCG District: 5
Date of Spill: 08/11/93
Location of Spill: Charleston, South Carolina
Latitude: 32°47.5' N
Longitude: 79°55.4' W
Spilled Material: chloroacetic acid
Spilled Material Type: 5
Amount: 120 barrels (58,400 pounds)
Source of Spill: IMO container onboard container vessel
Resources at Risk: human health
Dispersants: N
Bioremediation: N
In-situ Burning: N
Other Special Interest: unusual, experimental, innovative cleanup techniques
Shoreline Types Impacted: piers
Keywords: Centers for Disease Control, evacuation, salvage

Incident Summary:

In the early morning of August 11, 1993, a vapor cloud was seen moving over the Columbus Street Terminal in Charleston, South Carolina. The cloud seemed to be coming from the deck of the 939-foot container vessel *Newark Bay*. The ship carried two 5,000-gallon intermodal tanks; one tank contained acetaldehyde oxime (CAS 107-29-9), the other chloroacetic acid (CAS 79-11-8). Either chemical could have caused the vapor cloud and, since the tanks were stacked one on top of the other, it was not initially known which was on top. These chemicals are incompatible and if they had combined in the proper proportions, there could have been a violent reaction.

The Charleston Fire Department (FD) HAZMAT team performed the initial site survey in Level A protection from a crane that hoisted them over the deck of the ship. No vapor cloud was visible and neither tank appeared to be leaking. The FD HAZMAT team later determined that chloroacetic acid was leaking from a faulty valve on the top IMO tank, but no acetaldehyde oxime had been released. A six-inch hairline crack in the outer insulation skin of the container was also discovered. The vessel's owners accepted full responsibility for the discharge and hired local cleanup contractors. The tank owners (Hoyer USA, Inc.) hired a marine surveyor to examine the tank's structural integrity and determine the cause of the failure.

The on-scene weather was mild, winds one-half to three knots, with afternoon winds forecast to be nine to ten knots.

The USCG activated the AST and GST.

Behavior of Spilled Material:

Chloroacetic acid is heated during transport because it becomes solid at room temperature (freezing point is 143°F). The chemical spilled on deck caused the paint to blister. That which spilled overboard caused the water to bubble and formed a white foam-like sheen on the water's surface that persisted for nearly an hour. Nearly all the chloroacetic acid was lost; only about 150 gallons were recovered from the container by way of a tank-to-tank pumping transfer performed in Level B protective clothing.

Local residents reported a "vinegar-like" smell; a property associated with chloroacetic acid.

Countermeasures and Mitigation:

A command post was established upwind of the source and the Charleston FD established a 1,500-yard evacuation zone around the vessel. All shoreside personnel within the zone and all crew members aboard the vessel, with the exception of a minimum crew, were evacuated.

A 10- to 15-gallon pool of acid (20- by 15-foot circumference, 1/4- to 1/2-inch deep) remained on deck. FD and Strike Team personnel spread sodium ash (caustic soda) on the contaminated areas of the vessel to neutralize it.

Approximately 15 uncontaminated containers were offloaded to gain access to the damaged IMO tank. FD personnel conducted five Level A entries to unbuckle the containers. The deck and containers were decontaminated with high-pressure fresh-water washing. The decontaminated containers were placed in a decon containment area constructed from sorbent boom, plastic, and tarp. Acidity tests were performed with pH paper.

Removal and disposal of the spilled material and contaminated debris were performed by the contractors using shovels and brooms to remove the caustic soda from the vessel's deck. The source tank was removed and placed at a remote area to be stored and eventually moved to a local tank repair and cleaning company.

Other Special Interest Issues:

Shipping lanes and vehicle traffic routes near the spill were closed. The USCG COTP established a safety zone restricting vessel access in the Town Creek lower reach from the Cooper River Bridge to the passenger terminal.

The Centers for Disease Control (CDC) determined that the LC₅₀ for air of the chloroacetic acid is 72 parts per million and announced that anyone experiencing irritation, runny nose, or vomiting should seek immediate medical attention. Due to the warm temperatures, two cleanup personnel were sent to the hospital for dehydration and irregular heartbeats. They were treated and released.

Media interest was fairly high and the COTP gave several live interviews explaining the implications of this release.

NOAA Activities:

NOAA was notified of the incident on August 11, 1993, by MSO Charleston. The MSO briefed the SSC by telephone.

The SSC gathered information concerning reactivity of the chemicals and health concerns from Louisiana State University, Chemical Transportation Emergency Center, and CDC. The SSC told MSO that in proper proportions, the two chemicals could react violently. Fortunately, only chloroacetic acid was released.

NOAA provided Material Safety Data Sheets, Response Information Data Sheets, and information about acetaldehyde (the more volatile of the two chemicals) that confirmed that the evacuation distances were more than adequate precautions.

The CDC reported that unless the people smelling the "vinegar-like" odor associated with the chloroacetic acid experienced vomiting, they were most likely not exposed to a dose of concern.

The SSC provided this information to the MSO with directions for dealing with citizen complaints from exposure to chloroacetic acid fumes.

NOAA supported this incident for one day.

References:

Allied-Signal, Inc. 1986. Material Safety Data Sheet for acetaldehyde oxime. Morristown, NJ.

ATOCHEM, Inc. Material Safety Data Sheet for chloroacetic acid. Glenrock, NJ.

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

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

NOAA Hotline 134, 2 reports

Name of Spill:	Hurricane Emily
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill :	09/02/93
Location of Spill:	Hatteras Island, North Carolina
Latitude:	35°25' N
Longitude:	75°30' W
Spilled Material:	#2 diesel
Spilled Material Type:	1
Amount:	80 barrels
Source of Spill:	facility
Resources at Risk:	tidal marsh, sandy beach
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	aniline, amino benzene
Shoreline Types Impacted:	intertidal marshes
Keywords:	containment boom, sorbent boom, vacuum trucks

Incident Summary:

Hurricane Emily caused a number of small oil spills and one hazardous material spill near Cape Hatteras, North Carolina on September 1, 1993. After the hurricane moved north past the North Carolina Outer Banks, MSO Hampton Roads launched an observation flight to assess the damage done to the island's infrastructure, homes, and environment. The overflight found three areas in need of immediate attention: Oden Dock Marina (loss of a 500-gallon waste oil tank), Pelican's Roost Texaco Station (loss of a 2,000- to 3,000-gallon #2 diesel tank), and a location near the Pilot House Restaurant (loss of a home heating oil tank estimated to have contained less than 100 gallons). After the initial on-site inspections, MSO Hampton Roads maintained a staff at the island's Emergency Operations Center (EOC) with other Federal, state and local emergency response personnel for two weeks.

The USCG surveyed the entire coast of Hatteras Island by helicopter and land-based Pollution Response teams (PRTs). There was very little oil spilled; eight spills were reported and only three of these required cleanup. By September 3 cleanup at Oden's Marina and the restaurant had been completed and the removal of oil from the damaged Texaco tanks was underway. About 2,500 gallons of oil were collected and removed.

The emergency response activities from Hurricane Emily on Hatteras Island consumed the attention and resources of most of the emergency response staff and the island's residents. The actual oil cleanup was handled by the USCG and their contractor, IMS.

Behavior of Oil:

The light oil from the various tanks on the island moved downstream into the marsh structures next to each facility. The waste oil lost from the tank at Oden's Marina oiled marsh grasses next to the marina for a length of 100 yards with a black band of oil approximately 12 inches wide. A 150- by 500-yard pocket of oil was found behind Pelican's Roost Texaco, and a fairly heavy concentration of oil was found in a small inlet one-quarter mile east of the Pilot House Restaurant in Buxton, North Carolina.

Countermeasures and Mitigation:

USCG contractors used sorbent boom, hard boom, and vacuum trucks to remove the floating oil from the island's marsh areas next to the damaged tanks in the marina. However, the oiled grasses were not cut and no aggressive cleanup methods were used to remove the oil band on the marsh grasses. A boom in place at the marina was removed to allow natural flushing. The #2 diesel fuel lost from the Pelican's Roost Texaco was removed using vacuum trucks.

Other Special Interest Issues:

Two pint-sized bottles of amino benzene labeled "poison" were assumed to be lost from the Fischer Scientific Company. The bottles had been packed in vermiculite in a wooden box large enough to hold four pint bottles; only two were in the box. Even if this chemical was lost, there could not have been enough spilled to cause a health threat.

One container with two liter bottles of aniline was found in the Frisco Substation of the electric company. These were removed from the site by the electric company at the request of the MSO.

NOAA Activities:

NOAA was notified of this response on September 2, 1993, by MSO Hampton Roads as part of the normal notification process in the USCG's hurricane response plan. The SSC accompanied the MSO on overflights on September 3 and on-scene field assessments during the weekend of September 4 and 5. NOAA helped the MSO staff establish their command post in the island's EOC and status boards to track the incident investigations. The SSC provided reports to the MSO's office in Hampton Roads and to the EOC's main offices in Richmond, Virginia.

References:

NOAA Hotline 137, 2 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. 114 maps.

Name of Spill:	T/B <i>New Jersey</i>
NOAA SSC:	Gary Ott
USCG District:	5
Date of Spill :	09/18/93
Location of Spill:	Chesapeake and Delaware Canal
Latitude:	39°30' N
Longitude:	76°34' W
Spilled Material:	#6 fuel oil
Spilled Material Type:	4
Amount:	118 barrels
Source of Spill:	tank barge
Resources at Risk:	marsh grasses, benthic organisms
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	cleanup of marsh grasses, bioremediation
Shoreline Types Impacted:	marsh grasses, sand beaches
Keywords:	bioremediation

Incident Summary:

The T/B *New Jersey* grounded at 0130 on September 18, 1993, in the Chesapeake and Delaware (C&D) Canal. The tug and barge continued through the canal and tied up on the Delaware River side. The initial reports from vessels and responders were that the amount of #6 black oil lost from #1 starboard tank or the extent of oil trailing the vessel could not be determined. Heavy fog prevented an overflight of the potentially impacted areas from daybreak on September 18 until late afternoon. The C&D Canal remained closed from the time of the incident report until Saturday afternoon when the first overflights reported visible light sheen, but no visible oil in the canal or its immediate approaches. USCG response vessel's personnel reported only small oil streamers from off Turkey Point to the Elk River.

Soundings of the T/B *New Jersey* by the AST on the same afternoon suggested that the maximum loss would be 4,915 gallons, but a lesser amount was anticipated because no new oil sightings had been reported. A first light overflight on September 19 noted that the light sheen seen the previous day in the C&D Canal was no longer visible. Some sheen was reported in a small boat basin on the west end of the canal and oil was seen on the shoreline near Port Herman. This sand and gravel shoreline was oiled for about 1,500 yards between Town Point Neck and Sandy Point near the western entrance to the C&D Canal.

Behavior of Oil:

The #6 oil released from the T/B *New Jersey* moved out of the canal into the narrows at the top of Chesapeake Bay at the approaches to the canal. The oil moved with the tide back and forth in this area before grounding on the southeastern shoreline between Town Point Neck and Sandy Point.

Countermeasures and Mitigation:

The area from Old Town Point to near Port Herman, approximately 1,500 yards, was the most heavily affected with a band of oil approximately one-yard wide coating the grass and riprap. Cleanup operations concentrated on scraping and pressure and steam washing of the riprap between Old Town Point and Port Herman.

Other Special Interest Issues:

A representative of a bioremediation agent, REMTECH, offered to apply his product at no expense to a location that had been oiled near the village of Port Herman, Maryland. The riprap in the area had been steam cleaned; however, outside the riprap area at the head of a small 50-foot long drainage ditch, the oil could not be removed using flushing techniques. Neither the USCG OSC nor the State of Maryland had requested that the spiller take more cleanup actions at this location other than what had been accomplished. The State of Maryland would not allow the use of any bioremediation agent at this location.

NOAA Activities:

NOAA was notified on September 18, 1993, by MSO Baltimore. The MSO asked the SSC to come onscene September 20, 1993, to coordinate the assessment of the shoreline impacted by the oil. NOAA reported on the scope of the affected area to the RRT representative of USCG District 5. The RRT representative passed this report along to each of the Federal trustees. NOAA provided a resources-at-risk assessment and information about the fate and effects of #6 oil on the type of sand and gravel shoreline in the area. NOAA was asked to outline the activities that a representative of a bioremediation agent should take to propose the use of his product.

References:

NOAA Hotline 138, 9 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.

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Name of Spill: Steuart Petroleum
NOAA SSC: Gary Van Den Berg
USCG District: 7
Date of Spill: 01/02/93
Location of Spill: Jacksonville, Florida
Latitude: 30°41'N
Longitude: 081°28'W
Spilled Material: gasoline
Spilled Material Type: 1
Amount: 2,381 barrels
Source of Spill: facility
Resources at Risk: wading birds, American shad, striped bass
Dispersants: N
Bioremediation: N
In-situ Burning: N
Other Special Interest: human health and safety
Shoreline Types Impacted: none
Keywords: none

Incident Summary:

At approximately 0400 on January 2, 1993, there was an explosion and fire at the Steuart Petroleum Company Jacksonville Port Terminal in Jacksonville, Florida, killing a security guard. It is believed that a tank had been overfilled and when the security guard drove near it, a spark caused the explosion. The tank contained approximately 4,500,000 gallons of gasoline. Unburned product was contained in the berm area around the tank farm. Steuart Petroleum is located within 1,000 feet of the St. Johns River.

The Jacksonville Fire Department responded to the fire and, in addition to land-side fire-fighting equipment, stationed a fire-fighting boat on the St. Johns River as a precaution.

The U.S. Coast Guard (USCG) Captain of the Port (COTP) Jacksonville closed the channel from the Trout River Inlet through the southern end of the Long Branch range the morning of January 2. Later that day, the channel was opened to one-way traffic restricted to the east side.

The fire department transferred product from the damaged tank to other tanks and the damaged tank was continuously cooled throughout the operation. The fire was on top of the tank so the fire fighters blanketed that area with aqueous film forming foam (AFFF) attempting to smother the fire. To maintain the integrity of the tank, water was continuously pumped into it keeping the level constant. The resulting water-foam mixture was pumped from the berm area into the St. Johns River to sustain the necessary berm containment volume from January 4 until January 7 when the fire department declared the fire out.

On January 6, all water was drained from the tank and pure foam was introduced at both the top and bottom to completely extinguish the flames. A protective blanket of foam was placed on top of it, and a reflash watch was maintained throughout the night. The fire was declared out at 1400 on January 7.

Behavior of Spilled Material:

The toxicity of the water-foam mixture being discharged into the St. Johns River had the potential for a localized fish kill at the point of discharge. The amount of water moving through the river and the biodegradability of the AFFF made the possibility of impacts minimal.

Other Special Interest Issues:

A major health risk from a gasoline spill is benzene inhalation. Although benzene concentration in gasoline is not high, a massive spill will release a significant amount of the carcinogenic benzene. For these reasons, respiratory and skin protection were recommended for exposed personnel. The USCG conducted daily inspection tours on the river near the discharge. No fish kills or other undesirable affects were reported.

NOAA Activities:

NOAA was notified of the incident on January 2, 1993, by the USCG Marine Safety Office (MSO) Jacksonville and the Scientific Support Coordinator (SSC) reported onscene. NOAA supplied MSO with worst-case scenarios that could occur at the tank farm under the given circumstances and provided a run down on the resources that could be at risk. The SSC was onscene one day but continued to report health and safety information, effect of discharging the AFFF-water mixture into the river, and weather updates. NOAA was involved in this incident for six days.

References:

Barnea, Nir. 1993. *Health and safety concerns of gasoline*. Unpublished Report. Seattle: Hazardous Materials Response and Assessment Division, NOAA.

NOAA Hotline 113, 12 reports

Name of Spill:	<i>Miss Beholden</i>
NOAA SSC:	Gary Van Den Berg/Brad Benggio
USCG District:	7
Date of Spill:	03/13/93
Location of Spill:	Key West, Florida
Latitude:	24°28.9' N
Longitude:	81°42.6' W
Spilled Material:	diesel
Spilled Material Type:	2
Amount:	none
Source of Spill:	coastal freighter
Resources at Risk:	National Marine Sanctuary, coral reefs, reef fish, dolphins, whales, and coastal birds
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest(s):	complex, successful salvage operation
Shoreline Type(s)	none
Keywords:	NAVSUPSALV, salvage

Incident Summary:

At approximately 2100 on March 13, 1993, the *Miss Beholden* went aground five nautical miles off Key West, Florida on a live coral reef within the boundaries of the Florida Keys National Marine Sanctuary. The *Miss Beholden*, a 142-foot, steel-hull coastal freighter, sails under the St. Vincent flag. The vessel had approximately 5,000 gallons of diesel fuel-lube oil onboard contained in tanks that were not integral to the hull. No spillage was reported.

The vessel made several unsuccessful attempts to free herself from the reef the morning of March 14; a tug also tried unsuccessfully to pull her off the reef. As a precaution, six dewatering pumps were put aboard to be used, if needed, as soon as the vessel was refloated. National Marine Fisheries Service personnel tried to survey the damaged coral reef, but water turbidity prevented it. The weather (winds, east at 20-30 knots; seas, 7-10 feet) halted salvage operations until March 16.

A team of USCG marine inspectors went aboard the *Miss Beholden* on March 16 to conduct a casualty investigation. They found water in the forward hold, equalized to the sea, and two feet of water in the engine room despite pumping. The entire cargo (candy and cigarettes) appeared to be a total loss. The team was unable to determine the size, extent, or location of hull damage.

Because of continued poor weather, salvage operations were delayed until March 18. Before further attempts to remove the vessel from the reef were tried, the oil was recovered from the ship. Another vessel survey, completed on March 18 by the commanding officer of the Gulf Strike Team (GST) and the salvage master, revealed multiple holes through the bottom of the vessel in the engine room and cargo holds. All internal watertight bulkheads appeared to have been breached.

The U.S. Navy Superintendent of Salvage (NAVSUPSALV) briefed the On-Scene Coordinator (OSC) telling him they felt the vessel could be refloated and removed from the coral reef intact. Later that day, there was a Region IV Regional Response Team (RRT) teleconference to get a situation update and to discuss the OSC's plans for vessel salvage. The RRT recommended removing the vessel from the live coral reef to prevent damage to the resources from the residual pollutants still remaining onboard.

On March 19 approval was received from the Commandant, USCG for intervention. Oil recovery operations began on the morning of March 19 and by evening most of the product had been removed from the vessel. Personnel onscene from the GST and NAVSUPSALV provided expertise and assistance during removal operations.

On March 20 vessel removal operations began under the guidance of NAVSUPSALV and at 1530 the vessel refloated. *Miss Beholden* was towed out to deeper water on the same track line on which she had entered. After making certain she was seaworthy, she was moved to Robbie's Marina on Stock Island and released to NOAA.

NOAA activities:

NOAA was notified of the incident on March 13, 1993, by MSO Miami. The SSC provided support by telephone and facsimile.

An initial trajectory was provided to MSO Miami based on the 5,000 gallons of diesel-lube oil reportedly onboard the vessel. NOAA told MSO that diesel was highly volatile and would not remain a cohesive slick for very long because of the strong on-scene winds. The slick should not last more than 6 to 12 hours. A localized fish kill near the site of the grounding might occur, but a significant threat to the Florida Keys did not exist because of the small amount of product and the stormy weather. Weather updates were provided to the MSO twice daily during the response.

The SSC participated in two Region IV RRT teleconferences. Some of the issues raised were:

Should an attempt to refloat the vessel with fuel and cargo onboard be made or should they be removed before salvage operations? Because the vessel had structural damage it was decided to remove the fuel and cargo to lighten her before salvage operations began.

Was the ship structurally sound and could she hold together during reef removal operations? Initially, the OSC was told that the ship probably would not stay intact, and based on this advice decided to remove the diesel fuel-lube oil and clean the residual product from the vessel and leave the vessel on the reef (it would then be NOAA's responsibility to salvage the vessel). NOAA expressed a real concern with this plan because the residual diesel fuel-lube oil still presented a substantial pollution threat and felt that all removal options should be explored before leaving the vessel grounded on the reef. NAVSUPSALV believed the vessel could be salvaged (refloated) intact, and after some discussion, the OSC decided to attempt to refloat the vessel.

Was the contractor aware of the sensitivity of the reef and would all precautions be taken to minimize any additional damage to the reef? Sanctuary personnel marked the course with buoys that the vessel had used before the grounding. The reef received minimal additional damage during the removal operations.

The *Miss Beholden* response lasted eight days.

Reference:

NOAA Hotline 119, 12 reports

Name of Spill:	T/V <i>Prime Trader</i>
NOAA SSC	Gary Ott/Gary Van Den Berg/Brad Benggio
USCG District:	7
Date of Spill:	05/19/93
Location of Spill:	Saint Johns River, Jacksonville, Florida
Latitude:	30°41' N
Longitude:	83°28' W
Spilled Material:	#6 oil
Spilled Material Type:	4
Barrels:	24
Source of Spill:	tank vessel
Resources at Risk:	salt marshes, sand beaches, manatee, fish, birds
Dispersants:	N
Bioremediation:	N
In-Situ Burning:	N
Other Special Interest:	none
Shoreline Type(s) Impacted:	salt marsh and fine-grain sand beaches
Keywords:	vacuum trucks, sorbent boom, sorbent pads

Incident Summary:

At approximately 0530 on May 19, 1993, #6 fuel oil was spilled into the Saint Johns River during transfer operations at the Steuart Petroleum facility from the T/V *Prime Trader*, a 19,487-ton Maltese-flag vessel. The facility is located approximately one mile south of Trout Creek and just north of the downtown portion of Jacksonville, Florida. The initial report estimated that 1,000 gallons had been spilled.

Weather at the time of the spill was partly cloudy, temperature in the mid-80s, with westerly winds 10 to 15 knots. The spill occurred near the end of a flood tide so the local river currents were not at their peak velocity.

A misaligned valve onboard the *Prime Trader* caused this spill by overfilling one of the ship's holding tanks that subsequently overflowed onto the dock and into the water. Once the valve was aligned properly, transfer operations continued under USCG supervision. No further oil was spilled. The following day, the ship was allowed to transfer to a Jacksonville Port Authority berth for further cleaning of her deck and hull. On May 21 the vessel left Jacksonville. Because the oil almost immediately impacted the shoreline, response was primarily directed towards cleaning the sand beaches, the fringing wetland vegetation, and removing mobile pooled oil. The cleanup response continued through May 28.

The responsible party hired Jacksonville Pollution, a local contractor, to handle the cleanup operations, which were coordinated and overseen by the Federal On-Scene Coordinator (FOSC). Also onscene were representatives from NOAA, the Florida Department of Natural Resources, and the City of Jacksonville.

Behavior of Spilled Material:

When the oil entered the water it was carried downstream and blown to the eastern shore of the Saint Johns River where it impacted about one mile of shoreline. Overflight surveys confirmed that most of the oil had beached on the eastern shore and, although sheens were visible in the water, most of the oil remained confined to the fringing marsh areas and sandy beaches. The impacted area consisted of a narrow fringing band of marsh with fairly compacted sand behind wetland vegetation.

The initial report was 1,000 gallons spilled, but the contractor reported collecting 3,900 gallons of pure product. Gauging the ship's tanks showed that 35,000 gallons were accounted for. A shoreline survey conducted on June 7, 1993, by NOAA and MSO revealed two areas of sandy beach that still contained weathered, immobile oil. Small sheens periodically were visible offshore.

Countermeasures and Mitigation:

Although low-pressure washing had been considered as a countermeasure, it was decided that this might work oil into the sediments and cause more harm than good. Cleanup techniques were restricted to mechanical means: vacuum trucks to remove pooled oil in the water, sorbent booms and pads, and oil snares, which would create little additional impact to the area. These methods were effective.

Other Special Interest Issues:

The primary resource at risk was the fringing marsh and associated flora and fauna. Protection of manatees was of special interest to the MSO and was discussed extensively during all meetings with contractors and other response personnel. Although manatees were seen near the spill, no reports were received that indicated they had been affected by it. Three oil-related bird fatalities were reported.

NOAA Activities:

NOAA was notified of the incident on May 19, 1993, by MSO Jacksonville. The SSC did not go onscene, but rather provided requested information (resources at risk, weather updates, and trajectories) by phone and facsimile.

On June 6, 1993, the SSC inspected the site with the MSO, and recommended further cleanup of one area of sandy beach on which oil remained.

References:

NOAA Hotline #127, 4 reports.

Name of Spill: Diesel truck
NOAA SSC: Brad Benggio
USCG District: 7
Date of Spill: 06/08/93
Location of Spill: Guanajibo Ward, Cabo Rojo, Puerto Rico
Latitude: 18°7' N
Longitude: 67°10' W
Spilled Material: diesel
Spilled Material Type: 2
Amount: 7,000 gallons
Source of Spill: tank truck
Resources at Risk: mangroves, freshwater marsh, waterfowl, domestic ducks and geese, cattle
Dispersants: N
Bioremediation: Y
In-Situ Burning: N
Other Special Interest: effects to human health
Shoreline Type(s) Impacted: inland soil composed of moist, highly consolidated clay overgrown with grass
Keywords: bioremediation

Incident Summary:

On or about June 8, 1993, a tanker truck carrying 8,000 gallons of diesel fell from its front support near a duck farm and an unnamed creek in Guanajibo Ward, Cabo Rojo, Puerto Rico. A puncture at the base of the tank released an estimated 7,000 gallons of diesel that immediately ran down a hill, through a duck and geese farm, and into a small unnamed creek. This creek flows through areas used for cattle and a freshwater marsh on its way to the sea at Guanisibo Bay in southwest Puerto Rico.

The USCG was notified of this spill on June 14 by Puerto Rico's Environmental Quality Board (EQB). A team of USCG and U.S. Fish and Wildlife Service (USFWS) personnel inspected the site. The truck operator had removed the tank and was denying responsibility for the incident. USCG personnel collected samples to be used for fingerprinting and positive identification of the product.

A visual ground survey was conducted on the afternoon of June 20 by the NOAA SSC, the GST and a USCG District Response and Advisement Team (DRAT) environmental specialist. A moderate to strong odor of diesel was present at the spill site and the soil appeared to be saturated in several locations. Sheens were seen in the creek and on land in depressions where water collected. The creek was boomed in several areas with absorbent material, and absorbent pads were used to collect the spilled fuel. Several of the domestic ducks died from exposure to the diesel, but no other impacts or threats to animal life were observed. The grass in the spill area and along the banks of the creeks was killed. Reportedly, three days of very heavy rains had thoroughly flushed the impacted area and a freshwater flush of the area had been conducted by the local contractor before the GST survey. At the time of the survey the creek was stagnant, with no flow observed.

Overflights and videotaping of the impacted area were conducted on June 21. These overflights were used to determine the effectiveness of current containment and cleanup operations and define areas that might require additional response. Soil samples were obtained for laboratory analysis. Options for mitigation were discussed at meetings attended by representatives of the EQB, USFWS, the contractor, USCG, and NOAA. The

Caribbean Regional Response Team (CRRT) held teleconferences to discuss the situation and form a consensus for mitigation.

By June 22 the laboratory results were available, the cleanup crews were completing removal of oiled debris, and the mitigation response had been agreed upon by the on-scene personnel and the CRRT.

Behavior of Spilled Material:

The diesel ran down a sloped embankment into a small creek, killing the vegetation in its path. The release point of the product was approximately 100 yards from the creek. Because the soil was composed of dense, highly compacted clay, penetration into the ground was not very deep; about six inches in the worst areas. No impacts were observed farther downstream, in the freshwater marsh, or in the mangroves, but sheens were observed in a small pond near the coast.

Countermeasures and Mitigation:

Heavy rains flushed the area, but the contractor released a 3,000-gallon tank of water to flush it further. Digging an interruption trench to contain remaining diesel draining into the creek was considered, but the absence of new sheens in the water indicated that it was not necessary. Removing contaminated soil at the spill site and replacing it with new soil or remediating it in a separate area before returning it to its origin was also considered. The contaminated soil was left in place because enhanced erosion was feared and the total petroleum hydrocarbon (TPH) values obtained from the soil samples were high. To enhance natural biodegradation, in-situ aeration of soil to enhance natural biodegradation of the hydrocarbons was begun. A monitoring plan was established, including taking monthly soil samples to observe degradation of the hydrocarbons and frequently looking for additional sheening to assess the need for continued use of absorbent materials. When TPH values decline and vegetation begins to grow on the impacted areas, the soil will be fertilized and replanted with grass. It is expected that the monitoring plan will continue for six months, at which time the effectiveness of the mitigation can be gauged and more extensive soil sample analyses can be run.

Other Special Interest Issues:

Some residents needed medical attention after being exposed to the strong diesel vapors; none of the responders suffered any medical problems.

NOAA Activities:

NOAA was notified of the incident on June 16, 1993, by the USCG MSO San Juan, and requested to report onscene June 20. The SSC helped assess the impacted area and develop mitigation responses. The SSC obtained soil samples from the two most severely impacted areas for laboratory analysis. When the on-site assessment was concluded and mitigation response determined by the CRRT, the SSC reported to USCG MSO San Juan to brief the OSC and Chief of Port Operations before being released on June 23, 1993.

References:

NOAA Hotline, 130; 5 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.

Name of Spill: Barge *Bouchard 155*
NOAA SSC: Brad Benggio
USCG District: 7
Date of Spill: 08/10/93
Location of Spill: Tampa Bay, Florida
Latitude: 27°36' N
Longitude: 082°43' W
Spilled Material: #6 fuel oil
Spilled Material Type: 4
Amount: 8,000 barrels
Source of Spill: fuel barge
Resources at Risk: Shorelines—sand beaches, seawalls, mangroves, riprap and jetties
Biological resources —sea turtles
 Birds—least terns, black skimmers, snowy plovers, wilson plovers, gulls, pelicans, cormorants, varieties of wading birds, shorebirds, and other waterfowl
 Fish —bluefish, spotted sea trout, red drum, southern flounder, Florida pompano, striped mullet, black drum, sheepshead, and Spanish sardine
 Shellfish—shrimp, blue crab, spiny lobster, stone crab, squid, oysters, barnacles and bivalves associated with seawalls and rip rap
Mammals —manatees, porpoise, and pygmy sperm whales
Dispersants: N
Bioremediation: N
In-Situ Burning: N
Other Special Interests: oil burial on sand beaches, cleanup of buried oil, oil patches submerging and stabilizing around mangrove islands, stranded oil on oyster and seagrass beds and tidal flats, and chemical countermeasures, PES-51, underwater tarmats
Shoreline Type(s) Impacted: fine-grained sand beaches, mangrove islands, *Spartina* marsh, residential seawalls, and fringing mangroves.
Keywords: sorbent pompoms, high-pressure warm-water washes, sorbent boom

Incident Summary:

On August 10, 1993, at approximately 0545, the freighter *Balsa 37*, the barge *Ocean 255*, and the barge *Bouchard 155* collided in the shipping channel west of the Skyway Sunshine Bridge south of Mullet Key in Tampa Bay, Florida. MSO Tampa closed the port to vessel traffic. This collision caused three separate emergencies: 1) the *Balsa 37*, which was carrying a cargo of phosphate rock, was severely damaged on the starboard side, was listing at an increasing rate, and was in danger of capsizing in the channel; 2) the *Ocean 255*, which was loaded with jet fuel, gasoline, and a small amount of diesel fuel, was burning out of control just south of Mullet Key; and 3) the *Bouchard 155* was holed at the port bow, spilling approximately 8,000 barrels of #6 fuel oil into Tampa Bay.

Stabilizing the vessels was the first priority of responders. By 2200 the *Ocean 255* barge fire was extinguished and the GST was conducting cooling procedures and maintaining a fire watch. Lightering operations were well underway on the *Bouchard 155* barge in preparation for moving it to dockage in the Port of Tampa where it would be cleaned before dry

docking. The *Balsa 37* was intentionally grounded outside the shipping channel to prevent it from capsizing and to open the channel for traffic while repairs and stability evaluations were conducted.

August 10 overflight observations showed a three- to six-meter wide band of oil along the beaches. By the next day, this band appeared to be about half its original width. Systematic shoreline surveys were conducted and oil was found buried by two to eight inches of clean sand deposited during high tide. Cleanup crews focused on manually removing the band of surface oil high on the beach. A plan was developed to remove the subsurface oil without generating large volumes of sediment for handling, disposal, and replacement. The plan called for mechanical removal of the heavy buried layers, manual removal of moderately oiled sediments, and mechanically pushing stained sand onto the lower part of the beach for surf washing. Pompoms were strung along the surf zone to collect any oil refloated during the surf washing.

By August 11 the status of the vessels had improved substantially. The response focus began to change from emergency issues to skimming operations, protection strategies, forecasts, and planning.

Meanwhile, cleanup crews were contending with very thick oil that had been deposited around some mangrove islands. Tarmats formed when sediment was mixed with oil along the shallow flats surrounding the islands. Large thick mats coated mangrove roots, oyster and seagrass beds, and tidal mud flats. Most of this oil was vacuumed out using vacuum transfer units on grounded barges staged around the islands and shallow areas. Seawalls within the bay were being washed using high-pressure water heated to 110 degrees.

The GST was onscene throughout the spill response. They provided support with the Vessel of Opportunity Skimming System as well as the fire fighting, monitoring, and lightering of the *Ocean 255* barge.

Roughly 14.5 miles of fine-grained sand beach from St. Petersburg Beach north to Redington Shores Beach were affected by this spill. Sand beaches on Egmont Key at the entrance to Tampa Bay were also oiled. Additionally, four mangrove islands inside the entrance to Boca Ciega Bay at Johns Pass and two small areas of *Spartina* marsh were oiled. Jetties, seawalls, and riprap within the bay and at Johns Pass and Blind Pass were also oiled to varying degrees. It is estimated that over 30 miles of residential seawalls were oiled within Boca Ciega Bay. Some impact also occurred on the northern side of Mullet Key at Bonne Fortune Key in fringing mangroves.

Seawalls, jetties, walkways, and riprap were cleaned by high-pressure, hot-water washes. The shoreline cleaner PES-51 was considered for some of these cleaning needs, but after observing comparison tests performed by the manufacturer, the responsible party decided against its use.

NOAA worked with the RRT, the GST, the U.S. Army Corps of Engineers, the FOOSC, state officials, and various scientists and engineers to develop a sound method to deal with the tarmats. As of December 1993, debris from the incident was being washed ashore and cleanup of submerged tarmats offshore was ongoing.

Behavior of Spilled Material:

The #6 fuel oil from the *Bouchard 155* barge is the only material known to have been released during this incident. The oil initially formed a contiguous slick that moved west out of Tampa Bay. Once out of the bay, the oil moved west and north into the Gulf of Mexico

where it began to break up into more widely scattered fields and tarballs with some heavy concentrated bands. The winds were predominantly easterly initially but began to shift to westerly by August 12, driving the oil closer to shore. By August 14 shoreline oiling, reported as light tarballs, was occurring from southern St. Petersburg Beach north to Madeira Beach. By August 15 most of the floating oil had come ashore and heavily coated sand beaches, several mangrove islands, and seawalls within Boca Ciega Bay. By August 16 very little floating oil was seen offshore.

In the shallow, low-energy areas along the mangrove islands inside Johns Pass and at a few locations in the surf zone, a small fraction of the total spill mixed with beach sand and shallow sediments to form underwater tarmats. These mats were described as having the consistency of frosting or peanut butter with an outer skin that held the mat together. The mats within the bay area tended to fall apart once this skin was ruptured, but the mats offshore maintained their cohesiveness.

Several tarmats were located offshore in 6 to 20 feet of water. They averaged 20 by 150 feet and were about 2 inches thick. This oil was expected to weather very slowly with the mats probably remaining in place. Two of the mats were perpendicular to the shoreline in dredged borrow areas dating to 1985. The area is to be mapped to locate any additional tarmats. The FOSC issued an administrative order to the responsible party directing them to remove the submerged oil. Procedures for this operation were developed and approved. Remote sensors were used to find the submerged tarmats and divers manually removed them.

Countermeasures and Mitigation:

Both mechanical and manual countermeasures were used during this spill. Skimming operations were used to collect free-floating oil. Efficiency and effectiveness of skimming operations were extremely high. The oil-to-water ratio of retrieved product was estimated to be as high as 90 percent in many cases. A major limitation to skimming operations developed when much of the product was dispersed into widely scattered tarball fields and was essentially unavailable for retrieval. Skimming was effective until the oil came ashore.

Due to a southerly nearshore surface countercurrent, it was thought that transport of oil refloated during tidal cycles or surf washing might impact sensitive areas south of St. Petersburg Beach. Boom was deployed and maintained as a protective measure for these areas.

Once the oil beached, cleanup consisted of manual removal of the surface oil, mechanical removal of subsurface oil, and surf washing of stained sand. Removing sand and washing surf was done by using heavy equipment such as front-end loaders and graders. Cleanup techniques for removing buried oil were developed, tested, and monitored by a Shoreline Cleanup Technical Committee, with members from NOAA, the responsible party, the State of Florida, and the underwriter. Final grooming of the beaches was accomplished with graders and disking, normally to a depth of 12 inches. Care was taken not to disturb nesting sea turtles throughout the cleanup operations. All beaches were surveyed and inspected by a Shoreline "How Clean Is Clean" Committee consisting of representatives of the responsible party, USCG, NOAA, and officials from local and state agencies. The criteria used to judge beach cleanliness were visual observations and touch and smell analysis. To pass inspection, beaches had to look clean and the sand could not feel oily or have an oily odor. More elaborate sampling and laboratory analysis techniques were considered but would be very expensive and unnecessary. All oiled sand was disposed of in an approved non-hazardous landfill.

Oil in and around mangrove islands was removed by vacuuming. Areas were left oiled when it was felt that cleanup methods would cause greater impact than leaving the oil in place. Some of the submerged oil in very shallow areas was removed using buckets and shovels. Seagrass beds that received oiling were cleaned by gently lifting oil out of them by hand. "How clean is clean" inspections for mangroves, seagrass beds, and other sensitive areas would be judged on a case-by case-basis by the inspection committee. When the responsible party felt a particular area had been cleaned satisfactorily under the guidelines set by the Shoreline Cleanup Technical Committee, an inspection determined whether the area was in fact clean.

Other Special Interest Issues:

During the cleanup operations, a test demonstration of PES-51 for cleaning jetties, riprap, concrete walkways, and metal hand railings at the entrance to Johns Pass was conducted. PES-51 washes were performed twice. The effectiveness was compared to results from the high-pressure, hot-water washes being used to clean the seawalls within the bay. The water washes generally did a better job on the rocks and rough surfaces, whereas the PES-51 seemed to have a slight advantage on the smoother surfaces. After observing the tests, the RRT granted approval for the use of PES-51 on jetties, concrete and wooden walkways, and hand railings as needed. NOAA recommended using the water washes and then, if needed, use PES-51 to further clean the more heavily oiled and persistent areas. The responsible party chose not to use PES-51 for any of the cleaning.

The *Ocean 255* fire was a health and safety risk. The smoke plume presented a hazard as did the potential for explosions and burns. After the fire was out, and during subsequent lightering operations, the possibility of flashbacks or explosions still existed.

Heat stress became a problem for many of the responders and cleanup crews.

The potential health risks to swimmers and users of oil-contaminated public beaches became an issue. The oil spilled has a high aromatic fraction and high levels of sulfur. The viability of using public beaches while heavy equipment was in operation was also considered.

Local weather was watched closely throughout the spill response. Tropical storms or localized thunderstorms could be a detriment to the response. One responder was struck by lightning.

Representatives from the Occupational Safety and Health Administration (OSHA) were brought onscene to address these issues and to monitor proper worker safety. NOAA, the USCG, and OSHA worked together closely while addressing these issues.

The cooperation among all the parties involved in this response was exceptional. Local officials were supportive throughout the response and provided meaningful input to the process. The State of Florida assumed the role of lead trustee and did an excellent job of coordinating efforts for the response, while at the same time performing damage assessment duties. It was officially noted that the success of wildlife and bird rescue and treatment operations were unprecedented. Most of the birds affected by the spill were brown pelicans.

NOAA Activities:

NOAA was notified of this incident on August 10, 1993, by MSO Tampa Bay. The MSO needed immediate support, a former SSC, now with NOAA Aircraft Operations in Tampa, went onscene to help until the Florida SSC arrived at 1230. The NOAA on-scene team

consisted of representatives from NOAA HAZMAT Modeling and Simulation Studies Branch, and Biological Assessment Team, the SSC from Louisiana, and NOAA contractors. They were onscene through September 7.

The NOAA team provided daily weather, tides, currents, trajectory updates, and cleanup tracking and monitoring reports. The team also participated in all RRT teleconference calls, served on the Shoreline Cleanup Technical Committee and the "How Clean Is Clean" Committee. They provided evaluation and observation reports on cleanup techniques and progress to the FOSC, worked closely with all the responding agencies to develop sound approaches to cleanup and environmental issues, and provided support and information regarding several important health and safety issues.

NOAA coordinated efforts focused at trajectories, weather, tides and current information, and environmental response and study issues among several academic, state, and federal institutions.

NOAA's Aircraft Operations Center, based at MacDill Air Force Base provided helicopter support for overflights. They also provided temporary hangar storage for GST response equipment.

The USCG DRAT environmental specialist worked with the NOAA team on environmental issues. The director and one faculty member from the University of Miami's newly formed South Florida Oil Spill Research Center spent several days with the NOAA team to increase their knowledge of spill responses.

NOAA gave the FOSC a report addressing concerns, considerations, benefits, and liabilities of several possible techniques dealing with the removal of the tarmats and submerged oil.

References:

NOAA. 1993. *PES-51 Test Demonstration at the Bouchard 155 oil spill*. Draft Biological Assessment Team report. Seattle: Hazardous Materials Response and Assessment Division. 3 pp.

Michel, J. 1993. *Special Report: Evaluation of Options for Removal of Submerged Oil Offshore Treasure Island; Tampa Bay Oil Spill*, Columbia, South Carolina: Research Planning, Inc. 10 pp.

NOAA Hotline 133, 68 reports

U.S. Coast Guard District 8

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Name of Spill:	Pirate Well Platform
NOAA SSC:	Mike Barnhill
USCG District:	8
Date of Spill:	10/30/92
Location of Spill:	Mississippi River Delta, Louisiana
Latitude:	28°55' N
Longitude:	89°57' W
Spilled Material:	unknown
Spilled Material Type:	unknown
Barrels:	unknown
Source of Spill:	undetermined
Resources at Risk:	birds, fish, shellfish, marsh
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	undetermined
Keywords:	none

Incident Summary:

At approximately 0753 on October 30, 1992, CONOCO personnel notified the U.S. Coast Guard (USCG) that an unnamed tug and its barge had run over a well platform in the main channel of the Mississippi River. The platform was not owned by CONOCO; it was considered a "pirate" well, probably belonging to a small company. The wind was out of the southeast at 10 to 12 knots and there were two-foot seas at the time of the report. At 0830 a Minerals Management Service (MMS) aircraft happened to fly over the area and reported a three-mile slick tending to the northeast. The contents of the barge, the quantity of fuel on the tug, the product seen in the water, and the source of the leak were unknown.

The well was owned by South Parish Oil, a bankrupt company, and was thought to be a shut-in well, not a production well. The report of a collision by a tug with barges was unconfirmed and thought to be erroneous.

Overflights by private aircraft later in the day were unable to locate the source of the spill. The only beach impact reported was a stretch north of the site estimated from the air to be about 100 feet long and approximately 2 feet wide with light sheen trailing downwind. Reports from CONOCO engineers indicated that the oil probably came from a leaky valve and was considered only a minor problem.

A front was moving through the area causing wave action that hid any oil on the surface making acquisition of information from overflights impossible. The water was dark brown and the skies were overcast adding to the difficulty of aircrews to spot the spill.

NOAA Activities:

NOAA Scientific Support Coordinator (SSC) provided trajectory and resources at risk information to the Marine Safety Office (MSO), New Orleans. The SSC's services were discontinued after it was determined that this would not be considered a spill incident.

References:

NOAA Hotline 107, 5 reports.

Name of Spill:	ARCO Blowout
NOAA SSC:	Mike Barnhill
USCG District:	8
Date of Spill:	12/26/92
Location of Spill:	Mississippi River Delta, Louisiana
Latitude:	29°03'N
Longitude:	88°58'W
Spilled Material:	natural gas, hydrogen sulfide, and condensate
Spilled Material Type:	1
Barrels:	unknown
Source of Spill:	gas well
Resources at Risk:	personnel onsite, birds, fish, shellfish, marsh
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

At 0823, December 26, 1992, an ARCO oil rig blew out a mixture of South Louisiana crude oil, hydrogen sulfide, and natural gas at South Pass, Block 60, Mississippi River Delta, Louisiana. The blowout was reported to the USCG office by an ARCO employee. At 0900 a USCG overflight located the rig and reported that the release of natural gas, hydrogen sulfide, and a condensate of crude oil was ongoing and a boat on the upwind side of the rig was applying water to the diverter to cool it down. ARCO personnel on a rig less than one mile northeast of the blowout were prepared to evacuate in case of a wind shift.

On December 26, 1993, the slick was tended to the southwest. It was reported to be one to one and a half miles long and two to three hundred yards wide consisting mostly of a condensate. Rainbow and lighter sheen extended from one and a half to nine and a half miles from the rig. The smell of hydrogen sulfide was detected up to ten miles downwind. The amount of oil in the water appeared to be minimal.

An exclusion zone was established within a ten-mile radius of the well because of the hydrogen sulfide gas threat. The well was capped on December 28, 1992, without significant impact.

Behavior of Oil:

The condensate was released from the well under pressure and appeared to be mounded when it reached the water and quickly thinned to a point where it was not recoverable. Avoidance of the hydrogen sulfide and natural gases were the main concerns.

Countermeasures and Mitigation:

Because of hydrogen sulfide gas threat, an exclusion zone was established until the well was capped. The zone radius was estimated using a combination of ALOHA analysis and limited on-scene concentration readings.

NOAA Activities:

NOAA was notified of the incident by MSO New Orleans on December 26, 1992. The SSC reported onscene that afternoon. NOAA's involvement ended with the capping of the well on December 28, 1993.

References:

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

NOAA Hotline #112, 14 reports.

Research Planning Institute. 1989. *Sensitivity of coastal environments and wildlife to spilled oil: Louisiana. An atlas of coastal resources*. Seattle: Ocean Assessments Division, NOAA. 98 maps.

Name of Spill:	Sunshine Bridge
NOAA SSC:	Mike Barnhill
USCG District:	8
Date of Spill:	04/10/93
Location of Spill:	New Orleans, Louisiana
Latitude:	30°06' N
Longitude:	90°55' W
Spilled Material:	#6
Spilled Material Type:	4
Barrels:	2,100
Source of Spill:	barge
Resources at Risk:	birds, fish, shellfish, marsh
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	marsh, manmade docks and levees, river banks
Keywords:	none

Incident Summary:

At about 2315, April 9, 1993, a barge pushed by the tug *Dave Brassel* struck the Sunshine Bridge at mile marker 167 on the Mississippi River, north of New Orleans, Louisiana. Approximately 5,500 barrels of #6 fuel oil from the Texaco Convent Refinery, reportedly cut with diesel oil, was released from a forward tank of the barge. The damaged barge was placed on the west bank of the Mississippi and boomed quickly. The oil remaining onboard was transferred to a second barge.

At about 1500, April 10, 1993, the leading edge of the oil passed through downtown New Orleans and was expected to continue south to the mouth of the Mississippi River. The oil continued down the river through April 13, 1993. Deflection boom was used in an attempt to collect some of the oil as it moved downriver, but response tools were ineffective.

Behavior of Oil:

As the oil moved down the river it collected in cuts along the levees and in manmade docking areas. Most of the oil transited to and beyond the Mississippi Delta unimpeded. Because the oil was so difficult to find, responders began to wonder if it had sunk. NOAA advised that in all likelihood it had not sunk, but was just hard to see because its pour point was close to the water's temperature, the current was swift, and the water held so much silt. When the oil reached the slower currents of the delta under calm wind conditions, it would again be visible. As expected, the oil was seen again on April 13 collecting in large but very thin sheen fields. It was not recoverable.

The responsible party reported recovering approximately 330 barrels of the oil, but the accuracy of the report is unknown.

Countermeasures and Mitigation:

Deflection booming of the river and skimming operations were attempted on sheen fields found off the Mississippi River Delta. None of these efforts were effective. The five- to seven-knot currents prohibited the effective use of available response tools. Only about six percent of the oil was recovered.

NOAA Activities:

NOAA was notified of the incident at about 1200 on April 10, 1993, by MSO New Orleans. MSO requested resources-at-risk analysis, fate and effects analysis, and information on timing of the transit of the oil to the Mississippi River Delta. NOAA reported onscene April 11, 1993. Samples of the spilled product were collected for chemical analysis (fingerprinting, weathering). NOAA's response ended April 14, 1993.

References:

Galt, J.A. and D.L. Payton. 1981. Finite element routines for the analysis and simulation of nearshore circulation, *Mechanics of Oil Slicks*, Paris, France, pp. 121-132.

NOAA Hotline Report 124, 21 reports.

Research Planning Institute. 1989. *Sensitivity of coastal environments and wildlife to spilled oil: Louisiana. An atlas of coastal resources*. Seattle: Ocean Assessments Division, NOAA. 98 maps.

Name of Spill:	UNOCAL Dock No. 1
NOAA SSC:	Mike Barnhill
USCG District:	8
Date of Spill:	04/20/93
Location of Spill:	Port Neches, Texas
Latitude:	30°00' N
Longitude:	93°58' W
Spilled Material:	Kuwaiti light crude oil
Spilled Material Type:	2
Barrels:	2,100
Source of Spill:	facility
Resources at Risk:	birds, fish, shellfish, marsh
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	Elastol testing
Shoreline Types Impacted:	marsh, manmade shoreline, river banks
Keywords:	skimmers

Incident Summary:

At 0853 on April 20, 1993, a watchman making early morning rounds called the USCG MSO Port Arthur to report a crude oil spill at the UNOCAL Neches River facility. Pollution investigators confirmed the spill and overflight personnel reported that a marsh to the east of the spill site had been impacted. UNOCAL initially reported that 100 barrels had been released, but USCG overflight personnel estimated the spill at 1,000 barrels. The final calculation by UNOCAL was 2,100 barrels. The spill location was boomed and UNOCAL hired four contractors to clean up the marsh.

The cause of the spill may have been valve failure while crude was being transferred from a holding tank on the facility to an off-site tank. Reports indicated that the transfer may have been switched to an inappropriate pipeline, which subsequently overflowed. There were no alarms on the system.

UNOCAL immediately accepted responsibility for the incident and the cleanup of the impacted river banks and marsh. Cleanup activities were monitored by MSO Port Arthur until April 25, 1993, when the Federal On-Scene Coordinator (FOSC) turned final oversight function over to Texas General Land Office personnel.

Behavior of Oil:

The released crude was reported to have an API of 33. Due to the low energy in the marsh environment, it did not emulsify. The heaviest impact was found in Gray's Bayou, just to the east of the initial spill site. The oil was moved into the marsh by current and tidal action. A north wind on the first day helped move the oil out of the marsh, through Gray's Bayou, and into secondary and tertiary booming. UNOCAL reported that approximately 1,700 barrels of oil were recovered during the response.

Predominantly northerly winds coupled with the tidal influence flushed the oil from the marsh. Very little oil escaped the booms established in Gray's Bayou; that which did escape to the Neches River settled in natural collection points downstream and was easily recovered.

Countermeasures and Mitigation:

Large sheen in the marsh areas north and east of Gray's Bayou were unrecoverable because these areas are inaccessible. Boomed locations in Gray's Bayou were skimmed continuously using Marco skimmers and the USCG Gulf Strike Team's Desmi skimmers. The Marco skimmers were slow, but skimmed very little water with the oil; the Desmi skimmers were fast, but skimmed about 80 percent water. The Marco skimmers alone were not able to skim fast enough to remove most of the oil before the response was complicated by bad weather. Vacuum trucks were also used, but their effectiveness was never determined. Low- to medium-pressure, cold-water flushing was used to try to remove the oil from small pools in the mudflat on Gray's Bayou with only partial success.

Other Special Interest Issues:

Of special interest was the trial use of Elastol™. The trial run showed that the application system used was inappropriate for use in the marsh, and by the day of the trial, most of the oil in the booms had been removed by the Desmi skimmers. About 15 gallons of oil was treated during the trial, but the inadequacy of the spray system over applied the site. The over-treated oil became very sticky and would probably have had a negative impact on the marsh if it had entered it. The test indicated that further testing of this product is necessary if it is to be used near a marsh area.

NOAA Activities:

NOAA was notified of the incident on April 20, 1993, by MSO Port Arthur. The SSC reported to Port Arthur to aid in the spill response. NOAA provided trajectories and weather reports to MSO at the spill site. NOAA also provided continuous information and response oversight, monitored and documented marsh and river bank impacts, cold-water flushing activities, and Elastol™ trials. The FOSC requested that the SSC coordinate environmental concerns with the appropriate federal and state agencies.

References:

NOAA Hotline 125, 26 reports

Research Planning Institute. 1993. *Use of Elastol During the UNOCAL Spill on the Neches River 24 April 1993*. Seattle: Hazardous Materials Response and Assessment Division, NOAA.

Texas Water Commission. *Spill Response Map Series, Coastal Region* 26 general maps, 8 supplemental maps.

U.S. Coast Guard District 13

Mystery Spill	87
M/V <i>Nosac Forest</i>	89
M/V <i>Central</i>	93
Shannon Point Seafood Company Fire	97

Name of Spill: Mystery Spill
NOAA SSC: Sharon K. Christopherson
USCG District: 13
Date of Spill: 01/04/93
Location of Spill: Lincoln City, Oregon
Latitude: 44°52' N
Longitude: 124°02' W
Spilled Material: 4
Spilled Material Type: tarballs
Amount: unknown
Source of Spill: unknown, probably bilge pumping by offshore vessel
Resources at Risk: seabirds, waterfowl, marine mammals
Dispersants: N
Bioremediation: N
In-situ Burning: N
Other Special Interest: multi-agency shoreline surveys
Shoreline Types Impacted: coarse-sand beaches, exposed fine-sand beaches, exposed rocky shore, wavecut platform
Keywords: none

Incident Summary:

At 1137 on January 4, 1993, U.S. Coast Guard (USCG) Station Depoe Bay, Oregon received a report of oil on the local beaches. A USCG overflight that afternoon confirmed the presence of tarballs and oil impacts along a 15-mile stretch of shoreline south of Lincoln, Oregon between Gleneden Beach and Seal Rock. No source of the oil was found. A shoreline survey by Marine Safety Office (MSO) Portland personnel the following morning observed weathered pea- to grape-size tarball accumulations that warranted cleanup deposited along the high-tide line in at least five different areas between Lincoln City and Lost Creek. The Oil Pollution Fund was opened. Manual cleanup of the impacted areas was completed January 8, 1993.

Behavior of Oil:

The pea- to grape-size tarballs that impacted the shoreline appeared to be well-weathered black oil, most likely blown ashore from some distance offshore as a result of several days of strong westerly winds.

Intermittent impacts occurred along an 18-mile stretch of shoreline between Gleneden Beach and Beaver Creek. Five miles of shoreline along Gleneden Beach and Lincoln Beach had a sporadic distribution of tarballs ranging from pea to marble size. The majority of the tarballs were found mixed with organic debris left by the tide on the upper portion of the beach.

A second three-mile stretch of shoreline between Lost Creek and Thiel Creek also had localized concentrations of pea-sized or smaller tarballs mixed with organic debris. In both cases, the tarballs appeared to be well-weathered bunker or heavy waste oil. By the third day, blowing sand began burying the stranded tarballs in areas where the cleanup was not completed, but the total quantity of oil appeared to be too small to pose any significant problem.

The organic debris that mixed with the tarballs and sometimes formed piles two-feet thick, was composed of large numbers of the empty tubes of *Spiochaetopterus* sp., a tube worm found in large concentrations in sandy areas offshore. Local biologists believed that strong

wave action generated by a recent storm churned up one or more of these areas and washed the tubes ashore.

Oregon Department of Fish and Wildlife surveyed rocky intertidal areas next to the impacted beaches and found no evidence of stranded oil. The weathered condition of the oil and cold temperature kept the tarballs from sticking to the rocky surfaces.

Additional tarballs did wash up on a two-mile section of Gleneden Beach on January 15, but were in much lower concentrations and did not warrant cleanup.

Countermeasures and Mitigation:

Cleanup of impacted shorelines consisted of manual removal using shovels and rakes. Tarballs were usually raked into piles, and the material then sieved through a screen to separate the tarballs from organic material for disposal. While labor-intensive and slow, this process significantly reduced the volume of material to be disposed of.

Other Special Interest Issues:

A series of joint shoreline surveys of the impacted areas were conducted by USCG, NOAA, and Oregon departments of Environmental Quality, Fish and Wildlife, and State Parks to determine cleanup priorities and "how clean is clean."

NOAA Activities:

NOAA was notified of the incident on January 5, 1993, by MSO Portland who requested the Scientific Support Coordinatr (SSC) provide on-scene assistance. Initially there was concern that a source offshore could potentially impact numerous marine mammals, seabirds, and waterfowl present in the coastal waters. No offshore concentration of oil was identified in the overflights. NOAA provided weather forecasts for the cleanup operations, and participated in the multi-agency shoreline surveys of the impacted area.

References:

NOAA Hotline 114, 5 reports

Research Planning Institute. 1986. *Sensitivity of coastal environments and wildlife to spilled oil: Oregon and Washington. An atlas of coastal resources.* Seattle: Ocean Assessments Division, NOAA. 55 maps.

Name of Spill:	M/V <i>Nosac Forest</i>
NOAA SSC:	Sharon K. Christopherson
USCG District:	13
Date of Spill:	04/20/93
Location of Spill:	Blair Waterway, Tacoma, Washington
Latitude:	47°16'N
Longitude:	122°22'W
Spilled Material:	IFO 380
Spilled Material Type:	3
Amount:	95 barrels
Source of Spill:	non-tank vessel
Resources at Risk:	waterfowl, anadromous fish, nursery area
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N concerns, hazardous waste site, port authority
dredging pro	
Other Special Interest:	Native Americanject, worker safety
Shoreline Types Impacted:	mixed sediment beaches, riprap, piers
Keywords:	containment boom, low-pressure flushing, skimmers, sorbent pompoms, high-pressure flushing

Incident Summary:

At 0800 on April 21, 1993, MSO Puget Sound was notified that the forward tank of the M/V *Nosac Forest* had been overfilled while bunkering at the Pierce County Terminal in Tacoma, Washington. Approximately 200 gallons of IFO 380 was spilled into the Blair Waterway. It was later determined that approximately 4,000 gallons of fuel were spilled into the water, 1,500 gallons were contained on the deck, and 14,000 gallons were spilled and contained in the engine room bilges when a valve broke. Personnel from the barge supplying the fuel quickly deployed a boom around the vessel to contain the spill and began skimming the oil. At 2030, a shoreline survey found a 3,000-foot section of the northeast waterway shoreline covered with a two-foot wide ribbon of oil. An overflight the following morning saw pockets of black oil trapped at the east end of the waterway, with heavy rainbow sheen and emulsified oil scattered throughout Blair Waterway. A small quantity of light sheen was also seen in Commencement Bay. Through a combination of southwest winds and a series of deflection booms deployed along the north shoreline, the majority of the oil was contained in the east end of the waterway where it either beached or was recovered.

Recovery of pockets of free-floating oil was completed April 27. Active cleaning of impacted shorelines was completed May 2. Passive cleaning using snare booms (pompoms) deployed along the more heavily impacted shoreline continued until June 1.

Behavior of Oil:

The product spilled was an IFO 380 with a specific gravity of 0.9902, API 11.4 and a viscosity of 200cst at 50°C. Once spilled, the product behaved like a mixture of Bunker C and diesel.

Weak tidal currents and light southwest winds kept the majority of the oil in the southeast end of the waterway. Pockets of free-floating product were trapped by booms and collected near the vessel at the Pierce County Terminal, at the Weyerhaeuser Pier on the north side of the waterway, and the Blair Pier on the south side.

The heaviest shoreline impacts occurred along the riprap and sand/gravel beach at the Weyerhaeuser Pier. Moderate to heavy oiling also occurred on the riprap and sand/gravel

beach at the graving dock west of Weyerhaeuser, and the riprap protecting the turning basin shoreline east of Weyerhaeuser. Moderate levels of oil were found in the riprap under the west end of Blair Pier and a barge slip located on the south shore of the waterway west of the Pierce County Terminal. A thin-coated narrow band of black oil was found intermittently along the rest of the shoreline out to the entrance to Blair Waterway.

The Blair Waterway is one of five industrial waterways on the east side of Commencement Bay dredged and filled from wetlands at the mouth of the Puyallup River. The shoreline at the east end of the waterway where the spill occurred was characterized by a thick clay layer overlain with intermittent pockets of sand and gravel. The steeper backshore of the beach was stabilized with loose boulders and cobbles. Oil was deposited as a thick coating along approximately two miles of the shoreline in the early stages of the spill. Successive high tides tended to refloat the oil off the clay and sand areas, while the oil adhered loosely to the rough surfaces of the algae, rocks, gravel, and clumps of mussels and barnacles lying on top of the clay.

Countermeasures and Mitigation:

Significant pockets of black oil were trapped and contained by booms at the Pierce County Pier, Weyerhaeuser Dock, and Blair Waterway. Skimmers were used to recover the oil from these pockets. Deflection booms deployed along the northeast shore of Blair Waterway were used to recover oil refloated off the beaches by the high tide carried by the ebb current toward the waterway entrance. Oil was recovered from these booms after each ebb tide by skimmers or manually picked up from small workboats using sorbent pads and pompoms.

High-volume, low-pressure flushing was particularly successful in mobilizing black oil pooled in rocks and gravel in the mid- to upper-tidal level of the beach down to the water where it could be collected. Oil was flushed into a boom close to the water's edge and then recovered manually using sorbent pads and pompoms. Flushing operations were restricted to mid- to high tide to ensure adequate water protected the clean lower intertidal area from contamination by oil flushed out of the rocks. Active flushing was discontinued after about ten days when the volumes of oil recovered decreased and the proper tide window no longer occurred during daylight hours.

A limited amount of high-pressure flushing was used on some of the more heavily contaminated pilings at Pierce County Terminal and Weyerhaeuser Dock. The water pressure was maintained at a level just below the point where it knocked mussels and barnacles off to prevent moving contaminated organisms into the food chain. Hand-scraping a thick band of oil along a steep clay bank above the high-tide line in the barge slip was also tried to prevent the oil from being remobilized during the next spring tide. Tilling and turning over of small cobble armoring of sand and gravel in a heavily impacted area just west of Weyerhaeuser was done to release relatively unweathered oil from underneath the rocks and speed up natural flushing of the area.

Other Special Interest Issues:

One of the shorelines more heavily contaminated in this spill included an old graving dock located just west of the Weyerhaeuser Dock. This area was a hazardous waste site (arsenate slag) being cleaned up under U.S. Environmental Protection Agency (EPA) jurisdiction. Cleanup on this site was due to be signed off as final and the land turned over to the Puyallup Indian Tribe by the Port of Tacoma as part of a Federal Consent Decree. In addition, the Port of Tacoma had just completed a three-million dollar dredge spoils characterization study of all five waterways in preparation for a major waterway improvement project that would involve dredging some of the areas impacted by the oil spill. A meeting including the USCG, State of Washington, EPA, NOAA, the Port of Tacoma,

the Puyallup Tribe, and the responsible party was held to discuss the implication of these issues on the spill response. A key part of this meeting was to help the Port of Tacoma and the Puyallup Tribe understand how the decision to cease active cleanup of an oil spill is made, and what their options will be after the Federal/state cleanup is completed if there are still problems with the condition of their properties. The State On-Scene Coordinator (OSC) agreed to help the Port of Tacoma identify what needed to be done to determine if their current permit to dispose of dredge spoils will still be valid after the oil spill cleanup is completed. An agreement was reached that the Federal/state cleanup would continue until the environmental threat was minimized. Additional cleanup or restoration conditions would then be negotiated by the land owners directly with the responsible party. The Spill Response Site Safety Plan was modified to ensure protection of all response personnel working near the hazardous waste site.

NOAA Activities:

NOAA was notified of the incident on April 21, 1993, by MSO Puget Sound who asked the SSC to report onscene. NOAA provided weather forecasts, participated in overflights and mapped shoreline impacts throughout the spill response. The SSC participated in multi-agency shoreline surveys that agreed on cleanup recommendations and reached consensus on "how clean is clean." At the USCG's request, NOAA collected oil samples from selected impacted areas and analyzed their weathering and toxicity characteristics to help determine "how clean is clean." This information was shared with all interested parties. Follow-up sampling and analyses of the oil remaining on impacted shorelines are planned for spring 1994.

References:

NOAA Hotline 126, 6 reports

Name of Spill: M/V *Central*
NOAA SSC: Sharon K. Christopherson
USCG District: 13
Date of Spill : 06/03/93
Location of Spill: Longview, Washington
Latitude: 46°07' N
Longitude: 122°59' W
Spilled Material: IFO 180
Spilled Material Type: 3
Amount: 143 barrels
Source of Spill: non-tank vessel
Resources at Risk: refuges, wildlife preserves, state parks, shorebirds, diving birds, gulls, terns

Dispersants: N
Bioremediation: N
In-situ Burning: N
Other Special Interest: pre-planning (Geographical Response Plan [GRP]), high river level/flow, communication difficulties

Shoreline Types Impacted: vegetative river bank, freshwater marshes, low banks, riprap, mixed sediment beach

Keywords: containment boom, skimmers, sorbent pompoms

Incident Summary:

At 0730 on June 3, 1993, the 495-foot, Panama-flagged M/V *Central* spilled approximately 6,000 gallons of IFO into the Columbia River while bunkering from a tank barge in the anchorage area off Longview, Washington. The spill occurred because the crossover valve to the #4 starboard tank was left open while filling the #4 port tank. A boom was immediately deployed around the vessel, but failed to contain the oil due to entrainment under the boom in the more than two-knot current in the river. The Federal On-Scene Coordinator (FOSC) temporarily assumed control of the cleanup effort until the vessel's owners demonstrated their ability to take adequate actions in responding to the spill. The majority of the free-floating oil moved downstream and either dissipated or beached within the first 36 to 48 hours. Active shoreline cleanup was completed June 7, while passive cleanup with pompoms continued at one or two areas for two weeks.

Behavior of Oil:

At the time of the spill, the Columbia River level and flow rate were at historically high levels because of a recent release of water from the Bonneville Dam necessitated by abnormally high reservoir levels behind the dam. As a result, the leading edge of the spill was 20 miles downriver after the first 9 hours, and 47 miles within 24 hours. Without any strong winds, the heaviest concentration of the spill tracked down the middle of the deeper dredged shipping channels. The heaviest shoreline impacts occurred in sloughs and creek mouths along the Washington side of the river where the shipping channel is very close to the shore. These included Germany Creek/Coal Creek Slough, Steamboat Slough, Abernathy Creek, Mill Creek, and Willow Grove Beach. Recoverable quantities of oil were also trapped in the log booms anchored along the north shore of Puget Island in Clifton Channel. Due to the high water level at the time of the spill, many of the freshwater marshes in the middle of the river were at least partially submerged. Marsh impacts were lighter than expected, with primarily light staining of the tops of the plants and splotches of oil trapped in the overhanging tree limbs along the shoreline. The water level dropped rapidly for the first two days following the spill, frequently leaving a narrow band of oil stranded in the vegetation as much as four to five feet above the normal water level.

Countermeasures and Mitigation:

The majority of the free-floating oil traveled downriver; spreading out into broken patches of sheen by the time it reached the Columbia River Estuary 35 miles downstream from the source of the spill. Over 10,000 feet of boom were deployed to contain and recover oil in natural collection points and to protect sensitive areas. These locations had been pre-identified and response strategies developed and documented in a GRP developed two years ago at a workshop attended by industry and federal and state government agencies. Oil trapped by booms was removed by skimmers. With the exception of sheens coming off the more heavily contaminated shorelines, all free-floating oil was picked up or flushed down the river within the first 36 to 48 hours of the spill. Skimmers were kept on standby for two more days in case they were needed.

The heaviest shoreline contamination occurred when oil was trapped in riprap and along the mud-cobble at the entrance to Germany Creek. Manual removal of oily debris, hand wiping, limited vegetation cutting, and passive scrubbing and absorption by pompoms were the primary shoreline cleanup techniques used. Although a no-wake advisory was in effect, on several occasions response craft were swamped, containment booms broken loose, and oil pushed as far as 15 feet up the bank by large tankers and cargo vessels transiting the nearby channel at high speed. Active shoreline cleanup was completed on June 7, although passive cleanup with pompoms continued for two more weeks along two sections of riprap at Germany Creek.

Other Special Interest Issues:

Confusion over who would represent the vessel owner and take responsibility for cleanup delayed the initial response and resulted in the USCG assuming control. Based on vessel contingency plans on file, Washington State and the USCG understood that the local cleanup cooperative would be representing the owner. In the absence of a specific contract, this was disputed by the cleanup cooperative. A representative of the vessel owner was identified by the second day of the spill and assumed responsibility for the cleanup. The USCG and the states of Washington and Oregon are currently reviewing all vessel contingency plans relative to this issue.

There was also a high level of media interest during the first three days of the spill. Press briefings and interviews held jointly by the responsible party, state, and Federal OSC representatives onscene gave the public a favorable impression of a unified and timely response to the spill in television and newspaper coverage.

Radio and cellular phone coverage along this section of the Columbia River were relatively poor and spotty and complicated response coordination, especially during the first day or two of the response. A Washington State response trailer with an elevated radio aerial was brought in that improved communication with USCG and state offices in Portland and Olympia. Coordination between field units remained difficult, requiring personnel to stop work and get together for more frequent operational briefings. This was particularly difficult as response activities spread out along 45 miles of the Columbia River.

NOAA Activities:

NOAA was notified of the incident at 1500 on June 3, 1993, by MSO Portland and requested to provide assistance onscene. The SSC provided spill trajectories, weather forecasts, and resources at risk. Of primary concern were the numerous wildlife management areas and sensitive environments downstream of the spill site, including the Columbia White-tailed

Deer National Wildlife Refuge, the Lewis and Clark National Wildlife Refuge, and the nesting areas on Miller Sands, Rice Island, and Sand Island.

Throughout the response, NOAA participated in helicopter overflights and multi-agency shoreline surveys and made cleanup recommendations for the more sensitive environments. The SSC worked closely with the trustee agencies to evaluate the tradeoffs between the need to contain and remove oil trapped in sensitive environments along the river, and the impact these cleanup activities might cause to nesting populations and marsh habitats. At the USCG's request, the SSC addressed environmental issues during joint press briefings and coordinated multi-agency discussions of "how clean is clean."

As part of the determination of "how clean is clean," NOAA collected and analyzed oil from selected impacted areas along the river to assess weathering and toxicity characteristics. The results of these analyses were provided to all interested parties. The USCG, Oregon, and Washington want to re-evaluate the weather and toxicity characteristics of the oil remaining in the environment in the spring of 1994.

References:

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

NOAA Hotline, 128 8 reports

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

Name of Spill: Shannon Point Seafood Company Fire
NOAA SSC: Sharon K. Christopherson
USCG District: 13
Date of Spill: 07/26/93
Location of Spill: Shannon Point, Anacortes, Washington
Latitude: 48°31' N
Longitude: 122°39' W
Spilled Material: 5
Spilled Material Type: anhydrous ammonia, freon
Amount: 1,500 pounds ammonia, 100 pounds freon
Source of Spill: facility
Resources at Risk: commercial dock
Dispersants: N
Bioremediation: N
In-situ Burning: N
Other Special Interest: human health and safety, closure of channel to vessel traffic
Shoreline Types Impacted: none
Keywords: none

Incident Summary:

At 2215 on July 26, 1993, the USCG District 13 Operations Center received a report of a fire at the Shannon Point Seafood Company, a fish processing facility located in Anacortes, Washington. In addition to the fire, there was concern for the potential release of 5,000 pounds of anhydrous ammonia and 100 pounds of freon contained in storage and piping of the freezer unit of the facility. Initially a one and a half-mile safety zone was established and all businesses and residences within a one-mile radius of the facility were evacuated. The following morning, the safety zone was reduced to 500 yards. The Anacortes Fire Department was unable to put the fire out until most of the dock and buildings collapsed into the water. A small plume of ammonia was released when this occurred. Personnel evacuated from the area were allowed to return the evening of July 27 when the fire was declared under control.

Behavior of Hazardous Material:

An estimated 1,500 pounds of anhydrous ammonia were released during the height of the fire as the burning building and dock began to collapse. Observers reported a light brown cloud of vapor released as a plume rising up with the smoke to be carried northeast out over the Guemes Channel where it dissipated within several hundred yards with no adverse impacts. The light brown color of the plume indicated that at least some of the ammonia reacted to form nitrous oxide fumes in the fire. The remaining 3,500 pounds of anhydrous ammonia stored in a cement building next to the dock were not released.

Countermeasures and Mitigation:

Firefighters' attempts to control the fire failed because of the inaccessibility of the burning creosoted wood pilings beneath the pier. Water was pumped onto the dock and buildings situated directly above the fire in an attempt to prevent the fire from spreading by cooling down the area. The entire dock and all but one of the buildings were destroyed and collapsed into the water. Stick and sorbent booms were deployed to trap the debris that fell into the water and to contain the creosote sheen that was melted off the pilings until cleanup could be completed.

Two portable 1,000 pound tanks of anhydrous ammonia stored in an area next to the dock were safely removed during the fire. The remaining 2,500 pounds of anhydrous ammonia was removed from the refrigeration system of the cement building after the fire was under control.

Other Special Interest Issues:

The Anacortes Fire Department ordered the evacuation of approximately 450 people living within one mile of the Shannon Point Seafood Company during the early stages of the fire in response to the threatened ammonia release. The evacuation was coordinated by the Skagit County Department of Emergency Management and the police department. Residents were permitted to return to their homes at approximately 1900 on July 27. The initial one and a half-mile safety zone also included restricting vessel traffic transiting through Guemes channel located to the north of the facility. When the safety zone was reduced to 500 yards the following morning, vessel traffic in Guemes Channel was allowed to resume.

NOAA Activities:

NOAA was notified of the incident at 2230 on July 27, 1993, by MSO Puget Sound who requested the SSC provide recommendations on a safety zone and identify health and safety concerns. Initial estimates were that 5,000 pounds of anhydrous ammonia and 100 pounds of freon could possibly be released. Based on the low winds and stable atmospheric conditions during the night, the SSC recommended a safety zone of one and a half miles. In addition, using projections from ALOHA and a careful study of the local topography, NOAA provided information on population areas potentially at risk under several different release scenarios. By the following morning, it was determined that only 1,500 pounds of ammonia in the refrigeration system of the building on the dock were at risk from the fire; the remaining 3,500 pounds were in a separate cement building on the shore. Based on this and an increase in the local winds, NOAA recommended reducing the safety zone to 500 yards.

References:

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

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

U.S. Coast Guard District 14

Mystery Spill.....101

Name of Spill:	Mystery Spill
NOAA SSC:	Sharon K. Christopherson
USCG District:	14
Date of Spill:	06/14/93
Location of Spill:	Kauai Channel, Hawaii
Latitude:	21°51' N
Longitude:	159°44' W
Spilled Material:	Bunker C
Spilled Material Type:	4
Amount:	unknown
Source of Spill:	unknown, probably bilge pumping by vessel offshore
Resources at Risk:	native Hawaiian cultural lands, dolphins, whales, seabird sanctuary, USFWS wildlife refuge
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	restricted USN area
Shoreline Types Impacted:	none
Keywords:	skimmers

Incident Summary:

U.S. Coast Guard (USCG) Marine Safety Office (MSO) Honolulu received a report at 1150 on June 14, 1993, of an oil slick off the south coast of the island of Kauai. A USCG overflight of the area confirmed that the slick was 3.5 miles long by 300 yards wide and consisted of 95 percent sheen and 5 percent black oil in wind rows. The Coast Guard Cutter (CGC) *Washington* and the Clean Island Cooperative's skimmer were dispatched, arriving onscene the following morning. Skimming operations concentrated on the ribbons of dark oil until dark on June 15. Overflight personnel on the morning of June 16 saw a significantly dissipated slick broken into areas of light sheen and containing no recoverable oil. The CGC *Washington* and the skimmer were released at 0915 on June 16.

Behavior of Oil:

The original oil slick reported June 14 was located six miles south of Waimea and consisted of silver sheen and wind rows of black oil. It was estimated that under the influence of light east-southeast winds and a westerly current, light impacts in the form of scattered tarballs could occur along the southeast shore of Niihau Island in 48 hours if the slick held together. Concern was expressed that tarballs could reach the bird sanctuary at Kaula located 20 miles southwest of Niihau, but it was considered very unlikely that tarballs in any kind of concentration would make it that far. By June 15, the slick had moved six miles farther west and was showing signs of breaking up. Skimmers recovered most of the heavier streaks of oil during the afternoon. Personnel on the overflight of July 16 observed only a narrow band of light sheen one to two miles off the west coast of Kauai and scattered patches of sheen stretching to the southwest toward the southern tip of Niihau Island. Northeast trade winds of 15 to 20 knots overnight broke up the remaining sheen. There were no reported shoreline impacts.

Countermeasures and Mitigation:

Skimmers vectored in by observations from helicopter overflights recovered five barrels of the heavier oil. The remainder of the sheen was dissipated by the wind and wave action with no reported shoreline impacts.

Other Special Interest Issues:

Close coordination between the USCG pilots and the U.S. Navy was essential during this response because there is an active rocket testing range in the Kaulakahi Channel above latitude 22°N. No skimming operations were allowed in this area. Fortunately, most of the recoverable oil was concentrated in the southern part of the channel.

NOAA Activities:

NOAA was notified of the incident at 2200 on June 14, 1993, by MSO Honolulu who requested a trajectory and resources at risk. Due to the concern of possible shoreline impacts on the recreationally important south shore of Kauai and the threat to the bird sanctuary at Kaula, the Scientific Support Coordinator (SSC) went onscene at the request of the Federal On-Scene Coordinator. Onscene, the SSC briefed USCG and resource agencies on spill trajectories and participated in helicopter overflights until the spill dissipated.

References:

Research Planning Institute. 1986. *Sensitivity of coastal environments and wildlife to spilled oil: Hawaii. An atlas of coastal resources.* Seattle: Ocean Assessments Division, NOAA. 86 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.

U.S. Coast Guard District 17

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Name of Spill:	Tug <i>May</i>
NOAA SSC:	John W. Whitney
USCG District	17
Date of Spill:	11/22/92
Location of Spill:	Frederick Sound, Alaska
Latitude:	57°05' N
Longitude:	133°10' W
Spilled Material:	diesel
Spilled Material Type:	2
Barrels:	167
Source of Spill:	non-tank vessel
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	evaporation, sorbent boom

Incident Summary:

On November, 22, 1992, while pulling a tow of floating logs in calm water, the tug *May* suddenly capsized and sank in 50 fathoms at the mouth of Farragut Bay in Frederick Sound, Alaska. One crewmember escaped; three others went down with the vessel and were presumed drowned. The U.S. Coast Guard (USCG) launched an unsuccessful search and rescue mission that lasted about ten days.

The tug had 7,000 gallons of diesel onboard and immediately released several hundred gallons when it sank. The log boom, which was still attached, positioned itself directly over the sunken vessel and was contaminated by the released oil. After the initial release, fuel continued to rise from the vessel at the rate of a few gallons per hour causing a small surface sheen that evaporated and dispersed rapidly.

Behavior of Spilled Material:

Due to the nature of diesel and the strong winds on the night of November 22 and the next day, much of the oil dispersed or evaporated. No shorelines were impacted. Small amounts of diesel continued to be released for approximately ten days, but it all evaporated and/or dispersed.

Countermeasures and Mitigation:

Southeast Alaska Petroleum Resource Organization, the Southeast Alaska oil spill cooperative, responded with sorbent pads, booms, and personnel. Due to the strong currents in Frederick Sound, attempts to surround and capture the rising oil plume were unsuccessful. Most of the cleanup effort was directed at cleaning the oil-contaminated log boom with sorbents. About 800 gallons of fuel were recovered and the sorbents were burned on the beach. A remote camera is to be deployed to ascertain the condition and position of the sunken vessel. When weather permitted, cleanup efforts continued for ten days.

NOAA Activities:

NOAA was notified of the incident on November 22, 1992, by USCG Marine Safety Office (MSO) Juneau.

The Scientific Support Coordinator (SSC) provided weather projections, tidal current updates, and resources at risk information to the cleanup site as necessary. NOAA indicated that there were no resources at risk at this time of year. The NOAA response concluded after five days.

References:

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

Name of Spill:	Dolly Varden Platform
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	11/23/92
Location of Spill:	Cook Inlet, Alaska
Latitude:	60°45' N
Longitude:	151°40' W
Spilled Material:	crude and hydraulic oil
Spilled Material Type:	3
Barrels:	1
Source of Spill:	platform
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

At approximately 1530 on November 23, 1992, the waste liquids tank on the Marathon Dolly Varden platform overflowed allowing oil to drain into Cook Inlet. A slick of approximately 40 gallons of waste crude and hydraulic fluid, about 200 yards wide by 3/4 of a mile long extended away from the platform. Marathon immediately dispatched a helicopter to track the slick until dark. After dark a Cook Inlet Spill Response and Prevention Inc. (CISPRI) vessel tried unsuccessfully to locate the slick. A helicopter overflight the next morning found no trace of the oil.

Behavior of Spilled Material:

The high currents stretched the slick into a sheen almost immediately. The oil naturally dispersed within two tidal cycles with no impacts reported.

NOAA Activities:

NOAA was notified of the incident on November 23, 1992, by spill response officials from Marathon who asked for a prediction of where they might find the oil at first light the next morning. The NOAA SSC told them that the oil would probably disperse overnight, but if it didn't, the best place to look would be the mid-channel rip between the Forelands and Kalgin Island. No further response was necessary.

References:

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

Name of Spill:	King Cove Lagoon
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	12/4/92
Location of Spill:	King Cove, Alaska
Latitude:	55°3.0' N
Longitude:	162°19.0' W
Spilled Material:	unknown petroleum product
Spilled Material Type:	unknown
Quantity:	unknown
Source of Release:	suspected onshore facility
Resources at Risk:	birds and waterfowl
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Keywords:	sorbent boom

Incident Summary:

On December 4, 1992, the USCG was notified of a small sheen on King Cove Lagoon that seemed to be coming from the Peter Pan Seafood Company's tank farm on the barrier of the lagoon. Peter Pan Seafood did not accept responsibility for the fuel release, but did deploy 300 feet of harbor boom and some sorbent boom and pads around the beach where the sheen had been seen. Samples of the sheen were gathered and sent to the USCG Central Oil Identification Laboratory for analysis. Peter Pan Seafoods and the city of King Cove dug a recovery trench approximately 150 feet long paralleling the area of the sheening. Contaminated soil was found before the water table was reached. Approximately 17 gallons of product were recovered from the recovery trench. The winds ranged from light to 45 knots during this incident.

Behavior of Oil:

Only sheen was observed during this response. Roughly 17 gallons of product were collected from the recovery trench. The samples of the sheen were insufficient to provide distinctive fingerprints.

Countermeasures and Mitigation:

The affected shoreline was isolated with a boom, and a trench was dug to the water table in an effort to capture as much fuel as possible. The USCG is continuing negotiations with Peter Pan Seafoods and the city of King Cove over the placement of the trench and other matters pertaining to this spill.

NOAA Activities:

NOAA was notified of the incident on December 4, 1992, by the USCG, who requested weather information and resources at risk in the area. After discussions with the U.S. Fish and Wildlife Service, Alaska Department of Fish and Game, and National Marine Fisheries Service, the SSC reported that there might be fewer than 1,000 waterfowl in the lagoon, including some emperor geese and steller's eiders, a threatened species. Some sea otters might also be present. On-scene observers saw only a handful of small dark waterfowl up at the head of the lagoon.

Name of Spill:	F/V <i>Massacre Bay</i>
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	01/16/93
Location of Spill:	Alitak Bay, Alaska
Latitude:	56°50.4' N
Longitude:	154°04.6' W
Spilled Material:	diesel
Spilled Material Type:	2
Barrels:	unknown
Source of Spill:	non-tank vessel
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Shoreline Types Impacted:	none
Keywords:	none

Incident Summary:

The fishing vessel *Massacre Bay* grounded and capsized the morning of January 16, 1993, in Alitak Bay, Kodiak Island as the result of gale force winds ranging up to 45 knots out of the northwest. One crewmember was rescued by the USCG; three drowned. Diesel leaking from the vents caused a sheen that extended several hundred meters, but it rapidly dissipated in the rough weather. Total fuel capacity of the vessel was 5,000 gallons. Several weeks of bad weather prevented salvaging the vessel that was floating upside down in 20 to 30 feet of water. In the middle of February, divers inspected the vessel and capped the main fuel system vents. No additional fuel leakage was detected.

Behavior of Oil:

An unknown amount of diesel leaked out slowly and continuously for several weeks, but was rapidly dissipated by the wave action. The sheen only traveled several hundred meters from the source and did not jeopardize any resources. No areas were impacted.

NOAA Activities:

NOAA was notified of the incident on January 16, 1993, by USCG MSO Kodiak. The SSC contacted involved resource agencies by phone to ascertain resources that might be at risk from the oil. There were no critical resources in Alitak Bay then, but, the adjoining onshore areas are part of the Kodiak National Wildlife Refuge under the jurisdiction of the Department of the Interior. Sensitive areas nearby included Tugidak Island, a State Critical Habitat Area 10 to 15 miles to the southwest, and several lagoons in the area that might contain overwintering emperor geese. NOAA's involvement was concluded after notifying interested resource agencies.

Name of Spill:	F/V <i>Yukon</i>
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	03/24/93
Location of Spill:	Womens Bay, Kodiak, Alaska
Latitude:	57°30' N
Longitude:	152°30' W
Spilled Material:	diesel
Spilled Material Type:	2
Quantity:	1,000 gallons
Source of Release:	fishing vessel
Resources at Risk:	none
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Keywords:	sorbent boom

Incident Summary:

On March 24, 1993, the USCG received a report of a capsized vessel. The F/V *Yukon*, a 120-foot processor, had capsized at the dock in Womens Bay and was listing at 45 degrees with approximately 3,000 gallons of diesel onboard. The responsible party hired a contractor who boomed the vessel with 18-inch harbor boom and 8-inch sorbent boom. Divers were employed to plug the vents. Crews were able to right the vessel using onshore bulldozers, but not until approximately 1,000 gallons of fuel had been lost. Throughout the response, winds remained light and variable out of the south-southeast, blowing away from the sensitive tidal flats at the head of Womens Bay.

Behavior of Oil:

Some of the diesel naturally dispersed and evaporated, but approximately 700 gallons of diesel and waste oil were recovered from the water within the boomed area. No impacts to resources occurred.

Countermeasures and Mitigation:

Because the vessel was easily accessible, the responsible party was able to boom her off, allowing very little oil to escape.

NOAA Activities:

NOAA monitored the weather and the tidal current for the USCG and reported by phone.

Name of Spill: Ketchikan Pulp Mill
NOAA SSC: John W. Whitney
USCG District: 17
Date of Spill: 3/31/93
Location of Spill: Ketchikan, Alaska
Latitude: 55°25' N
Longitude: 131°42' W
Spilled Material: aqueous magnesium bisulfite solution and sulfur dioxide gas
Spilled Material Type: 5
Quantity: 25,000 gallons of magnesium bisulfite
13,000 pounds of sulfur dioxide
Source of Release: shoreside facility
Resources at Risk: none
Dispersants: N
Bioremediation: N
In-situ Burning: N
Other Special Interest: none
Keywords: none

Incident Summary:

At approximately 0700 on March 31, 1993, a six-inch titanium pipe used in pulp production ruptured. The rupture discharged a mixture of wood chips and magnesium bisulfite solution into a floor drain that led to the main sewer outfall and ultimately discharged into Ward Cove. The pH of the spilled magnesium bisulfite solution was approximately 2.0. The digester holds approximately 25,000 gallons of which an unknown quantity ran into Ward Cove. When the spill occurred, gaseous sulfur dioxide was released into the air from the aqueous magnesium bisulfite solution. One employee was overcome by this gas and taken to the hospital, treated, and released. Due to the prevailing winds, personnel were evacuated from the surrounding buildings until the sulfur dioxide dissipated. A continuous monitoring of the pH on the Ward Cove outfall indicated only a 0.3 drop in the pH reading when the accident occurred; within the limits of the pulp mill's National Pollutant Discharge Elimination System permit.

Behavior of Chemical:

The sulfur dioxide gas dispersed and dissipated near the source of the spill.

Countermeasures and Mitigation:

Immediately after the discharge, a valve was secured to stop it and efforts were begun by Ketchikan Pulp Company personnel to neutralize the spilled material with a sodium hydroxide solution. Recovered wood chips were placed into another digester to be made into pulp.

NOAA Activities:

NOAA was notified of this incident on March 31, 1993, by MSO Juneau who requested information on the behavior and possible effects of magnesium bisulfide. The SSC responded by telephone.

References:

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

Name of Spill:	F/V <i>Phoenix</i>
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	04/12/93
Location of Spill:	Umnak Island, Aleutian Islands, Alaska
Latitude:	53°10.5' N
Longitude:	168°47.9' W
Spilled Material:	diesel
Spilled Material Type:	2
Quantity:	7,000 gallons
Source of Release:	fishing vessel
Resources at Risk:	marine mammals, seal haulout
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Keywords:	none

Incident Summary:

On the morning of April 12, 1993, the USCG received a report that the F/V *Phoenix* was floundering just offshore Umnak Island in the Aleutian chain, between Twin Lava Point and Derby Point. The vessel's rigging had become entangled in the rudder and she was drifting towards the rocky shoreline on the northwest side of Umnak Island carrying 7,000 gallons of diesel. The western winds grounded and holed the vessel. All fuel was lost. A USCG lightering/salvage vessel arrived from Dutch Harbor and confirmed the complete loss of fuel. Various USCG overflights reported a mile or more of sheen being rapidly dispersed by severe west winds. No wildlife was observed in the area.

Behavior of Oil:

Winds up to 40 knots rapidly dispersed the diesel at sea and against the rocky shoreline. No wildlife areas were impacted.

Countermeasures and Mitigation:

No cleanup was attempted because of the area's remoteness.

NOAA Activities:

NOAA was notified of the incident on April 12, 1993, by MSO Anchorage. The SSC kept the USCG responders apprised of the weather and of any resources that may have been put at risk. NOAA's support continued for four days.

Name of Spill:	UNOCAL Granite Point Platform
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	4/21/92
Location of Spill:	Granite Point, Upper Cook Inlet, Alaska
Latitude:	60°57.43' N
Longitude:	151°19.54' W
Spilled Material	diesel
Spilled Material Type:	2
Quantity:	2,000 gallons
Source of Release:	platform
Resources at Risk:	coastal bird habitat
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Keywords:	evaporation, dispersion

Incident Summary:

On April 21, 1993, 2,000 gallons of diesel were spilled from the UNOCAL Granite Point Platform into Upper Cook Inlet. While transferring diesel from the main fuel tank to a day tank, a valve was inadvertently left open. The day tank overflowed and poured diesel into the inlet for about five hours before the valve was closed.

UNOCAL mustered a full response team to the CISPRI command post in Nikiski and launched several CISPRI vessels carrying sorbent sweep. The strong tidal currents stretched the diesel sheen for a few miles. The USCG joined UNOCAL on overflights monitoring the rapidly dispersing diesel. Within three tidal cycles the diesel sheen had disappeared. Using response vessels to collect the diesel proved unsuccessful. During the incident, the weather was clear with light winds from the southwest.

Behavior of Oil:

The spilled diesel was stretched into a sheen by the Cook Inlet tidal currents very shortly after it hit the water and moved with the current during three tidal cycles before dissipating. No impacts occurred and no oil was recovered.

Countermeasures and Mitigation:

The energetics of Cook Inlet thinned and dispersed the diesel, leaving vessels equipped with sorbent sweep skimmers largely ineffective.

NOAA Activities:

NOAA was notified of the incident on April 21, 1993, by the USCG. NOAA advised that the sheen would rapidly dissipate and that cleanup would be largely unsuccessful.

Name of Spill:	F/V <i>Francis Lee</i>
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	07/23/93
Location of Spill:	Kodiak Island, Alaska
Latitude:	56°55' N
Longitude:	153°35' W
Spilled Material:	diesel
Spilled Material Type:	2
Quantity:	14,000 to 16,000 gallons
Source of Release:	non-tank vessel
Resources at Risk:	seabird colonies three to four miles away
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Keywords:	evaporation

Incident Summary:

On the morning of July 23, 1993, the F/V *Francis Lee* ran aground on the north side of Two-Headed Island, southeast of Kodiak Island, Alaska with 24,000 gallons of diesel onboard. A hole in the #3 tank resulted in a two and one-half mile sheen to the northeast. Coast Guard Cutter *Mustang* arrived onscene and helped dewater the vessel. To lighten the *Francis Lee* enough to be pulled off the reef, 14,000 gallons of diesel were pumped from her into a barge. The vessel was declared a total loss. The original plan was for the *Mustang* to tow *Francis Lee* beyond the three-mile limit and scuttle her; however, shortly after being pulled from the reef on July 25, the vessel capsized and was scuttled in 50 fathoms of water between Two-Headed Island and the island of Kodiak. The *Francis Lee* went down with approximately 2,000 gallons of diesel still onboard.

Winds ranged from 15 to 25 knots from the south throughout this incident.

Behavior of Oil:

The diesel rapidly thinned, evaporated, and dispersed.

NOAA Activities:

NOAA was notified of the incident on July 23, 1993, by MSO Kodiak who requested weather and resources-at-risk information.

NOAA told MSO that there appear to be no bird colonies on Two-Headed Island but there is a harbor seal and a sea lion haulout on the west side. Bird colonies, salmon streams, and eagle nests may be three to four miles north, but should not be impacted because of the direction of the wind.

Name of Spill: M/V *Yorktown Clipper*
NOAA SSC: John W. Whitney
USCG District: 17
Date of Spill: 08/18/93
Location of Spill: Geikie Rock in Glacier Bay National Park, Alaska
Latitude: 58°42' N
Longitude: 136°20' W
Spilled Material: diesel
Spilled Material Type: 2
Quantity: 100 gallons
Source of Release: non-tank vessel
Resources at Risk: waterfowl, gulls, and eagles; molting scooters and black oyster catchers
Dispersants: N
Bioremediation: N
In-situ Burning: N
Other Special Interest: occurred in a National Park
Keywords: evaporation, salvage, air activated pumps

Incident Summary:

At 1600 on August 18, 1993, the cruise vessel, M/V *Yorktown Clipper*, ran aground on a charted rock, Geikie Rock, about 20 miles up Glacier Bay. The weather was clear and calm at the time of the incident. The vessel incurred major damage to the bow section. Approximately 100 gallons of diesel was released into the water from a 7,200 gallon bow fuel tank before the large influx of water created a water bottom. The vessel was rapidly taking on water and in danger of sinking, but the USCG provided air-deployable pumps that curbed the onrush of water. The *Yorktown Clipper* went to Shag Cove, a small arm in Glacier Bay, under its own power where she was boomed while divers, salvors, and marine architects worked to evaluate, stabilize, and patch the holes with wood plugs, epoxy, and concrete.

Because the vessel was within the bounds of Glacier Bay National Park, park service personnel were concerned about an additional release of diesel as it exited Glacier Bay. With NOAA assisting, they evaluated resources, made contingency plans, and issued the following recommendations as to the conditions under which the vessel should leave the Bay:

- The vessel will get underway shortly before high tide and transit the bay at ebb tide at no more than five knots down the main channel.
- A medium-size landing craft with pollution response equipment will escort the ship.
- Speed outside Glacier Bay will be determined by the vessel's master.
- The vessel will make periodic security broadcasts while inside Glacier Bay.

The vessel safely exited the Bay on August 24.

Media interest was very high throughout the event because the incident occurred in a National Park.

Behavior of Oil:

A sheen of 200 by 500 yards was reported after the initial release of the 100 gallons of diesel. However, the diesel rapidly thinned, dispersed, and evaporated. No areas were impacted.

Countermeasures and Mitigation:

No countermeasures were used on the spill; however, while under repair, the vessel was completely boomed off as was a salmon stream in Shag Cove.

NOAA Activities:

NOAA read about this incident in the paper on August 18, 1993, and contacted MSO Juneau for details. The USCG reported that the amount of product lost was insignificant. National Park personnel became concerned because of the location of the spill and requested NOAA's assistance. NOAA assured the parks personnel that the possibility of an additional catastrophic release of the remaining 13,000 gallons of diesel was very unlikely. NOAA used examples of previous Cook Inlet diesel spills to explain that the high-current environment of the inlet made response efforts ineffectual.

NOAA was involved with this incident for three days.

Name of Spill: F/V *Billy and I*
NOAA SSC: John W. Whitney
USCG District: 17
Date of Spill: 08/21/93
Location of Spill: San Fernando Island, Southeast Alaska
Latitude: 55°28' N
Longitude: 133°42' W
Spilled Material: diesel
Spilled Material Type: 2
Quantity: 10 gallons
Source of Release: non-tank vessel
Resources at Risk: none
Dispersants: N
Bioremediation: N
In-situ Burning: N
Other Special Interest: none
Keywords: evaporation, sorbent boom

Incident Summary:

Shortly before midnight on August 20, 1993, the F/V *Billy and I* was reportedly taking on water near the south end of San Fernando Island, west of Prince of Wales Island, in southeast Alaska. When the USCG arrived, the vessel was at a 90 degree list to the port side and there was sheen in the water. The vessel carried 600 gallons of diesel.

With the help of private boats, the owner was able to close all vents from which fuel could escape. A day tank located on the upper part of the vessel released approximately 10 gallons of diesel. A hole on the starboard side two feet below the waterline was patched with plywood and visqueen material. Sorbent boom was placed around the *Billy and I*, but the amount collected was minimal because wind and tidal action caused the sheen to dissipate rapidly. After being dewatered on the previous low tide, the vessel refloated on the incoming tide and was towed into Craig and put on the grid.

The winds during the incident were from the south-southeast, 20 to 30 knots.

Behavior of Oil:

The sheen dissipated rapidly with wind and wave actions.

NOAA Activities:

NOAA was notified of the incident on August 21, 1993, by the USCG. NOAA told the USCG that any additional diesel released would sheen and dissipate rapidly.

Name of Spill:	M/V <i>Sun Tide</i>
NOAA SSC:	John W. Whitney
USCG District:	17
Date of Spill:	08/23/93
Location of Spill:	Upper Cook Inlet, Alaska
Latitude:	61°00' N
Longitude:	151°00' W
Spilled Material:	diesel
Spilled Material Type:	2
Quantity:	6,000 gallons
Source of Release:	non-tank vessel
Resources at Risk:	waterfowl
Dispersants:	N
Bioremediation:	N
In-situ Burning:	N
Other Special Interest:	none
Keywords:	evaporation

Incident Summary:

At 0300 on August 23, 1993, the spill response vessel, M/V *Sun Tide* collided with the ARCO jack-up drilling rig, *Gilbert Rowe*, and ruptured a diesel fuel tank releasing 6,000 gallons into Upper Cook Inlet between the North Forelands and Possession Point. The first overflight at daylight reported a one- by two-mile rainbow sheen. Subsequent overflights showed the product to be dispersing and evaporating rapidly and by early afternoon the sheen had nearly disappeared. The vessel laid out its own boom and CISPRI deployed 18 response vessels, including nine fishing boats to tow boom. Weather was mild with light winds and a two-foot chop on the water.

Behavior of Oil:

The diesel dissipated far more rapidly than predicted. The prediction was that a sheen would be observed for up to 90 hours but the entire incident was over in 12 hours. This is probably attributable to the numerous convergence zones in this part of Cook Inlet and the turbulence developed as the water flows past the oil platforms. The response efforts were essentially ineffectual and no impacts occurred.

NOAA Activities:

NOAA was notified of the incident on August 23, 1993, by the USCG. The initial report gave the amount of diesel lost as 11,000 to 13,000 gallons. In actuality, only about 6,000 gallons were lost. NOAA advised the USCG to monitor the situation.

Abbreviations and Acronyms

AFFF	aqueous film forming foam
ACOE	Army Corps of Engineers
ALOHA™	Areal Locations of Hazardous Atmospheres
API	American Petroleum Institute
AST	Atlantic Strike Team
ATSDR	Agency for Toxic Substances and Disease Registry
CAMEO™	Computer-Aided Management of Emergency Operations
CDC	Centers for Disease Control
CGC	coast guard cutter
CHEMTREC	Chemical Transportation Emergency Center
CISPRI	Cook Inlet Spill Prevention and Response Inc.
COIL	Central Oil Identification Laboratory (USCG)
COTP	Captain of the Port (USCG)
CRRT	Caribbean Regional Response Team
C/V	container vessel
DCM	Dangerous Cargo Manifest
DEEP	Dispersant Employment and Evaluation Plan
DEP	Department of Environmental Protection (MA)
DEPE	Department of Environmental Protection and Energy (NJ)
DOD	Department of Defense
DRAT	District Response and Advisement Team (USCG)
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
EQB	Environmental Quality Board (Puerto Rico)
FOSC	Federal On-Scene Coordinator
F/V	fishing vessel
GRP	Geographical Response Plan
GST	Gulf Strike Team
HAZMAT	hazardous material/Hazardous Material Response and Assessment Division (NOAA)
IFO	intermediate fuel oil
IMO	International Maritime Organisation
IMS	Information Management System
IMS	International Marine Service
JP	jet petroleum

LC	lethal concentration
LSU	Louisiana State University
MMS	Minerals Management Service
MSD	Marine Safety Detachment (USCG)
MSO	Marine Safety Office (USCG)
MSRC	Marine Spill Response Corporation
mt	metric ton(s)
M/V	motor vessel
NASB	Naval Air Station Brunswick
NAVSUPSAL	Navy Superintendent of Salvage
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmosphere Administration
NRC	National Response Center
NSF	National Strike Force (USCG divers)
NST	National Strike Team
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyls
ppm	parts per million
PRT	Pollution Response Team
RP	responsible party
RRT	Regional Response Team
SMI	Specialized Marine Inc.
SSC	Scientific Support Coordinator (NOAA)
T/B	tank barge
T/V	tank vessel
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
USN	United States Navy