

Pacific States/British Columbia Oil Spill Task Force

Summary of West Coast Oil Spill Data

Calendar Year 2013

March 2015



CONTACT INFORMATION

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Data analysis and summary report
by Camille Stephens

OIL SPILL DATA PROJECT

Summary of Regional Spill Data (CY 2013)

The Task Force's regional oil spill database, which was launched in 2003, is a unique and valuable resource that enables us to track regional trends in spills and related causal factors. Using a standardized data dictionary to ensure uniform entries, we collect data on all spills of a barrel (40 gallons) or larger.

DATABASE WORKGROUP

Database Workgroup provides staff-level coordination to help ensure that data is collected in a consistent manner by all Task Force member agencies. The Pacific States/British Columbia Oil Spill Task Force Data Dictionary (available at oilspilltaskforce.org/ourwork/data-project/) was developed by the Database Workgroup and establishes standardized terms and definitions for collecting spill data.

Workgroup members include:

- Jason Seifert (Alaska Department of Environmental Conservation)
- Cathy Conway, Adrian Chatigny, and Damon Williams (California Department of Fish and Wildlife, Office of Spill Prevention and Response)
- Mike Zollitsch (Oregon Department of Environmental Quality)
- Marcia Graf and Curtis Martin (Hawaii Department of Human Health)
- Jack Barfield (Washington Department of Ecology)

The British Columbia Ministry of Environment monitors the project, is developing a spill database, and plans to join the Task Force project as soon as possible.

DATA LIMITATIONS

- Each agency that assists in the creation and maintenance of the Task Force database in no way guarantees the accuracy of the information and no guarantee of accuracy shall be expressed or implied.
- Only spills of one barrel (40 gallons) or larger are included in our Database.
- The Task Force oil spill database is created and maintained for informational purposes only. The data it contains reflects the respective agencies' best information at the time it was entered in the database. This means that recorded quantities may be under-reported. It remains an ongoing challenge to refine the information entered to a level of specificity that supports effective analysis while also taking into account the varied collection capabilities

of member agencies.

HIGHLIGHTS

The 2013 data is provided on the following pages. Highlights include:

- A total of 1,176 releases occurred during 2013, with a total volume of 874,833 gallons spilled. Of those, 11 releases were over 10,000 gallons.

Non-Crude Spills

- 1,081 releases were non-crude spills totaling 740,141 gallons.
- Power Generation Utilities (33%) and Oil Exploration and Production (30%) were the major sources during 2013.
- 84% of the total volume was attributed to Human Error (50%) or Equipment Failure (34%).
- Approximately two-thirds of the non-crude volume was spilled to Land (66%).

Crude Oil Spills

- 95 Crude oil releases totaling 134,692 gallons occurred in 2013.
- Crude oil releases comprised 15% the total volume for 2013.
- Equipment failure (47%) was the predominant cause of crude oil spills during 2013.
- Structural Failure (53%) was the cause of approximately half of all Structural Failure-caused crude oil spills.
- Nearly all (96%) of crude oil releases were to Land.

We note that California's spill volumes often exceed that from other West Coast states; this reflects California's uniqueness. California has the largest population of all our member jurisdictions, which means more transportation of petroleum products to cover demand, which increases the statistical likelihood of an incident. In addition, California produces as well as refines petroleum, which further increases the risk of spills. California also has an aging infrastructure that has not been well maintained by producers, driving up the number of oil-water spills to land in recent years. California's Office of Spill Prevention and Response has no prevention jurisdiction over these producers.

Trends

The 2002-2013 data provides us with an opportunity to look at 12-year trends, which is also shown in this report. Here are the highlights:

- A total of 11,988 releases occurred during the 12-year period, with a total volume of approximately 10.2 million gallons.
- Over that 12-year period, the combined volume of Non-Crude spills was 2.5 that for Crude Oil spills.
- The top two Crude Oil spills during the 12-year period were 463,848 gallons in California (2008) and a 267,000 gallon spill in Alaska (2006). The combined volume of these two incidents comprised 25% of the total Crude Oil volume released for the period.
- Facilities (52%) and Pipelines (20%) were the major sources of spills during the 12-year period.
- Equipment Failure (55%) and Human Error (32%) were the major spill causes.

FOR MORE INFORMATION

Data summaries for calendar years 2002 – 2012, as well as other information about the Pacific States/British Columbia Oil Spill Task Force and its work, are available at www.oilspilltaskforce.org. Summaries for years prior to 2012 are included in the Task Force Annual Reports for those years. Beginning with calendar year 2012, the data summary was created as a separate document available at oilspilltaskforce.org/ourwork/data-project/

For questions specifically related to this report or the Task Force's data project, contact Sarah Brace, Executive Coordinator at Sarah@VedaEnv.com.

Summary of Releases by Product (2013)

Product	Spill Count	Gallons	% Total Volume
Diesel oil/Marine gas oil	528	177,605	20.3%
Mineral Oil/Transformer Oil	169	140,597	16.1%
Crude Oil	95	134,692	15.4%
Oily Water Mixture	104	132,136	15.1%
Gasoline	35	114,476	13.1%
Unknown	40	59,423	6.8%
Asphalt/Creosote	14	52,637	6.0%
Edible/Vegetable Oil	18	27,000	3.1%
Jet Fuel/Kerosene	24	9,120	1.0%
Lube Oil/Motor Oil	34	8,386	1.0%
Hydraulic Oil	59	6,322	0.7%
Waste Oil	16	4,159	0.5%
Other	19	4,030	0.5%
Aviation Gasoline	6	1,374	0.2%
Bunker C/IFO/HFO	8	1,149	0.1%
Heating Oil	6	1,027	0.1%
LNG/LPG	1	700	0.1%
Total	1,176	874,833	

2013

ANNUAL SUMMARY OF SPILLS

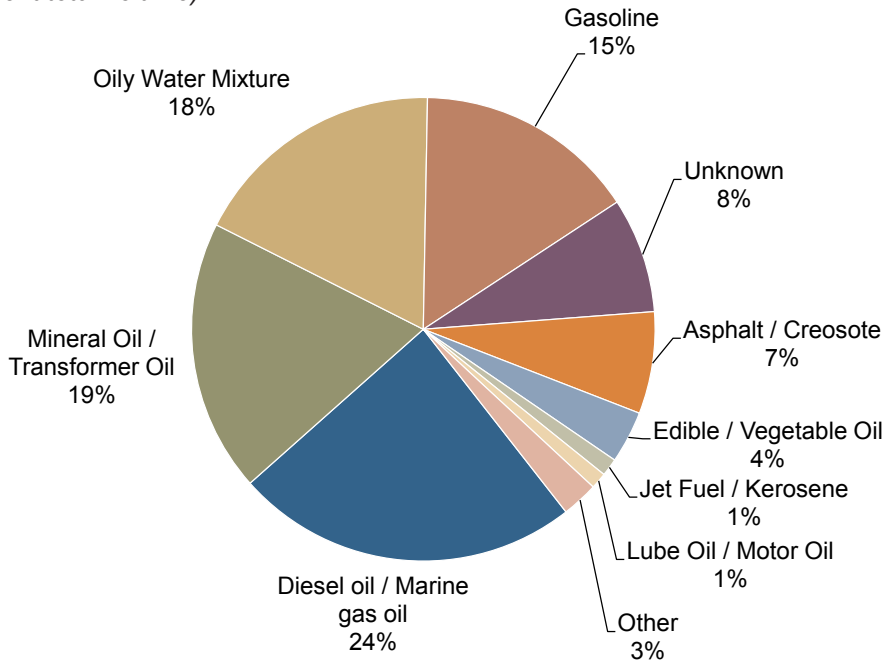
- A total of 1,176 releases occurred during 2013, with a total volume of 874,833 gallons.

Spills Greater Than 10,000 Gallons (2013)

Product	Volume	State	Date	Source Type	Cause Type	Medium
Gasoline	80,000	California	8/31/2013	Vehicle	Human Error	Land
Mineral Oil/Transformer Oil	70,000	California	4/16/2013	Facility	Human Error	Fresh Water
Unknown	35,910	California	12/3/2013	Facility	Equipment Failure	Land
Diesel Oil/Marine Gas Oil	32,000	California	1/25/2013	Vehicle	External Conditions	Fresh Water
Crude Oil	21,000	California	12/10/2013	Pipeline	Unknown	Land
Asphalt/Creosote	20,575	Washington	4/30/2013	Facility	Human Error	Land
Diesel Oil/Marine Gas Oil	20,000	California	4/13/2013	Vessel	Unknown	Marine
Mineral Oil/Transformer Oil	20,000	Washington	3/25/2013	Facility	Equipment Failure	Land
Edible/Vegetable Oil	14,400	California	4/8/2013	Facility	Human Error	Land
Oily Water Mixture	11,760	California	12/10/2013	Unknown	Unknown	Land
Asphalt/Creosote	10,080	California	2/13/2013	Facility	Equipment Failure	Land

Non-Crude Spills by Product, All States (2013)

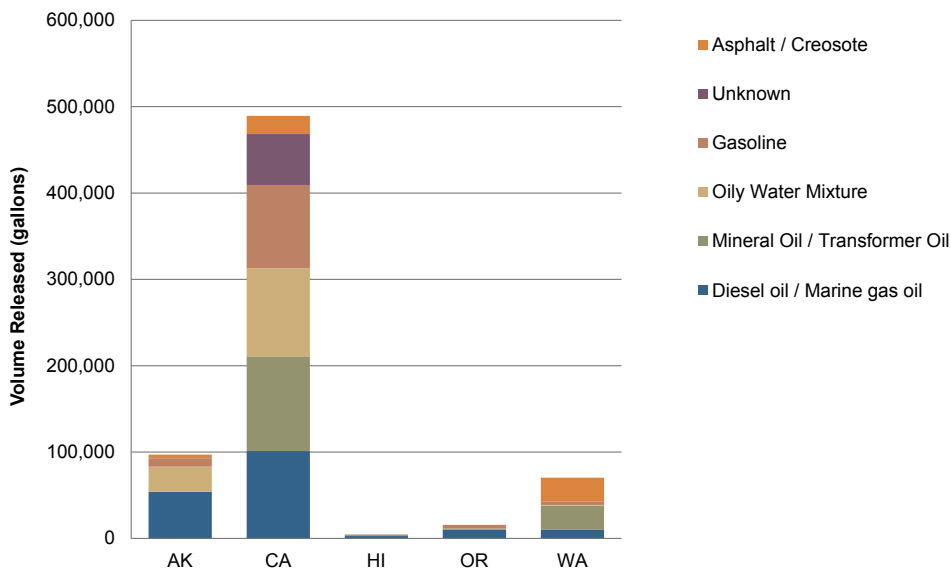
(percent total volume)



NOTE: "Other" includes classifications comprising 1% or less of the total volume released: Hydraulic Oil, Waste Oil, Aviation Gasoline, Bunker C/I/O/HFO, Heating Oil, LNG/LPG

Non-Crude Spills by Product and State (2013)

(5% or more total volume)



2013

NON-CRUDE SPILLS

Total Spills 1,081
Total Volume (gal) 740,141
Average Spill Size (gal) 685

Summary by Product

Top Products

Product	Gallons
Diesel oil/Marine gas oil	177,605
Mineral Oil/Transformer Oil	140,597
Oily Water Mixture	132,136
Gasoline	114,476
Unknown	59,423

- 1,081 non-crude spills totalling 740,141 gallons occurred during 2013.

2013

NON-CRUDE SPILLS

Summary by Source

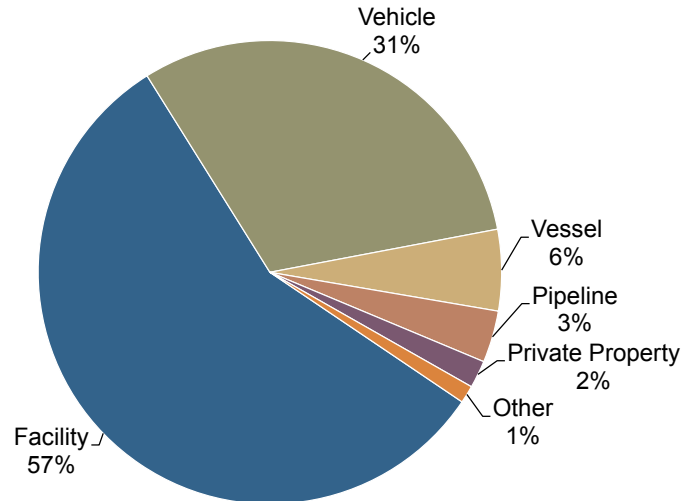
Top Sources

Source	Gallons
Facility	419,380
Vehicle	228,800
Vessel	41,940
Pipeline	26,758
Private Property	14,203

- Facilities (57%) and Vehicles (31%) were the major sources of non-crude spills during 2013.

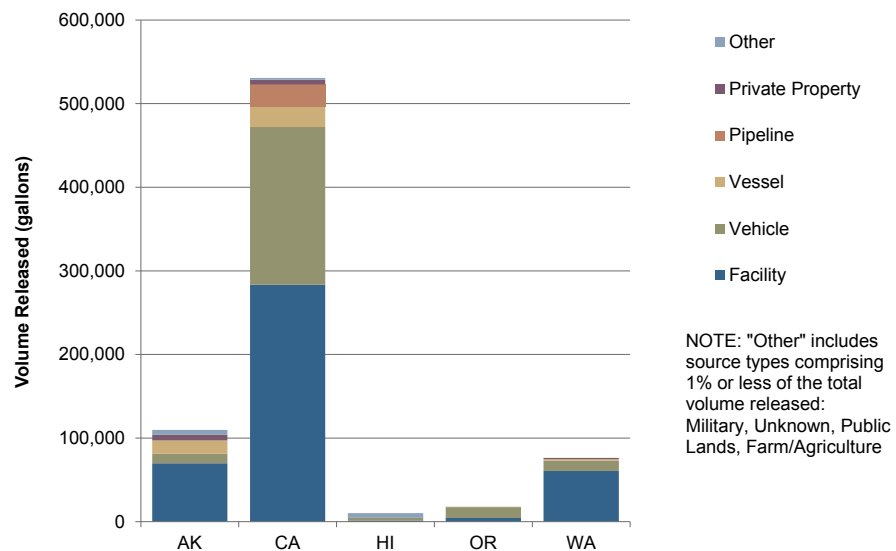
Non-Crude Spills by Source, All States (2013)

(percent total volume)



NOTE: "Other" includes classifications comprising 1% or less of the total volume released: Military, Unknown, Public Lands, Farm/Agriculture

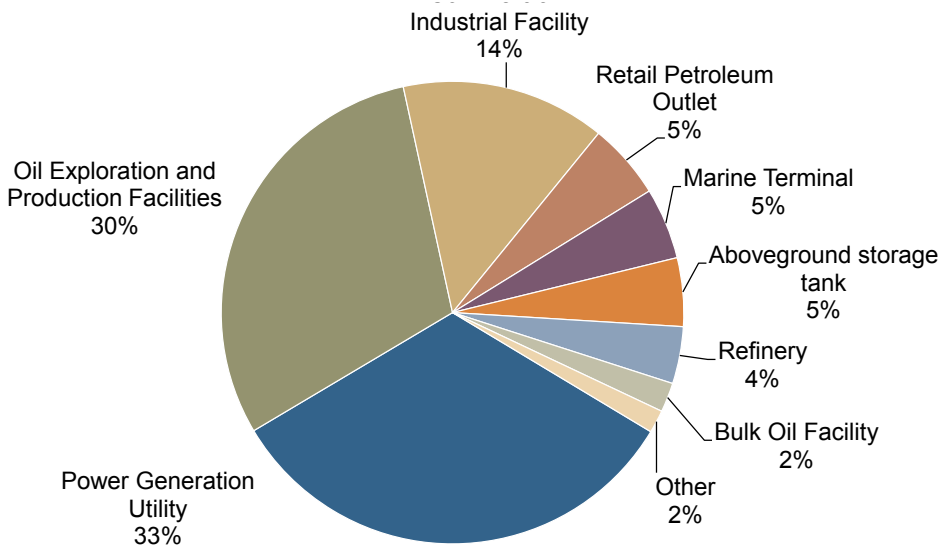
Non-Crude Spills by Source and State (2013)



NOTE: "Other" includes source types comprising 1% or less of the total volume released: Military, Unknown, Public Lands, Farm/Agriculture

Non-Crude Spills -- Facility Detail (2013)

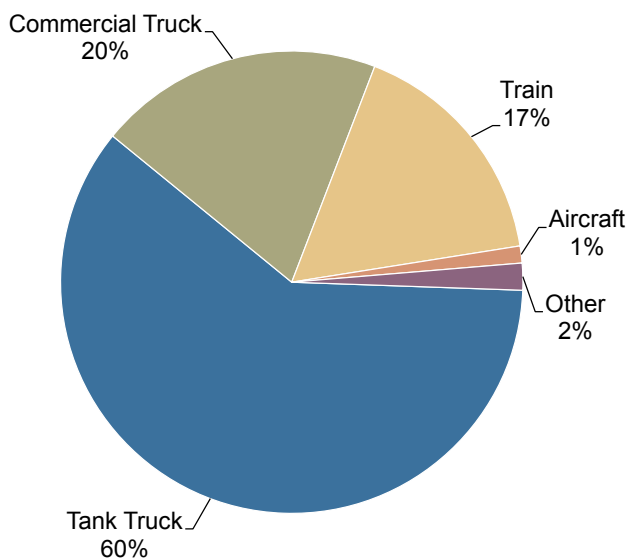
(percent total volume)



NOTE: "Other" includes classifications comprising 1% or less of the total volume released: Underground Storage Tank, Government Facilities, Marina, Drum or Container, Unknown, Shipyard/Port Facility, Tank Truck

Non-Crude Spills -- Vehicle Detail (2013)

(percent total volume)



NOTE: "Other" includes classifications comprising 1% or less of the total volume released: Non-commercial Vehicle and Construction/Utility Vehicle

2013

NON-CRUDE SPILLS

Summary by Source (continued)

- Power Generation Utility (33%) and Oil Exploration and Production Facilities (30%) were the top contributors to facility spills.
- 60% of the non-crude spill volume for vehicles was from Tank Trucks.

2013

NON-CRUDE SPILLS

Summary by Cause

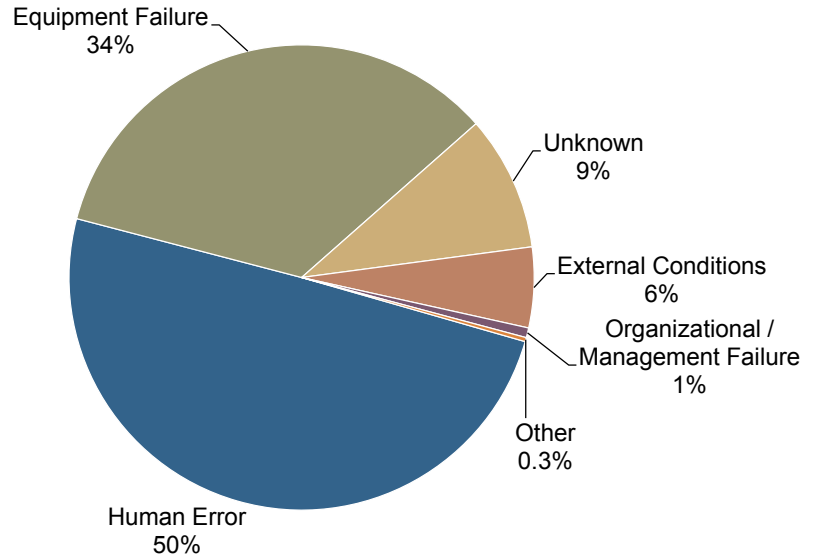
Top Causes

Cause	Gallons
Human Error	367,336
Equipment Failure	254,785
Unknown	69,507
External Conditions	41,401
Organizational/Management Failure	5,032

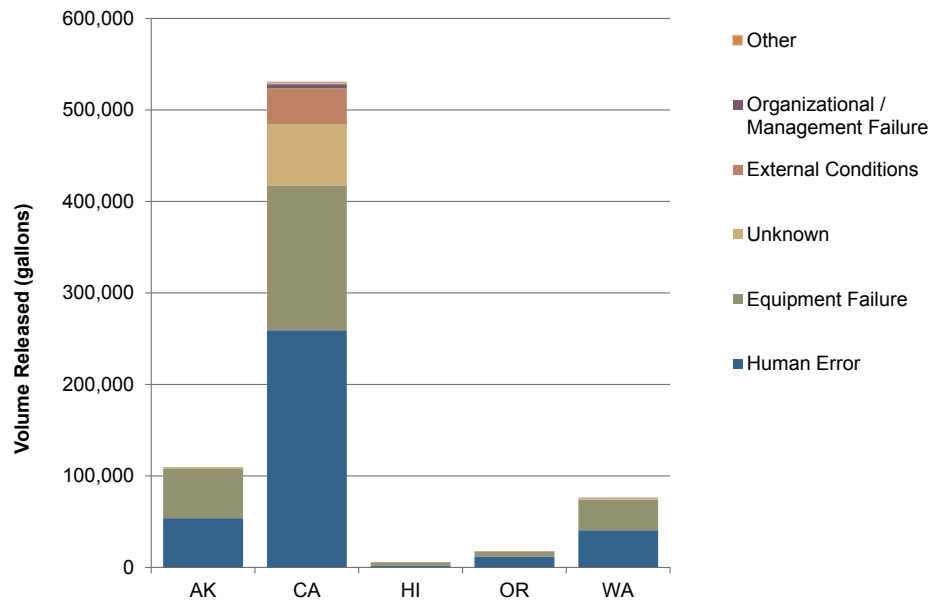
- Over three-quarters of the total non-crude spill volume was attributable to Human Error (50%) or Equipment Failure (34%).

Non-Crude Spills by Cause, All States (2013)

(percent total volume)

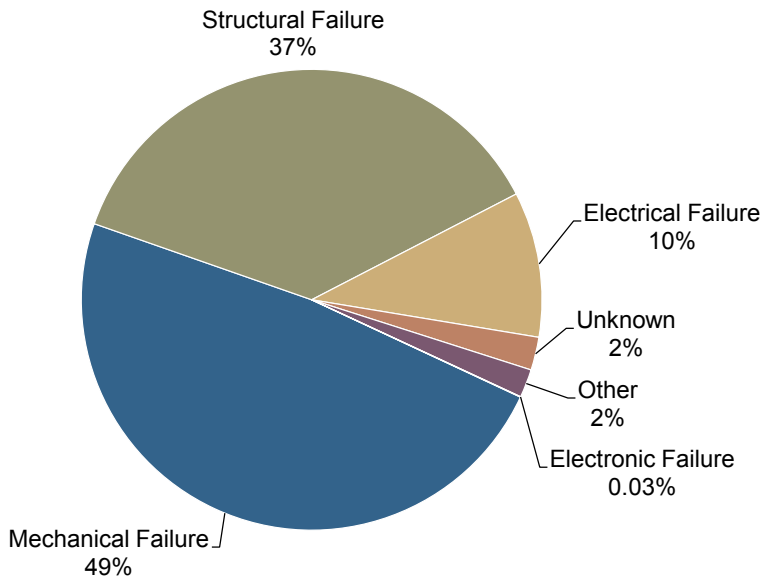


Non-Crude Spills by Cause and State (2013)



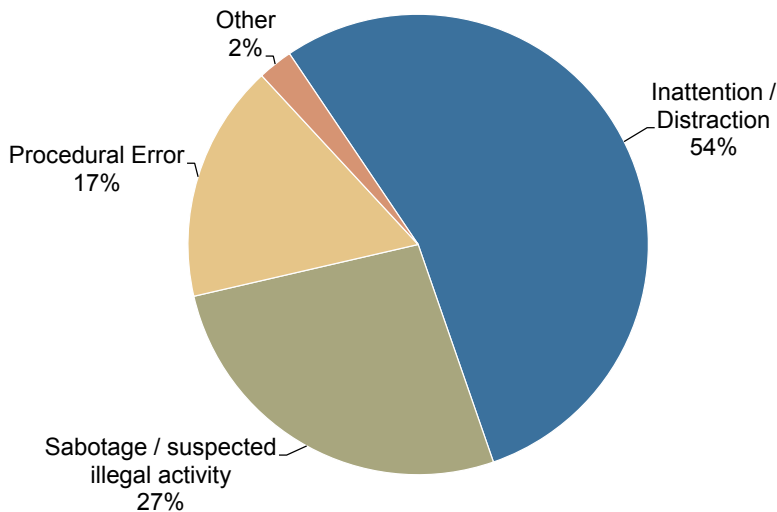
Non-Crude Spills -- Equipment Failure Detail (2013)

(percent total volume)



Non-Crude Spills -- Human Error Detail (2013)

(percent total volume)



NOTE: "Other" includes classifications comprising 1% or less of the total volume released: Improper Equipment Use, Judgment, Deliberate Violation, Inexperience, Inaccurate Computation, Illegal Drugs/alcohol, Fatigue/Reduced Alertness, Illness

2013

NON-CRUDE SPILLS

Summary by Cause (continued)

- More than 80% of the total Equipment Failure spill volume was due to either Structural Failure (37%) or Mechanical Failure (49%).

2013

NON-CRUDE SPILLS

Summary by Activity

Top Activities

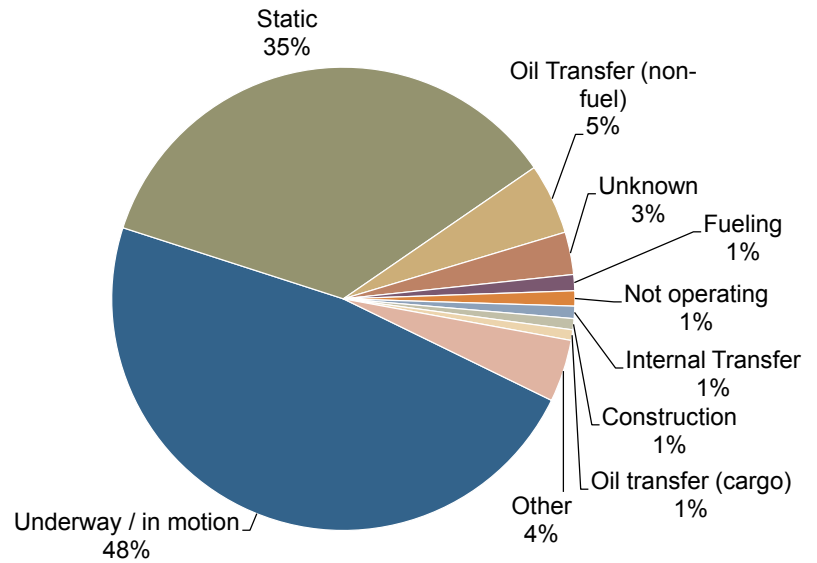
Activity	Gallons
Underway/in motion	353,376
Static	262,348
Oil Transfer (non-fuel)	36,579
Other	32,159
Unknown	21,955

- Underway/in motion was the main activity at the time of the spill (48%).

¹Underway/In Motion: (1) Vessel underway conducting normal operations, no oil movements in progress (oil movements include ballasting, tank washing, internal transfers); (2) Vehicle in motion conducting designed function

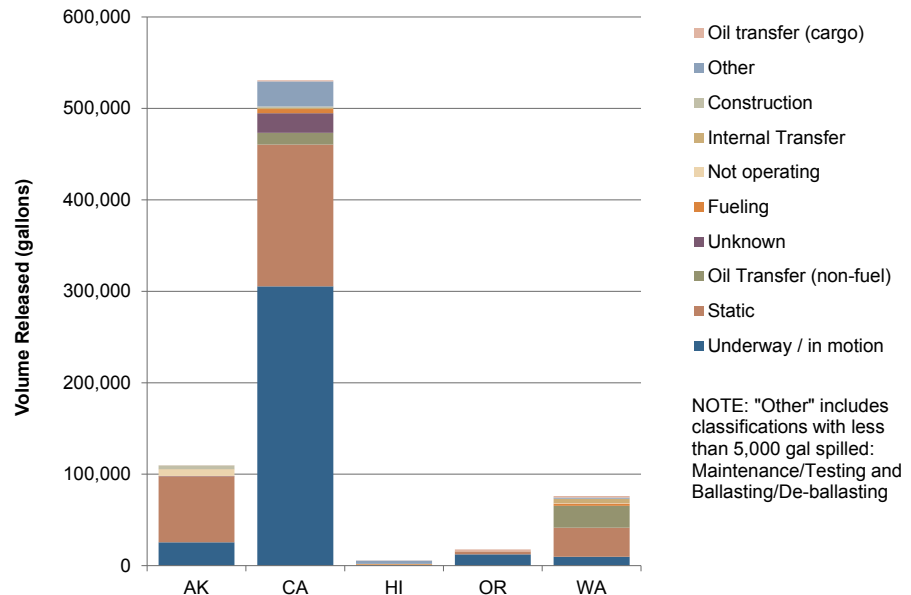
Non-Crude Spills by Activity (2013)

(percent total volume)



NOTE: "Other" includes classifications with less than 5,000 gal spilled: Maintenance/Testing and Ballasting/De-ballasting

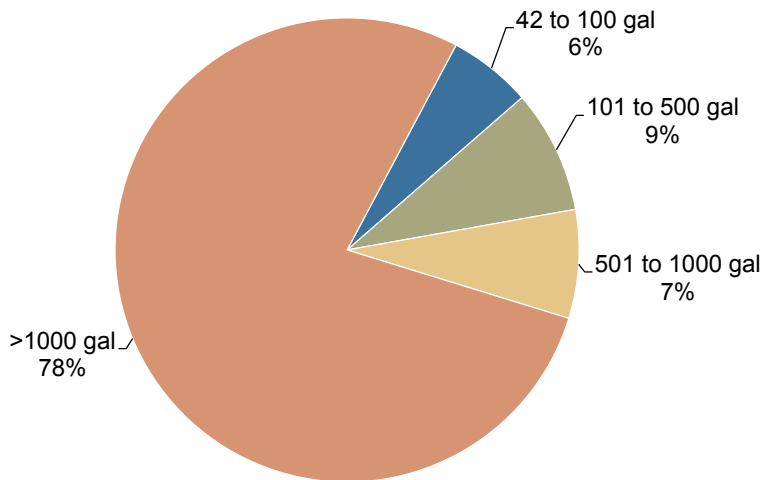
Non-Crude Spills by Activity and State (2013)



NOTE: "Other" includes classifications with less than 5,000 gal spilled: Maintenance/Testing and Ballasting/De-ballasting

Non-Crude Spills by Spill Size (2013)

(percent total volume)



2013

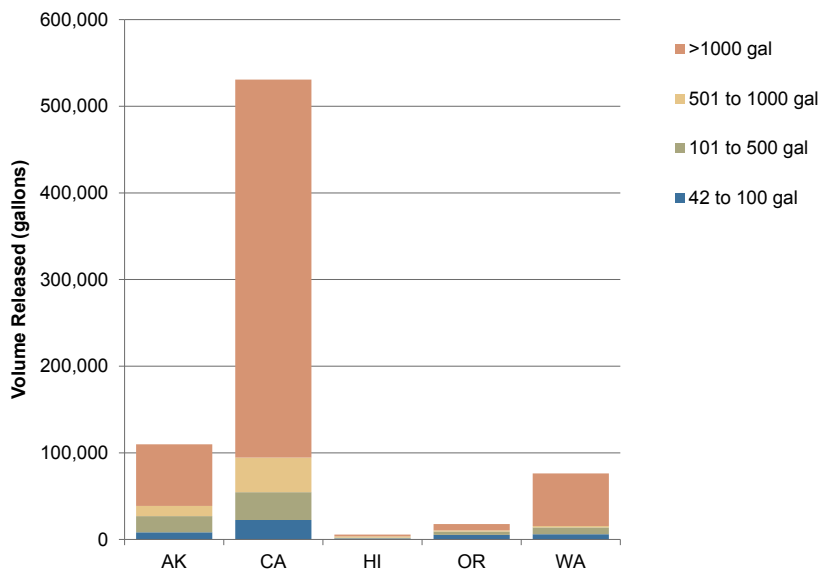
NON-CRUDE SPILLS

Summary by Spill Size

Size Class	Gallons
42 to 100 gal	43,052
101 to 500 gal	63,674
501 to 1000 gal	55,992
>1000 gal	577,423

- 78% of the total non-crude volume was comprised of spills with volumes greater than 1,000 gallons.

Non-Crude Spills by Spill Size and State (2013)



2013

NON-CRUDE SPILLS

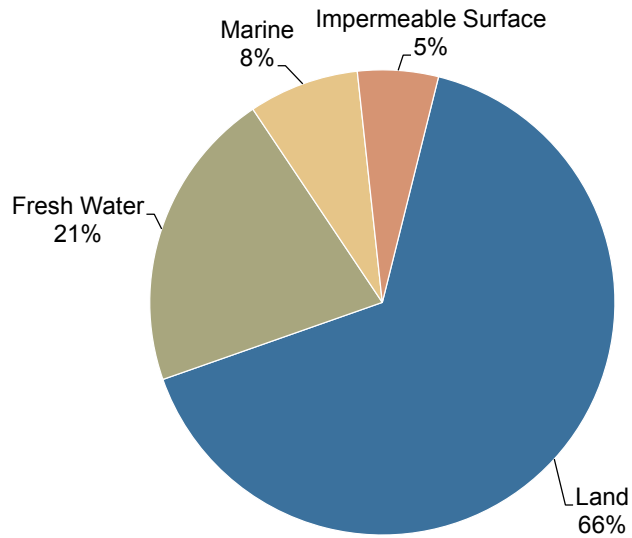
Summary by Medium

Medium	Gallons
Land	486,542
Fresh Water	155,279
Marine	56,819
Impermeable Surface	41,501

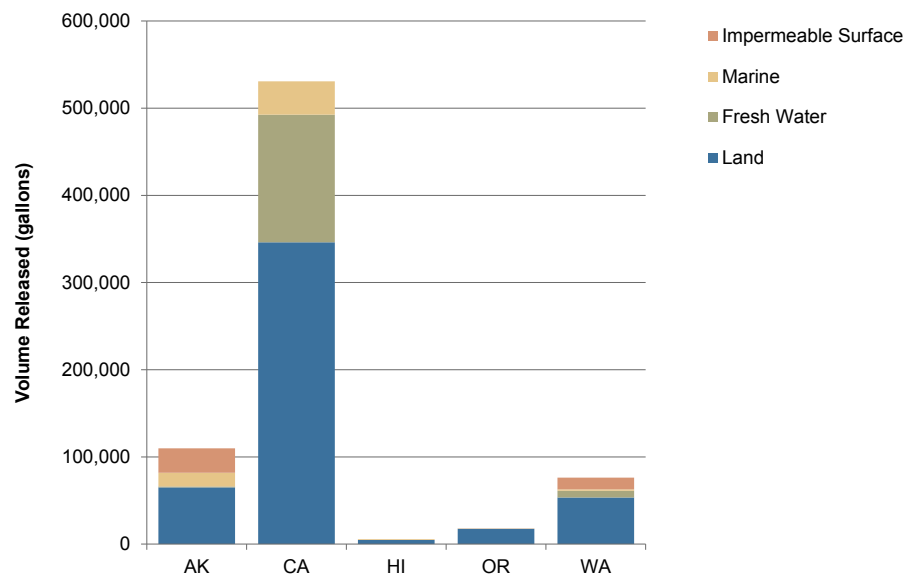
- Approximately two-thirds (66%) of the non-crude volume was spilled to Land.

Non-Crude Spills by Medium Impacted (2013)

(percent total volume)

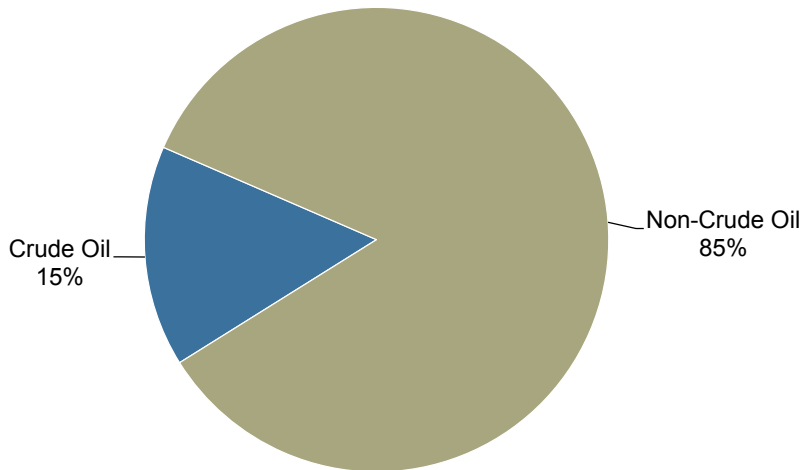


Non-Crude Spills by Medium and State (2013)



Crude Spills vs. Non-Crude Spills, All States (2013)

(percent total volume)



2013

CRUDE SPILLS

Total Spills	95
Total Volume (gal)	134,692
Average Spill Size (gal)	1,418

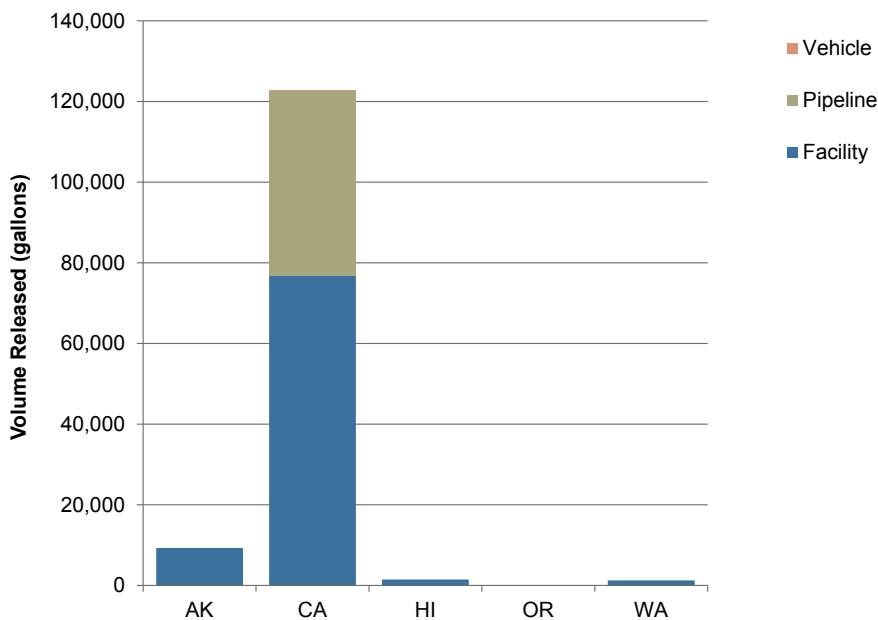
Product Type	Gallons
Non-crude Oil	740,141
Crude Oil	134,692
Total	874,833

- Crude oil comprised 15% the total volume for 2013.

Top Sources

Source Type	Gallons
Facility	88,704
Pipeline	45,938
Vehicle	50

Crude Spills by Source Type and State (2013)



2013

CRUDE SPILLS

Top Causes

Cause Type	gallons
Equipment Failure	63,752
Unknown	39,822
Human Error	23,038
Other	7,728
External Conditions	352

- Equipment Failure (47%) was the predominant cause of crude oil spills during 2013 .

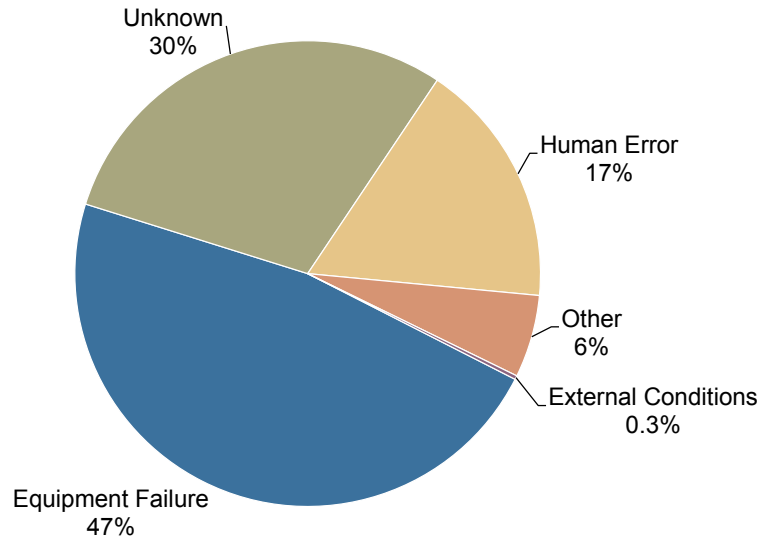
Equipment Failure Detail

Cause	gallons
Structural Failure	33,629
Mechanical Failure	23,950
Electrical Failure	3,058
Other	2,730
Unknown	385

- Structural Failure (53%) and Mechanical Failure (37%) comprised over half of spill volume due to Equipment Failure.

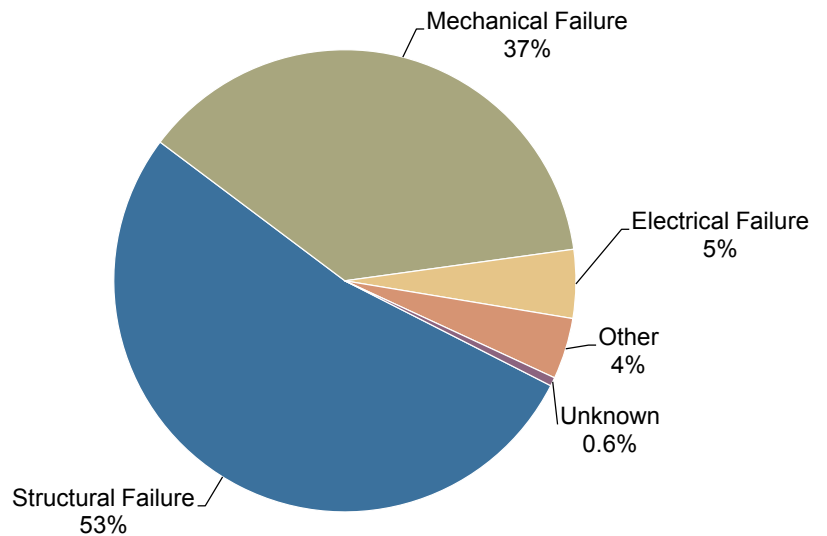
Crude Spills by Cause, All States (2013)

(percent total volume)



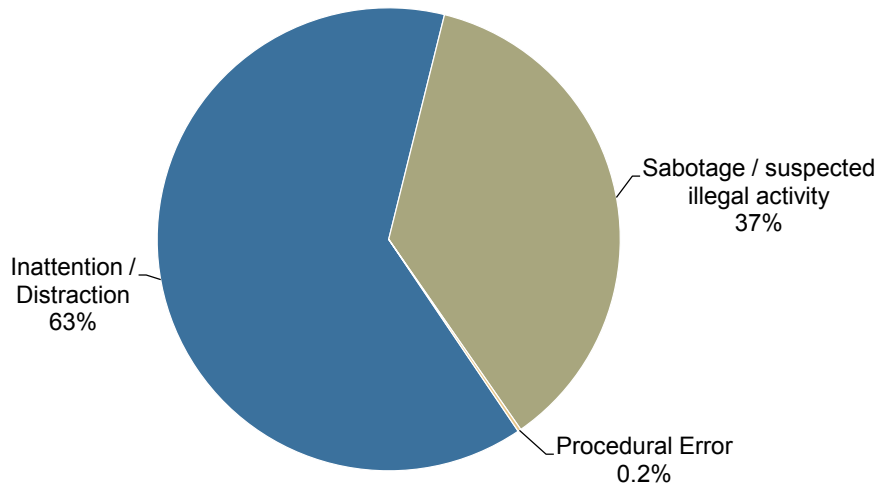
Crude Spills -- Equipment Failure Detail (2013)

(percent total volume)



Crude Spills -- Human Error Detail (2013)

(percent total volume)



2013

CRUDE SPILLS

Human Error Detail

Cause	gallons
Inattention/Distraction	14,588
Sabotage/suspected illegal activity	8,400
Procedural Error	50

- Inattention/Distraction (63%) was the main cause of spills attributed to Human Error.

2013

CRUDE SPILLS

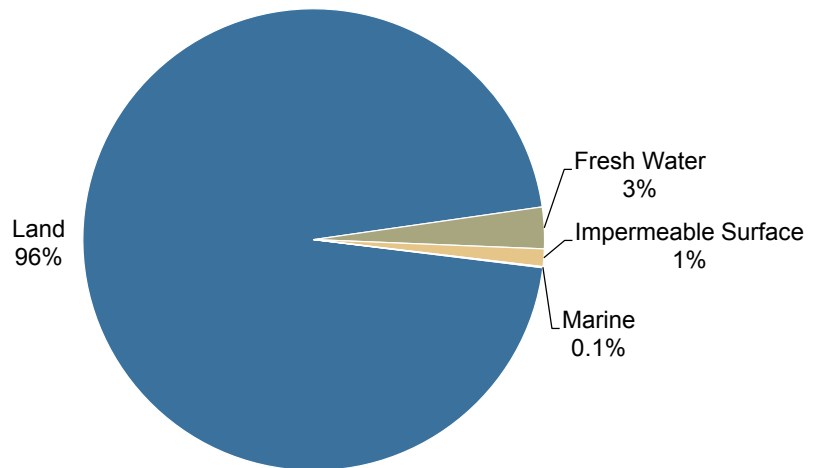
Summary by Medium

Medium	Gallons
Land	129,023
Fresh Water	3,912
Impermeable Surface	1,657
Marine	100

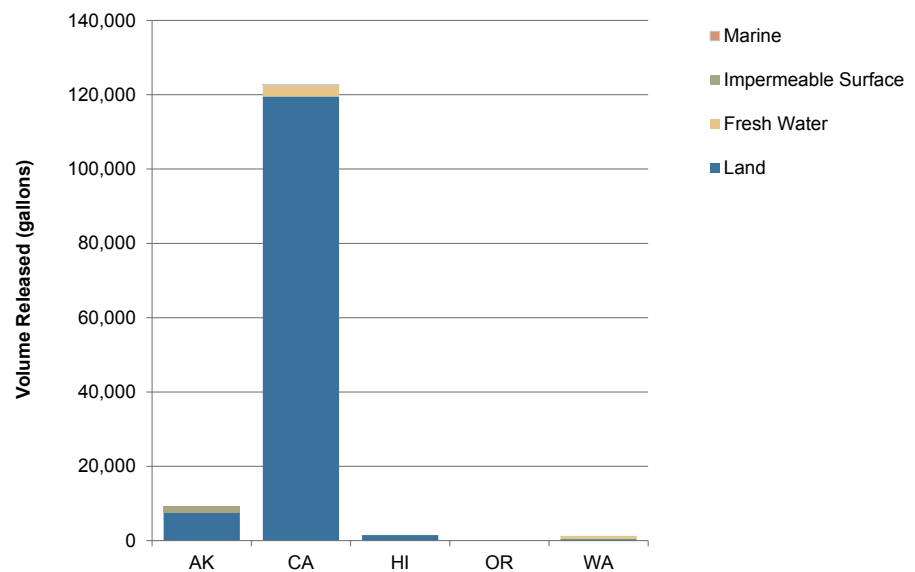
- During 2013, crude spills to Land (96%) comprised the highest percent total volume.

Crude Oil Spills by Medium Impacted (2013)

(percent total volume)



Crude Spills by Medium and State (2013)



SUMMARY OF SPILLS (2002-2013)

- A total of 11,988, releases occurred during the 12-year period 2002-2013, with a total volume of approximately 10.2 million gallons.

Releases by Product (2002-2013)

Product	Spill Count	Gallons	% Total Volume
Crude Oil	1,352	2,871,117	28.2%
Diesel oil/Marine Gas Oil	5,793	2,577,496	25.3%
Oily Water Mixture	491	1,309,919	12.9%
Bunker C/IFO/HFO	93	733,416	7.2%
Gasoline	420	604,084	5.9%
Other	370	577,186	5.7%
Mineral Oil/Transformer Oil	1,194	384,808	3.8%
Kerosene/Jet Fuel	241	233,600	2.3%
Asphalt/Creosote	144	210,660	2.1%
Aviation Gasoline	142	151,467	1.5%
Unknown	118	123,021	1.2%
Lube oil/Motor oil	462	115,967	1.1%
Waste oil	299	89,766	0.9%
Hydraulic oil	595	77,702	0.8%
Edible/Vegetable Oil	59	52,905	0.5%
Heating oil	201	45,428	0.4%
LNG/LPG	14	12,280	0.1%
Total	11,988	10,170,822	

Spills Greater Than 10,000 Gallons (2002-2013)

Number of Spills	124
Releases to Water	25
Crude	33
Non-crude	91

Product	Volume	State	Date	Source Type	Cause Type	Medium
Crude Oil	463,848	California	04/24/08	Pipeline	Equipment Failure	Land
Diesel Oil/Marine Gas Oil	420,000	California	10/30/07	Facility	Equipment Failure	Land
Bunker C/IFO/HFO	321,052	Alaska	12/08/04	Vessel	Human Error	Marine
Bunker C/IFO/HFO	270,000	Washington	08/25/04	Facility	Human Error	Land
Crude Oil	267,000	Alaska	03/02/06	Pipeline	Equipment Failure	Land
Other	193,200	California	01/04/10	Facility	Equipment Failure	Land
Crude Oil	191,562	Alaska	05/25/10	Pipeline	Equipment Failure	Impermeable Surface
Diesel Oil/Marine Gas Oil	145,000	Alaska	03/23/08	Vessel	Human Error	Marine
Diesel Oil/Marine Gas Oil	142,800	Alaska	01/11/10	Facility	Human Error	Marine
Oily Water Mixture	128,000	California	11/26/08	Facility	Equipment Failure	Land
Crude Oil	126,000	California	03/09/07	Facility	Equipment Failure	Land
Crude Oil	126,000	California	03/23/05	Pipeline	External Conditions	Fresh Water
Aviation gasoline	115,353	California	11/22/04	Pipeline	Equipment Failure	Land
Other	112,000	Oregon	05/04/11	Vehicle	Equipment Failure	Land
Oily Water Mixture	100,000	California	09/07/12	Facility	Equipment Failure	Fresh Water
Crude Oil	87,192	California	01/10/07	Facility	Equipment Failure	Land
Gasoline	80,000	California	08/31/13	Vehicle	Human Error	Land
Mineral Oil/Transformer Oil	70,000	California	04/16/13	Facility	Human Error	Fresh Water
Crude Oil	63,000	California	04/23/07	Facility	Equipment Failure	Land
Oily Water Mixture	63,000	California	01/17/12	Facility	Equipment Failure	Land
Oily Water Mixture	63,000	California	07/29/08	Facility	Unknown	Land
Diesel Oil/Marine Gas Oil	58,800	California	07/07/07	Facility	Human Error	Land
Bunker C/IFO/HFO	58,000	California	11/07/07	Vessel	Human Error	Marine
Crude Oil	42,000	California	10/23/12	Facility	Organizational/man- agement Failure	Fresh Water
Crude Oil	42,000	California	06/12/07	Pipeline	Equipment Failure	Land
Mineral Oil/Transformer Oil	42,000	California	12/08/10	Facility	Equipment Failure	Land
Crude Oil	40,000	California	04/17/07	Pipeline	Equipment Failure	Land
Oily water mixture	37,306	California	11/11/06	Facility	Equipment Failure	Impermeable Surface
Oily Water Mixture	36,750	California	06/24/09	Facility	Equipment Failure	Land
Unknown	35,910	California	12/03/13	Facility	Equipment Failure	Land
Oily water mixture	33,600	California	04/14/06	Pipeline	Equipment Failure	Impermeable Surface
Kerosene/jet fuel	33,600	California	02/15/10	Vessel	Organizational/man- agement Failure	Marine
Diesel Oil/Marine Gas Oil	32,000	California	01/25/13	Vehicle	External Conditions	Fresh Water
Oily Water Mixture	31,500	California	12/03/09	Facility	Equipment Failure	Land
Oily Water Mixture	31,500	California	06/10/08	Facility	External Conditions	Land
Oily Water Mixture	30,240	California	04/20/07	Facility	Equipment Failure	Land
Diesel Oil/Marine Gas Oil	30,000	Oregon	05/09/02	Other	External Conditions	Fresh Water
Crude Oil	29,400	California	10/01/06	Facility	Equipment Failure	Impermeable Surface

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Spills Greater than 10,000 Gallons -- *continued*

Product	Volume	State	Date	Source Type	Cause Type	Medium
Gasoline	29,400	California	08/14/05	Pipeline	Human Error	Land
Gasoline	27,500	California	04/25/07	Vehicle	Equipment Failure	Land
Gasoline	27,000	Washington	03/23/12	Facility	Equipment Failure	Land
Crude Oil	26,460	California	01/30/06	Pipeline	Human Error	Land
Crude Oil	26,250	California	06/11/08	Facility	Equipment Failure	Land
Oily Water Mixture	26,250	California	06/17/09	Facility	Equipment Failure	Land
Crude Oil	25,200	California	11/24/12	Facility	Equipment Failure	Land
Crude Oil	25,200	California	11/27/05	Pipeline	Equipment Failure	Land
Diesel Oil/Marine Gas Oil	24,500	Washington	10/27/10	Facility	Equipment Failure	Land
Gasoline	24,500	Hawaii	10/06/04	Unknown	Equipment Failure	Land
Kerosene/Jet Fuel	24,000	Washington	03/01/05	Pipeline	Equipment Failure	Land
Kerosene/jet fuel	22,388	California	05/18/11	Vehicle	Unknown	Marine
Oily Water Mixture	21,546	California	06/27/08	Facility	Equipment Failure	Land
Crude Oil	21,336	California	06/01/10	Pipeline	Equipment Failure	Land
Oily Water Mixture	21,000	California	03/29/07	Pipeline	Human Error	Land
Unknown	21,000	Oregon	01/13/11	Vehicle	Equipment Failure	Land
Other	21,000	California	06/04/03	Facility	Equipment Failure	Marine
Crude Oil	21,000	California	11/06/06	Facility	Unknown	Land
Diesel Oil/Marine Gas Oil	21,000	California	05/18/06	Pipeline	Equipment Failure	Land
Crude Oil	21,000	California	12/10/13	Pipeline	Unknown	Land
Oily Water Mixture	21,000	California	07/11/08	Facility	Equipment Failure	Land
Crude Oil	20,622	California	09/06/08	Facility	Equipment Failure	Land
Asphalt/Creosote	20,575	Washington	04/30/13	Facility	Human Error	Land
Diesel Oil/Marine Gas Oil	20,000	California	04/13/13	Vessel	Unknown	Marine
Diesel Oil/Marine Gas Oil	20,000	California	12/08/09	Facility	Human Error	Land
Diesel Oil/Marine Gas Oil	20,000	California	11/07/12	Vessel	Organizational/man- agement Failure	Marine
Mineral Oil/Transformer Oil	20,000	Washington	03/25/13	Facility	Equipment Failure	Land
Diesel Oil/Marine Gas Oil	20,000	California	05/02/05	Pipeline	Equipment Failure	Land
Gasoline	18,900	Hawaii	02/13/08	Facility	Human Error	Land
Crude Oil	18,900	California	05/15/06	Facility	Human Error	Land
Diesel Oil/Marine Gas Oil	18,200	Washington	11/03/06	Facility	Equipment Failure	Land
Crude Oil	17,640	California	05/27/12	Facility	Equipment Failure	Land
Bunker C/IFO/HFO	17,000	California	09/14/11	Private Prop- erty	Equipment Failure	Marine
Crude Oil	16,800	California	12/03/09	Facility	Equipment Failure	Land
Gasoline	16,800	California	03/24/06	Vehicle	Unknown	Land
Crude Oil	16,800	California	10/13/06	Pipeline	Equipment Failure	Land
Crude Oil	16,800	California	06/02/06	Facility	Equipment Failure	Impermeable Surface
Bunker C/IFO/HFO	16,800	California	08/07/07	Facility	Equipment Failure	Land
Waste Oil	15,750	Washington	06/12/06	Facility	Equipment Failure	Land
Diesel Oil/Marine Gas Oil	15,000	Oregon	10/31/05	Facility	Human Error	Fresh Water
Diesel Oil/Marine Gas Oil	15,000	Washington	08/01/08	Facility	Equipment Failure	Impermeable Surface
Other	14,700	California	12/04/04	Pipeline	Equipment Failure	Fresh Water
Diesel Oil/Marine Gas Oil	14,680	Alaska	12/08/04	Vessel	Human Error	Marine
Edible/Vegetable Oil	14,400	California	04/08/13	Facility	Human Error	Land
Oily Water Mixture	14,070	California	07/29/07	Facility	Human Error	Land
Oily water mixture	14,000	California	09/16/06	Pipeline	Equipment Failure	Land

Spills Greater than 10,000 Gallons -- *continued*

Product	Volume	State	Date	Source Type	Cause Type	Medium
Crude Oil	14,000	California	03/07/03	Pipeline	Equipment Failure	Land
Diesel Oil/Marine Gas Oil	14,000	Hawaii	11/01/11	Vessel	Equipment Failure	Land
Oily Water Mixture	13,659	California	01/10/07	Facility	Equipment Failure	Land
Kerosene/jet fuel	13,630	Alaska	10/30/08	Facility	Equipment Failure	Land
Bunker C/IFO/HFO	13,524	Washington	04/07/05	Facility	Human Error	Land
Crude Oil	13,500	Alaska	11/29/09	Facility	Equipment Failure	Land
Oily Water Mixture	13,440	California	01/21/07	Facility	External Conditions	Land
Asphalt/Creosote	13,000	Oregon	08/11/04	Vehicle	Equipment Failure	Land
Diesel Oil/Marine Gas Oil	13,000	Hawaii	07/20/06	Vessel	Equipment Failure	Marine
Mineral oil/Transformer oil	13,000	Hawaii	03/22/07	Vessel	Equipment Failure	Marine
Crude Oil	12,852	California	06/28/10	Facility	Equipment Failure	Fresh Water
Oily Water Mixture	12,684	California	04/03/08	Facility	Equipment Failure	Land
Oily Water Mixture	12,600	California	10/12/07	Pipeline	Equipment Failure	Land
Crude Oil	12,600	California	11/26/07	Facility	Equipment Failure	Land
Oily Water Mixture	12,600	California	12/03/09	Facility	Equipment Failure	Land
Asphalt/creosote	12,600	California	11/13/09	Facility	Human Error	Land
Crude Oil	12,600	California	07/15/07	Facility	Equipment Failure	Land
Oily water mixture	12,600	Alaska	01/29/07	Facility	Equipment Failure	Land
Oily Water Mixture	12,600	California	10/15/12	Facility	Equipment Failure	Land
Diesel Oil/Marine Gas Oil	12,248	Alaska	04/24/05	Facility	Human Error	Land
Other/Unknown	12,118	Alaska	12/18/02	Facility	Other	Land
Mineral oil/Transformer oil	12,096	California	09/30/07	Pipeline	Equipment Failure	Land
Diesel Oil/Marine Gas Oil	12,045	Alaska	01/19/12	Facility	Human Error	Impermeable Surface
Crude Oil	12,012	California	06/28/12	Facility	Equipment Failure	Land
Crude Oil	12,000	California	03/15/07	Facility	Equipment Failure	Land
Oily Water Mixture	11,970	California	05/01/07	Pipeline	Equipment Failure	Land
Oily Water Mixture	11,760	California	12/10/13	Unknown	Unknown	Land
Crude Oil	11,676	California	03/04/06	Facility	Equipment Failure	Land
Other/Unknown	11,611	Alaska	02/26/02	Facility	Other	Land
Diesel Oil/Marine Gas Oil	11,000	Alaska	11/17/03	Facility	Human Error	Land
Gasoline	11,000	Washington	11/27/03	Vehicle	Unknown	Fresh Water
Gasoline	11,000	Washington	03/23/09	Vehicle	Human Error	Land
Gasoline	11,000	Oregon	12/02/02	Vehicle	Human Error	Fresh Water
Diesel Oil/Marine Gas Oil	10,584	Hawaii	08/05/05	Pipeline	Equipment Failure	Land
Oily water mixture	10,500	California	05/29/06	Pipeline	Equipment Failure	Fresh Water
Oily water mixture	10,500	California	08/12/06	Pipeline	Equipment Failure	Land
Oily Water Mixture	10,500	California	04/11/08	Facility	Human Error	Land
Other	10,500	Washington	09/13/07	Facility	Human Error	Land
Asphalt/Creosote	10,080	California	02/13/13	Facility	Equipment Failure	Land
Crude Oil	10,080	California	07/21/08	Pipeline	Equipment Failure	Land

Crude vs. Non-Crude Spills by Year (2002-2013)

Year	Non-Crude Oil		Crude Oil		Total	
	Spill Count	Gallons	Spill Count	Gallons	Spill Count	Gallons
2002	516	367,909	23	12,769	539	380,678
2003	533	225,721	16	28,015	549	253,736
2004	573	973,545	7	2,092	580	975,637
2005	580	299,516	19	172,871	599	472,387
2006	1,155	594,280	242	589,867	1,397	1,184,147
2007	1,202	1,179,964	209	530,918	1,411	1,710,882
2008	1,154	823,197	225	700,297	1,379	1,523,494
2009	942	401,591	134	120,972	1,076	522,563
2010	946	696,557	129	303,808	1,075	1,000,365
2011	947	441,790	128	73,004	1,075	514,794
2012	1,007	555,494	125	201,812	1,132	757,306
2013	1,081	740,141	95	134,692	1,176	874,833
12-YR Total	10,636	7,299,705	1,352	2,871,117	11,988	10,170,822
12-YR AVG	886	608,309	113	239,260	999	847,569

2002-2013

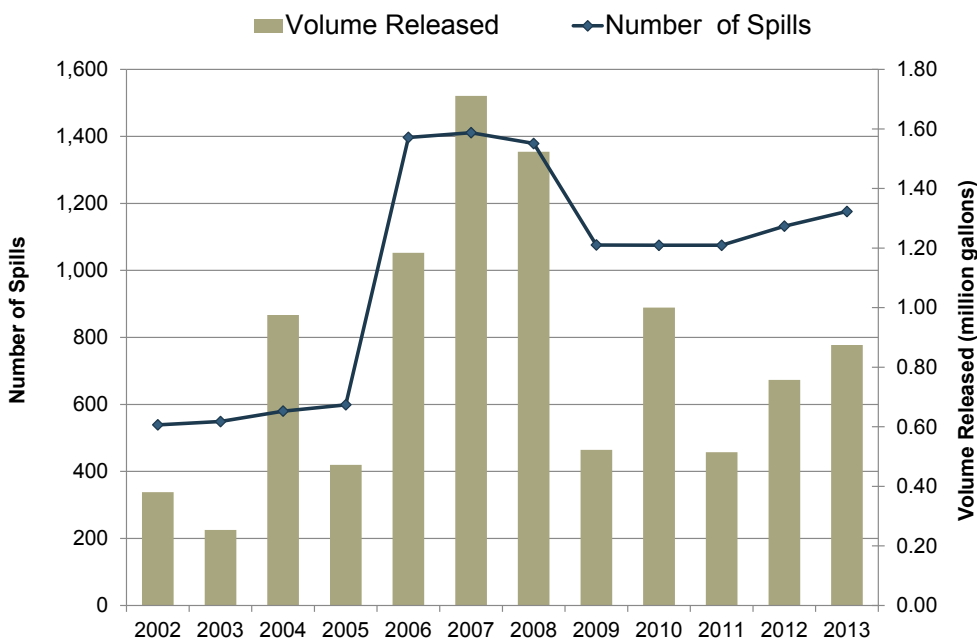
Summary by Product

- Over the 12-year period, the combined volume of Non-Crude spills was more than 2.5 times that for Crude Oil spills.

Crude Oil Spills

- The top two Crude Oil spills during the 12-year period were 463,848 gallons in California (2008) and a 267,000 gallon spill in Alaska (2006). The combined volume of these two incidents comprised 25% of the total Crude Oil volume released for the period.

Number of Spills and Volume Released (2002-2013)



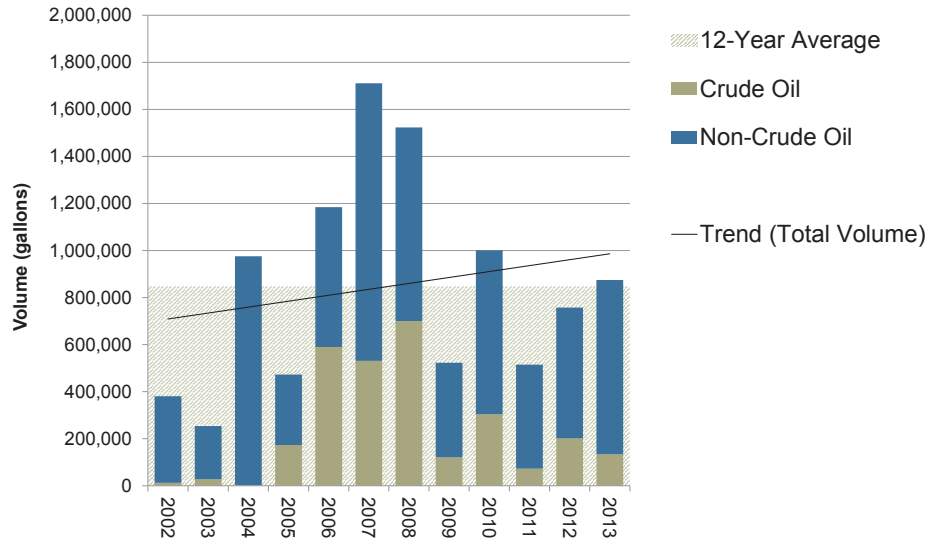
2002-2013

Non-Crude Oil Spills

(see graph on following page)

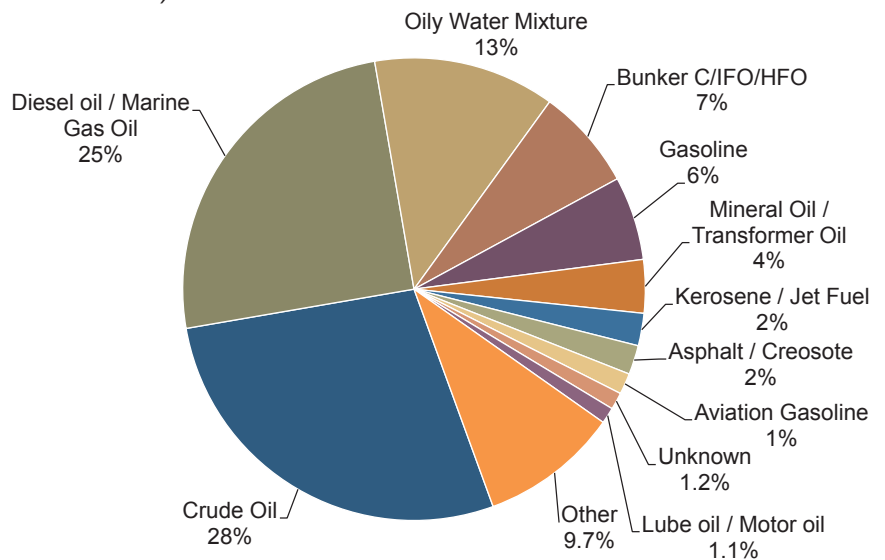
- Diesel Oil/Marine Gas Oil comprised 25% of the total spill volume and 35% of the Non-Crude spill volume for the period.

Crude vs. Non-Crude Spills (2002-2013)



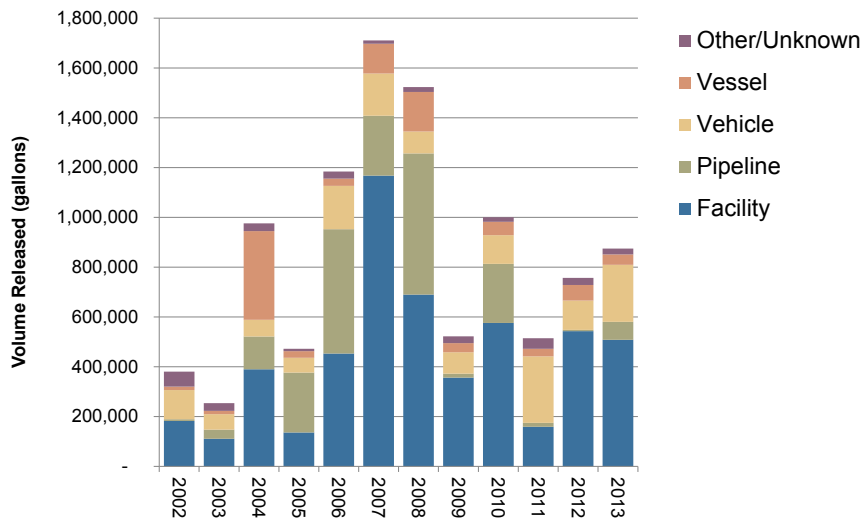
Spills by Product (2002-2013)

(percent total volume)



NOTE: "Other" includes products comprising 1% or less of the total volume released: Waste oil, Hydraulic oil, Edible/Vegetable Oil, Heating oil, LNG/LPG

Annual Spill Volume by Source (2002-2013)



2002-2013

Summary by Source

- Overall, Facilities (52%) and Pipelines (20%) were the major sources of spills during the 12-year period.
- Facilities were the source of 54% of the Non-Crude spill volume.
- Pipelines (52%) and Facilities (46%) were the major sources of Crude Oil spills.

Non-Crude Oil Spill Sources

Source	gallons
Facility	3,957,220
Vehicle	1,518,325
Vessel	938,379
Pipeline	565,647
Other/Unknown	314,077
Military	5,187
Public Lands	470
Farm/Agriculture	400
Total	7,299,705

Crude Oil Spill Sources

Source	gallons
Pipeline	1,504,225
Facility	1,315,892
Vehicle	32,319
Other/Unknown	13,347
Vessel	5,334
Total	2,871,117

2002-2013

Summary by Cause

- Overall, Equipment Failure (55%) and Human Error (32%) were the major spill causes.
- Equipment Failure (46%) and Human Error (41%) were the predominant causes for Non-Crude spills
- 80% of the total Crude Oil spill volume was due to Equipment Failure.

Non-Crude Oil Spills

Cause	gallons
Equipment Failure	3,335,728
Human Error	2,979,878
Other/Unknown	607,476
External Conditions	275,622
Organizational/Management Failure	101,001

Crude Oil Spills

Cause	gallons
Equipment Failure	2,287,027
Human Error	240,144
External Conditions	158,796
Other/Unknown	137,249
Organizational/management Failure	47,901

Annual Spill Volume by Cause (2002-2013)

