

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS

Tony Knowles, *Governor*

John T. Shively, *Commissioner*

Milton A. Wiltse, *Acting Director and State Geologist*

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ANALYSIS OF HISTORICAL OIL AND GAS LEASE
SALE AND EXPLORATION DATA FOR ALASKA

by
Richard W. Kornbrath
In cooperation with the Division of Oil and Gas



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ANALYSIS OF HISTORICAL OIL AND GAS LEASE SALE AND EXPLORATION DATA FOR ALASKA

by
Richard W. Kornbrath¹

INTRODUCTION

This report examines the relationship between competitive oil and gas lease-sale offerings and the success rate of subsequent exploration. In some past state lease sales, all the tracts offered were leased. However, in most state lease sales and in all the federal lease sales in Alaska, substantially fewer tracts have been leased than were offered. Of the tracts leased by the oil industry, virtually all are "explored," but to very different degrees; some tracts have been commercially developed, some have been drilled without success, and many have reverted back to the state without drilling.

To understand the potential impacts from exploration and development, specific activities and techniques that are generally used (or that may be contemplated) to locate and extract subsurface hydrocarbons must be considered. These possible activities should be viewed in the proper perspective by examining their frequency of occurrence and the likelihood that a given lease offering or an individual lease will undergo exploration drilling with a subsequent commercial discovery over the lifetime of the lease.

Northern Alaska and Cook Inlet are the dominant oil regions of the state (figs. 1 and 2), and account for most lease sale offerings. Historical lease sale data from state and federal sales in Alaska have been compiled by sale number, date, and region (tables 1-3). A complete database of all producing fields, known but undeveloped accumulations, and discoveries has been assembled and categorized by region, hydrocarbon type (oil or gas), date of discovery, and status (tables 4-9). A commercial well-log database containing all the exploration and development wells in the state has also been used to compile lists of the numbers and types of wells drilled in each region of the state. The data are summarized in tables 10-12 and figures 3 and 4.

THE EXPLORATION PROCESS

Exploration for oil and gas is often misinterpreted solely as the drilling of exploration wells. In fact, most exploration activities are conducted without ever drilling a new exploration well. The actual drilling of a well, when it does occur, is the culmination of a comprehensive

evaluation process that may take many years to complete and is reserved for those prospects with sufficient revenue-generating potential to offset the high costs of lease acquisition, drilling, and development. This analysis shows that few leases offered in competitive sales are ever drilled, and fewer yet are found to hold commercial quantities of hydrocarbons. Understanding this is critical to rationally weigh the benefits versus the financial risk of oil and gas exploration and to make rational land-use decisions. In actual process, "exploration" primarily entails highly technical subsurface mapping efforts conducted in oil-company offices; moreover, potentially "intrusive" activities such as drilling, field development, facilities construction, and product transportation are unlikely to occur on the vast majority of tracts being offered for lease.

The term "exploration," as it pertains to the search for commercial quantities of oil and gas, encompasses a broad range of techniques and activities developed by geoscientists to help detect and find hydrocarbons trapped in rocks beneath the earth's surface. These techniques and activities attempt to take advantage of different aspects of the generally accepted model used to explain the formation of hydrocarbon deposits in the subsurface.

Briefly, this geologic model recognizes source rock, reservoir rock, a seal, a trap, timing, and migration as the most important elements responsible for most hydrocarbon deposits. Source rocks (normally shales) are organic-rich, generally fine-grained rocks that have the capacity to generate hydrocarbons under certain subsurface burial temperatures and pressures. Reservoir rock (normally porous sandstone or limestone) refers to a rock type that has interconnected pore space capable of storing and then yielding liquid or gaseous hydrocarbons. Seal refers to the generally fine-grained rock type that forms an impervious barrier over a trap, preventing the further migration or escape of hydrocarbons. Trap or trapping mechanism describes the combination of elements (structural and/or stratigraphic) that result in particular geometries in subsurface reservoir rocks conducive to collecting and storing hydrocarbons. Finally, timing and migration describe the processes related to the subsurface movement (generally up-structure or updip), over time, of hydrocarbons after the time of formation of a subsurface trap.

The State of Alaska's Five-Year Oil and Gas Leasing Program establishes biennial lists of proposed lease-sale areas projected five years into the future. This lead time,

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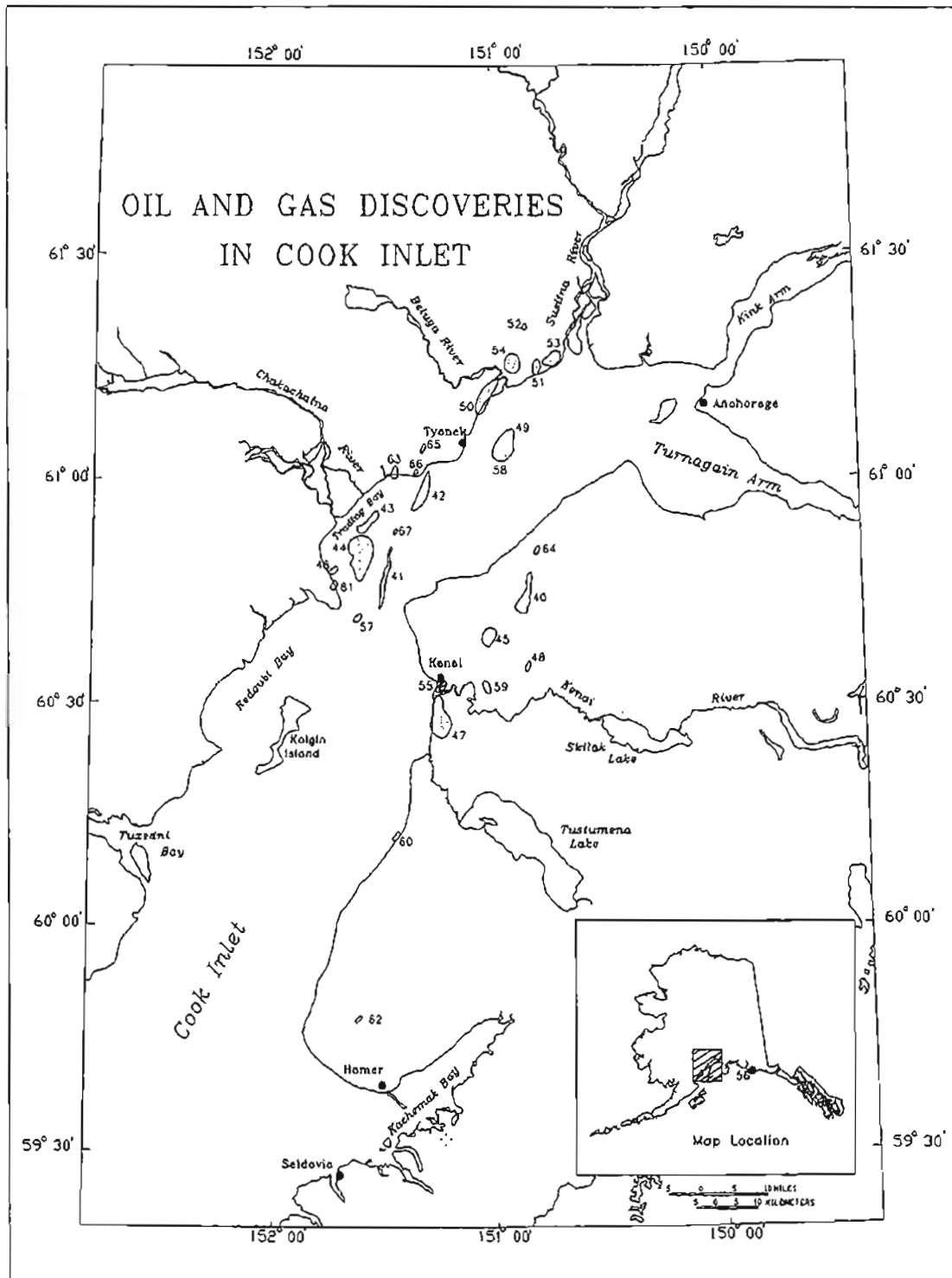


Figure 2. Oil and gas discoveries in Cook Inlet. (The numbers by the discoveries are keyed to table 9.)

in addition to providing a stable and predictable schedule as a basis for comprehensive reviews of potential benefits and impacts, enables the oil industry to target specific areas for exploration *before* the actual lease sale. Exploration for oil and gas prior to a lease sale follows a very logical and predictable path that begins with the gathering and compilation of existing technical information in the oil-company offices, the construction of geologic and geophysical maps and other displays to illuminate prospective areas, and the acquisition of additional information that may be desirable.

The first stage of "exploration" can be considered to be those activities and techniques that examine different aspects of the geologic model for hydrocarbon formation *before* leasing. For example, one group of geoscientists will review existing seismic data and previously drilled wells in a particular area to create subsurface maps that will be the basis for evaluating the area for potential subsurface traps. Another group may be in the field conducting studies of rock outcroppings, which may reveal information on source-rock potential, type of hydrocarbons, or the likelihood for reservoir rock in the subsurface. Engineers and economists may be looking at flow rates, potential productivity, or the drilling costs associated with known accumulations that have similarities to the area under investigation. When these studies reveal gaps in the data or interesting leads, additional seismic data may be acquired by individual companies, groups, or consortiums of companies, or by seismic-acquisition companies to sell later on speculation. Prospect maps generated at this stage are used to make probabilistic estimates of the amount of trapped petroleum. The same maps are used to guide the companies' competitive bids at the time of the lease sale. The most potentially "intrusive" activity during this first phase of exploration is the acquisition of new seismic data if the companies deem it necessary.

The second stage of exploration occurs after lease acquisition, following a lease sale. At this point a company knows which lands it has rights to and can begin a thorough evaluation of that land. Again, the predominant activity in this phase is unobtrusive studies conducted primarily in the office. For example, if a block of leases has been acquired and there is a greater expectation of an eventual return on investment, expenditures toward the evaluation effort can be increased. At this point, advanced computer mapping techniques are used to analyze and refine geologic interpretations and produce upgraded, more detailed subsurface prospect maps. Much time and effort is put into these types of complex analyses. At the same time, company officers may contact other companies that also acquired a lease interest in the area and may be interested in joint exploration to trim costs, increase efficiency, and spread risk. If the mapped prospects look

good both geologically and economically when stacked up against dozens, or perhaps hundreds, of other prospects or investment opportunities, and if the companies' financial situations are favorable given the current timing and management philosophy, further exploration expenditures may be considered.

At times, the second stage of exploration will lead to another round of seismic-data acquisition and subsequent interpretation. Today, with advanced computer modeling and three-dimensional seismic surveys, it is often more cost effective to acquire new and better seismic data, re-interpret the prospect by integrating the new data, and conduct another round of even more rigorous prospect delineation than it is to go out at this point and drill an exploration well. Despite all the expensive technology, however, no amount of studies provide any certainty that hydrocarbons are present, and there are no methods to directly detect commercial hydrocarbons beneath the surface. Only drilling can determine the actual presence of producible hydrocarbons.

The third stage of exploration entails the actual drilling of an exploration well. At this point, the prospect beneath a lease has survived an exhaustive geologic and economic "culling" and review process, and all the other needed elements such as timing, rig availability and suitability, intercompany coordination, allocation of exploration budgets, and management commitment have finally come together. The results of the first exploration well, which may take months to fully analyze, will determine the next course of action. In most cases—as the statistics in this report show—an exploration well fails to find a hydrocarbon deposit. However, if the results are positive and hydrocarbon-bearing rocks are encountered, additional delineation drilling and seismic data acquisition may be needed. Further lease acquisition or intercompany agreements may also be desirable. The decision to pursue further delineation drilling is based primarily on the perceived (or potential) commerciality of the deposit. The estimated size and the complexity of a newly discovered deposit will generally govern the number of delineation wells needed (and the timing of the drilling of these tests) in this latter stage of exploration.

All the data from the exploration and delineation wells and from the geological and geophysical mapping efforts are used to rigorously refine the assessment of in-place and recoverable hydrocarbons trapped in the prospect. This complex interpretation of the quantity and producibility of the deposit is considered in light of engineering and economic models that assess the feasibility, costs, and timing of development. Within a time period of 5 to 10 years from lease acquisition through discovery and delineation, a go or no-go decision on development is finally made. At this stage—when a new discovery has been sufficiently delineated and the

companies make a commitment to commercial development by applying to form development units, participating areas, or pool rule areas—the exploration phase can be considered complete.

DATABASE AND SOURCES OF INFORMATION

The data used in this analysis and the various compilations and calculations are displayed in tables 1-12 and figures 3 and 4. Locations of the oil and gas discoveries are depicted on the maps of northern Alaska and Cook Inlet in figures 1 and 2. The historical information on competitive lease sales was compiled from data supplied by the Alaska Department of Natural Resources, Division of Oil and Gas. Much of the lease-sale data can be found in the division's 1993 Five-Year Oil and Gas Leasing Program document. Updates through the current year and further details of mixed sale areas were provided by division staff.

Federal lease sales data were obtained from the 1994 Alaska OCS Statistical Summary by the Alaska Regional Office of the Minerals Management Service and compiled from their master list of leases. The Bureau of Land Management provided data for the onshore competitive sales held in National Petroleum Reserve-Alaska (NPR).

Information on known oil and gas fields, discoveries, and undeveloped accumulations was compiled from the 1994 Division of Oil and Gas Historical and Projected Oil and Gas Consumption report. Updated material and more recent information on estimated volumes were provided by division staff.

Finally, the Petroleum Information Corporation well database on CD-ROM (PetroROM Well Data), subscribed to by the Division of Oil and Gas and current through April 1994, provided a means to conduct searches by well type to assess the numbers of exploration wells drilled by region of the state.

RESULTS OF ANALYSIS

LEASING DATA

From December 10, 1959, to the present, 89 state and federal sales have been conducted in Alaska. Twelve other sales (six state and six federal) have been canceled for various reasons. The areas offered for lease encompass onshore and offshore lands that overlie parts of sedimentary basins throughout the state, along the coastline, and into the federal Outer Continental Shelf (OCS). The two dominant areas of leasing, exploration, and development are Cook Inlet and northern Alaska (tables 1-3, figs. 1 and 2).

Table 10 provides details of the compiled lease sales data. The 89 state and federal lease sales, combined, have offered 34,096 tracts for competitive leasing, or a combined total of 171,069,120 acres. The state alone, in 68 sales, has offered 9,018 tracts (26,686,902 acres), and leased 4,654 tracts (11,611,495 acres). The federal government, in 21 sales, has offered 25,078 tracts (144,382,218 acres), and leased 1,618 tracts (9,894,273 acres). Of the state tracts leased, only 1,148 remain active (validly held and rentals being paid) as of May 1994. The federal government reports 334 active OCS leases and about 155 active onshore leases (an accurate account of the onshore leases was not available from the Bureau of Land Management) as of February 1994, and the number of leases being "relinquished" (returned) is increasing.

In this compilation, some of the tracts offered include some reoffered tracts or acreage that represent either multiple offerings of the same lands that were not leased initially or lands leased once and then reoffered. In addition, the tracts and acreage leased also include some lands that may have been leased more than once. With the current database it is difficult to separate first-time, original tract offerings from multiple offerings. However, inasmuch as each lease sale is a distinct event in time, at which tracts may (or may not) receive bids, distinguishing between these categories is not thought to be significant.

For comparison, a 1994 Land Status (Ownership) Map (oral commun., Mark Myers, Department of Natural Resources) with sedimentary basin outlines was used to estimate that the total state acreage available for leasing in Cook Inlet is about 8 million acres and in northern Alaska, about 14 million acres. This combined estimate (about 22 million acres) compares favorably to the total state Cook Inlet (10,412,283 acres) and northern Alaska (13,416,981 acres) acreage already offered for lease (23,829,264 acres). Because the state has offered virtually all its Cook Inlet and northern Alaska lands for lease, the inference is that perhaps as much as 2 million acres—mostly in Cook Inlet—would fall in one of the categories of reoffered lands.

The statistics in table 10 show that the total number of state tracts leased in all 68 state sales represents an average of about 51.6 percent of the tracts offered. This number is somewhat smaller (43.5 percent) when calculated based upon acreages offered and leased. The average number of federal tracts leased in the 21 federal offerings is only about 6.4 percent, or when calculated based on acreage, about 6.8 percent. The discrepancy in these percentages is undoubtedly a result of the large OCS areas the Minerals Management Service has historically offered for leasing. Federal lease sales in areas such as the Navarin Basin, Chukchi Sea, Beaufort Shelf, and even in NPR, encompass millions of acres in a single offering, compared to state sales which historically offer only hundreds

of thousands of acres. In addition, it is likely that the high costs associated with exploration programs in the arctic and western Alaska OCS have had a dampening effect on leasing in those areas. For these reasons, the combined average of all (federal and state) tracts leased of about 18.4 percent is viewed as probably not being a very meaningful historical estimate. Rather, more importance should be placed on the individual state and federal averages.

Another calculation was performed on just the state sales in the two dominant oil and gas regions of the state, Cook Inlet and northern Alaska. In 34 Cook Inlet offerings (comprised of 27 sales and the Cook Inlet portion of seven other sales), about 56.4 percent of the tracts were leased (48.1 percent based upon acreage). In 31 northern Alaska sales (comprised of 29 sales and portions of two other sales), about 49.7 percent of the tracts were leased (43.5 percent based upon acreage).

KNOWN DEPOSITS AND DRILLED WELLS

All known hydrocarbon deposits in the state are listed on tables 4–9, 11. There are currently 28 developed fields (12 in northern Alaska, 16 in Cook Inlet) producing oil or gas or both; as of May 1994, the total number of state leases contributing to this production is 282. No federal OCS leases currently produce, but 35 onshore leases in Cook Inlet do have production.

Table 11, provides a summary of Alaska hydrocarbon deposits. The total number of undeveloped accumulations or discoveries in northern Alaska is 27, which includes Point Thomson and Flaxman Island as two separate discoveries. In Cook Inlet, there are 11 additional known, but currently nonproducing, accumulations. These include three fields that have previously produced but are now shut in (Sterling, Nicolai Creek, and Moquawkie). Table 11 also includes the abandoned Katalla field onshore in the Gulf of Alaska. The total number of known, but nonproducing, accumulations for the state is 39.

The grand total of all Alaska discoveries—the combined number of producing fields and nonproducing accumulations—is 67.

The well database used to assess numbers of exploration wells is organized into onshore and offshore parts on CD-ROM for Alaska. These categories are not strictly adhered to in all cases, as the “onshore” listing contains many wells drilled offshore in state waters along the northern Alaska Beaufort Sea coast and in Cook Inlet. These and other minor problems with the data format do not materially impact the validity of the data sorts performed in this analysis. This database employs 11 categories to describe initial well status, ranging from new field wildcat to development wells, injection wells,

stratigraphic tests and others. For this analysis, exploration wells are considered to be those wells that fall into the following three status categories: new field wildcat, new pool wildcat, and outpost-extension.

The total number of wells (all types) drilled in Alaska through April 1994 is 4,057 according to the database (table 11). A convenient dividing line for separating the North Slope Basin (north of the Brooks Range) from the rest of the state is lat 68° N. The database reveals that north of this latitude, 2,911 wells have been drilled; south of this line, 1,146 wells have been drilled. A total of 751 exploration wells have been drilled in the state through April 1994. In northern Alaska, which includes all onshore areas north of lat 68° N., the Beaufort Sea, and the Chukchi Sea, 350 exploration wells have been drilled. In Cook Inlet, the area between lat 58.5°–62° and long 149°–153.5°, 266 exploration wells have been drilled.

CONCLUSIONS

Historical leasing data show that, on average, about half of the tracts offered in state sales are ultimately leased (51.6 percent of the tracts are leased or 43.5 percent of the acreage offered is leased). Average for state Cook Inlet leased tracts is slightly higher (56.4 percent) and the federal averages are considerably lower. The significance of this lease information is that although virtually all the offered tracts will have undergone an initial stage of exploration prior to the lease sale, only about half of the offered tracts have undergone the more rigorous second stage of exploration, which may involve a second phase of seismic-data acquisition.

In the third exploration stage (exploratory wells), the number of tracts initially offered for lease that might be drilled has already been reduced by about half. Information from the well database shows that 751 exploratory wells have been drilled in Alaska from 1900 through April 1994. This number includes 79 early wells (many in Katalla and NPRA) that were drilled prior to 1960. The state competitive leasing program began with the Cook Inlet Lease Sale 1 on December 10, 1959, and the federal program in Alaska began with Sale 39 in 1976. Thus, the total number of drilled exploratory wells resulting from competitive leasing is 672. It is reasonable to assume that most of these wells were located on separate tracts, that is, there were not two or more exploratory wells on a given lease. This information leads to the conclusion that of the total number of leased tracts in all state and federal competitive sales (6,272), only 672 were actually drilled (10.7 percent) (table 12). If this percentage is calculated just for state leases and exploratory wells (which is difficult because of the data format), the estimate is slightly higher.

Examining the data further reveals the success ratio (percent of discoveries versus the number of drilled exploration wells) of exploratory drilling in Alaska. For example, the total number of discoveries (producing fields plus all other known accumulations) for Alaska is 67. Eleven of these deposits (mostly in NPRA) were identified before competitive leasing began in December 1959 (table 9). The historical success ratio of exploratory drilling since 1960 is the 56 discoveries divided by the 672 exploratory wells, or about 8.3 percent (table 12). This calculation assumes that only one exploratory well was drilled on each discovery, an assumption that is not totally valid inasmuch as one or two delineation wells drilled after the initial discovery well may be counted in the "exploration well count." However, even if the well count is arbitrarily reduced to 600 exploratory wells, the success ratio only rises to about 9.3 percent, indicating that the originally calculated 8.3 percent success ratio is still within a reasonable and logical range.

Finally, it is important to examine the success ratios for *commercially successful* discoveries. In Alaska, there are currently 28 producing oil or gas accumulations, and three other fields (Sterling, Nicolai Creek, and Moquawkie) that have produced in the past. Three currently producing fields were found prior to 1960 (South Barrow, Swanson River, and Kenai gas fields). Therefore, 28 fields meet the criteria of current or past production since Sale 1. The 28 fields divided by the 672 exploratory wells reveal that about 4.2 percent of the exploratory wells drilled since 1960 have found commercially viable fields in Alaska (table 12). Again, this calculation assumes that only one exploratory well was drilled on each commercial field, an assumption that is not totally valid inasmuch as one or two delineation wells drilled after the initial discovery well may be counted in the "exploration well count." However, an arbitrary reduction in the exploratory well count does not significantly affect the range of the 4.2 percent estimated commercial success ratio.

As of May 1994, 282 state and 35 federal leases were producing hydrocarbons. Twelve additional leases (oral commun., Bill Van Dyke, Department of Natural Resources) have produced hydrocarbons at some point in the past (from fields or parts of fields that are now shut in), bringing the total number of state and federal leases that have produced or are currently producing to about 329. Therefore, of the total state and federal tracts leased (6,272) only about 5.2 percent ($329/6,272 \times 100$) are being (or have been) commercially produced (table 12). This

number is slightly higher (about 6.3 percent) when calculated with just the 4,654 state tracts leased and state producing leases (294). When calculated with the 9,018 total state tracts *offered* for lease (table 1), just 3.3 percent ($294/9,018 \times 100$) of the total state tracts offered for lease were or are being produced.

The state has realized enormous financial benefits from leasing its subsurface oil and gas rights. Revenues from bonuses, rentals, royalties, and taxes on petroleum exploration and development have contributed tremendously to the state's economy, infrastructure, standard of living, and fiscal health. Potential or perceived conflicts between the state's leasing program and other activities have historically been evaluated in the best-interest findings, which were compiled by the department prior to leasing.

Data compiled and analyzed in this study can help increase public understanding of the process and results of state and federal land leasing for oil exploration. The study points out that when land is made available for lease, only half will be leased; of the land leased, only a small percentage will be explored; and the exploration of a still smaller percentage of the leases will lead to discovery of oil and subsequent development.

KEY HISTORICAL PERCENTAGES

- About half of the state tracts offered for leasing have actually been leased.
- About 10.7 percent of the state and federal tracts leased have actually been drilled.
- Discoveries have been made by about 8.3 percent of all the state and federal exploratory wells drilled since competitive leasing began.
- Commercial deposits have been found by about 4.2 percent of all the state and federal exploratory wells drilled since competitive leasing began.
- About 5.2 percent of the total state and federal tracts leased have been commercially developed (were or are being produced). About 3.3 percent of the total state tracts offered for lease have been commercially developed (were or are being produced).

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Table 1. Summary of past state competitive lease sales as of May 1994

Sale	Sale date	Acres offered	Percent leased	Acres leased	Average \$/acre	Tracts offered	Tracts leased	Bonus received	Dominant area	Area
1	12/10/59	88,055.00	87.66%	77,191.00	52.08	37	31	\$ 4,020,342.43	Cook Inlet	Wide Bay, Kenai to Ninilchik, Kachemak Bay
2	7/13/60	17,567.51	93.96%	16,505.57	24.70	27	26	407,654.54	Cook Inlet	Kenai Pen., W. Forelands, Nushagak Bay
3 (1)*	12/7/60	73,047.70	31.30%	22,866.70	1.54	26	9	35,325.31	Mixed	Katalla, Kalifonsky Beach, Herendeen Bay
4	1/25/61	400	100.00%	400	679.04	3	3	271,614.40	Cook Inlet	Ninilchik uplands
5 (2)	5/23/61	97,876.00	98.06%	95,980.00	74.71	102	99	7,170,464.88	Mixed	Tyonek, Controller Bay, Pavlov Bay
6	8/4/61	13,257.00	100.00%	13,257.00	8.35	6	6	110,671.55	Gulf Ak.	Controller Bay
7 (3)	12/19/61	255,708.44	73.18%	187,118.44	79.43	68	53	14,863,049.33	Mixed	Icy, Yakutat, Kachemak bays, S. Kenai, N. CI
8	4/24/62	1,061.70	100.00%	1,061.70	4.80	8	8	5,097.00	Cook Inlet	Big Lake, uplands
9 (4)	7/11/62	315,668.93	83.77%	264,436.93	59.42	89	76	15,714,112.60	Mixed	Tyonek, Knik, Kalgin Is., S. Kenai, Wide Bay
10	5/8/63	167,583.06	84.43%	141,490.51	29.23	200	158	4,136,224.92	Cook Inlet	Tyonek, Kenai, offshore/uplands
11	8/2/63		CANCELED							Yakutat Bay
12	12/11/63	346,782.40	71.25%	247,089.00	12.31	308	207	3,042,680.74	Cook Inlet	Forelands, Knik/Turnagain, U. CI, Kenai Pen.
13 (5)	12/9/64	1,194,373.00	60.39%	721,224.00	7.68	610	341	5,537,099.85	Mixed	Fire Is., W. Forelands, Prudhoe West
14	7/14/65	754,033.00	53.45%	403,000.00	15.25	297	159	6,145,472.59	North Slope	Prudhoe west to Canning R., offshore/uplands
15	9/28/65	403,042.06	74.87%	301,751.28	15.49	293	216	4,674,343.74	Cook Inlet	N. CI, Kalgin, Redoubt Bay, Knik, S. Kenai
16 (6)	7/19/66	184,410.05	72.66%	133,987.29	52.55	205	153	7,040,880.17	Mixed	Kenai Pen., N. CI, Middleton Is., Redoubt Bay
17	11/22/66	19,229.70	96.67%	18,589.70	7.33	36	35	136,279.67	Cook Inlet	Big Lake, Kenai, offshore/uplands
18 (7)	1/24/67	47,729.00	91.47%	43,657.00	33.90	23	20	1,479,906.19	Mixed	Katalla, Prudhoe, offshore/uplands
19	3/28/67	2,560.00	REJECTED	12/9/74						Lower Cook Inlet, offshore/uplands
20	7/25/67	311,249.89	82.39%	256,447.31	73.14	295	220	18,757,340.88	Cook Inlet	Big Lake, Knik, N. CI, Kalgin Is., Ninilchik
21	3/26/68	346,623.00	47.59%	164,961.00	18.24	308	147	3,009,224.00	Ak. Pen.	Port Heiden and Port Moller, offshore
22	10/29/68	111,199.48	54.20%	60,272.15	17.29	230	125	1,042,219.90	Cook Inlet	Big Lake, W. Forelands, Kachemak. to Kenai
23	9/10/69	450,858.47	91.50%	412,548.47	2,181.66	179	164	900,041,605.34	North Slope	Colville to Canning R., offshore/uplands
24	5/12/71	196,635.07	47.10%	92,617.97	4.92	244	106	455,640.57	Cook Inlet	Big Lake, Knik, Kenai, West Forelands
25	9/26/72	325,401.42	54.78%	178,244.71	7.43	259	152	1,324,673.40	Cook Inlet	Big Lake, Knik, Belukha, N. CI
26	12/11/72	399,920.96	44.50%	177,972.56	8.75	218	105	1,557,848.84	Cook Inlet	North Cook Inlet
27	5/9/73	308,400.81	36.93%	113,891.71	9.92	210	96	1,130,324.51	Cook Inlet	Tuxedni, Ninilchik, Kenai, Kalgin
28	12/13/73	166,648.04	58.69%	97,803.69	253.77	98	62	24,819,189.91	Cook Inlet	Ninilchik, Kachemak Bay, Belukha
29	10/23/74	278,269.43	45.68%	127,119.65	8.19	164	82	1,040,909.98	Cook Inlet	Kalgin, Ninilchik, N. CI, Turnagain, Big Lake
29A	10/17/78		CANCELED							Point Thomson
29B	7/24/79	34,678.04	100.00%	34,678.04	4.56	20	20	158,041.78	Copper R.	Copper River Basin
30	12/12/79	341,140.18	86.86%	296,307.65	1,914.87	71	62	567,391,497.48	North Slope	Beaufort Sea (Joint Federal & State)
31	9/16/80	196,268.00	100.00%	196,268.00	63.12	78	78	12,387,469.60	North Slope	Prudhoe uplands, Kuparuk R. to Mik. Bay
33	5/13/81	815,000.00	52.76%	429,978.16	10.00	202	103	4,299,781.60	Cook Inlet	Upper CI, Kenai Pen., Susitna
32	8/25/81	202,836.74	75.15%	152,428.22	10.00	78	59	1,524,282.20	Cook Inlet	Lower Cook Inlet, Kenai Pen. and offshore
35	2/2/82	601,171.50	21.82%	131,190.69	10.00	149	31	1,311,906.90	Cook Inlet	Lower CI, Kenai Pen., Redoubt north to Drift R.
36	5/26/82	56,862.41	100.00%	56,862.41	573.02	13	13	32,583,451.87	North Slope	Beaufort Sea, Pt. Thomson area
37	8/24/82	852,603.08	19.80%	168,849.00	3.33	217	33	562,943.90	Copper R.	Middle Tanana and Copper River basins
37A	8/24/82	1,874.60	100.00%	1,874.60	52.00	1	1	97,479.20	Cook Inlet	Chakok River Exempt (Kenai Pen.)
34	9/28/82	1,231,517.00	46.44%	571,954.00	46.70	261	119	26,713,018.17	North Slope	Prudhoe uplands, Sag R. to Canning R.

Table 1. Summary of past state competitive lease sales as of May 1994 (cont.)

Sale	Sale date	Acres offered	Percent leased	Acres leased	Average \$/acre	Tracts offered	Tracts leased	Bonus received	Dominant area	Area
38	1/19/83		CANCELED							Norton Basin
39	5/17/83	211,988.08	100.00%	211,988.08	99.05	42	42	\$20,998,100.98	North Slope	Beaufort Sea, Gwydyr Bay to Harrison Bay
40	9/28/83	1,044,745.02	42.44%	443,354.88	7.17	284	140	3,177,178.26	Cook Inlet	Upper CI, Anchorage south to Homer
42	1/24/84		CANCELED							Minchumina Basin
43&43A	5/22/84	374,152.89	95.65%	357,863.02	94.53	84	81	33,827,377.15	North Slope	Beaufort, Pitt Pt. to Harrison Bay; Colville/PB
41	9/18/84	1,437,930.46	19.40%	278,938.96	3.03	308	63	843,964.92	Bristol Bay	Bristol Bay Uplands: Kvichak R. to Port Heiden
46A	2/26/85	248,584.64	76.45%	190,041.54	13.28	65	50	2,523,333.71	Cook Inlet	CI Exempt, Kenai Pen., Susitna, N. CI
45A	9/24/85	606,385.00	27.19%	164,885.00	28.25	113	32	4,657,478.08	North Slope	NS Exempt, Canning R. to Colville R.
47	9/24/85	192,568.81	94.80%	182,559.81	63.79	50	48	11,645,003.26	North Slope	Kuparuk Uplands; south of Prudhoe Bay
48	2/25/86	526,101.00	50.70%	266,736.00	9.16	104	54	2,444,341.85	North Slope	Kuparuk Uplands; south of Kuparuk oil field
48A	2/25/86	42,053.00	100.00%	42,053.00	12.13	11	11	510,255.16	North Slope	Mikkelsen Bay, Foggy Is. Bay
49	6/24/86	1,189,099.61	33.21%	394,880.74	2.40	260	98	947,171.27	Cook Inlet	Kalgin Is., Yentna/Skwentna, Alexander Cr.
51	1/27/87	592,142.00	16.99%	100,632.00	2.88	119	26	289,624.90	North Slope	Prud. Bay Uplands, Canning R. to Sag R.
50	6/30/87	118,147.31	100.00%	118,147.31	56.05	35	35	6,621,722.81	North Slope	Camden Bay, Flaxman Is. to Hulahula R.
54	1/26/88	421,809.16	80.29%	338,687.16	13.83	89	72	4,683,388.24	North Slope	Kuparuk Uplands, Colville R. delta
66A	6/28/88		CANCELED							North Slope Exempt
55	9/28/88	201,706.79	47.91%	96,631.90	152.13	56	25	14,700,602.00	North Slope	Demarcation Pt., Canning R. to Canada
69A	9/28/88	775,555.00	47.51%	368,490.00	16.61	155	75	6,119,135.00	North Slope	Kuparuk Uplands, Canning R. to Colville R.
52	1/24/89	175,981.48	29.81%	52,463.34	33.12	43	15	1,737,512.66	North Slope	Beaufort Sea, Pitt Point to Tangent Point
72A	1/24/89	677.15	100.00%	677.15	671.90	1	1	454,977.40	North Slope	Oliktok Point uplands
67A	1/29/91	549,364.06	34.87%	191,588.06	28.77	140	55	5,511,338.27	Cook Inlet	CI Exempt, Anch., Upper CI, Kenai Pen.
70A	1/29/91	532,152.82	79.03%	420,567.82	65.88	135	109	27,707,540.94	North Slope	Kuparuk Uplands, Canning R. to Colville R.
64	6/4/91	754,542.40	4.52%	34,143.00	7.10	141	6	242,389.00	North Slope	Kavik, Canning R. to Sagavanirktok R.
65	6/4/91	491,090.94	35.20%	172,864.61	40.46	108	36	6,993,949.12	North Slope	Beaufort Sea, Pitt Point to Canning R.
74	9/24/91	605,850.89	4.39%	26,604.99	12.06	134	5	320,852.72	Cook Inlet	Nikishka to Ninilchik, Drift R., N. CI
61	1/22/92	991,087.00	26.29%	260,550.00	9.32	181	46	2,429,551.00	North Slope	White Hills, Colville R. to White Hills
68	6/2/92	153,445.00	0.00%	0	0.00	36	0	0	North Slope	Beaufort Sea, Nulavik to Tangent Point
75	12/8/92	217,205.00	57.47%	124,832.00	78.11	90	55	9,750,111.21	North Slope	Kuparuk Uplands, Colville to Sag R.
76	1/26/93	393,024.70	36.00%	141,503.66	461.25	86	36	65,269,166.65	Cook Inlet	Upper Cook Inlet
67 A-W	1/26/93	282,577.26	45.94%	129,809.69	18.75	69	33	2,433,863.85	Cook Inlet	West Cook Inlet
77	5/25/93	1,260,146.00	3.63%	45,727.00	25.47	228	8	1,164,555.34	North Slope	Nanushuk onshore, Chandler to Ivishak.. R.
70 A-W	5/25/93	37,655.00	74.51%	28,055.00	48.41	11	8	1,358,027.12	North Slope	Kuparuk Uplands, Canning to Kavik R.
57	9/21/93	1,033,248.01	0.00%	0	0.00	196	0	0	North Slope	North Slope Foothills
75A	9/21/93	14,342.72	100.00%	14,342.72	31.36	11	11	449,846.80	North Slope	Colville River Exempt
TOTALS:		26,686,901.87	43.51 %	11,611,494.55	164.91	9,018	4,654	\$1,914,812,429.61		

* (1-7 refers to mixed areas described in table 2.)

Table 2. Details of mixed state lease-sale areas

Mixed areas	Sale number	Sale date	Acres offered	Percent leased	Acres leased	Average \$/acre	Tracts offered	Tracts leased	Bonus received	Dominant area	Area
(1)	3 CI	12/7/60	1,851.70	100.00	1,851.70	5.41	1	1	\$ 10,026.25	Cook Inlet	Kalifornsky Beach area
	3 GOA	12/7/60	12,275.00	42.83	5,257.00	1.10	6	3	5,777.81	Gulf Ak.	Katalla area
	3 Kod	12/7/60	12,270.00	0.00	0.00	0.00	4	0	0.00	Kodiak	Offshore Kodiak
	3 Ak. Pen.	12/7/60	46,651.00	33.78	15,758.00	1.24	15	5	19,521.25	Ak. Pen.	Herendeen Bay
		Totals:	73,047.70	31.30	22,866.70	1.54	26	9	35,325.31		
(2)	5 CI	5/23/61	58,275.00	96.75	56,379.00	124.84	93	90	7,038,533.38	Cook Inlet	Tyonek area
	5 GOA	5/23/61	23,508.00	100.00	23,508.00	2.82	6	6	66,203.88	Gulf Ak.	Controller Bay
	5 Ak. Pen.	5/23/61	16,093.00	100.00	16,093.00	4.08	3	3	65,727.62	Ak. Pen.	Pavlov Bay
		Totals:	97,876.00	98.06	95,980.00	74.71	102	99	7,170,464.88		
(3)	7 CI	12/19/61	205,251.44	72.06	147,911.44	98.66	56	44	14,593,659.13	Cook Inlet	S. Kenai, N. CI
	7 GOA	12/19/61	50,457.00	77.70	39,207.00	6.87	12	9	269,390.20	Gulf Ak.	Icy Bay, Yakutat
		Totals:	255,708.44	73.18	187,118.44	79.43	68	53	14,863,049.33		
(4)	9 CI	7/11/62	310,310.46	85.00	263,758.46	59.24	84	74	15,626,116.56	Cook Inlet	Tyonek, Knik, S. Kenai
	9 Ak. Pen.	7/11/62	5,358.47	12.66	678.47	129.70	5	2	87,996.04	Ak. Pen.	Wide Bay
		Totals:	315,668.93	83.77	264,436.93	59.42	89	76	15,714,112.60		
(5)	13 CI	12/9/64	569,916.00	44.97	256,299.00	4.53	361	157	1,160,576.56	Cook Inlet	Fire Is., W. Forelands areas
	13 N. Ak.	12/9/64	624,457.00	74.45	464,925.00	9.41	249	184	4,376,523.29	N. Alaska	Prudhoe West area
		Totals:	1,194,373.00	60.39	721,224.00	7.68	610	341	5,537,099.85		
(6)	16 CI	7/19/66	153,441.05	69.63	106,835.29	24.18	181	132	2,583,748.87	Cook Inlet	Kenai Pen., N. CI
	16 GOA	7/19/66	30,969.00	87.67	27,152.00	164.15	24	21	4,457,131.30	Gulf Ak.	Middleton Island
		Totals:	184,410.05	72.66	133,987.29	52.55	205	153	7,040,880.17		
(7)	18 N. Ak.	1/24/67	37,662.00	100.00	37,662.00	39.02	15	15	1,469,645.39	N. Alaska	Prudhoe area
	18 GOA	1/24/67	10,067.00	59.55	5,995.00	1.71	8	5	10,260.80	Gulf Ak.	Katalla
		Totals:	47,729.00	91.47	43,657.00	33.90	23	20	1,479,906.19		

Table 3. Summary of past federal lease sales (updated February 1994)

Sale	Sale date	Acres offered	Percent leased	Acres leased	Average \$/acre	Blocks offered	Blocks leased	High bid total ^a	Bonus received	Area
39	4/13/76	1,008,499.00	40.56	409,058	1,368.60	189	76	\$571,871,587	\$559,836,587	Gulf of Alaska
CI	10/27/77	768,580.00	64.44	495,307	804.49	135	87	400,319,543	398,471,313	Cook Inlet
BF	12/11/79	173,423.00	49.46	85,776	5,697.29	46	24	491,728,138	488,691,138	Beaufort Sea
55	10/21/80	1,195,569.00	16.67	199,261	550.79	210	35	117,550,113	109,751,073	Gulf of Alaska
RS-1	6/30/81	996,300.00	0.57	5,693	29.95	175	1	3,091,738	170,496	Gulf of Alaska
60	9/29/81	858,247.00	8.52	73,157	60.23	153	13	4,405,899	4,405,899	Cook Inlet
821	1/27/82	1,516,257.00	44.57	675,816	86.34	59	26	na	58,351,262	NPRA
822	5/26/82	3,519,515.00	7.85	276,396	35.24	212	12	na	9,741,022	NPRA
RS-2	8/5/82	785,089.60	0.00	0	0.00	140	0	0	0	Cook Inlet
71	10/13/82	1,825,770.40	36.31	662,860	3,101.16	338	121	2,067,604,786	2,055,632,336	Beaufort Sea - Diapir Field
57	3/15/83	2,379,751.00	14.11	335,898	946.34	418	59	325,267,372	317,873,372	Norton Basin
70	4/12/83	2,688,787.00	20.12	540,917	788.40	479	96	427,343,830	426,458,830	St. George Basin
831	7/20/83	2,195,845.00	18.96	416,433	40.02	84	18	na	16,666,659	NPRA
85	3/9/84	CANCELED								Barrow Arch/Chukchi
83	4/17/84	28,048,995.00	3.31	927,989	556.38	5,036	163	631,228,331 ^b	516,317,331	Navarin Basin
841	7/18/84	1,590,677.00	0.00	0	0.00	64	0	na	0	NPRA
87	8/22/84	7,773,446.82	15.54	1,207,714	722.00	1,419	227	877,131,327 ^b	871,964,327	Beaufort Sea - Diapir Field
99	2/20/85	CANCELED								Shumagin
86	2/26/86	CANCELED								Shumagin
100	4/11/86	CANCELED								Norton Basin
89	5/2/86	CANCELED								St. George Basin
88	5/2/86	CANCELED								Gulf of Alaska
97	3/16/88	18,277,806.00	6.08	1,110,742	103.77	3,344	202	115,261,636 ^b	115,261,636	Beaufort Sea
109	5/25/88	25,631,122.00	7.47	1,914,285	249.72	4,694	350	478,177,948	478,032,631	Chukchi Sea
92	10/11/88	5,603,586.00	2.17	121,754	783.87	990	23	95,439,500	95,439,500	N. Aleutian Basin
124	6/26/91	18,556,976.24	1.49	276,004	60.89	3,417	57	16,807,025	16,807,025	Beaufort Sea
126	8/28/91	18,987,975.69	0.84	159,213	44.70	3,476	28	7,117,304	7,117,304	Chukchi Sea
TOTALS:		144,382,217.75	6.85	9,894,273	661.69	25,078	1,618	6,630,346,077	6,546,989,741	

^aIncludes only accepted and rejected high bid amounts.^bDoes not include 17 blocks (39,168 hectares) in Sale 83 affected by a Soviet claim of jurisdiction. Bids on these blocks were rejected on December 14, 1988. Does not include 4 blocks (9,216 hectares) in Sale 87 and 16 blocks (35,353 hectares) in Sale 97 affected by a Canadian claim of jurisdiction. Bids on these blocks have been determined to be adequate but will not be accepted or rejected until the U.S. determines that it is in its best interest to do so. The 1/5-bonus amounts received for these bids have been placed in an interest-bearing account.

Table 4. Producing fields of northern Alaska as of January 1994

Status	Years in production	No.	Field name	Year of discovery	Projected avg. 1994 daily prod. (x1000 bbls/day)	Estimated original recov. reserves	Cumulative production thru 1993	Remaining reserves as of 1/94	Est. ultimate recovery as of 1/94	Est. percent depleted as of 1/94
Oil production (Millions of barrels)										
P	1969-present	1	Prudhoe Bay	1967	1,078	9,590	8,307	3,618	11,925	69.7%
P	1981-present	2	Lisburne	1967	24	400	98	83	181	54.2%
P	1981-present	3	Kuparuk River	1969	315	1,200	1,070	1,142	2,212	48.4%
P	1985-present ^a	4	Milne Point ^b	1969	20	60	34	81	115	29.5%
P	1993-present	5	Prudhoe Bay other ^c	1970, 1976	6	25	1	25	26	3.2%
P	1986-present	6	Endicott ^d	1978	100	375	243	262	505	48.1%
P 4/94	1994	7	Niakuk ^e	1985	10	55	0	55	55	0.0%
P	1993-present	8	Point McIntyre	1988	90	300	2	356	358	0.5%
TOTALS:						12,005	9,755	5,622	15,377	
Gas production (Billions of cubic feet)										
P	1958-present	1	South Barrow	1949	not available	25	21	4	25	84.0%
P	1969-present	2	Prudhoe Bay	1967	not available	28,500	1,631	21,551	23,182	7.0%
P	1981-present	3	Lisburne	1967	not available	635	70	277	347	20.2%
P	1981-present	4	Kuparuk River	1969	not available	640	261	709	970	26.9%
P	1985-present ^f	5	Milne Point ^{b,f}	1969	not available	n/a	9	n/a	n/a	n/a
P	1981-present	6	East Barrow	1974	not available	12	7	6	13	53.8%
P	1993-present	7	Prudhoe Bay other ^c	1976	not available	n/a	1	n/a	n/a	n/a
P	1986-present	8	Endicott ^d	1978	not available	731	71	908	979	7.3%
P	1992-present	9	Walakpa	1980	not available	n/a	1	n/a	n/a	n/a
TOTALS:						30,543	2,072	23,455	25,516	

P = producing

^aMilne Point was shut in for 1988 and part of 1987^bMilne Point includes Schrader Bluff; Schrader Bluff production commenced in 1991^cIncludes West Beach and N. Prudhoe Bay State (discovered in 1970) together^dIncludes Sag Delta North; Sag Delta production commenced in 1989^eIncludes Alapah (Lisburne)^fMilne Pt. is assigned no gas reserves because most of its gas will be used for production fuel

Sources: "Historical and Projected Oil and Gas Consumption," DNR, Feb. 1994; "Estimates of Oil Reserves in Alaska" and "Estimates of Gas Reserves in Alaska," AOGCC, Jan. 1994

Table 5. Significant undeveloped northern Alaska hydrocarbon accumulations as of January 1994

Status	Years in production	No.	Field name	Year of discovery	Projected avg. 1994 daily prod. (x1000 bbls/day)	Estimated original recov. reserves	Cumulative production thru 1993	Remaining reserves as of 1/94	Est. ultimate recovery as of 1/94	Est. percent depleted as of 1/94
Oil accumulations (Millions of barrels)										
UD	1983-1986 ^a	1	West Sak	1969	0	147	0.755	149	150	0.5%
UD	none	2	Point Thomson/Flaxman	1977 ^b	0	200	0	200	200	0.0%
UD	none	3	Northstar/Seal Island	1984	0	180	0	180	180	0.0%
Gas accumulations (Billions of cubic feet)										
UD	none	1	Point Thomson/Flaxman	1977	0	3,500	0	3,000	3,000	0.0%

UD = undeveloped

^aWest Sak Pilot Project^bFlaxman Island accumulation discovered in 1975

Sources: "Historical and Projected Oil and Gas Consumption," DNR, Feb. 1994; "Estimates of Oil Reserves in Alaska" and "Estimates of Gas Reserves in Alaska," AOGCC, Jan. 1994

Table 6. *Other undeveloped northern Alaska hydrocarbon discoveries as of January 1994*

No.	Field name	Year of discovery	Estimated original recov. reserves
Oil discoveries (Millions of barrels)			
1	Umiat	1946	50
2	Fish Creek	1949	n/a
3	Simpson	1950	12
4	Mikkelson	1978	n/a
5	Gwydyr Bay	1981	n/a
6	Tern Island	1983	n/a
7	Hemi Springs	1984	n/a
8	Colville Delta	1985	n/a
9	Hammerhead	1986	n/a
10	Sandpiper Island	1986	n/a
11	Badami	1990	n/a
12	Kuvlum	1992	n/a
13	Fiord (Colville Delta)	1992	n/a
14	Kalubik (Colville Delta)	1992	n/a
15	Cascade	1993	n/a
16	Sourdough	1994	n/a

No.	Field name	Year of discovery	Estimated original recov. reserves
Gas discoveries (Billions of cubic feet)			
1	Meade	1950	20
2	Wolf Creek	1951	n/a
3	Gubik	1951	600
4	Square Lake	1952	58
5	East Umiat	1963	n/a
6	Kavik	1969	n/a
7	Kernik	1972	n/a

Table 7. Producing fields of Cook Inlet as of January 1994

Status	Years in production	No.	Field name	Year of discovery	Projected avg. 1994 daily prod. (x1000 bbls/day)	Estimated original recov. reserves	Cumulative production thru 1993	Remaining reserves as of 1/94	Est. ultimate recovery as of 1/94	Est. percent depleted as of 1/94
Oil production (Millions of barrels)										
P	1958-present	1	Swanson River (federal)	1957	n/a	217	219	11	230	95.2%
P	1968-present	2	Middle Ground Shoal	1962	6.1	162	169	16	185	91.3%
P	1967-present	3	Granite Point	1965	6.2	126	120	14	134	89.6%
P	1967-present	4	Trading Bay	1965	2.2	90	95	6	101	94.0%
P	1965-present	5	McArthur River	1965	17.9	574	561	42	603	93.0%
P	1972-present	6	Beaver Creek (federal)	1965	n/a	4	5	1	6	82.2%
P	1993-present	7	West McArthur River	1991	2	n/a	0	5	5	2.0%
TOTALS:						1,173	1,168	95	1,263	
Gas production (Billions of cubic feet)										
P	1958-present	1	Swanson River (federal)	1957	not available	259.000	0.000	165.000	165.000	0.0%
P	1960-present	2	Kenai	1959	not available	2,496.000	2,081.189	204.000	2,285.189	91.1%
P	1978-present ^c	3	West Fork	1960	not available	n/a	4.049	4.000	8.049	50.3%
P	1965-present	4	Middle Ground Shoal	1962	not available	86.000	91.983	11.000	102.983	89.3%
P	1969-present	5	North Cook Inlet	1962	not available	1,594.000	1,089.657	410.000	1,499.657	72.7%
P	1963-present ^b	6	Beluga River	1962	not available	1,003.000	455.358	375.000	830.358	54.8%
P	1967-present	7	Granite Point	1965	not available	105.000	104.804	33.000	137.804	76.1%
P	1965-present	8	Trading Bay	1965	not available	63.000	69.564	29.000	98.564	70.6%
P	1967-present	9	McArthur River	1965	not available	965.000	617.615	349.000	966.615	63.9%
P	1973-present	10	Beaver Creek (federal)	1965	not available	241.500	127.176	115.000	242.176	52.5%
P	1990-present	11	Ivan River	1966	not available	n/a	11.112	n/a	n/a	n/a
P	1984-present	12	Lewis River	1975	not available	n/a	8.157	n/a	n/a	n/a
P	1990-present	13	Stump Lake	1978	not available	n/a	4.464	185 ^c	194.302 ^c	2.1% ^c
P	1986-present	14	Pretty Creek	1979	not available	n/a	4.838	"	"	"
P	1988-present	15	Cannery Loop	1979	not available	300.000	65.726	226.000	291.726	22.5%
P	1993-present	16	West McArthur River	1991	not available	n/a	0.031	n/a	n/a	n/a
TOTALS:						7,112.500	4,735.723	1,921.000	6,628.121	

P = producing

^aWest Fork was shut in from 1986 through 1990^bBeluga did not produce in 1965 and 1966^cPretty Creek and Stump Lake remaining reserves and ultimate recovery are combined

Sources: "Historical and Projected Oil and Gas Consumption," DNR, Feb. 1994; "Estimates of Oil Reserves in Alaska" and "Estimates of Gas Reserves in Alaska," AOGCC, Jan. 1994

Table 8. Other known Cook Inlet^a hydrocarbon accumulations as of January 1994

Status	Years in production	No.	Field name	Year of Discovery	Projected avg. 1994 daily prod. (x1000 bbls/day)	Estimated original recov. reserves	Cumulative production thru 1993	Remaining reserves as of 1/94	Est. ultimate recovery as of 1/94	Est. percent depleted as of 1/94
Oil accumulations (Millions of barrels)										
ABND	1904-1933	1	Katalla (Gulf of Alaska)	1902	0	n/a	0.154	n/a	n/a	n/a
UD	none	2	Redoubt Shoal	1968	0	n/a	0.000	n/a	n/a	0.0%
UD	none	3	Sunfish	1991	0	n/a	0.000	77.000	77.000	0.0%
Gas accumulations (Billions of cubic feet)										
SI	1962-1986	1	Sterling ^b	1961	not available	25.100	2.088	23.000	25.088	8.3%
UD	none	2	Falls Creek	1961	not available	n/a	0.019	13.000	13.019	0.1%
UD	none	3	West Foreland	1962	not available	n/a	0.000	20.000	20.000	0.0%
UD	none	4	N. Middle Ground Shoal	1964	not available	n/a	n/a	n/a	n/a	n/a
SI	1967-1970	5	Moquawkie	1965	not available	n/a	0.985	n/a	n/a	n/a
UD	none	6	North Fork	1965	not available	n/a	0.105	12.000	12.105	0.9%
SI	1968-1977	7	Nicolai Creek	1966	not available	n/a	1.062	2.000	3.062	34.7%
UD	none	8	Birch Hill	1967	not available	11.000	0.065	11.000	11.065	0.6%
UD	none	9	Albert Kaloa	1968	not available	n/a	0.119	n/a	n/a	n/a

^aIncludes Katalla, onshore in the Gulf of Alaska^bSterling field has been shut in since 1987

ABND = abandoned

UD = undeveloped

SI = shut-in

Sources: "Historical and Projected Oil and Gas Consumption," DNR, Feb. 1994; "Estimates of Oil Reserves in Alaska" and "Estimates of Gas Reserves in Alaska," AOGCC, Jan. 1994

Table 9. Complete listing of all Alaska discoveries

No.	Field/accumulation	Discovery date	Fluid type(s)	Status	No.	Field/accumulation	Discovery date	Fluid type(s)	Status
Northern Alaska					Cook Inlet				
1	Prudhoe Bay	1967	Oil, Gas	P	40	Swanson River	1957	Oil, Gas	P
2	Lisburne	1967	Oil, Gas	P	41	Middle Ground Shoal	1962	Oil, Gas	P
3	Kuparuk River	1969	Oil, Gas	P	42	Granite Point	1965	Oil, Gas	P
4	Milne Point	1969	Oil, Gas	P	43	Trading Bay	1965	Oil, Gas	P
5	Prud. Bay - West Beach	1976	Oil, Gas	P	44	McArthur River	1965	Oil, Gas	P
6	Prud. Bay - N. PB St.	1970	Oil, Gas	P	45	Beaver Creek	1965	Oil, Gas	P
7	Endicott	1978	Oil, Gas	P	46	West McArthur River	1991	Oil, Gas	P
8	Niakuk	1985	Oil	P	47	Kenai	1959	Gas	P
9	Point McIntyre	1988	Oil, Gas	P	48	West Fork	1960	Gas	P
10	South Barrow	1949	Gas	P	49	North Cook Inlet	1962	Gas	P
11	East Barrow	1974	Gas	P	50	Beluga River	1962	Gas	P
12	Walakpa	1980	Gas	P	51	Ivan River	1966	Gas	P
13	West Sak	1969	Oil	UD	52	Lewis River	1975	Gas	P
14	Point Thomson	1977	Oil, Gas	UD	53	Stump Lake	1978	Gas	P
15	Northstar/Seal Island	1984	Oil	UD	54	Pretty Creek	1979	Gas	P
16	Flaxman Island	1975	Oil	UD	55	Cannery Loop	1979	Gas	P
17	Umiat	1946	Oil	UD	56	Katalla (Gulf of Alaska)	1902	Oil	ABND
18	Fish Creek	1949	Oil	UD	57	Redoubt Shoal	1968	Oil	UD
19	Simpson	1950	Oil	UD	58	Sunfish	1991	Oil	UD
20	Mikkelsen	1978	Oil	UD	59	Sterling	1961	Gas	SI
21	Gwydyr Bay	1981	Oil	UD	60	Falls Creek	1961	Gas	UD
22	Tern Island	1983	Oil	UD	61	West Foreland	1962	Gas	UD
23	Hemi Springs	1984	Oil	UD	62	North Fork	1965	Gas	UD
24	Colville Delta	1985	Oil	UD	63	Nicolai Creek	1966	Gas	SI
25	Hammerhead	1986	Oil	UD	64	Birch Hill	1967	Gas	UD
26	Sandpiper Island	1986	Oil	UD	65	Moquawkie	1965	Gas	SI
27	Badami	1990	Oil	UD	66	Albert Kaloa	1968	Gas	UD
28	Kuvlum	1992	Oil	UD	67	N. Middle Ground Shoal	1964	Gas	UD
29	Fiord (Colville Delta)	1992	Oil	UD	<p>Abbreviations</p> <p>P = producing</p> <p>UD = undeveloped</p> <p>ABND = abandoned</p> <p>SI = shut in</p> <p> = discovered prior to competitive leasing, 12/59</p>				
30	Kalubik (Colville Delta)	1992	Oil	UD					
31	Cascade	1993	Oil	UD					
32	Sourdough	1994	n/a	UD					
33	Meade	1950	Gas	UD					
34	Wolf Creek	1951	Gas	UD					
35	Gubik	1951	Gas	UD					
36	Square Lake	1952	Gas	UD					
37	East Umiat	1963	Gas	UD					
38	Kavik	1969	Gas	UD					
39	Kemik	1972	Gas	UD					

Table 10. *Compiled lease sale data through May 1994*

STATE SALES ONLY				
	Tracts offered ^a	Tracts leased ^b	Acres offered ^a	Acres leased ^b
Cook Inlet				
34 Sales ^c	4,889	2,756	10,412,283.20	5,012,400.63
North Alaska ^d				
31 Sales ^e	3,202	1,590	13,416,980.62	5,842,423.45
FEDERAL SALES ONLY				
Cook Inlet				
3 Sales ^f	428	100	2,411,916.60	568,464.00
North Alaska ^d				
11 Sales	17,153	1,065	100,048,814.15	6,785,239.00
STATE AND FEDERAL SALES				
68 State Sales	9,018	4,654	26,686,901.87	11,611,494.55
21 Fed. Sales	25,078	1,618	144,382,217.75	9,894,273.00
Total:	34,096	6,272	171,069,119.62	21,505,767.55
PERCENTAGES OF TRACTS LEASED TO TRACTS OFFERED				
	Cook Inlet only	North Alaska only	All areas	
State	56.37%	49.66%	51.61%	
Federal	23.36%	6.21%	6.45%	
State & Federal	53.71%	13.04%	18.40%	
PERCENTAGES OF ACRES LEASED TO ACRES OFFERED				
	Cook Inlet only	North Alaska only	All areas	
State	48.14%	43.54%	43.51%	
Federal	23.57%	6.78%	6.85%	
State & Federal	43.52%	11.13%	12.57%	

^aIncludes all tracts or acreage; new and reoffered^bIncludes some released tracts or acreage^c27 CI sales plus the CI portions of 7 other sales^dNorth Alaska; entire North Slope onshore (including NPRA), Beaufort Sea, and Chukchi Sea^e29 North Alaska sales plus the North Alaska portions of 2 other sales^fIncludes one reoffering sale, RS-2**Note:** Number of active state leases (as of 5/94): 1,148

Number of producing state leases (as of 5/94): 282 (about 12 more have produced in past)

Number of active OCS federal leases (as of 2/94): 334 (no OCS leases produce)

Number of active onshore federal leases (as of 5/94): 155

Number of producing onshore federal leases (as of 5/94): 35

Table 11. Hydrocarbon deposit summaries and well counts through April 1994

CURRENTLY PRODUCING FIELDS				NONPRODUCING DEPOSITS				ALL DEPOSITS
Area	Oil	Gas only	Total	Area	Shut in	Undvlpd	Total	GRAND TOTALS
N. Alaska	9	3	12	N. Alaska	0	27	27	39
Cook Inlet	7	9	16	Cook Inlet	3*	8	11	27
Other	0	0	0	Other	1**	0	1	1
Total producing fields:			28	Total of other deposits:			39	67

*Sterling, Nicolai Creek, and Moquawkie

**Katalja Field (Gulf of Alaska) produced briefly and is now considered abandoned

CURRENTLY AND PAST PRODUCING FIELDS DISCOVERED POST-1959*				ALL DEPOSITS DISCOVERED POST-1959*			
N. Alaska		11		N. Alaska		31	
Cook Inlet		17		Cook Inlet		25	

*Commercial fields that were discovered after 1959, and have produced or are producing

*All deposits (commercial and noncommercial) that were made after 1959

Note: Competitive leasing began with State Sale No. 1 in December 1959. All discoveries found after that date, including commercially produced fields and noncommercial accumulations, are a result of the competitive leasing programs.

NUMBERS OF DRILLED WELLS* IN ALASKA

Areas	All types of wells	Exploration wells	Exploration wells post-1959
N. of 68° latitude ^b	2,911	350	335
S. of 68° latitude ^c	1,146	401	337
Entire State Total:	4,057	751	672
Cook Inlet Only ^d	973	266	248
Northern Alaska ^e	2,911	350	335
N. Alaska & C.I. Total:	3,884	616	583

*State and Federal, onshore and offshore

^bIncludes new field wildcats, new pool wildcats, and outpost-extension wells

^cEntire North Slope onshore (including NPRA), Beaufort Sea, and Chukchi Sea

^dRest of state other than (f)

^eJust Cook Inlet, defined by lat 58.5°-62° and long 149°-153.5°

^fSame as (f)

Table 12. *Historical percentages and success ratios through April 1994***PERCENTAGES OF TRACTS LEASED THAT WERE ACTUALLY DRILLED BY EXPLORATORY WELLS**

	Exploratory wells drilled ^a	Total tracts leased ^b	Calculated percentage
Northern Alaska	335	2,655	12.6 %
Cook Inlet	248	2,856	8.7 %
Entire State	672	6,272	10.7 %

^aWells drilled after December 1959, the beginning of competitive leasing^bState and federal tracts leased**PERCENTAGES OF TRACTS LEASED THAT ARE BEING COMMERCIALY PRODUCED**

	Producing leases ^c	Total tracts leased	Calculated percentage
State	294	4,654	6.3 %
Federal	35	1,618	2.2 %
State and federal	329	6,272	5.2 %

^cCurrently producing or have produced in the past**PERCENTAGES OF TRACTS OFFERED THAT ARE BEING COMMERCIALY PRODUCED**

	Producing leases ^c	Total tracts offered	Calculated percentage
State	294	9,018	3.3 %

REGIONAL EXPLORATION WELL SUCCESS RATIOS

Area	ALL DEPOSITS POST-1959 Success ratio	ALL COMMERCIAL FIELDS, POST-1959 Success ratio
Northern Alaska	$31/335 \times 100 = 9.2 \%$	$11/335 \times 100 = 3.3 \%$
Cook Inlet	$25/248 \times 100 = 10.1 \%$	$17/248 \times 100 = 6.9 \%$
Entire State	$56/672 \times 100 = 8.3 \%$	$28/672 \times 100 = 4.2 \%$

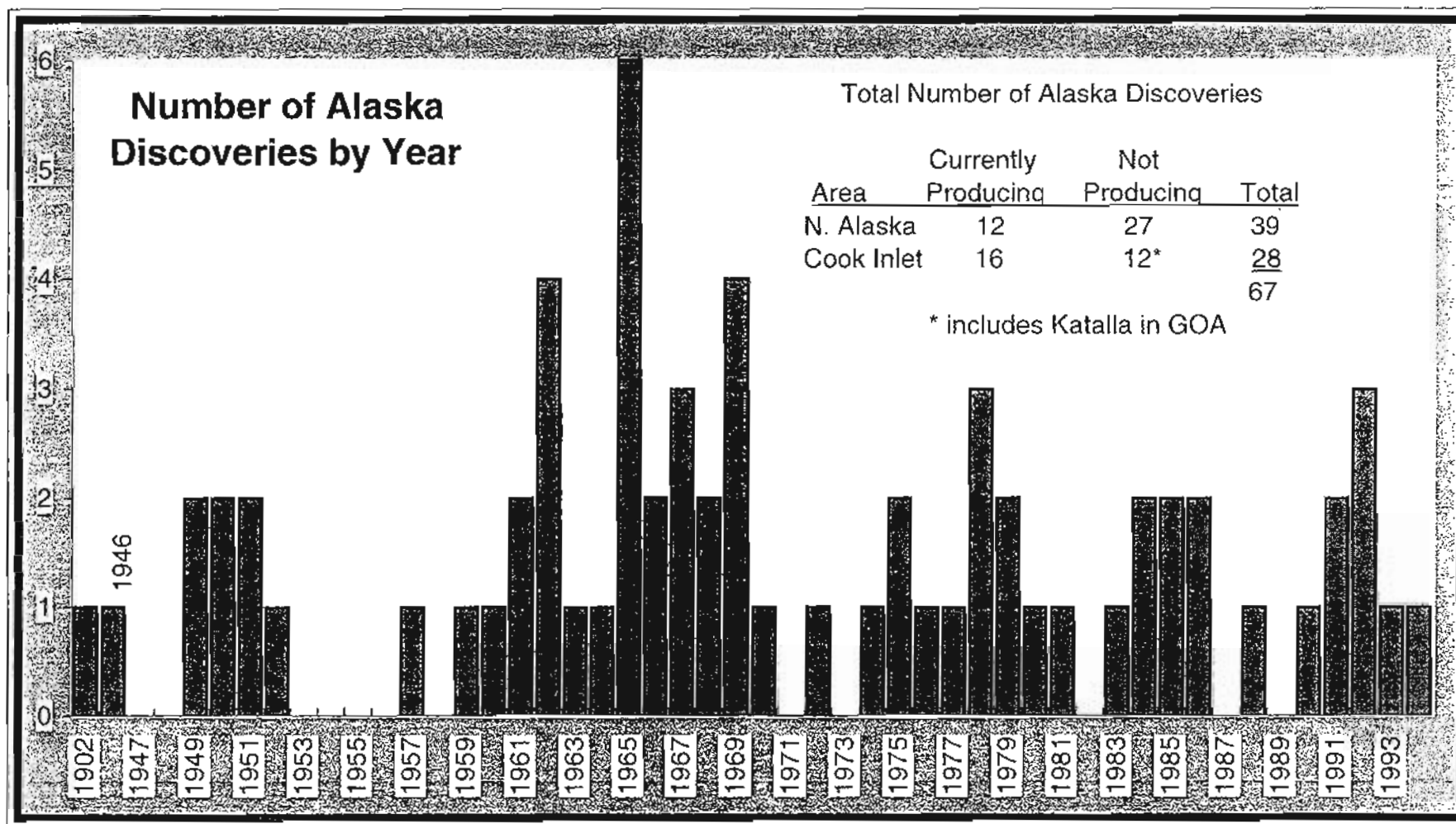


Figure 3. Number of Alaska discoveries by year through April 1994.

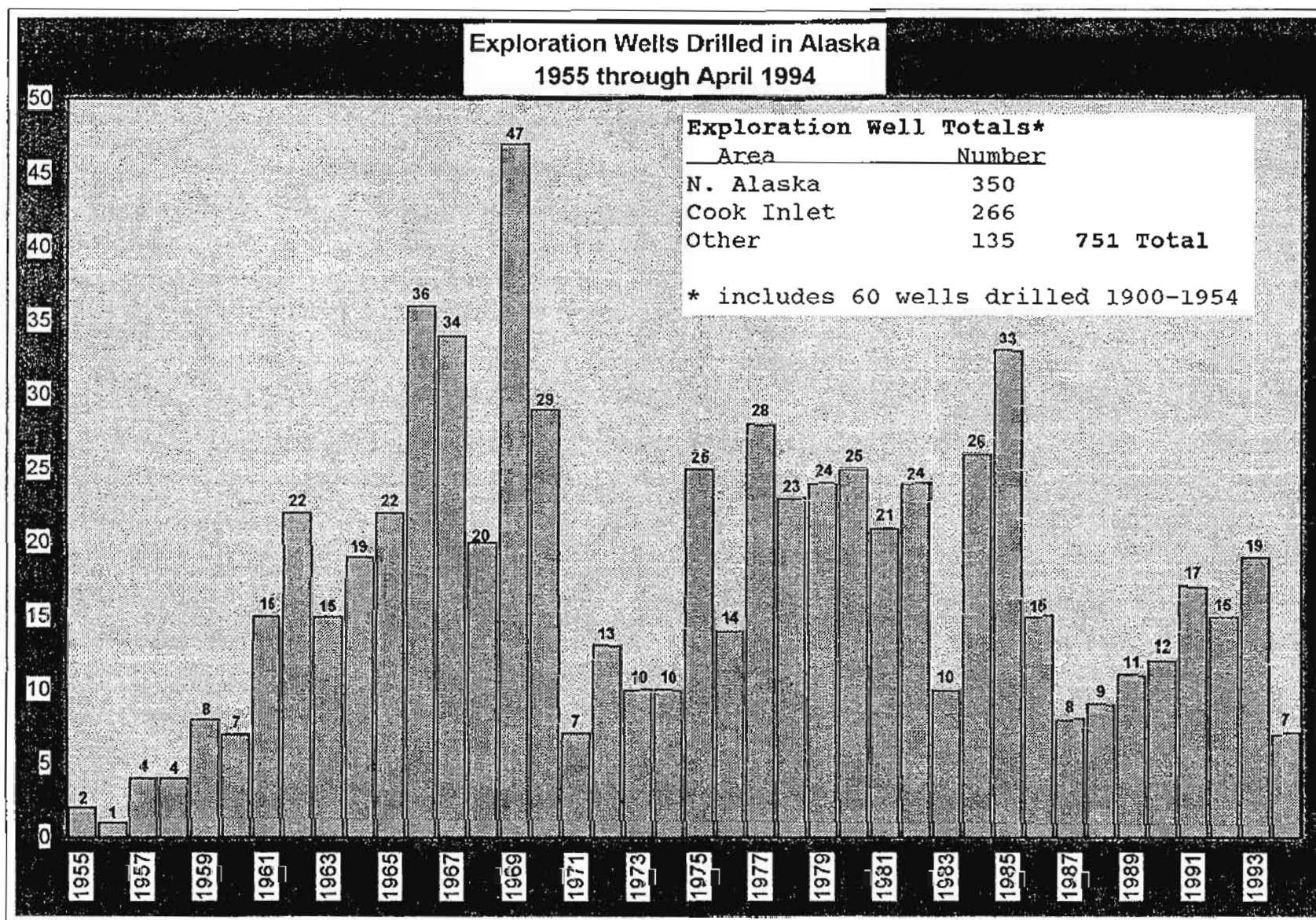


Figure 4. Exploration wells drilled in Alaska through April 1994.