OCS Report
MMS 2007-029

Oil-Spill Risk Analysis: Contingency Planning Statistics for Gulf of Mexico OCS Activities in the Walker Ridge Planning Area

U.S. Department of the Interior
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By:

Walter R. Johnson
Zhen-Gang Ji
Charles F. Marshall
Eileen M. Lear (Editor)

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Introduction

The Federal Government offers U.S. Outer Continental Shelf (OCS) lands in the Gulf of Mexico (GOM) for oil and gas leasing. Because oil spills may occur from activities associated with offshore oil exploration, production, and transportation resulting from these lease sales, the Minerals Management Service (MMS) has conducted a formal oil-spill risk analysis (OSRA) to provide spill statistics that can be used in contingency planning for these areas. This report summarizes the results of that analysis, the objective of which was to estimate the risk of oil-spill contact to coastal resources in the GOM from oil spills accidentally occurring from the OCS activities (LaBelle, 2001).

The occurrence of oil spills is fundamentally a matter of probability. There is no certainty regarding the amount of oil that would be produced, or the size or likelihood of a spill that would occur, during the estimated life of a given lease sale. Neither can the winds and ocean currents that transport oil spills be known for certain. A probabilistic event such as an oil-spill occurrence or oil-spill contact to an environmentally sensitive area cannot be predicted, only an estimate of its likelihood (its probability) can be quantified.

This report provides the contingency planning statistics for the OCS activities in the GOM. The probabilities of oil spill occurrence and the combined probabilities of contact in the GOM are already presented in previous reports (Ji et al. 2002a, 2002b). This report is available from the MMS's Internet site (*http://www.mms.gov*).

Framework of the Analysis

Domain/Study Area

The domain (shown in fig.1) defines the geographic boundaries that encompass the environmental resources at risk of contact by a hypothetical oil spill from OCS operations in the lease areas. Although few hypothetical oil spills were likely to extend beyond the borders of the domain within 30 days after release (the maximum elapsed time considered), we have tracked and tabulated spills that would travel beyond the open-ocean boundaries. These spills could contact land or other environmental resources outside the domain.

The study area (shown in fig. 1) is the Walker Ridge Planning Area that encompasses a portion of the offshore waters within the Gulf of Mexico. The subarea of Walker Ridge that contains the Cascade and Chinook Projects is approximately 140 to 160 nautical miles offshore and is close to the limits of the Exclusive Economic Zone–the maritime region extending 200 nautical miles from the baseline of the territorial sea, in which the United States has exclusive rights and jurisdiction over living and nonliving natural resources. The study area was created as a hypothetical oil-spill launch area, which is used to represent oil-spill risks from platforms in the Cascade and Chinook Projects (fig. 1).

Hypothetical Spill Locations

The OSRA Model initiated hypothetical oil spills uniformly in space and time from within the study area, as shown in figure 1. At $1/10^{o}$ intervals in the north-south direction (about 11 kilometers [km]) and $1/10^{o}$ intervals in the east-west direction (about 10 km), the model launched an oil spill every 1.0 day. At this resolution, there were 15 total launch points in space, and a total of 5,760 oil-spill trajectories were launched from each spatial grid point over two time periods, 9 years and 7 years, as described below (see “Oil Spill Trajectory Simulations”). The spatial resolution of the spill simulations was well within the spatial resolution of the input data, and the interval of time between releases was sufficiently short to sample weather-scale changes in the input winds (Price et al., 2003).

The sensitivity tests on the OSRA Model (Price et al., 2002) indicated that, statistically, the above-mentioned spatial resolution ($1/10^{o}$ by $1/10^{o}$) and time resolution (1.0 day) are sufficient to represent the spatial and time variations of the particle trajectories in the area.

Environmental Resources

The environmental resources considered in this analysis include the counties and parishes along the coast of the Gulf of Mexico. Figures 2 and 3 depict locations of these counties and parishes. The MMS used data derived from the Coastal Offshore Resource Information System (CORIS) and other databases (USDOI, MMS, 1999). The CORIS data were developed and supported by State and Federal Agencies and the oil industry operating along the Gulf Coast. The environmental resources considered also include 17 U.S./Mexico international boundary segments (fig. 4).

All onshore, coastal environmental resource locations were represented by one or more partitions of the coastline, herein called land. The study area coastline was partitioned into 162 equidistant land segments of approximately 10-mile (16-km) length. The partitions were formed by creating straight lines between two points projected onto the coast; therefore, the actual miles of shoreline represented by each land segment may be greater than 10 miles, depending upon the complexity of the coastal area.

The counties and parishes examined in this OSRA are shown below.

Counties/Parishes (set 1)--shown on Figure 2

C1-Cameron, TX
C3-Kenedy, TX
C5-Nueces, TX
C7-Calhoun, TX
C9-Brazoria, TX
C11-Chambers, TX
C13-Cameron, LA
C15-Iberia, LA
C17-Terrebonne, LA
C19-Jefferson, LA
C21-St. Bernard, LA
C25-Baldwin, AL
C27-Santa Rosa, FL
C29-Walton, FL
C31-Gulf, FL
C33-Wakulla, FL
C35-Taylor, FL
C37-Levy, FL
C39-Hernando, FL
C41-Pinellas, FL
C43-Manatee, FL
C45-Charlotte, FL

C23-Jackson, MS
C47-Collier, FL

Counties/Parishes (set 2)--shown on Figure 3

C2-Willacy, TX
C4-Kleberg, TX
C6-Aransas, TX
C8-Matagorda, TX
C10-Galveston, TX
C12-Jefferson, TX
C14-Vermilion, LA
C16-St. Mary, LA
C18-Lafourche, LA
C20-Plaquemines, LA
C22-Hancock & Harrison, MS
C24-Mobile, AL
C26-Escambia, FL
C28-Okaloosa, FL
C30-Bay, FL
C32-Franklin, FL
C34-Jefferson, FL
C36-Dixie, FL
C38-Citrus, FL
C40-Pasco, FL
C42-Hillsborough, FL
C44-Sarasota, FL
C46-Lee, FL
C48-Monroe, FL

Oil-Spill Risk Analysis

In this report, the OSRA was conducted to calculate the trajectories of oil spills from hypothetical spill locations to various environmental resources.

Risk analyses may be characterized as “hazard-based” or “risk-based.” A hazard-based analysis examines possible events regardless of their low (or high) likelihood. For example, a potential impact would not lose significance because the risk has been reduced due to an increase in the level of control, such as engineering standards. A risk-based analysis, on the other hand, does take into account the likelihood of the event occurring or the measures that can be taken to mitigate against its potential impacts. This OSRA is designed for use as a hazard-based assessment. Therefore, the likelihood of oil spills occurring on the OCS was not considered in the analysis.

Oil-Spill Trajectory Simulations

The OSRA Model, originally developed by Smith et al. (1982) and enhanced by MMS over the years (LaBelle and Anderson, 1985; Ji et al., 2003, Ji et al. 2004), simulates oil-spill transport using realistic data fields of winds and ocean currents in the GOM. An oil spill on the ocean surface moves around by the complex surface ocean currents exerting a shear force on the spilled oil from below. In addition, the prevailing wind exerts an additional shear force on the spill from above, and the combination of the two forces causes the transportation of the oil spill away from its initial spill location. In the OSRA Model, the velocity of a hypothetical oil spill is the linear superposition of the surface ocean current and the wind drift caused by the winds. The model calculates the movement of hypothetical spills by successively integrating time sequences of two spatially gridded input fields: the surface ocean currents and the sea-level winds, both of which were generated by other computer models using many observations of relevant physical parameters. In this fashion, the OSRA Model generates time sequences of hypothetical oil-spill locations–essentially, oil-spill trajectories.

At each successive time step, the OSRA Model compares the location of the hypothetical spills against the geographic boundaries of shoreline and designated offshore environmental resources. The model counts the occurrences of oil-spill contact to these areas during the time periods that the habitat is known to be used by the resource. Finally, the frequencies of oil-spill contact are computed for designated oil-spill travel times (e.g., 3, 10, or 30 days) by dividing the total number of oil-spill contacts by the total number of hypothetical spills initiated in the model from a given hypothetical spill location. The frequencies of oil-spill contact are the model-estimated probabilities of oil-spill contact. The OSRA Model output provides the estimated probabilities of contact to all identified offshore environmental resources and segments of shoreline from locations chosen to represent hypothetical oil spills from oil production and transportation facilities, at several selected oil-spill travel times.

There are factors not explicitly considered by the OSRA Model that can affect the transport of spilled oil as well as the dimensions, volume, and nature of the oil spills contacting environmental resources or the shoreline. These include possible cleanup operations, chemical composition or biological weathering of oil spills, or the spreading and splitting of oil spills. The OSRA analysts have chosen to take a more environmentally conservative approach by presuming persistence of spilled oil over the selected time duration of the trajectories.

In the trajectory simulation portion of the OSRA Model, many hypothetical oil-spill trajectories are produced by numerically integrating a temporally and spatially varying ocean current field, and superposing on that an empirical wind-induced drift of the hypothetical oil spills (Samuels et al., 1982). Collectively, the trajectories represent a statistical ensemble of simulated oil-spill displacements produced by a field of winds derived from observations and numerically derived ocean currents. The winds and currents are assumed to be statistically similar to those that will occur in the Gulf during future offshore activities. In other words, the oil-spill risk analysts assume that the frequency of strong wind events in the wind field is the same as what will occur during future offshore activities. By inference, the frequencies of contact by the simulated oil spills are the same as what could occur from actual oil spills during future offshore activities.

Another portion of the OSRA Model tabulates the contacts by the simulated oil spills. The model contains the geographical boundaries of a variety of identified environmental features. At every integration time step, the OSRA Model tracks the locations of the simulated spills and counts the number of oil-spill contacts to segments of shoreline (counties/parishes). A contact to shore will stop the trajectory of an oil spill; no re-washing is assumed in this model. After specified periods of time, the OSRA Model will divide the total number of contacts to the coastline segments by the total number of simulated oil spills from a given geographic location. These ratios are the estimated probabilities of oil-spill contact from offshore activities at that geographic location, assuming spill occurrence.

Conducting an oil-spill risk analysis needs detailed information on ocean currents and wind fields (Ji, 2004). The ocean currents used are numerically computed from an ocean circulation model of the GOM driven by analyzed meteorological forces (the near-surface winds and the total heat fluxes) and observed river inflow into the GOM (Herring et al., 1999; Oey et al., 2004; Oey, 2005). The models used are versions of the Princeton Ocean Model (POM), which is an enhanced version of the earlier constructed Mellor-Blumberg Model. It is a three-dimensional, time-dependent, primitive equation model using orthogonal curvilinear coordinates in the horizontal and a topographically conformal coordinate in the vertical. The use of these coordinates allows for a realistic coastline and bottom topography, including a sloping shelf, to be represented in the model simulation. The model incorporates the Mellor-Yamada turbulence closure model to provide a parameterization of the vertical mixing process through the water column.

The prognostic variables of the model are velocity, temperature, salinity, turbulence kinetic energy, and turbulence macroscale. The momentum equations are nonlinear and incorporate a variable Coriolis parameter. Prognostic equations governing the thermodynamic quantities (temperature and salinity) account for water mass variations brought about by highly time-dependent coastal upwelling processes. The processes responsible for eddy production, movement, and eventual dissipation are also included in the model physics. Other computed variables include density, vertical eddy viscosity, and vertical eddy diffusivity.

Two separate model runs were used to calculate the trajectories for this statistical report. The first was a 9-year simulation performed by Dynalysis of Princeton (Herring, et al., 1999). The POM was driven by winds and heat fluxes over the 9-year period, 1986 through 1994, which were analyzed by the European Center for Medium-Range Weather Forecasts (ECMWF). The second ocean model calculation was performed by Princeton University (Oey, 2003; Oey, et al., 2004). This simulation covered the 7-year period, 1993 through 1999, and the results were saved at 1-hour intervals. This run included the assimilation of sea surface altimeter observations, to improve the ocean model results. The surface currents were then computed for input into the OSRA Model along with the concurrent wind field. The OSRA Model used the same wind field to calculate the empirical wind drift of the simulated spills. The statistics for the contacts by the trajectories forced by the two model runs were combined for the average probabilities.

The ocean model simulations were extensively skill-assessed with many observations from the GOM (Herring et al., 1999; Oey, et al., 2004, Oey, 2005). These extensive sets of observations afford a rigorous test of the model’s ability to reproduce ocean transport as well as prominent features of the Gulf, such as the Loop Current and strong mesoscale eddies, which are easily observed from satellite-borne instrumentation. With these observations and other current measurements from moored current meters, a good determination of the model’s veracity was made. Both the POM models did an excellent job in reproducing the characteristics of the GOM surface currents both on and off the continental shelf. The surface current field manifests all the dominant structures in time and space as the observed currents and is, therefore, applicable in the statistical estimation of future spill risk that the OSRA Model makes.

Trajectories of hypothetical spills were initiated every 1.0 day from each of the 15 launch points in space—3,240 trajectories per launch point over the 9-year simulation period and 2,520 over the 7-year simulation period. The chosen number of trajectories per site (5,760) was small enough to be computationally practical and large enough to reduce the random sampling error to an insignificant level. Also, the weather-scale changes in the winds are at least minimally sampled with simulated spills started every 1.0 day.

The OSRA Model integrates the spill velocities (a linear superposition of surface ocean currents and empirical wind drift) by integrating in time to produce the spill trajectories. The time step selected was 1 hour to fully utilize the spatial resolution of the ocean current field and to achieve a stable set of trajectories. The velocity field was bilinearly interpolated from the 3-hourly or 1-hourly grid to get velocities at 1-hour intervals. Smaller time steps did not produce significant differences in the simulated trajectories after 30 model days, so the 1-hour time step was chosen for this analysis. Ji et al. (2004) summarized the latest improvement on the OSRA Model and the model sensitivity tests.

Conditional Probabilities of Contact

The probability that an oil spill will contact a specific environmental resource within a given time of travel from a certain location or spill point is termed a conditional probability, the condition being that a spill is assumed to have occurred. Each trajectory was allowed to continue for as long as 30 days. However, if the hypothetical spill contacted shoreline sooner than 30 days after the start of the spill, the spill trajectory was terminated, and the contact was recorded. On the other hand, the international boundary segments do not terminate the trajectories, so that one trajectory could contact more than one segment, based on changing wind and current histories.

The trajectories simulated by the model represent only hypothetical pathways of oil slicks; they do not involve any direct consideration of cleanup, dispersion, or weathering processes that could alter the quantity or properties of oil that might eventually contact the environmental resource locations. However, an implicit analysis of weathering and decay can be considered by choosing a travel time for the simulated oil spills when they contact environmental resource locations that represent the likely persistence of the oil slick on the water surface. The MMS performed an analysis of the likely weathering and cleanup of a typical offshore oil spill of 1,000 bbl or greater occurring under the proposed action scenarios (USDOI, MMS, 2002). The analysis of the slick's fate showed that a typical GOM oil slick of 1,000 bbl or greater, exposed to typical winds and currents, would not persist on the water surface beyond 10 days. Therefore, OSRA Model trajectories were analyzed on an annual basis for 3, 10, and 30 days, and the probabilities of oil-spill contact occurring within these time periods are reported in tables 1 and 2. The probabilities of oil-spill contact were also analyzed on a seasonal basis, and these probabilities are reported in tables 1 (counties/parishes), and tables 3 through 6 (sea segments). The counties and parishes with all probabilities of less than 0.5 percent are not shown.

Discussion

As one might expect, the environmental resource locations closest to the spill sites had the greatest risk of contact. As the model run duration increases, more of the identified environmental resources could have meaningful probabilities of contact (> 0.5%). The longer transit times (up to 30 days) allowed by the model enable more hypothetical spills to reach the environmental resources from more distant spill locations. With increased travel time, the complex patterns of wind and ocean currents produce eddy-like motions of the oil spills and multiple opportunities for a spill to make contact with any given environmental resource. The hypothetical oil-spill launch area for this analysis is between 140 and 160 nautical miles from the coast, which resulted in no probabilities of contact to county/parish land segments of greater than 0.5 percent for 3 to 10 days and an annual average maximum of 2 percent (table 1). Due to the climatology of the wind, the spring season had the higher average probabilities of contact to these segments (the highest being 8 percent), and the fall season had the lowest (none greater than 0.5 percent). The hypothetical launch area was approximately 40 to 55 nautical miles from the international boundary segments, thus these segments have annual average contact probabilities of up to 16 percent within 10 days (table 2). The international boundary segments do not terminate the trajectories, so that one trajectory could contact more than one segment, based on changing wind and current histories.

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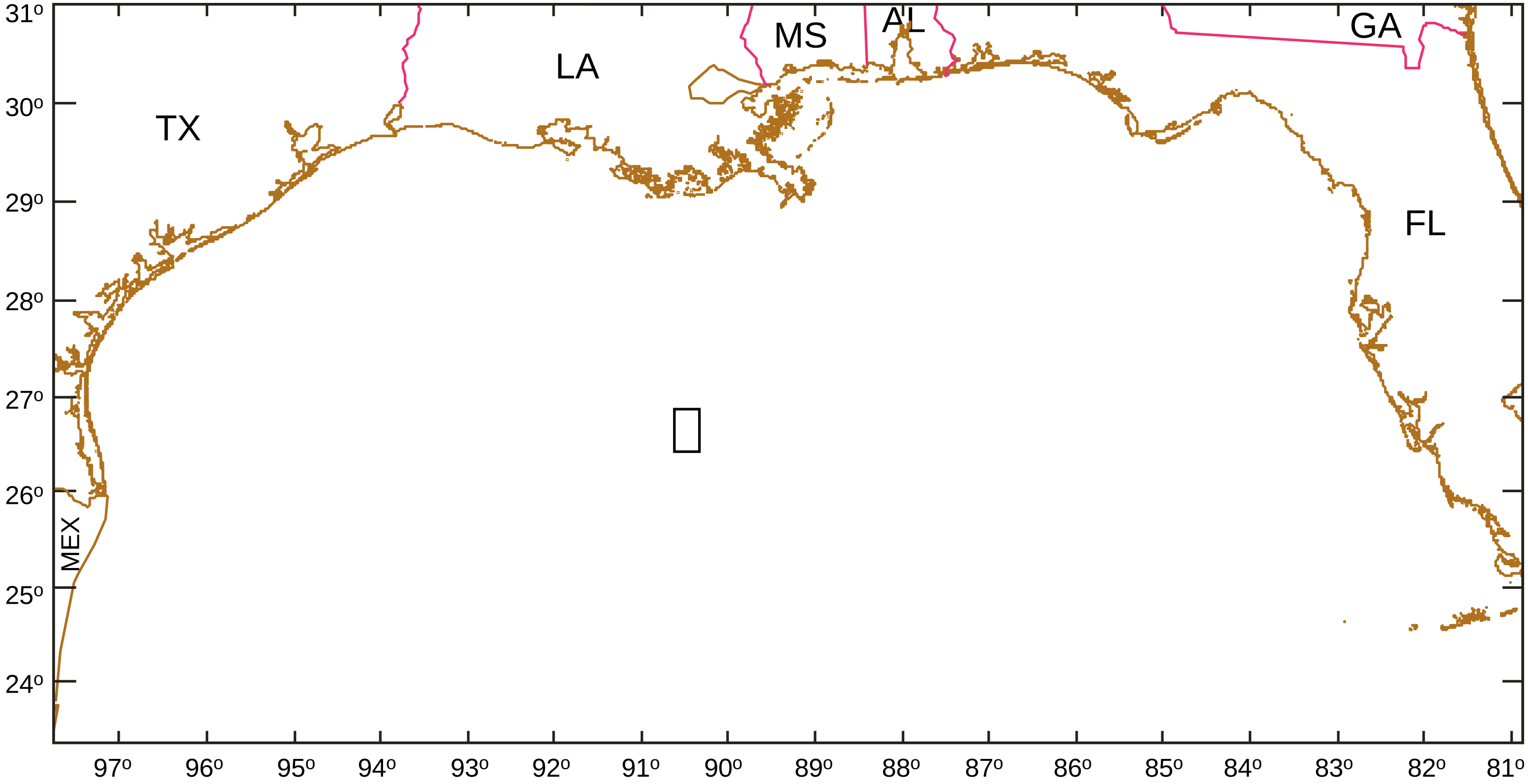

Figure 1. Location of the oil-spill launch area for the Cascade and Chinook projects in the Walker Ridge Planning Area.

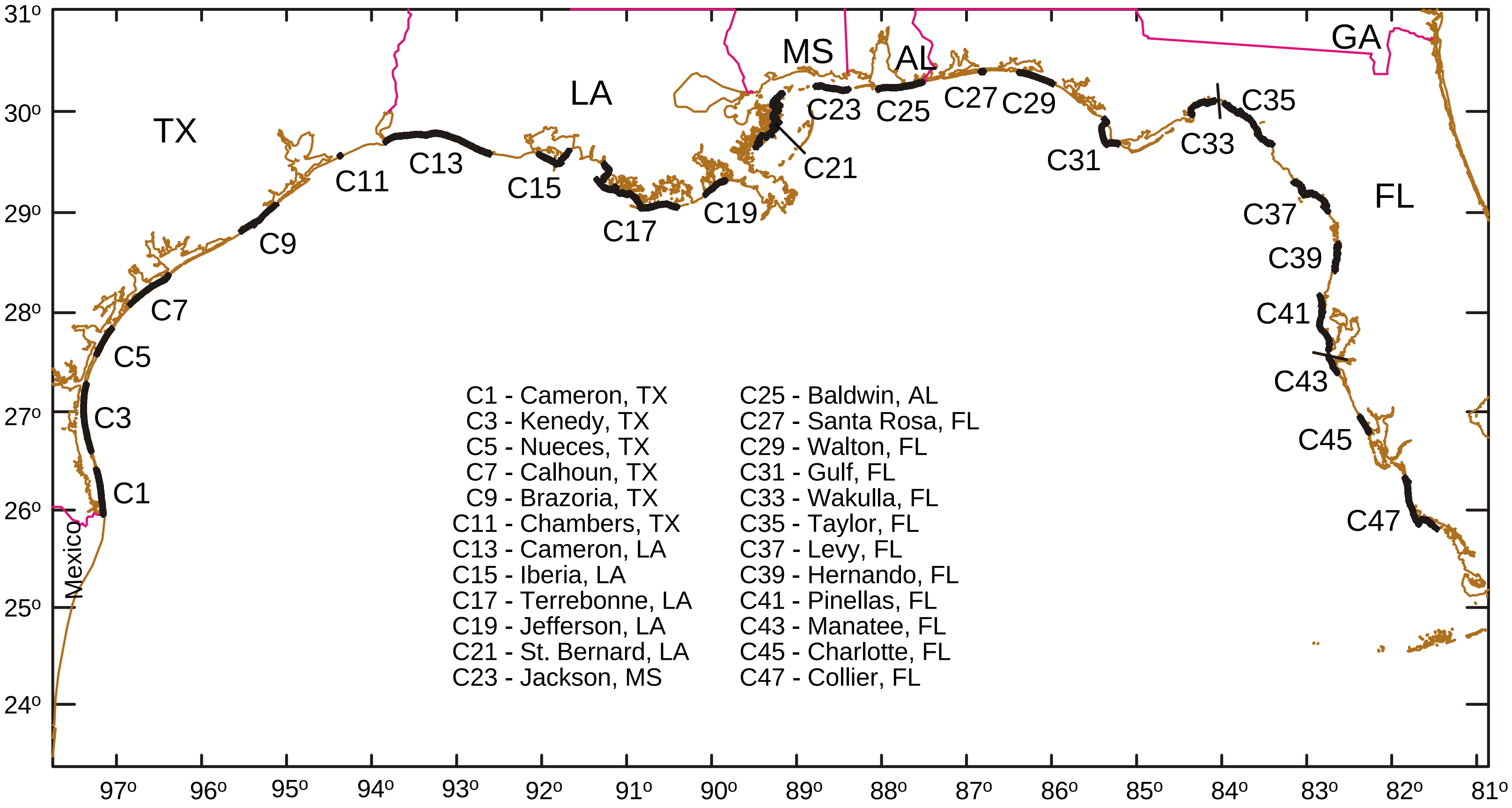

Figure 2. Locations of Gulf of Mexico counties/parishes (set 1). (Shading is not to scale.)

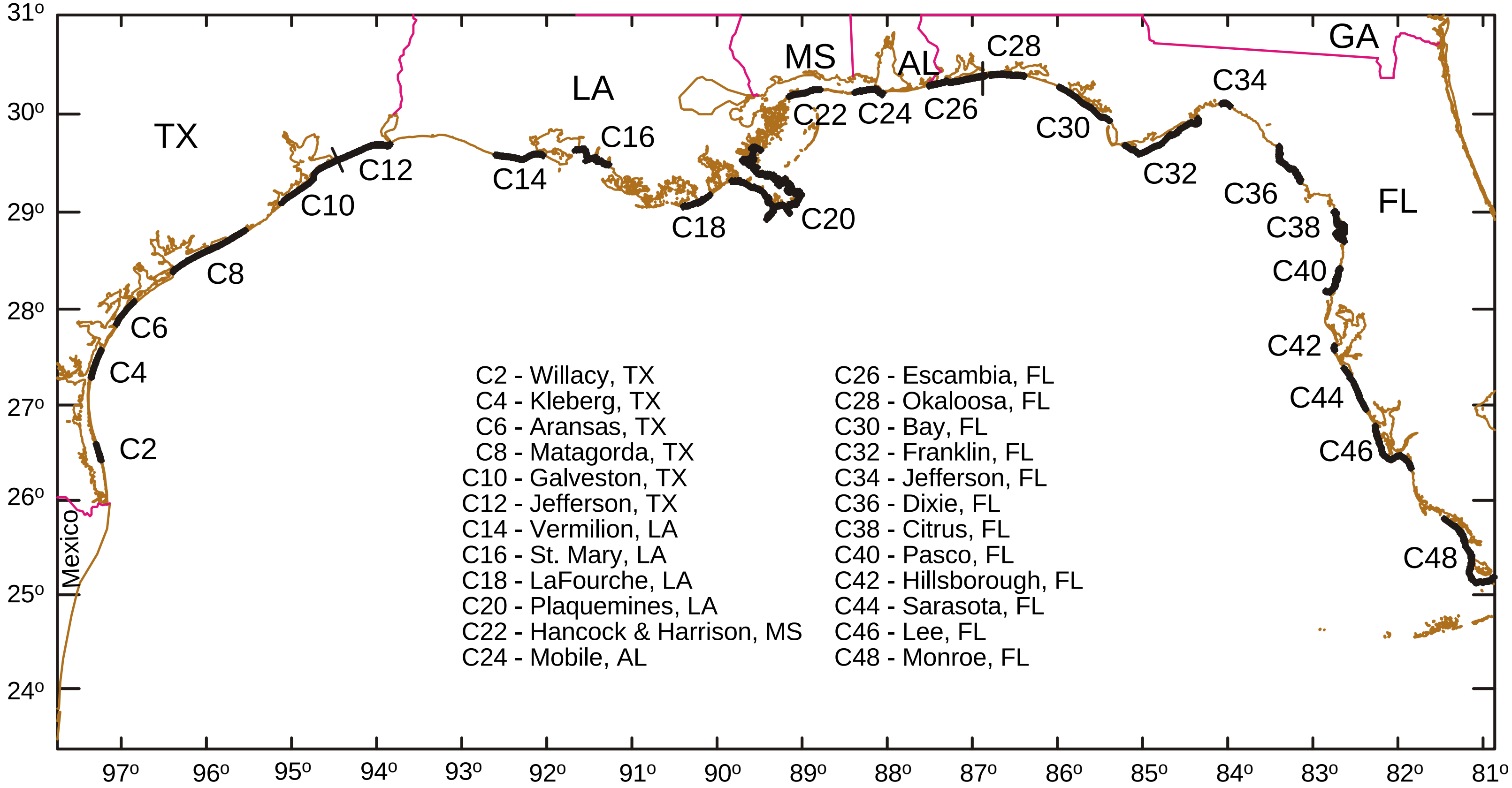

Figure 3. Locations of Gulf of Mexico counties/parishes (set 2). (Shading is not to scale.)

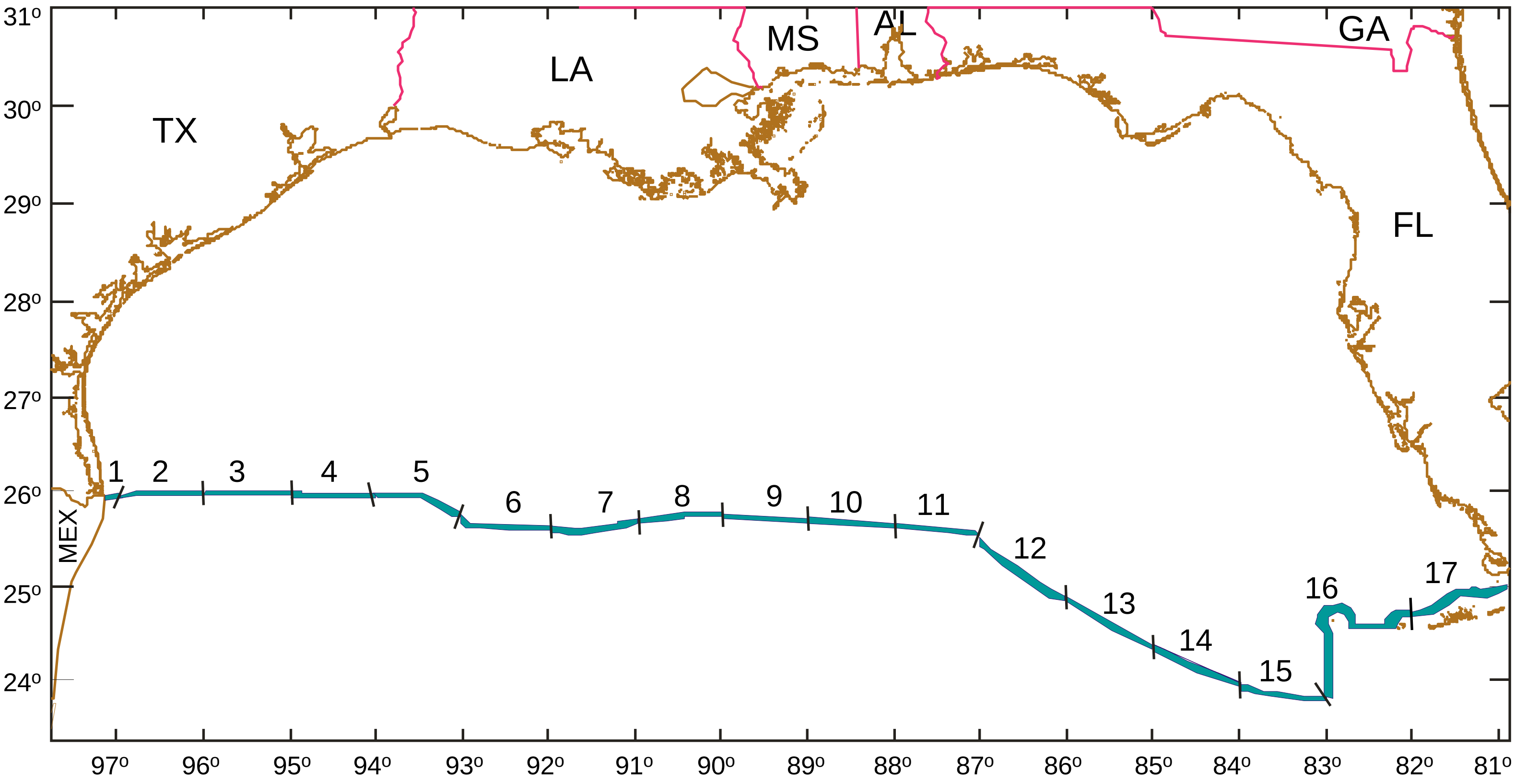

Figure 4. Locations of the U.S./Mexico international boundary segments in the Gulf of Mexico.

Table 1. Probabilities (expressed as percent chance) that an oil spill starting within a particular launch area in the Walker Ridge Planning Area will contact a county/parish land segment within 30 days

County/Parish	Annual	Winter	Spring	Summer	Fall
C7	n	n	1	n	n
C8	1	2	2	n	n
C9	1	1	2	n	n
C10	2	2	6	1	n
C12	1	n	3	n	n
C13	2	1	8	n	n
C14	1	n	4	n	n
C15	n	n	2	n	n
C17	1	n	5	n	n
C18	1	n	2	n	n
C19	n	n	1	n	n
C20	1	n	5	1	n

Notes: ** = Greater than 99.5 percent; n = less than 0.5 percent.
Rows with all values less than 0.5 percent are not shown.

Location of county/parish land segments
C7 (Calhoun, TX)
C8 (Matagorda, TX)
C9 (Brazoria, TX)
C10 (Galveston, TX)
C12 (Jefferson, TX)
C13 (Cameron, LA)
C14 (Vermilion, LA)
C15 (Iberia, LA)
C17 (Terrebonne, LA)
C18 (LaFourche, LA)
C19 (Jefferson, LA)
C20 (Plaquemines, LA)

Table 2. Probabilities (expressed as percent chance) that an oil spill starting within a particular launch area in the Walker Ridge Planning Area will contact an international boundary sea segment within 3, 10 and 30 days

International Boundary Sea Segment	Number of Days		
	3	10	30
1	n	n	n
2	n	n	n
3	n	n	2
4	n	n	4
5	n	1	9
6	n	4	17
7	2	13	26
8	6	16	23
9	1	7	12
10	n	2	5
11	n	n	1
12	n	n	1
13	n	n	1
14	n	n	n
15	n	n	n
16	n	n	n
17	n	n	n

Note: ** = Greater than 99.5 percent; n = Less than 0.5 percent.

Location of boundary sea segments

1 (to 97° W. long.)
2 (97-96° W. long.)
3 (96-95° W. long.)
4 (95-94° W. long.)
5 (94-93° W. long.)
6 (93-92° W. long.)
7 (92-91° W. long.)
8 (91-90° W. long.)
9 (90-89° W. long.)
10 (89-88° W. long.)
11 (88-87° W. long.)
12 (87-86° W. long.)
13 (86-85° W. long.)
14 (85-84° W. long.)
15 (84-83° W. long.)
16 (83-82° W. long.)
17 (82-81° W. long.)

Table 3. Probabilities (expressed as percent chance) that an oil spill starting within a particular launch area in the Walker Ridge Planning Area in the winter season will contact an international boundary sea segment within 3, 10 and 30 days

International Boundary Sea Segment	Number of Days		
	3	10	30
1	n	n	n
2	n	n	n
3	n	n	4
4	n	n	5
5	n	1	10
6	n	2	18
7	2	14	31
8	10	23	29
9	n	2	6
10	n	n	2
11	n	n	1
12	n	n	n
13	n	n	n
14	n	n	n
15	n	n	n
16	n	n	n
17	n	n	n

Note: ** = Greater than 99.5 percent; n = Less than 0.5 percent.

Location of boundary sea segments

1 (to 97^{o} W. long.)
2 (97-96^{o} W. long.)
3 (96-95^{o} W. long.)
4 (95-94^{o} W. long.)
5 (94-93^{o} W. long.)
6 (93-92^{o} W. long.)
7 (92-91^{o} W. long.)
8 (91-90^{o} W. long.)
9 (90-89^{o} W. long.)
10 (89-88^{o} W. long.)
11 (88-87^{o} W. long.)
12 (87-86^{o} W. long.)
13 (86-85^{o} W. long.)
14 (85-84^{o} W. long.)
15 (84-83^{o} W. long.)
16 (83-82^{o} W. long.)
17 (82-81^{o} W. long.)

Table 4. Probabilities (expressed as percent chance) that an oil spill starting within a particular launch area in the Walker Ridge Planning Area in the spring season will contact an international boundary sea segment within 3, 10 and 30 days

International Boundary Sea Segment	Number of Days		
	3	10	30
1	n	n	n
2	n	n	n
3	n	n	n
4	n	n	1
5	n	n	4
6	n	1	4
7	n	4	11
8	n	2	6
9	n	1	5
10	n	2	3
11	n	n	n
12	n	n	1
13	n	n	2
14	n	n	n
15	n	n	n
16	n	n	n
17	n	n	n

Note: ** = Greater than 99.5 percent; n = Less than 0.5 percent.

<u>Location of boundary sea segments</u>
1 (to 97^{o} W. long.)
2 (97-96^{o} W. long.)
3 (96-95^{o} W. long.)
4 (95-94^{o} W. long.)
5 (94-93^{o} W. long.)
6 (93-92^{o} W. long.)
7 (92-91^{o} W. long.)
8 (91-90^{o} W. long.)
9 (90-89^{o} W. long.)
10 (89-88^{o} W. long.)
11 (88-87^{o} W. long.)
12 (87-86^{o} W. long.)
13 (86-85^{o} W. long.)
14 (85-84^{o} W. long.)
15 (84-83^{o} W. long.)
16 (83-82^{o} W. long.)
17 (82-81^{o} W. long.)

Table 5. Probabilities (expressed as percent chance) that an oil spill starting within a particular launch area in the Walker Ridge Planning Area in the summer season will contact an international boundary sea segment within 3, 10 and 30 days

International Boundary Sea Segment	Number of Days		
	3	10	30
1	n	n	n
2	n	n	n
3	n	n	2
4	n	n	5
5	n	1	10
6	n	7	21
7	4	14	24
8	2	5	12
9	1	4	7
10	n	n	1
11	n	n	n
12	n	n	1
13	n	n	1
14	n	n	1
15	n	n	1
16	n	n	n
17	n	n	n

Note: ** = Greater than 99.5 percent; n = Less than 0.5 percent.

<u>Location of boundary sea segments</u>

1 (to 97° W. long.)
2 (97-96° W. long.)
3 (96-95° W. long.)
4 (95-94° W. long.)
5 (94-93° W. long.)
6 (93-92° W. long.)
7 (92-91° W. long.)
8 (91-90° W. long.)
9 (90-89° W. long.)
10 (89-88° W. long.)
11 (88-87° W. long.)
12 (87-86° W. long.)
13 (86-85° W. long.)
14 (85-84° W. long.)
15 (84-83° W. long.)
16 (83-82° W. long.)
17 (82-81° W. long.)

Table 6. Probabilities (expressed as percent chance) that an oil spill starting within a particular launch area in the Walker Ridge Planning Area in the fall season will contact an international boundary sea segment within 3, 10 and 30 days

International Boundary Sea Segment	Number of Days		
	3	10	30
1	n	n	n
2	n	n	1
3	n	n	1
4	n	n	4
5	n	1	11
6	n	8	23
7	1	19	38
8	14	32	44
9	3	21	31
10	n	5	13
11	n	n	2
12	n	n	1
13	n	n	n
14	n	n	n
15	n	n	n
16	n	n	n
17	n	n	n

Note: ** = Greater than 99.5 percent; n = Less than 0.5 percent.

Location of boundary sea segments

1 (to 97^o W. long.)
4 (95-94^o W. long.)
7 (92-91^o W. long.)
10 (89-88^o W. long.)
13 (86-85^o W. long.)
16 (83-82^o W. long.)
2 (97-96^o W. long.)
5 (94-93^o W. long.)
8 (91-90^o W. long.)
11 (88-87^o W. long.)
14 (85-84^o W. long.)
17 (82-81^o W. long.)
3 (96-95^o W. long.)
6 (93-92^o W. long.)
9 (90-89^o W. long.)
12 (87-86^o W. long.)
15 (84-83^o W. long.)

The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Minerals Revenue Management** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.