

U.S. Department of
Homeland Security

United States
Coast Guard



Commandant
United States Coast Guard

2100 Second Street, S.W.
Washington, DC 20593-0001
Staff Symbol: G-ICA
Phone: (202) 366-4280
Fax: (202) 366-7124

5730

JAN 20 2004

The Honorable J. Dennis Hastert
Speaker of the House of Representatives
Washington, DC 20515

Dear Mr. Speaker:

Section 7001 of Title VII of the 1990 Oil Pollution Act (OPA 90) requires the Chairman of the Interagency Coordinating Committee on Oil Pollution Research to **submit** biennial reports on activities to be carried out in the current two-fiscal year period. This **sixth** biennial report responds to the congressional requirement by summarizing activities carried out in fiscal years 2001 and 2002 and projects the Committee's activities for fiscal years 2003 and 2004.

During the two-year period of 2001 - 2002 the Committee continued to serve as a forum for the exchange of information regarding individual agency research and development activities. During the two year period of 2003 - 2004 the Committee will continue to meet and participate through it member agencies in future national and international research and development forums.

An identical letter has been sent to the President of the Senate.

Sincerely,

A handwritten signature in cursive script that reads "J. J. Saboe".

J. J. SABOE
Captain, U.S. Coast Guard
Chairman, Interagency
Coordinating Committee on
Oil Pollution Research

Enclosure: (1) Report to Congress on the Interagency Coordinating Committee on Oil
Spill Pollution Research

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The Honorable Richard B. Cheney
President of the Senate
Washington, DC 20510

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Pollution Research



U. S. DEPARTMENT OF HOMELAND SECURITY
UNITED STATES COAST GUARD



REPORT TO CONGRESS
ON THE
INTERAGENCY COORDINATING COMMITTEE
ON
OIL POLLUTION RESEARCH

October 2003

REPORT TO CONGRESS ON THE INTERAGENCY COORDINATING COMMITTEE ON OIL SPILL POLLUTION RESEARCH

Section 7001 of Title VII of the Oil Pollution Act of 1990 (OPA 90) requires the Chairman of the Interagency Coordinating Committee on Oil Pollution Research (Committee) to submit biennial reports on activities carried out under section 7001 in the preceding two fiscal years and on proposed activities to be carried out within the current two-fiscal year period.

The Federal Reports Elimination and Sunset Act of 1995 (P.L. 104-66) eliminated all annual, semi annual, or other regular periodic reports to Congress effective May 15, 2000 unless specifically exempted. The Interagency Coordinating Committee on Oil Spill Research report was not exempted from elimination and therefore terminated. However, in 2002, Congress reinstated the requirements for this report and several others under 33 U.S.C. Sec. 2761 (P.L. 107-295). This report responds to the continued congressional requirement by summarizing activities carried out under section 7001 of OPA 90 in 2001 and 2002, and assessing the Committee's role in fiscal years 2003 and 2004.

Title VII of OPA 90 created the Interagency Committee and proscribed that the Committee include representatives from the Department of Commerce (including the National Oceanic and Atmospheric Administration (NOAA) and the National Institute of Standards and Technology), the Department of Energy, the Department of the Interior (including the Minerals Management Service (MMS) and the United States Fish and Wildlife Service), the Department of Transportation (including the United States Coast Guard, the Maritime Administration, and the Research and Special Projects Administration), the Department of Defense (including the Army Corps of Engineers and the Navy), the Environmental Protection Agency (EPA), the National Aeronautics and Space Administration, and the United States Fire Administration in the Federal Emergency Management Agency. The participating agencies remain supportive of the committee's efforts and persist in cultivating Oil Spill Research and Development (R&D) projects. However, the committee relies solely on individual agency funding. The committee leverages available resources whenever possible by holding its meetings in conjunction with those of the National Response Team's Science and Technology subcommittee, which meets the last Thursday of every month.

Title VII also requires that a representative from the Department of Transportation (DOT) serve as Chairman of the Interagency Committee. DOT selected the U.S. Coast Guard to chair, and a representative of the U.S. Coast Guard has served as chairman since the Committee's inception. The U.S. Coast Guard is currently discussing with DOT whether or how its recent transfer to the Department of Homeland Security should affect its role as Chair of the Committee.

Oil Pollution Research and Development Plan - The committee prepared the original Research and Technology Plan, which defined the role of each of the federal agencies involved in Oil Spill Research and Development, and submitted it to Congress in April 1992. A review of this plan was conducted by the National Research Council's Committee on Oil Spill Research and Development under the auspices of the Marine Board and funded by the Committee. Based on input from the Marine Board, the plan was revised using a framework that addresses spill prevention, human factors, and the field testing/demonstration of developed response technologies in May, 1993. The current version of the plan, still based on the Marine Board's recommendations, is dated April 1997 and remains the guiding document for the Committee.

**REPORT TO CONGRESS ON THE INTERAGENCY COORDINATING
COMMITTEE ON OIL SPILL POLLUTION RESEARCH**

Regional Research Grant Program - As set forth in 33 U.S.C. Sec. 2761 (c) (8), the Interagency Coordinating Committee coordinated a program for competitive grants to university and research institutes. Committee research grants were last awarded in fiscal year 1996. No grant funding has been received since that time and none remains under this program. A summary of the grants awarded between fiscal year 1994 and fiscal year 1996 is provided as enclosure (1).

Port Oil Pollution Minimization Demonstration Projects - Section 2761 (c)(6) of OPA 90 directed that Port Oil Pollution Minimization Demonstration Projects be conducted in New York, New Orleans and Los Angeles/Long Beach. The Great Lakes Oil Pollution Research and Development Act of 1990 amended OPA 90 to include a fourth demonstration on ports in the Great Lakes. To date, two of the Demonstration Projects have been completed (New Orleans in December 1994 and New York in October 1995). Although the remaining two demonstrations have not been held thus far, the Coast Guard believes that the objectives of the port demonstration program, as described in OPA 90, are being addressed by several periodic domestic and international oil spill conferences. The International Oil Spill Conference (biennial), the Clean Gulf Conference (annual) the Fresh Water Spill Symposium (biennial), the Ohio Spill Prevention and Emergency Response Conference (annual) and the Inland Spills Conference (annual) provide extensive forums for the display of the latest spill cleanup and removal technologies.

Coordination Meetings - In an effort to garner continued participation from state and industry representatives for Research and Development initiatives, coordination meetings were held during the following conferences:

- March, 2001: International Oil Spill Conference/ Tampa, FL;
- March, 2002: IMO R&D Forum "High Density Oil Spill Response"/Brest, France;
- March, 2002: Freshwater/Inland Spills Conference/ Cleveland, OH;
- April, 2002: Spill of National Significance (SONS) exercise, New Orleans, LA;
- June, 2002: Arctic & Marine Oil Spill (AMOP) Technical Seminar/Alberta, Canada; and
- November, 2002: Clean Gulf, Galveston, TX.

Research and Development Work Efforts - During fiscal year 2001 and fiscal year 2002, the Committee continued work on a number of R&D initiatives that were conducted and funded by the U.S. Coast Guard to include an INLAND In-Situ Burning Manual, an In-Situ Burn Risk Communication Manual, and a decision tool for Oil Response in Fast Water. In addition, the Coast Guard continued work on the following research and development projects, which contribute to oil spill prevention and response enhancements.

Project Name	Description
Vessel Traffic Management and Intelligent Waterways Research	Technologies that improve control of movement of vessels in crowded waterways to lessen chance of tanker collisions/allisions
Decision Support and Risk Management	Improved identification and prioritization of risks and ability to efficiently and effectively allocate resources to respond to threats.
Human Effort/Human Performance	Improved identification and prioritization of risks as they relate to human error threats (i.e. shipboard fatigue)

**REPORT TO CONGRESS ON THE INTERAGENCY COORDINATING
COMMITTEE ON OIL SPILL POLLUTION RESEARCH**

Project Name	Description
Oil Spill Response Capability	Monitoring new technologies that can improve oil spill response capability (i.e. in-situ burn, fast water contamination options)
Improved Surveillance and Sensor Capability	Remote sensing tools for early identification of size and direction of oil spills.
Interdiction Technologies	Technologies focused on two threats: 1) high speed attacks by personal watercraft on maritime targets (oil tankers) and 2) stopping large vessels that threaten port facilities (oil storage, etc.)
Technology Assessment	Improved command and control and response coordination among all first responders.
Coast Guard Mobile Communications	Tools to facilitate command and control of operational assets and eliminate blind spots where lack of effective communication could hamper oil spill response activities.

To prevent duplication of R&D initiatives, the Committee developed a prioritized list of R&D projects for fiscal years 2003 and 2004, which are contained in the following table.

Sponsor	R&D Projects FY03-FY04
National Academy of Science	Understanding Oil Spill Dispersant: Efficacy and Effects study
National Academy of Science	Wrecks in U.S. Waters
TBD	Weapons of Mass Destruction (WMD) Response Tools to address radiological, biological and/or hazardous chemical threats to response personnel
TBD	Recovery of Heavy Oils (oil which sinks below the surface) and Vessel Salvage and On-Site Countermeasures.

During this reporting period, the Committee has not under taken any international cooperation activities. However, the Committee remains devoted to seeking out avenues to maximize the exchange and dissemination of information regarding oil pollution research needs and plans to hold meetings in conjunction with the following conferences scheduled for fiscal years 2003 and 2004:

- April, 2004: Freshwater/Inland Spills Conference/New Orleans, LA; and
- November, 2004: Clean Gulf/New Orleans, LA.

Enclosures (2) through (5) are lists of EPA, MMS, U.S. Coast Guard Research and Development Center and NOAA R&D publications developed in FY01 and FY02.

**The Interagency Coordinating Committee on Oil spill
Pollution R&D – Regional Research Grant Program**

Cost : FY94 \$1,250,000 (\$500,000 was given to VOLPE to administer the Grant because the USCG did not have grant authority).

FY94 Grants

- “Hydrodynamic Modeling of Oil Containment”
- “Development of a Prototype PC-Based Shipboard Piloting Expert System”
- “Development of a Rapid Current Containment Boom”
- “Source Identification of Oil Spills Based on Isotopic Composition of Individual Components in Weathered oil Samples”
- “Preventing Oil Spills by Evaluating, Monitoring, and Managing Port and Waterway Risk”
- “Development of an Oil Spill Response Simulation System that Determines Strategies Interactively”
- “Effect of Water Accommodated Fraction of Crude Oil and Dispersed Oil on the Early Life Stages of Two Marine Species”
- “Oil Spill Prevention Through the Improved Management of Human and Organization Errors in the Operation of Tankers and Barges
- “Decision Support Technology of Oil Spill Response Configuration Planning
- “The influence of Dispersant on Petroleum Bioavailability Within a Marine Food Chain”

Cost: \$750,000

FY95 Grants

- “Development of a Rapid Current Containment Boom”
- “Hydrodynamic Modeling of Oil Containment”
- “Source Identification of Oil Spills Based on Isotopic Composition of Individual Components in Weathered oil Samples”
- “Rupture Analysis of Oil Tankers in a Side Collision”
- Develop Micro and Mesoscale Methods for Predicting the Behavior of Low API Gravity Oils Spilled on Water”
- Filtration Studies for Removal of Oil from Water in Ports”

Enclosure (1)

- Human Factor Analysis of Human Reliability in Marine Systems.”

Cost: (ACOE funded \$188,994)

FY96 Grants

- “Study of Gulf Coast Spill Contingency Plans “Remediation and Restoration”

**EPA Publications on Chemical Countermeasures for Oil Spills
FY01 – FY 02**

Ecotoxicology and Wetland Bioremediation

1. Venosa, A.D., M.T. Suidan, K. Lee, S.E. Cobanli, S. Garcia-Blanco and J.R. Haines 2002. "Bioremediation and biorestitution of a crude oil-contaminated freshwater wetland on the St. Lawrence River. *Bioremediation J.* 6(3): 261-281.
2. Venosa A.D., and X. Zhu (2003). Biodegradation of crude oil contaminating marine shorelines and freshwater wetlands. Review Article *Spill Science and Technology Bulletin* (In press).
3. Roy, R., K. Lee and C.W. Greer (2003) Bioremediation of a controlled oil spill in a freshwater wetland: Effect of crude oil and N nutrients on denitrification and N₂O emission. *Applied and Environmental Microbiology* (Submitted)
4. Johnson, B.T., J.D. Petty, J.N. Huckins, K. Lee and J. Gauthier (2003) SPMD-TOX for risk assessment of simulated oil spill on the St. Lawrence River. *Bioremediation Journal* (Submitted)
5. Blaise, C., F. Gagne, N. Chevre, M. Harwood, K. Lee, J. Lappalainen, G. Persoone and K. Doe (2003) Toxicity assessment of oil-contaminated freshwater sediments. *Bioremediation Journal* (Submitted)
6. Jackman, P., K.G. Doe, K. Lee and A.D. Venosa (2003) Monitoring the effectiveness of remediation techniques using sediment toxicity tests with *Hyallorella azteca*. *Bioremediation Journal* (Submitted)
7. Lee, K., A.D. Venosa, M.T. Suidan, S. Garcia-Blanco, C.W. Greer, G. Wohlgeschaffen, S.E. Cobanli, G.H. Tremblay and K.G. Doe (2003) Habitat recovery in an oil-contaminated salt marsh following biorestitution treatments. Proceedings of the 2003 International Oil Spill Conference, Vancouver, BC., April 7-10, 2003. American Petroleum Institute Publication No. 14730A - CD ROM (American Petroleum Institute Publication No. 14730B - Bound copy: In Press)
8. Garcia-Blanco, S., A. Pruden, M.T. Suidan, A.D. Venosa and K. Lee (2002) Bioremediation Treatment Effects On Microbial Community Structure In A Crude Oil-Contaminated Coastal Marsh. *Water Science & Technology*. (In Press)
9. Kiparissis, Y., K. Lee, C. Ho, J. Reynolds, N. Henry and P.V. Hodson (2002) Chronic Toxicity of Oiled-Sediments to Japanese Medaka. In: Proceedings of the 29th Annual Aquatic Toxicity Workshop, C.V. Eichkoff, G.C. van Aggelen and A.J. Niimi (eds.), October 21-23, 2002, Whistler, British Columbia. *Can. Tech. Rep. Fish. Aquatic. Sci.* 2438: 60

10. Hodson, P.V., T. Cross, A. Ewert, S. Zambon and K. Lee (2002) Evidence for the bioavailability of PAH from oiled beach sediments *in situ*. In: Proceedings of the 29th Annual Aquatic Toxicity Workshop, C.V. Eichkoff, G.C. van Aggelen and A.J. Niimi (eds.), October 21-23, 2002, Whistler, British Columbia. Can. Tech. Rep. Fish. Aquatic. Sci. 2438: 60

11. Lee, K., A.D. Venosa, M.T. Suidan, C.W. Greer, G. Wohlgeschaffen, C. Cobanli, G.H. Tremblay, J. Gauthier and K. Doe (2002) Monitoring recovery of a crude oil-contaminated saltmarsh following in-situ remediation treatments. In: Coastal Environment: Environmental Problems in Coastal Regions IV, C.A. Brebbia (ed.), WIT Press, Southampton, pp. 127-139.

12. Venosa, A.D., M.T. Suidan, K. Lee, S.E. Cobanli, S. Garcia-Blanco and J.R. Haines (2002) Bioremediation of oil-contaminated coastal freshwater and saltwater wetlands. In: Coastal Environment: Environmental Problems in Coastal Regions IV, C.A. Brebbia (ed.), WIT Press, Southampton, pp. 139-150.

13. Lee, K., S. Cobanli, G. Wohlgeschaffen, A.D. Venosa, M.T. Suidan, J. Gauthier, G.H. Tremblay, C.W. Greer and K.G. Doe (2002) Habitat recovery in a crude oil-contaminated saltmarsh following bioremediation treatments. Proceedings of the 25th the Arctic and Marine Oilspill Program (AMOP) Technical Seminar, Calgary, Alberta, Canada, June 11-13, 2002. pp. 329-340.

14. Kiparissis, Y., C. Ho, J. Reynolds, N. Henry, P.V. Hodson and K. Lee (2002) Chronic toxicity of oiled-sediments to Japanese Medaka. Proceedings of the 25th Arctic and Marine Oilspill Program (AMOP) Technical Seminar, Calgary, Alberta, Canada, June 11-13, 2002. pp. 959-968.

15. Hodson, P.V., T. Cross, A. Ewert, S. Zambon and K. Lee (2002) Evidence for the bioavailability of PAH from oiled beach sediments *in situ*. Proceedings of the 25th Arctic and Marine Oilspill Program (AMOP) Technical Seminar, Calgary, Alberta, Canada, June 11-13, 2002. pp. 379-388.

16. Engel, M., C. Nalewajko, K. Lee, A.D. Venosa, M. T. Suidan and I.A. Mendelssohn (2002) Response and potential influence of *Spartina alterniflora* in the biodegradation of fuel oil. Proceedings of the 25th Arctic and Marine Oilspill Program (AMOP) Technical Seminar, Calgary, Alberta, Canada, June 11-13, 2002. pp. 1301-1312.

17. Doe, K.G., P. M. Jackman and K. Lee (2002) Monitoring the effectiveness of remediation techniques using sediment toxicity tests with the amphipod *Eohaustorius estuarius*. Proceedings of the 25th Arctic and Marine Oilspill Program (AMOP) Technical Seminar, Calgary, Alberta, Canada, June 11-13, 2002. pp. 369-378.

2. Lin, Q. et al. 2002. "The dose-response relationship between no. 2 fuel oil and the growth of the salt marsh grass *Spartina alterniflora*." Marine Poll. Bulletin 44:897-902.

18. Haines, J. R. et al., 2002. "Microbial population analysis as a measure of ecosystem restoration," *Bioremediation J.*, 6(3):283-296.
19. Hodson, P.V. et al., 2002. "Bioavailability to fish of sediment PAH as an indicator of the success of in-situ remediation treatments at an experimental oil spill." *Bioremediation J.*, 6(3):297-313.
20. Lee, L.E.J., et al. 2002. "Snails as biomonitors of oil-spill and bioremediation strategies." *Bioremediation J.*, 6(4):373-386.
21. Greer, C.W. et al., 2003. "Indigenous sediment microbial activity in response to nutrient enrichment and plant growth following a controlled oil spill on a freshwater wetland." *Bioremediation J.*, 7(1):69-80.
22. Hodson, P.V., S. Zambon, A. Ewert, I. Ibrahim, Y. Kiparissis, M. Windle, K. Lee and A.D. Venosa (2001) Evaluating the efficiency of oil spill countermeasures by monitoring changes in the bioavailability and toxicity to fish of PAH from wetland sediments. Proceedings of the 24th Arctic and Marine Oilspill (AMOP) Technical Seminar, Edmonton, Alberta, June 12-14, 2001. pp. 211-222.
23. Lee, K., G. Wohlgeschaffen, S. E. Cobanli and J. Gauthier, K. G. Doe, P. M. Jackman A. D. Venosa, L. E. J. Lee, M.T. Suidan and S. Garcia-Blanco (2001) Monitoring habitat recovery and toxicity reduction in an oiled freshwater wetland to determine remediation success. Proceedings of the 24th Arctic and Marine Oilspill (AMOP) Technical Seminar, Edmonton, Alberta, June 12-14, 2001, pp. 195-210.
24. Lee, K., K.G. Doe, L.E.J. Lee, M.T. Suidan and A.D. Venosa (2001) Remediation of an oil-contaminated experimental freshwater wetland: Habitat recovery and toxicity reduction. Proceedings of the 2001 International Oil Spill Conference, Tampa Florida, USA, March 26-29, 2001. pp. 323-328.
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35. Longpré, D., K. Lee, G.H. Tremblay, and V. Jarry (2000) The response of *Scirpus pungens* to crude oil contaminated sediments. The 27th Annual Aquatic Toxicity Workshop, St. John's, Newfoundland, 1-4 October 2000. pp. 127.

36. Zambon, S., Y. Kiparissis, I. Ibrahim, T. Chan, K. Lee, A.D. Venosa, and P.V. Hodson (2000) Remediation of oiled beach sediments as indicated by effects on fish. The 27th Annual Aquatic Toxicity Workshop, St. John's, Newfoundland, 1-4 October 2000. pp. 73.
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Guidance Document

1. Zhu, X., A.D. Venosa, M.T. Suidan and K. Lee (2001) Guidelines for the Bioremediation of marine shorelines and freshwater wetlands. Land Remediation and Pollution Control Division, National Risk Management Research Laboratory of the U.S. Environmental Protection Agency, Technical Report: EPA Contract 68-C7-0057, 163 pp.
2. Zhu, X. et al., 2003. "Guidelines for the Bioremediation of Oil-Contaminated Salt Marshes." In review. When completed, it will be uploaded to the EPA Oil Spill web site.
3. Zhu, X. et al. 2003. "Literature review on the use of bioremediation agents for the cleanup of oil-contaminated estuarine environments." In review. When completed, it will be uploaded to the EPA Oil Spill Web site.

Dispersants

1. Venosa, A.D. et al. 2002. "The baffled flask test for dispersant effectiveness: a round robin evaluation of reproducibility and repeatability." Spill Sci. & Technol. Bulletin, 7(5-6): 299-308.
2. Sorial, G. et. al. 2003. "Oil spill dispersant effectiveness protocol. Part I: modification of the EPA swirling flask test. " Submitted to ASCE J. Env. Engrg.

3. Sorial, G. et al. 2003. "Oil spill dispersant effectiveness protocol. Part II: performance of the revised protocol." Submitted to ASCE J. Env. Engrg.

Orimulsion

1. Venosa, A.D. et al. 2003. "Biodegradability of Orimulsion in saltwater and freshwater environments." Proc. IOSC, Amer. Petrol. Inst., Washington, D.C.

Vegetable Oil

1. Li, Z. and Wrenn, B.A. 2003. "Kinetics of Anaerobic Biodegradation of Vegetable Oil in Freshwater Sediments." Submitted to Water Research.

2. Li, Z., R. J. Downer, and B. A. Wrenn. 2003. "Remediation of Floating Vegetable Oil Spills by Sedimentation Followed by Anaerobic Biodegradation." Proc. IOSC, Vancouver, BC. American Petroleum Institute, Washington, D.C.

3. Wincele, D. E., B.A. Wrenn, and A.D. Venosa. 2003. "Sedimentation of Oil-Mineral Aggregates for Remediation of Vegetable Oil Spills". Submitted, Water Environment Res.

Oil Composition

1. Wang, Z., B. Hollebone, M. Fingas, B. Fieldhouse, L. Sigouin, and J. Weaver. 2003. "Development of a Composition Database for Selected Multicomponent Oils." Proceedings of 2003 International Oil Spill Conference. Vancouver, Canada, April 6-11, 2003. pp. 64-65.

Minerals Management Services
FY01 – FY02
Publications

1. The Program for Mechanical Oil Recovery in Ice-Infested Waters (MORICE), Phase 4 Report, SINTEF Applied Chemistry, April 2000
2. The Program for Mechanical Oil Recovery in Ice-Infested Waters (MORICE), Phase 5 Report, SINTEF Applied Chemistry, June 2001
3. The Program for Mechanical Oil Recovery in Ice-Infested Waters (MORICE), Final Project Report, SINTEF Applied Chemistry, December 2002
4. Using Satellite Radar Imagery to Detect Leaking Abandoned Oil Wells on the U.S. Outer Continental Shelf, Phase I, Technology Demonstration, Final Report, Advanced Resources International, Inc. Arlington, Virginia, January 3, 2001.
5. Fingas, Merv, Ben Fieldhouse, James Lane, and Joseph Mullin, Studies of Water-in-Oil Emulsions: Testing of Emulsion Formation in OHMSETT, September 2001
6. Extending Temporary Storage Capacity Offshore With Emulsion Breakers, Final Report, Ian Buist, S.L. Ross Environmental Research, March 15, 2002.
7. Research on Powdered Activated Carbon to Remove Dissolved Oil Spill Dispersants from Ohmsett Basin Water, Final Report, Ian Buist, S.L. Ross Environmental Research, July 11, 2003
8. Davies, L., Daniel, F., Swannell, R., Braddock, J., Biodegradability of Chemically-Dispersed Oil. A report produced for the Minerals Management Service, Alaska Department of Environmental Conservation, and United States Coast Guard, March 2001.
9. Technology Assessment of the Use of Dispersants on Spills from Drilling and Production Facilities in the Gulf of Mexico Outer Continental Shelf, S.L. Ross Environmental Research, Ltd., December 2000.
10. Laboratory Study to Compare the Effectiveness of Chemical Dispersants when Applied Dilute versus Neat, S.L. Ross Environmental Research Limited, March 2000.
11. Laboratory Study to Compare the Effectiveness of Chemical Dispersants When Applied Dilute versus Neat, R.C. Belore, S.L. Ross Environmental Research Limited, June 2000.
12. Results of Laboratory Test on the Potential for using In Situ Burning on Seventeen Crude Oils, McCourt, J., Buist, I.A, S.L. Ross Environmental Research Limited, June 2000.

13. Detection and Tracking of Oil Under Ice, Final Report, DF Dickins Associates Ltd, October 6, 2000.

14. In Situ Oil Burning in the Marshland Environment – Soil Temperatures Resulting from Crude Oil and Diesel Fuel Burns, National Institute of Standards and Technology, June 2001.

USCG R&D Oil Spill Response Reports

<i>Title</i>	<i>NTIS Accession Number</i>	<i>USCG Number</i>
Effects of Weathering on the Flammability of Oils	ADA376001	CG-D-004-00
In-Situ Burn Investigation: Exercise #1 Galveston, Texas	ADA384650	CG-D-018-00
Test and Evaluation of Four Fire Resistant Booms at OHMSETT	ADA371800	CG-D-025-99
Predicting the Behavior of Orimulsion Spilled on Water (Two Volumes)	ADA371844 ADA371851	CG-D-024-99
Control of Oil Spills in Fast Water Currents, a Technology Assessment	ADA369279	CG-D-018-99
Past In-Situ Burning Possibilities	ADA368258	CG-D-017-99
Second Phase Evaluation of a Protocol for Testing a Fire Resistant Oil Spill Containment Boom	ADA367977	CG-D-015-99
Evaluating a Protocol for Testing a Fire-Resistant Oil Spill Containment Boom	ADA364692	CG-D-007-99
Test and Evaluation of Six Fire Resistant Booms at Ohmsett	ADA344642	CG-D-012-98
Investigation of a Multi-Sensor Method to Map Oil Spill Thickness	ADA343664	CG-D-009-98
Test and Evaluation of Oil/Water Separator: Intr Septor 250 and FRAMO "Skimmer Separator"	ADA330969	CG-D-023-97
U.S. Coast Guard 1995 Oil Pollution Research Grants, Publications II	ADA330202	CG-D-022-97
U.S. Coast Guard 1995 Oil Pollution Research Grants, Publications I	ADA330201	CG-D-022-97
Phase II - Demonstration: Seawater Hydraulic Transfer Pump	ADA339281	CG-D-013-97
Phase I - Feasibility Study: Seawater Hydraulic Transfer Pump	ADA336841	CG-D-012-97
Development of Composite Components for the CCN-150-5C Transfer Pump	ADA327731	CG-D-011-97
Feasibility of Using Composite Materials to Reduce the Weight of the CCN-150 Transfer Pump	ADA327727	CG-D-010-97
USCG 1994 Oil Pollution Research Grants, Part I	ADA325735	CG-D-027-96
USCG 1994 Oil Pollution Research Grants, Part II	ADA325734	CG-D-027-96
At-Sea Evaluation of the Coast Guard VOSS, NOFI-V and FIOCS Oil Recovery Systems	ADA319794	CG-D-019-96
Test Tank Evaluation of a Frequency Scanning Microwave Radiometer to Estimate Oil Thickness and Physical Properties	ADA320082	CG-D-018-96
Analysis of the Causes of Chemical Spills from Marine Transportation or Related Facilities	ADA309262	CG-D-008-96
Oil/Water Separator, Test and Evaluation	ADA308186	CG-D-006-96
The CANFLEX "Sea Slug" Temporary Storage Device and the DOAS Flotation Collar	ADA308226	CG-D-005-96
Ohmsett Tests of Lancer Inflatable Barge	ADA308014	CG-D-004-96

<i>Title</i>	<i>NTIS Accession Number</i>	<i>USCG Number</i>
Improving the Performance of Oil Spill Containment Booms in Waves, Part I – Literature Review, Part II - Physical Model Study: Procedure and Results	ADA304305	CG-D-043-95
Robotic-Remote Operated Sensing Device for U.S. Coast Guard	ADA302929	CG-D-041-95
Oil Spill Risk Assessment Model and the Ranking of Ports for Oil Spill Vulnerability	ADA302991	CG-D-035-95
Evaluation of Infrared Sensors for Oil Spill Response Operations	ADA303656	CG-D-018-95
Condensed USCG Oil Spill Response Health and Safety Plans	ADA299133	CG-D-015-95
The Detection of Oil Slicks at Night with Airborne Infrared Imagers	ADA289731	CG-D-030-94
Design, Construction, Test, and Evaluation of a Frequency Scanning/Radiometer for Measuring Oil Slick Thicknesses	ADA290040	CG-D-029-94
Ohmsett Tests of LORI LSC-2 Skimming Systems	ADA294352	CG-D-017-94
Evaluation of Night Capable Sensors for the Detection of Oil on Water	ADA281728	CG-D-009-94
Ohmsett Test of NOFI Vee-Sweep and NOFI 600S Oilboom	ADA279525	CG-D-004-94
Evaluation of Synthetic Aperture Radar for Oil Spill Response	ADA278796	CG-D-002-94
Investigation of Self-Help Oil-Spill Response Techniques and Equipment	ADA260881	CG-D-021-92
Probabilistic Oil Outflow Analysis of Alternative Tanker Designs – Addendum I	ADA257714	CG-D-019-92
Probabilistic Oil Outflow Analysis of Alternative Tanker Designs	ADA253656	CG-D-014-92
National Strike Force (NSF) Oil Spill Response Equipment Upgrade	ADA242434	CG-D-006-91
Oil Recovery Systems for Coast Guard Coastal Buoy Tenders Volume I: Technical Report (Volume II: Manufacturer's Information - internal document)	ADA235890	CG-D-004-91
Classification of Floating CHRIS Chemicals for the Development of a Spill Response Manual	ADA229917	CG-D-016-90
Response Manual for Combating Spills of Floating Hazardous CHRIS Chemicals	ADA230398	CG-D-015-90
Arctic Oil Spill Response Planning Guide for the Alaskan Beaufort Sea	ADA204788	CG-D-018-88
Selection of Priority Hazardous Chemicals for Permeation Testing & Hazardous Chemical Spill Detection & Analysis	ADA172370	CG-D-022-86
Review of Methods to Track Oil in Arctic Waters	ADA164679	CG-D-028-85
Field Guide for Arctic Oil Spill Behavior	ADA151064	CG-D-002-85
Atlas of the Beaufort Sea	ADA149545	CG-D-033-84
Hazardous Chemical Discharge Prevention & Reduction	ADA146648	CG-D-029-84
Feasibility Studies for Identification of Santa Barbara Natural Seep and Platform Oils	#PB85115293	CG-D-028-84
Development and Calibration of an Oil Spill Behavior Model	ADA133693	CG-D-027-83

<i>Title</i>	<i>NTIS Accession Number</i>	<i>USCG Number</i>
Feasibility of Using RECON III-B as a CG Hazardous Chemical Spill Response Tool	ADA127309	CG-D-006-83
Aerial Photographic Surveys Analyzed to Deduce Oil Spill Movement During the Decay and Breakup of Fast Ice, Prudhoe Bay, Alaska	ADA126395	CG-D-051-82
Long-Term Movement of Satellite Tracked Buoys in the Beaufort Sea	ADA126344	CG-D-048-82
1982 Beaufort Sea Current Records: A Data Report Volume IV	ADA122088	CG-D-035-82
1981 Beaufort Sea Current Records: A Data Report Volume III	ADA122087	CG-D-035-82
1981 Beaufort Sea Current Records: A Data Report Volume II	ADA122086	CG-D-035-82
1981 Beaufort Sea Current Records: A Data Report Volume I	ADA122085	CG-D-035-82
A Laboratory Experiment on Oil Weathering Under Arctic Conditions	ADA129033	CG-D-034-82
Surface Drifter Study - Beaufort Sea, Alaska	ADA126350	CG-D-033-82
Laboratory Studies of Oil Spill Behavior in Broken Sea Fields	ADA114178	CG-D-012-82
Hazardous Chemical Container Feasibility/Concept Design Study	ADA114141	CG-D-005-82
Hazardous Chemical Fluorometer Development	ADA129997	CG-D-079-81
Modeling Sea Ice Trajectories for Oil Spill Tracking	ADA126316	CG-D-028-81
Test and Evaluation of the Trecon Incenerator	ADA099527	CG-D-019-81
State-of-the-Art Survey of Remotely Operated Vehicles for Coast Guard Hazardous Chemical Spill Response	ADA093826	CG-D-067-80
Hazardous Chemical Pump Tests	ADA091052	CG-D-057-80
Foam Plug Development	ADA088104	CG-D-030-80
Hazardous Chemical Vapor Reduction Device Development	ADA079488	CG-D-084-79
A Luminescence Survey of Hazardous Materials	ADA073828	CG-D-053-79
The Analysis of Sediment Samples for Hydrocarbons	ADA073822	CG-D-046-79
Development of a Chemical Method for Detecting Petrogenic Hydrocarbons in the Presence of Biogenic Hydrocarbons Down to the 5 PPB Level	ADA072375	CG-D-040-79
Evaluation of the Usefulness of Biological Indicators for Detecting Petroleum Hydrocarbons in the Water Column	ADA072474	CG-D-039-79
A Scientific Study to Develop a Practical Method for Assessing the Cleanup of "Sour" (High Sulfur) Crude Oil Spills in Littoral Sands Using Benthic Microorganisms	ADA075763	CG-D-027-79
Inquiry into the Suitability of Protozoa as Biological Indicators of Oil Pollution	ADA064184	CG-D-083-78
Biological Effects of Oil Pollution - A Comprehensive Bibliography with Abstracts	ADA064196	CG-D-075-78
An Atlas of Gas Chromatograms of Oils Using Dual Flame-Ionization and Nitrogen Phosphorous Detectors	ADA054966	CG-D-019-78
Oil Spill Identification System	ADA044750	CG-D-052-77

<i>Title</i>	<i>NTIS Accession Number</i>	<i>USCG Number</i>
Estimate of Maximum Level of Oil Innocuous to Marine Biota as Inferred from Literature Review	ADA044601	CG-D-043-77
Use of Pattern Recognition Techniques for Typing and Identification of Oil Spills	ADA043802	CG-D-038-77
Methods of Identifying Source of Petroleum Found in the Marine Environments, Report II	ADA047256	CG-D-037-77
The U.S. Coast Guard Oil Water Separator Testing Laboratory	ADA042744	CG-D-033-77
Field Infrared Method to Discriminate Natural Seeps from Non-Seeps (Santa Barbara, California Area)	ADA042861	CG-D-032-77
Development of a Simple, Rapid Field Technique for Estimating Oil Concentrations in the Sediments	ADA042976	CG-D-027-77
Identification of Oil Slicks by Infrared Spectroscopy	ADA040975	CG-D-019-77
Classification of Oils by the Application of Pattern Recognition Techniques to Infrared Spectra	ADA039387	CG-D-006-77
A Preliminary Test of a Government-Owned Local Area Oil on Water Surveillance System	ADA040541	CG-D-121-76
Movement of Spilled Oil Over the Beaufort Sea Shelf - A Forecast	ADA033580	CG-D-101-76
Oil Spill Identification Bibliography	ADA029126	CG-D-041-76
Preliminary Projection of Oil Spill Movement for Three Potential Deepwater Port Sites in the Gulf of Mexico	ADA024331	CG-D-019-76
Studies on the Composition and Aging of Marine Tars	ADA022882	CG-D-009-76
High Seas Oil Containment Barrier Mooring System	ADA020980	CG-D-176-75
A Computer Simulation Technique for Oil Spills Off the New Jersey-Delaware Coastline	ADA018947	CG-D-171-75
Predicted Oil Slick Movement From Various Locations Off the New Jersey-Delaware Coastline	ADA019019	CG-D-137-75
Identification of Weathered Oil Films Found in the Marine Environment	ADA015883	CG-D-107-75
Monitoring Dissolved Hydrocarbons as a Function of the Tidal Cycle (New York Harbor)	ADA015882	CG-D-106-75
An Oil Slick Sampling System	ADA010708	CG-D-071-75
Methods of Identifying and Determining Source and Age of Petroleum Found in the Marine Environment	ADA010704	CG-D-061-75
Determination of the Leeway of Oil Slicks	ADA006822	CG-D-060-75
Tar Ball Distribution in the Western North Atlantic Ocean	ADA006821	CG-D-052-75
Oil Spill Identification System	ADA003803	CG-D-041-75
A Numerical Model for Simulation of Oil Spreading and Transport and its Application for Predicting Oil Slick Movement in Bays	ADA780424	CG-D-022-75
Discrimination of Waste Oils by Micro Emission Spectrochemical Analysis	ADA787717	CG-D-021-75

<i>Title</i>	<i>NTIS Accession Number</i>	<i>USCG Number</i>
Chemical and Physical Characterization of Tar Samples from the Marine Environment	ADA787788	CG-D-020-75
A Quantitative and Qualitative Survey of Oils and Tars Stranded on Galveston Island Beaches	ADA787718	CG-D-010-75
The Fate and Behavior of Crude Oil on Marine Life	ADA786584	CG-D-009-75
Fate of Petroleum Hydrocarbons in Beach Sand	ADA786582	CG-D-008-75
Weathering of Oil at Sea	ADA787789	CG-D-007-75
A Technique for Predicting the Movement of Oil Spills in New York Harbor	ADA786627	CG-D-006-75
Wind Drift Currents and Spread of Contamination in Shelf Water	ADA786610	CG-D-005-75
Galveston Harbor: Factors Affecting Pollution and Pollution Monitoring	ADA786650	CG-D-004-75
Tar Pollution Survey at Golden Beach, Florida	ADA786632	CG-D-003-75
A Portable Gas Chromatographic Technique to Measure Dissolved Hydrocarbons in Sea Water	ADA786583	CG-D-002-75

**The Interagency Coordinating Committee on Oil spill
Pollution R&D – Regional Research Grant Program**

1994

- University of Rhode Island “Hydrodynamic Modeling of Oil Containment”
- Rensselaer Polytechnic Institute “Development of a Prototype PC-Based Shipboard Piloting Expert System”
- University of new Hampshire “Development of a Rapid Current Containment Boom”
- University of Oklahoma “Source Identification of Oil Spills Based on Isotopic Composition of Individual Components in Weathered oil Samples”
- Louisiana Sate University “Preventing Oil Spills by Evaluating, Monitoring, and Managing Port and Waterway Risk”
- SRI International “Development of an Oil Spill Response Simulation System that Determines Strategies Interactively”
- University of California, Santa Cruz “Effect of Water Accommodated Fraction of Crud Oil and Dispersed Oil on the Early Life Stages of Two Marine Species”
- University of California, Berkeley “Oil Spill Prevention Through the Improved management of Human and Organization Errors in the operation of Tankers and Barges
- SRI International “Decision Support Technology of Oil Spill Response Configuration Planning
- University of California, Santa Cruz “The influence of Dispersant on Petroleum Bioavailability Within a Marine Food Chain”

1996

- University of Miami, “Study of Gulf Coast Spill Contingency Plans “Remediation and Restoration” (ACOE funded \$188,994)

**The National Oceanic Atmospheric Administration Research
and Development Center publications
FY01 – Fy02**

Response Reports and Case Histories

Reports describing responses to oil spills and chemical accidents; spill case histories; and a database of past oil spills and chemical accidents.

1. Historical Incidents Database Search this database for information about past oil spills, as well as chemical accidents (located on our Incident News website). (webposted 8/10/00)
2. Oil Spill Case Histories (PDF file; 2.2 MB) Summaries of significant U.S. and international spills between 1967 and 1991. These summaries are also available in the Historical Incidents Database. (revised 8/16/01 to correct an error in the volume of spilled oil reported for the Arabian Gulf/Kuwait incident.)
3. Barge Morris J. Berman Spill: NOAA's Scientific Response (PDF file; 2.0 MB) 1995 report on the response to the first major oil spill since area contingency plans were developed; this was also the first major spill since passage of the Oil Pollution Act of 1990 for which the U.S. Coast Guard served as the sole executor of the response. (webposted 1/7/98)
4. Hazmat Modeling Products for Spill Response and Planning (PDF file; 1.1 MB) A report describing products to help professional responders, as well as the general public, understand, plan for, and respond to oil and chemical spills. (webposted 1/10/03)
5. Trajectory Analysis Handbook 2002 guidebook explaining the basic concepts involved in analyzing the trajectory of spilled oil. (webposted 8/13/02)
 - a. Questions and Answers: Spill Trajectory Analysis (PDF file; 261K) Technical explanation of spill trajectory analysis and how it differs from oil spill trajectory modeling. (webposted 3/23/98)
 - b. Digital Distribution Standard for NOAA Trajectory Analysis Information (PDF file; 246K) 1996 technical description of a method for preparing a set of "minimum regret" trajectory model runs for use in trajectory analysis, and a standard digital file format for presenting the results. (webposted 3/23/98)
6. Shoreline Assessment Manual (PDF file; 3.1 MB) Third edition of a manual outlining methods for conducting shoreline assessments and using the results to make cleanup decisions. (third edition with minor revisions webposted 1/10/02)
 - a. Shoreline Assessment Forms Forms for recording observations during shoreline assessments.
7. The Shoreline Countermeasures Manuals View a description of NOAA's shoreline countermeasures manuals; view or download manuals for temperate and tropical coastal environments and for Alaska.

ENCLOSURE (5)

8. Characteristic Coastal Habitats: Choosing Spill Response Alternatives A job aid for shoreline cleanup decision-making. (webposted 3/15/01)
9. Characteristics of Response Strategies: A Guide for Spill Response Planning in Marine Environments This job aid helps response decision-makers with tradeoff decisions for specific habitats and response options. (webposted 06/18/03)
10. An Introduction to Coastal Habitats and Biological Resources for Spill Response 1992 training manual covering physical, geological, and biological considerations relevant to oil spill response and cleanup.(webposted 2/3/99)
11. Aerial Observations of Oil at Sea (PDF file; 28K) 1996 report recommending how to assess spilled oil from the air. (webposted 1/7/98)
12. In-Situ Burning Page Guidance documents and reports on in-situ burning and burn monitoring. (webposted 5/3/99)
13. SMART Guidance document describing a monitoring program for in-situ burning and dispersants. (webposted 3/29/00)
14. Mechanical Protection Guidelines (PDF file; 1.2 MB) 1994 manual describing how to deploy booms, barriers, and other mechanical protection devices during a spill response. (webposted 1/7/98)
15. Matrix Effects on Fluorometric Monitoring and Quantification of Dispersed Oil in the Open Ocean and Coastal Environment: Results of the 1999 R/V Ferrel Research Project (PDF file; 520K) Report on a study designed to identify the potential for matrix effects related to monitoring of dispersed oil. (webposted 1/10/02)
16. Leaking Tank Experiments with Orimulsion™ and Canola Oil (PDF file; 416K) Report on investigations into the behavior of heavy oil products, with the goal of improving tank leak rate estimates. (webposted 1/10/02)
17. Physical Processes Affecting the Movement and Spreading of Oils in Inland Waters (PDF file; 1.1 MB) 1995 technical report describing the mechanisms that move and spread oil in lakes and rivers. (webposted 3/23/98)
18. Assessment of Risks Associated With the Shipment and Transfer of Group V Oils (PDF file; 422K) 1994 report describing the chemical and physical properties of Group V oils (oils with specific gravities near that of water; also called LAPIO) and reviewing potential response considerations when this type of oil is spilled. (webposted 1/8/98)
19. Assessment of Risks Associated With the Shipment and Transfer of LAPIO in the St. Johns River, Northern and Central Florida. (PDF file; 1.2 MB) 1994 report describing the properties of LAPIO (oils with specific gravities near that of water; also called Group V oils), analyzing the resources at risk in the St. Johns River, and reviewing spill response considerations for this type of oil. (webposted 1/8/98)

20. Chemistry and Environmental Effects of the Shoreline Cleaner PES-51 (PDF file; 57K) 1994 report on a NOAA evaluation of the shoreline cleaner PES-51. (webposted 1/7/98)
21. Managing Seafood Safety after an Oil Spill (PDF file; 1 MB) A 2002 guide to help seafood managers and other spill responders determine appropriate seafood management actions in response to a spill.