UNITED STATES DEPARMENT OF THE INTERIOR
MINERALS MANAGEMENT SERVICE

AN OILSPILL RISK ANALYSIS FOR THE NAVARIN BASIN LEASE OFFERING (MARCH 1984)

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Introduction

The Federal Government has proposed to offer Outer Continental Shelf (OCS) lands in the Navarin Basin for oil and gas leasing. The estimates of oil resources (billion barrels) in the Navarin Basin planning area are: (1) 0.30 (low), (2) 0.60 (medium), (3) 1.2 (high), and (4) 2.4 (highest). There is a 76 percent probability that commercial hydrocarbons are present in the planning area, and this report examines what could happen if oil is found. Contingent upon actual discovery of oil, production is expected to span a period of 25 to 30 years.

Oilspills are a major concern associated with offshore oil production. An important fact that stands out when one attempts to evaluate the significance of accidental oilspills is that the problem is fundamentally probabilistic. Uncertainty exists about the amount of oil that will be produced from the leases and the number and size of spills that might occur during the life of production, as well as the wind and current conditions that would exist at the time of a spill occurrence and give movement and direction to the oil slick. Although some of the uncertainty reflects incomplete and imperfect data, considerable uncertainty is simply inherent in the problem of describing future events over which complete control cannot be exercised. Since it cannot be predicted with certainty that a probabilistic event such as an oilspill will occur, only the likelihood of occurrence can be quantified. The range of possible effects that may accompany a decision on oil and gas production must be considered. In attempting to maintain perspective on the problem, each potential effect must be associated with a quantitative estimate of its probability of occurrence.

This report summarizes results of an oilspill risk analysis conducted for the proposed Navarin Basin (March 1984) Lease Offering. The study had the objective of determining relative risks associated with oil and gas production in different regions of the proposed lease area. The study was undertaken for consideration in the draft environmental impact statement (EIS), which is prepared for the area by the Minerals Management Service (MMS) and to aid in the final selection of tracts to be offered for sale. A description of the oilspill trajectory analysis model used in this analysis can be found in previous papers (Lanfear and others, 1979; Smith and others, 1982; Lanfear and Samuels, 1981). The analysis was conducted in three parts corresponding to different aspects of the overall problem. The first part dealt with the probability of oilspill occurrence and the second with the trajectories of oilspills from potential launch points to various targets. Results of the first two parts of the analysis were then combined to give estimates of the overall oilspill risk associated with oil and gas production in the lease area.

Summary of the Proposed Action and the Major Alternatives

The proposed action is to offer for lease, tracts on the Outer Continental Shelf in the Bering Sea. The study area for this analysis extends from latitude 53° N. to 70° N., and from longitude 170° E. to 155° W. (figure 1).

The study area and the planning area are shown in figure 1. The launch points which represent platform locations, and locations along pipeline and tanker routes are shown in figure 2.

If oil is discovered and the area is developed for production, there are a number of ways in which oil can be transported.

SCENARIO a: If the high estimate of oil (1.2 billion barrels) is found, then the proposed transportation scheme is to pipe all the oil to a terminus on St. Matthew Island. From there, the oil would be tankered to a trans-shipment terminal near Unimak Pass.

SCENARIO b: If the highest estimate of oil (2.4 billion barrels) is found then the proposed transportation scheme is to pipe this oil to a terminus on St. Paul Island. From there the oil would be tankered to a trans-shipment terminal near Unimak Pass.

SCENARIO c: If the medium estimate of oil (0.6 billion barrels) is found, then the proposed transportation scheme is offshore loading of tankers and transportation of this oil to a trans-shipment terminal near Unimak Pass.

A cumulative analysis was also performed which considered the oilspill risks of oil produced in Norton Sound (0.48 billion barrels estimated), St. George Basin (1.12 billion barrels estimated) and the tankering of Canadian oil through the study area (1.7 billion barrels estimated).

Environmental Resources

The locations of 31 categories of environmental resources (or targets, as they are designated in this paper) were digitized in the same coordinate system, or base map, as that used in trajectory simulations. Targets were selected by MMS analysts. Maps showing the digitized targets are shown in figure 3. The monthly sensitivities of these targets were also recorded so that, for example, a target such as migrating birds could be contacted by simulated oilspills only when the birds would be in the area. All targets are considered to be vulnerable year round unless otherwise indicated. The targets are listed below:

Unimak Pass
Pribilof Islands

Nunivak Island
St. Matthew Island - E
St. Matthew Island - W
St. Lawrence Island - E
St. Lawrence Island - S
St. Lawrence Island - W
Yukon Delta
Fishery Resource Area 1
Fishery Resource Area 2
Fishery Resource Area 3
Fishery Resource Area 4
Fishery Resource Area 5
Sea Segment 1
Sea Segment 2
Sea Segment 3
Sea Segment 4
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Because the trajectory model simulates an oilspill as a point, most targets have been given an areal extent slightly greater than they actually occupy. For example, some shoreline targets extend a short distance offshore; this allows the model to simulate a spill that approaches land, makes partial contact, withdraws, and continues on its way.

To provide a more detailed analysis for land or land-based targets, the model includes a feature that allows subdividing the coastline and model boundaries into segments. Figure 4 shows the coastline and model boundaries divided into 200 segments of approximately equal length.

Estimated Quantity of Oil Resources

Considerable uncertainty exists in estimating the volume of oil that will be discovered and produced as a result of an OCS lease sale. A question exists as to whether oilspill risk calculations should be based upon a single estimate of volume, or should consider volume as a random variable and include some probability distribution for volume in computing oilspill occurrence probabilities. The choice may depend upon how the results are to be incorporated into the benefit/risk analysis.

Benefits and risks (as well as many environmental impacts), are functions of the volume of oil, and are not independent of each other. Greater risks are associated with greater volumes of oil and greater economic benefits. If benefits are evaluated by assuming production of a specific amount of oil, then the corresponding risks should be stated in a conditional form such as, "the risks are ..., given that the volume is ..." If benefits are evaluated for a number of discrete volumes, then risks should likewise be calculated for the same volumes. Any statements about the likelihood of the presence of a particular volume of oil apply equally well to the likelihood of the corresponding benefits and risks.

The estimated oil resources used for oilspill risk calculations in this report correspond to those used by MMS in preparing the draft EIS for the lease sale. These estimates are contained in the exploration and development report for the Navarin Basin (Wilson and Lynch, 1982). A 76 percent chance exists that oil is present in commercial quantities in the planning area (Wilson and Lynch, 1982). Four cases of resource recovery were considered: low (0.3), medium (0.60), high (1.2), and highest (2.4). All estimates are in billion barrels of oil.

We cannot overemphasize that these estimates are based on the assumption that oil is present; if it is not present, a 24 percent probability (Wilson and Lynch, 1982), then, obviously, no oilspill risks exist. The remainder of this analysis is designed to answer the question, "What are the risks <u>if oil is found</u>?"

In addition to the crude oil estimated to be produced over the 25- to 30-year expected life of the Navarin Basin leases, MMS estimates that 0.48, and 1.12 billion barrels of oil will be produced and transported from the Norton Sound and St. George Basin leases, respectively. In addition, it is assumed that 1.7 billion barrels of Canadian oil will be tankered through the study area.

Probability of Oilspills Occurring

The probability of oilspills occurring (given that oil is present) is based on the assumption that spills occur independently of each other as a Poisson process, with a rate derived from past OCS experience and dependent upon the volume of oil produced and transported. All types of spills of 1,000 barrels, or larger, were considered in this analysis, including not only well blowouts, but also other accidents on platforms, transportation of oil to shore, and, in some cases, further transportation from an intermediate terminus to refineries. These types of accidents were classified as either platform, pipeline, or tanker spills. By including all of these risks, the risks of the proposed OCS leasing can be compared to those of other alternatives.

Lanfear and Amstutz (1982) examined oilspill occurrence rates applicable to the U.S. OCS. Basing their results upon new, more recent, and more complete data bases than were available for earlier OSTA models, they recommended updated spill rates for pipeline spills, and some significant changes in the spill rates for platforms and tankers. This analysis uses the new spill rates for all accident categories.

Spill rates for OCS platforms are based on the record for the U.S. OCS (Gulf of Mexico, and California; Alaska had no Federal OCS oil production) from 1964 through 1980, in which 5 spills of 10,000 barrels, or larger, are noted, along with 7 spills of 1,000 to 10,000 barrels in size. Nakassis (1982) conducted a statistical analysis of this record, 1964-1979, and concluded that the platform spill rate did not remain constant, since 1964, but had decreased significantly. Using this trend analysis, and updating for the 1980 data, the spill rate for platform spills of 1,000 barrels, or larger, is 1.0 spills per billion barrels produced, and the spill rate for platform spills of 10,000 barrels, or larger, is 0.44 spills per billion barrels.

Like platform spills, the spill rate for pipelines is based on the record for the U.S. OCS from 1964 through 1980. 2 spills of 10,000 barrels, or larger are in the data base, along with 6 spills of 1,000 to 10,000 barrels. No trend in the pipeline spill rate is evident. The spill rate for pipeline spills of 1,000 barrels, or larger is 1.60 spills per billion barrels transported, and the rate for spills of 10,000 barrels, or larger, is 0.67 spills per billion barrels.

For tanker spill rates, previous OSTA models for Alaska (Lanfear and others, 1979, LaBelle and others, 1980, Samuels and Lanfear, 1981, Samuels and Hopkins, 1981, and Samuels and others, 1982) used data for years prior to 1973. Using a new data base (The Futures Group and World Information Systems, 1982) covering the years 1974 through 1980, Lanfear and Amstutz (1982) concluded that the tanker spill rate (expressed as spills per billion barrels transported) since 1974 was only about a third of that found prior to 1973. Thus, this analysis uses a significantly lower tanker spill rate than the earlier models. From 1974 through 1980, the data base contain records of 57 tanker spills of crude oil of 10,000 barrels, or larger, and another 57 spills of 1,000 to 10,000 barrels in size; during this period, approximately 88 billion barrels of oil were transported. Lanfear and Amstutz (1982) were able to separate the 114 tanker spills into those occurring in port (i.e., inland of the breakwater, etc.) and those occurring at sea. While this information does not affect predictions of the overall occurrence rate, it does affect assumptions about where spills are likely to occur, and the appropriate weights were assigned along tanker routes to account for "at sea"/"in port" spills. The overall spill rate for tanker spills of 1,000 barrels, or larger, is 1.3 spills per billion barrels transported (0.90 at sea, and 0.40 in port), and the rate for spills of 10,000 barrels, or larger, is 0.65 spills per billion barrels (0.50 at sea, and 0.15 in port).

In summary, the spill rates, expressed as spills per billion barrels produced or transported, used in this report are:

	≥1,000 bbl	≥10,000 bbl
Platforms	1.0	0.44
Pipelines	1.6	0.67
Tankers, total	1.3	0.65
at sea	0.90	0.50
in port	0.40	0.15

Spill frequency estimates were also calculated for production and transportation of oil from sales Norton Sound (sale 57) and St. George (sale 70) and for transportation of Canadian oil. The assumption was made that only one-quarter of the spills from tanker transportation of Canadian oil would occur within the study area and that the remainder of the spills would occur outside the study area. Table 1 shows the expected number of spills and the most likely number of spills that will occur during the entire expected production life of the planning area.

Oilspill Trajectory Simulations

Oilspill trajectories were simulated by the RAND Corporation, Santa Monica California, using their three-dimensional model for estuaries and coastal seas (Liu and Leendertse, 1981a,b). The application of this model was developed as part of the MMS environmental studies program in the Bering Sea. Twenty-six launch points were selected representing platform locations, pipelines, and tanker routes in the study area. In this analysis, the location of the center of mass of each hypothetical oilspill was reported every 12 hours. Oilspill trajectories were simulated under three sets of environmental conditions. The first set, which included the months December through May was termed the ice-cover condition. During this period, the Navarin Basin is occasionally covered by ice floes. For each launch point, 20 oilspills were simulated under different weather scenarios. The second set was an ice-free condition which included the months June through August. During this period, 20 hypothetical oilspills were launched from each site. The third set was also an ice-free condition including the months September through November. For this period, 20 hypothetical oilspills were launched from each site. The trajectories calculated by RAND were transmitted to the Minerals Management Service Reston, VA., on computer-compatible tapes. The _x,y_ coordinates of the trajectories in the RAND grid system were converted to the MMS grid system by a linear transformation. As the simulated oilspill was moved, any contacts with targets were recorded. Spill movement continued until the spill hit land, moved off the map, or aged more than 30 days.

The trajectories simulated by the model represent only hypothetical pathways of oil slicks and do not involve any direct consideration of cleanup, dispersion, or weathering processes which could determine the quantity or quality of oil that might eventually come in contact with targets. An implicit analysis of weathering and decay can be considered by noting the age of simulated oilspills when they contact targets. For this analysis, three time periods were selected: 3 days, to represent diminished toxicity of the spill; 10 days, to allow for deployment of cleanup equipment; and 30 days, to represent the difficulty of tracking or locating spills after this time.

When calculating probabilities from Monte Carlo trials it is desirable to estimate the error associated with this technique. The calculation of the standard deviation s, for a particular probability p is calculated as follows:

$$s = \mathrm{SQRT}(p(1-p)/N)$$

where N = number of trials. The shape of this distribution approximates the normal curve, thus, table 2 shows, for the 90-percent confidence level of this distribution, values of s as a function of p and N.

Each entry in tables 3, 4, and 5 represents the probability (expressed as percent chance) that, if a spill starts from a certain launch point, it will contact a particular target within 3, 10, or 30 days, respectively. Tables 6 to 8 present similar probabilities for land and boundary segments. These conditional probabilities allow for the possibility that the targets may not be vulnerable to oilspills for the entire year; a target that is vulnerable for only 1 month, for example, could have a conditional probability no higher than about 1/12.

Combined Analysis of Oilspill Occurrence and Oilspill Trajectory Simulations

Data in table 1 indicate the probabilities of different numbers of oilspills occurring. Tables 3 to 8 indicate the probabilities that targets or land segments will be contacted, given that an oilspill occurs. The probability that, if an oilspill occurs at a certain location, or launch point, it will contact a specific target within a given time-of-travel (under the circumstances described above) is termed a conditional probability because it depends on oilspill occurrence. For a set of nt targets and nl launch points, these conditional probabilities can be represented in a matrix form. Let [C] be an $nt \times nl$ matrix, where each element $c(i,j)$ is the probability that an oilspill will hit target i, given that a spill occurs at launch point j. Note that launch points can represent potential spill starting points from production areas or transportation routes.

Spill occurrence can be represented by another matrix [S]. With nl launch points and ns production sites, the dimensions of [S] are nl x ns. Let each element s(j,k) be the expected number of spills occurring at launch point j due to production of a unit volume of oil at site k. These spills can result from either production or transportation. The s(j,k) can be determined as functions of the volume of oil (spills per billion barrels). Each column of [S] corresponds to one production site and one transportation route. If alternative and mutually exclusive transportation routes are considered for the same production site, they can be represented by additional columns of [S], effectively increasing ns.

Define matrix [U] as:

$$[U] = [C] \times [S]$$

Matrix [U] which has dimensions nt x ns, is termed the unit risk matrix because each element u(i,k) corresponds to the expected number of spills occurring and contacting target i due to the production of a unit volume of oil at site k. With [U], it is a relatively simple matter to find the expected contacts to each target, given a set of oil volumes at each site. Let [V] be a vector of dimension ns, where each element v(k) corresponds to the volume of oil expected to be found at production site k. Then, if [L] is a vector of dimension nt, where each element l(i) corresponds to the expected number of contacts to target i,

$$[L] = [U] \times [V]$$

Similar calculations can also be made for land segments.

Using Bayesian techniques, Devanney and Stewart (1974) showed that the probability of n oilspill contacts can be described by a negative binomial distribution. Smith and others (1980), however, noted that when actual exposure is much less than historical exposure, as is the case for most oilspill risk analyses, the negative binomial distribution can be approximated by a Poisson distribution. The Poisson distribution has a significant advantage in calculations because it is defined by only one parameter, the expected number of spills. The matrix [L] thus contains all the information needed to use the Poisson distribution: if P(n,i) is the probability of exactly n contacts to target i, then:

$$P(n,i) = [l(i)^{n} * \exp(-l(i))]/n!$$

A critical difference exists between the conditional probabilities calculated in the previous section and the overall probabilities calculated in this section. Conditional probabilities depend only on the winds and currents in the study area -- elements over which the decisionmaker has no control. Overall probabilities, on the other hand, will depend not only on the physical conditions but also on the course of action chosen by the decisionmaker, that is, choosing to sell or not to sell the lease tracts.

Tables 9 to 16 compare the probabilities (expressed as percent chance) of one or more oilspills (greater than 1,000 barrels or greater than 10,000 barrels) and the expected number of oilspills occurring and contacting targets or segments within periods of 3, 10, and 30 days, over the expected production life of Sale 83 leases. The oilspill risks were compared for highest, high, and medium resource estimates; where the high estimate was associated with transportation scenario a, highest estimate with scenario b, and the medium estimate with scenario c.

Conclusions

This analysis with its assumptions indicates that if oil exists in commercial quantities in the Navarin Basin planning area (a 76 percent chance), the probability that one or more oilspills of 1,000 barrels of larger will occur and contact land within 3 days ranges between less than 0.5 percent to 13 percent (depending on the transportation scenario); for contact within 30 days, the probability range increases to 14 to 60 percent. For spills of 10,000 barrels or larger, (contact within 3 days) these probability ranges are: less than 0.5 percent to 6 percent, and 7 to 35 percent, (contact within 30 days). These probabilities assume no weathering of the oil and no cleanup or containment operations. The time-of-travel provides a means for implicitly considering these effects.

If oil from Norton Sound, St. George Basin, and Canadian tankering is considered, the probability of one or more spills occurring and contacting land becomes 83 percent (scenario b), 78 percent (scenario a), and 63 percent (scenario c).

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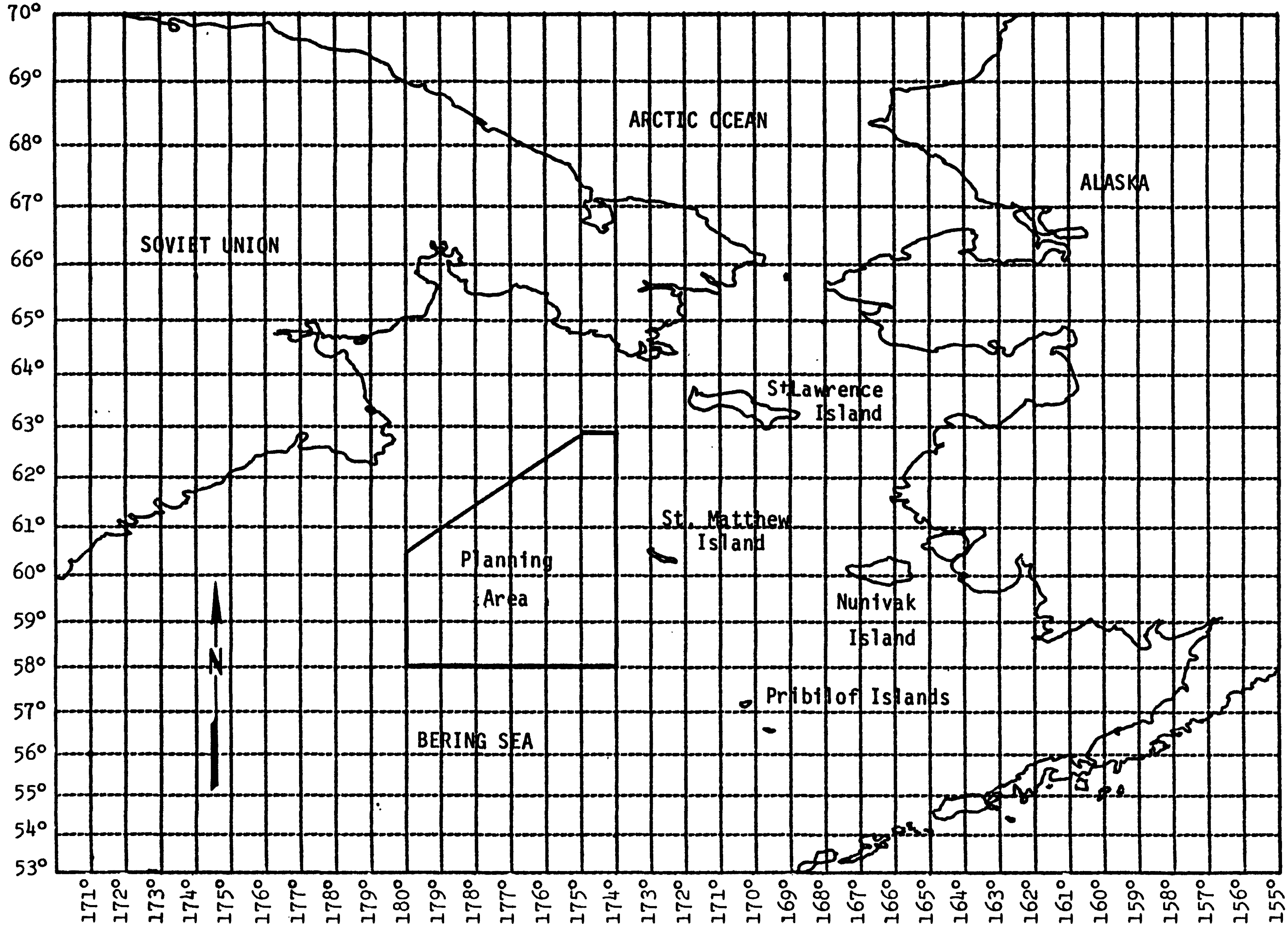

Figure 1. -- Map showing the Navarin Basin OCS Lease Offering study area.

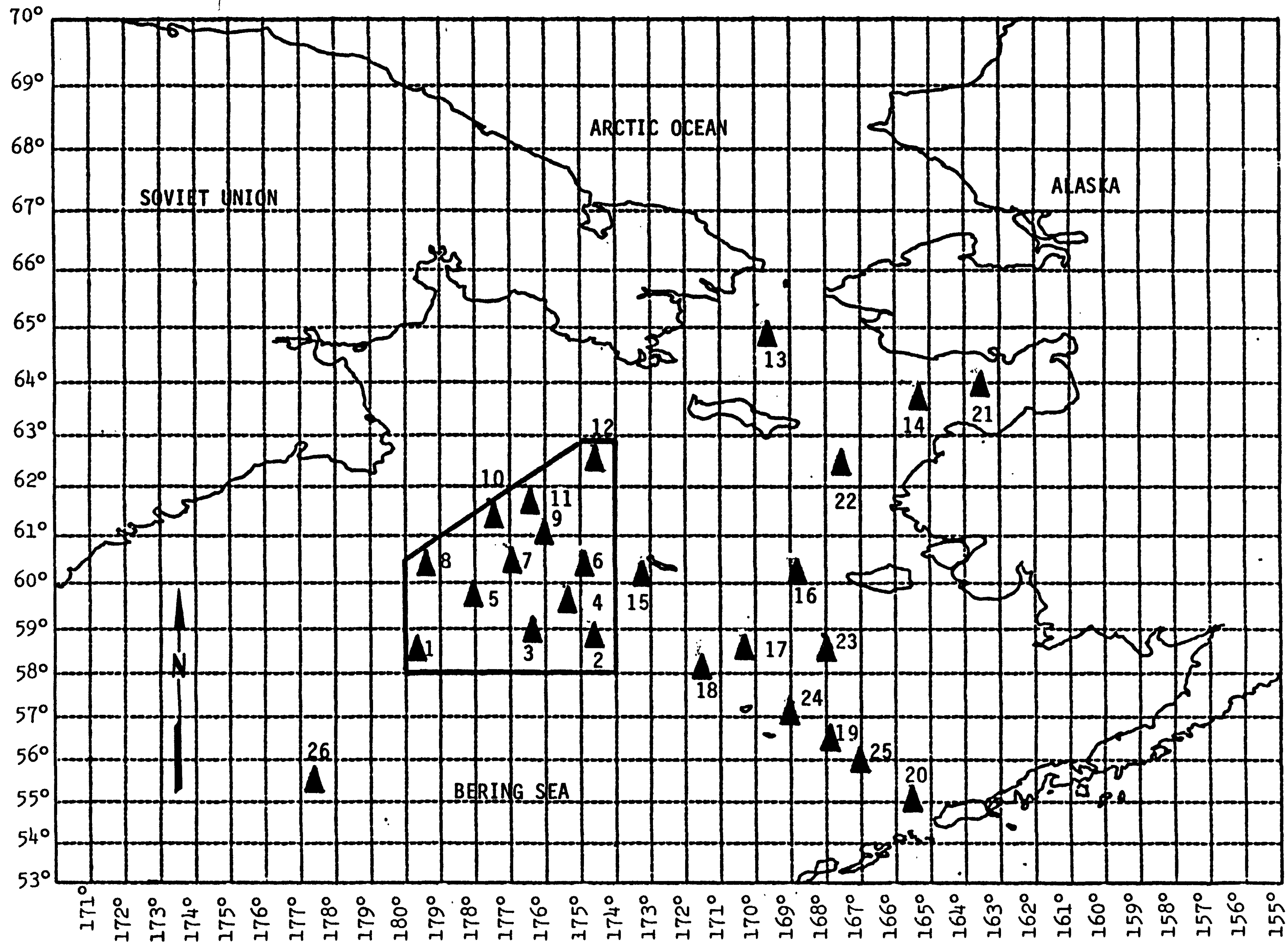

Figure 2. -- Map showing the launch points (P1-P26) for Navarin Basin OCS Lease Offering.

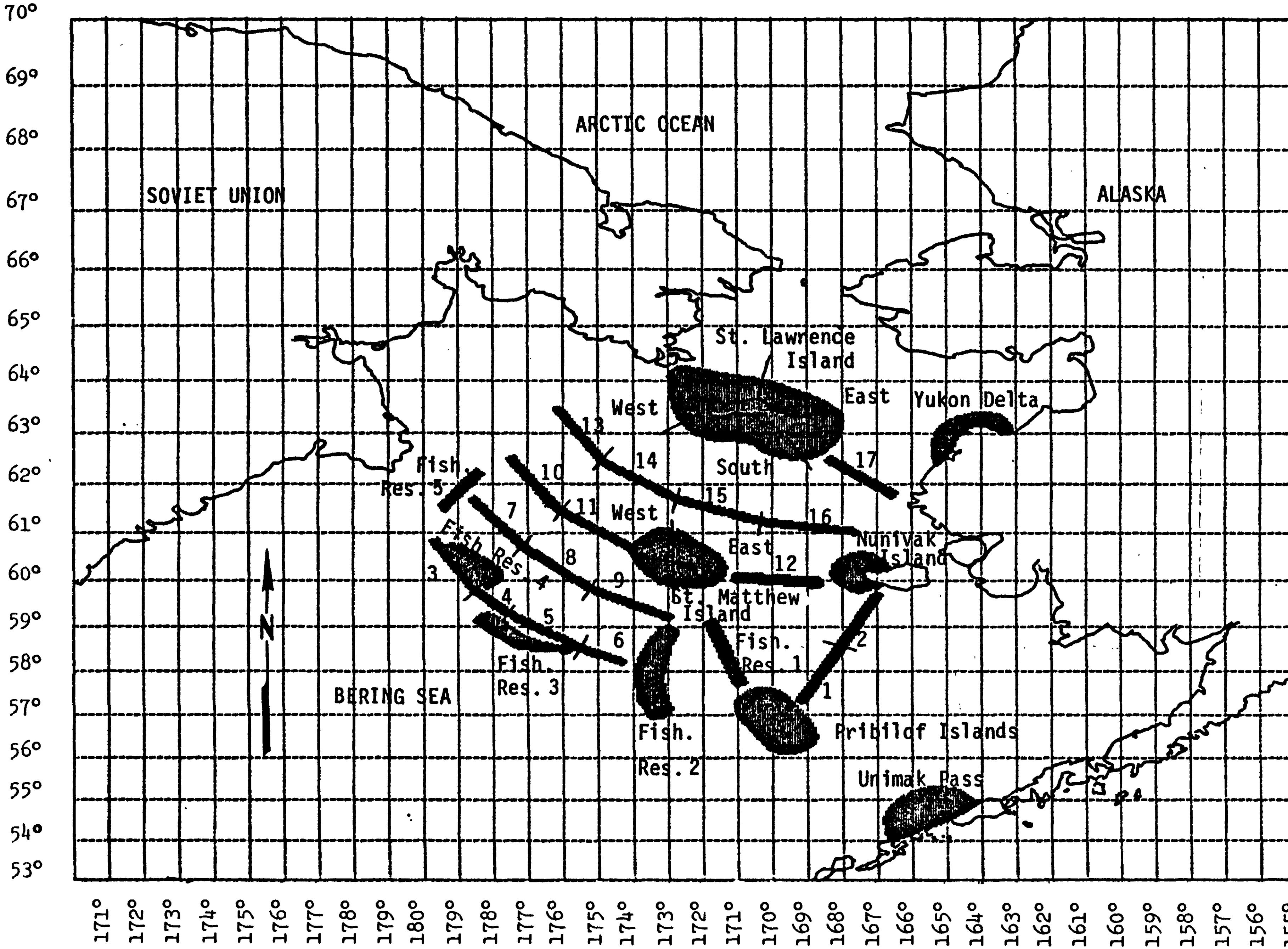

Figure 3.--Map showing the location of nine biological resource areas (Unimak Pass, Pribilof Islands, Nunivak Island, St. Matthew Island - East and West, St. Lawrence Island - East, South, and West, Yukon Delta), five fishery resource areas (Fish. Res. 1-5), and 17 sea segments (1-17) for the Navarin Basin OCS Lease Offering.

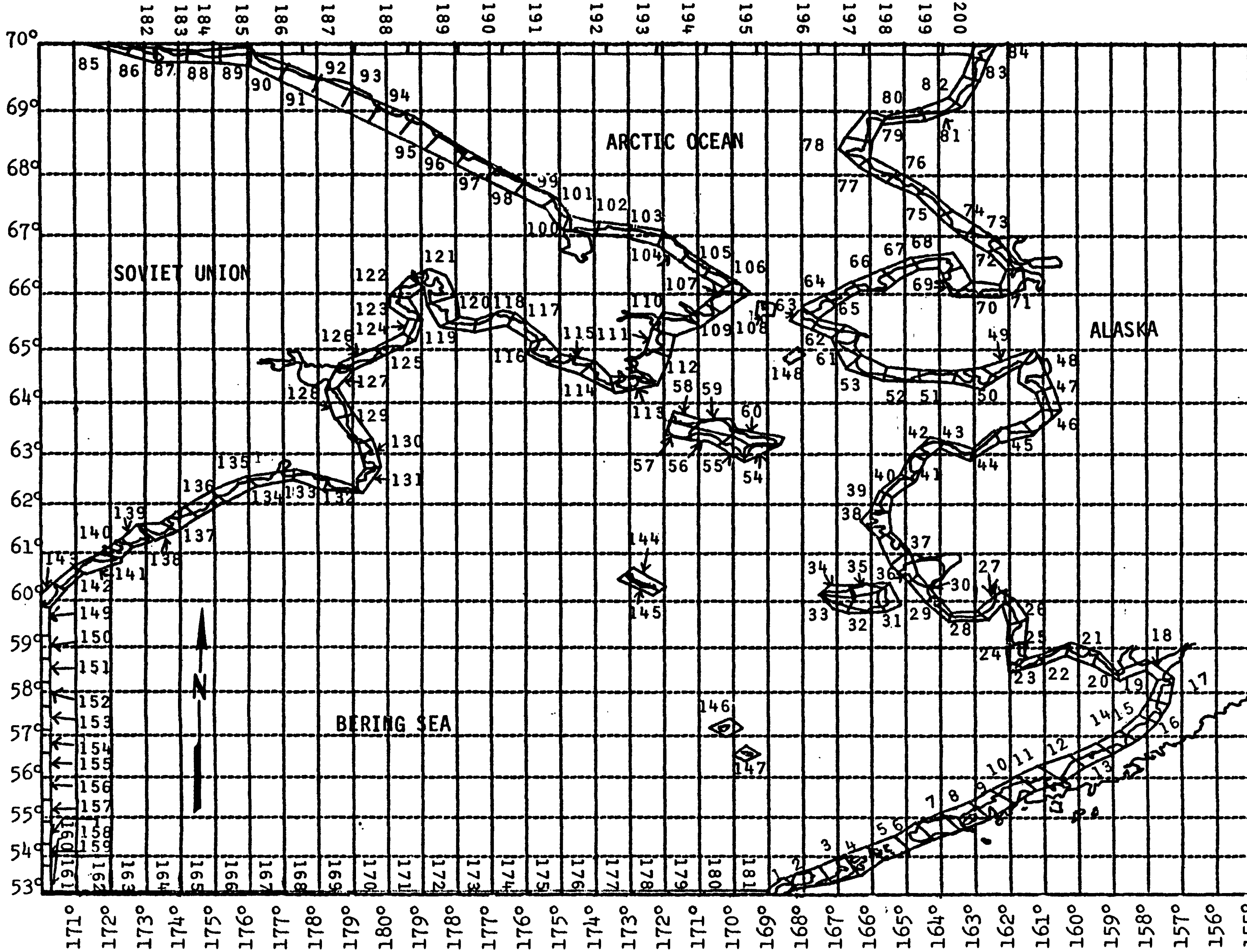

Figure 4.--Map showing the division of Navarin Basin open sea boundary and coastline into 200 segments of approximately equal length.

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Table 1.--Oilspill probability estimates for spills greater than 1,000 and 10,000 barrels resulting over the expected production life of Navarin Basin Lease Offering, Norton Sound, St. George Basin, and Canadian tankering.

	Expected number of spills from platforms		Expected number of spills from transportation		Total Number of spills		Probability of one or more spills (platforms)		Probability of one or more spills (transportation)	
	≥1,000	≥10,000	≥1,000	≥10,000	≥1,000	≥10,000	≥1,000	≥10,000	≥1,000	≥10,000
Scenario A (1.2) * (high estimate)	1.20	0.53	3.48	1.58	4.68	2.11	0.70	0.41	0.97	0.80
Scenario B (2.4) * (highest estimate)	2.40	1.06	6.96	3.17	9.36	4.23	0.91	0.65	0.99+	0.96
Scenario C (0.6)* (medium estimate)	0.60	0.26	1.62	0.75	2.22	1.01	0.45	0.23	0.80	0.53
Norton Sound Oil (0.48)*	0.48	0.21	1.39	0.63	1.87	0.84	0.38	0.19	0.75	0.47
St. George Basin Oil (1.12)*	1.12	0.49	1.79	0.75	2.91	1.24	0.67	0.39	0.83	0.53
Canadian Tankering (1.7)*	0.0	0.0	0.38	0.21	0.38	0.21	0.0	0.0	0.32	0.19

*Assumed amount of oil in billion barrels

Table 2.--Monte Carlo error as a function of the number of trials and the estimated probability.

	NUMBER OF TRIALS									
PROB	10	20	40	44	50	100	200	500	1000	2000
0.02	0.07	0.05	0.04	0.03	0.03	0.02	0.02	0.01	0.01	0.01
0.04	0.10	0.07	0.05	0.05	0.05	0.03	0.02	0.01	0.01	0.01
0.06	0.12	0.09	0.06	0.06	0.06	0.04	0.03	0.02	0.01	0.01
0.08	0.14	0.10	0.07	0.07	0.06	0.04	0.03	0.02	0.01	0.01
0.10	0.16	0.11	0.08	0.07	0.07	0.05	0.04	0.02	0.02	0.01
0.12	0.17	0.12	0.08	0.08	0.08	0.05	0.04	0.02	0.02	0.01
0.14	0.18	0.13	0.09	0.08	0.08	0.06	0.04	0.03	0.02	0.01
0.16	0.19	0.14	0.10	0.09	0.09	0.06	0.04	0.03	0.02	0.01
0.18	0.20	0.14	0.10	0.09	0.09	0.06	0.04	0.03	0.02	0.01
0.20	0.21	0.15	0.10	0.10	0.09	0.07	0.05	0.03	0.02	0.01
0.22	0.22	0.16	0.11	0.10	0.10	0.07	0.05	0.03	0.02	0.01
0.24	0.22	0.16	0.11	0.10	0.10	0.07	0.05	0.03	0.02	0.02
0.26	0.23	0.16	0.11	0.11	0.10	0.07	0.05	0.03	0.02	0.02
0.28	0.23	0.17	0.12	0.11	0.10	0.07	0.05	0.03	0.02	0.02
0.30	0.24	0.17	0.12	0.11	0.11	0.08	0.05	0.03	0.02	0.02
0.32	0.24	0.17	0.12	0.11	0.11	0.08	0.05	0.03	0.02	0.02
0.34	0.25	0.17	0.12	0.12	0.11	0.08	0.06	0.03	0.02	0.02
0.36	0.25	0.18	0.13	0.12	0.11	0.08	0.06	0.04	0.03	0.02
0.38	0.25	0.18	0.13	0.12	0.11	0.08	0.06	0.04	0.03	0.02
0.40	0.26	0.18	0.13	0.12	0.11	0.08	0.06	0.04	0.03	0.02
0.42	0.26	0.18	0.13	0.12	0.12	0.08	0.06	0.04	0.03	0.02
0.44	0.26	0.18	0.13	0.12	0.12	0.08	0.06	0.04	0.03	0.02
0.46	0.26	0.18	0.13	0.12	0.12	0.08	0.06	0.04	0.03	0.02
0.48	0.26	0.18	0.13	0.12	0.12	0.08	0.06	0.04	0.03	0.02
0.50	0.26	0.18	0.13	0.12	0.12	0.08	0.06	0.04	0.03	0.02

Level of significance = 90 percent

Table 3. -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain target within 3 days.

Target	Hypothetical Spill Location																									
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26
Land	n	n	n	n	n	4	n	n	n	n	n	n	n	n	14	5	n	n	n	n	n	n	n	n	n	n
Unimak Pass	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	**	n	n	n	n	n	n
Pribilof Islands	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	74	n	n
Nunivak Island	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	5	n	n	n	n	n	n	n	n	n	n
St. Matthew Is.-E	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
St. Matthew Is.-W	n	n	n	n	n	4	n	n	n	n	n	n	n	n	**	n	n	n	n	n	n	n	n	n	n	n
St. Lawrence Is.-E	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
St. Lawrence Is.-S	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
St. Lawrence Is.-W	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	5	n	n	n	n
Yukon Delta	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Fish. Res. Area 1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	42	n	n	n	n	n	n	n	n
Fish. Res. Area 2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Fish. Res. Area 3	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Fish. Res. Area 4	n	n	n	n	7	n	n	19	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Fish. Res. Area 5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	65	7	n	n
Sea Segmemt 2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	**	n	n	n
Sea Segment 3	n	n	n	n	4	n	n	**	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 4	n	n	n	n	66	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 5	n	n	52	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 7	n	n	n	n	n	n	10	n	n	39	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 8	n	n	n	5	n	2	31	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 9	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 10	n	n	n	n	n	n	n	n	2	n	**	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 11	n	n	n	n	n	n	n	n	4	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 12	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	**	n	n	n	n	n	n	n	n	n	n
Sea Segment 13	n	n	n	n	n	n	n	n	n	n	n	21	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 14	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 15	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 16	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	47	n	n	n	n

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

Table 4. -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain target within 10 days.

Target	Hypothetical Spill Location																									
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26
Land	n	n	n	n	n	24	n	n	n	n	n	n	7	7	32	22	n	n	n	n	4	n	n	2	n	n
Unimak Pass	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	**	n	n	n	n	n	n
Pribilof Islands	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	32	n	n	n	n	74	5	n
Nunivak Island	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	22	n	n	n	n	n	n	n	n	n	n
St. Matthew Is.-E	n	n	n	n	n	2	n	n	n	n	n	n	n	n	21	n	2	n	n	n	n	n	n	n	n	n
St. Matthew Is.-W	n	n	n	n	n	22	n	n	n	n	n	n	n	n	**	n	n	n	n	n	n	n	n	n	n	n
St. Lawrence Is.-E	n	n	n	n	n	n	n	n	n	n	n	n	5	n	n	n	n	n	n	n	n	n	n	n	n	n
St. Lawrence Is.-S	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	7	n	n	n	n
St. Lawrence Is.-W	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	20	n	n	n	n
Yukon Delta	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Fish. Res. Area 1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	47	45	n	n	n	n	n	n	n	n
Fish. Res. Area 2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	24	n	n	n	n	n	n	n	n
Fish. Res. Area 3	n	1	37	n	19	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Fish. Res. Area 4	n	n	n	n	10	n	27	25	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Fish. Res. Area 5	n	n	n	n	n	n	2	n	2	22	7	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	5	n	n	n	65	7	n	n
Sea Segment 2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	**	n	n	n
Sea Segment 3	n	n	n	n	22	n	n	**	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 4	n	n	n	n	66	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 5	n	9	65	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 6	n	22	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 7	n	n	n	n	n	n	15	n	25	57	13	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 8	n	n	n	7	n	34	35	n	24	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 9	n	n	n	20	n	12	n	n	n	n	n	n	n	n	2	n	n	2	n	n	n	n	n	n	n	n
Sea Segment 10	n	n	n	n	n	n	n	n	7	19	**	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 11	n	n	n	n	n	7	n	n	24	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 12	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	**	n	n	n	n	n	n	2	n	n	n
Sea Segment 13	n	n	n	n	n	n	n	n	n	n	n	62	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 14	n	n	n	n	n	n	n	n	n	n	n	9	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 15	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 16	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 17	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	60	n	n	n	n

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

Table 5. -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain target within 30 days.

Target	Hypothetical Spill Location																									
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26
Land	n	n	6	5	1	25	4	n	5	10	7	17	51	31	35	27	6	1	14	20	25	22	6	24	5	n
Unimak Pass	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	**	n	n	n	n	9	n
Pribilof Islands	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	14	2	45	n	n	n	20	74	20	n
Nunivak Island	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	26	n	n	n	n	n	4	n	n	n	n
St. Matthew Is.-E	n	n	2	5	n	2	n	n	5	n	n	n	n	n	27	30	5	n	n	n	n	n	5	n	n	n
St. Matthew Is.-W	n	1	6	15	n	24	4	n	6	n	n	n	n	n	**	17	5	n	n	n	n	n	5	n	n	n
St. Lawrence Is.-E	n	n	n	n	n	n	n	n	n	n	n	7	26	n	n	n	n	n	n	n	n	10	n	n	n	n
St. Lawrence Is.-S	n	n	n	n	1	1	1	n	n	n	2	20	n	14	n	n	n	n	n	n	2	30	n	n	n	n
St. Lawrence Is.-W	n	n	n	n	n	n	n	n	n	n	n	2	n	36	n	n	n	n	n	n	11	27	n	n	n	n
Yukon Delta	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	9	4	n	n	n	n
Fish. Res. Area 1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	11	56	45	5	n	n	n	24	10	n	n
Fish. Res. Area 2	n	5	n	n	n	n	n	n	n	n	n	n	n	n	5	2	41	57	2	n	n	n	13	10	n	n
Fish. Res. Area 3	22	17	65	24	20	2	6	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Fish. Res. Area 4	n	7	2	20	10	16	49	25	24	24	4	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Fish. Res. Area 5	n	n	n	n	n	13	7	n	27	35	32	5	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	7	2	n	5	n	n	n	66	9	n	n
Sea Segment 2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	7	n	n	n	n	n	**	n	n	n
Sea Segment 3	n	n	2	2	22	2	36	**	20	20	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 4	10	n	13	10	66	2	9	n	1	5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 5	13	29	70	27	2	9	9	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 6	n	27	n	1	n	2	n	n	n	n	n	n	n	n	n	n	2	10	n	n	n	n	n	n	n	n
Sea Segment 7	n	n	n	2	n	22	15	19	47	60	41	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 8	n	n	13	9	25	52	35	7	31	n	2	n	n	n	14	n	7	2	n	n	n	n	n	n	n	n
Sea Segment 9	n	15	9	25	n	17	n	n	n	n	n	n	n	n	29	2	13	5	n	n	n	n	2	n	n	n
Sea Segment 10	n	n	n	n	n	n	n	6	7	25	**	22	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 11	n	n	n	n	2	7	24	2	25	1	2	4	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 12	n	n	n	n	n	n	n	n	n	n	n	n	n	n	4	**	n	n	n	n	n	n	5	n	n	n
Sea Segment 13	n	n	n	n	n	n	n	n	n	6	5	67	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Sea Segment 14	n	n	n	n	n	n	n	n	7	7	21	9	n	n	n	n	n	n	n	n	n	2	n	n	n	n
Sea Segment 15	n	n	n	n	1	1	1	n	2	n	n	n	n	n	2	5	n	n	n	n	n	14	n	n	n	n
Sea Segment 16	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	26	n	n	n	n
Sea Segment 17	n	n	n	n	n	n	n	n	n	n	n	n	n	13	n	n	n	n	n	n	n	60	n	n	n	n

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

Table 6. -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain land or boundary segment within 3 days.

Segment	Hypothetical Spill Location																									
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26
33	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n
34	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n
145	n	n	n	n	n	4	n	n	n	n	n	n	n	n	14	n	n	n	n	n	n	n	n	n	n	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.

Table 7. -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain land or boundary segment within 10 days.

Segment	Hypothetical Spill Location																									
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26
33	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	11	n	n	n	n	n	n	n	n	n	n
34	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	11	n	n	n	n	n	n	n	n	n	n
50	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	4	n	n	n	n	n
52	n	n	n	n	n	n	n	n	n	n	n	n	n	5	n	n	n	n	n	n	n	n	n	n	n	n
53	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n
55	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
106	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n
107	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n
109	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n
144	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
145	n	n	n	n	n	20	n	n	n	n	n	n	n	n	32	n	n	n	n	n	n	n	n	n	n	n
147.	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	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.

Table 8. -- Probabilities (expressed as percent chance) that an oilspill starting at a particular location will contact a certain land or boundary segment within 30 days.

Segment	Hypothetical Spill Location P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26
3	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n
5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n
6	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	5	n	n	n	n	n	n
7	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	7	n	n	n	n	n	n
33	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	11	n	n	n	n	n	n	n	n	n	n
34	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	11	n	n	n	n	n	1	n	n	n	n
39	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	4	n	n	n	n
40	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	6	n	n	n	n
41	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	4	n	n	n	n
42	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	4	n	n	n	n	n
48	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n
49	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n
50	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	16	n	n	n	n	n
51	n	n	n	n	n	n	n	n	n	n	n	n	n	9	n	n	n	n	n	n	n	n	n	n	n	n
52	n	n	n	n	n	n	n	n	n	n	n	n	n	7	n	n	n	n	n	n	n	n	n	n	n	n
53	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n
54	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n
55	n	n	n	n	1	1	1	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n
56	n	n	n	n	n	n	n	n	n	n	n	4	n	5	n	n	n	n	n	n	n	2	n	n	n	n
57	n	n	n	n	n	n	n	n	n	n	n	6	n	n	n	n	n	n	n	n	n	n	n	n	n	n
58	n	n	n	n	n	n	n	n	n	n	n	1	1	n	n	n	n	n	n	n	n	n	n	n	n	n
59	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	5	n	n	n	n
61	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n
62	n	n	n	n	n	n	n	n	n	n	n	n	1	n	n	n	n	n	n	n	n	n	n	n	n	n
63	n	n	n	n	n	n	n	n	n	n	n	n	14	n	n	n	n	n	n	n	n	n	n	n	n	n
64	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n
65	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n
106	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n
107	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n
109	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n
110	n	n	n	n	n	n	n	n	n	n	n	n	n	5	n	n	n	n	n	n	n	n	n	n	n	n
111	n	n	n	n	n	n	n	n	n	n	n	n	7	n	n	n	n	n	n	n	n	n	n	n	n	n
112	n	n	n	n	n	n	n	n	n	n	n	n	5	n	n	n	n	n	n	n	n	n	n	n	n	n
113	n	n	n	n	n	n	n	n	n	n	n	n	9	n	n	n	n	n	n	n	n	n	n	n	n	n
127	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n
131	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
132	n	n	n	n	n	n	n	n	5	7	5	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
133	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
144	n	n	n	1	n	2	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
145	n	n	6	4	n	21	n	n	n	n	n	n	n	n	35	5	n	n	n	n	n	n	n	n	n	n
146	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	5	1	5	n	n	n	6	11	2	n
147	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	1	n	9	n	n	n	n	12	2	n
162	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2
181	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	2	n	n	n	n	n	n

Notes: ** = Greater than 99.5 percent; n = less than 0.5 percent.

Table 9. -- Probabilities (expressed as percent chance) of one or more spills, and the expected number of spills (mean) occurring and contacting targets over the expected production life of the lease area, scenario a vs. scenario b vs. scenario c. Probabilities are for spills 1,000 barrels and greater.

Target	Within 3 days						Within 10 days						Within 30 days					
	scenario a		scenario b		scenario c		scenario a		scenario b		scenario c		scenario a		scenario b		scenario c	
	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean
Land	13	0.1	2	0.0	n	0.0	33	0.4	16	0.2	3	0.0	48	0.7	60	0.9	14	0.1
Unimak Pass	34	0.4	64	1.0	19	0.2	34	0.4	64	1.0	19	0.2	35	0.4	66	1.1	20	0.2
Pribilof Islands	12	0.1	79	1.6	6	0.1	18	0.2	83	1.8	10	0.1	24	0.3	86	1.9	12	0.1
Nunivak Island	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0
St. Matthew Is.-E	21	0.2	n	0.0	n	0.0	36	0.4	1	0.0	n	0.0	42	0.5	6	0.1	2	0.0
St. Matthew Is.-W	68	1.2	2	0.0	n	0.0	71	1.2	12	0.1	3	0.0	74	1.3	24	0.3	8	0.1
St. Lawrence Is.-E	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	2	0.0	1	0.0
St. Lawrence Is.-S	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0	5	0.1	8	0.1	2	0.0
St. Lawrence Is.-W	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0
Yukon Delta	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0
Fish. Res. Area 1	n	0.0	33	0.4	4	0.0	8	0.1	34	0.4	4	0.0	12	0.1	45	0.6	5	0.1
Fish. Res. Area 2	n	0.0	n	0.0	n	0.0	n	0.0	20	0.2	2	0.0	14	0.2	57	0.7	9	0.1
Fish. Res. Area 3	n	0.0	n	0.0	n	0.0	9	0.1	21	0.2	8	0.1	24	0.3	46	0.6	24	0.3
Fish. Res. Area 4	4	0.0	7	0.1	2	0.0	11	0.1	19	0.2	6	0.1	34	0.4	50	0.7	21	0.2
Fish. Res. Area 5	n	0.0	n	0.0	n	0.0	6	0.1	10	0.1	3	0.0	22	0.3	34	0.4	10	0.1
Sea Segment 1	1	0.0	11	0.1	1	0.0	2	0.0	13	0.1	1	0.0	3	0.0	14	0.2	1	0.0
Sea Segmemt 2	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0	n	0.0
Sea Segment 3	15	0.2	25	0.3	8	0.1	17	0.2	30	0.4	10	0.1	31	0.4	48	0.7	17	0.2
Sea Segment 4	10	0.1	21	0.2	7	0.1	10	0.1	21	0.2	7	0.1	18	0.2	33	0.4	12	0.1
Sea Segment 5	8	0.1	20	0.2	8	0.1	12	0.1	29	0.3	14	0.1	28	0.3	51	0.7	29	0.3
Sea Segment 6	n	0.0	n	0.0	n	0.0	4	0.0	13	0.1	12	0.1	7	0.1	25	0.3	15	0.2
Sea Segment 7	8	0.1	14	0.1	4	0.0	18	0.2	30	0.4	9	0.1	36	0.4	51	0.7	17	0.2
Sea Segment 8	9	0.1	14	0.2	5	0.0	26	0.3	36	0.5	11	0.1	47	0.6	54	0.8	19	0.2
Sea Segment 9	1	0.0	1	0.0	n	0.0	13	0.1	17	0.2	6	0.1	38	0.5	33	0.4	16	0.2
Sea Segment 10	15	0.2	26	0.3	8	0.1	18	0.2	31	0.4	9	0.1	23	0.3	38	0.5	12	0.1
Sea Segment 11	1	0.0	1	0.0	n	0.0	9	0.1	13	0.1	4	0.0	15	0.2	23	0.3	7	0.1
Sea Segment 12	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	3	0.0	n	0.0	n	0.0
Sea Segment 13	4	0.0	6	0.1	2	0.0	12	0.1	17	0.2	5	0.1	14	0.1	21	0.2	6	0.1
Sea Segment 14	n	0.0	n	0.0	n	0.0	2	0.0	3	0.0	1	0.0	8	0.1	13	0.1	4	0.0
Sea Segment 15	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0	4	0.0	3	0.0	1	0.0
Sea Segment 16	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0
Sea Segment 17	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0

Note: n = less than 0.5 percent; *** = greater than 99.5 percent.

Table 10. -- Probabilities (expressed as percent chance) of one or more spills, and the expected number of spills (mean) occurring and contacting land or boundary segments over the expected production life of the lease area, scenario a vs. scenario b vs. scenario c. Probabilities are for spills 1,000 barrels and greater.

Segment	Within 3 days: scenario a Prob	scenario a Mean	scenario b Prob	scenario b Mean	scenario c Prob	scenario c Mean	Within 10 days: scenario a Prob	scenario a Mean	scenario b Prob	scenario b Mean	scenario c Prob	scenario c Mean	Within 30 days: scenario a Prob	scenario a Mean	scenario b Prob	scenario b Mean	scenario c Prob	scenario c Mean
3	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0
5	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0
6	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	3	0.0	n	0.0
7	21	0.2	38	0.5	11	0.1	21	0.2	38	0.5	11	0.1	22	0.3	41	0.5	12	0.1
54	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0
55	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0	1	0.0	2	0.0	n	0.0
56	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0
57	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	2	0.0	1	0.0
127	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0
131	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0
132	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	3	0.0	5	0.1	1	0.0
133	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0
144	21	0.2	n	0.0	n	0.0	22	0.3	1	0.0	n	0.0	23	0.3	3	0.0	1	0.0
145	32	0.4	2	0.0	n	0.0	46	0.6	11	0.1	3	0.0	49	0.7	15	0.2	4	0.0
146	n	0.0	38	0.5	n	0.0	n	0.0	38	0.5	n	0.0	4	0.0	50	0.7	2	0.0
147	n	0.0	n	0.0	n	0.0	n	0.0	4	0.0	n	0.0	4	0.0	22	0.2	2	0.0
181	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0

Note: n = less than 0.5 percent; ** = greater than 99.5 percent. Segments with less than 0.5 percent probability of one or more contacts within 30 days are not shown.

Table 11. -- Probabilities (expressed as percent chance) of one or more spills, and the expected number of spills (mean) occurring and contacting targets over the expected production life of the lease area, scenario a vs. scenario b vs. scenario c. Oil from Norton Sound, St. George Basin, and Canadian tankering is included. Probabilities are for spills 1,000 barrels and greater.

Target	------- Within 3 days ---------						------- Within 10 days --------						------- Within 30 days --------					
	scenario a		scenario b		scenario c		scenario a		scenario b		scenario c		scenario a		scenario b		scenario c	
	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean
Land	13	0.1	2	0.0	1	0.0	38	0.5	22	0.2	10	0.1	78	1.5	83	1.8	63	1.0
Unimak Pass	69	1.2	83	1.8	62	1.0	69	1.2	83	1.8	62	1.0	71	1.3	85	1.9	64	1.0
Pribilof Islands	12	0.1	79	1.6	6	0.1	55	0.8	91	2.4	51	0.7	70	1.2	94	2.9	65	1.1
Nunivak Island	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0	2	0.0	2	0.0	2	0.0
St. Matthew Is.-E	21	0.2	n	0.0	n	0.0	36	0.4	1	0.0	n	0.0	43	0.6	8	0.1	4	0.0
St. Matthew Is.-W	68	1.2	2	0.0	n	0.0	71	1.2	12	0.1	3	0.0	74	1.3	25	0.3	9	0.1
St. Lawrence Is.-E	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	4	0.0	5	0.0	3	0.0
St. Lawrence Is.-S	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0	12	0.1	15	0.2	9	0.1
St. Lawrence Is.-W	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0	18	0.2	18	0.2	18	0.2
Yukon Delta	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	12	0.1	12	0.1	12	0.1
Fish. Res. Area 1	n	0.0	33	0.4	4	0.0	8	0.1	34	0.4	4	0.0	21	0.2	50	0.7	15	0.2
Fish. Res. Area 2	n	0.0	n	0.0	n	0.0	n	0.0	20	0.2	2	0.0	18	0.2	54	0.8	13	0.1
Fish. Res. Area 3	n	0.0	n	0.0	n	0.0	10	0.1	22	0.2	9	0.1	26	0.3	47	0.6	26	0.3
Fish. Res. Area 4	4	0.0	8	0.1	3	0.0	11	0.1	19	0.2	6	0.1	34	0.4	51	0.7	21	0.2
Fish. Res. Area 5	n	0.0	n	0.0	n	0.0	6	0.1	10	0.1	3	0.0	24	0.3	35	0.4	12	0.1
Sea Segment 1	5	0.0	14	0.1	4	0.0	14	0.1	23	0.3	13	0.1	15	0.2	25	0.3	13	0.1
Sea Segmemt 2	5	0.1	5	0.1	5	0.1	5	0.1	5	0.1	5	0.1	7	0.1	5	0.1	5	0.1
Sea Segment 3	15	0.2	25	0.3	8	0.1	18	0.2	31	0.4	11	0.1	32	0.4	49	0.7	18	0.2
Sea Segment 4	14	0.2	24	0.3	11	0.1	14	0.2	24	0.3	11	0.1	22	0.3	36	0.4	16	0.2
Sea Segment 5	8	0.1	20	0.2	8	0.1	12	0.1	29	0.3	14	0.1	29	0.3	51	0.7	29	0.3
Sea Segment 6	n	0.0	n	0.0	n	0.0	4	0.0	13	0.1	12	0.1	7	0.1	25	0.3	15	0.2
Sea Segment 7	8	0.1	14	0.1	4	0.0	19	0.2	30	0.4	10	0.1	37	0.5	53	0.7	20	0.2
Sea Segment 8	9	0.1	14	0.2	5	0.0	26	0.3	36	0.5	11	0.1	48	0.6	55	0.8	20	0.2
Sea Segment 9	1	0.0	1	0.0	n	0.0	13	0.1	17	0.2	6	0.1	38	0.5	33	0.4	16	0.2
Sea Segment 10	20	0.2	30	0.4	13	0.1	23	0.3	35	0.4	15	0.2	29	0.3	42	0.6	19	0.2
Sea Segment 11	1	0.0	1	0.0	n	0.0	9	0.1	13	0.1	4	0.0	16	0.2	24	0.3	7	0.1
Sea Segment 12	5	0.1	5	0.1	5	0.1	5	0.1	5	0.1	5	0.1	9	0.1	6	0.1	6	0.1
Sea Segment 13	5	0.1	8	0.1	3	0.0	15	0.2	21	0.2	9	0.1	18	0.2	25	0.3	11	0.1
Sea Segment 14	n	0.0	n	0.0	n	0.0	2	0.0	3	0.0	1	0.0	10	0.1	15	0.2	6	0.1
Sea Segment 15	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0	5	0.0	4	0.0	2	0.0
Sea Segment 16	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0
Sea Segment 17	3	0.0	3	0.0	3	0.0	3	0.0	3	0.0	3	0.0	4	0.0	4	0.0	4	0.0

Note: n = less than 0.5 percent; ** = greater than 99.5 percent.

Table 12. -- Probabilities (expressed as percent chance) of one or more spills; and the expected number of spills (mean) occurring and contacting land or boundary segments over the expected production life of the lease area, scenario a vs. scenario b vs. scenario c. Oil from Norton Sound, St. George Basin, and Canadian tankering is included. Probabilities are for spills 1,000 barrels and greater.

Segment	Within 3 days: scenario a cumul. Prob	Mean	scenario b cumul. Prob	Mean	scenario c cumul. Prob	Mean	Within 10 days: scenario a cumul. Prob	Mean	scenario b cumul. Prob	Mean	scenario c cumul. Prob	Mean	Within 30 days: scenario a cumul. Prob	Mean	scenario b cumul. Prob	Mean	scenario c cumul. Prob	Mean
3	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	3	0.0	2	0.0
5	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	3	0.0	2	0.0
6	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	4	0.0	6	0.1	4	0.0
7	29	0.3	44	0.6	19	0.2	29	0.3	44	0.6	19	0.2	33	0.4	49	0.7	24	0.3
33	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0	1	0.0	1	0.0	1	0.0
34	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0	1	0.0	1	0.0	1	0.0
41	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	4	0.0	4	0.0	4	0.0
42	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	5	0.1	5	0.1	5	0.1
48	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	2	0.0	2	0.0
49	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	2	0.0	2	0.0
50	n	0.0	n	0.0	n	0.0	5	0.1	5	0.1	5	0.1	20	0.2	20	0.2	20	0.2
54	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0
55	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0	1	0.0	2	0.0	1	0.0
56	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	2	0.0	1	0.0
57	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	2	0.0	1	0.0
58	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0
59	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0
63	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0
113	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0
127	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0
131	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0
132	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	3	0.0	6	0.1	2	0.0
133	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0
144	21	0.2	n	0.0	n	0.0	22	0.3	1	0.0	n	0.0	23	0.3	3	0.0	1	0.0
145	32	0.4	2	0.0	n	0.0	46	0.6	11	0.1	3	0.0	49	0.7	16	0.2	5	0.0
146	n	0.0	38	0.5	n	0.0	n	0.0	38	0.5	n	0.0	14	0.2	55	0.8	12	0.1
147	n	0.0	n	0.0	n	0.0	n	0.0	4	0.0	n	0.0	19	0.2	34	0.4	17	0.2
181	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	3	0.0	2	0.0

Note: n = less than 0.5 percent; ** = greater than 99.5 percent. Segments with less than 0.5 percent probability of one or more contacts within 30 days are not shown.

Table 13. -- Probabilities (expressed as percent chance) of one or more spills, and the expected number of spills (mean) occurring and contacting targets over the expected production life of the lease area, scenario a vs. scenario b vs. scenario c. Probabilities are for spills 10,000 barrels and greater.

Target	Within 3 days						Within 10 days						Within 30 days					
	scenario a		scenario b		scenario c		scenario a		scenario b		scenario c		scenario a		scenario b		scenario c	
	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean
Land	6	0.1	1	0.0	n	0.0	16	0.2	7	0.1	1	0.0	26	0.3	35	0.4	7	0.1
Unimak Pass	17	0.2	38	0.5	9	0.1	17	0.2	38	0.5	9	0.1	18	0.2	40	0.5	9	0.1
Pribilof Islands	7	0.1	50	0.7	4	0.0	11	0.1	55	0.8	5	0.1	14	0.2	59	0.9	7	0.1
Nunivak Island	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0
St. Matthew Is.-E	9	0.1	n	0.0	n	0.0	17	0.2	1	0.0	n	0.0	20	0.2	3	0.0	1	0.0
St. Matthew Is.-W	39	0.5	1	0.0	n	0.0	41	0.5	5	0.1	1	0.0	44	0.6	11	0.1	4	0.0
St. Lawrence Is.-E	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0
St. Lawrence Is.-S	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	4	0.0	1	0.0
St. Lawrence Is.-W	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0
Yukon Delta	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0
Fish. Res. Area 1	n	0.0	15	0.2	2	0.0	5	0.0	16	0.2	2	0.0	7	0.1	23	0.3	3	0.0
Fish. Res. Area 2	n	0.0	n	0.0	n	0.0	n	0.0	9	0.1	1	0.0	8	0.1	27	0.3	5	0.0
Fish. Res. Area 3	n	0.0	n	0.0	n	0.0	4	0.0	10	0.1	3	0.0	11	0.1	23	0.3	11	0.1
Fish. Res. Area 4	2	0.0	3	0.0	1	0.0	5	0.0	9	0.1	2	0.0	16	0.2	26	0.3	10	0.1
Fish. Res. Area 5	n	0.0	n	0.0	n	0.0	2	0.0	4	0.0	1	0.0	10	0.1	16	0.2	5	0.0
Sea Segment 1	1	0.0	5	0.1	n	0.0	1	0.0	6	0.1	1	0.0	2	0.0	7	0.1	1	0.0
Sea Segmemt 2	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0	n	0.0
Sea Segment 3	7	0.1	12	0.1	3	0.0	8	0.1	14	0.2	4	0.0	15	0.2	25	0.3	8	0.1
Sea Segment 4	5	0.0	9	0.1	3	0.0	5	0.0	9	0.1	3	0.0	8	0.1	16	0.2	5	0.1
Sea Segment 5	4	0.0	9	0.1	3	0.0	5	0.1	14	0.1	6	0.1	13	0.1	26	0.3	14	0.1
Sea Segment 6	n	0.0	n	0.0	n	0.0	2	0.0	6	0.1	5	0.1	3	0.0	12	0.1	7	0.1
Sea Segment 7	3	0.0	6	0.1	2	0.0	8	0.1	14	0.2	4	0.0	17	0.2	27	0.3	8	0.1
Sea Segment 8	4	0.0	6	0.1	2	0.0	12	0.1	18	0.2	5	0.1	24	0.3	29	0.3	9	0.1
Sea Segment 9	n	0.0	n	0.0	n	0.0	6	0.1	8	0.1	2	0.0	19	0.2	16	0.2	7	0.1
Sea Segment 10	7	0.1	12	0.1	3	0.0	8	0.1	15	0.2	4	0.0	11	0.1	19	0.2	5	0.1
Sea Segment 11	n	0.0	1	0.0	n	0.0	4	0.0	6	0.1	2	0.0	7	0.1	11	0.1	3	0.0
Sea Segment 12	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0	n	0.0
Sea Segment 13	2	0.0	3	0.0	1	0.0	5	0.1	8	0.1	2	0.0	6	0.1	10	0.1	3	0.0
Sea Segment 14	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0	3	0.0	6	0.1	2	0.0
Sea Segment 15	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	1	0.0	n	0.0
Sea Segment 16	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0
Sea Segment 17	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0

Note: n = less than 0.5 percent; ** = greater than 99.5 percent.

Table 14. -- Probabilities (expressed as percent chance) of one or more spills, and the expected number of spills (mean) occurring and contacting land or boundary segments over the expected production life of the lease area, scenario a vs. scenario b vs. scenario c. Probabilities are for spills 10,000 barrels and greater.

Segment	Within 3 days scenario a		Within 3 days scenario b		Within 3 days scenario c		Within 10 days scenario a		Within 10 days scenario b		Within 10 days scenario c		Within 30 days scenario a		Within 30 days scenario b		Within 30 days scenario c	
	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean	Prob	Mean
3	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0
5	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0
6	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0
7	9	0.1	16	0.2	4	0.0	9	0.1	16	0.2	4	0.0	9	0.1	18	0.2	5	0.0
55	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0
57	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0
132	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	2	0.0	1	0.0
144	9	0.1	n	0.0	n	0.0	9	0.1	1	0.0	n	0.0	9	0.1	1	0.0	n	0.0
145	14	0.2	1	0.0	n	0.0	23	0.3	5	0.0	1	0.0	24	0.3	7	0.1	2	0.0
146	n	0.0	16	0.2	n	0.0	n	0.0	16	0.2	n	0.0	2	0.0	25	0.3	1	0.0
147	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	n	0.0	2	0.0	11	0.1	1	0.0
181	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0

Note: n = less than 0.5 percent; ** = greater than 99.5 percent. Segments with less than 0.5 percent probability of one or more contacts within 30 days are not shown.

Table 15. -- Probabilities (expressed as percent chance) of one or more spills, and the expected number of spills (mean) occurring and contacting targets over the expected production life of the lease area, scenario a vs. scenario b vs. scenario c. Oil from Norton Sound, St. George Basin, and Canadian tankering is included. Probabilities are for spills 10,000 barrels and greater.

Target	Within 3 days						Within 10 days						Within 30 days					
	scenario a		scenario b		scenario c		scenario a		scenario b		scenario c		scenario a		scenario b		scenario c	
	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean
Land	6	0.1	1	0.0	n	0.0	19	0.2	10	0.1	5	0.0	49	0.7	56	0.8	36	0.5
Unimak Pass	40	0.5	55	0.8	34	0.4	40	0.5	55	0.8	34	0.4	42	0.5	57	0.9	36	0.4
Pribilof Islands	7	0.1	50	0.7	4	0.0	31	0.4	66	1.1	27	0.3	43	0.6	73	1.3	38	0.5
Nunivak Island	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0	1	0.0	1	0.0	1	0.0
St. Matthew Is.-E	9	0.1	n	0.0	n	0.0	17	0.2	1	0.0	n	0.0	21	0.2	4	0.0	2	0.0
St. Matthew Is.-W	39	0.5	1	0.0	n	0.0	41	0.5	5	0.1	1	0.0	44	0.6	12	0.1	4	0.0
St. Lawrence Is.-E	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	2	0.0	2	0.0
St. Lawrence Is.-S	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	n	0.0	6	0.1	7	0.1	5	0.0
St. Lawrence Is.-W	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0	9	0.1	9	0.1	8	0.1
Yukon Delta	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	5	0.1	5	0.1	5	0.1
Fish. Res. Area 1	n	0.0	15	0.2	2	0.0	5	0.0	16	0.2	2	0.0	11	0.1	27	0.3	8	0.1
Fish. Res. Area 2	n	0.0	n	0.0	n	0.0	n	0.0	9	0.1	1	0.0	10	0.1	29	0.3	7	0.1
Fish. Res. Area 3	n	0.0	n	0.0	n	0.0	5	0.0	10	0.1	4	0.0	13	0.1	24	0.3	12	0.1
Fish. Res. Area 4	2	0.0	4	0.0	1	0.0	5	0.1	9	0.1	3	0.0	17	0.2	26	0.3	10	0.1
Fish. Res. Area 5	n	0.0	n	0.0	n	0.0	3	0.0	5	0.0	1	0.0	12	0.1	17	0.2	6	0.1
Sea Segment 1	3	0.0	7	0.1	2	0.0	7	0.1	12	0.1	6	0.1	7	0.1	13	0.1	7	0.1
Sea Segmemt 2	3	0.0	3	0.0	3	0.0	3	0.0	3	0.0	3	0.0	4	0.0	3	0.0	3	0.0
Sea Segment 3	7	0.1	12	0.1	4	0.0	9	0.1	15	0.2	5	0.1	15	0.2	25	0.3	8	0.1
Sea Segment 4	7	0.1	12	0.1	5	0.1	7	0.1	12	0.1	5	0.1	11	0.1	18	0.2	8	0.1
Sea Segment 5	4	0.0	9	0.1	3	0.0	6	0.1	14	0.1	6	0.1	14	0.1	26	0.3	14	0.2
Sea Segment 6	n	0.0	n	0.0	n	0.0	2	0.0	6	0.1	5	0.1	3	0.0	12	0.1	7	0.1
Sea Segment 7	3	0.0	6	0.1	2	0.0	9	0.1	15	0.2	4	0.0	19	0.2	28	0.3	9	0.1
Sea Segment 8	4	0.0	6	0.1	2	0.0	12	0.1	18	0.2	5	0.1	25	0.3	29	0.3	9	0.1
Sea Segment 9	n	0.0	n	0.0	n	0.0	6	0.1	8	0.1	2	0.0	19	0.2	16	0.2	7	0.1
Sea Segment 10	10	0.1	15	0.2	7	0.1	12	0.1	18	0.2	8	0.1	15	0.2	22	0.2	9	0.1
Sea Segment 11	n	0.0	1	0.0	n	0.0	4	0.0	6	0.1	2	0.0	7	0.1	11	0.1	5	0.0
Sea Segment 12	3	0.0	3	0.0	3	0.0	3	0.0	3	0.0	3	0.0	5	0.0	3	0.0	3	0.0
Sea Segment 13	3	0.0	4	0.0	2	0.0	7	0.1	10	0.1	4	0.0	9	0.1	12	0.1	5	0.1
Sea Segment 14	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0	5	0.0	7	0.1	3	0.0
Sea Segment 15	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	2	0.0	1	0.0
Sea Segment 16	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0
Sea Segment 17	1	0.0	1	0.0	1	0.0	2	0.0	2	0.0	2	0.0	2	0.0	2	0.0	2	0.0

Note: n = less than 0.5 percent; ** = greater than 99.5 percent.

Table 16. -- Probabilities (expressed as percent chance) of one or more spills, and the expected number of spills (mean) occurring and contacting land or boundary segments over the expected production life of the lease area, scenario a vs. scenario b vs. scenario c. Oil from Norton Sound, St. George Basin, and Canadian tankering is included. Probabilities are for spills 10,000 barrels and greater.

Segment	Within 3 days						Within 10 days						Within 30 days					
	scenario a		scenario b		scenario c		scenario a		scenario b		scenario c		scenario a		scenario b		scenario c	
	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean	cumul. Prob	Mean
3	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0
5	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0
6	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	3	0.0	2	0.0
7	12	0.1	19	0.2	8	0.1	12	0.1	19	0.2	8	0.1	14	0.2	23	0.3	10	0.1
41	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	2	0.0	2	0.0
42	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	2	0.0	2	0.0
48	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0
49	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0
50	n	0.0	n	0.0	n	0.0	2	0.0	2	0.0	2	0.0	9	0.1	9	0.1	9	0.1
55	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0
56	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0
57	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	n	0.0
132	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	3	0.0	1	0.0
144	9	0.1	n	0.0	n	0.0	9	0.1	1	0.0	n	0.0	9	0.1	1	0.0	n	0.0
145	14	0.2	1	0.0	n	0.0	23	0.3	5	0.0	1	0.0	24	0.3	7	0.1	2	0.0
146	n	0.0	16	0.2	n	0.0	n	0.0	16	0.2	n	0.0	7	0.1	28	0.3	6	0.1
147	n	0.0	n	0.0	n	0.0	n	0.0	2	0.0	n	0.0	9	0.1	18	0.2	8	0.1
181	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	n	0.0	1	0.0	1	0.0	1	0.0

Note: n = less than 0.5 percent; ** = greater than 99.5 percent. Segments with less than 0.5 percent probability of one or more contacts within 30 days are not shown.