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Statistics of Petroleum Exploration in the Non-Communist World Outside the United States and Canada

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A summary of the geographic location, amount, and results of petroleum exploration, including an atlas showing explored and delineated prospective areas through 1982

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ABSTRACT

The search for petroleum has expanded to include most countries in the world. From January 1, 1950, through 1980, about 160,000 crew months were spent in geologic and geophysical exploration in a study area that includes all non-Communist countries outside the United States and Canada. By the end of 1982, almost 27,000 wildcat wells had been drilled in this study area; these and other pre-1983 wells delineated a prospective area of 1.56 million square miles in which about 836 billion barrels of ultimately recoverable crude oil has been found, 62 percent of it since 1950. The delineated prospective area is still expanding at a rate of 56,000 square miles per year (60 square miles per wildcat well) for the study area, and it is increasing in nearly every country in the study area. Maps of the delineated prospective area in each country show that in most countries, only a small part of the national territory has been explored. In spite of the expansion of the searched area, however, the rate of discovery has declined significantly from 22 million barrels per exploratory well in the 1950's to 8 million barrels per exploratory well in the 1970's.

INTRODUCTION

This report summarizes, for the general reader, basic statistics of petroleum exploration in the non-Communist world outside the United States and Canada from 1950 through 1980. The summary includes the number of crew months of geophysical and geological exploration each year by country (table 1), the numbers of exploratory wells and wildcat wells drilled each year by country (tables 2, 3), and the amount of crude oil discovered (fig. 1). Graphs (figs. 2–13) show regional trends in exploration and oil discovery. Maps (figs. 14–51) show the area that has been drilled for petroleum, and more graphs (figs. 14–51) illustrate that the area being explored has been expanding in nearly every country in the study area.

Although data on exploration of the study area before 1950 are sparse, we know that most of the exploration has been conducted since 1950. However, 38 percent of the oil discovered by the end of 1980 had already been found by 1950. To find the remaining 62 percent of the oil discovered by the end of 1980, exploration increased after 1950, and eventually, wildcat drilling moved from onshore areas to the offshore and to areas having hostile exploration climates. From January 1, 1976, through 1980, 40 percent of the wildcat wells drilled in the study area were offshore. Just 15 years earlier, from January 1, 1961, through 1965, offshore wildcat wells accounted for only 15 percent of the study area's total wildcat wells.

If the industry as a whole has been reasonably efficient in finding the largest and lowest cost fields early in the exploration history of an area, past exploration statistics and discovery data are useful for estimating the magnitude of undiscovered resources. As a measure of its current and future prospects, the costs that the industry is willing to incur for the discovery and production of oil can be inferred from its selection of areas for exploration and development.

The data in this report provide those responsible for planning exploration programs, both for industry and for international agencies, a perspective on what is known about the petroleum potential of a specific area. For an individual decisionmaker to obtain this broad information is generally expensive and time consuming. By placing these data in the public domain, we hope to reduce the cost significantly.

EXPLORATION AND DISCOVERIES, 1950 THROUGH 1980

Data showing the extent and intensity of the search for petroleum in the study area are presented in tables 1–3. Table 1 gives crew months of geologic and geophysical (G&G) data collection from 1950 through 1980 by country and year. These data were compiled from the foreign developments issues of the *Bulletin of the American Association of Petroleum Geologists* (*AAPG Bulletin*). Included are surface-geology studies, land and marine seismic surveys, gravity surveys, and magnetic surveys. From January 1, 1950, through 1980, about 160,000 crew months were spent in G&G surveys. The AAPG reports containing the G&G data were written by many different authors and had no standard format. We estimated some crew months from reports indicating seismic-line miles. Table 1 shows nearly every country in the study area to have had some G&G exploration at one time or another. However, G&G surveys were concentrated (1) in countries having large amounts of commercial crude oil, (2) in mature areas where exploration has focused on undiscovered small fields, or (3) in areas where drilling is particularly expensive; for example, the North Sea.

Exploratory drilling statistics, including but not restricted to wildcat-well statistics, were also compiled from the annual foreign developments issues of the *AAPG Bulletin*. Table 2 presents the number of exploratory wells completed each year in each country in the study area from 1950 through 1980. The authors of the individual country reports did not follow a standard format, and they probably used a variety of definitions for identifying exploratory wells. We also deduced some well numbers from annual exploratory footage. Data are missing for some countries such as India and Iraq that once regarded drilling levels as state secrets.

Table 3 shows new-field wildcat wells by country and by year from 1951 through 1982 and excludes deeper pool wells, shallower pool wells, extension wells, outpost wells, and new-pool exploratory wells. The data in table 3 are from Petroconsultants, S.A., Geneva.

The AAPG data probably represent the most complete historical data available. Nevertheless, the major defect in tables 1 and 2 is unreported data. When we compare table 2 with table 3, we see that both tables are missing data. Even for years after 1960, data for some Latin American countries and Iraq are incomplete. Annual totals in tables 1–3 show no significant increase in exploration in response to the sharp increases in world crude-oil prices during the 1970's except that the number of wildcat wells rose in 1981 and 1982.

Cumulative totals (for 1951 through 1980) from tables 1–3 are summarized on the maps in figures 1*A*–*F*. By examining figure 1 and relationships among G&G, AAPG exploratory wells, and Petroconsultants' wildcat wells, we can determine where drilling data might be missing and can even estimate the number of unreported wells. For example, data suggest that, on average, 3–6 crew months are spent in G&G surveys for each exploratory well. Thus, we could conservatively estimate that two-thirds of the exploratory wells in Groups I and II in Asia (fig. 1*E*) are not reported.

Figure 1 also shows estimates of oil found from January 1, 1951, through 1980. For this period, the totals show that, on average, 14.1 million barrels were found per AAPG exploratory well in the study area. The amount found in the United States during this period was 0.19 million barrels per exploratory well.

The Middle East accounted for more than 63 percent of the oil discovered in the study area from January 1, 1951, through 1980 but only about 7 percent of the wildcat wells. Africa had 16 percent of the oil discovered in the study area during this period, South America 6 percent, Western Europe 5 percent, Mexico 5 percent, Asia 3.5 percent, and the southwestern Pacific less than 1 percent. Western Europe accounted for 29 percent of the wildcat wells drilled in the study area from 1951 through 1980, Africa 24 percent, Asia 12 percent, South America 20 percent, and the southwestern Pacific 6.4 percent.

Cumulative numbers of crew months spent collecting G&G data since January 1, 1951, in each region are compared in figure 2. Some G&G data collection typically precedes the drilling of wildcat wells. Data are used by geologists to locate sedimentary basins where oil may have formed, to extrapolate information from wells to other areas, and to site wells over geologic structures where oil may be trapped. The crews collecting G&G data in the study area (table 1) used more sophisticated techniques than the rather primitive methods in use when most of the U.S. oil was found.

The time profile of cumulative numbers of wildcat wells for each region from January 1, 1951, through 1982 is presented in figure 3. By 1982,

the region having the most wildcats was Western Europe and Turkey. Western Europe was drilled so intensively because small oil fields were profitable to develop owing to their proximity to markets. Also, natural-gas markets in Europe made gas profitable to find and produce. Figure 3 shows no surge in wildcat drilling in response to the crude-oil price increases in the 1970's.

Figure 4 shows that wildcat drilling shifted to offshore areas even before 1970. This figure compares onshore and offshore drilling for Western Europe and Turkey, Africa, and South America from January 1, 1951, through 1980. Intensive offshore exploration started during the 1966–70 period in these three areas. By that time, the United States had been producing offshore for nearly 20 years and had already invented the technology. During 1982, of the 1,085 wildcat wells drilled in the study area (table 3), 582 were drilled offshore. Figures 5–7 show that the movement of exploration offshore was a result of declining returns to onshore exploration and the comparatively higher returns that could be initially obtained offshore.

Annual crude-oil discovery rates averaged for 5-year periods from 1950 through 1980 in each region are presented in figure 5. For the last 5-year period, for all areas except the Middle East, at least half of the oil discovered was offshore. Without the offshore discoveries, the declines in overall discoveries for the Middle East and Africa during the last 20 years would have been much sharper. More than 90 percent of the oil discovered in Western Europe from 1966 through 1980 was offshore.

The graphs presented in figure 6 compare the amounts of oil found per wildcat well from January 1, 1951, through 1980 in different regions. To provide an accurate picture of the significance of the Persian Gulf area, data for it rather than the total Middle East are graphed in figure 6. The Persian Gulf area accounts for nearly 100 percent of the oil discovered but only 53 percent of the wildcat wells drilled during this period in the Middle East. In the figure, the vertical axis measures the discovery rate in millions of barrels per wildcat well. The horizontal axis measures the cumulative number of wildcat wells drilled in the non-Communist countries in each region since January 1, 1951. Each step represents a 5-year period from 1951 through 1980. The six graphs are scaled so that the area under the discovery-rate curve corresponds to the volume of crude oil discovered. The area that corresponds to 40 billion barrels is shown in the upper right corner. This area is the same for all six graphs even though the cumulative-drilling scale and the discovery-rate scale are different in each graph. The figure shows that the Persian Gulf area is still the best place to explore for oil. It is followed by Western Europe and Turkey and, in particular, the North Sea. When the areas under the regional graphs are compared, the dominance of the Persian Gulf area is obvious.

When figures 5 and 6 are examined together, the role of offshore discoveries becomes evident. Almost every increase in a region's discovery rate can be traced to significant offshore discoveries. From 1976 through 1980, three-fourths of all oil discovered in Africa was offshore (fig. 5). Nearly all the crude oil discovered from 1976 through 1980 in Western Europe, Asia, and the southwestern Pacific was offshore.

Figure 7 shows the composite discovery rate (in millions of barrels per exploratory well) for the study area. Note that in figure 7, exploratory wells are used rather than wildcat wells. The most significant feature in the discovery-rate curve is a decline from 22 million barrels per exploratory well in the 1950's to 8 million barrels per exploratory well in the 1970's.

SIZE DISTRIBUTION OF PETROLEUM PROVINCES

Many factors affect the rate at which petroleum is discovered. For example, improved geologic understanding of a petroleum province and improved geophysical measurements of the subsurface both tend to increase the rate at which petroleum is discovered. One factor, however, tends to reduce the rate of petroleum discovery; it is the highly skewed distribution of sizes of oil fields. The few large fields are so large that they contain most of the recoverable oil in a petroleum province, a country, a continent, or the world. Size distribution is so important because once the few large fields in an area have been found, improvements in geologic understanding and geophysical surveys do not compensate for the fact that the fields remaining to be discovered are so small compared with those that have already been found. The principal contribution of improvements in technology is to make the exploration for smaller fields profitable and to lessen the risks of drilling in hostile regions where high costs limit the number of dry holes that can be accepted.

Within a petroleum province, the skewed distribution of field sizes causes a rapid decline in the discovery rate after the discovery of the few large fields. This decline encourages explorationists to begin exploring new petroleum provinces while they are still exploring old areas. The size distribution of provinces, when measured in barrels of recoverable oil, shows the same skewness as does the size distribution of fields. For this reason, we need to examine the sizes of different petroleum provinces.

The 77 significant petroleum provinces in the study area are listed in table 4. A significant province contains at least one field having 100 million barrels of recoverable crude oil. The size of a province is not known because fields remain to be discovered within a province. Therefore, rather than size, table 4 lists the amount of oil discovered by the end of 1982. The significant provinces account for 99 percent of the 836 billion barrels of oil discovered in the study area through 1982. Definitions of province boundaries are somewhat arbitrary. We have followed the province definitions used by Petroconsultants, S.A., Geneva, in 1983.

Figure 8 shows the current estimated size distribution of these 77 provinces. One province, the Arabian Platform (in the Persian Gulf area), contains almost 50 percent of the total crude oil discovered in these 77 provinces. The 11 provinces having the most crude oil contain about 88 percent of all oil in the 77 provinces. Of the total oil in all significant provinces, South America and Africa contain about 10 percent each, and Asia, Western Europe, and Mexico, about 3.5 percent each. The Middle East contains more than 69 percent of the oil in the significant provinces. The two significant provinces in the southwestern Pacific (Australia) account for less than 0.5 percent of the total oil.

More information on the significant provinces in each region follows. Central America and the Caribbean area have no significant provinces.

Significant provinces of South America.—Significant provinces in South America were identified early in this continent's exploration history. Figure 9 shows the historical sequence of initial discoveries in each of the 20 significant provinces in South America and the amount of oil found through 1982. Only 3 of the 10 largest provinces in South America were identified by discoveries after 1920. The two largest geologic provinces in South America, Maracaibo and Maturin, account for 73 percent of oil discovered in South America's significant provinces. Bolivar Coastal, a super-giant[1] field probably containing more than 32 billion barrels of oil, is in the Maracaibo Basin. In South America, exploration moved from west to east but was concentrated along coastal areas. Interior areas were evaluated relatively late. The Petroconsultants, S.A., Geneva, records show that only 6 of the 20 significant provinces have had discoveries of at least 100 million barrels since 1972 and only 2 of the 20 have had such discoveries since 1980. The absence of major discoveries in most of these provinces during the last decade suggests that most of South America has been explored rather thoroughly.

Significant provinces of Mexico.—In Mexico, 77 percent of the oil discovered in significant provinces through 1982 is in the Reforma-Campeche Provinces. The offshore fields in the Campeche Province were discovered in 1976; Reforma Province discoveries date back to 1958. The Cantarel complex in the Campeche Province is thought to contain several giant or super-giant fields. Other provinces having fields of at least 100 million barrels are Tampico, Saline Basin, and Golden Lane Atoll. These all had discoveries prior to 1910.

Significant provinces of Western Europe.—Most of the crude oil discovered in Western Europe is in offshore provinces that were not systematically evaluated until the 1960's and 1970's. The North Sea provinces of Viking Graben, Central Graben, and East Shetland Basin contain 73 percent of all the oil discovered in Western Europe's significant provinces. These three provinces contained some of the earliest North Sea discoveries. Figure 10 shows the historical sequence of initial discoveries in each of the identified significant provinces. About 12 percent of Western Europe's discovered oil is outside the North Sea area. In most North Sea provinces being actively explored, discoveries of at least 100 million barrels continue to be made. The significant interior onshore provinces had almost all their discoveries prior to 1950, and only one has had discoveries of at least 100 million barrels in the last decade. Areas drilled in the southern part of Western Europe appear to be gas prone.

Significant provinces of the Middle East.—Three provinces in the Middle East, the Arabian Platform, the Zagros Fold Belt, and the Rub Al Khali Basin, together contain more than 566 billion barrels of oil. This represents more than 60

[1]A super-giant field contains at least 5 billion barrels of recoverable crude oil, and a giant field contains at least 500 million barrels.

percent of all the oil ever discovered in non-Communist areas outside the United States and Canada. These three provinces have sometimes been grouped as one and called the Arabian Basin. The initial discoveries in the Zagros Fold Belt and the Arabian Platform were in 1903 and 1932, respectively. In 1954, the first discovery in the Rub Al Khali Basin was made. The three other significant provinces in the Middle East are the Oman Foreland (4.3 billion barrels), the Southeast Turkey Folded Zone (0.6 billion barrels), and the Central Iranian Platform (0.1 billion barrels). Of the 37 super-giant fields identified by Nehring (1980), 26 are in the three largest Middle East provinces. The two largest oil fields in the world, Ghawar (86 billion barrels) and Burgan (74.5 billion barrels), account for about 28 percent of the oil discovered in significant provinces in the Middle East and 19 percent of the oil discovered in the study area.

Significant provinces of Africa.—Modern petroleum exploration did not begin in most of Africa until the 1950's. Six of the thirteen significant provinces have totals of more than 1 billion barrels of discoveries each. These six provinces contain 96 percent of the oil discovered in Africa's significant provinces. Except for the Suez Graben, all six provinces had their initial discoveries in the 1950's. The three provinces containing the greatest amount of oil, Sirte Basin (Libya), Niger Delta (Nigeria and Cameroon), and Trias Province (Algeria and Tunisia), contain about 78 percent of all the oil discovered in Africa. Figure 11 shows the historical sequence of initial discoveries in each province and the amount of oil found through 1982. Initially, discoveries in African provinces were concentrated in North Africa and near coastal areas in western Africa. Only much later did petroleum exploration move toward interior areas. Africa's two super-giant fields, Hassi-Messoaud (7 billion barrels) in the Trias Province and Sarir (6.6 billion barrels) in the Sirte Basin, are in North Africa. Unlike most of the provinces in South America, 9 of the 13 significant petroleum provinces of Africa have had discoveries of at least 100 million barrels since 1970; many of these were offshore. We have no record of significant oil discoveries in southern and southeastern Africa.

Significant provinces of non-Communist Asia.—As shown by figure 12, 10 of the 14 significant provinces in non-Communist Asia were identified before 1940. Assam Basin was the earliest discovery in the Indian Subcontinental area, and Atjeh Basin was the earliest in Indonesia. The three provinces having the largest amount of discovered oil, Rokan-Kampar Basin, Brunei-Saigon Basin, and Kutei Basin, account for slightly more than 60 percent of the total oil in Asia's significant provinces. About 90 percent of the oil is contained in the eight provinces that had at least 1 billion barrels of oil each. No super-giant fields have been found in the provinces identified in figure 12. However, half of the 14 significant provinces have had discoveries of at least 100 million barrels since 1970, nearly all offshore.

Significant provinces of the southwestern Pacific.—In the southwestern Pacific area, the Gippsland and Barrow Basins have fields of at least 100 million barrels. Discoveries in the Gippsland Basin amount to about 3 billion barrels, whereas total oil discovered in the Barrow Basin is 316 million barrels.

PROSPECTIVE AREA DELINEATED BY DRILLING

Petroleum exploration has been confined to a small part of the world because not all areas contain sedimentary basins in which oil may have formed, and typically, only a small part of an individual sedimentary basin is of interest to explorationists. Estimates of prospective area, the area worth exploring for petroleum, have been made by various methods. In this report, we use the term "delineated prospective area," and we use drilling data and a very mechanical method of computation to derive a much more limited and clearly defined estimate than that given by other authors. Wallace Pratt in 1944 (p. 123) wrote,"The areas of first class promise for petroleum over the earth's surface aggregate to some 6 million square miles." L.F. Ivanhoe (1980) estimated the total area worth exploring (in our study area) to be 1.04 to 9.36 million square miles. B.F. Grossling, in his book "Window on Oil" (1976), estimated this area (in our study area) to be 18.4 million square miles. Offshore areas accounted for about 29 percent of Ivanhoe's estimate and 27 percent of Grossling's estimate. Thus, onshore areas of the Ivanhoe estimates represented between 2.5 and 22 percent of the study area's total land area, whereas Grossling's onshore estimate represented 44.9 percent of it.

Here, the prospective area delineated by drilling is defined as all points that are reasonably close to wells and interior to the drilled area.

A point is considered to be within the delineated prospective area if and only if a well is in each of the four quarters of a square centered at the point; the sides of the square are 40 miles long and are parallel to the longitude and latitude lines. Maps in figures 14–51 show the delineated prospective area as defined here for most countries in the study area. The method for calculating the delineated prospective areas and establishing their locations is presented in the appendix.

The delineated prospective area within 2 miles of a well is also shown in figures 14–51 and is called the explored area (see the appendix). This explored area within the delineated prospective area is unlikely to contain many undiscovered fields larger than 100 million barrels. The total explored area accounts for about 17 percent of the total delineated prospective area within the study area. Some areas within the delineated prospective area may never become as densely drilled as the explored area because they were found to be unproductive and not worth further evaluation.

Table 5 presents the estimates of the delineated prospective areas, explored areas, and total land areas by region in the study area. The combined onshore and offshore estimates of the delineated prospective area amount to less than 5 percent of the total land area. The explored area amounts to less than 1 percent of the total land area.

The historical drilling data giving the location, date, and depth of wells represent the end product of the exploration decisions. Explorationists typically prepare numerous detailed studies to identify and compare alternative sites. Although it is impossible for us to assemble or replicate these studies, the well locations and results of exploration provide a basis for defining the area of interest to explorationists.

Figure 13 shows the growth in the delineated prospective area within the study area. Similar graphs are presented for individual countries and country groups in figures 14–51. The reader should note that the growth of the delineated prospective area in the 1950's is greatly overstated in figure 13 and in the graphs in figures 14–51 because data on most of the pre-1950 wells were not available. However, we think that the part of the curve representing drilling done after 1970 accurately reflects the growth in the delineated prospective area. The graphs in figures 14–51 show the delineated prospective area to be expanding in almost every country, indicating that the industry was still able to find new prospects in undrilled areas in 1982. Since 1970, the delineated prospective area within the study area has been growing at about 56,000 square miles per year (60 square miles per wildcat well).

In spite of the fact that the increase in delineated prospective area per well has been steady, the amount of oil found per wildcat has declined. This decline suggests that the more recent additions to the delineated area have, on the average, less oil per square mile than previously delineated areas. A more detailed study of the relation between the location of discoveries and the newly delineated prospective area is required to substantiate this conjecture of declining quality. The reader can examine the location of the delineated and explored areas in figures 14–51. Maps are labeled with names of petroleum provinces and the year of the earliest discovery we know of in each province. The salient statistics about exploration and petroleum provinces in each country or group of countries are presented in the figure captions.

In figure captions 14–51, we included a measure of returns to exploration, an oil richness index indicating the number of barrels of recoverable oil discovered divided by the number of square miles in the delineated prospective area. Outside the Middle East, the index ranges from 0 to 0.5 million barrels per square mile. It indicates the relative success the industry has had in each area. Because the delineated prospective area has been so restrictively defined, the total resources of a country or region cannot be estimated by multiplying the richness times a high figure for the prospective area.

REFERENCES CITED

American Association of Petroleum Geologists (AAPG), 1951–81, foreign developments issues of the AAPG Bulletin: v. 35–65.

G. & C. Merriam Company, 1975, Webster's new collegiate dictionary: Springfield, Mass., 1536 p.

Grossling, B.F., 1976, Window on oil: London, Financial Times Ltd., 140 p.

Ivanhoe, L.F., 1980, World's prospective petroleum areas: Oil and Gas Journal, v. 78, no. 17, p. 146–148.

Nehring, R.F., 1980, The outlook for world oil resources: Oil and Gas Journal, v. 78, no. 43, p. 170–175.

Pratt, W.E., 1944, Our petroleum resources: American Scientist, v. 32, no. 2, p. 120–128.

Random House, Inc., 1973, The Random House college dictionary: New York, 1568 p.

TABLES 1–5

TABLE 1.—*Crew months of geologic and geophysical exploration by year, 1950–80,*

[Data are from the annual foreign developments issues of the *Bulletin of the American Association*

Area	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
Latin America and the Caribbean[1] (fig. 1A)																
Mexico	262	387	421	375	351	381	374	385	365	368	369	377	394	392	547	637
Bahamas	7	0	0	2	0	0	0	0	0	0	0	0	2	1	0	0
Cuba[2]	7	35	0	4	49	0	0	175	0	0	0	0	84	12	43	0
Haiti	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dominican Republic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jamaica	0	0	0	0	0	0	0	46	0	0	0	0	0	0	0	0
Barbados	2	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lesser Antilles[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Belize	4	0	11	6	4	0	0	0	0	12	0	0	3	0	0	5
Honduras	0	0	0	0	0	0	0	0	0	0	36	0	38	9	0	0
Guatemala	0	0	0	0	0	0	21	21	3	15	11	29	4	0	0	2
Nicaragua	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Costa Rica	0	0	14	24	0	36	0	2	10	5	12	0	7	6	0	0
Panama	0	0	0	1	0	0	0	0	0	2	0	0	2	1	0	0
Colombia	99	117	113	178	192	239	286	311	223	162	141	81	121	143	256	237
Venezuela	408	400	469	484	411	412	391	452	424	211	46	12	14	20	9	23
Trinidad and Tobago	0	15	20	31	0	0	0	0	3	0	0	0	13	33	15	23
Guyana	0	0	0	0	0	0	0	0	0	0	52	0	0	2	0	0
Suriname	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	2
French Guiana[4]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Ecuador	0	0	1	1	3	10	0	0	19	29	26	0	0	0	6	29
Peru	64	69	113	158	151	172	152	180	128	202	183	78	103	99	57	59
Bolivia	0	0	0	0	34	0	0	0	0	381	255	147	83	70	93	70
Uruguay	0	17	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Paraguay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brazil	149	155	152	83	204	187	272	402	481	461	272	325	418	496	493	490
Chile	46	8	0	0	0	108	0	60	0	48	0	136	130	127	116	75
Argentina	0	314	252	254	243	246	197	241	325	0	317	311	400	314	324	438

[1]No crew months were reported for El Salvador.

[2]Data for Cuba are incomplete for 1960–80.

[3]For this report, the Lesser Antilles are considered to consist of the islands from Grenada to St. Thomas, except Barbados, which is listed separately.

[4]French Guiana is listed separately although it is an overseas department of France.

for non-Communist countries except the United States and Canada

of Petroleum Geologists. Crew months for 1951–80 are summarized in figure 1]

Area	1950–65	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Total
Latin America and the Caribbean[1]--Continued																	
Mexico	6385	695	704	785	652	680	704	699	0	0	0	1032	768	1068	1508	1805	17485
Bahamas	12	1	0	7	2	4	1	3	0	0	0	0	0	0	0	0	30
Cuba[2]	409	0	0	0	0	36	0	0	0	56	0	0	0	0	0	0	501
Haiti	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1	4
Dominican Republic	0	0	0	0	5	4	0	0	0	0	0	0	0	22	17	1	49
Jamaica	46	0	8	1	9	0	0	0	3	1	0	0	0	5	1	5	79
Barbados	22	0	0	1	2	0	0	0	1	0	1	0	0	0	1	9	37
Lesser Antilles[3]	0	1	0	0	0	1	1	0	5	1	2	0	2	1	1	1	16
Belize	45	7	2	6	6	7	3	2	4	2	2	18	7	8	3	3	125
Honduras	83	0	1	2	7	9	4	3	0	1	2	0	0	5	0	2	119
Guatemala	106	0	0	0	5	13	7	1	7	16	12	12	6	27	61	9	282
Nicaragua	3	20	11	7	4	5	3	2	4	4	1	3	2	0	0	1	70
Costa Rica	116	0	0	2	8	0	1	0	0	0	0	0	0	0	0	0	127
Panama	6	0	0	2	24	24	2	2	0	0	1	1	0	1	0	0	63
Colombia	2899	118	148	134	80	84	75	85	56	58	54	61	77	68	76	60	4133
Venezuela	4186	17	9	15	21	25	32	35	43	0	64	38	52	65	80	143	4825
Trinidad and Tobago	153	14	7	22	12	2	1	5	1	0	13	1	0	2	0	15	248
Guyana	54	1	0	1	0	0	2	0	2	0	0	0	0	0	0	9	69
Suriname	10	0	0	3	1	0	0	1	1	1	0	1	0	2	0	0	20
French Guiana[4]	3	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	6
Ecuador	124	55	43	49	53	69	78	66	7	6	11	20	18	22	29	52	702
Peru	1968	52	74	60	17	30	94	161	259	305	105	30	16	16	2	2	3191
Bolivia	1133	0	107	96	71	78	68	83	83	161	229	104	66	67	27	22	2395
Uruguay	18	0	0	0	0	0	1	0	0	1	7	3	0	1	0	0	31
Paraguay	0	4	5	0	1	12	1	2	0	6	31	8	5	0	12	8	95
Brazil	5040	822	743	259	209	194	144	144	133	117	116	0	97	102	99	227	8446
Chile	854	55	42	38	36	35	47	45	48	51	52	56	43	64	54	52	1572
Argentina	4176	431	450	500	400	468	382	383	363	353	394	468	339	412	178	422	10119

Area	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
Western Europe[5] (fig. 1B)																
Norway	0	0	0	0	0	0	0	0	0	0	5	6	30	41	88	63
Sweden	0	0	0	0	0	0	0	0	0	0	0	0	0	7	2	4
Denmark	24	15	24	11	0	0	3	12	12	0	0	0	2	14	19	24
Ireland	0	0	0	0	0	0	0	0	0	0	2	19	14	9	24	4
United Kingdom	0	0	0	20	24	20	31	39	32	28	13	25	50	41	100	71
Netherlands	0	23	12	12	12	17	29	24	24	27	20	20	37	57	151	137
Germany, Fed. Rep. of	272	333	409	395	391	458	500	540	608	512	455	526	404	408	367	304
North Sea[7]	0	0	0	0	0	0	0	4	4	4	4	4	14	120	118	81
France	100	113	147	280	180	243	317	436	412	208	410	178	203	151	119	105
Switzerland	0	0	0	6	10	6	33	39	8	18	11	21	18	9	6	8
Austria	0	9	24	24	24	0	28	75	114	104	62	52	63	91	80	78
Italy	141	129	126	168	168	362	351	497	469	360	376	223	311	285	215	183
Greece	0	0	0	0	9	32	17	10	0	0	33	55	54	55	18	11
Portugal	2	0	0	0	15	33	60	39	2	0	27	21	30	7	0	0
Spain	10	9	11	110	143	197	204	190	182	147	243	360	236	289	195	207
Malta	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0
Middle East (fig. 1C)																
Turkey	16	45	67	58	68	104	242	343	324	306	150	117	101	79	88	110
Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0
Syria	47	12	0	0	0	0	0	28	0	30	12	0	12	24	36	36
Lebanon	0	0	0	0	0	0	0	0	0	0	4	2	0	0	0	0
Israel	0	0	0	0	0	30	24	30	20	13	12	9	15	6	13	33
Jordan	0	0	0	0	0	0	42	27	2	4	2	0	0	0	0	3
Iraq	201	265	0	104	74	74	0	62	102	99	88	25	2	0	0	0
Iran	44	35	14	26	24	26	26	58	101	182	66	57	76	102	99	33
Saudi Arabia	90	63	81	54	63	45	60	60	48	35	18	21	18	31	48	35
Kuwait	6	5	12	16	11	10	9	12	6	0	2	7	0	10	0	3
Neutral Zone[8]	18	0	3	0	0	0	0	0	0	5	8	0	2	2	12	2
Bahrain	0	0	0	0	0	0	0	18	0	0	0	2	0	0	3	4
Qatar	30	36	0	0	24	18	0	4	12	7	0	2	3	0	22	13
Oman	3	3	0	0	0	0	24	78	65	52	28	19	12	15	23	38
North Yemen	0	0	0	0	0	30	15	0	0	0	0	0	0	0	0	0
South Yemen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
United Arab Emirates	23	20	0	18	30	54	131	84	67	79	33	29	39	83	84	56

[5]No crew months were reported for Andorra, Belgium, Finland, Iceland, Liechtenstein, Luxemburg, or Monaco.

[6]This entry includes 6 crew months from Greenland.

[7]North Sea data given separately here are also included in the totals for Denmark, the Federal Republic of Germany, the Netherlands, Norway, and the United Kingdom.

[8]The Neutral Zone is shown in figure 28.

for non-Communist countries except the United States and Canada—Continued

Area	1950-65	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Total
Western Europe[5]--Continued																	
Norway	233	41	44	33	16	16	54	54	36	46	33	44	42	46	24	17	779
Sweden	13	0	13	4	3	17	13	3	3	6	6	0	5	7	0	[6]5	[6]98
Denmark	160	23	9	0	3	0	0	17	37	30	16	1	0	9	10	[6]16	[6]331
Ireland	72	20	0	1	4	3	3	15	2	10	5	3	6	6	0	6	156
United Kingdom	494	41	50	29	35	34	65	111	43	40	30	79	49	62	85	11	1258
Netherlands	602	45	55	92	77	81	109	102	62	46	46	51	45	39	38	47	1537
Germany, Fed. Rep. of.	6882	261	194	167	163	151	127	96	97	122	129	120	127	116	105	111	8968
North Sea[7]	353	58	67	50	26	25	109	122	106	90	80	80	80	70	0	0	1316
France	3602	76	84	69	80	67	38	21	26	40	29	25	35	46	39	77	4354
Switzerland	193	4	4	3	10	8	7	2	13	20	14	14	9	13	16	6	336
Austria	828	86	84	66	54	65	74	53	42	45	44	72	62	88	84	67	1814
Italy	4364	154	256	240	275	244	201	153	113	128	163	215	204	206	31	252	7199
Greece	294	28	0	0	4	7	4	5	12	16	7	8	16	30	6	32	469
Portugal	236	0	0	0	18	0	0	0	2	14	3	0	0	6	4	4	287
Spain	2733	169	157	128	67	64	58	107	62	69	89	109	89	56	67	60	4084
Malta	9	0	0	0	0	0	2	3	0	1	1	0	0	0	0	4	20
Middle East--Continued																	
Turkey	2218	77	45	154	82	160	92	85	96	83	108	135	181	20	123	177	3836
Cyprus	6	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	7
Syria	237	36	24	26	0	36	36	48	48	42	30	24	0	36	104	67	794
Lebanon	6	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	9
Israel	205	27	42	17	22	12	0	6	6	14	36	36	13	0	0	0	436
Jordan	80	0	3	4	12	0	4	0	0	0	0	12	5	8	5	0	133
Iraq	1096	0	0	0	0	7	24	0	33	14	84	0	72	0	0	0	1330
Iran	969	29	21	31	41	83	33	29	19	50	71	0	70	59	0	0	1505
Saudi Arabia	770	54	57	80	109	77	65	14	65	85	207	84	72	72	60	138	2009
Kuwait	109	3	0	0	11	8	0	2	1	0	0	0	0	0	4	0	138
Neutral Zone[8]	52	1	6	1	1	24	5	1	0	0	10	0	10	10	2	0	123
Bahrain	27	1	4	0	0	0	7	4	2	9	13	2	0	0	0	0	69
Qatar	171	11	1	4	1	3	1	1	1	6	2	0	18	12	0	1	233
Oman	360	37	67	76	72	58	93	50	19	32	58	60	62	65	92	103	1304
North Yemen	45	0	0	0	0	0	20	0	0	6	2	0	0	5	3	0	81
South Yemen	0	0	0	0	0	0	0	0	0	0	6	2	1	6	1	5	21
United Arab Emirates	830	0	0	0	23	35	22	3	2	4	13	0	19	74	0	21	1046

TABLE 1.—*Crew months of geologic and geophysical exploration by year, 1950–80,*

Area	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
								Africa[9] (fig. 1D)								
Morocco	27	34	56	83	55	51	87	41	39	31	79	70	62	45	83	33
Algeria	38	46	57	367	387	354	269	281	311	703	414	329	285	192	128	41
Tunisia	0	0	0	0	132	74	61	23	24	29	54	75	88	62	39	81
Libya	0	0	0	0	0	70	251	621	1558	667	813	672	481	407	326	231
Egypt	4	0	0	0	41	141	95	6	12	37	4	38	41	29	98	157
Western Sahara	0	0	0	0	0	0	0	0	0	12	137	309	107	20	0	0
Mauritania	0	0	0	0	0	0	0	0	12	9	0	16	0	0	0	0
Mali	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0
Niger	0	0	0	0	0	0	0	0	38	22	6	55	39	4	0	0
Chad	0	0	0	0	0	0	0	0	0	0	0	2	11	0	14	0
Sudan	27	138	119	128	5	0	0	0	3	18	0	18	11	0	0	0
Senegal	0	0	35	31	20	48	58	77	50	38	38	9	4	13	4	7
The Gambia	0	0	0	0	0	0	0	5	0	5	6	0	0	0	0	0
Guinea-Bissau	0	0	0	0	0	0	0	0	0	0	19	3	0	0	0	0
Guinea	0	0	0	0	0	0	0	0	3	6	6	0	0	0	0	0
Sierra Leone	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Liberia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ivory Coast	0	0	0	0	0	0	0	0	14	13	0	0	9	0	0	0
Ghana	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
Togo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Benin	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4
Nigeria	0	57	76	69	58	53	53	64	88	94	115	99	80	131	133	165
Cameroon	3	7	11	7	14	17	25	0	3	0	0	1	5	4	5	2
Central African Republic	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0
Equatorial Guinea	0	0	0	0	0	0	0	0	0	1	9	3	5	0	0	0
Gabon	55	70	21	36	71	72	41	64	41	33	56	32	18	21	27	29
Sao Tome and Principe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Congo	0	0	0	0	0	0	0	0	12	13	9	8	1	0	0	0
Zaire	18	0	0	12	12	12	0	0	1	14	0	0	0	0	8	2
Ethiopia	38	33	8	18	6	0	12	0	0	37	0	0	0	21	39	64
Somalia	0	0	0	0	0	0	0	0	0	0	87	0	0	0	47	10
Uganda	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kenya	0	11	0	0	15	10	12	0	6	26	30	8	14	12	0	0
Angola	8	2	29	45	57	48	33	16	33	42	51	19	5	7	3	19
Tanzania	0	3	0	48	45	25	79	43	34	18	0	12	4	0	4	0
Mozambique	28	40	27	22	29	23	0	0	0	72	39	20	13	32	27	3
Namibia	0	0	0	0	0	0	0	0	0	0	0	24	101	8	0	5
Lesotho	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Africa	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	15
Madagascar	44	23	27	31	43	54	64	94	76	30	6	0	21	20	15	3
Mauritius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seychelles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[9]No crew months were reported for Botswana, Burkina Faso (formerly Upper Volta), Burundi, Cape Verde, Comoros, Djibouti, Malawi, Rwanda, Swaziland, Zambia, or Zimbabwe.

Area	1950-65	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Total
Africa[9]--Continued																	
Morocco	876	46	9	61	75	73	78	49	21	13	154	103	49	8	2	20	1637
Algeria	4202	67	173	133	144	208	256	312	270	280	290	265	303	300	300	300	7803
Tunisia	742	104	78	46	57	35	24	55	61	64	38	6	24	43	56	65	1498
Libya	6097	185	271	241	311	218	137	86	34	45	88	75	94	102	87	106	8177
Egypt	703	101	109	94	78	100	120	116	30	57	122	122	132	64	43	60	2051
Western Sahara	585	1	0	1	4	1	7	7	1	0	0	0	0	0	0	0	607
Mauritania	37	0	0	1	1	0	12	46	5	0	0	0	0	0	0	0	102
Mali	6	0	0	0	0	0	0	0	23	40	0	0	0	0	3	1	73
Niger	164	0	0	0	0	16	31	31	29	15	8	0	11	17	3	1	326
Chad	27	0	0	0	0	9	8	11	6	0	8	28	16	15	4	0	132
Sudan	467	0	1	3	0	0	0	0	0	4	15	15	23	17	24	26	595
Senegal	432	3	6	1	4	0	12	24	23	16	2	2	0	0	0	13	538
The Gambia	16	0	0	0	1	0	0	0	2	1	3	0	0	0	0	3	26
Guinea-Bissau	22	1	0	1	0	0	0	0	3	0	0	0	0	0	0	0	27
Guinea	15	0	0	0	0	1	0	0	0	4	0	0	0	0	0	2	22
Sierra Leone	2	0	0	0	0	5	0	1	0	0	0	0	0	0	0	6	14
Liberia	0	0	0	0	1	3	1	1	0	0	0	0	0	0	0	0	6
Ivory Coast	36	0	0	0	0	1	9	0	3	2	5	1	6	5	1	3	72
Ghana	2	0	8	0	2	3	1	5	2	2	1	0	2	1	3	1	33
Togo	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Benin	5	0	0	1	4	0	1	1	0	0	1	0	0	0	0	0	13
Nigeria	1335	189	116	63	73	100	170	165	91	94	51	58	37	111	83	18	2754
Cameroon	104	1	5	16	17	14	6	2	3	1	1	15	10	24	39	57	315
Central African Rep.	13	0	0	0	0	0	0	0	1	0	2	1	4	0	2	0	23
Equatorial Guinea	18	0	0	3	1	8	0	0	0	0	0	0	0	0	0	6	36
Gabon	687	34	22	15	7	22	27	17	28	31	61	85	46	31	23	31	1167
Sao Tome and Principe	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	7
Congo	43	0	0	0	1	0	1	2	1	9	3	2	1	4	3	28	98
Zaire	79	1	0	0	0	8	12	10	0	29	9	2	4	0	0	0	154
Ethiopia	276	64	43	24	1	1	6	17	46	60	10	0	0	0	0	0	548
Somalia	144	21	49	113	5	8	0	0	0	0	0	0	0	0	2	19	361
Uganda	0	0	0	0	15	0	1	0	0	0	0	0	0	0	0	0	16
Kenya	144	7	12	24	24	15	0	3	10	34	27	25	0	0	0	6	331
Angola	417	9	35	55	48	46	62	40	34	19	18	2	0	1	3	10	799
Tanzania	315	0	0	0	5	9	46	20	3	0	19	3	0	0	0	0	420
Mozambique	375	25	28	38	42	30	1	0	0	0	0	0	0	0	0	0	539
Namibia	138	0	0	12	25	25	4	7	13	4	2	3	0	0	0	0	233
Lesotho	0	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	11
South Africa	19	117	158	10	123	43	26	42	13	73	8	13	3	0	5	12	665
Madagascar	551	6	0	13	43	14	31	48	15	6	0	0	0	0	0	0	727
Mauritius	0	0	0	0	0	0	1	6	4	1	5	0	0	0	0	0	17
Seychelles	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	3	7

TABLE 1.—*Crew months of geologic and geophysical exploration by year, 1950–80,*

Area	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
Asia[10] (fig. 1E)																
Pakistan	0	0	18	6	48	47	64	85	114	127	92	45	44	61	42	86
Maldives	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
India	9	18	20	0	33	57	37	20	212	82	370	240	244	302	300	477
Bangladesh	4	9	11	6	9	24	26	39	39	50	26	15	6	18	0	0
Burma	0	0	0	0	0	0	9	0	0	21	2	0	46	40	0	0
Thailand	0	0	0	0	0	0	0	0	0	0	18	0	0	0	6	2
Sri Lanka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malaysia	71	78	84	86	73	0	65	39	26	13	1	0	0	7	1	18
Brunei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Timor[11]	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1
Indonesia[12]	285	247	215	175	149	107	123	87	73	58	42	3	4	20	97	100
Japan	81	208	150	88	158	116	40	219	352	177	150	157	133	104	90	96
South Korea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taiwan	0	0	0	0	0	0	36	15	0	0	70	70	71	80	90	15
Philippines	9	12	18	12	6	6	106	203	273	298	330	350	149	68	87	40
Southwestern Pacific (fig. 1F)																
Papua New Guinea	46	42	48	63	79	66	62	72	53	24	18	6	0	0	7	18
Oceania[13]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australia	0	36	32	91	166	227	160	218	221	34	150	90	390	433	426	495
New Caledonia[14]	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
New Zealand	0	0	0	0	0	8	59	88	85	56	55	43	24	50	0	0
Total	2870	3766	3563	4327	4623	5270	5766	7402	8397	7022	7110	6133	6072	5774	5917	5880

[10]No crew months were reported for Afghanistan, Bhutan, Nepal, or Singapore.
[11]East Timor is listed separately although it is part of Indonesia.
[12]Data for Indonesia exclude those for East Timor.
[13]For this report, Oceania is considered to consist of Fiji, Kiribati, Nauru, Solomon Islands, Tonga, Tuvalu, Vanuatu (formerly New Hebrides), and Western Samoa.
[14]New Caledonia is listed separately although it is an overseas territory of France.

for non-Communist countries except the United States and Canada—Continued

Area	1950-65	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Total
Asia[10]--Continued																	
Pakistan	879	58	60	144	76	94	24	127	53	70	36	81	52	37	54	104	1949
Maldives	0	0	0	0	0	0	0	0	6	1	0	2	0	0	0	0	9
India	2421	305	384	0	0	0	477	145	384	300	18	588	360	362	392	0	6136
Bangladesh	282	0	0	0	40	0	0	12	1	1	24	22	0	32	0	0	414
Burma	118	0	0	0	36	2	98	105	176	3	10	0	0	0	0	0	548
Thailand	26	0	0	11	8	0	1	7	6	5	0	1	2	0	17	60	144
Sri Lanka	0	0	0	0	0	0	0	1	1	15	24	2	0	0	0	0	43
Malaysia	562	0	0	0	43	3	13	13	12	7	12	5	20	2	6	16	714
Brunei	0	50	69	14	0	0	0	1	5	0	12	15	8	3	6	0	183
East Timor[11]	3	12	1	5	0	1	1	0	12	2	0	0	0	0	0	0	37
Indonesia[12]	1785	88	18	71	28	219	438	388	599	466	400	204	118	173	507	240	5742
Japan	2319	110	101	97	118	0	12	108	50	92	0	84	63	39	432	52	3677
South Korea	0	0	0	0	0	1	2	6	8	1	0	0	0	0	0	0	18
Taiwan	447	74	58	66	59	56	5	0	51	41	12	58	44	38	32	35	1076
Philippines	1967	11	19	0	0	22	6	3	30	5	25	30	31	38	41	49	2277
Southwestern Pacific--Continued																	
Papua New Guinea	604	13	38	21	43	9	7	24	0	0	11	11	5	0	0	1	787
Oceania[13]	0	0	0	0	2	1	2	2	9	0	0	0	0	5	6	5	32
Australia	3169	404	226	165	175	178	86	119	40	41	15	77	45	112	125	350	5327
New Caledonia[14]	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
New Zealand	468	2	3	3	28	10	23	34	9	5	0	6	0	11	7	2	611
Total	89892	5626	5674	4782	4577	4653	5101	4926	4101	4081	3903	4965	4223	4654	5364	5781	162309

TABLE 2.—*Exploratory wells by year, 1950–80, for non-Communist*

[Exploratory wells include, but are not limited to, wildcat wells. Data are from the annual foreign developments issues of the *Bulletin of the*

Area	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
Latin America and the Caribbean[1] (fig. 1A)																
Mexico	100	129	111	128	121	114	113	108	76	133	176	160	133	99	109	139
Bahamas	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Cuba[2]	0	0	0	1	0	31	45	27	28	10	0	11	4	0	7	0
Haiti	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
Dominican Republic	0	0	0	0	0	0	0	0	3	0	2	0	0	0	0	0
Jamaica	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0
Barbados	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0
Lesser Antilles[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Belize	0	0	0	0	0	1	1	1	6	0	0	1	4	1	0	0
Honduras	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Guatemala	0	0	0	0	0	0	0	0	5	0	3	2	1	0	0	0
Nicaragua	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Costa Rica	0	0	0	0	0	3	2	0	1	2	2	0	1	2	0	0
Panama	0	0	0	0	0	0	1	1	2	0	0	1	3	0	0	0
Colombia	4	8	50	14	24	20	18	26	32	60	50	39	20	22	30	20
Venezuela	66	99	111	151	178	165	140	174	193	110	72	80	64	51	53	56
Trinidad and Tobago	9	9	7	5	9	10	22	19	12	17	24	31	20	37	53	37
Guyana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Suriname	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
French Guiana[4]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ecuador	2	4	25	24	23	26	16	25	3	6	8	4	0	0	6	21
Peru	32	43	38	62	55	24	31	16	14	3	21	26	25	26	8	30
Bolivia	2	1	0	0	6	2	5	0	9	12	18	14	13	10	13	16
Uruguay	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Paraguay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brazil	6	4	4	6	6	10	8	38	56	92	95	76	70	89	86	98
Chile	5	4	6	12	20	13	15	17	20	19	11	14	19	14	14	8
Argentina	0	23	47	40	54	48	51	38	33	0	121	84	130	76	55	78

[1]No exploratory wells were reported for El Salvador.

[2]Data for Cuba are incomplete for 1960–80.

[3]For this report, the Lesser Antilles are considered to consist of the islands from Grenada to St. Thomas, except Barbados, which is listed separately.

[4]French Guiana is listed separately although it is an overseas department of France.

countries except the United States and Canada

American Association of Petroleum Geologists. Exploratory wells drilled in 1951–80 are summarized in figure 1]

Area	1950–65	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Total
Latin America and the Caribbean[1]--Continued																	
Mexico	1949	153	135	151	134	130	129	143	104	98	87	79	79	83	83	85	3622
Bahamas	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	3
Cuba[2]	164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	164
Haiti	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	5
Dominican Republic	5	0	0	1	7	2	0	0	0	0	0	0	0	0	3	0	18
Jamaica	4	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	7
Barbados	3	9	1	0	0	1	2	0	0	0	0	0	0	1	0	0	17
Lesser Antilles[3]	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Belize	15	0	2	0	0	0	0	5	3	0	4	0	0	0	2	0	31
Honduras	1	0	0	0	1	0	1	3	3	0	1	0	0	2	0	2	14
Guatemala	11	0	0	2	0	0	0	1	1	2	3	5	0	0	3	4	32
Nicaragua	1	0	1	2	5	8	3	0	0	3	2	0	3	3	0	0	31
Costa Rica	13	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	14
Panama	8	0	0	0	0	0	1	0	0	2	0	0	0	1	1	0	13
Colombia	437	24	18	21	30	16	17	20	20	24	14	21	27	29	30	34	782
Venezuela	1763	26	31	29	33	38	44	64	63	76	35	45	48	46	63	142	2546
Trinidad and Tobago	321	36	14	23	20	21	35	23	15	13	14	12	17	8	13	13	598
Guyana	0	3	6	0	0	0	1	0	0	2	3	1	0	0	0	0	16
Suriname	1	2	1	4	17	7	1	0	0	0	1	0	0	1	0	0	35
French Guiana[4]	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2
Ecuador	193	31	14	8	8	20	15	20	8	5	3	3	5	3	9	0	345
Peru	454	24	50	36	38	28	21	25	31	43	43	36	37	28	3	13	910
Bolivia	121	15	28	28	15	10	4	8	4	7	7	16	14	13	12	6	308
Uruguay	1	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	4
Paraguay	0	0	3	0	0	0	11	6	0	0	1	1	3	3	1	0	29
Brazil	744	98	110	115	86	100	87	80	78	86	87	105	100	89	134	166	2265
Chile	211	15	10	17	19	24	20	33	20	25	23	22	7	14	22	16	498
Argentina	878	116	92	85	86	113	145	110	139	117	78	83	143	81	71	110	2447

TABLE 2.—*Exploratory wells by year, 1950–80, for non-Communist*

Area	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
Western Europe[5] (fig. 1B)																
Norway	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sweden	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Denmark	2	2	1	3	0	0	2	0	9	2	0	0	0	0	0	0
Ireland	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	0
United Kingdom	2	1	1	4	7	15	10	6	17	9	8	4	0	6	5	21
Netherlands	11	11	7	17	14	9	7	8	8	11	4	4	4	4	23	40
Germany, Fed. Rep. of	63	125	140	80	103	107	113	107	123	99	76	53	49	46	16	36
North Sea[6]	0	0	0	0	0	0	0	0	0	0	0	1	3	0	1	13
France	31	17	34	42	42	17	42	98	138	132	111	104	102	105	78	58
Switzerland	0	0	0	1	0	0	0	0	1	0	3	2	1	2	3	2
Austria	0	0	0	0	0	0	15	21	13	17	17	11	11	11	13	17
Italy	6	3	35	26	27	41	56	72	72	80	78	68	83	69	70	37
Greece	0	0	0	0	2	0	1	8	1	0	0	6	6	9	0	2
Portugal	1	0	0	0	14	6	1	2	5	8	1	1	1	4	0	0
Spain	2	3	3	2	4	12	15	17	15	13	9	14	19	23	11	15
Malta	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Middle East (fig. 1C)																
Turkey	1	4	4	2	1	0	0	7	11	21	21	39	19	16	14	23
Cyprus	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Syria	1	0	0	0	0	0	1	0	1	4	2	0	0	0	0	0
Lebanon	0	0	0	1	0	0	0	0	0	0	1	0	0	2	6	0
Israel	0	0	0	1	1	8	10	7	7	4	6	4	7	6	12	10
Jordan	0	0	0	0	0	0	0	1	1	3	1	0	0	0	1	5
Iraq	1	2	0	6	5	4	8	6	7	5	10	5	0	0	0	0
Iran	2	0	1	0	0	0	2	4	2	3	3	6	9	8	16	7
Saudi Arabia	0	7	6	1	2	6	3	1	0	0	10	10	8	2	3	7
Kuwait	0	2	2	0	2	1	2	1	2	3	2	8	3	6	5	5
Neutral Zone[7]	3	1	1	0	3	2	1	0	0	0	1	4	7	9	0	2
Bahrain	4	11	0	0	9	4	2	0	0	1	0	1	1	3	0	1
Qatar	0	0	1	2	0	1	1	0	0	0	3	1	1	4	6	0
Oman	0	0	0	0	0	0	1	1	0	1	2	0	3	2	0	1
North Yemen	0	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0
South Yemen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
United Arab Emirates	0	1	1	0	1	1	2	2	3	4	4	0	4	5	8	5

[5]No exploratory wells were reported for Andorra, Belgium, Finland, Iceland, Liechtenstein, Luxemburg, or Monaco.
[6]North Sea data given separately here are also included in the totals for Denmark, the Federal Republic of Germany, the Netherlands, Norway, and the United Kingdom.
[7]The Neutral Zone is shown in figure 28.

Area	1950-65	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Total
Western Europe[5]--Continued																	
Norway	0	1	5	11	14	13	13	14	13	18	14	21	14	14	26	35	226
Sweden	1	1	3	1	0	0	5	22	21	25	31	5	7	32	11	21	186
Denmark	21	3	1	7	2	3	3	1	4	3	5	7	5	3	2	4	74
Ireland	6	0	0	0	0	0	3	3	3	4	7	6	6	15	8	3	64
United Kingdom	116	33	39	39	55	34	32	34	55	74	93	70	72	45	60	81	932
Netherlands	182	10	4	19	35	27	29	33	18	19	24	26	28	28	31	37	550
Germany, Fed. Rep. of.	1336	57	40	42	45	24	27	26	22	30	26	29	37	27	49	37	1854
North Sea[6]	18	27	41	59	80	54	53	50	76	92	124	109	107	78	98	134	1200
France	1151	30	23	15	23	14	7	11	11	9	11	15	14	17	24	24	1399
Switzerland	15	1	0	0	0	0	0	0	1	0	0	0	1	1	0	1	20
Austria	146	16	8	14	19	15	25	21	21	24	37	36	26	33	28	26	495
Italy	823	46	24	31	38	27	40	43	24	20	24	25	20	61	43	60	1349
Greece	35	1	10	0	0	2	1	2	3	4	0	1	5	3	5	5	77
Portugal	44	0	0	0	0	0	0	0	0	3	8	8	1	0	2	0	66
Spain	177	17	14	17	9	7	13	7	19	10	16	23	18	18	18	24	407
Malta	1	0	0	0	0	0	1	2	1	0	0	0	0	0	0	1	6
Middle East--Continued																	
Turkey	183	31	21	21	11	34	21	25	35	37	56	53	33	26	12	29	628
Cyprus	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3
Syria	9	1	0	1	1	1	1	1	0	1	0	0	0	0	3	2	21
Lebanon	10	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	12
Israel	83	11	10	12	5	8	6	4	2	1	9	12	12	5	7	11	198
Jordan	12	0	0	0	1	0	3	0	0	0	0	0	0	1	0	0	17
Iraq	59	0	0	0	2	1	0	1	3	2	1	2	5	0	0	0	76
Iran	63	19	40	9	11	8	10	6	36	26	26	26	25	17	2	5	329
Saudi Arabia	66	3	8	6	3	2	4	10	7	9	21	16	12	8	37	40	252
Kuwait	44	5	1	1	0	1	2	2	0	0	0	2	1	0	7	0	66
Neutral Zone[7]	34	3	2	0	0	0	0	0	1	0	0	0	0	0	0	0	40
Bahrain	37	1	0	0	0	0	0	1	1	0	1	0	0	1	0	1	43
Qatar	20	0	5	0	0	3	4	5	1	0	0	2	0	2	2	4	48
Oman	11	0	0	0	5	2	10	16	7	0	0	0	9	19	19	17	115
North Yemen	6	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	8
South Yemen	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	4
United Arab Emirates	41	16	11	13	12	14	9	15	16	12	9	20	9	0	0	14	211

TABLE 2.—*Exploratory wells by year, 1950–80, for non-Communist*

Area	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
Africa[8] (fig. 1D)																
Morocco	20	66	38	53	40	26	12	5	5	3	4	13	8	3	8	5
Algeria	14	12	11	11	18	22	46	30	39	37	48	64	62	25	46	24
Tunisia	3	0	3	7	12	5	4	4	5	5	0	1	8	4	4	7
Libya	0	0	0	0	0	0	0	4	25	41	98	125	173	245	167	136
Egypt	6	0	0	0	3	4	2	5	5	2	6	4	6	12	9	8
Western Sahara	0	0	0	0	0	0	0	0	0	0	2	13	30	7	4	3
Mauritania	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mali	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Niger	0	0	0	0	0	0	0	0	0	0	0	0	6	1	2	0
Chad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sudan	0	0	0	0	0	0	0	0	0	0	0	1	3	2	0	0
Senegal	0	0	0	0	0	0	0	0	3	11	5	8	1	0	0	0
The Gambia	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Guinea-Bissau	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0
Guinea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Liberia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ivory Coast	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0
Ghana	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0
Togo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Benin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nigeria	0	0	1	2	10	7	4	1	17	37	25	15	5	22	37	65
Cameroon	0	0	14	3	2	2	3	3	1	1	0	0	0	0	0	1
Equatorial Guinea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gabon	0	0	0	0	0	0	0	0	25	19	7	8	15	4	2	8
Congo	0	0	0	0	0	0	0	0	2	1	6	1	2	1	0	0
Zaire	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1
Ethiopia	1	0	1	1	0	6	0	0	0	0	0	0	0	1	0	1
Somalia	0	0	0	0	0	0	0	2	2	5	4	3	4	0	1	4
Uganda	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kenya	0	0	0	0	0	0	1	0	1	2	2	1	1	2	0	0
Angola	0	0	0	3	4	1	8	6	4	10	11	10	6	10	6	10
Tanzania	0	0	0	0	0	0	1	0	4	5	5	0	1	0	0	0
Mozambique	0	0	0	2	0	0	1	2	0	0	0	1	3	2	0	5
Namibia	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0
Lesotho	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Africa	0	0	0	0	1	1	3	0	0	0	0	0	1	0	0	0
Madagascar	0	1	2	0	0	3	3	4	5	3	6	0	0	1	0	1
Mauritius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seychelles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[8]No exploratory wells were reported for Botswana, Burkina Faso (formerly Upper Volta), Burundi, Cape Verde, Central African Republic, Comoros, Djibouti, Malawi, Rwanda, Sao Tome and Principe, Sierra Leone, Swaziland, Zambia, or Zimbabwe.

Area	1950-65	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Total
Africa[8]--Continued																	
Morocco	309	12	9	8	14	1	8	7	4	2	5	8	5	4	7	10	413
Algeria	509	17	17	17	31	37	25	10	13	9	17	11	15	23	33	32	816
Tunisia	72	7	10	5	4	6	13	12	9	16	8	10	10	11	13	15	221
Libya	1014	62	41	80	70	51	41	34	25	32	45	22	33	41	28	37	1656
Egypt	72	14	7	21	23	33	22	26	15	12	20	34	30	24	33	45	431
Western Sahara	59	4	5	0	1	1	0	1	1	0	0	0	0	0	0	0	72
Mauritania	0	0	0	0	3	2	0	1	1	3	0	0	0	0	0	1	11
Mali	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Niger	9	0	0	0	0	0	0	0	0	0	6	0	0	0	3	3	21
Chad	0	0	0	0	0	0	0	0	0	4	4	4	3	5	1	0	21
Sudan	6	0	0	0	0	0	0	0	0	0	1	2	1	4	6	8	28
Senegal	28	2	5	2	3	5	6	1	0	0	1	2	1	0	0	0	56
The Gambia	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3
Guinea-Bissau	4	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	9
Guinea	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2
Liberia	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4
Ivory Coast	4	0	0	0	0	0	0	2	1	1	3	1	10	5	3	2	32
Ghana	4	1	1	0	0	11	2	1	1	1	5	0	2	1	2	0	32
Togo	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	3
Benin	0	0	0	2	2	4	0	1	2	0	0	0	0	0	0	0	11
Nigeria	248	66	79	38	27	31	55	61	45	51	33	21	24	35	22	31	867
Cameroon	30	0	4	1	1	6	2	5	3	5	7	7	32	21	25	17	166
Equatorial Guinea	0	0	0	5	0	0	1	0	0	0	0	0	0	0	0	0	6
Gabon	88	9	10	10	20	13	11	17	15	13	23	19	19	20	22	15	324
Congo	13	0	0	0	1	1	2	7	4	6	4	0	0	6	11	11	66
Zaire	4	0	0	0	0	2	1	6	3	0	4	2	1	5	1	0	29
Ethiopia	11	2	0	0	2	1	0	3	5	3	0	0	1	0	0	0	28
Somalia	25	1	1	2	2	0	0	1	0	1	1	0	1	0	0	1	36
Uganda	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Kenya	10	0	1	1	0	1	2	0	0	0	1	2	0	1	0	0	19
Angola	89	15	24	55	31	25	29	15	8	20	10	0	6	6	6	2	341
Tanzania	16	0	0	0	0	0	0	0	0	2	0	3	1	0	1	0	23
Mozambique	16	1	16	0	0	12	5	1	0	0	0	0	0	0	0	0	51
Namibia	4	0	0	0	0	3	0	0	1	1	0	0	0	0	0	0	9
Lesotho	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
South Africa	6	6	2	2	9	15	13	10	18	5	7	8	12	9	12	8	142
Madagascar	29	0	0	0	0	1	8	1	2	4	1	0	0	0	0	0	46
Mauritius	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Seychelles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1

TABLE 2.—*Exploratory wells by year, 1950–80, for non-Communist*

Area	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
Asia[9] (fig. 1E)																
Pakistan	1	0	3	0	2	2	2	9	3	9	6	4	4	3	3	4
Maldives	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
India	2	0	0	2	4	0	3	10	5	6	7	3	0	5	0	0
Bangladesh	0	0	0	0	0	0	0	0	0	0	4	1	4	0	0	0
Burma	0	0	0	0	0	0	0	0	2	4	3	3	15	0	0	0
Thailand	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0
Sri Lanka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malaysia	0	1	1	4	3	10	7	8	2	2	9	6	8	3	4	0
Brunei	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Timor[10]	0	0	0	0	0	0	0	8	0	1	2	1	3	0	0	0
Indonesia[11]	19	24	14	9	7	7	9	15	12	18	20	0	0	28	19	14
Japan	1	6	3	25	39	40	18	45	79	72	44	98	95	55	95	105
South Korea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taiwan	3	0	0	0	2	5	4	6	0	5	4	7	4	5	1	5
Philippines	3	0	3	1	0	0	1	2	4	9	32	12	8	2	15	0
Southwestern Pacific[12] (fig. 1F)																
Papua New Guinea	8	5	8	1	12	14	7	8	8	5	5	0	1	0	0	1
Oceania[13]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australia	0	1	1	2	20	37	61	47	27	52	23	17	53	107	137	155
New Zealand	0	0	0	0	0	0	0	0	0	1	2	1	2	4	8	7
Total	440	630	739	758	915	897	965	1091	1216	1254	1372	1316	1385	1329	1295	1367

[9]No exploratory wells were reported for Afghanistan, Bhutan, Nepal, or Singapore.
[10]East Timor is listed separately although it is part of Indonesia.
[11]Data for Indonesia exclude those for East Timor.
[12]No exploratory wells were reported for New Caledonia (an overseas territory of France).
[13]For this report, Oceania is considered to consist of Fiji, Kiribati, Nauru, Solomon Islands, Tonga, Tuvalu, Vanuatu (formerly New Hebrides), and Western Samoa.

Area	1950-65	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Total
Asia[9]--Continued																	
Pakistan	55	3	6	5	4	6	4	3	3	5	5	1	4	6	11	10	131
Maldives	0	0	0	0	3	0	0	0	0	0	0	1	0	0	0	0	4
India	47	0	0	0	10	0	0	7	10	0	0	0	22	66	65	14	241
Bangladesh	9	0	0	0	0	0	0	0	1	0	2	5	5	2	0	0	24
Burma	27	0	0	0	0	1	0	6	0	6	10	9	0	0	0	11	70
Thailand	4	0	0	0	0	0	1	4	3	14	10	17	3	8	10	14	88
Sri Lanka	0	0	0	0	0	0	0	0	0	1	0	3	0	0	0	0	4
Malaysia	68	9	12	17	22	14	11	19	18	31	11	12	14	16	58	44	376
Brunei	0	0	0	0	5	0	0	6	10	0	0	11	3	7	5	1	48
East Timor[10]	15	0	0	0	2	3	3	3	0	0	4	0	0	0	0	0	30
Indonesia[11]	215	3	5	17	32	84	135	137	169	168	180	130	115	146	154	182	1872
Japan	820	78	67	71	49	0	4	8	36	28	25	19	29	36	25	24	1319
South Korea	0	0	0	0	0	0	0	1	5	0	2	0	0	0	0	2	10
Taiwan	51	6	8	15	15	5	9	5	18	17	18	10	15	20	18	30	260
Philippines	92	0	0	0	0	2	17	8	10	7	13	8	15	18	23	23	236
Southwestern Pacific[12]--Continued																	
Papua New Guinea	83	2	4	8	4	2	2	1	6	0	3	2	1	1	0	0	119
Oceania[13]	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3	2	7
Australia	740	100	83	86	51	110	65	92	61	51	20	17	17	51	49	67	1660
New Zealand	25	3	1	1	10	10	9	6	0	0	5	7	3	3	2	4	89
Total	16973	1282	1205	1252	1246	1261	1321	1376	1340	1353	1344	1245	1302	1385	1502	1741	37124

TABLE 3.—*Wildcat wells through 1982 and by year from 1951 to 1982 for*

[Data are from a computer tape released in April 1983 by Petroconsultants, S.A., Geneva.

Area	Pre-1951	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Latin America and the Caribbean[1] (fig. 1A)																		
Mexico	74	8	6	3	9	8	10	9	10	10	21	21	14	0	0	0	0	0
Bahamas	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Cuba[2]	3	0	1	0	3	12	28	21	21	11	3	6	1	0	7	2	0	0
Haiti	2	0	0	0	0	1	2	0	0	1	0	0	0	0	0	0	0	0
Dominican Republic	2	0	0	0	0	0	0	0	4	0	2	3	0	0	0	0	0	2
Jamaica	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0
Barbados	1	0	0	0	2	1	2	0	1	0	0	0	0	0	0	0	9	3
Lesser Antilles[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Belize	0	0	0	0	0	0	2	1	6	2	0	1	1	1	0	0	0	2
Honduras	2	0	0	0	0	0	1	1	0	0	0	0	0	1	0	2	4	1
Guatemala	1	0	0	0	0	0	0	0	1	3	2	2	1	0	0	0	0	0
Nicaragua	5	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Costa Rica	7	0	0	0	0	3	2	3	1	3	2	0	2	3	0	0	0	0
Panama	11	0	0	0	0	0	2	1	2	2	0	1	4	0	0	0	0	0
Colombia	116	8	7	11	22	12	14	21	30	30	35	34	22	24	21	19	20	18
Venezuela	431	30	29	30	37	57	49	70	124	73	27	31	14	9	2	13	4	10
Trinidad and Tobago	0	1	2	1	2	7	9	0	9	9	6	5	7	13	7	6	1	1
Guyana	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Suriname	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	4	1
French Guiana[4]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ecuador	35	1	1	1	4	0	0	2	1	5	9	1	0	1	1	0	0	3
Peru	25	4	3	2	12	7	7	7	8	1	3	5	4	4	1	5	4	5
Bolivia	21	0	0	0	3	3	2	1	12	7	12	12	16	11	11	7	12	16
Uruguay	28	0	0	0	0	1	2	0	2	1	0	0	0	0	0	0	1	0
Paraguay	5	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	3
Brazil	5	4	2	3	0	10	6	16	23	33	51	33	33	41	34	35	35	27
Chile	15	3	6	3	8	3	2	8	6	3	8	13	21	14	13	13	16	12
Argentina	27	7	4	3	11	8	28	15	6	20	63	45	40	30	19	46	47	30

[1]No wildcat wells were reported for El Salvador.
[2]Data for Cuba are incomplete for 1960–82.
[3]For this report, the Lesser Antilles are considered to consist of the islands from Grenada to St. Thomas, except Barbados, which is listed separately.
[4]French Guiana is listed separately although it is an overseas department of France.

Wildcat wells drilled in 1951–80 are summarized in figure 1. unkn, unknown]

Area	Pre-1968	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	Date unkn	Total
Latin America and the Caribbean[1]--Continued																		
Mexico	203	0	0	0	0	0	0	0	0	1	27	7	5	1	3	0	0	247
Bahamas	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	4
Cuba[2]	119	1	2	0	0	0	0	0	0	0	1	0	0	0	0	0	116	239
Haiti	6	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	2	11
Dominican Republic	13	0	6	1	0	0	0	0	0	0	0	0	3	0	1	1	4	29
Jamaica	4	0	0	1	1	0	1	0	0	0	0	0	0	0	0	4	0	11
Barbados	19	0	0	1	2	0	0	0	0	0	0	1	0	0	0	0	22	45
Lesser Antilles[3]	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	2
Belize	16	0	0	0	0	5	2	1	4	0	2	0	2	0	3	2	0	37
Honduras	12	0	1	0	1	3	3	0	1	0	0	2	0	2	0	0	0	25
Guatemala	10	1	0	0	0	3	3	2	1	3	4	0	1	3	7	9	1	48
Nicaragua	7	2	4	8	3	0	0	2	3	0	2	3	0	0	0	0	2	36
Costa Rica	26	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	27
Panama	23	0	0	0	1	0	0	2	0	0	0	1	1	0	0	0	0	28
Colombia	464	19	20	21	16	18	20	15	11	14	14	14	24	28	54	58	109	919
Venezuela	1040	3	7	1	1	17	16	11	6	11	1	9	12	4	0	1	21	1161
Trinidad and Tobago	86	9	3	4	10	14	8	5	7	9	6	3	2	2	1	3	14	186
Guyana	3	0	0	0	1	0	0	2	3	1	0	0	0	0	0	2	0	12
Suriname	9	4	3	4	1	0	0	0	1	0	0	1	0	0	0	3	13	39
French Guiana[4]	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Ecuador	65	4	5	11	13	18	7	5	1	2	4	3	9	5	0	4	8	164
Peru	107	5	2	11	5	17	12	16	38	10	12	7	1	3	5	8	5	264
Bolivia	146	10	2	5	3	5	4	5	6	12	8	9	8	4	14	8	0	249
Uruguay	35	0	0	0	0	0	0	0	0	2	0	1	1	0	0	0	28	67
Paraguay	12	0	0	0	11	5	0	0	1	1	3	3	0	0	1	0	0	37
Brazil	391	12	12	21	26	23	40	29	37	40	26	54	75	67	67	78	11	1009
Chile	167	16	18	17	18	31	17	27	16	14	3	4	1	3	11	1	48	412
Argentina	449	28	25	60	61	47	41	13	31	41	72	42	42	47	55	44	173	1271

TABLE 3.—*Wildcat wells through 1982 and by year from 1951 to 1982 for*

Area	Pre-1951	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Western Europe[5] (fig. 1B)																		
Norway	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5
Sweden	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Denmark[6]	7	4	4	3	0	0	0	0	9	2	0	0	0	0	0	0	3	2
Ireland	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0
United Kingdom	113	0	0	5	5	9	5	4	14	10	8	5	3	5	6	28	31	41
Netherlands	42	11	8	12	11	8	4	4	6	10	3	2	8	2	23	35	9	2
Belgium	0	0	0	0	0	0	0	0	0	0	1	0	2	0	1	0	0	0
Germany, Fed. Rep. of	60	51	38	59	88	45	103	85	23	71	74	46	47	18	54	31	45	31
North Sea[7]	0	0	0	0	0	0	0	0	0	0	0	1	6	0	2	18	27	39
France	36	15	11	17	20	26	42	58	91	116	102	101	100	92	77	57	30	25
Switzerland	3	0	0	0	0	0	0	0	1	0	3	2	1	2	3	1	1	0
Austria	0	0	0	0	0	0	2	2	4	5	10	5	8	8	10	7	12	7
Italy	39	2	6	23	18	32	43	79	66	85	99	84	107	91	80	47	63	30
Greece	0	0	0	0	0	0	1	1	1	0	0	6	5	6	2	1	0	10
Portugal	0	0	0	0	0	1	1	2	5	8	0	1	1	4	0	0	0	0
Spain	10	1	1	1	6	4	11	12	8	16	9	15	16	22	12	16	19	12
Malta	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Middle East[8] (fig. 1C)																		
Turkey	4	2	2	0	3	1	1	6	11	19	19	34	18	12	14	30	26	18
Cyprus	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	0	0	0
Syria	9	1	0	0	0	0	1	0	2	4	3	2	3	1	0	1	0	0
Lebanon	1	0	0	1	0	0	0	0	0	0	1	1	0	2	0	0	1	0
Israel	1	0	0	0	2	6	9	10	8	5	4	5	5	3	8	9	11	7
Jordan	0	0	0	0	0	0	0	1	1	3	1	0	0	0	0	2	0	0
Iraq	50	1	1	4	1	1	3	5	4	5	9	8	0	0	0	0	0	0
Iran	8	2	0	1	1	0	1	1	1	2	3	8	9	5	7	11	17	21
Saudi Arabia	7	2	0	0	0	0	1	0	2	0	0	0	0	2	2	2	3	9
Kuwait	1	1	1	0	0	1	1	1	0	3	0	1	3	12	1	2	5	1
Neutral Zone[9]	0	0	1	1	3	2	1	0	0	0	1	2	5	3	0	1	3	2
Bahrain	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1	1	0
Qatar	0	0	0	2	0	1	1	0	0	0	3	0	6	3	3	0	1	4
Oman	0	0	0	0	0	1	1	2	0	2	2	0	3	3	6	1	8	2
North Yemen	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
South Yemen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Abu Dhabi[10]	0	1	0	0	1	0	1	1	0	0	0	0	2	1	4	3	0	4
Al Fujayrah[10]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dubai[10]	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0
Ra's al Khaymah[10]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Sharjah[10]	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	1	0
Umm al Qaywayn[10]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1

[5]No wildcat wells were reported for Andorra, Finland, Iceland, Liechtenstein, Luxemburg, or Monaco.
[6]Data for Denmark include five wildcat wells in Greenland—one drilled in 1976 and four drilled in 1977.
[7]North Sea data given separately here are also included in the totals for Denmark, the Federal Republic of Germany, the Netherlands, Norway, and the United Kingdom.
[8]No wildcat wells were reported for Ajman, one of the United Arab Emirates.
[9]The Neutral Zone is shown in figure 28.
[10]One of the seven United Arab Emirates.

Area	Pre-1968	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	Date unkn	Total
Western Europe[5]--Continued																		
Norway	7	10	15	12	13	14	19	14	16	20	10	13	12	20	20	30	4	249
Sweden	2	2	0	0	4	10	13	14	28	6	7	34	11	12	18	9	11	181
Denmark[6]	34	7	2	3	2	0	4	2	3	8	9	3	1	4	2	5	0	89
Ireland	6	0	0	0	3	2	4	4	6	5	6	16	7	2	7	4	0	72
United Kingdom	292	37	50	29	33	33	55	68	80	62	71	34	36	34	52	77	13	1056
Netherlands	200	14	28	22	29	22	19	18	20	21	26	19	19	28	23	28	20	556
Belgium	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5
Germany, Fed. Rep. of	969	38	42	28	26	24	28	29	25	27	20	28	25	25	34	13	106	1487
North Sea[7]	93	58	74	49	53	48	71	82	108	91	108	63	54	67	65	107	0	1191
France	1016	13	25	13	6	10	12	9	11	14	13	17	20	21	39	34	19	1292
Switzerland	17	0	0	0	0	0	1	0	0	0	1	1	0	1	1	1	4	27
Austria	80	8	16	12	20	6	13	13	32	15	28	22	22	16	19	11	39	372
Italy	994	26	48	34	43	50	32	21	29	28	22	61	42	53	73	69	114	1739
Greece	33	0	0	2	1	1	3	3	0	1	5	2	4	5	4	11	6	81
Portugal	23	0	0	0	0	0	0	3	7	9	1	0	2	0	1	3	4	53
Spain	191	15	10	7	10	6	18	8	15	19	15	18	11	22	20	10	8	403
Malta	1	0	0	0	0	3	1	0	0	0	0	0	0	0	0	2	0	7
Middle East[8]--Continued																		
Turkey	220	25	10	31	16	23	25	33	42	40	23	23	10	15	13	25	12	586
Cyprus	4	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Syria	27	1	0	0	0	0	0	0	2	5	1	0	3	2	3	3	3	50
Lebanon	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Israel	93	9	5	8	4	5	2	0	8	8	16	7	1	7	6	8	14	201
Jordan	8	0	0	1	3	1	0	0	0	0	0	1	0	0	0	0	1	15
Iraq	92	0	2	0	1	0	3	2	1	3	2	1	0	0	0	0	0	107
Iran	98	18	15	16	10	10	19	22	22	21	11	14	7	1	0	0	3	287
Saudi Arabia	30	7	3	2	6	7	3	3	6	3	4	5	6	5	2	0	1	93
Kuwait	34	0	0	2	1	1	1	0	0	1	0	0	0	0	0	0	3	43
Neutral Zone[9]	25	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	4	32
Bahrain	5	0	0	0	0	1	1	0	1	0	0	1	0	1	0	0	1	11
Qatar	24	3	2	2	4	0	2	0	0	1	0	1	3	1	0	2	6	51
Oman	31	4	6	2	11	11	16	6	9	11	8	10	13	16	14	20	18	206
North Yemen	3	0	0	0	0	2	0	0	0	1	0	0	0	1	1	0	0	8
South Yemen	2	0	0	0	0	0	0	0	0	0	0	1	2	0	3	3	2	13
Abu Dhabi[10]	18	7	9	14	10	3	11	5	3	8	2	4	6	1	6	8	7	122
Al Fujayrah[10]	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	3
Dubai[10]	5	1	0	0	1	1	1	0	0	4	1	0	2	2	1	2	1	22
Ra's al Khaymah[10]	1	0	1	0	1	1	0	0	0	1	1	0	0	1	0	1	0	8
Sharjah[10]	5	0	0	0	1	1	1	1	0	0	0	1	0	2	1	2	0	15
Umm al Qaywayn[10]	2	0	0	0	1	0	0	0	0	2	1	0	0	0	1	0	0	7

TABLE 3.—*Wildcat wells through 1982 and by year from 1951 to 1982 for*

Area	Pre-1951	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Africa[11] (fig. 1D)																		
Morocco	0	0	0	0	0	1	0	1	1	4	3	14	13	2	8	6	10	7
Algeria	1	5	5	6	16	24	37	30	40	41	54	67	73	66	50	19	16	18
Tunisia	3	0	4	7	15	5	5	4	5	5	0	1	7	4	5	6	7	10
Libya	0	0	0	0	0	0	0	8	23	31	71	88	110	132	135	110	63	39
Egypt	111	0	0	0	4	5	4	7	4	3	7	9	8	11	9	9	14	8
Western Sahara	0	0	0	0	0	0	0	0	0	0	0	7	14	7	4	3	4	5
Mauritania	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Mali	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Niger	0	0	0	0	0	0	0	0	0	0	0	0	6	1	2	0	0	0
Chad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sudan	0	0	0	0	0	0	0	0	0	0	0	1	3	2	0	0	0	0
Senegal	0	0	0	0	0	1	1	0	3	7	8	7	2	0	0	0	2	5
The Gambia	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Guinea-Bissau	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0
Guinea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sierra Leone	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Liberia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ivory Coast	0	0	0	0	0	0	0	2	3	1	1	1	0	0	0	0	0	0
Ghana	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	1
Togo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Benin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nigeria	0	0	1	2	2	6	2	2	17	36	24	17	6	16	36	60	68	81
Cameroon	0	0	0	1	1	0	2	2	1	1	0	0	0	0	0	1	0	4
Equatorial Guinea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Gabon	0	3	9	9	5	8	5	11	24	18	8	8	15	5	1	7	8	10
Congo	0	0	0	0	0	0	0	0	1	1	6	1	2	1	0	0	0	0
Zaire	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	3	0	0
Ethiopia	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0
Somalia	0	0	0	0	0	0	1	4	7	6	3	3	2	3	1	3	1	1
Kenya	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	0	1
Angola	0	0	0	3	4	1	1	5	5	8	21	12	4	9	3	16	9	12
Tanzania	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0
Mozambique	0	0	0	2	0	0	1	2	0	0	0	1	3	2	0	5	1	16
Zimbabwe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Namibia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lesotho	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Africa	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	3
Madagascar	3	0	2	3	0	1	3	3	5	3	6	0	0	1	1	1	0	0
Mauritius	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seychelles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[11]No wildcat wells were reported for Botswana, Burkina Faso (formerly Upper Volta), Burundi, Cape Verde, Central African Republic, Comoros, Djibouti, Malawi, Rwanda, Sao Tome and Principe, Swaziland, Uganda, or Zambia.

Area	Pre-1968	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	Date unkn	Total
Africa[11]--Continued																		
Morocco	70	9	14	1	8	7	3	3	4	6	2	4	7	9	10	5	48	210
Algeria	568	18	29	39	26	9	9	14	16	28	23	8	3	2	0	0	5	797
Tunisia	93	5	3	5	11	13	9	16	8	9	8	7	12	16	33	17	39	304
Libya	810	77	71	47	40	26	17	18	39	23	26	34	20	17	24	23	11	1323
Egypt	213	25	25	34	23	20	16	12	17	31	35	24	27	32	34	36	47	651
Western Sahara	44	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	14	62
Mauritania	2	0	2	2	0	1	1	3	0	0	0	0	0	1	0	0	0	12
Mali	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2
Niger	9	0	0	0	0	0	0	0	7	0	0	0	3	2	0	2	0	23
Chad	0	0	0	0	0	0	0	4	2	4	3	5	1	0	0	0	0	19
Sudan	6	0	0	0	0	0	0	0	0	2	1	4	5	2	11	10	0	41
Senegal	36	2	3	5	5	1	0	0	1	2	1	0	0	0	0	1	14	71
The Gambia	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3
Guinea-Bissau	4	2	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	10
Guinea	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Sierra Leone	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Liberia	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Ivory Coast	8	0	0	0	0	2	1	1	0	0	3	5	3	1	3	8	0	35
Ghana	5	1	0	10	1	1	1	1	4	0	1	1	1	0	2	1	1	31
Togo	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Benin	0	1	1	2	0	0	2	0	0	0	0	0	0	0	0	0	0	6
Nigeria	376	40	21	24	55	56	42	53	36	16	28	33	27	35	23	20	0	885
Cameroon	13	0	1	6	2	4	2	3	7	4	24	13	13	16	15	7	1	131
Equatorial Guinea	1	5	0	0	1	0	0	0	0	0	0	0	0	0	0	4	0	11
Gabon	154	11	21	12	11	17	14	15	17	15	17	11	18	17	22	13	0	385
Congo	12	0	1	2	2	8	5	6	4	0	0	5	6	9	9	8	3	80
Zaire	6	0	0	0	2	6	5	0	4	2	2	2	1	0	3	4	0	37
Ethiopia	7	0	2	1	0	2	5	3	0	0	1	0	0	0	0	0	11	32
Somalia	35	2	2	0	0	0	1	1	1	1	1	0	0	1	0	3	0	48
Kenya	5	1	0	0	2	0	0	0	1	2	0	1	0	0	1	1	0	14
Angola	113	51	27	19	24	13	6	27	10	1	5	3	3	3	11	19	34	369
Tanzania	3	0	0	0	0	0	0	2	0	3	1	0	1	0	0	1	0	11
Mozambique	33	0	0	10	7	2	1	0	0	0	0	0	0	0	0	0	0	53
Zimbabwe	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Namibia	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	2	6
Lesotho	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
South Africa	8	3	12	14	18	11	17	1	15	16	11	10	5	8	3	1	18	171
Madagascar	32	0	0	1	8	1	2	4	1	0	0	0	0	0	0	0	0	49
Mauritius	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
Seychelles	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3

TABLE 3.—*Wildcat wells through 1982 and by year from 1951 to 1982 for*

Area	Pre-1951	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Asia[12] (fig. 1E)																		
Afghanistan	0	0	0	0	0	0	0	0	0	0	1	0	2	0	4	0	0	0
Pakistan	3	0	0	0	0	2	3	11	9	9	2	2	2	0	3	2	2	3
Maldives	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
India	4	0	0	2	0	0	1	2	4	3	6	6	7	5	8	15	8	5
Bangladesh	1	1	1	2	0	1	0	0	1	2	5	1	2	1	0	1	0	2
Burma	2	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0
Thailand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sri Lanka	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malaysia	0	2	0	1	1	3	0	3	3	0	2	2	8	2	2	0	3	5
Brunei	3	0	0	2	10	0	0	1	0	1	0	0	1	2	0	0	1	0
East Timor[13]	0	0	0	0	0	0	0	0	1	2	0	3	3	0	0	0	0	0
Indonesia[14]	0	1	1	1	5	4	4	1	0	3	2	0	0	7	14	3	4	5
Japan	0	0	0	0	0	0	0	0	1	2	0	3	0	2	1	3	2	4
South Korea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taiwan	1	0	0	0	0	0	0	0	0	0	0	0	1	1	5	3	8	9
Philippines	20	0	3	1	0	0	1	3	4	13	17	14	10	3	16	0	0	0
Southwestern Pacific[15] (fig. 1F)																		
Papua New Guinea	0	1	1	0	0	3	3	2	4	1	2	0	1	1	1	1	0	4
Oceania[16]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Australia	49	1	1	2	2	20	8	19	13	15	18	17	41	88	102	135	91	62
New Zealand	4	0	0	0	0	0	0	0	0	1	0	3	2	3	8	5	3	3
Total	1420	174	163	230	337	360	486	582	705	807	868	834	892	835	855	858	781	696

[12]No wildcat wells were reported for Bhutan, Nepal, or Singapore.

[13]East Timor is listed separately although it is part of Indonesia.

[14]Data for Indonesia exclude those for East Timor.

[15]No wildcat wells were reported for New Caledonia (an overseas territory of France).

[16]For this report, Oceania is considered to consist of Fiji, Kiribati, Nauru, Solomon Islands, Tonga, Tuvalu, Vanuatu (formerly New Hebrides), and Western Samoa; all wildcat wells in Oceania were drilled in Fiji.

Area	Pre-1968	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	Date unkn	Total
Asia[12]--Continued																		
Afghanistan	7	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Pakistan	53	4	2	1	3	4	3	6	4	2	3	2	4	2	8	2	2	105
Maldives	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
India	76	9	2	4	3	3	4	4	6	18	13	16	10	12	12	4	15	211
Bangladesh	21	2	1	2	0	0	0	0	0	5	5	1	0	1	2	2	1	43
Burma	8	0	0	0	0	3	3	6	9	10	0	0	0	0	7	3	0	49
Thailand	0	0	0	0	1	4	3	16	6	17	0	1	1	3	14	9	0	75
Sri Lanka	0	0	0	0	0	0	0	1	1	3	0	0	0	0	2	0	0	7
Malaysia	37	1	30	25	14	18	17	13	23	5	11	17	36	20	28	9	57	361
Brunei	21	0	4	1	0	3	5	1	1	1	3	6	4	1	3	5	3	62
East Timor[13]	9	0	2	2	1	3	0	0	1	0	0	0	0	0	0	0	0	18
Indonesia[14]	55	22	27	66	114	106	137	142	131	106	79	97	110	123	130	103	12	1560
Japan	18	3	2	0	4	5	13	16	21	14	18	20	13	6	8	5	4	170
South Korea	0	0	0	0	0	0	4	1	2	0	0	0	0	2	1	0	0	10
Taiwan	28	4	11	5	9	6	15	14	17	8	11	7	9	9	8	0	55	216
Philippines	105	0	0	0	6	9	10	8	12	8	13	12	16	22	13	11	16	261
Southwestern Pacific[15]--Continued																		
Papua New Guinea	25	8	4	2	2	1	5	2	3	2	1	1	0	1	0	1	59	117
Oceania[16]	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	3	0	5
Australia	684	67	81	91	56	64	51	39	17	14	18	41	38	48	99	131	2	1541
New Zealand	32	5	7	8	7	10	1	0	3	6	2	8	1	4	5	3	0	102
Total	11884	737	813	856	905	894	914	870	989	890	867	901	852	896	1132	1085	1476	26961

TABLE 4.—*Year of first discovery and cumulative recoverable crude-oil discoveries through 1982 in the 77*

[Each significant province has at least one field containing 100 million barrels of recoverable crude oil. Data are from a computer tape released of the U.S. Department of Energy (written commun.,

Petroleum province, country	Year of first discovery	Cumulative recoverable crude-oil discoveries through 1982, in barrels × 10^6
South America (fig. 9)		
Talara-Progreso Basin, Ecuador and Peru	1863	1,504
South Caribbean Area, Trinidad and Tobago and Venezuela	1867	1,785
Guarico Basin, Venezuela	1901	251
Southeast Offshore (Galeota) Basin, Trinidad and Tobago	1902	813
Maturin Basin, Venezuela	1913	13,313
Maracaibo Basin, Colombia and Venezuela	1914	44,236
San Jorge Basin, Argentina	1916	1,600
Middle Magdalena Basin, Colombia	1918	1,866
Neuquen Basin, Argentina	1922	864
Cuyo Basin, Argentina	1932	943
Orinoco Heavy Oil Belt 2, Venezuela	1937	1,162
Reconcavo Basin, Brazil	1939	1,567
Magallanes Basin, Chile and Argentina	1945	544
Barinas Basin, Venezuela	1948	2,819
Meta Basin, Colombia	1948	270
Sergipe-Alagoas Basin, Brazil	1957	357
Putumayo Basin, Colombia	1963	265
Napo Basin, Ecuador	1967	2,824
Maranon Basin, Peru	1971	693
Campos Basin, Brazil	1975	951
Total		78,627
Mexico (not illustrated)		
Saline Basin	1904	1,454
Tampico	1904	3,776
Golden Lane Atoll	1907	1,631
Reforma	1958	9,231
Campeche	1976	14,086
Total		30,178

Petroleum province, country	Year of first discovery	Cumulative recoverable crude-oil discoveries through 1982, in barrels × 10^6
Western Europe (fig. 10)		
Lower Saxony Basin, Federal Republic of Germany	1874	1,334
Vienna Basin, Austria	1930	667
Southern North Sea Basin, Netherlands, Federal Republic of Germany, and United Kingdom	1939	400
Aquitaine Basin, France	1939	438
Sicilian Flysch Zone, Italy	1940	455
Paris Basin, France	1958	275
Central Graben, United Kingdom, Norway, Denmark, Netherlands, and Federal Republic of Germany	1966	6,439
Vestland Arch, Norway and United Kingdom	1968	610
Kavala Graben, Greece	1971	160
Viking Graben, United Kingdom and Norway	1971	11,068
Witch Ground Graben, United Kingdom	1973	1,410
East Shetland Basin, Norway and United Kingdom	1974	4,633
Moray Firth Basin, United Kingdom	1974	569
Fladen Ground Spur, United Kingdom	1975	125
West Shetland Basin, United Kingdom	1977	600
Porcupine Basin, Ireland	1978	114
Horda Platform, Norway	1979	755
Total		30,052

in June 1983 by Petroconsultants, S.A., Geneva, and from W.D. Dietzman in the Dallas, Tex., office of the Energy Information Administration 1983). Data for four areas are graphed in figures 9–12]

Petroleum province, country	Year of first discovery	Cumulative recoverable crude-oil discoveries through 1982, in barrels × 10^6
Middle East (not illustrated)		
Zagros Fold Belt, Syria, Iraq, and Iran	1903	103,933
Arabian Platform, Saudi Arabia, Kuwait, Neutral Zone, Bahrain, Qatar, Oman, Syria, Iraq, Iran, and Abu Dhabi	1932	394,965
Southeast Turkey Folded Zone, Turkey	1940	644
Rub Al Khali Basin, Saudi Arabia, Qatar, Abu Dhabi, Dubai, Ra's al Khaymah, Sharjah, and Iran	1954	68,122
Central Iranian Platform, Iran	1956	125
Oman Foreland, Oman, Ra's al Khaymah, Sharjah, and Iran	1962	4,282
Total		572,071
Africa (fig. 11)		
Suez Graben, Egypt	1886	5,386
Pelagian Basin, Tunisia and Libya	1949	974
Niger Delta, Nigeria and Cameroon	1954	17,644
Illizi Basin, Algeria	1956	3,731
Trias Province, Tunisia and Algeria	1956	13,826
Gabon Coastal Basin, Angola, Gabon, Congo, and Zaire	1956	4,408
Moudjir (Oriental Erg) Basin, Algeria	1957	784
Sirte Basin, Libya	1958	35,893
Ghadames Basin, Algeria	1960	811
Gulf of Guinea Northern Shelf, Ivory Coast, Togo, Ghana, and Benin	1968	424
Aaiun-Tarfaya Basin, Morocco	1969	100
Chad Central Depression, Chad	1974	100
Sudan Continental Basin, Sudan	1979	400
Total		84,481

Petroleum province, country	Year of first discovery	Cumulative recoverable crude-oil discoveries through 1982, in barrels × 10^6
Asia (fig. 12)		
Atjeh Basin, Indonesia	1885	448
Assam Basin, India	1889	729
Jambi-Palembang Basin, Indonesia	1896	1,304
Kutei Basin, Indonesia	1897	3,375
Tarakan Basin, Indonesia	1900	324
Irrawaddy Basin, Burma	1902	528
Brunei-Saigon Basin, Malaysia and Brunei	1910	4,129
Vogelkop Basin, Indonesia	1936	661
Meratus High, Indonesia	1937	120
Rokan-Kampar Basin, Indonesia	1939	10,190
Cambay Basin, India	1958	2,800
West Java Basin, Indonesia	1969	1,056
Gulf of Thailand Basin, Thailand, Indonesia, and Malaysia	1969	1,332
Sunda Basin, Indonesia	1970	1,657
Total		28,653
Southwestern Pacific (not illustrated)		
Gippsland Basin, Australia	1924	3,015
Barrow Basin, Australia	1964	316
Total		3,331

TABLE 5.—*The land area, the delineated prospective area, and the explored area for non-Communist parts of eight regions through 1982*

[This table summarizes data in captions of figures 14–51. The land areas are from individual country entries in "The Random House College Dictionary" (Random House, 1973). The means of calculating explored areas and delineated prospective areas are explained in the appendix. All areas are in square miles]

Region	Land area	Delineated prospective area	Explored area
Caribbean (fig. 14)	85,172	12,265	2,056
Central America (fig. 15)	212,318	12,545	2,141
South America (figs. 16–24)	6,863,319	285,238	55,633
Western Europe (figs. 25–26)	2,224,254.5	386,519	74,513
Middle East (figs. 27–31)	2,146,790	153,526	19,621
Africa (figs. 32–43)	11,644,658	399,030	61,851
Asia (figs. 44–48)	3,443,324	199,562	33,615
Southwestern Pacific (figs. 49–51)	3,293,782	115,482	19,013
Total	29,913,617.5	1,564,167	268,443

FIGURES 1–13

[Figures 14–51 follow figure 13]

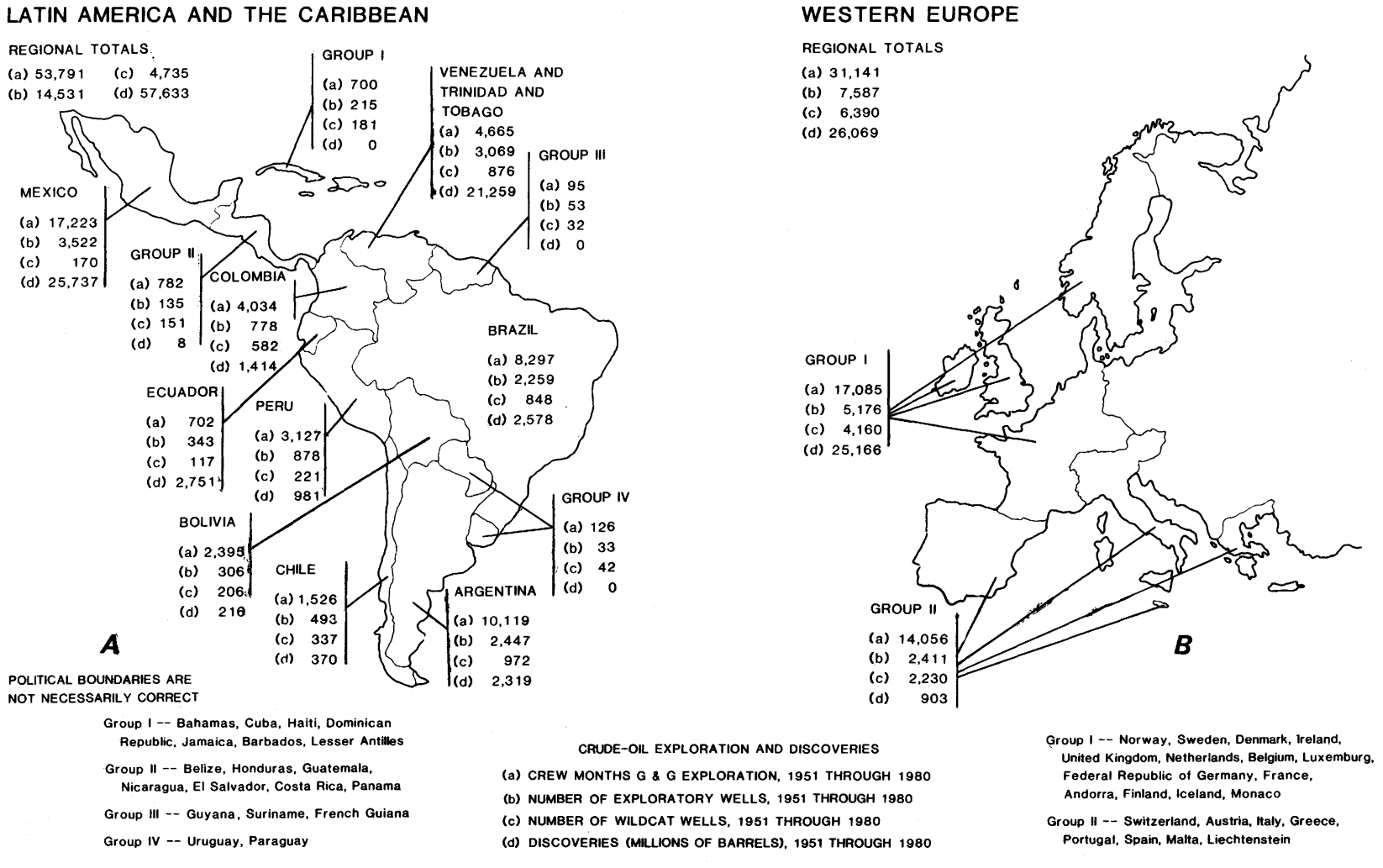
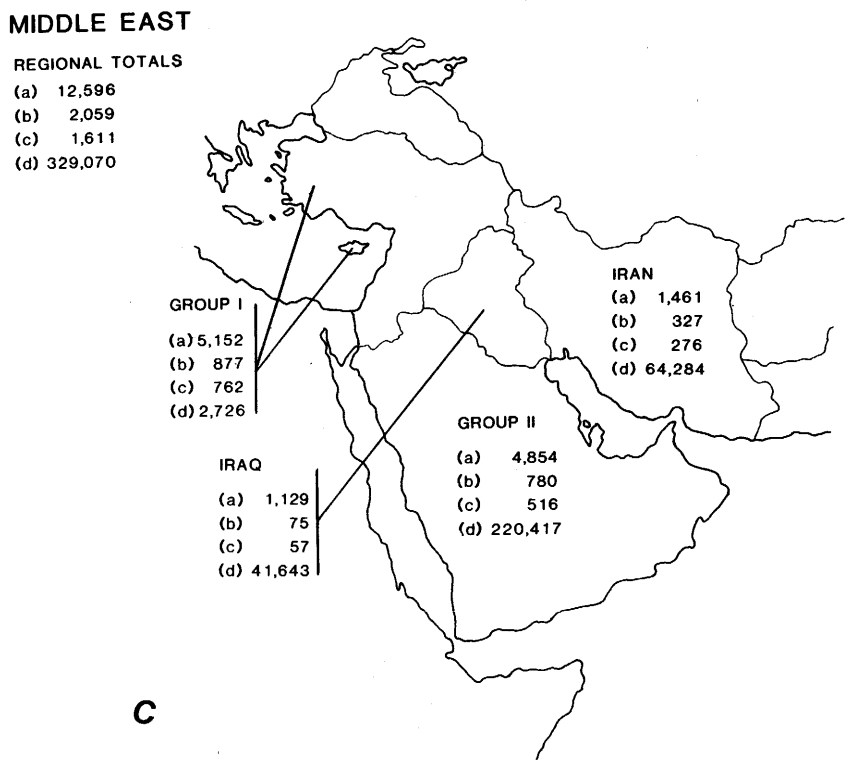
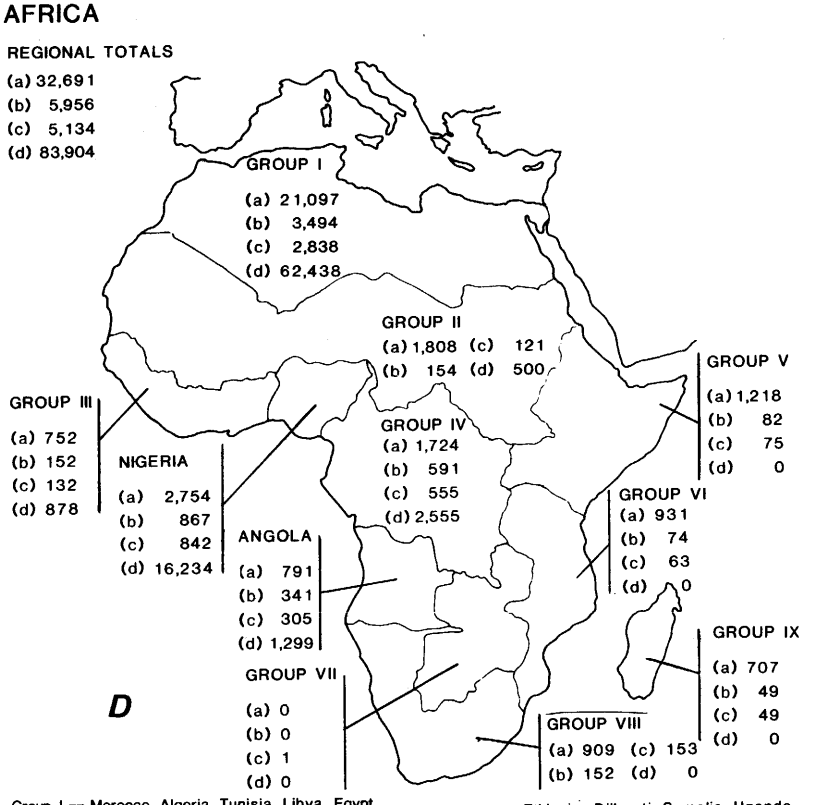


FIGURE 1.—Summary of crude-oil exploration and discovery data, January 1, 1951, through 1980, for the non-Communist world outside the United States and Canada. Data are shown for six areas in figures 1*A*–*F*: *A*, Latin America and the Caribbean; *B*, Western Europe; *C*, the Middle East; *D*, Africa; *E*, Asia; and *F*, the southwestern Pacific. Four types of information are provided for each country or group of countries as items (a)–(d). In (a) are crew months of geologic and geophysical (G&G) exploration, 1951 through 1980, from table 1. In (b) are numbers of exploratory wells, 1951 through 1980, from table 2. Data in tables 1 and 2 are from the annual foreign developments issues of the *Bulletin of the American Association of Petroleum Geologists*. In (c) are numbers of wildcat wells, 1951 through 1980, from table 3. Data in table 3 are from a computer tape released in April 1983 by Petroconsultants, S.A., Geneva. In (d) are amounts (in millions of barrels) of ultimately recoverable crude oil discovered, 1951 through 1980. Data in (d) are from a Petroconsultants tape released in June 1983 and from W.D. Dietzman in the Dallas, Tex., office of the Energy Information Administration of the U.S. Department of Energy (written commun., 1983). To save space, some countries were combined into groups. Countries in each group are listed below each figure.





POLITICAL BOUNDARIES ARE NOT NECESSARILY CORRECT

Group I -- Turkey, Cyprus, Syria, Lebanon, Israel, Jordan

Group II -- Saudi Arabia, Kuwait, Neutral Zone, Bahrain, Qatar, United Arab Emirates (Abu Dhabi, Ajman, Al Fujayrah, Dubai, Ra's al Khaymah, Sharjah, Umm al Qaywayn), Oman, North Yemen, South Yemen

CRUDE-OIL EXPLORATION AND DISCOVERIES

(a) CREW MONTHS G & G EXPLORATION, 1951 THROUGH 1980

(b) NUMBER OF EXPLORATORY WELLS, 1951 THROUGH 1980

(c) NUMBER OF WILDCAT WELLS, 1951 THROUGH 1980

(d) DISCOVERIES (MILLIONS OF BARRELS), 1951 THROUGH 1980

Group I -- Morocco, Algeria, Tunisia, Libya, Egypt

Group II -- Western Sahara, Mauritania, Mali, Niger, Chad, Sudan, Burkina Faso (formerly Upper Volta)

Group III -- Senegal, The Gambia, Guinea-Bissau, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Benin, Cape Verde

Group IV -- Cameroon, Central African Republic, Equatorial Guinea, Gabon, Sao Tome and Principe, Congo, Zaire, Rwanda, Burundi

Group V -- Ethiopia, Djibouti, Somalia, Uganda, Kenya

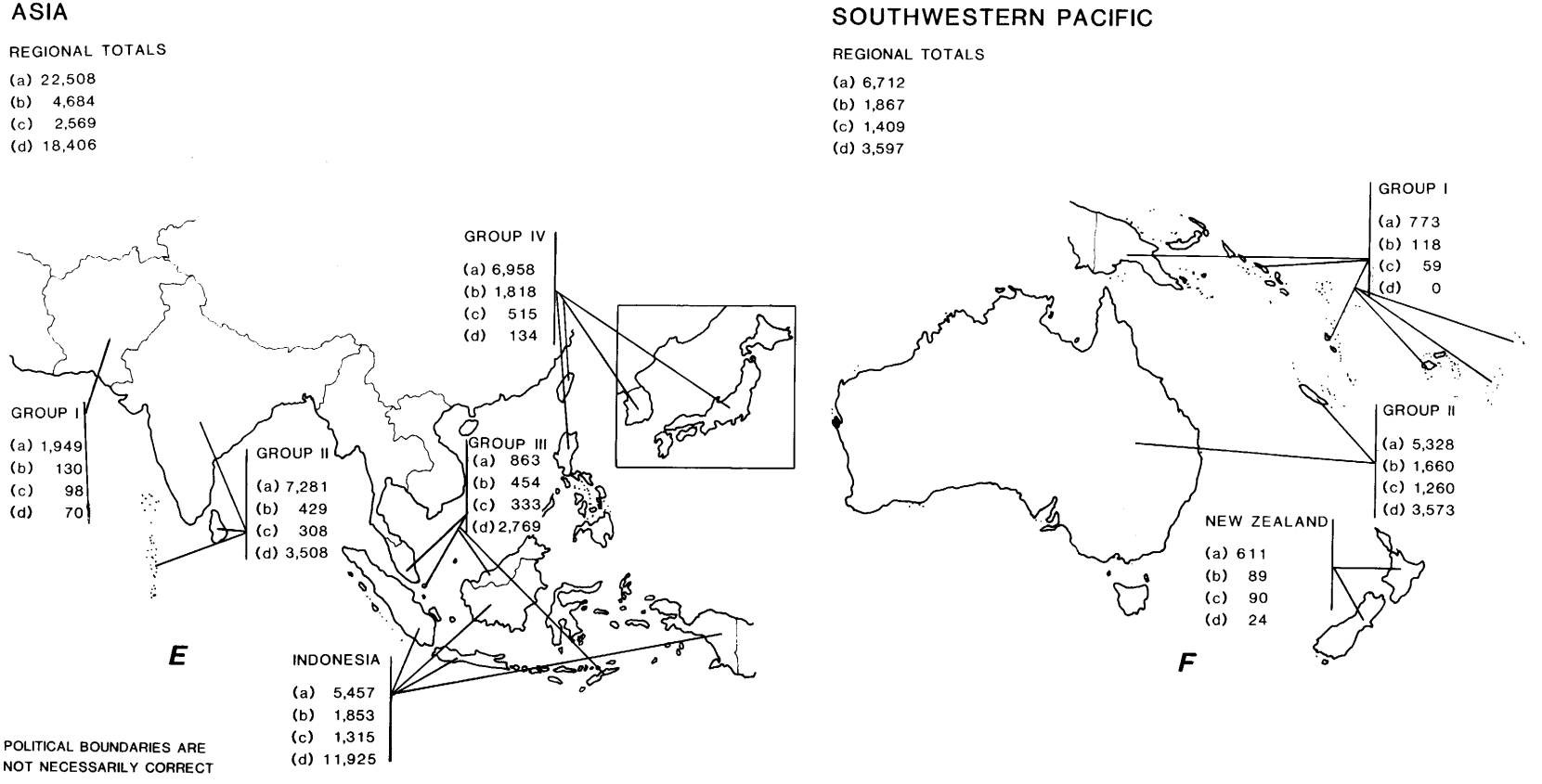
Group VI -- Tanzania, Malawi, Mozambique

Group VII -- Zimbabwe, Botswana, Zambia

Group VIII -- Swaziland, Namibia, Lesotho. South Africa

Group IX -- Madagascar, Mauritius, Seychelles, Comoros

FIGURE 1.—Continued.



Group I -- Afghanistan, Pakistan

Group II -- Maldives, India, Bangladesh, Burma, Thailand, Sri Lanka, Nepal, Bhutan

Group III -- Malaysia, Brunei, East Timor, Singapore

Group IV -- Japan, South Korea, Taiwan, Philippines

CRUDE-OIL EXPLORATION AND DISCOVERIES

(a) CREW MONTHS G & G EXPLORATION, 1951 THROUGH 1980

(b) NUMBER OF EXPLORATORY WELLS, 1951 THROUGH 1980

(c) NUMBER OF WILDCAT WELLS, 1951 THROUGH 1980

(d) DISCOVERIES (MILLIONS OF BARRELS), 1951 THROUGH 1980

Group I -- Papua New Guinea, Oceania (Fiji, Solomon Islands, Tonga, Vanuatu (formerly New Hebrides), Nauru, Kiribati, Tuvalu, Western Samoa)

Group II -- Australia, New Caledonia (an overseas territory of France)

FIGURE 1.—Continued.

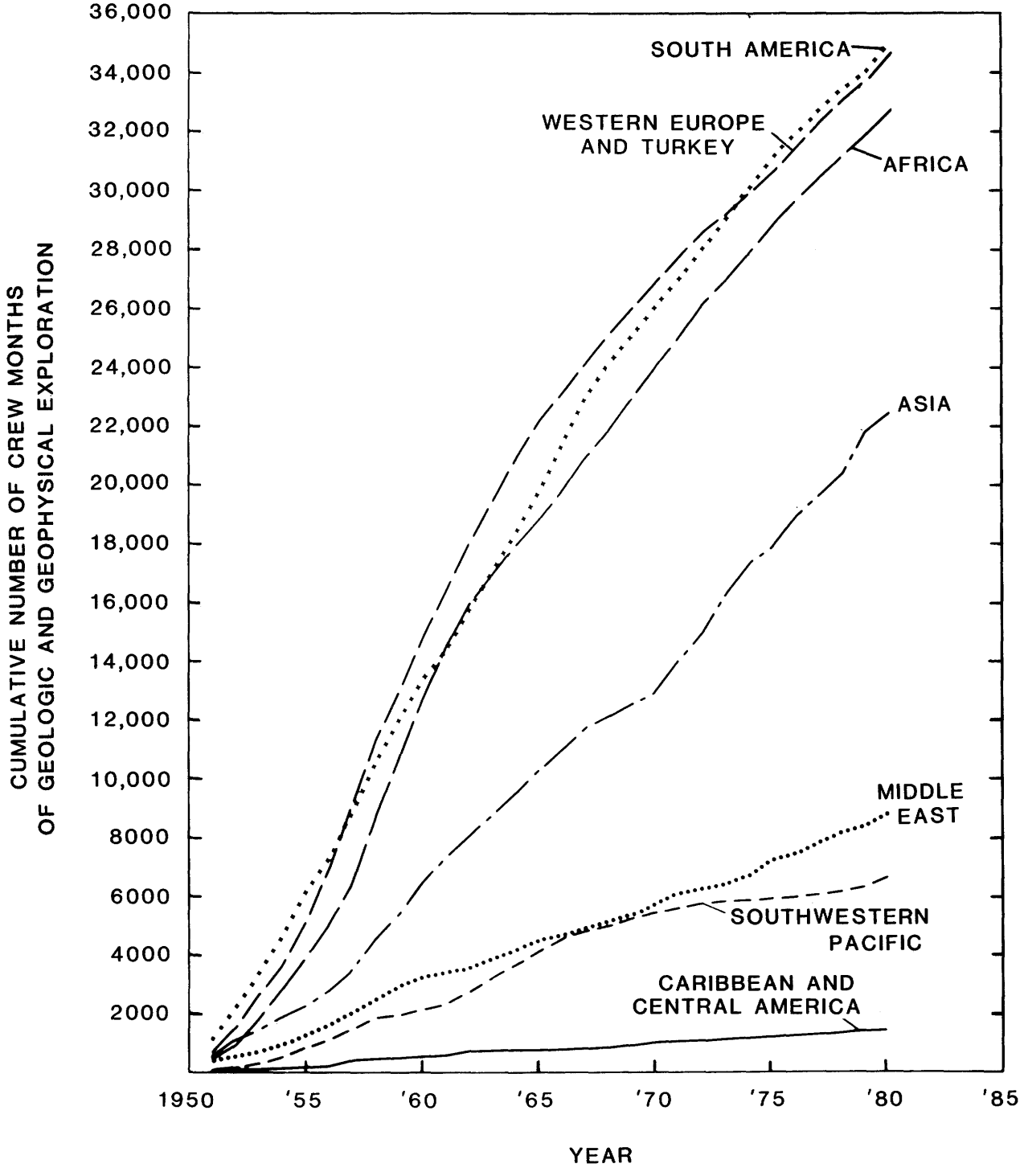


FIGURE 2.—Time profile of the cumulative number of crew months of geologic and geophysical exploration in non-Communist countries in each region outside North America, 1951 through 1980. Data are from foreign developments issues of the *Bulletin of the American Association of Petroleum Geologists* and are presented in different ways in figure 1 and table 1.

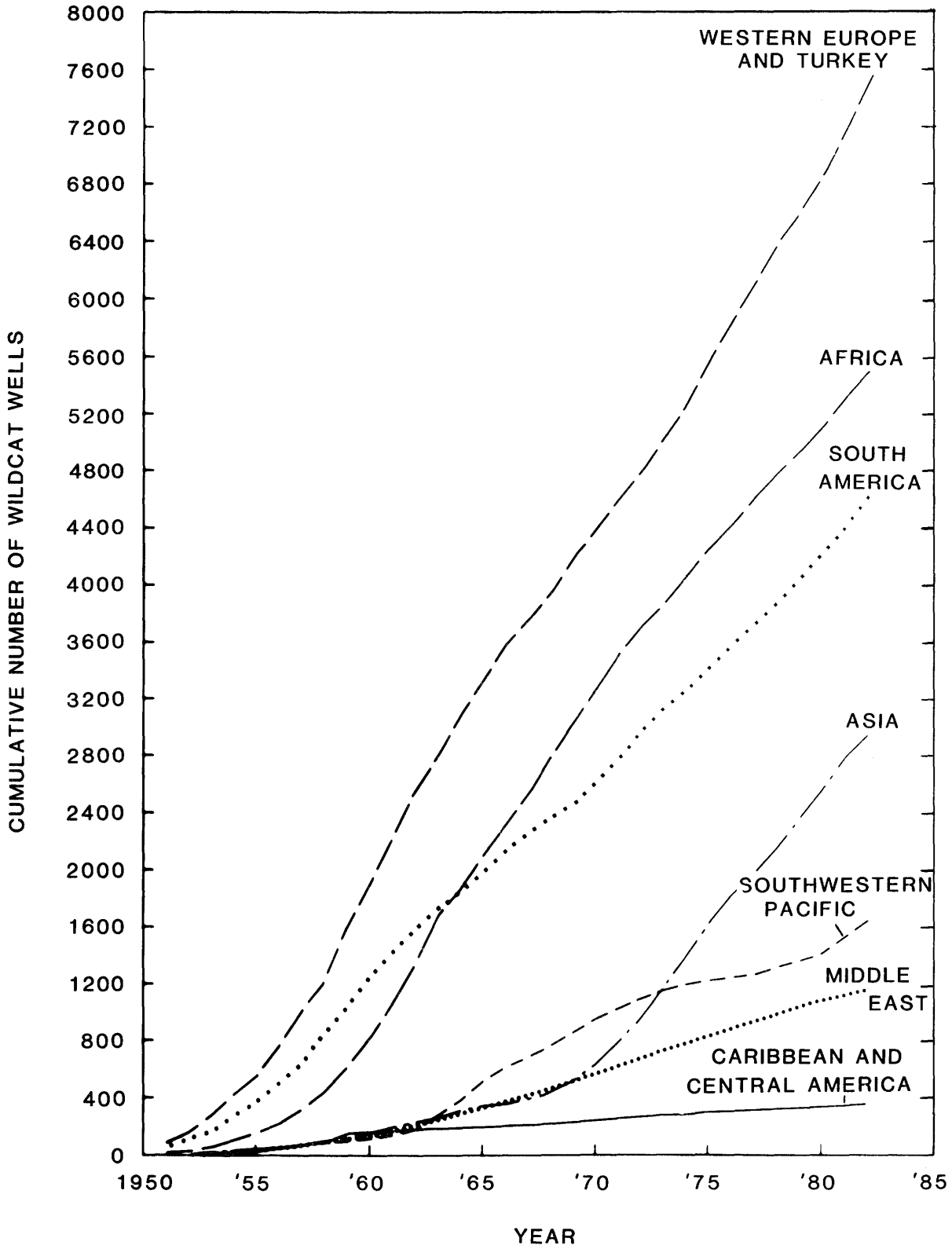


FIGURE 3.—Time profile of the cumulative number of wildcat wells drilled in non-Communist countries in each region outside North America, 1951 through 1982. Data are from a computer tape released in April 1983 by Petroconsultants, S.A., Geneva, and are given by country and year in table 3.

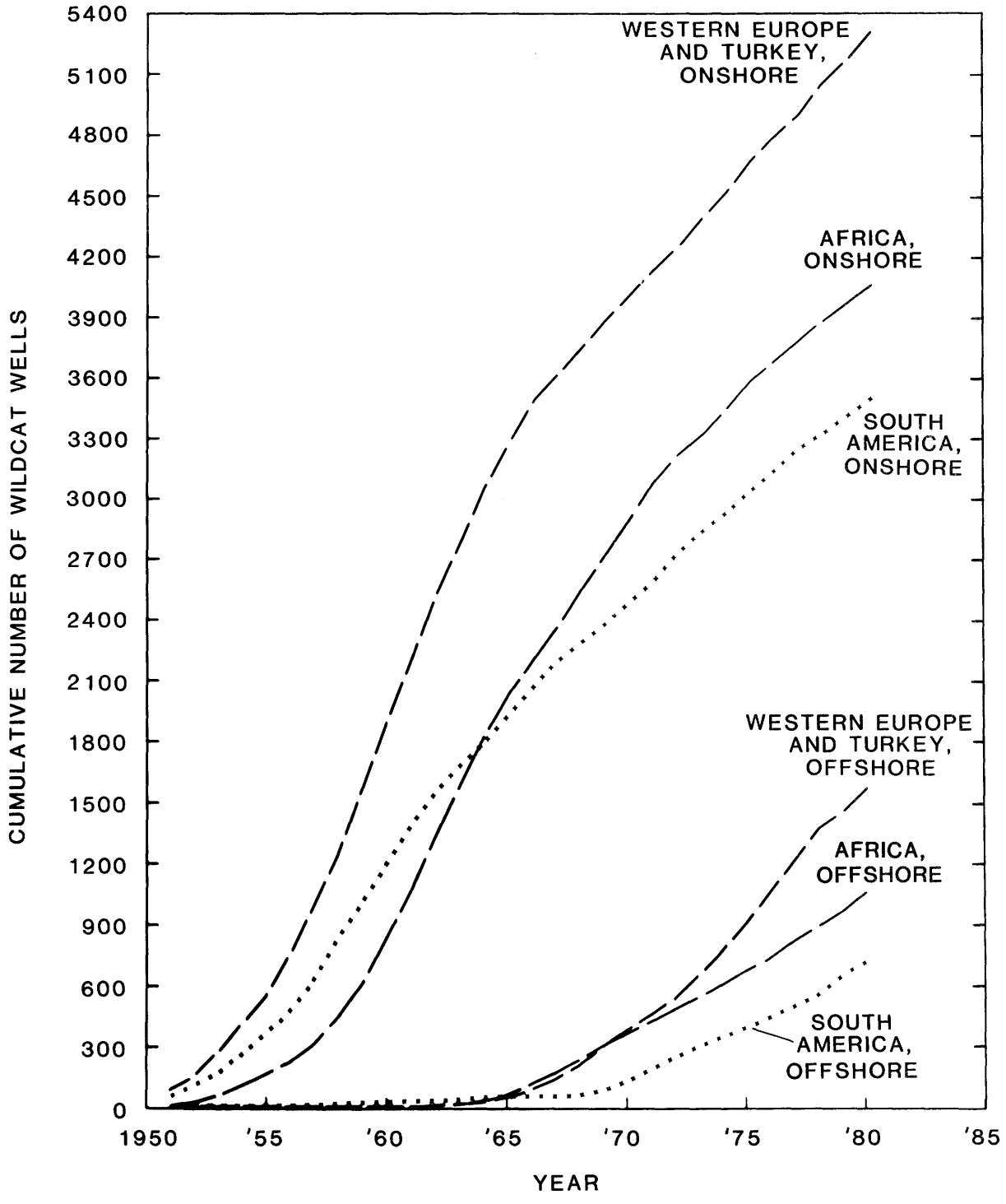


FIGURE 4.—Time profile of the cumulative number of onshore and offshore wildcat wells drilled in Western Europe and Turkey, Africa, and South America, 1951 through 1980. Data are from a computer tape released in April 1983 by Petroconsultants, S.A., Geneva.

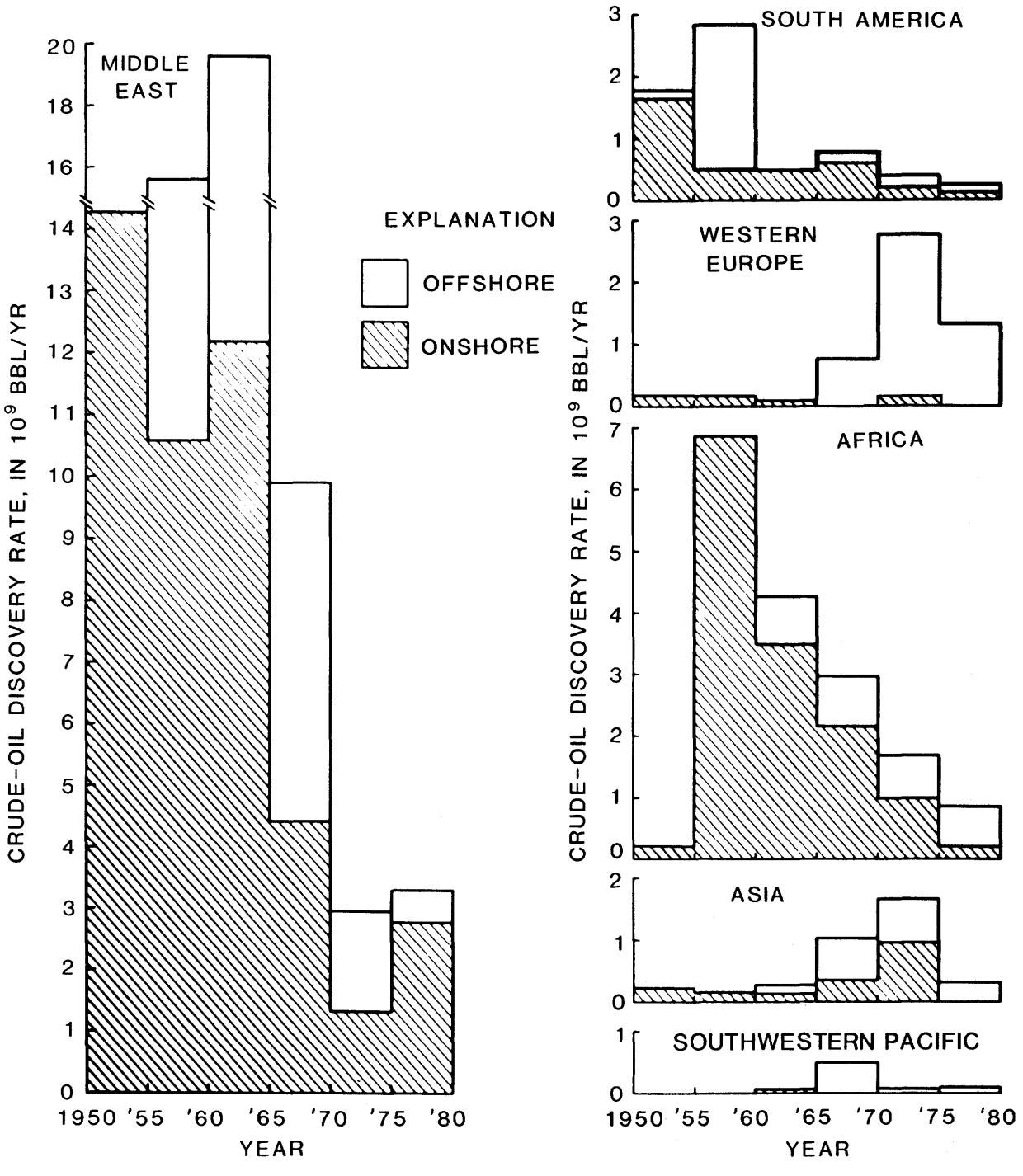


FIGURE 5.—Annual crude-oil discovery rates, in billions of barrels per year, for non-Communist countries in the Middle East (including Turkey), South America, Western Europe, Africa, Asia, and the southwestern Pacific. Data are averaged for 5-year periods, 1951–80, for offshore and onshore discoveries. The estimates of the recoverable oil in discovered fields are from a computer tape released in June 1983 by Petroconsultants, S.A., Geneva, and from W.D. Dietzman in the Dallas, Tex., office of the Energy Information Administration of the U.S. Department of Energy (written commun., 1983).

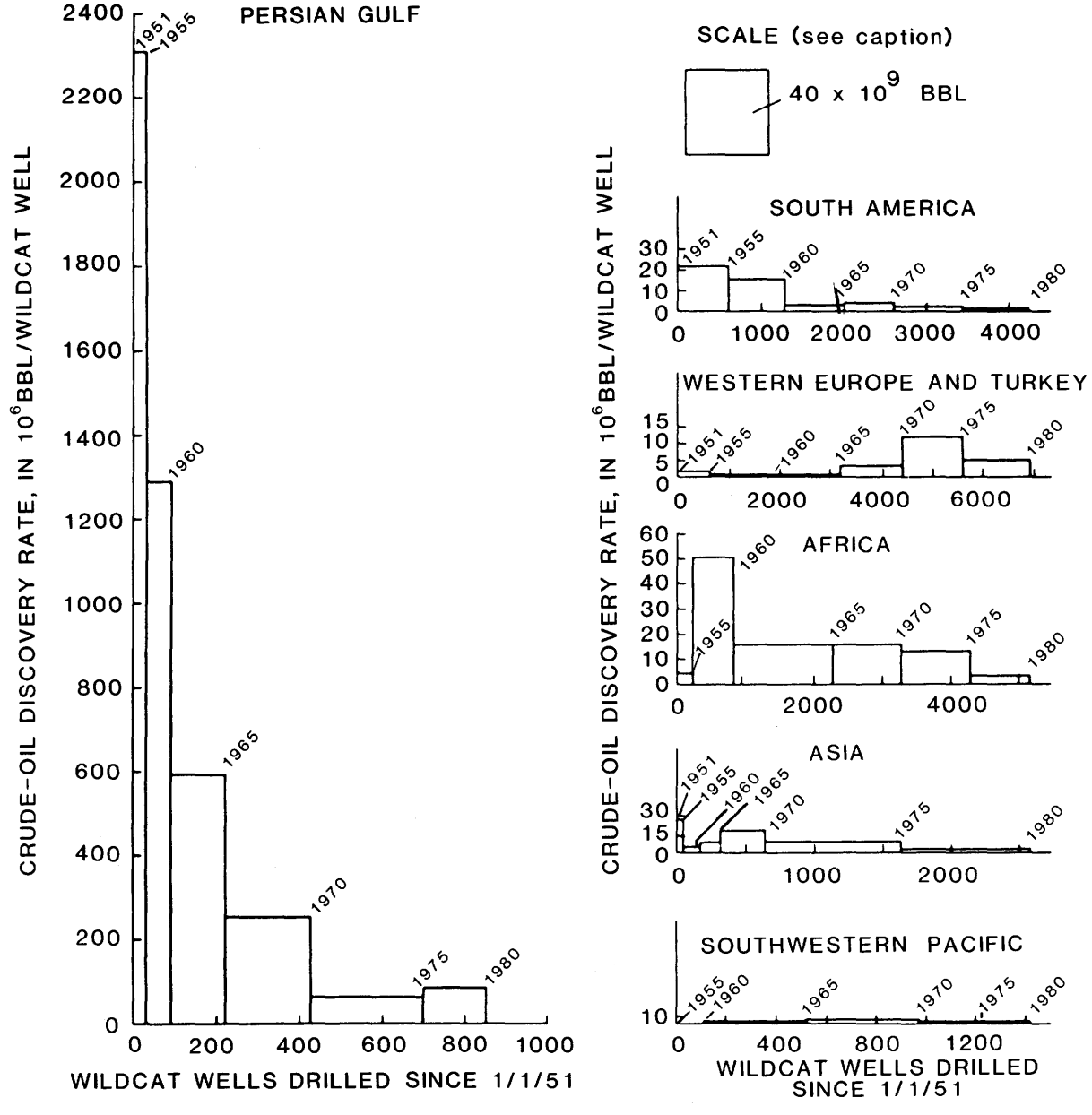


FIGURE 6.—Amount of crude oil (in millions of barrels) discovered per wildcat well versus the number of wildcat wells drilled since January 1, 1951, for non-Communist countries in six regions. Data are averaged for 5-year periods, 1951–80. Vertical and horizontal scales are unique to each graph. However, the areas beneath the respective discovery-rate curves are drawn to the scale in the upper right part of the figure. Wildcat-well data (table 3) are from a computer tape released in April 1983 by Petroconsultants, S.A., Geneva. The estimates of the recoverable oil in discovered fields are from a computer tape released in June 1983 by Petroconsultants and from W.D. Dietzman in the Dallas, Tex., office of the Energy Information Administration of the U.S. Department of Energy (written commun., 1983). The Persian Gulf is used here rather than the whole Middle East; the countries composing the Persian Gulf for this figure are Iran, Iraq, Saudi Arabia, Kuwait, Neutral Zone, Bahrain, Qatar, Oman, North Yemen, South Yemen, and United Arab Emirates.

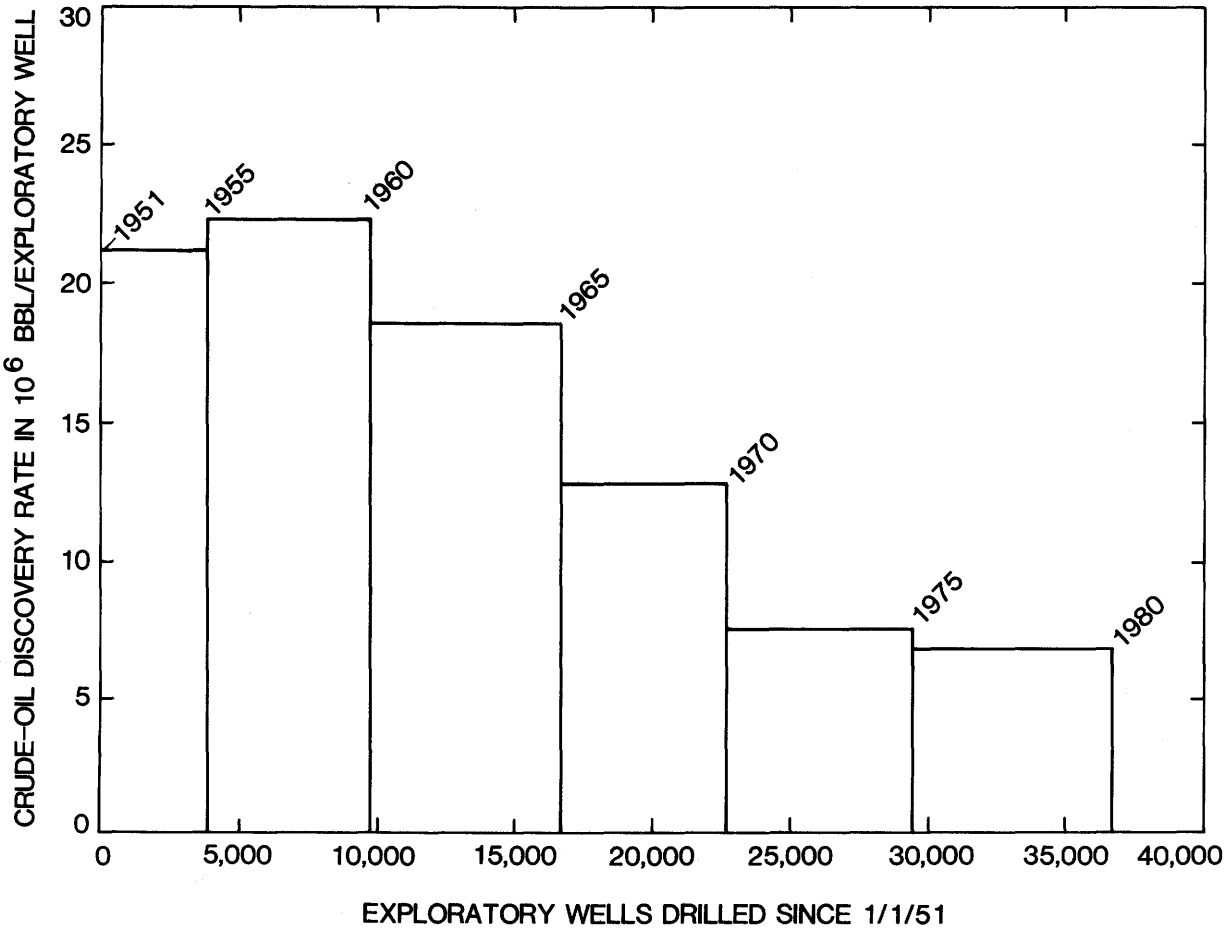


FIGURE 7.—Amount of crude oil (in millions of barrels) discovered per exploratory well versus the number of exploratory wells drilled since January 1, 1951, in the non-Communist world outside the United States and Canada. Data are averaged for 5-year periods, 1951–80. Exploratory-well data (table 2) are from the foreign developments issues of the *Bulletin of the American Association of Petroleum Geologists*. The estimates of the recoverable oil in discovered fields are from a computer tape released in June 1983 by Petroconsultants, S.A., Geneva, and from W.D. Dietzman in the Dallas, Tex., office of the Energy Information Administration of the U.S. Department of Energy (written commun., 1983).

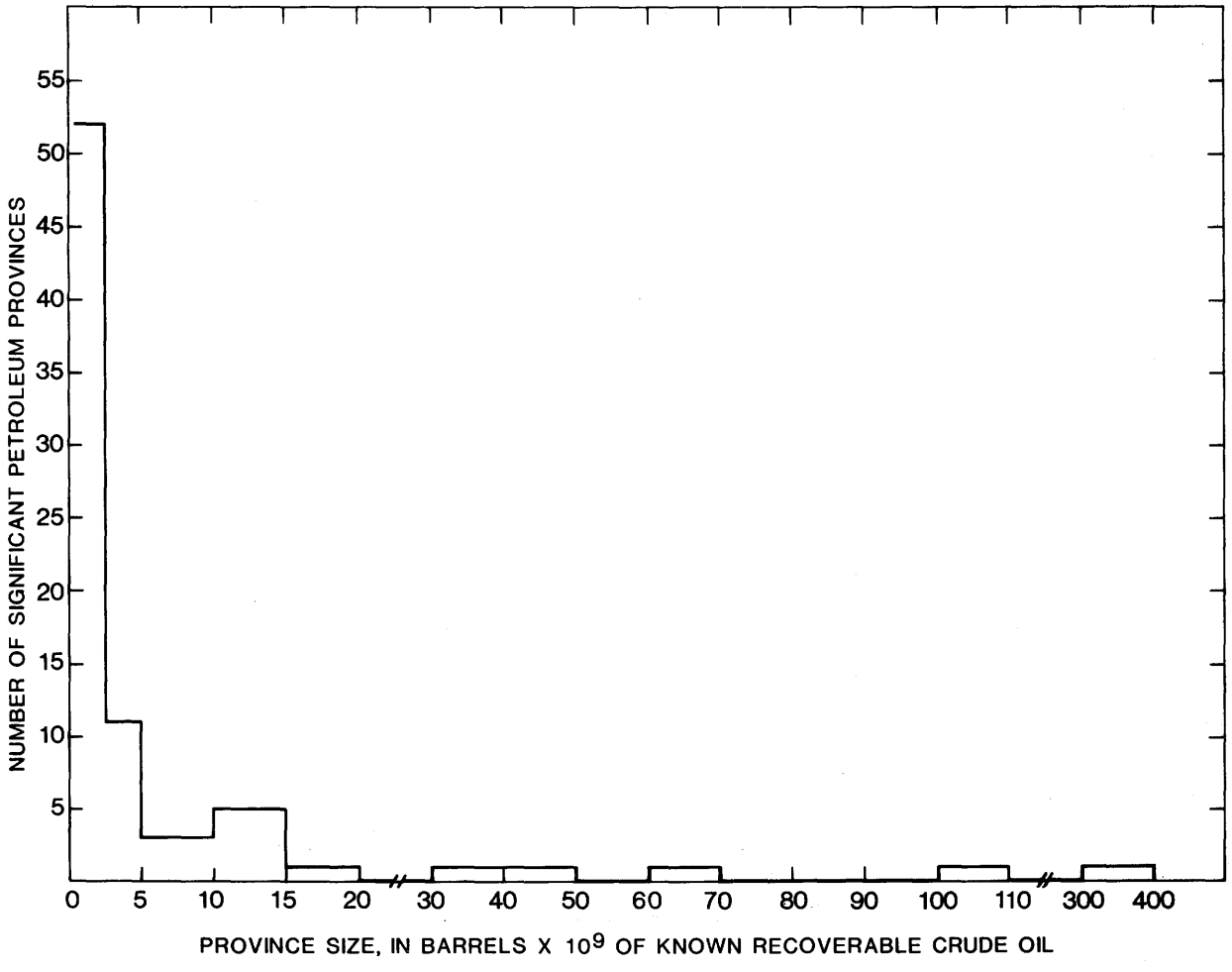


FIGURE 8.—Frequency distribution of sizes of the 77 significant petroleum provinces through 1982 in the non-Communist world outside the United States and Canada. Estimates of recoverable crude oil in each province are from a computer tape released in June 1983 by Petroconsultants, S.A., Geneva, and from W.D. Dietzman in the Dallas, Tex., office of the Energy Information Administration of the U.S. Department of Energy (written commun., 1983). Each significant province has at least one field containing 100 million barrels of recoverable crude oil.

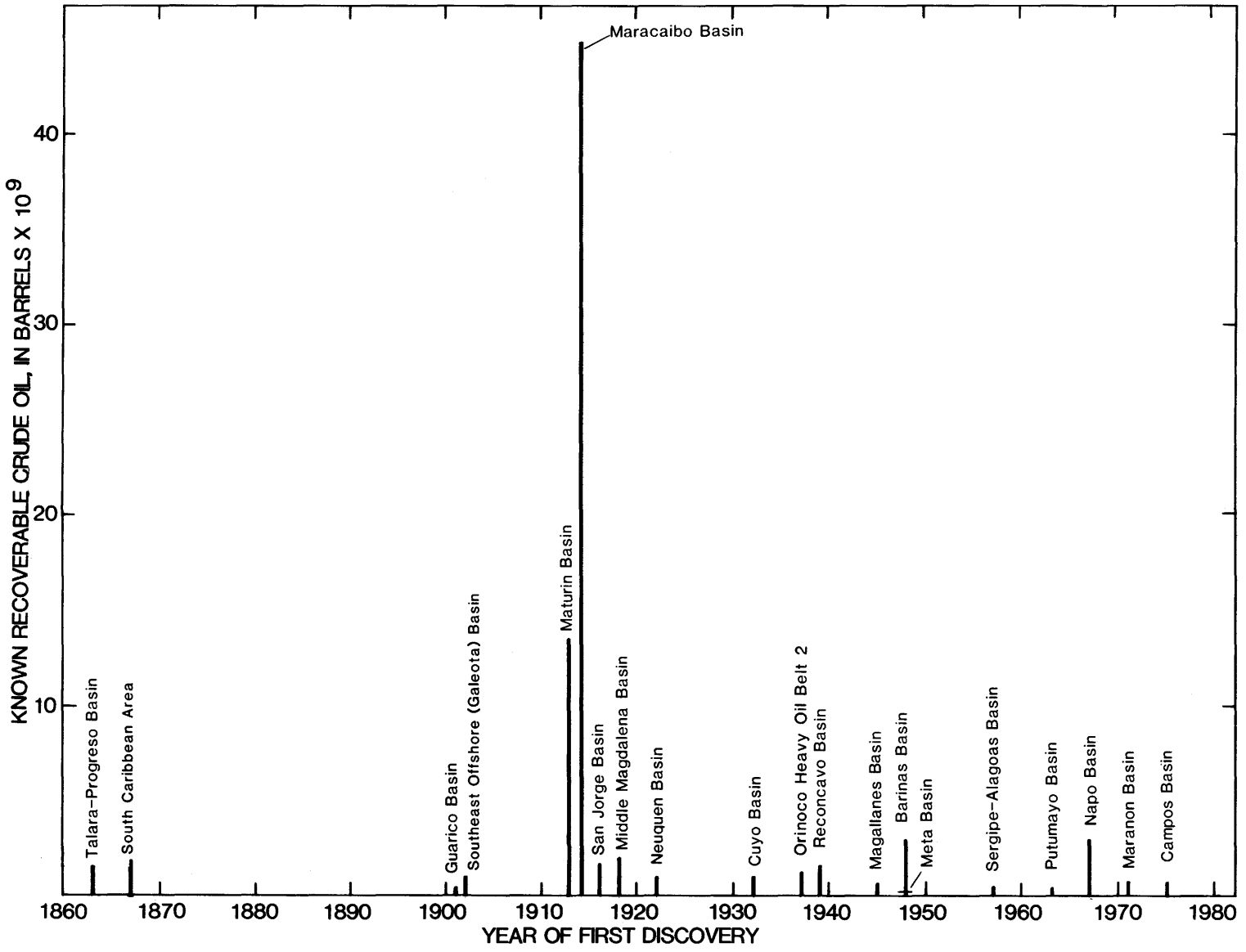


FIGURE 9.—Historical sequence by year of the first discovery in each significant petroleum province of South America. Heights of the spikes show the magnitude of total discoveries through 1982 in each province. Discovery dates, discovery magnitudes, and province names are from a computer tape released in June 1983 by Petroconsultants, S.A., Geneva, and are also given in table 4. Each significant province has at least one field containing 100 million barrels of recoverable crude oil.

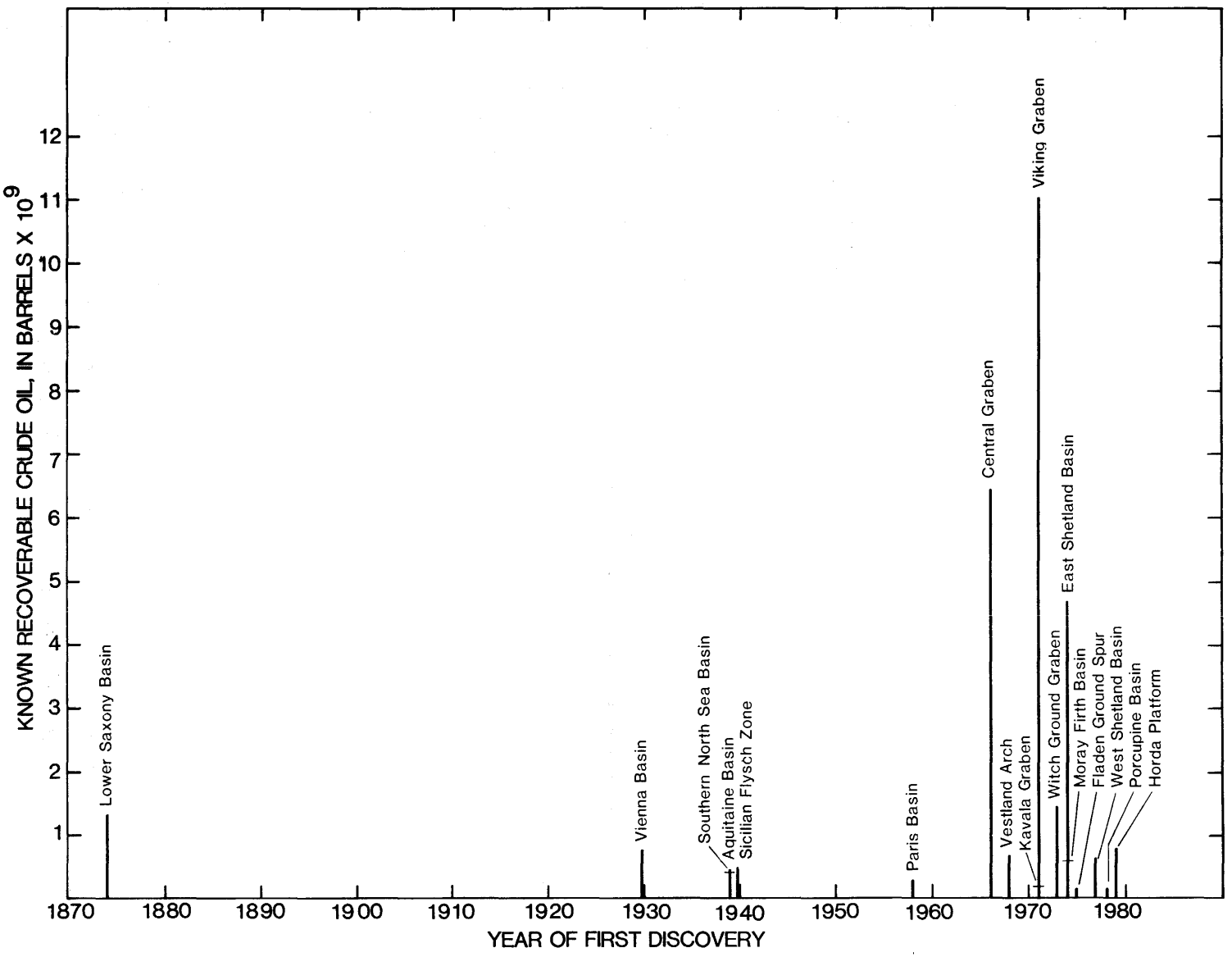


FIGURE 10.—Historical sequence by year of the first discovery in each significant petroleum province of Western Europe. Heights of the spikes show the magnitude of total discoveries through 1982 in each province. Discovery dates, discovery magnitudes, and province names are from a computer tape released in June 1983 by Petroconsultants, S.A., Geneva, and are also given in table 4. Each significant province has at least one field containing 100 million barrels of recoverable crude oil.

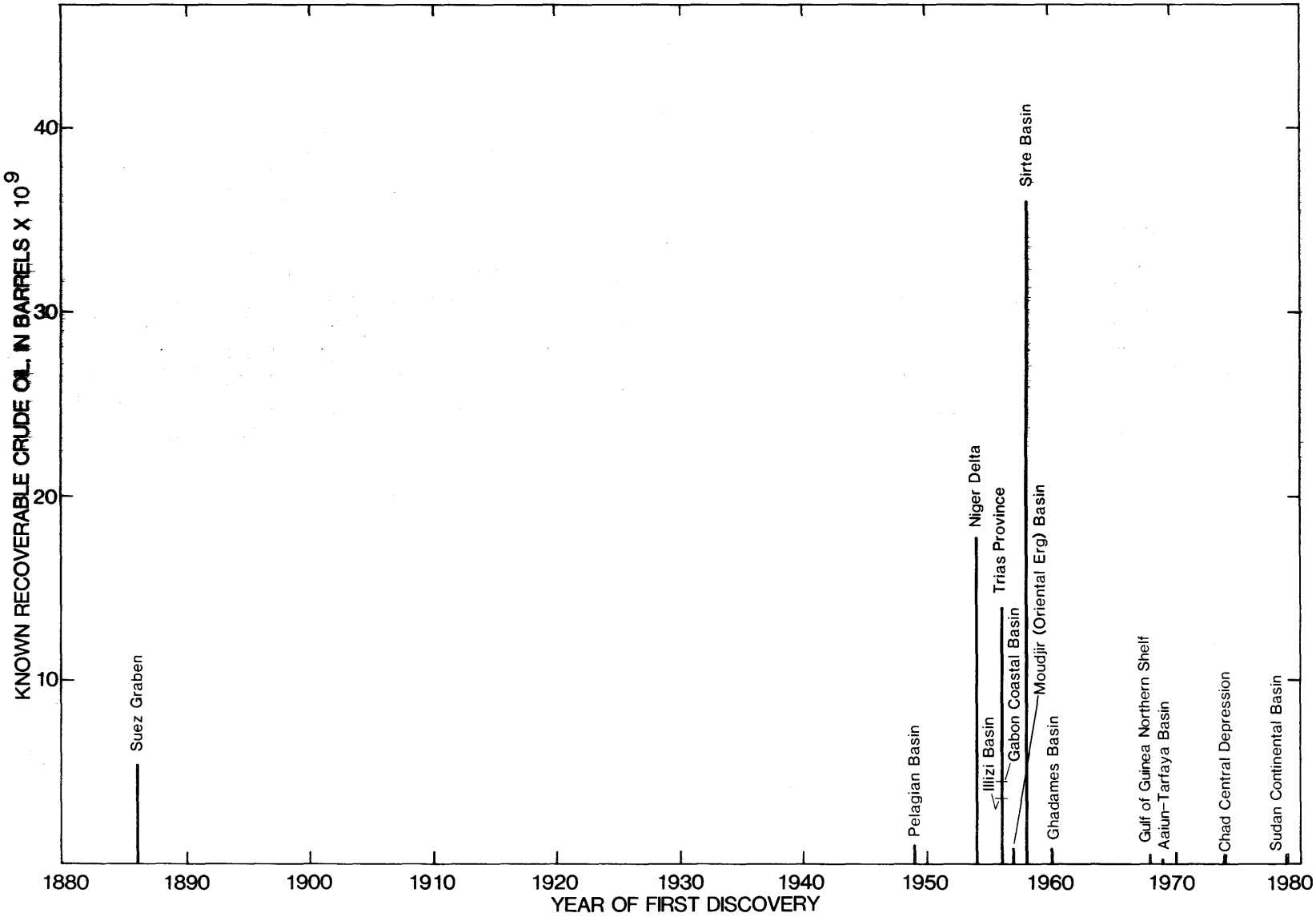


FIGURE 11.—Historical sequence by year of the first discovery in each significant petroleum province of Africa. Heights of the spikes show the magnitude of total discoveries through 1982 in each province. Discovery dates, discovery magnitudes, and province names are from a computer tape released in June 1983 by Petroconsultants, S.A., Geneva, and are also given in table 4. Each significant province has at least one field containing 100 million barrels of recoverable crude oil.

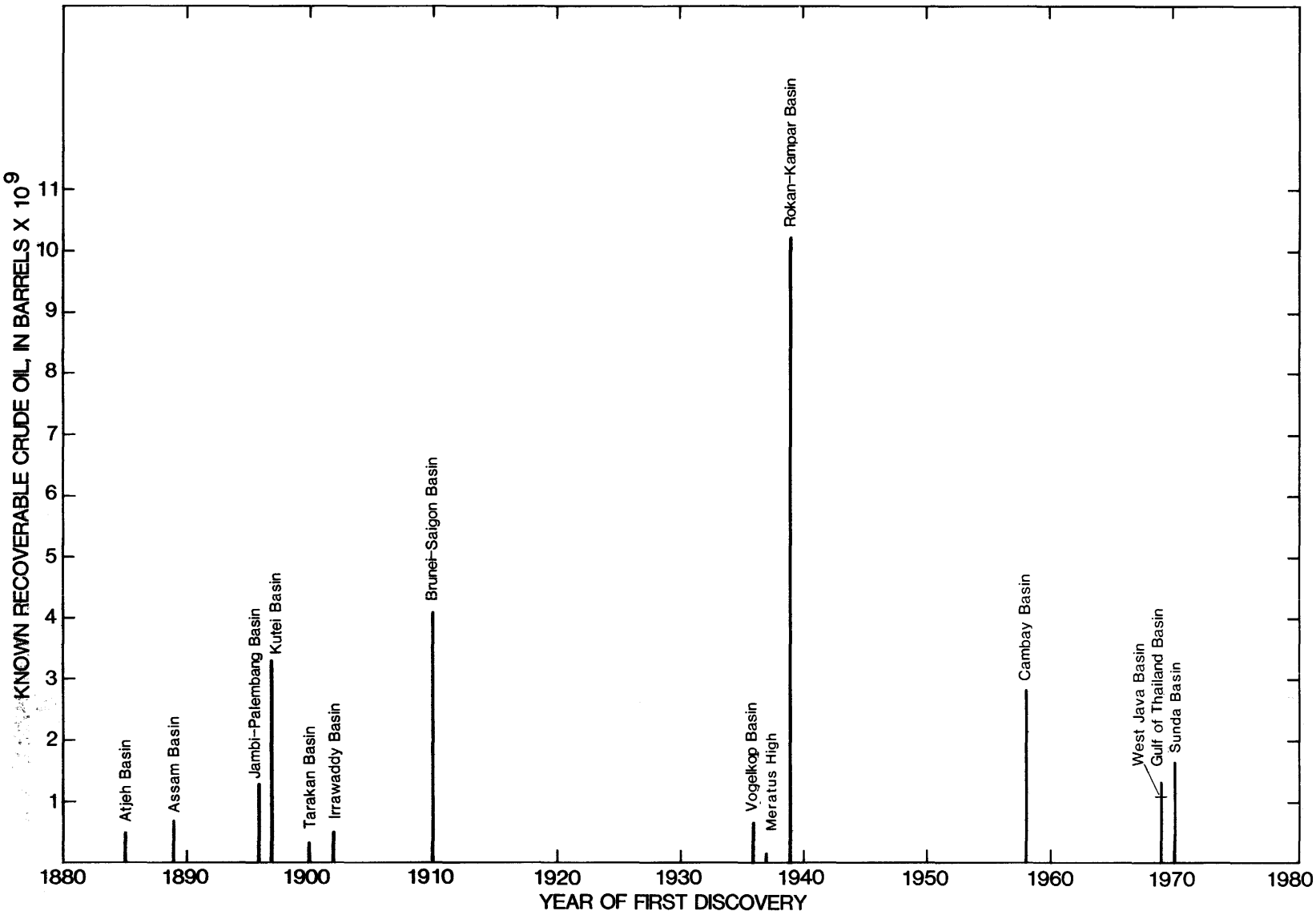


FIGURE 12.—Historical sequence by year of the first discovery in each significant petroleum province in non-Communist Asia. Heights of the spikes show the magnitude of total discoveries through 1982 in each province. Discovery dates, discovery magnitudes, and province names are from a computer tape released in June 1983 by Petroconsultants, S.A., Geneva, and are also given in table 4. Each significant province has at least one field containing 100 million barrels of recoverable crude oil.

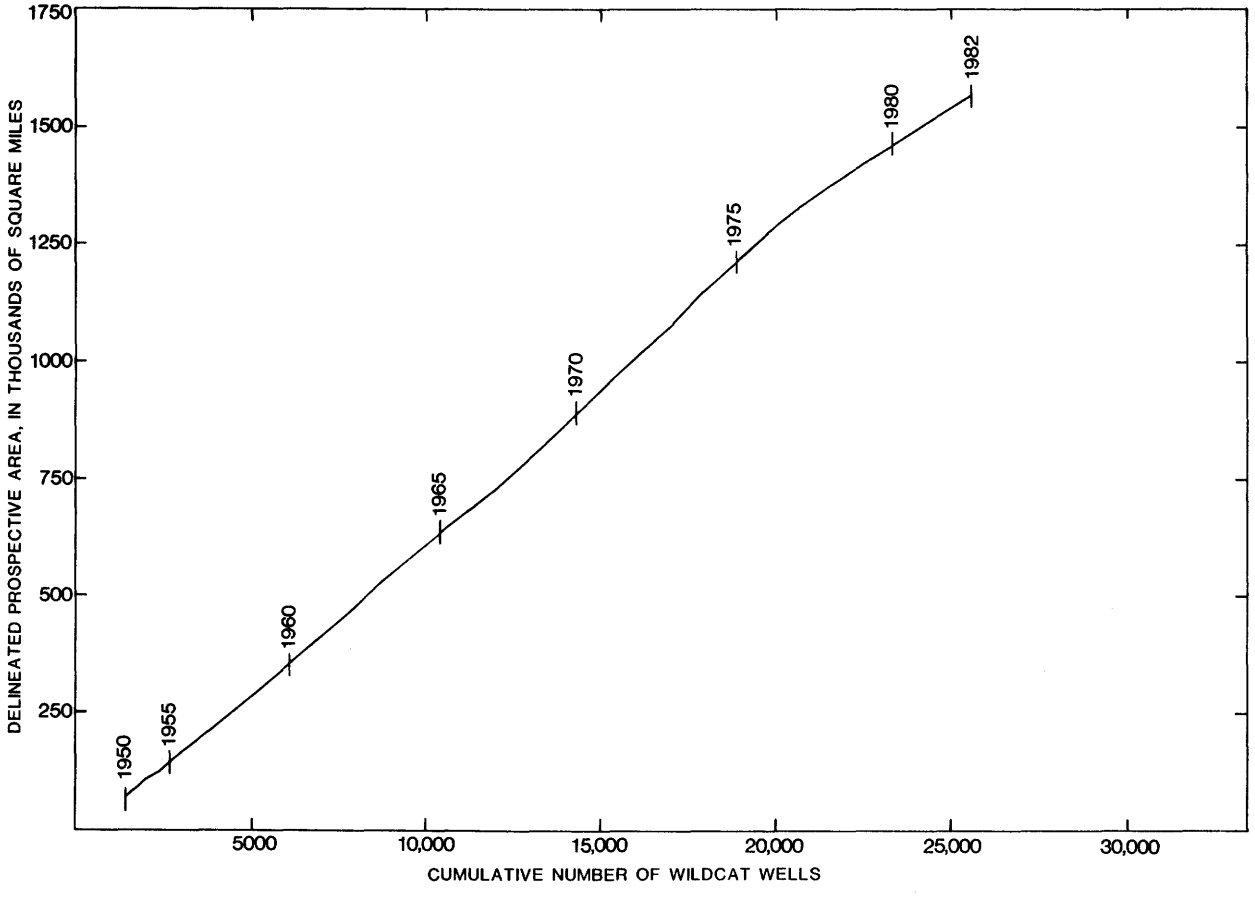


FIGURE 13.—Prospective area (in thousands of square miles) delineated by wildcat wells through 1982 in non-Communist countries outside Canada, the United States, and Mexico. Wildcat-well data are from a computer tape released in April 1983 by Petroconsultants, S.A., Geneva. Calculation of delineated prospective area is explained in the appendix.

FIGURES 14–51

Figures 14–51 show delineated prospective areas, explored areas, and known petroleum provinces of non-Communist countries outside the United States and Canada. No figure was prepared for Mexico as data for that country are incomplete. All other countries in tables 1–3 are in figures 14–51. Each figure contains a map, a graph, and a summary of exploration data. If significant petroleum provinces are present in the mapped area, a table provides information on them. Definitions of terms and sources of information in figures 14–51 are given below.

Maps.—All the maps were drawn by the Dissplа[1] (Display Integrated Software System and Plotting LAnguage) mapping package, which was copyrighted in 1981 by Integrated Software Systems Corp., San Diego, Calif. Political boundaries are internal to the Dissplа program and are not necessarily correct. The methods of computing and plotting the explored areas and the delineated prospective areas are described in the appendix. If only part of a country is shown, no explored or delineated prospective area could be shown in the rest of the country.

Names of known petroleum provinces and years of first discoveries in them in each country are shown on each map and are from a computer tape released in June 1983 by Petroconsultants, S.A., Geneva. Of all the known petroleum provinces shown in figures 14–51, 77 are significant because each has at least one field containing 100 million barrels (table 4). Information on the significant provinces is given in the tables facing the maps only for countries in which the province has at least one field containing more than 100 million barrels.

Graphs.—The graphs show the growth in delineated prospective area in relation to the cumulative number of wildcat wells in a country or group of countries. Wildcat wells are from a computer tape released in April 1983 by Petroconsultants; the well data graphed are those in table 3 minus the wells whose dates and locations are unknown.

Many wildcat wells drilled before 1950 were not recorded in our data so that the delineated prospective area as of 1950 is underestimated. Records of followup drilling after 1950 resulted in an overestimate of the rate of increase of the delineated prospective area after 1950. Nonetheless, we believe that the growth in the delineated prospective area after 1970 is real and is not an artifact of earlier missing data.

Summaries of exploration data.—Land areas are from individual country entries in the "Random House College Dictionary" (Random House, 1973). The delineated prospective areas and the explored areas were computed as explained in the appendix. Wildcat wells are from a computer tape released in April 1983 by Petroconsultants; the 1982 totals are those in table 3 minus the wells whose dates and locations are unknown. Current growth in delineated prospective area per wildcat is derived from the graph. Reported discoveries of recoverable crude oil through 1982 are from a Petroconsultants tape released in June 1983 and from W.D. Dietzman in the Dallas, Tex., office of the Energy Information Administration of the U.S. Department of Energy (written commun., 1983). The information on discoveries is incomplete.

[1]Any use of trade names in this report is for descriptive purposes only and does not constitute endorsement by the U.S. Geological Survey.

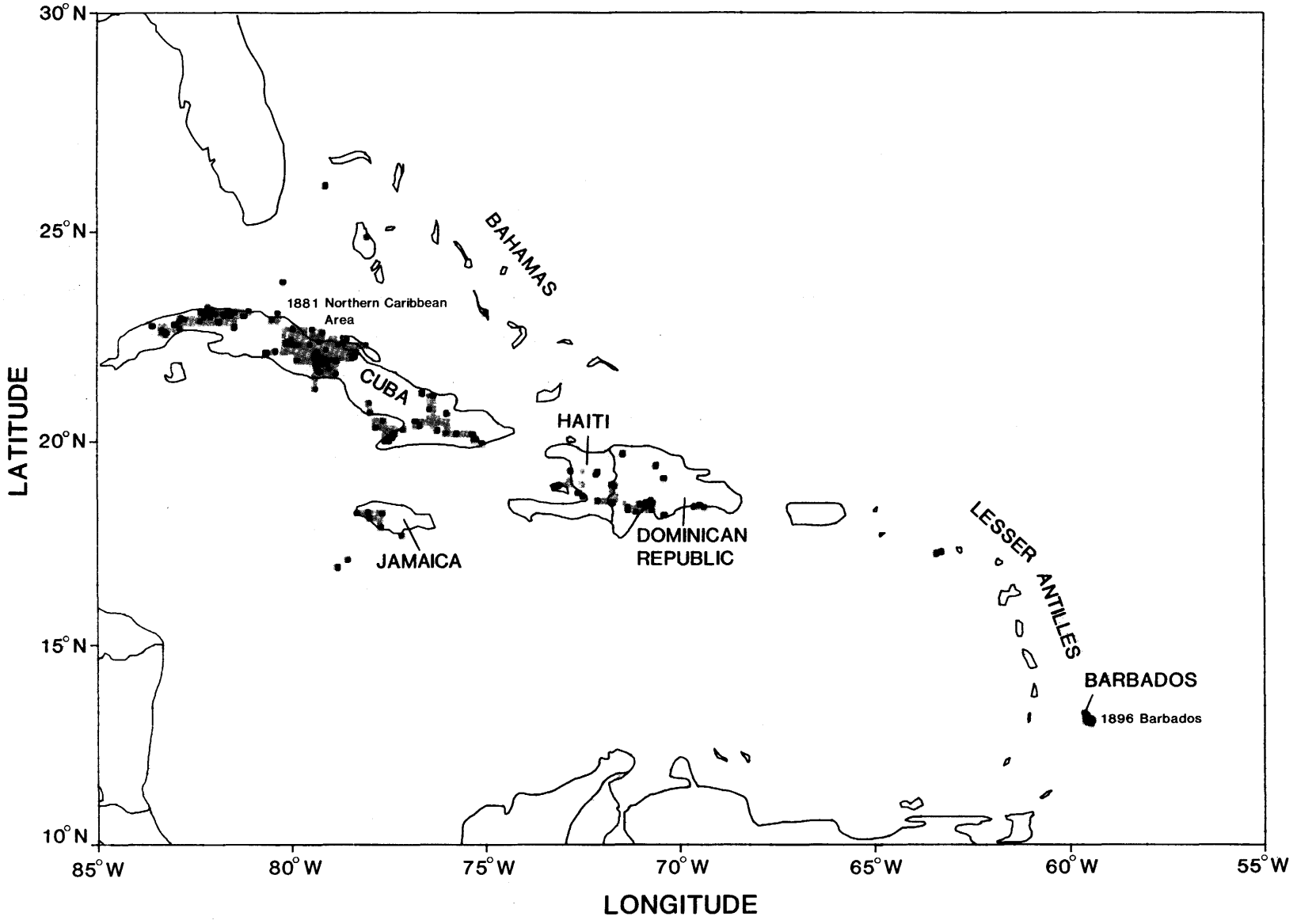
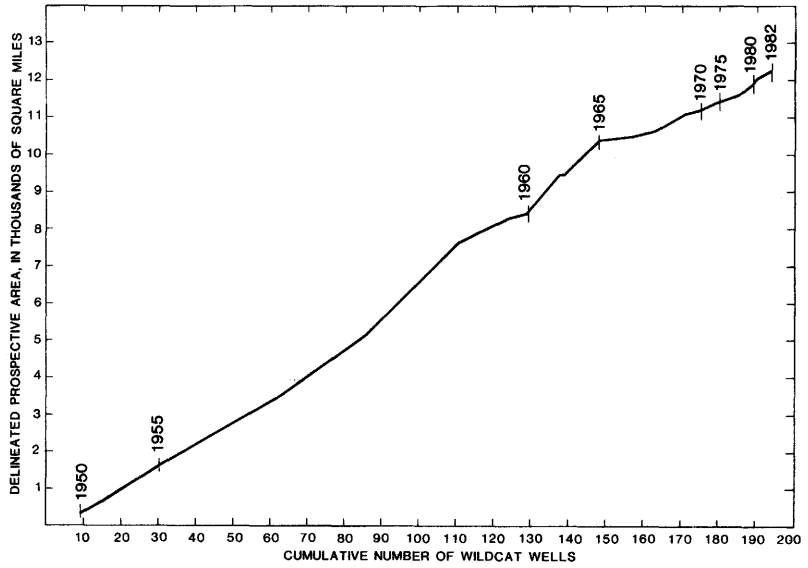


FIGURE 14.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of the Caribbean.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi²
Bahamas	4,404
Cuba*	44,218
Haiti	10,714
Dominican Republic	19,129
Jamaica	4,413
Barbados	161
Lesser Antilles**	2,133
Total	85,172

Delineated prospective area through 1982: 12,265 mi²

Explored area through 1982: 2,056 mi²

Wildcat wells through 1982: 194

Current growth in delineated prospective area per wildcat: 56 mi²

Reported discoveries of recoverable crude oil through 1982: Field sizes not available

*Data for Cuba are incomplete since 1960.

**For this report, the Lesser Antilles are considered to consist of the islands from Grenada to St. Thomas, except Barbados, which is listed separately.

FIGURE 14.—Continued.

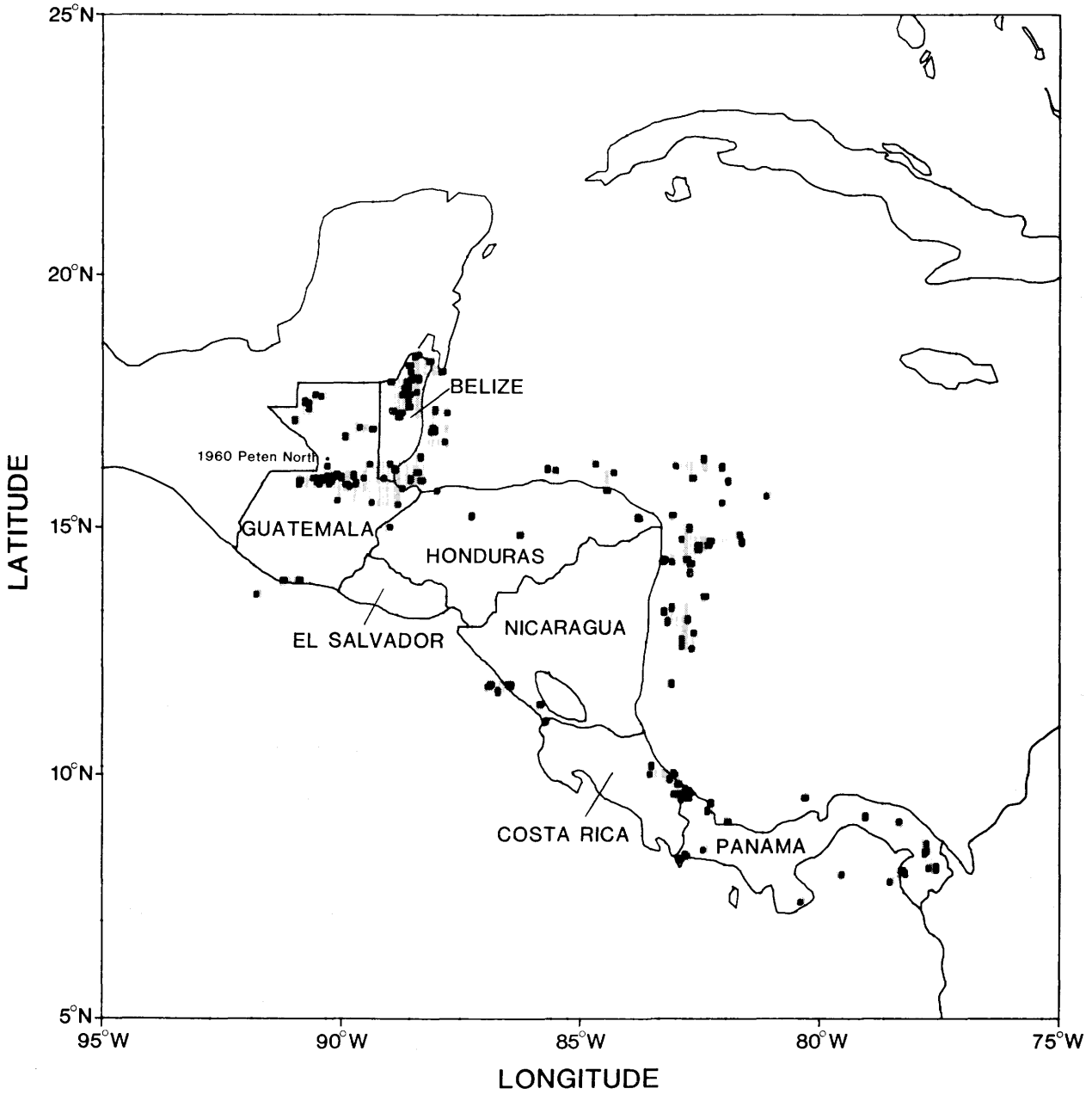
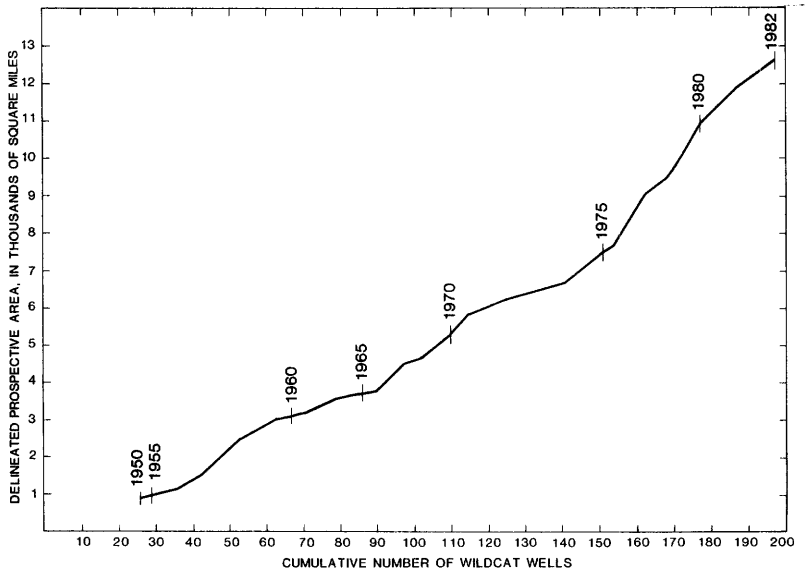


FIGURE 15.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Central America.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi²
Belize	8,867
Honduras	43,277
Guatemala	42,042
Nicaragua	57,143
El Salvador	13,176
Costa Rica	19,238
Panama	28,575
Total	212,318

Delineated prospective area through 1982: 12,545 mi^2

Explored area through 1982: 2,141 mi^2

Wildcat wells through 1982: 197

Current growth in delineated prospective area per wildcat: 81 mi^2

Reported discoveries of recoverable crude oil through 1982: 0.06×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.005 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 15.—Continued.

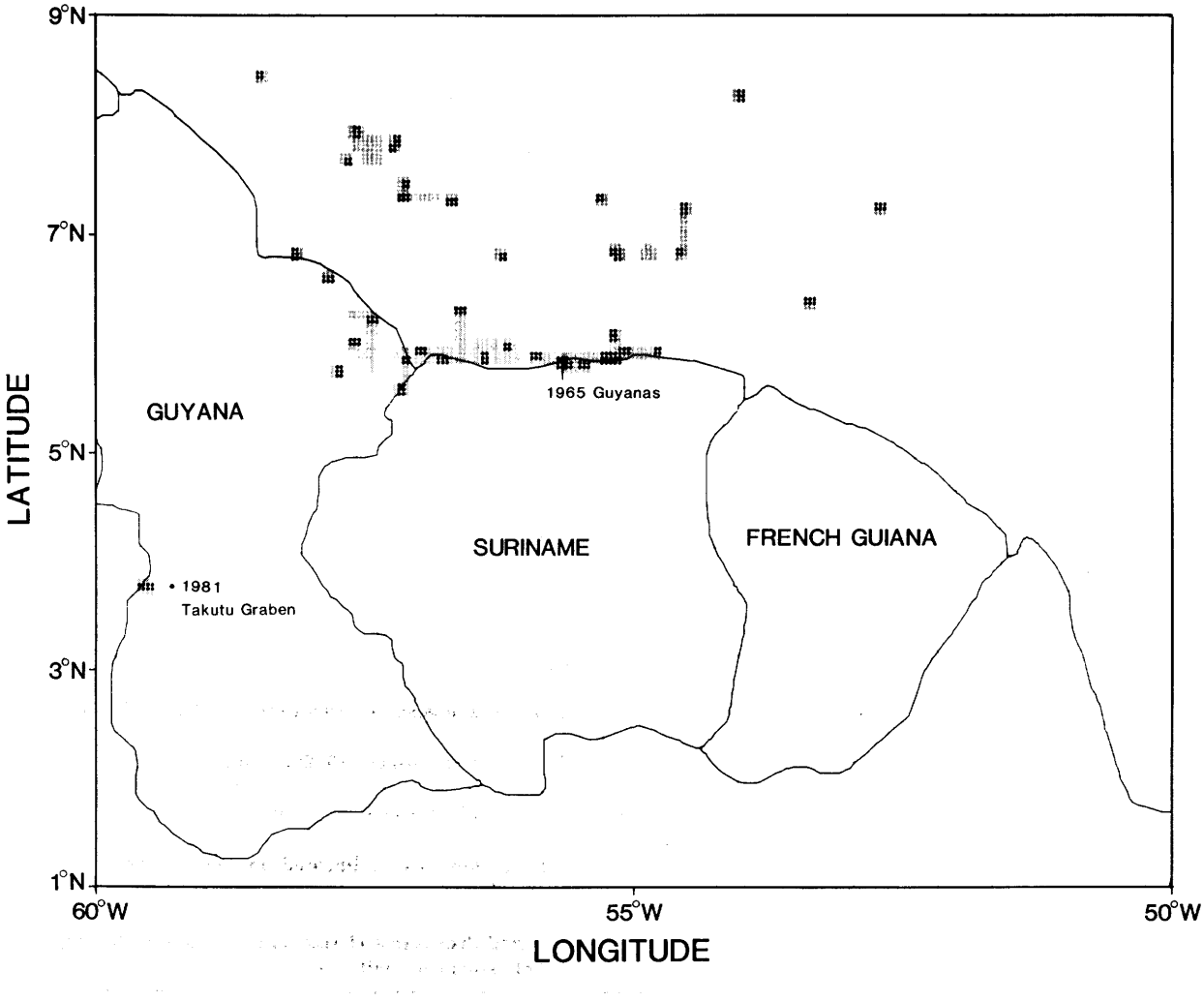
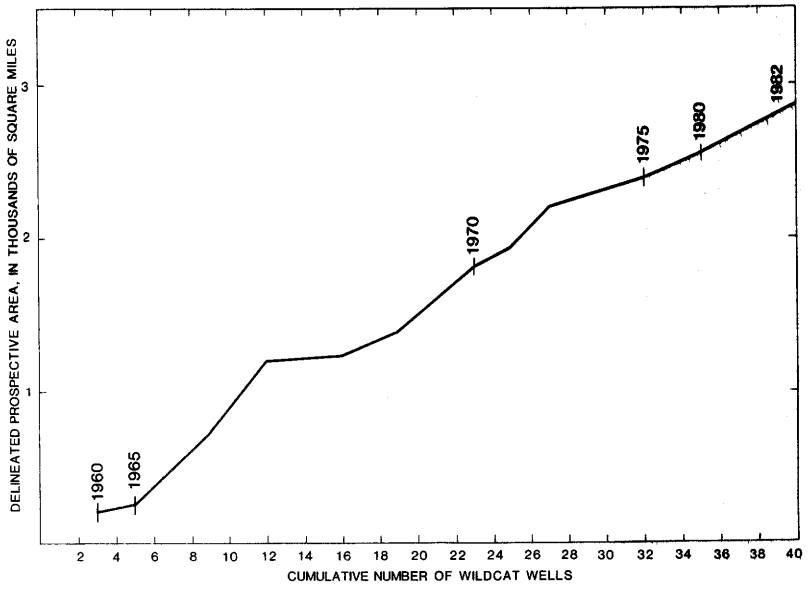


FIGURE 16.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Guyana, Suriname, and French Guiana, South America. French Guiana is listed separately although it is an overseas department of France.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi²
Guyana	82,978
Suriname	60,230
French Guiana	35,135
Total	178,343

Delineated prospective area through 1982: 2,863 mi²

Explored area through 1982: 580 mi²

Wildcat wells through 1982: 40

Current growth in delineated prospective area per wildcat: 72 mi²

Reported discoveries of recoverable crude oil through 1982: Field sizes not available

FIGURE 16.—Continued.

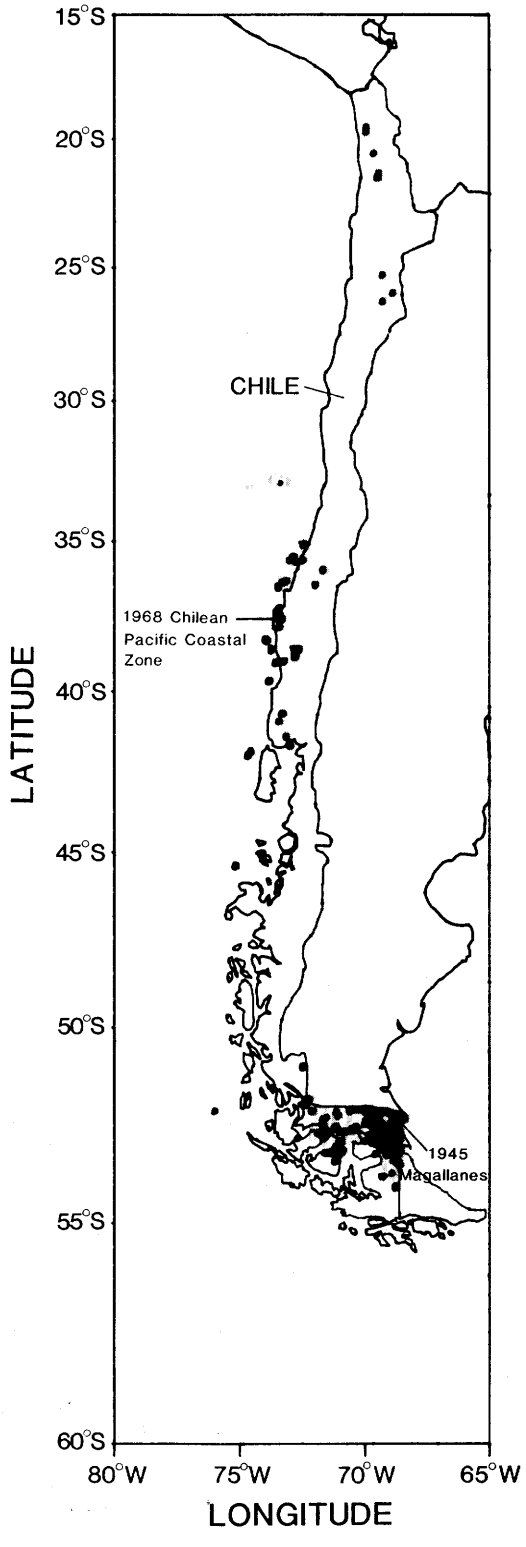
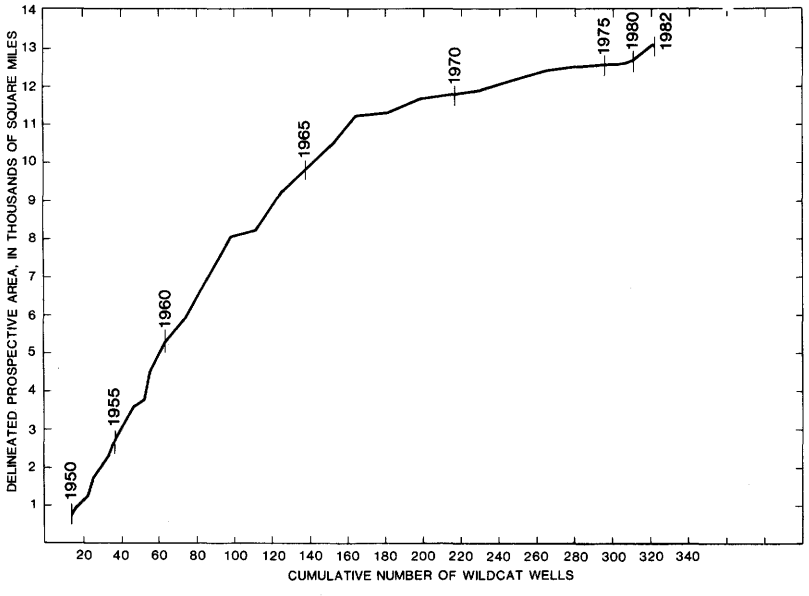


FIGURE 17.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Chile, South America.

Growth in delineated prospective area, 1950–82



Significant petroleum province

Significant petroleum province	Year of first discovery in this province in Chile	Cumulative discoveries in this province in Chile through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Magallanes	1945	155	375

Exploration data

Land area: 286,396 mi^2

Delineated prospective area through 1982: 13,037 mi^2

Explored area through 1982: 2,562 mi^2

Wildcat wells through 1982: 322

Current growth in delineated prospective area per wildcat: 13 mi^2

Reported discoveries of recoverable crude oil through 1982: 0.4×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.033 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 17.—Continued.

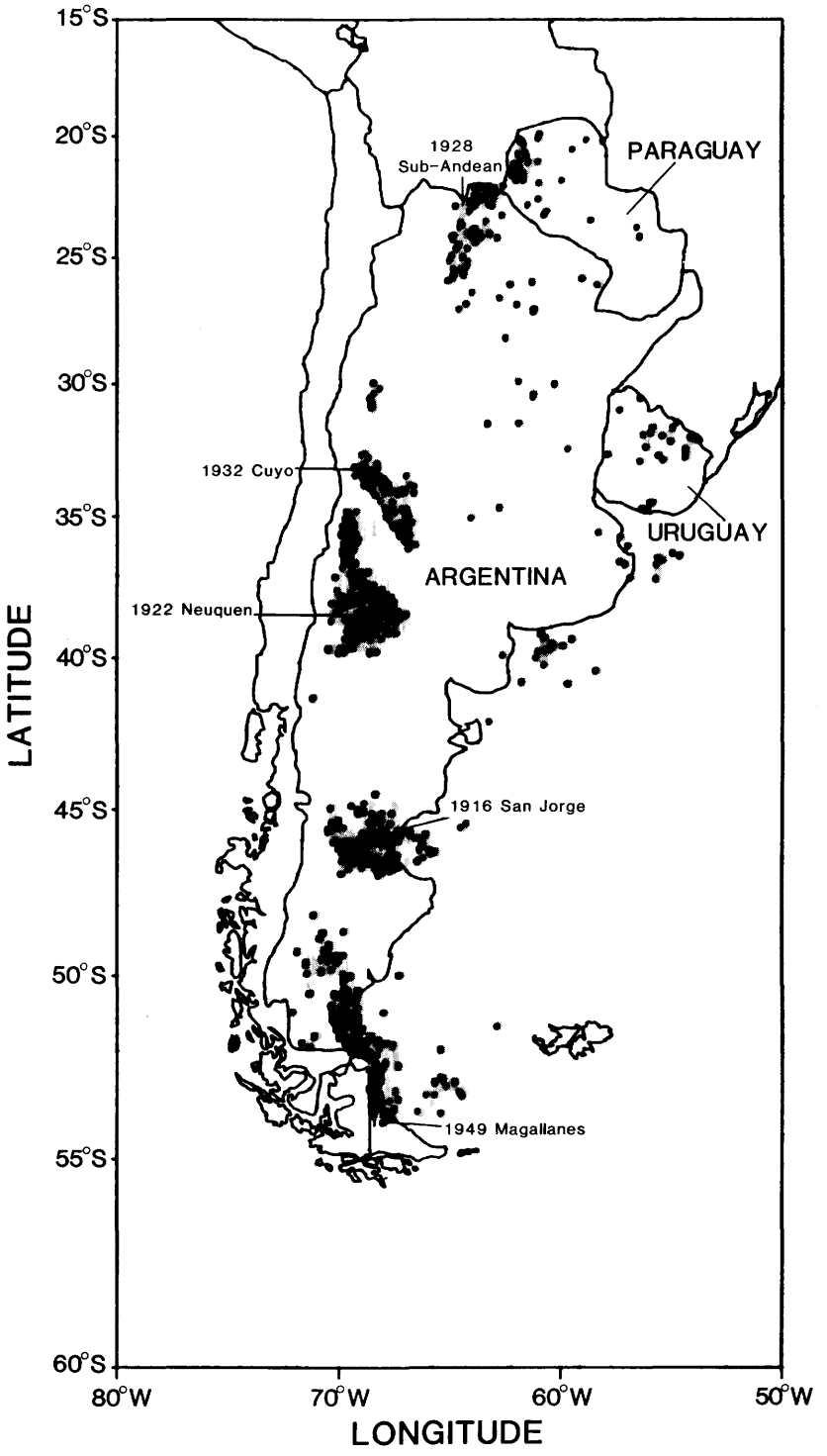
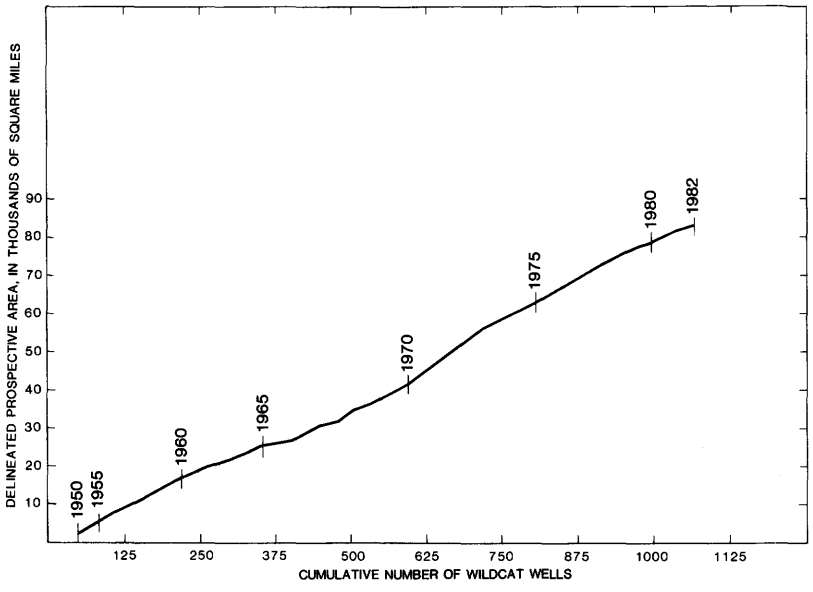


FIGURE 18.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Argentina, Uruguay, and Paraguay, South America.

Growth in delineated prospective area, 1950–82



Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in Argentina	Cumulative discoveries in this province in Argentina through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Neuquen	1922	369	864
San Jorge	1916	810	1,600
Cuyo	1932	750	943
Total		1,929	3,407

Exploration data

Country	Land area, mi^2
Argentina	1,084,120
Uruguay	72,172
Paraguay	157,047
Total	1,313,339

Delineated prospective area through 1982: 83,030 mi^2

Explored area through 1982: 13,309 mi^2

Wildcat wells through 1982: 1,064

Current growth in delineated prospective area per wildcat: 61 mi^2

Reported discoveries of recoverable crude oil through 1982: 5.8×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.068 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 18.—Continued.

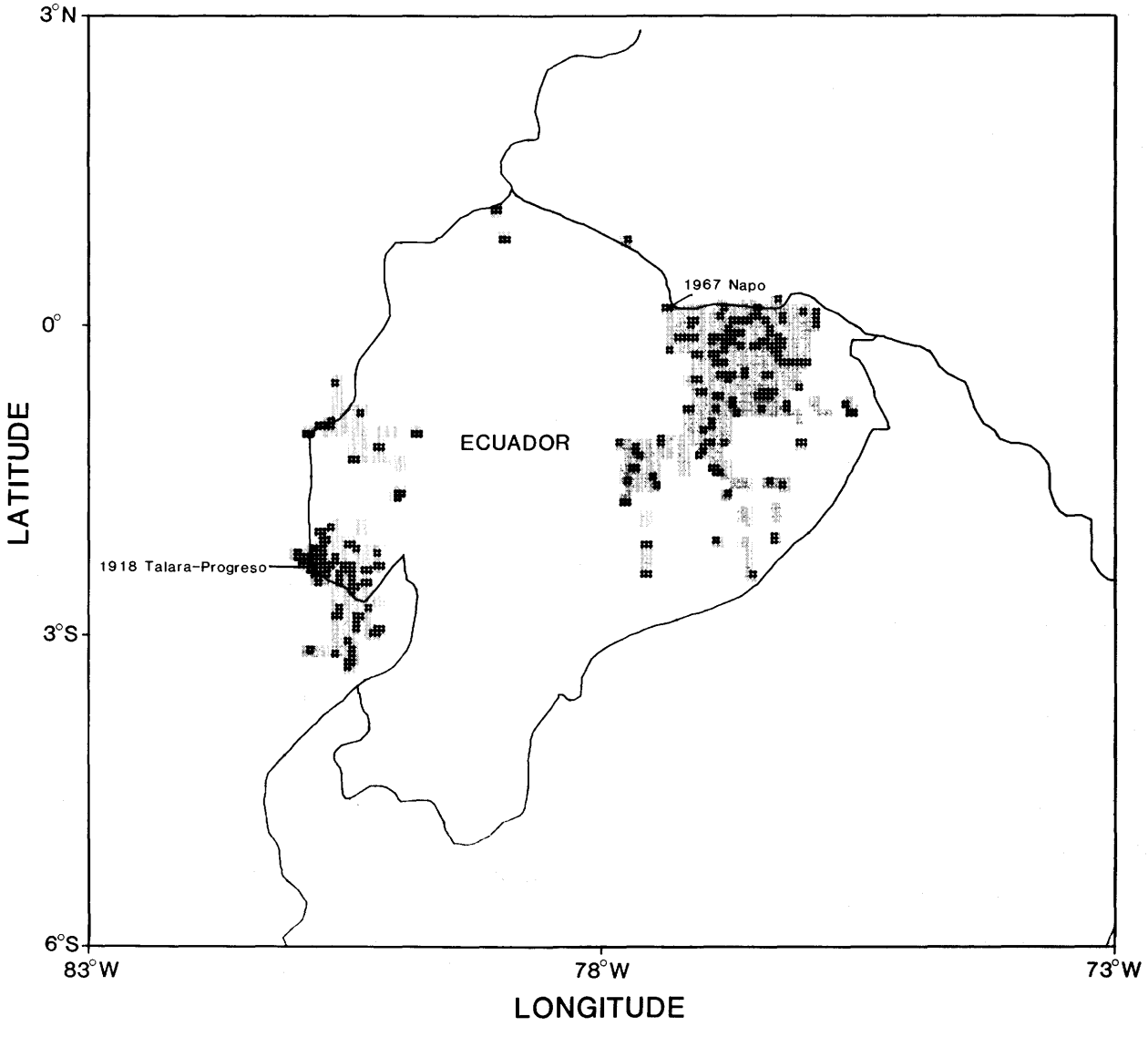
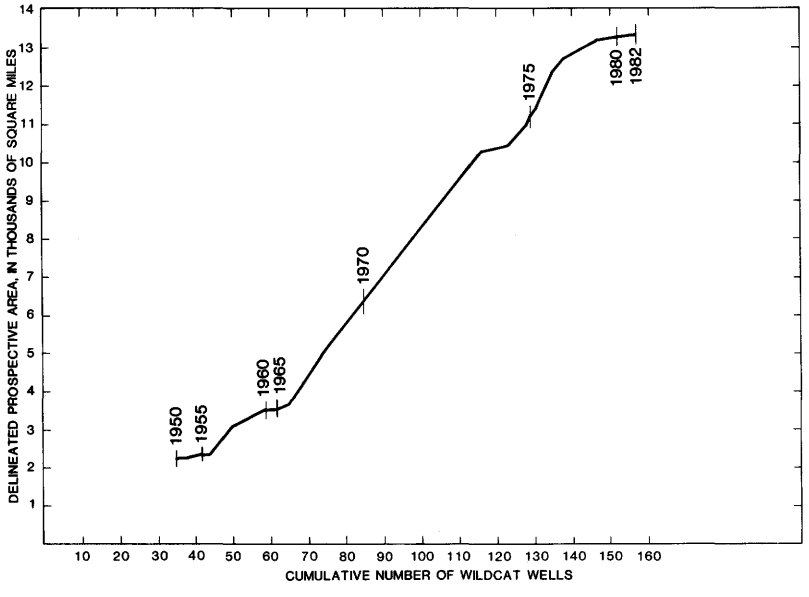


FIGURE 19.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Ecuador, South America.

Growth in delineated prospective area, 1950–82



Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in Ecuador	Cumulative discoveries in this province in Ecuador through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Talara-Progreso	1918	119	119
Napo	1967	2,521	2,824
Total		2,640	2,943

Exploration data

Land area: 104,510 mi^2

Delineated prospective area through 1982: 13,306 mi^2

Explored area through 1982: 1,949 mi^2

Wildcat wells through 1982: 156

Current growth in delineated prospective area per wildcat: 101 mi^2

Reported discoveries of recoverable crude oil through 1982: 2.9×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.216 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 19.—Continued.

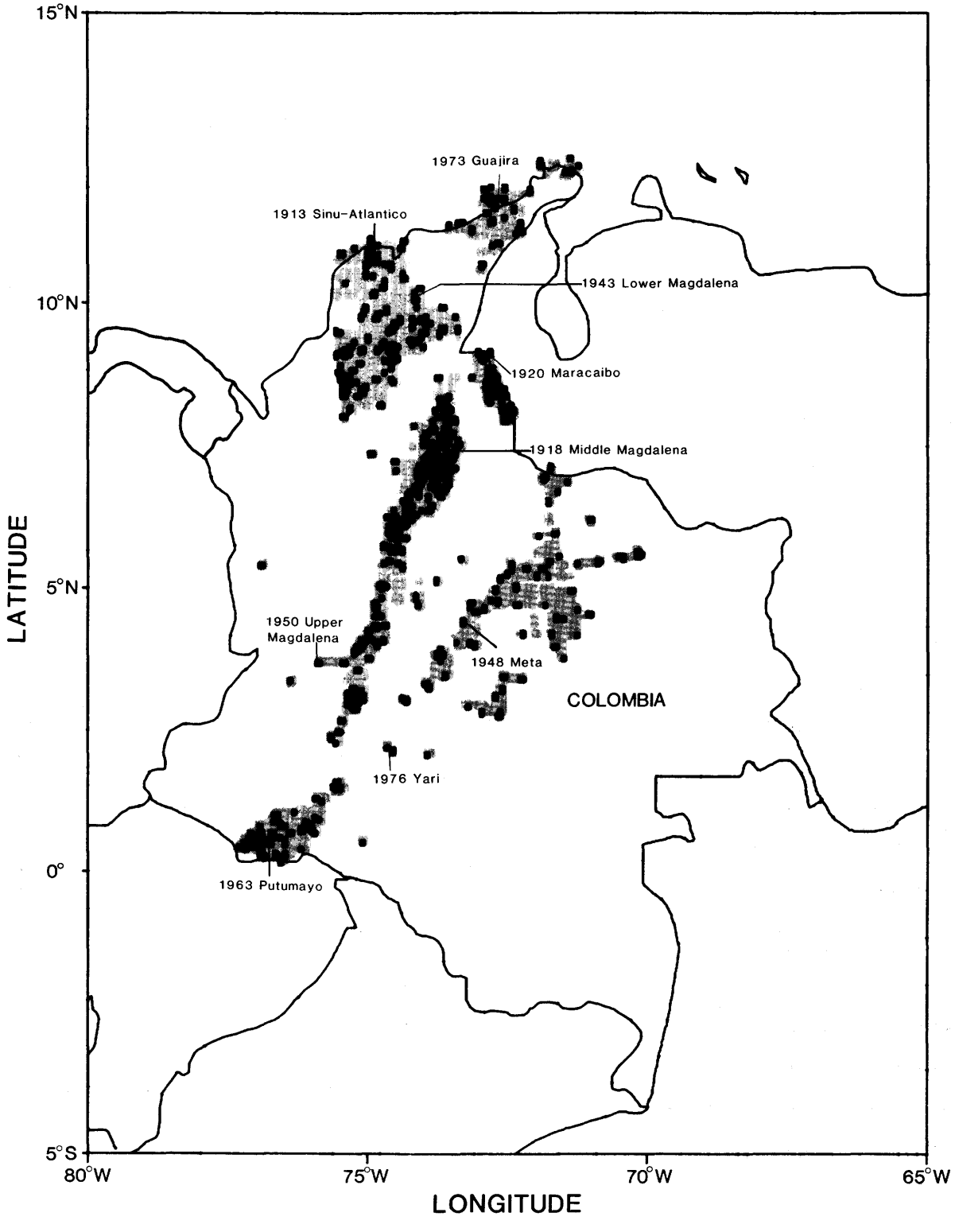
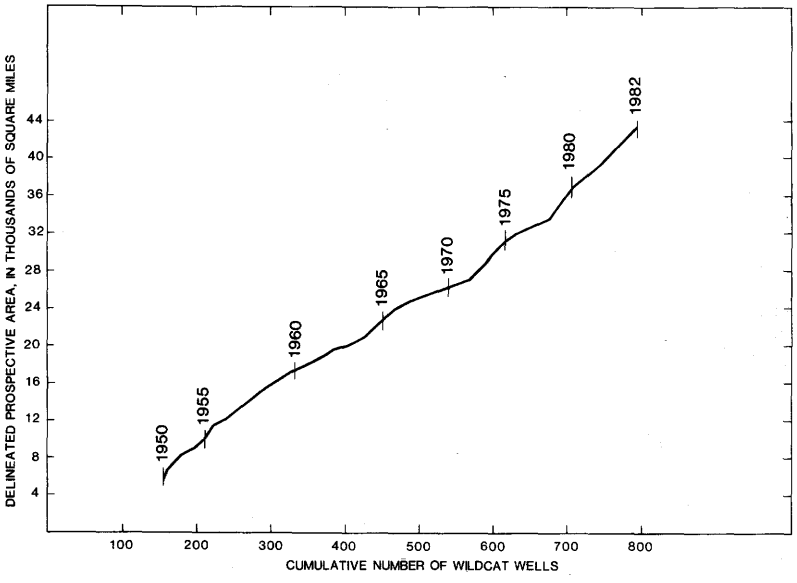


FIGURE 20.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Colombia, South America.

Growth in delineated prospective area, 1950–82



Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in Colombia	Cumulative discoveries in this province in Colombia through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Middle Magdalena	1918	1,450	1,866
Maracaibo	1920	370	430
Meta	1948	170	270
Putumayo	1963	230	265
Total		2,220	2,831

Exploration data

Land area: 439,828 mi^2

Delineated prospective area through 1982: 43,429 mi^2

Explored area through 1982: 8,109 mi^2

Wildcat wells through 1982: 792

Current growth in delineated prospective area per wildcat: 77 mi^2

Reported discoveries of recoverable crude oil through 1982: 3.1×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.069 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 20.—Continued.

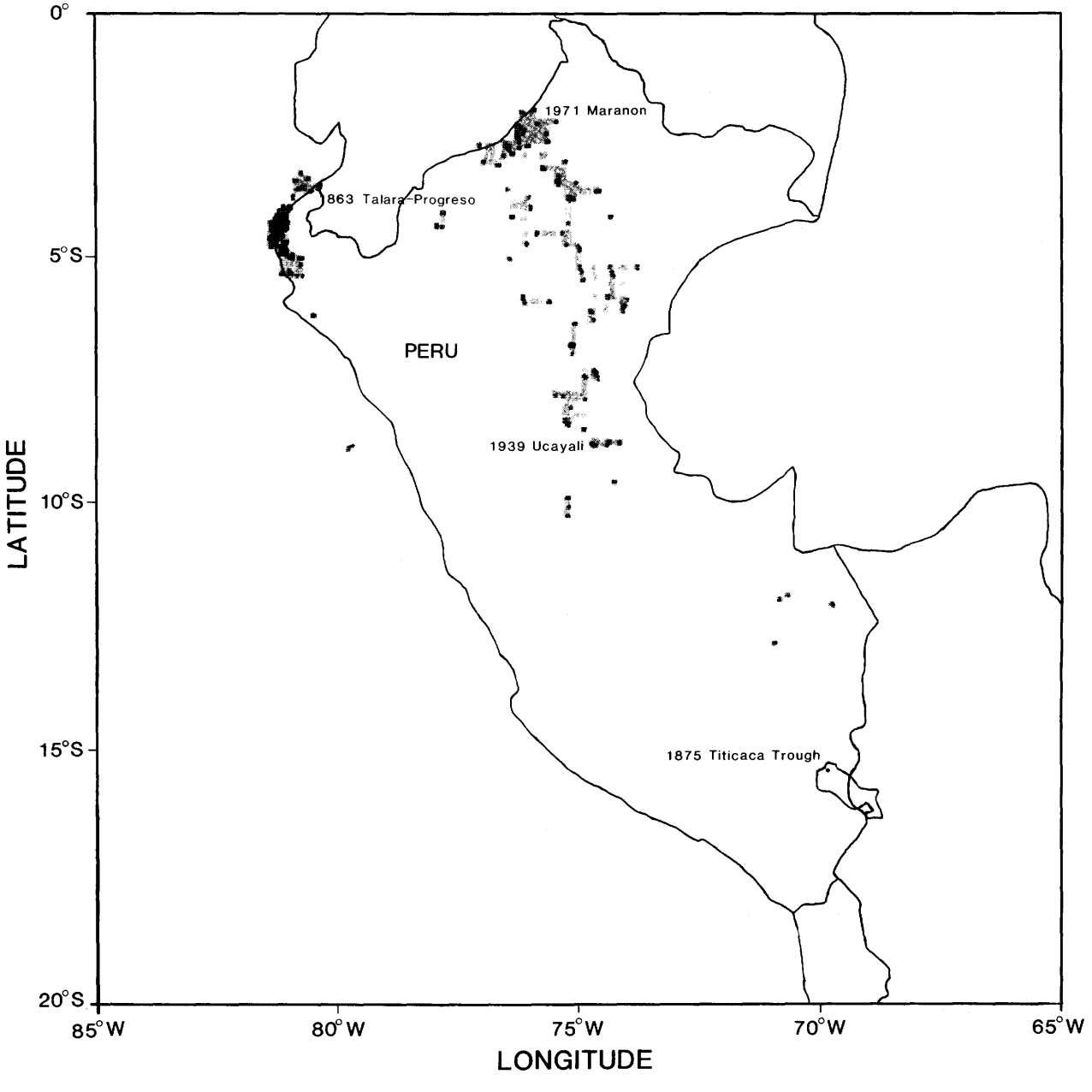
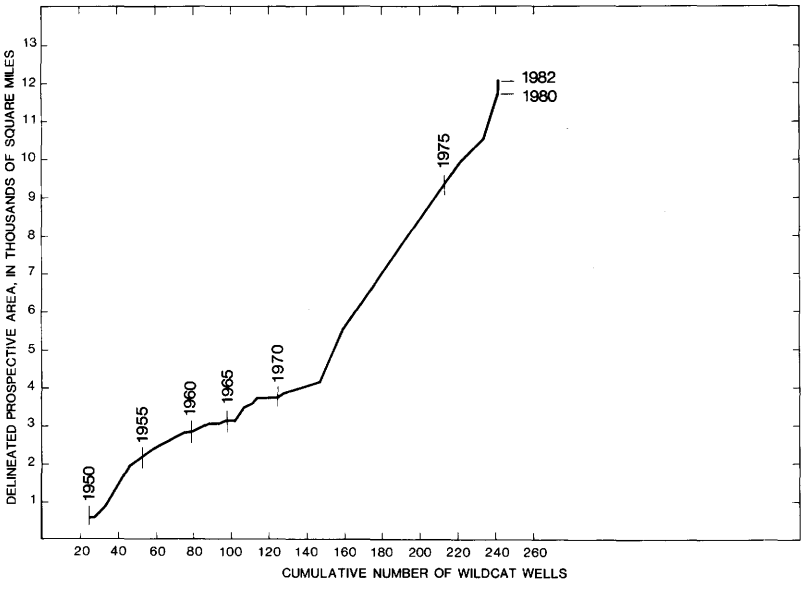


FIGURE 21.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Peru, South America.

Growth in delineated prospective area, 1950–82



Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in Peru	Cumulative discoveries in this province in Peru through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Talara-Progeso	1863	1,385	1,385
Maranon	1971	350	693
Total		1,735	2,078

Exploration data

Land area: 496,222 mi^2

Delineated prospective area through 1982: 12,033 mi^2

Explored area through 1982: 2,485 mi^2

Wildcat wells through 1982: 241

Current growth in delineated prospective area per wildcat: 84 mi^2

Reported discoveries of recoverable crude oil through 1982: 2.1×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.174 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 21.—Continued.

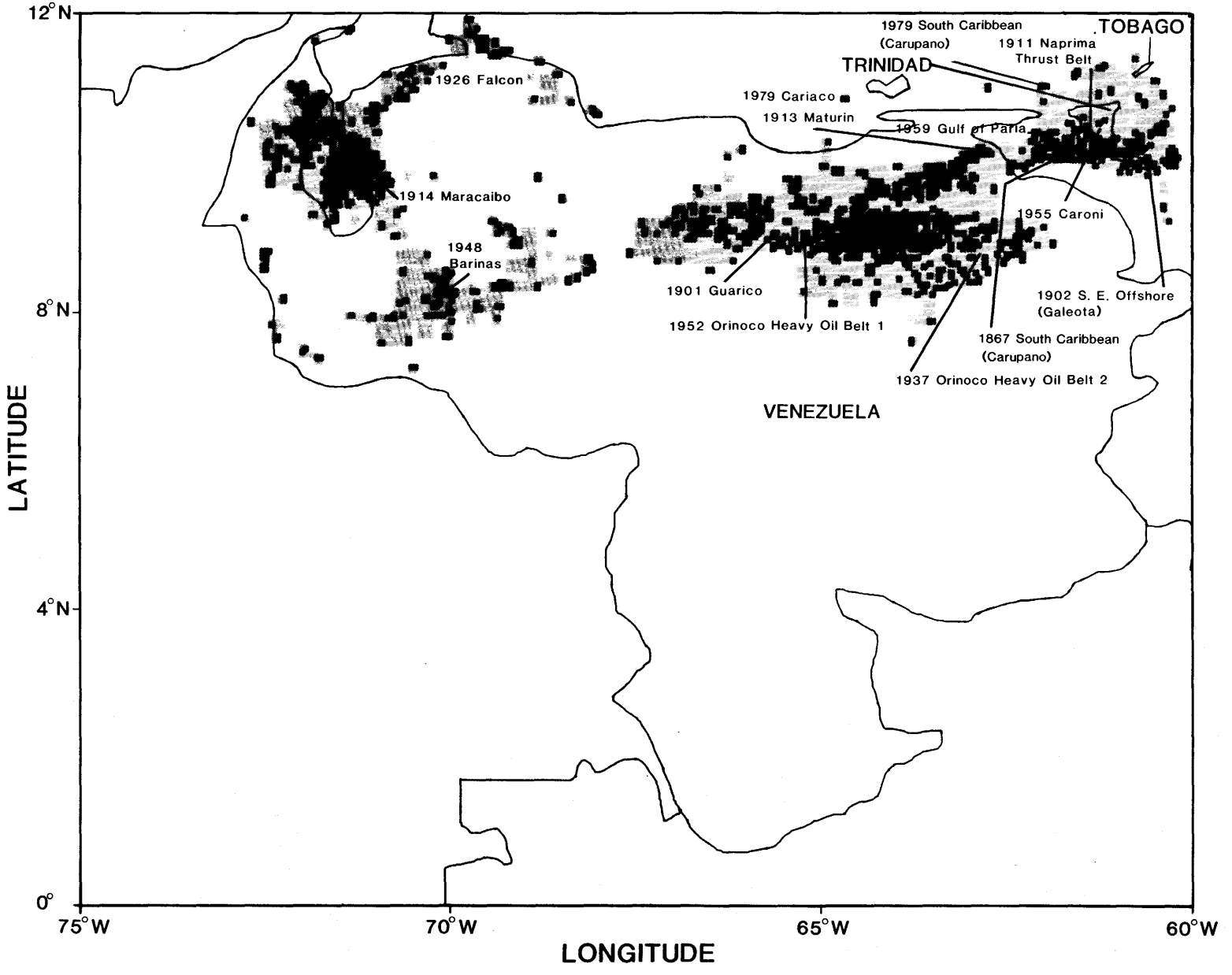
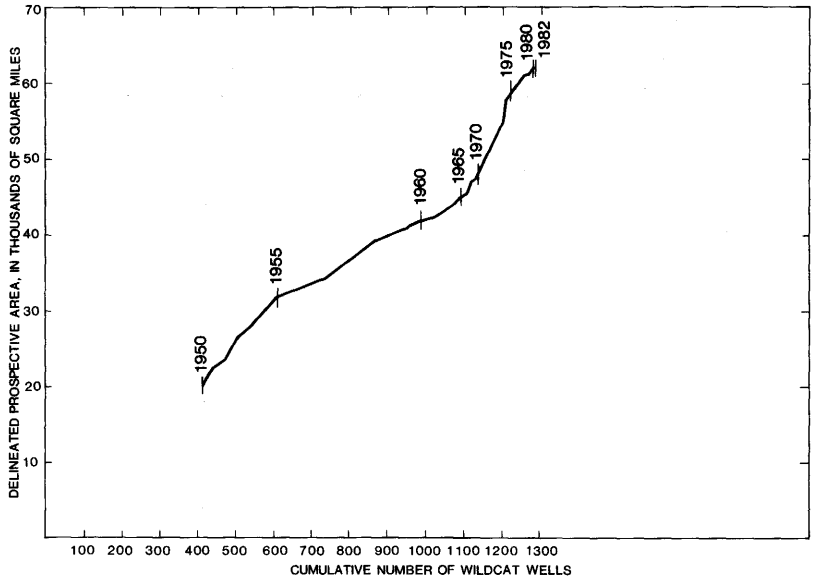


FIGURE 22.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Venezuela and Trinidad and Tobago, South America.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi^2
Venezuela	352,143
Trinidad and Tobago	1,980
Total	354,123

Delineated prospective area through 1982: 62,061 mi^2

Explored area through 1982: 16,068 mi^2

Wildcat wells through 1982: 1,282

Current growth in delineated prospective area per wildcat: 84 mi^2

Reported discoveries of recoverable crude oil through 1982: 64.2×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 1.035 \times 10^6 \text{ bbl/mi}^2$$

Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in this country	Cumulative discoveries in this province in this country through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Venezuela			
Guarico	1901	162	251
Maturin	1913	12,998	13,313
Maracaibo	1914	43,674	43,806
Orinoco Heavy Oil Belt 2	1937	1,088	1,162
Barinas	1948	2,714	2,819
Total		60,636	61,451
Trinidad and Tobago			
South Caribbean	1867	1,200	1,785
Southeast Offshore (Galeota)	1902	629	813
Total		1,829	2,598

FIGURE 22.—Continued.

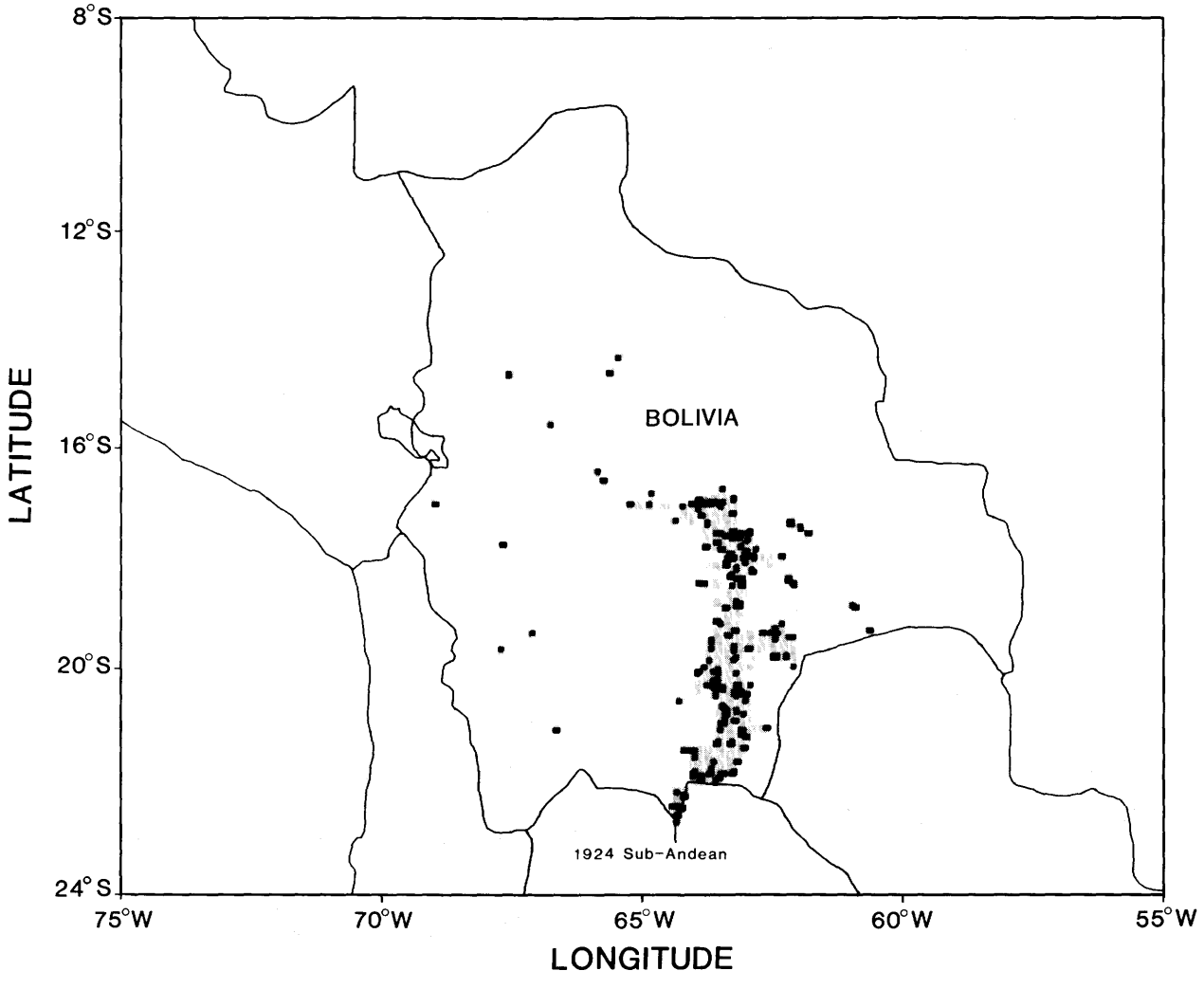
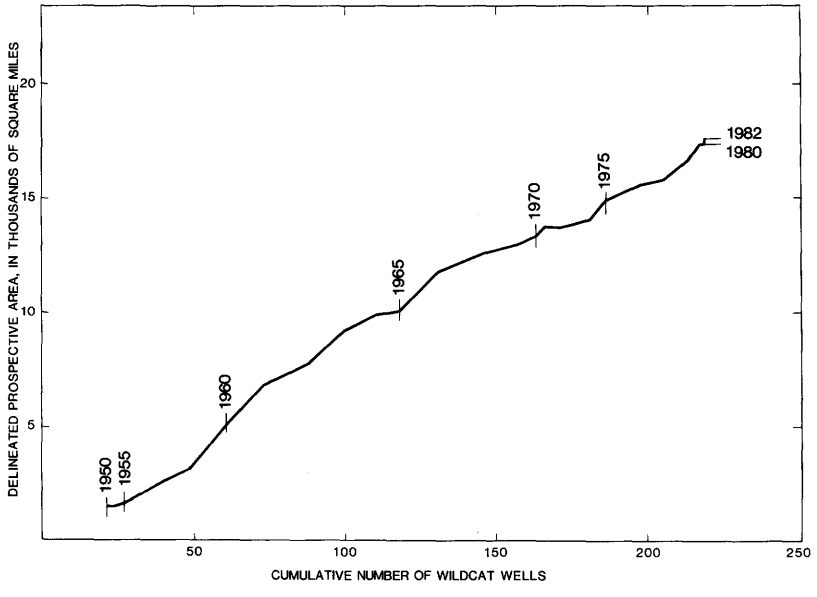


FIGURE 23.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Bolivia, South America.

Growth in delineated prospective area, 1950–82



Exploration data

Land area: 404,388 mi^2

Delineated prospective area through 1982: 17,468 mi^2

Explored area through 1982: 2,457 mi^2

Wildcat wells through 1982: 218

Current growth in delineated prospective area per wildcat: 75 mi^2

Reported discoveries of recoverable crude oil through 1982: 0.4×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.022 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 23.—Continued.

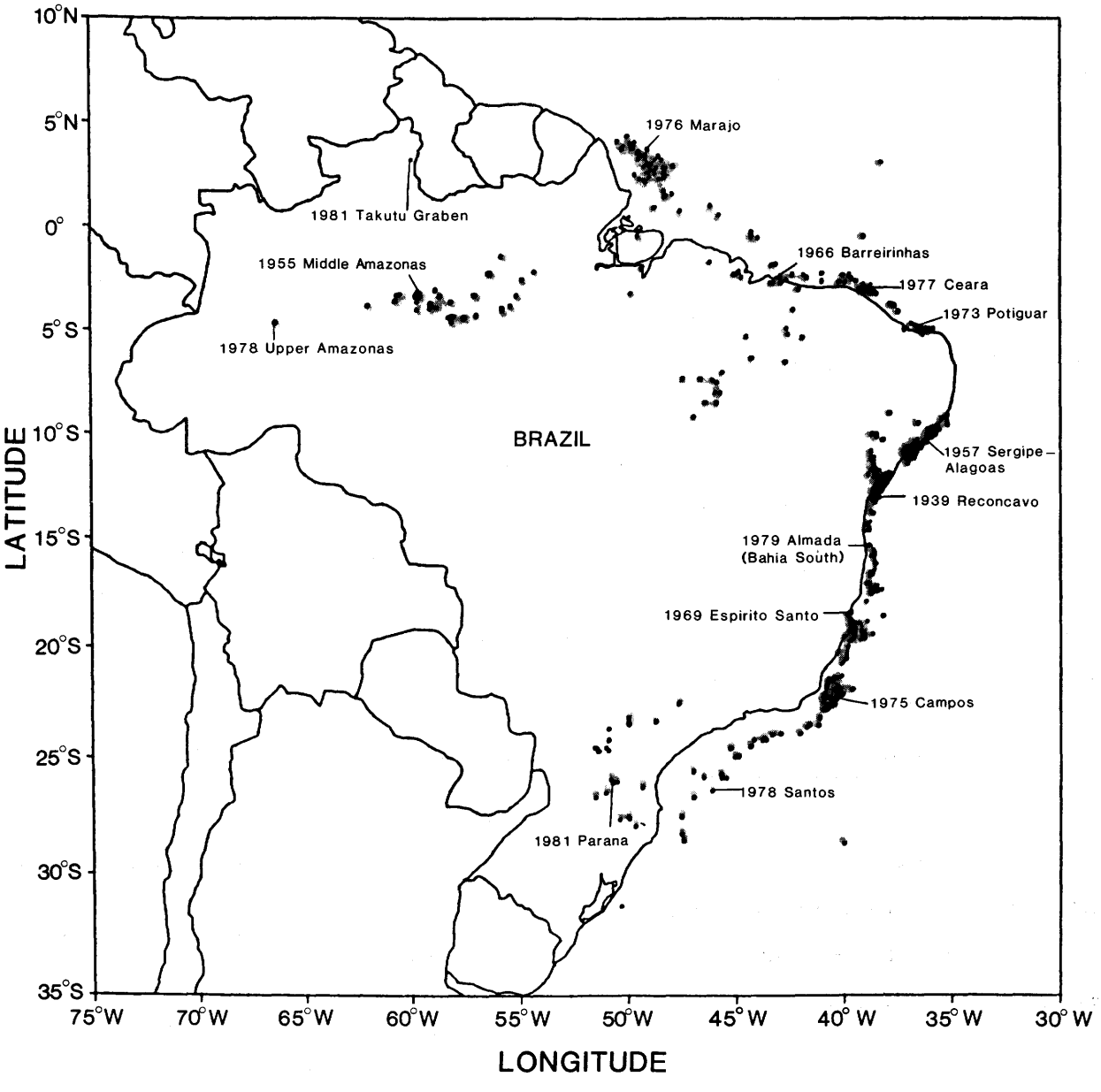
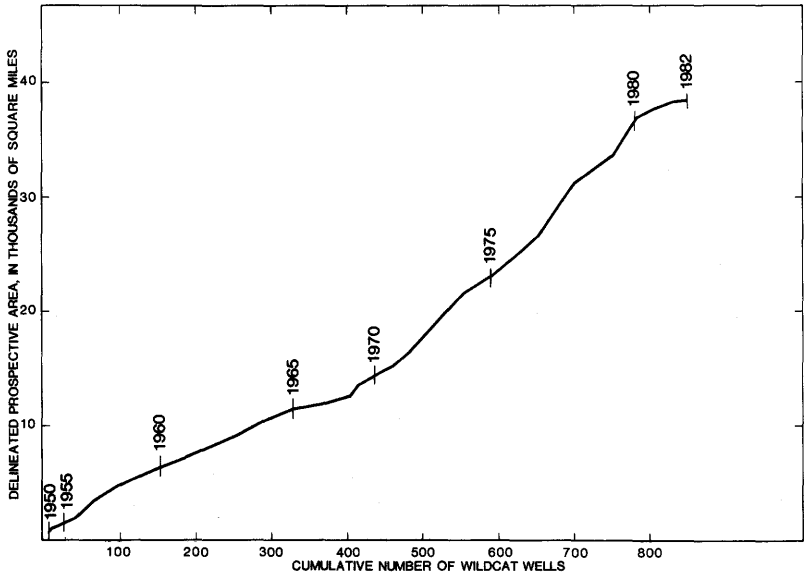


FIGURE 24.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Brazil, South America.

Growth in delineated prospective area, 1950–82



Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in Brazil	Cumulative discoveries in this province in Brazil through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Reconcavo	1939	1,260	1,567
Sergipe-Alagoas	1957	190	357
Campos	1975	492	951
Total		1,942	2,875

Exploration data

Land area: 3,286,170 mi^2

Delineated prospective area through 1982: 38,011 mi^2

Explored area through 1982: 8,114 mi^2

Wildcat wells through 1982: 848

Current growth in delineated prospective area per wildcat: 62 mi^2

Reported discoveries of recoverable crude oil through 1982: 3.1×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.075 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 24.—Continued.

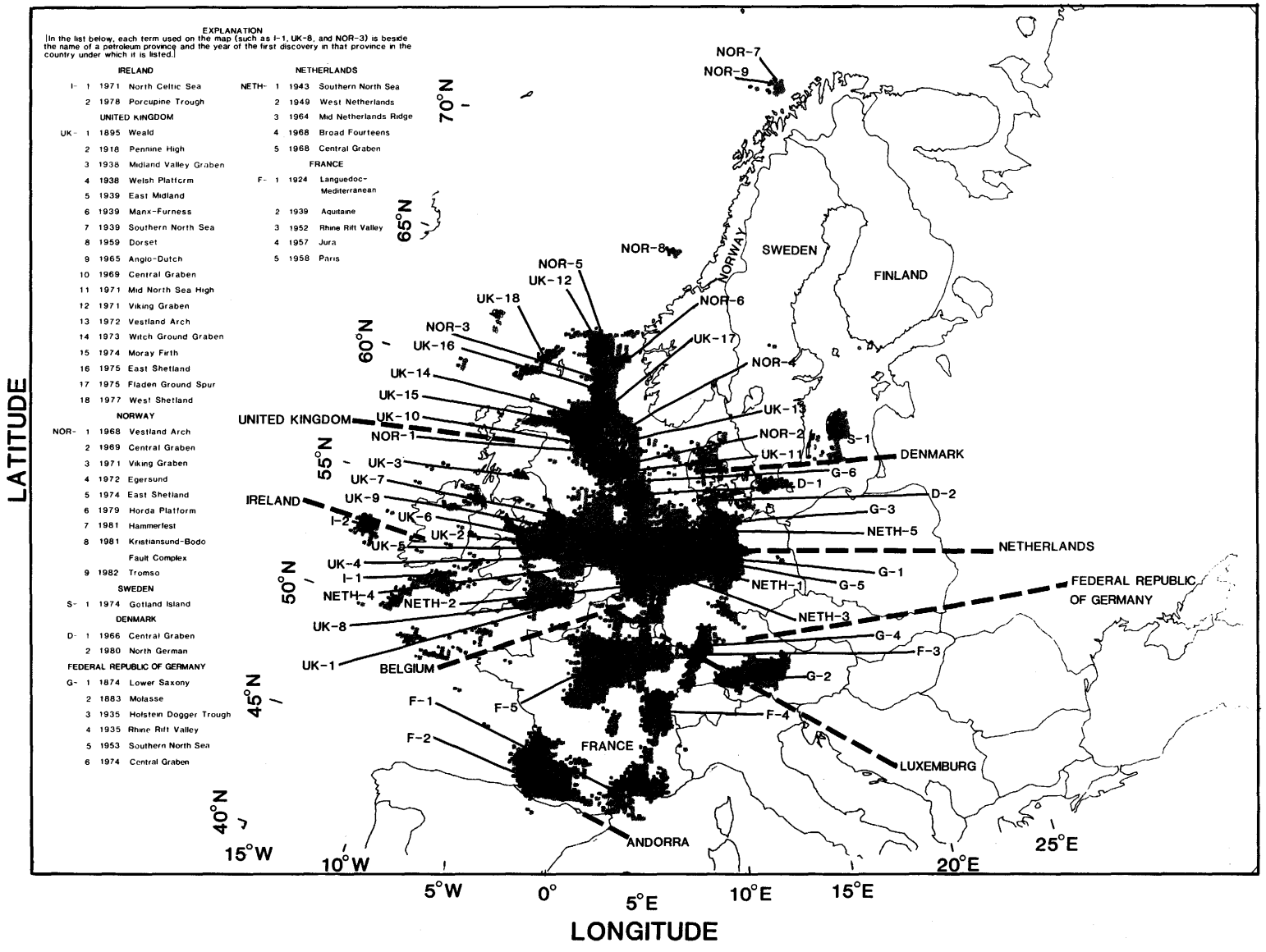
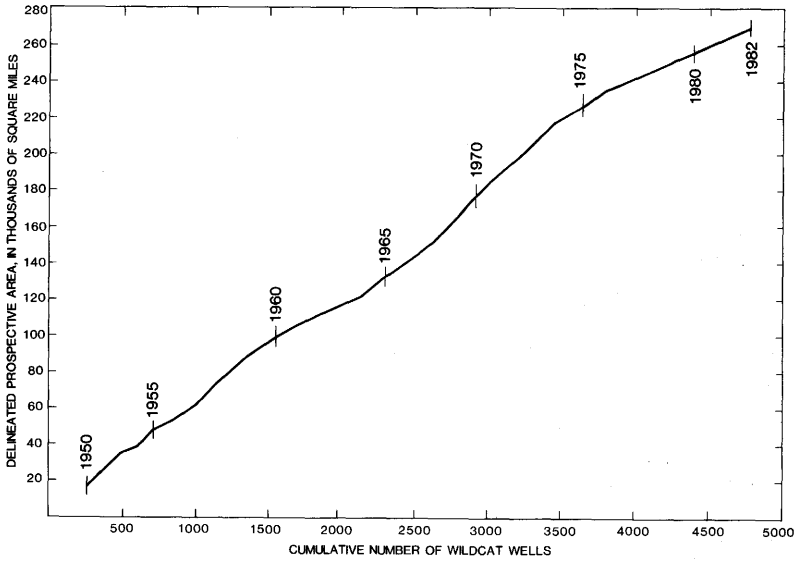


FIGURE 25.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of the northern part of Western Europe.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi²
United Kingdom	93,377
Ireland	27,137
France	212,736
Netherlands	13,433
Belgium	11,779
Luxemburg	999
Federal Republic of Germany	94,905
Norway	124,555
Denmark	16,576
Sweden	173,394
Finland	130,119
Andorra	191
Monaco (not shown)	.5
Greenland*	840,000
Iceland (not shown)	39,698
Total	1,778,899.5

Delineated prospective area through 1982: 269,563 mi^2

Explored area through 1982: 50,623 mi^2

Wildcat wells through 1982: 4,766

Current growth in delineated prospective area per wildcat: 41 mi^2

Reported discoveries of recoverable crude oil through 1982: 28.7×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.106 \times 10^6 \text{ bbl/mi}^2$$

*Greenland is listed separately here although it is part of Denmark. Greenland is not shown on the map, and its five wildcat wells and the explored and delineated prospective areas defined by them are not included in the data given here.

Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in this country	Cumulative discoveries in this province in this country through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
United Kingdom			
Central Graben	1969	2,842	3,392
Viking Graben	1971	8,521	9,548
Witch Ground Graben	1973	1,090	1,410
Moray Firth	1974	128	569
Fladen Ground Spur	1975	100	125
West Shetland	1977	600	600
Total		13,281	15,644
Ireland			
Porcupine	1978	114	114
France			
Aquitaine	1939	210	438
Paris	1958	200	275
Total		410	713
Netherlands			
Southern North Sea	1943	400	400
Federal Republic of Germany			
Lower Saxony	1874	576	1,334
Norway			
Vestland Arch	1968	480	610
Central Graben	1969	2,030	2,244
Viking Graben	1971	1,400	1,520
East Shetland	1974	4,528	4,553
Horda Platform	1979	755	755
Total		9,193	9,682
Denmark			
Central Graben	1966	421	732

FIGURE 25.—Continued.

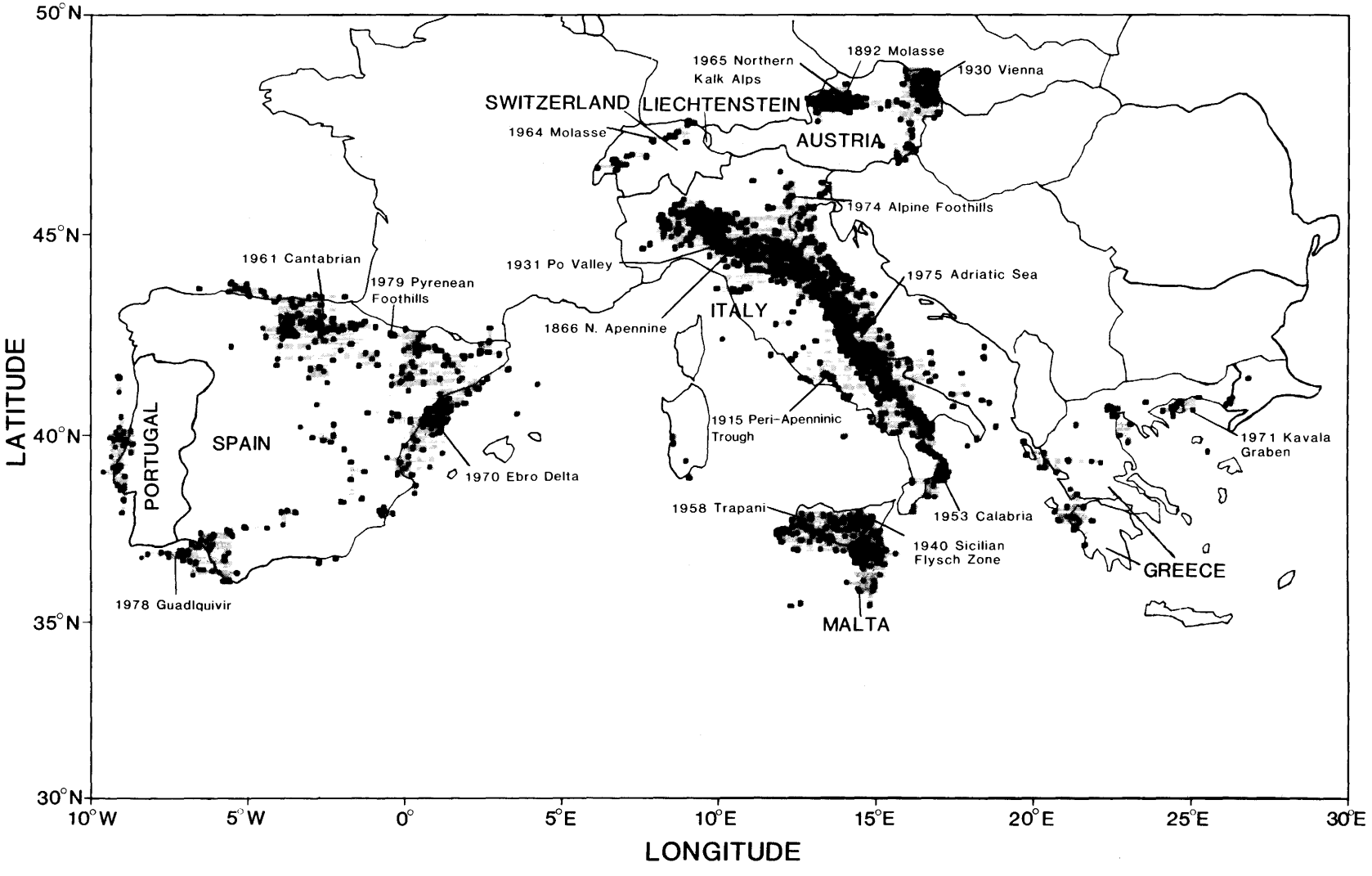
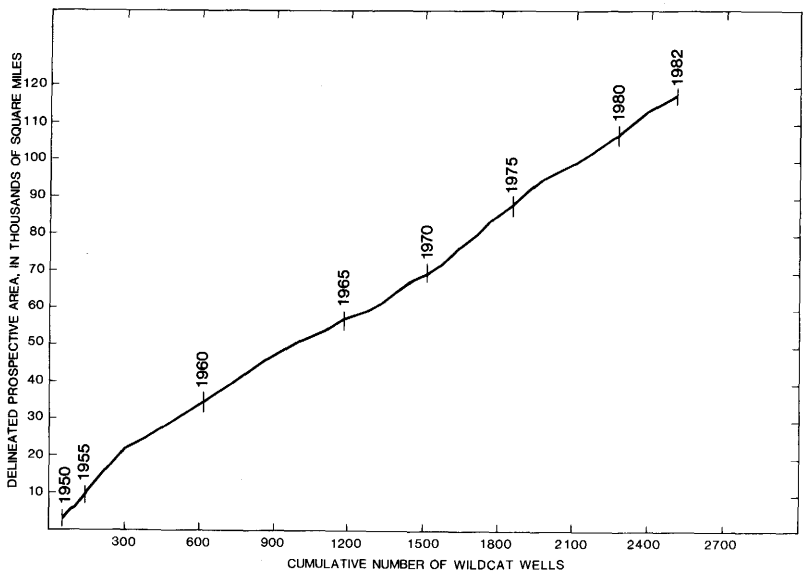


FIGURE 26.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of the middle and southern parts of Western Europe.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi^2
Austria	32,381
Liechtenstein	65
Italy	116,294
Switzerland	15,944
Greece	50,147
Portugal	35,414
Spain	194,988
Malta	122
Total	445,355

Delineated prospective area through 1982: 116,956 mi^2

Explored area through 1982: 23,890 mi^2

Wildcat wells through 1982: 2,504

Current growth in delineated prospective area per wildcat: 35 mi^2

Reported discoveries of recoverable crude oil through 1982: 1.7×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.014 \times 10^6 \text{ bbl/mi}^2$$

Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in this country	Cumulative discoveries in this province in this country through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Austria			
Vienna	1930	460	667
Italy			
Sicilian Flysch Zone	1940	440	455
Greece			
Kavala Graben	1971	160	160

FIGURE 26.—Continued.

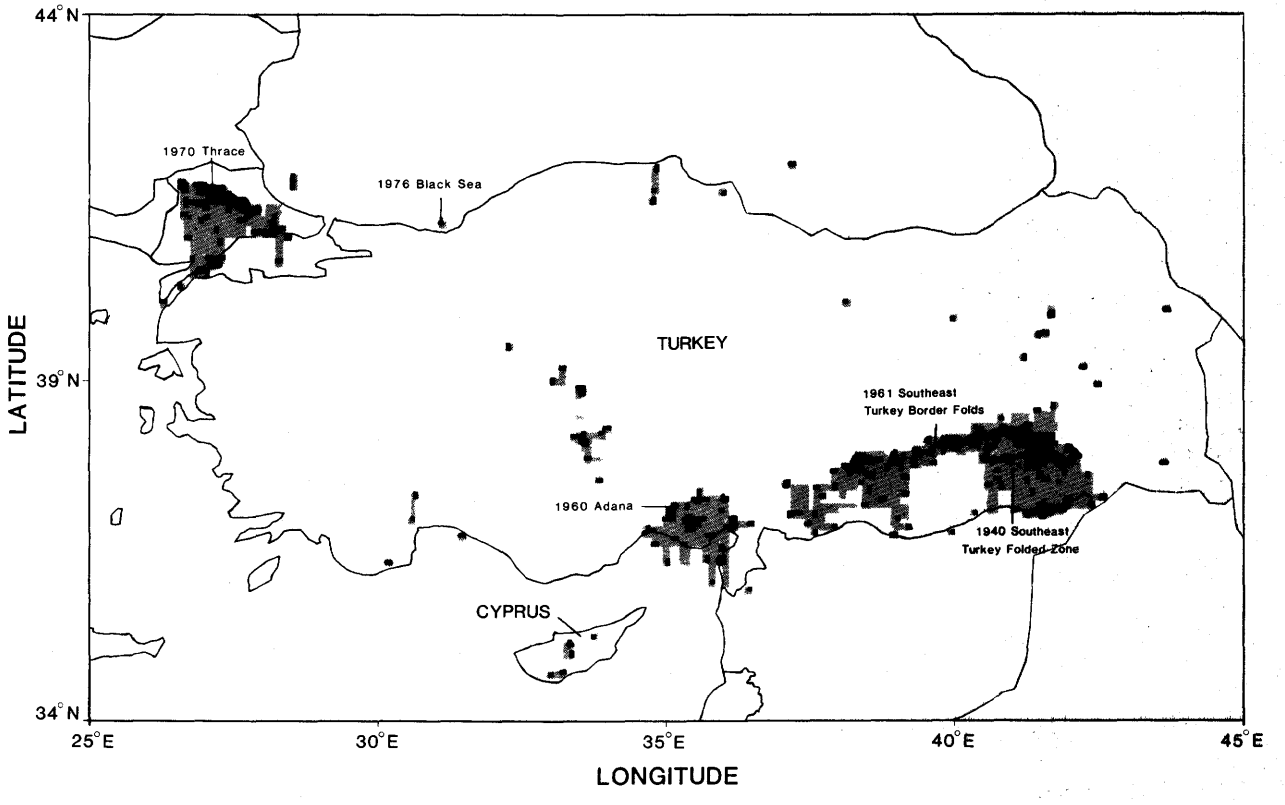
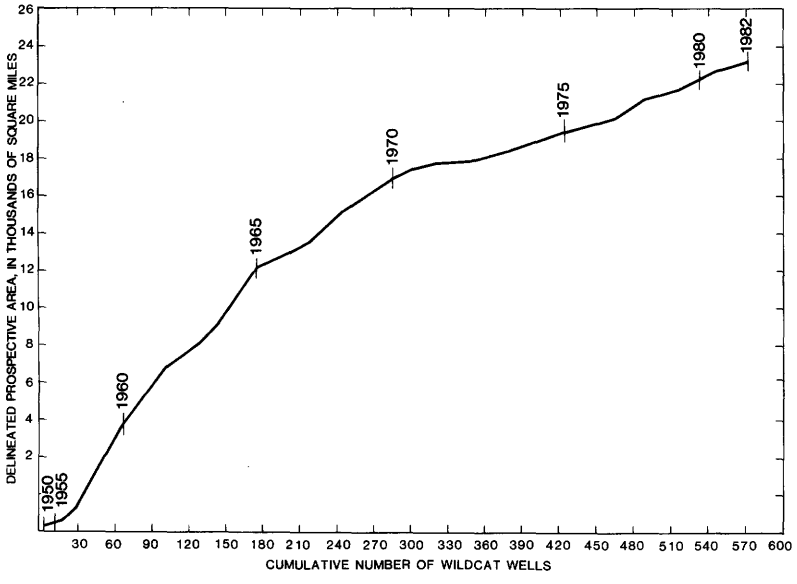


FIGURE 27.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Turkey and Cyprus, Middle East.

Growth in delineated prospective area, 1950–82



Significant petroleum province

Significant petroleum province	Year of first discovery in this province in Turkey	Cumulative discoveries in this province in Turkey through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Southeast Turkey Folded Zone	1940	380	644

Exploration data

Country	Land area, mi^2
Turkey	296,184
Cyprus	3,572
Total	299,756

Delineated prospective area through 1982: 25,393 mi^2

Explored area through 1982: 5,322 mi^2

Wildcat wells through 1982: 577

Current growth in delineated prospective area per wildcat: 25 mi^2

Reported discoveries of recoverable crude oil through 1982: 0.6×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.026 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 27.—Continued.

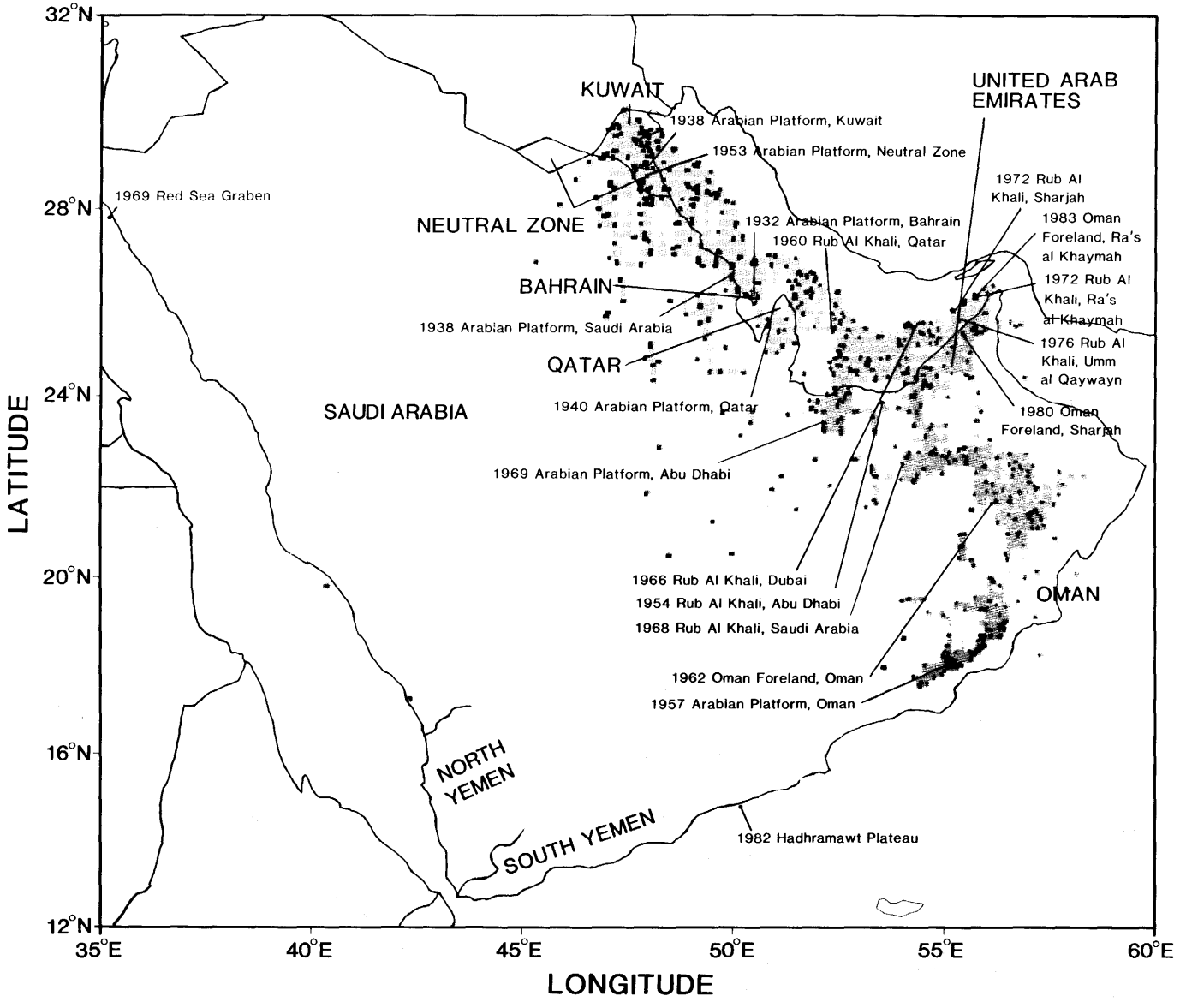
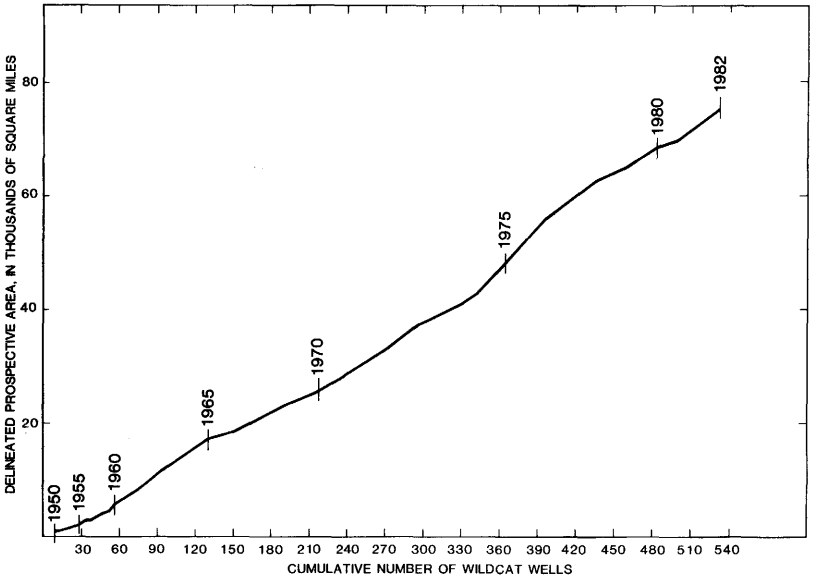


FIGURE 28.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of the Arabian Peninsula, Middle East.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi²
Saudi Arabia	600,000
Kuwait	8,000
Neutral Zone*	2,800
Bahrain	232
Qatar	4,000
Oman	82,000
North Yemen	75,000
South Yemen	112,000
United Arab Emirates	35,600
Total	919,632

Delineated prospective area through 1982: 75,100 mi^2

Explored area through 1982: 7,732 mi^2

Wildcat wells through 1982: 530

Current growth in delineated prospective area per wildcat: 131 mi^2

Reported discoveries of recoverable crude oil through 1982: 405.8×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 5.391 \times 10^6 \text{ bbl/mi}^2$$

*The Neutral Zone's land area is estimated from the map drawn by Dissipla.

Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in this country	Cumulative discoveries in this province in this country through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Saudia Arabia			
Arabian Platform	1938	208,025	208,420
Rub Al Khali	1968	2,855	2,925
Total		210,880	211,345
Kuwait			
Arabian Platform	1938	108,889	108,889
Neutral Zone			
Arabian Platform	1953	15,230	15,230
Bahrain			
Arabian Platform	1932	1,025	1,025
Qatar			
Arabian Platform	1940	2,420	2,420
Rub Al Khali	1960	5,275	5,275
Total		7,695	7,695
Abu Dhabi*			
Rub Al Khali	1954	51,317	51,332
Dubai*			
Rub Al Khali	1966	2,816	2,816
Ra's al Khaymah*			
Rub Al Khali	1972	1,943	1,943
Sharjah*			
Rub Al Khali	1972	505	505
Oman			
Arabian Platform	1957	395	765
Oman Foreland	1962	4,247	4,247
Total		4,642	5,012

*One of the seven United Arab Emirates.

FIGURE 28.—Continued.

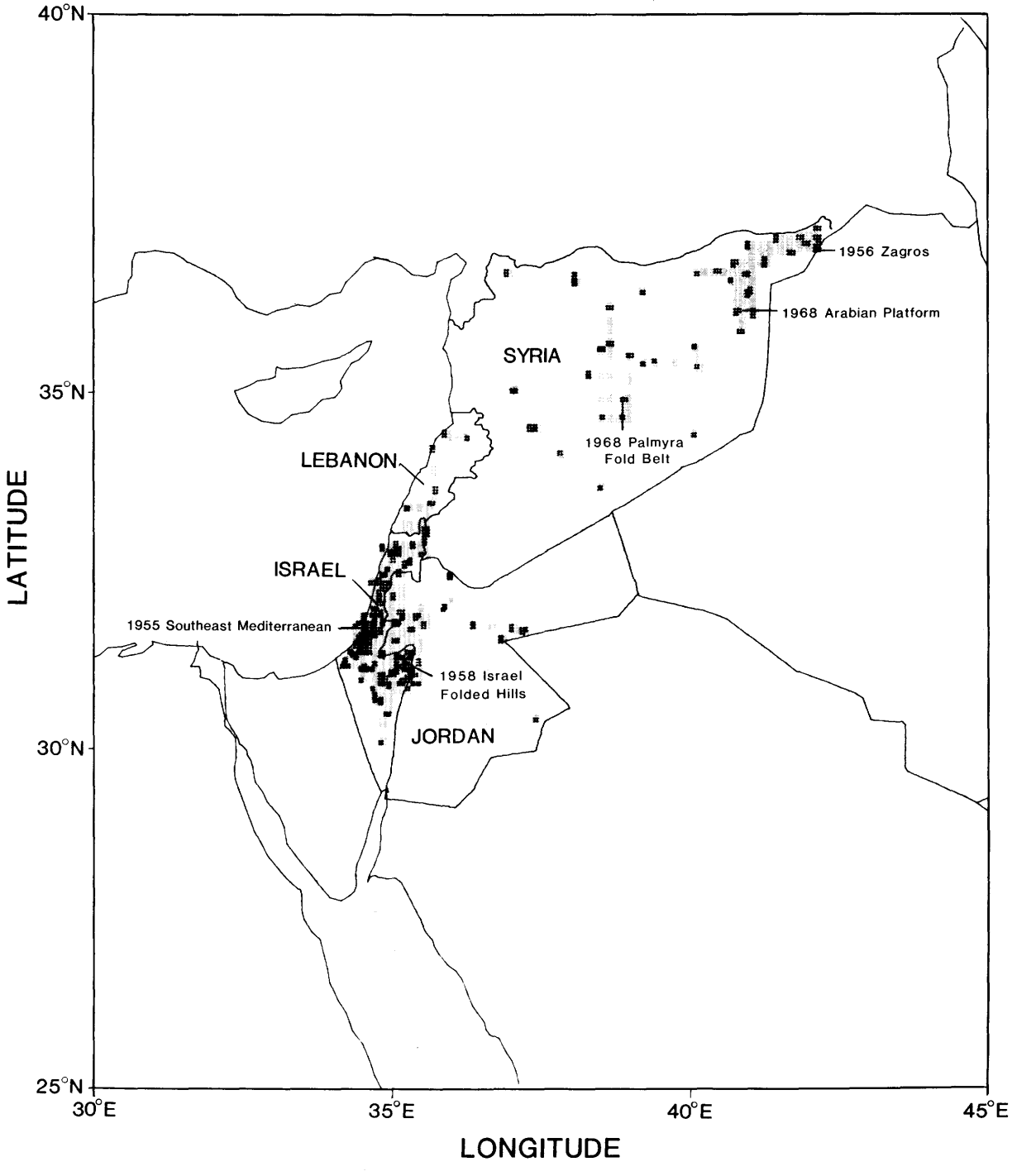
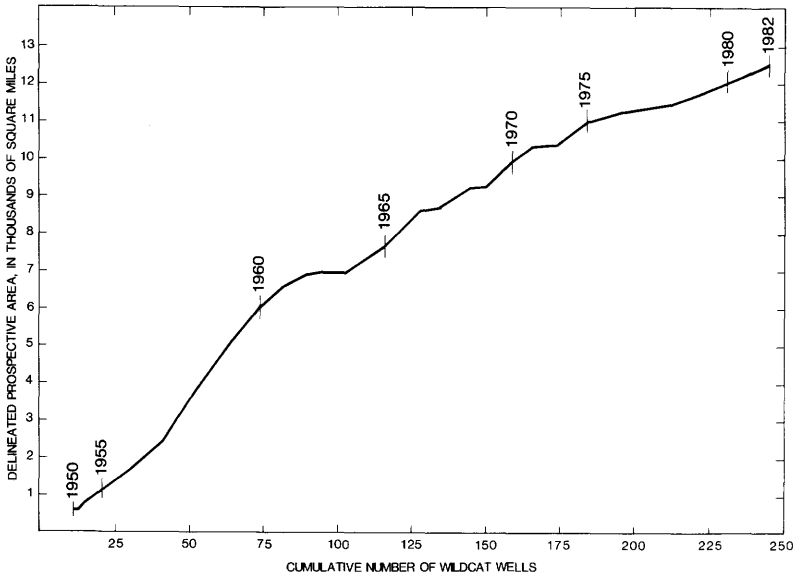


FIGURE 29.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Syria, Lebanon, Israel, and Jordan, Middle East.

Growth in delineated prospective area, 1950–82



Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in Syria	Cumulative discoveries in this province in Syria through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Zagros	1956	1,994	2,127
Arabian Platform	1968	130	197
Total		2,124	2,324

Exploration data

Country	Land area, mi^2
Syria	71,227
Lebanon	3,927
Israel	7,984
Jordan	37,264
Total	120,402

Delineated prospective area through 1982: 12,467 mi^2

Explored area through 1982: 2,258 mi^2

Wildcat wells through 1982: 245

Current growth in delineated prospective area per wildcat: 33 mi^2

Reported discoveries of recoverable crude oil through 1982: 2.3×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.188 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 29.—Continued.

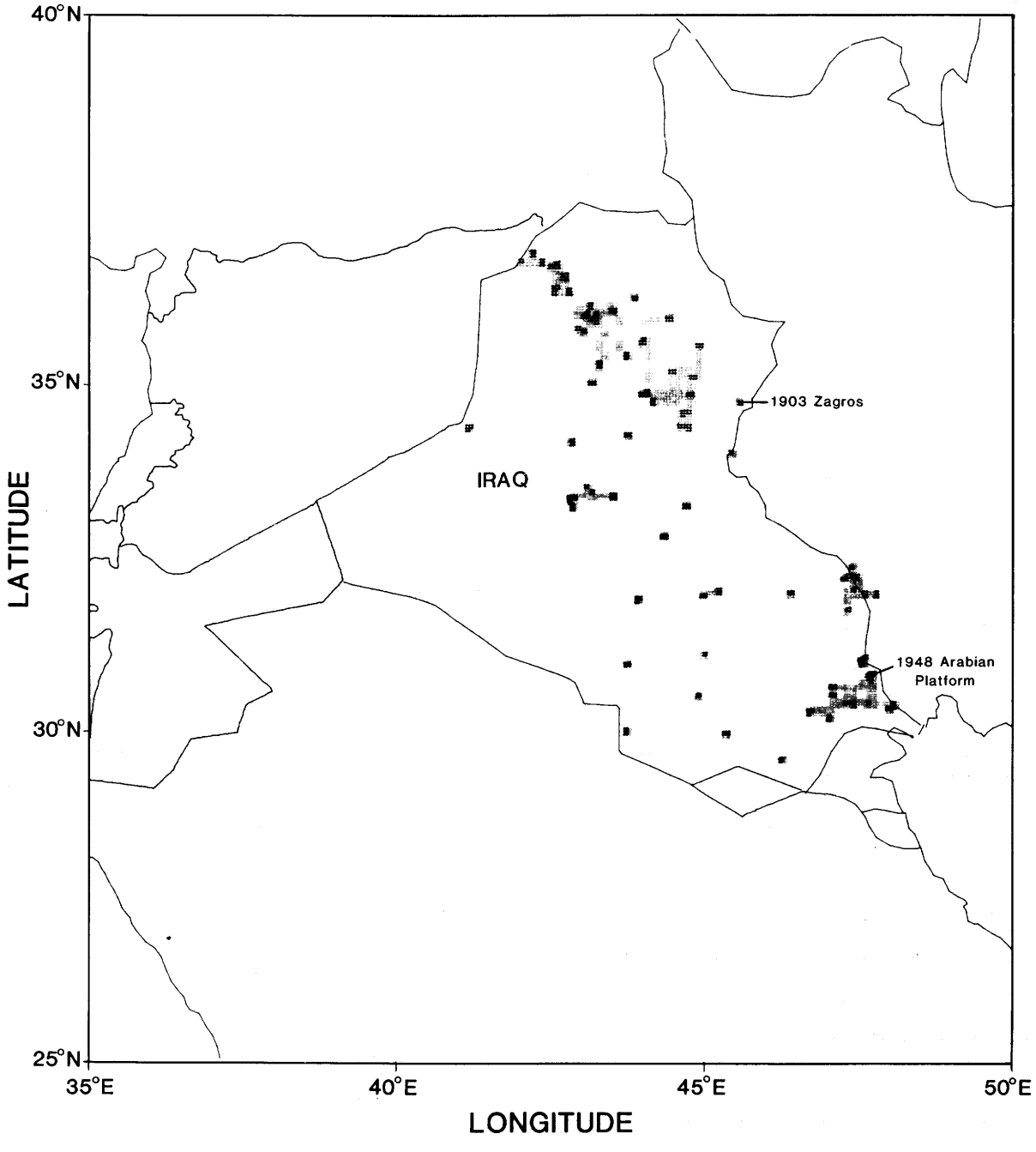
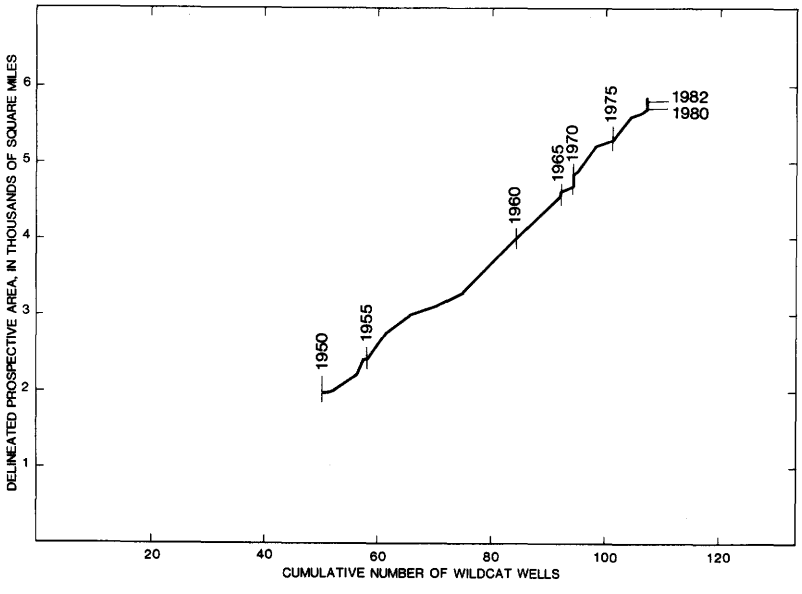


FIGURE 30.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Iraq, Middle East.

Growth in delineated prospective area, 1950–82



Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in Iraq	Cumulative discoveries in this province in Iraq through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Zagros	1903	27,843	27,903
Arabian Platform	1948	41,220	41,370
Total		69,063	69,273

Exploration data

Land area: 172,000 mi^2

Delineated prospective area through 1982: 5,789 mi^2

Explored area through 1982: 1,145 mi^2

Wildcat wells through 1982: 107

Current growth in delineated prospective area per wildcat: 54 mi^2

Reported discoveries of recoverable crude oil through 1982: 69.3×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 11.971 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 30.—Continued.

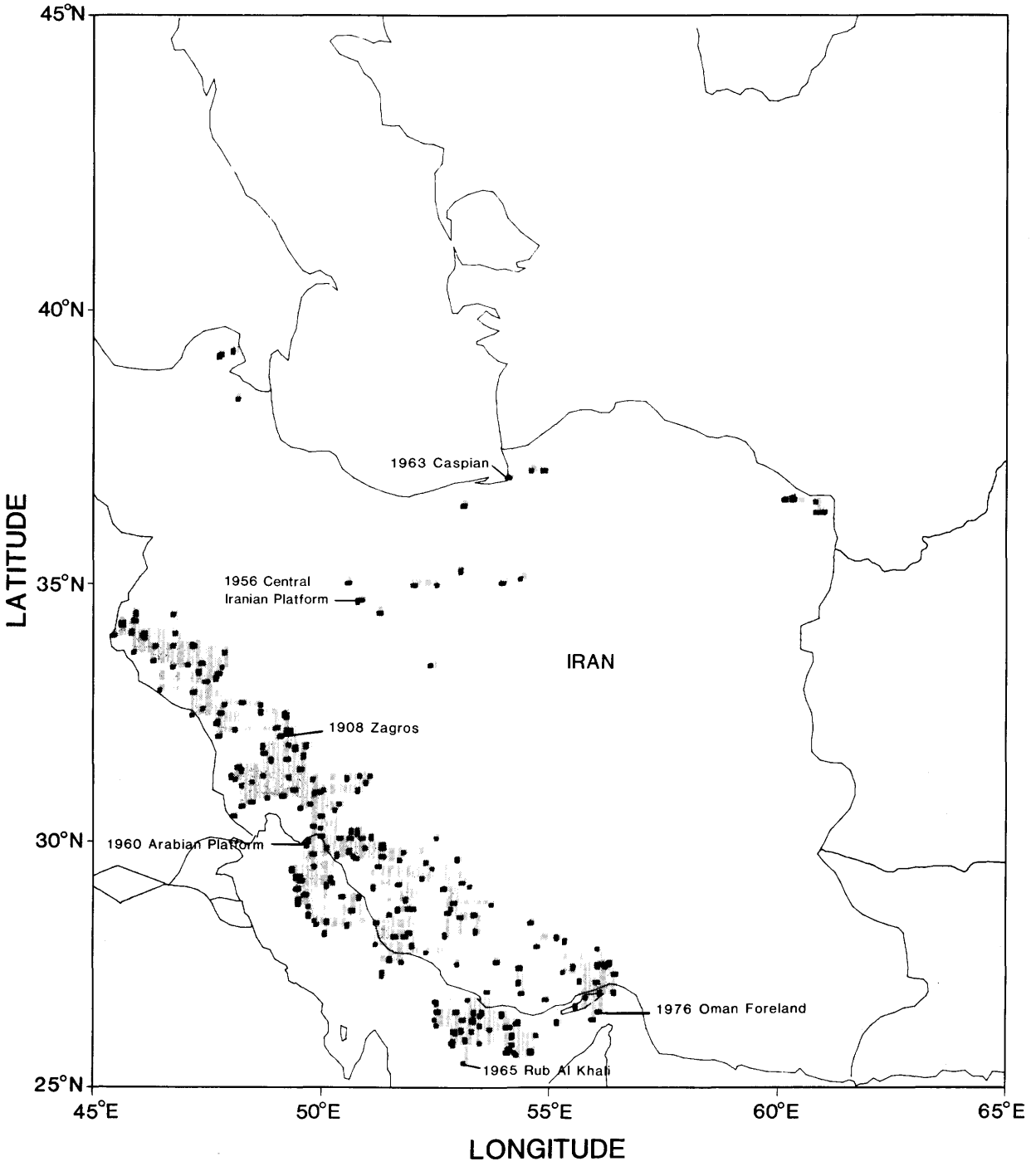
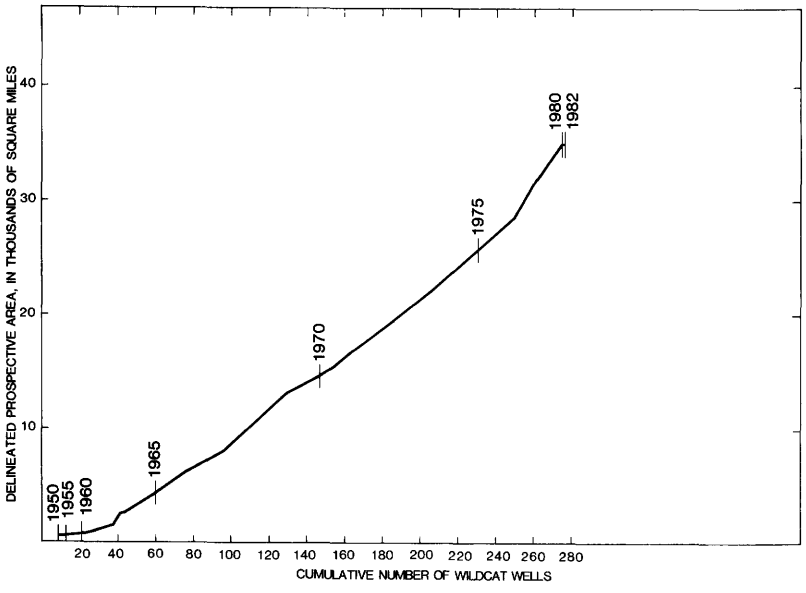


FIGURE 31.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Iran, Middle East.

Growth in delineated prospective area, 1950–82



Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in Iran	Cumulative discoveries in this province in Iran through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Zagros	1908	73,424	73,903
Central Iranian Platform	1956	125	125
Arabian Platform	1960	16,203	16,203
Rub Al Khali	1965	3,326	3,326
Total		93,078	93,557

Exploration data

Land area: 635,000 mi^2

Delineated prospective area through 1982: 34,777 mi^2

Explored area through 1982: 3,164 mi^2

Wildcat wells through 1982: 275

Current growth in delineated prospective area per wildcat: 171 mi^2

Reported discoveries of recoverable crude oil through 1982: 93.6×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 2.691 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 31.—Continued.

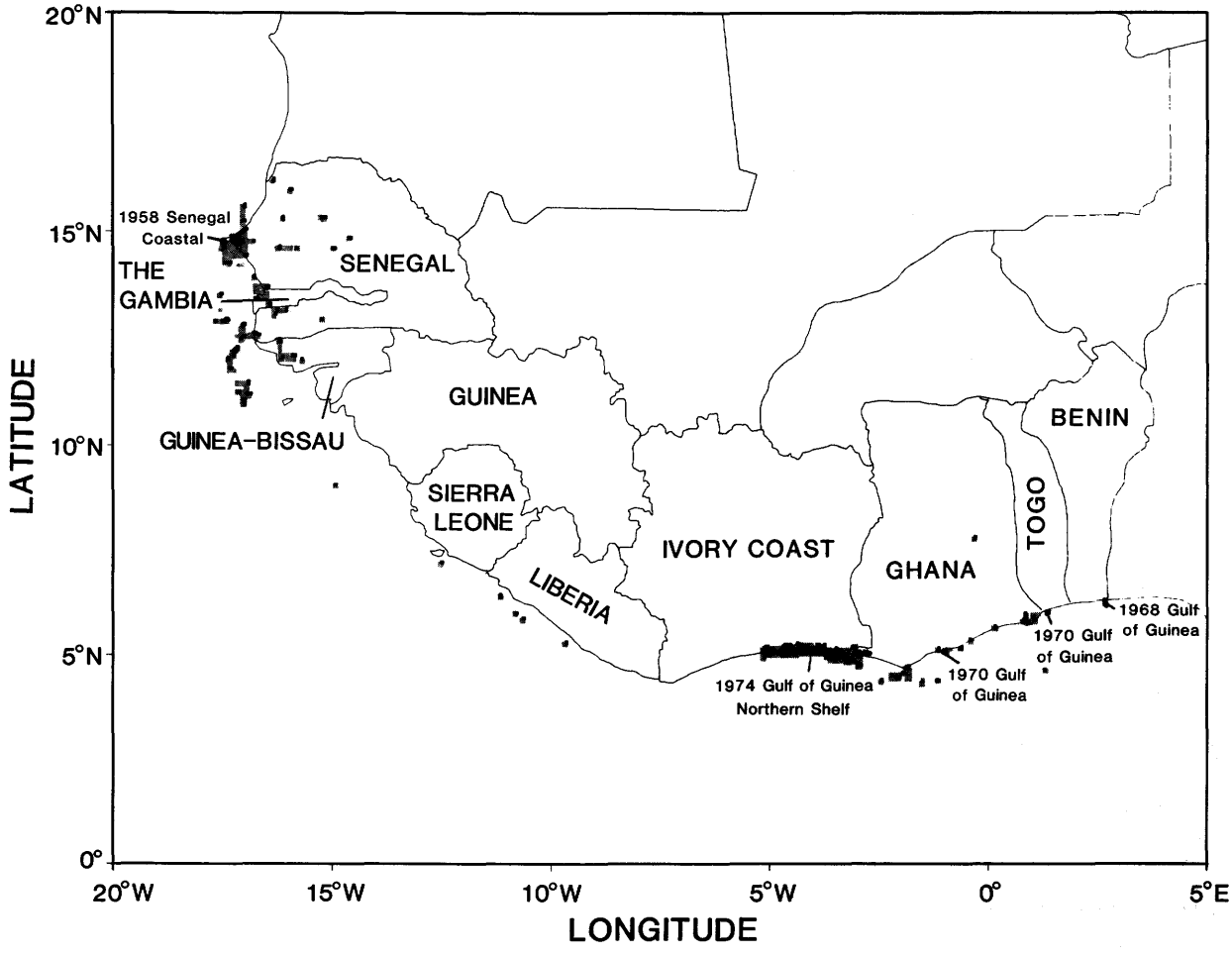
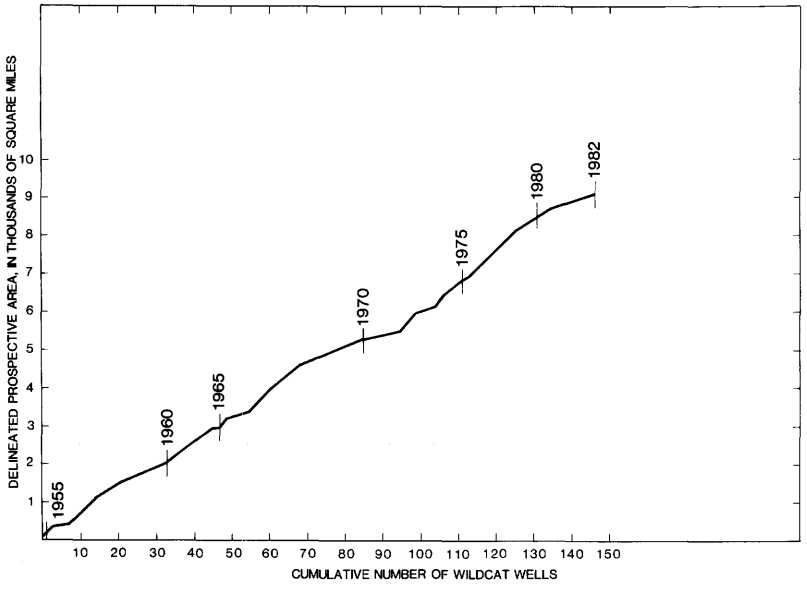


FIGURE 32.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Senegal, The Gambia, Guinea-Bissau, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Benin, and Cape Verde, Africa. Because Cape Verde is west of the area mapped and has no reported wells, it is not shown.

Growth in delineated prospective area, 1950–82



Significant petroleum province

Significant petroleum province	Year of first discovery in this province in Ivory Coast	Cumulative discoveries in this province in Ivory Coast through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Gulf of Guinea Northern Shelf	1974	364	394

Exploration data

Country	Land area, mi^2
Senegal	76,084
The Gambia	4,003
Guinea-Bissau	13,948
Guinea	96,900
Sierra Leone	27,925
Liberia	43,000
Ivory Coast	127,520
Ghana	91,843
Togo	21,830
Benin	43,484
Cape Verde (not shown)	1,557
Total	548,094

Delineated prospective area through 1982: 9,064 mi^2

Explored area through 1982: 2,040 mi^2

Wildcat wells through 1982: 147

Current growth in delineated prospective area per wildcat: 61 mi^2

Reported discoveries of recoverable crude oil through 1982: 0.4×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.047 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 32.—Continued.

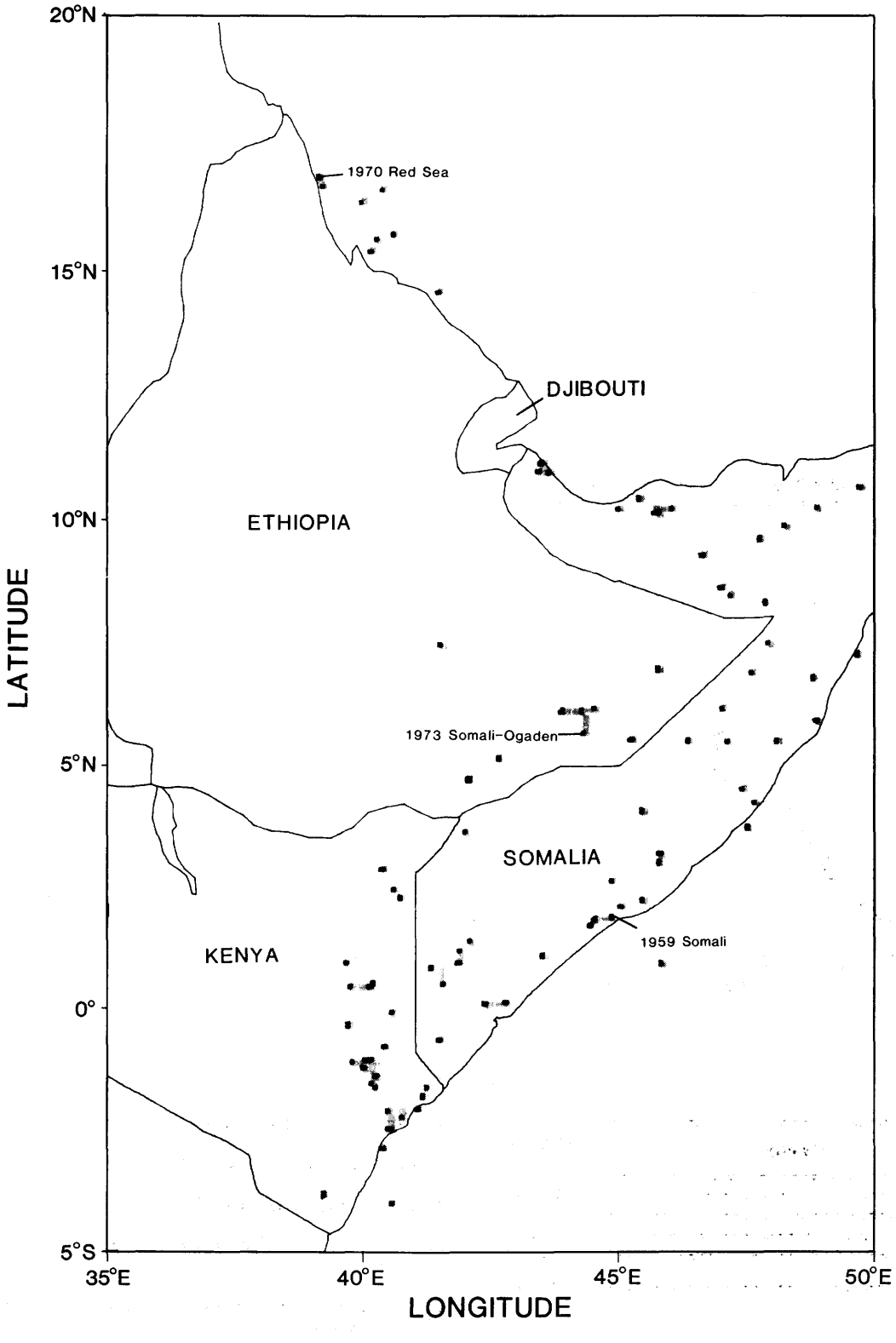
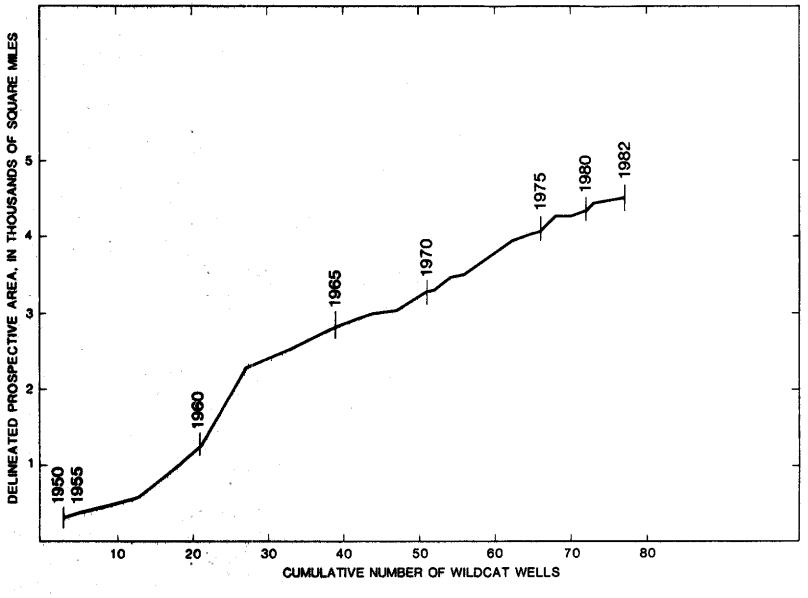


FIGURE 33.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Ethiopia, Djibouti, Somalia, and Kenya, Africa.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi²
Ethiopia	409,266
Djibouti	8,492
Somalia	246,198
Kenya	223,478
Total	887,434

Delineated prospective area through 1982: 4,478 mi²

Explored area through 1982: 1,201 mi²

Wildcat wells through 1982: 77

Current growth in delineated prospective area per wildcat: 58 mi²

Reported discoveries of recoverable crude oil through 1982: Field sizes not available

FIGURE 33.—Continued.

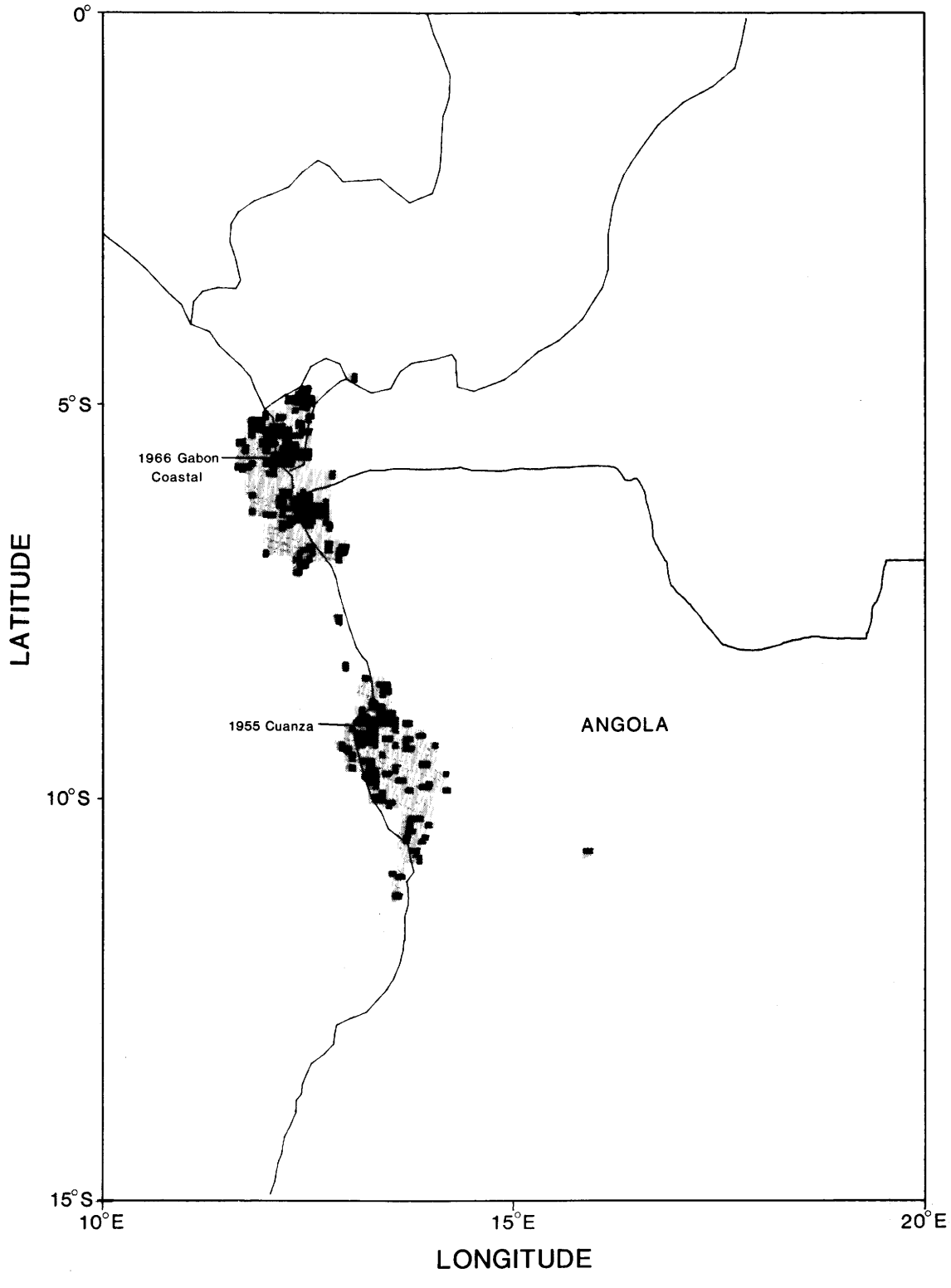
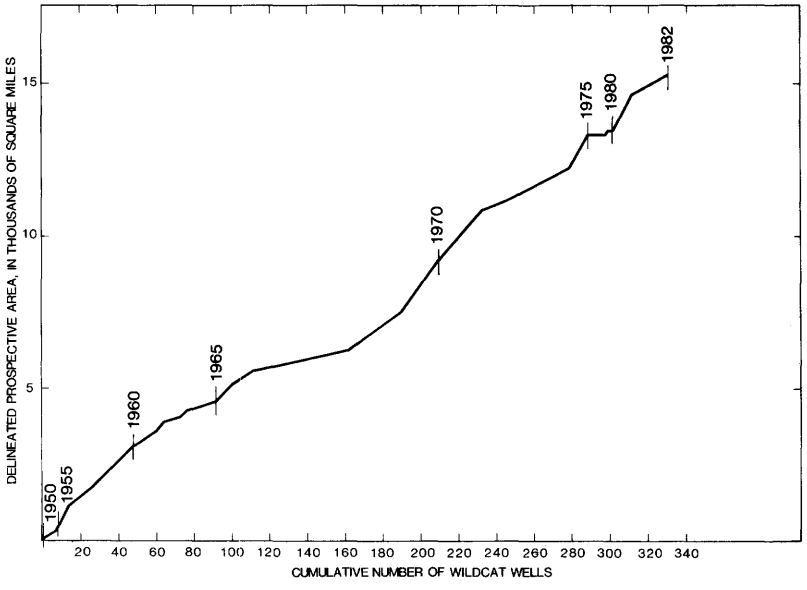


FIGURE 34.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Angola, Africa.

Growth in delineated prospective area, 1950–82



Significant petroleum province

Significant petroleum province	Year of first discovery in this province in Angola	Cumulative discoveries in this province in Angola through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Gabon Coastal	1966	1,590	1,932

Exploration data

Land area: 481,226 mi^2

Delineated prospective area through 1982: 15,191 mi^2

Explored area through 1982: 3,203 mi^2

Wildcat wells through 1982: 330

Current growth in delineated prospective area per wildcat: 45 mi^2

Reported discoveries of recoverable crude oil through 1982: 2.0×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.130 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 34.—Continued.

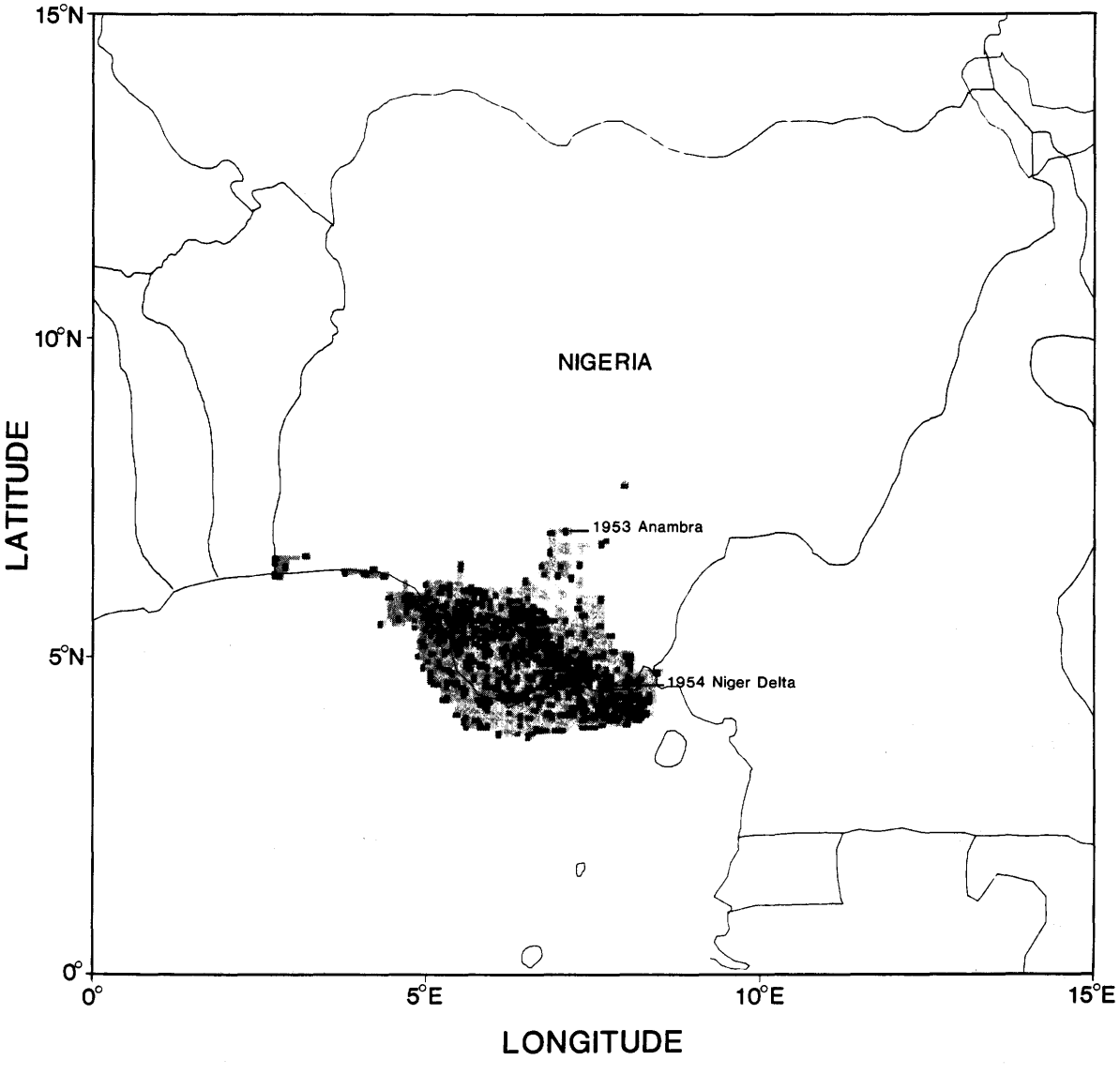
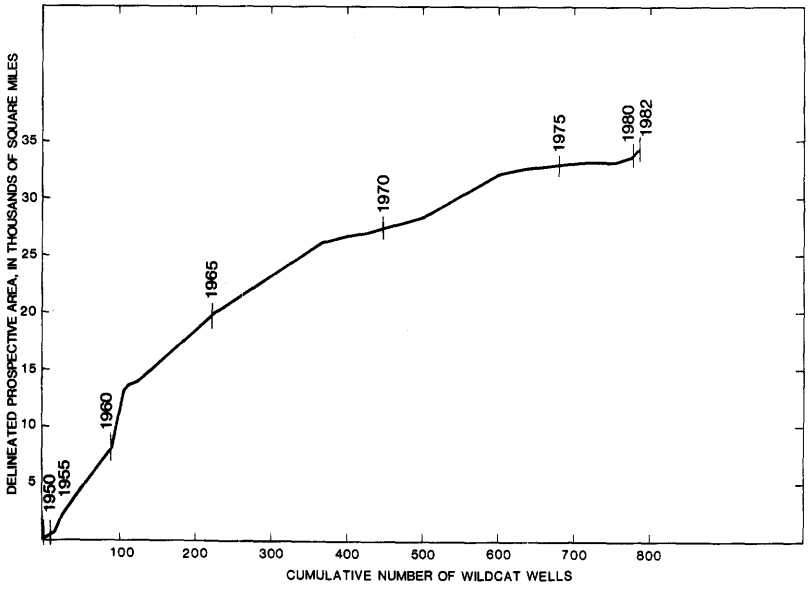


FIGURE 35.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Nigeria, Africa.

Growth in delineated prospective area, 1950–82



Significant petroleum province

Significant petroleum province	Year of first discovery in this province in Nigeria	Cumulative discoveries in this province in Nigeria through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Niger Delta	1954	12,498	17,227

Exploration data

Land area: 356,599 mi^2

Delineated prospective area through 1982: 34,297 mi^2

Explored area through 1982: 8,009 mi^2

Wildcat wells through 1982: 783

Current growth in delineated prospective area per wildcat: 16 mi^2

Reported discoveries of recoverable crude oil through 1982: 17.2×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.502 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 35.—Continued.

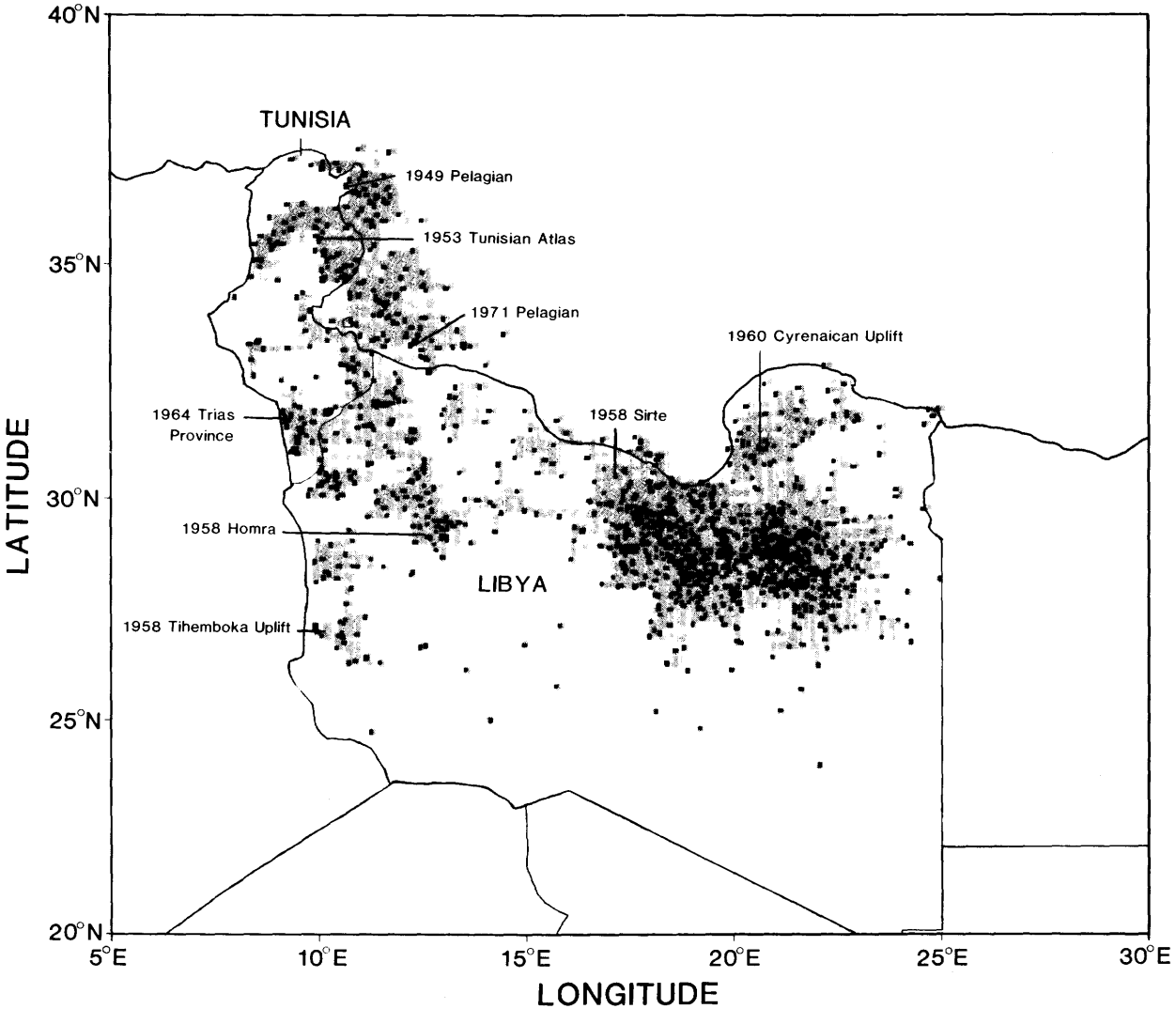
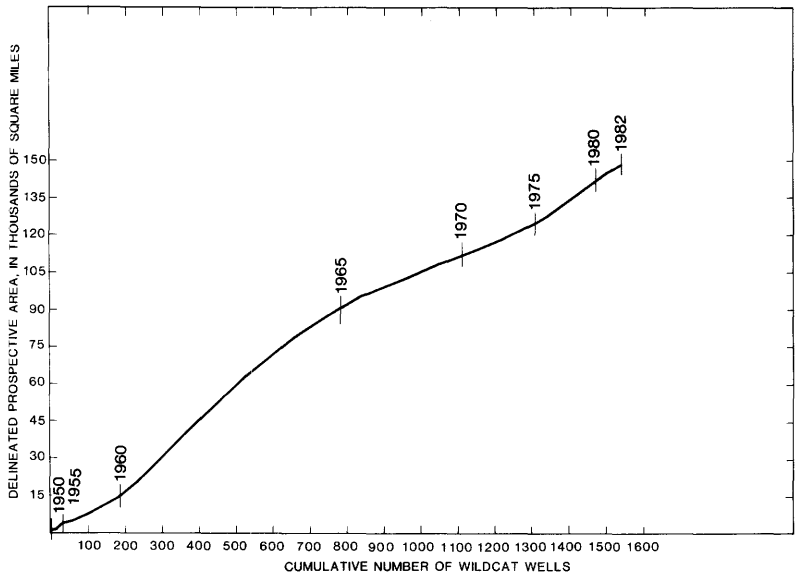


FIGURE 36.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Tunisia and Libya, Africa.

Growth in delineated prospective area, 1950–82



Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in this country	Cumulative discoveries in this province in this country through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Tunisia			
Pelagian	1949	555	642
Trias Province	1964	540	659
Total		1,095	1,301
Libya			
Sirte	1958	33,355	35,893
Pelagian	1971	250	332
Total		33,605	36,225

Exploration data

Country	Land area, mi^2
Tunisia	48,330
Libya	679,400
Total	727,730

Delineated prospective area through 1982: 147,369 mi^2

Explored area through 1982: 17,877 mi^2

Wildcat wells through 1982: 1,538

Current growth in delineated prospective area per wildcat: 105 mi^2

Reported discoveries of recoverable crude oil through 1982: 37.6×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.255 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 36.—Continued.

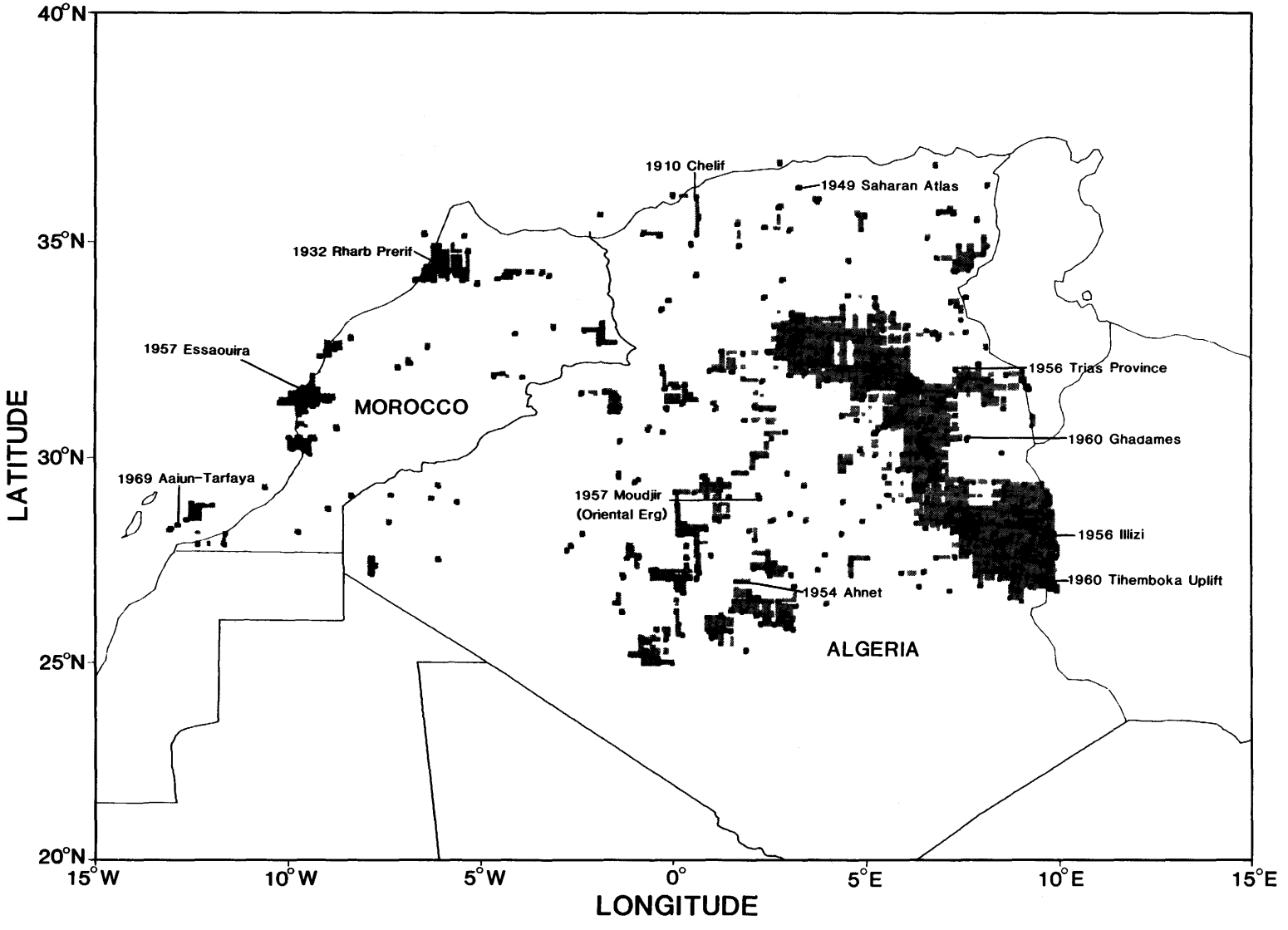
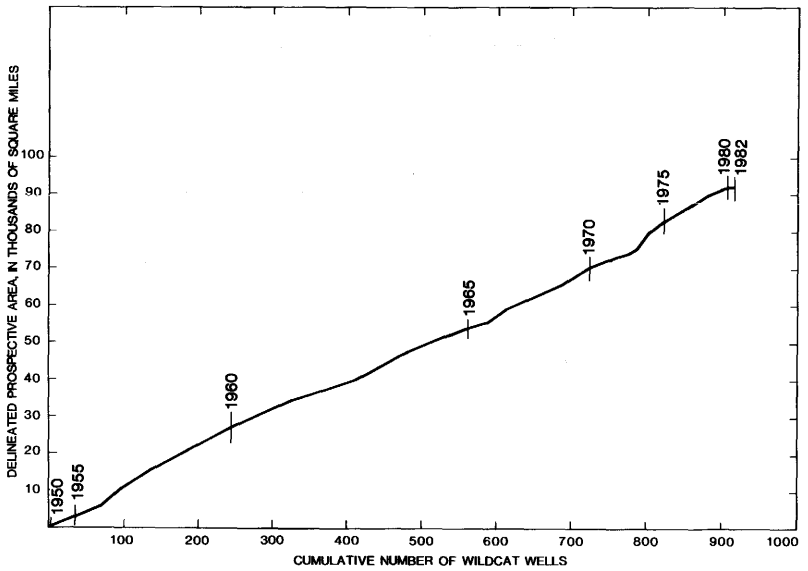


FIGURE 37.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Morocco and Algeria, Africa.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi²
Morocco	172,104
Algeria	919,595
Total	1,091,699

Delineated prospective area through 1982: 91,547 mi²

Explored area through 1982: 12,304 mi²

Wildcat wells through 1982: 915

Current growth in delineated prospective area per wildcat: 100 mi²

Reported discoveries of recoverable crude oil through 1982: 18.6×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.203 \times 10^6 \text{ bbl/mi}^2$$

Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in this country	Cumulative discoveries in this province in this country through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Morocco			
Aaiun-Tarfaya	1969	100	100
Algeria			
Trias Province	1956	12,057	13,167
Illizi	1956	2,534	3,731
Moudjir (Oriental Erg)	1957	658	784
Ghadames	1960	415	811
Total		15,664	18,493

FIGURE 37.—Continued.

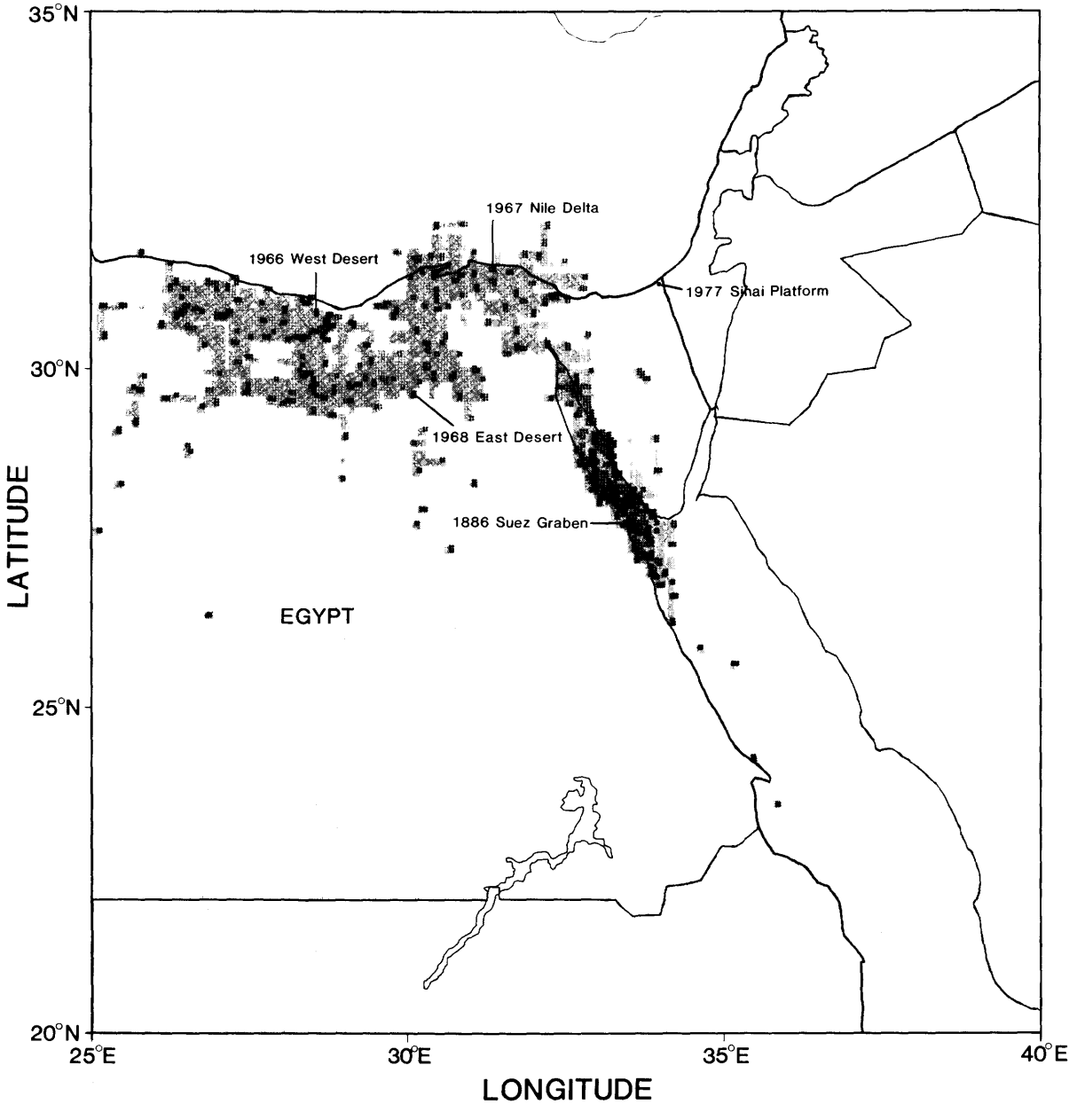
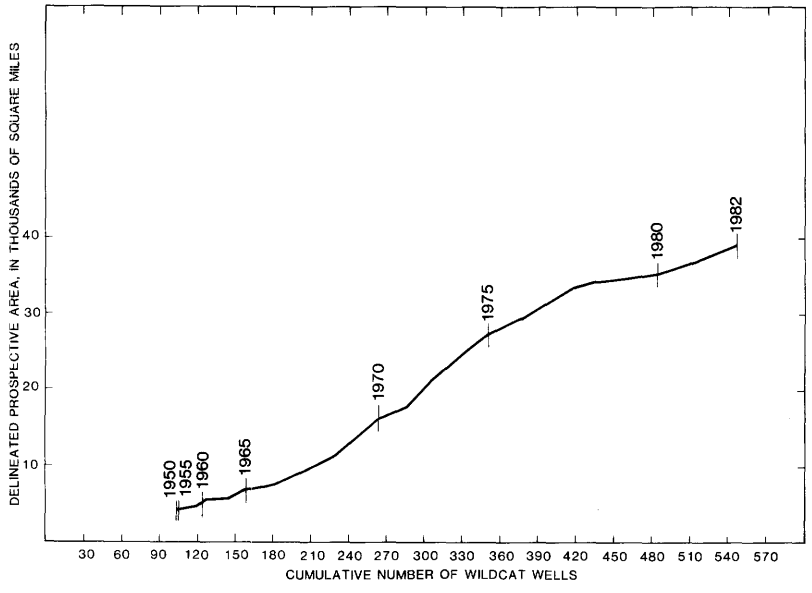


FIGURE 38.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Egypt, Africa.

Growth in delineated prospective area, 1950–82



Significant petroleum province

Significant petroleum province	Year of first discovery in this province in Egypt	Cumulative discoveries in this province in Egypt through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Suez Graben	1886	4,518	5,386

Exploration data

Land area: 386,198 mi^2

Delineated prospective area through 1982: 38,829 mi^2

Explored area through 1982: 5,523 mi^2

Wildcat wells through 1982: 545

Current growth in delineated prospective area per wildcat: 52 mi^2

Reported discoveries of recoverable crude oil through 1982: 7.0×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.180 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 38.—Continued.

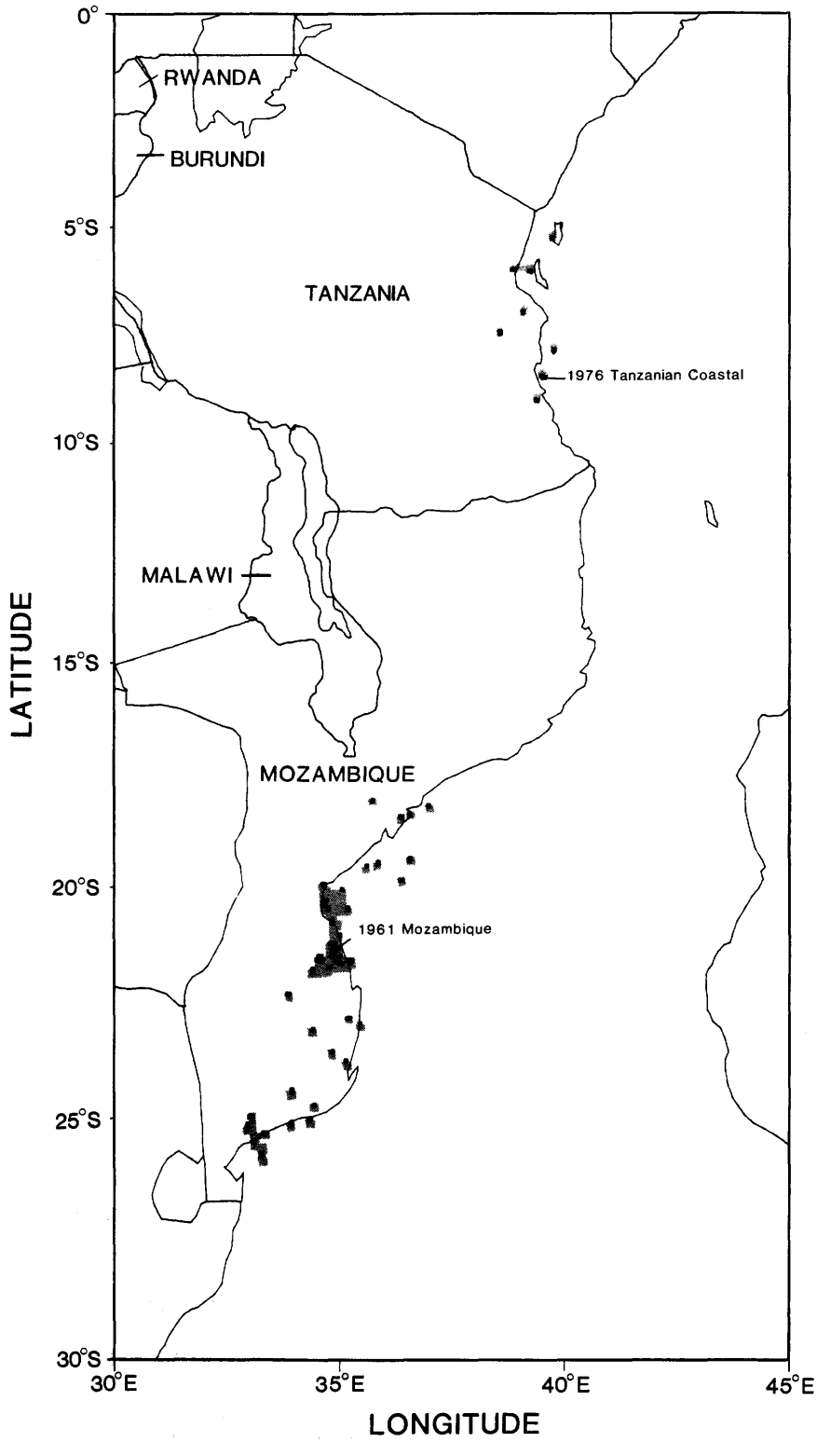
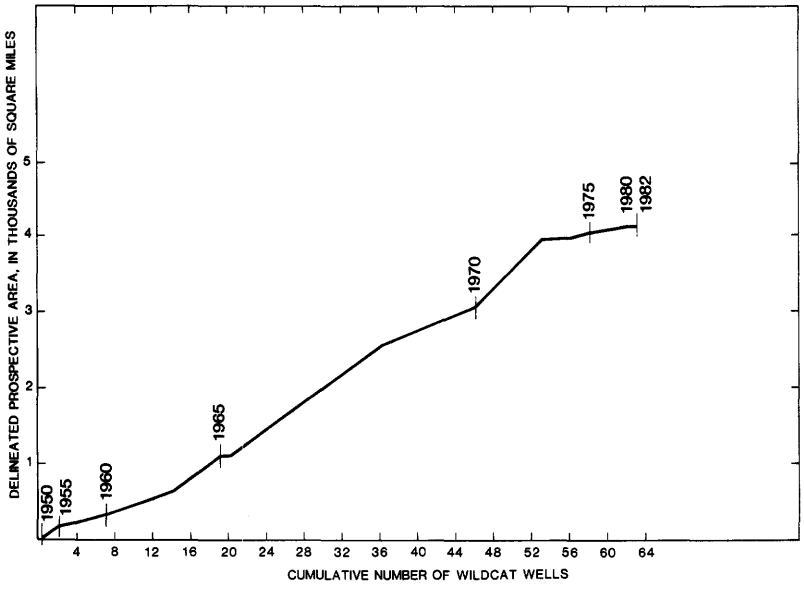


FIGURE 39.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Tanzania, Malawi, Mozambique, Burundi, and Rwanda, Africa.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi²
Tanzania	362,820
Malawi	49,177
Mozambique	297,731
Burundi	10,747
Rwanda	10,169
Total	730,644

Delineated prospective area through 1982: 4,113 mi²

Explored area through 1982: 756 mi²

Wildcat wells through 1982: 63

Current growth in delineated prospective area per wildcat: 65 mi²

Reported discoveries of recoverable crude oil through 1982: Field sizes not available

FIGURE 39.—Continued.

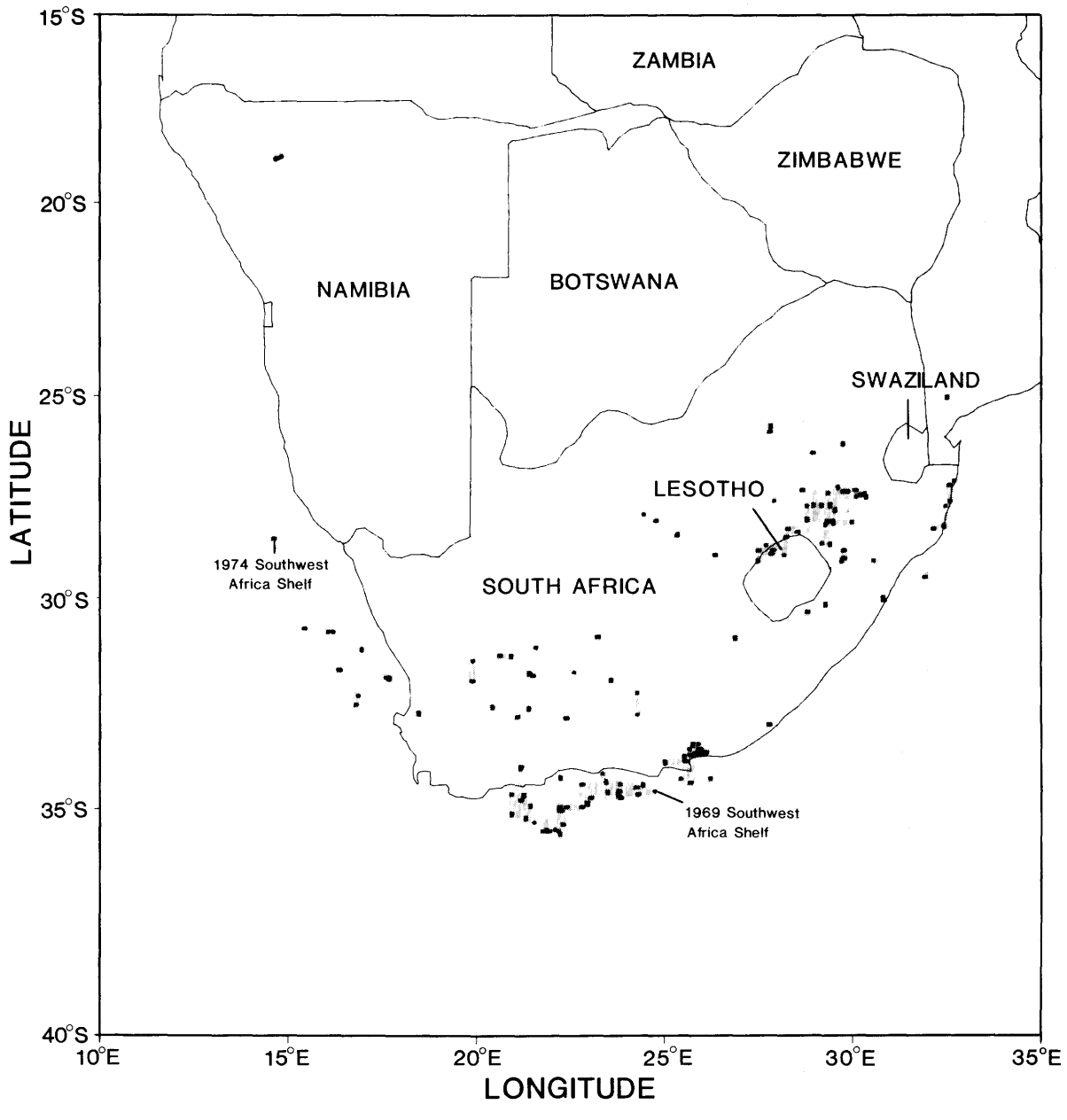
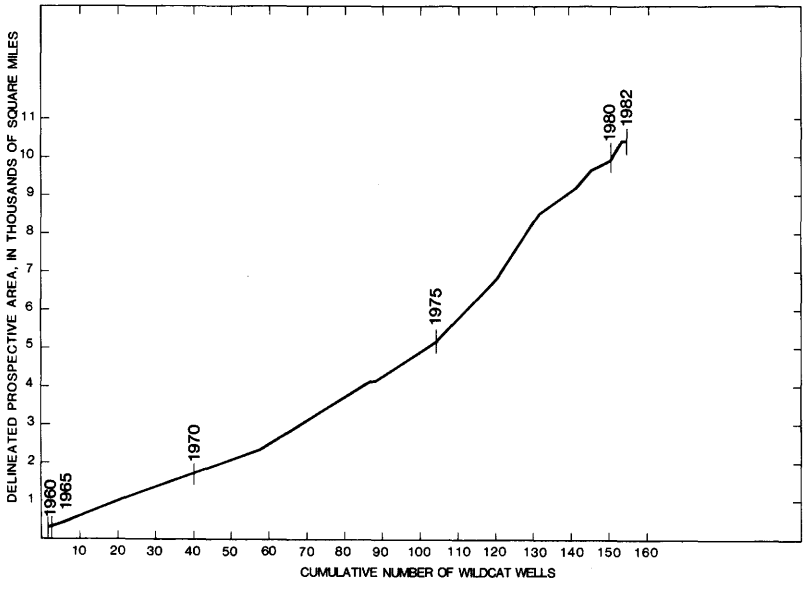


FIGURE 40.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Swaziland, Namibia, Lesotho, Zimbabwe, Zambia, Botswana, and South Africa, Africa.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi^2
Swaziland	6,704
Namibia	317,725
Lesotho	11,716
Zimbabwe	150,338
Zambia	288,130
Botswana	275,000
South Africa	472,000
Total	1,521,613

Delineated prospective area through 1982: 10,443 mi^2

Explored area through 1982: 1,864 mi^2

Wildcat wells through 1982: 154

Current growth in delineated prospective area per wildcat: 84 mi^2

Reported discoveries of recoverable crude oil through 1982: Field sizes not available

FIGURE 40.—Continued.

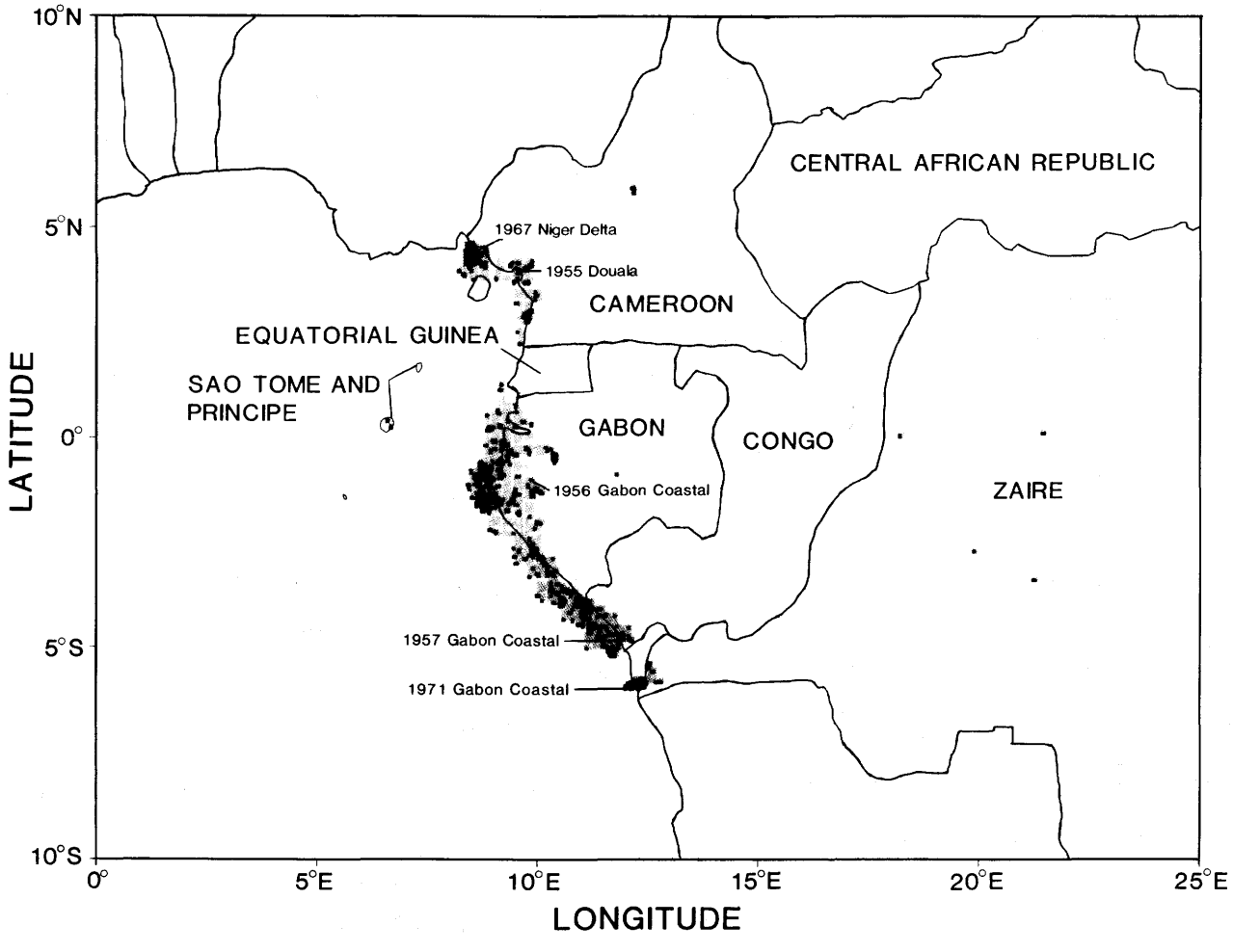
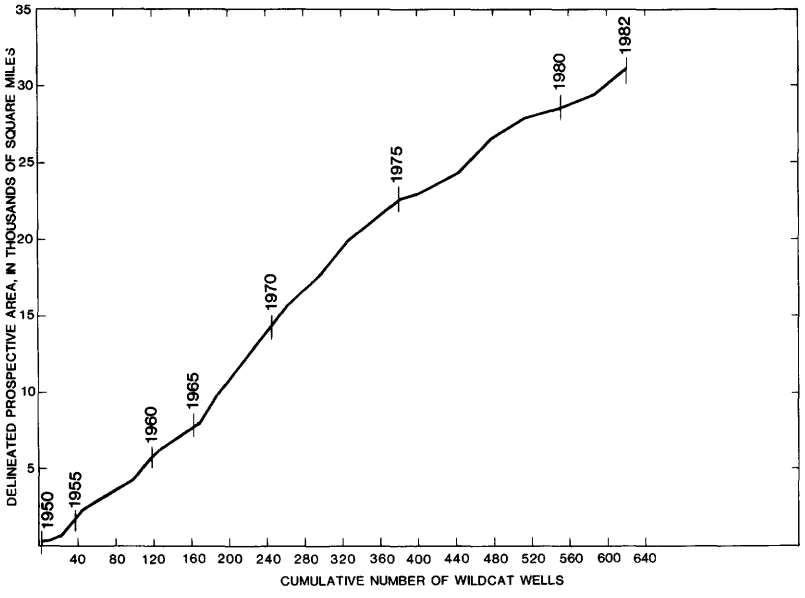


FIGURE 41.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Cameroon, Central African Republic, Equatorial Guinea, Gabon, Sao Tome and Principe, Congo, and Zaire, Africa.

Growth in delineated prospective area, 1950–82



Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in this country	Cumulative discoveries in this province in this country through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Cameroon			
Niger Delta	1967	120	417
Gabon			
Gabon Coastal	1956	730	1,592
Congo			
Gabon Coastal	1957	560	698
Zaire			
Gabon Coastal	1971	110	186

Exploration data

Country	Land area, mi^2
Cameroon	183,350
Central African Republic	238,000
Equatorial Guinea	10,824
Gabon	102,290
Sao Tome and Principe	372
Congo	132,046
Zaire	905,063
Total	1,571,945

Delineated prospective area through 1982: 31,061 mi^2

Explored area through 1982: 6,500 mi^2

Wildcat wells through 1982: 619

Current growth in delineated prospective area per wildcat: 37 mi^2

Reported discoveries of recoverable crude oil through 1982: 2.9×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.093 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 41.—Continued.

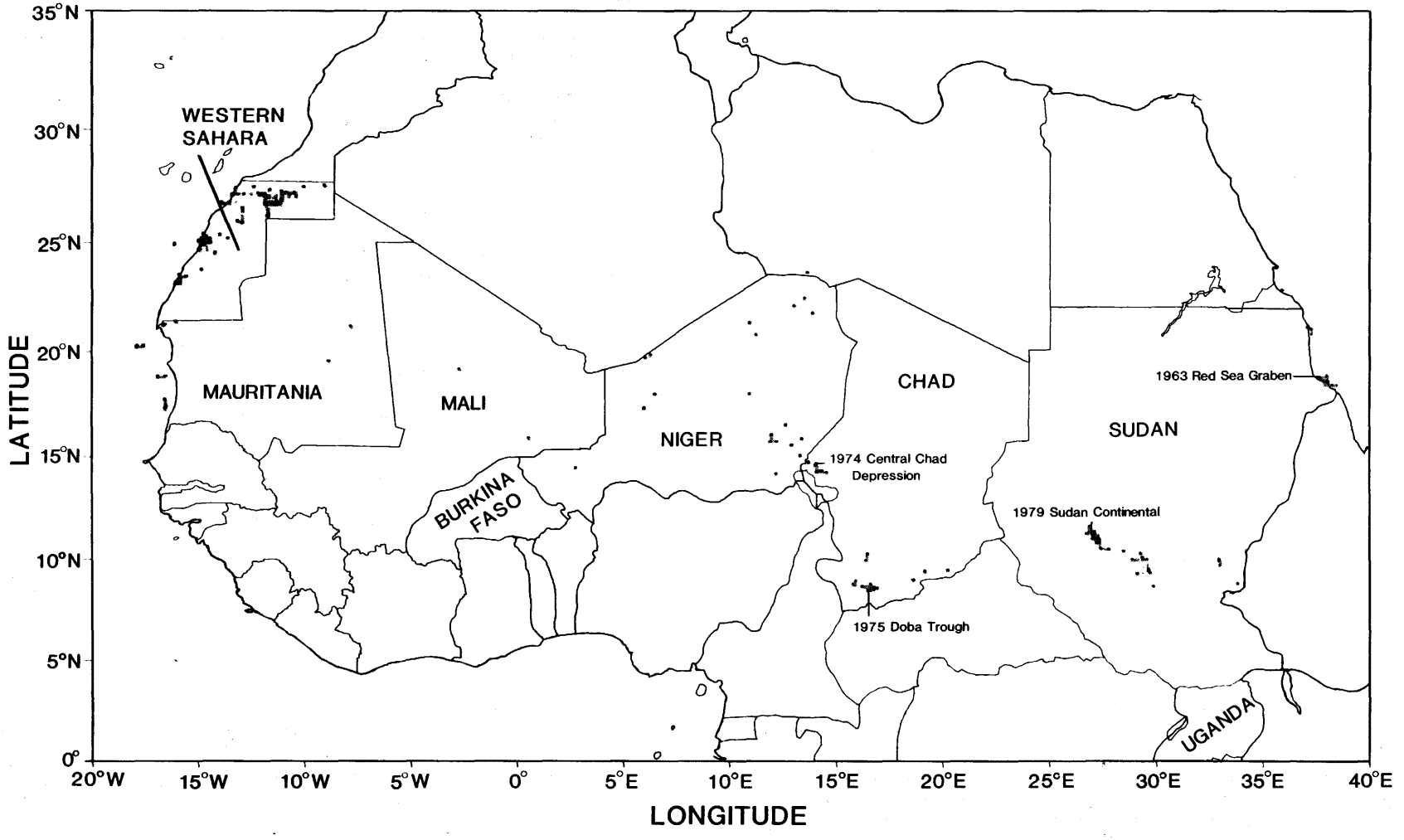
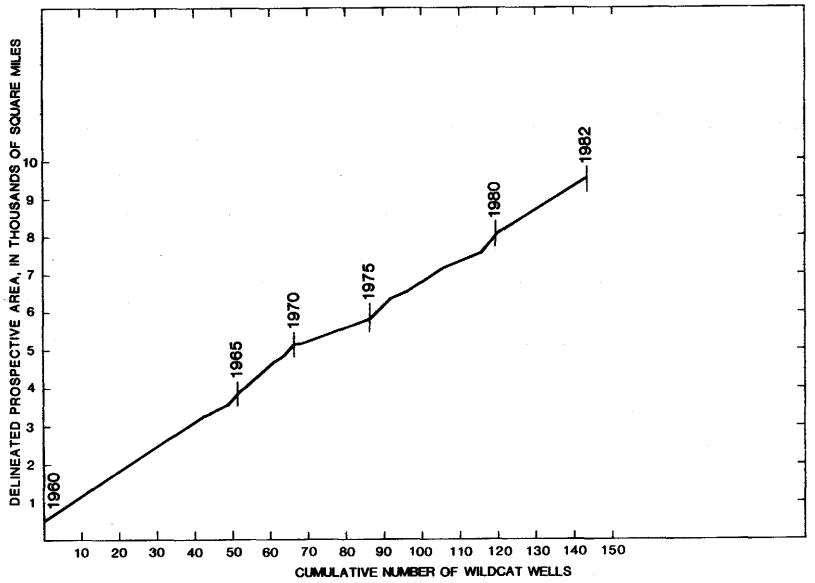


FIGURE 42.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Western Sahara, Mauritania, Mali, Burkina Faso (formerly Upper Volta), Niger, Chad, Sudan, and Uganda, Africa.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi^2
Western Sahara	102,703
Mauritania	418,120
Mali	463,500
Burkina Faso	106,111
Niger	458,976
Chad	501,000
Sudan	967,500
Uganda	93,981
Total	3,111,891

Delineated prospective area through 1982: 9,481 mi^2

Explored area through 1982: 1,934 mi^2

Wildcat wells through 1982: 143

Current growth in delineated prospective area per wildcat: 64 mi^2

Reported discoveries of recoverable crude oil through 1982: 0.5×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.053 \times 10^6 \text{ bbl/mi}^2$$

Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in this country	Cumulative discoveries in this province in this country through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Chad			
Central Chad Depression	1974	100	100
Sudan			
Sudan Continental	1979	400	400

FIGURE 42.—Continued.

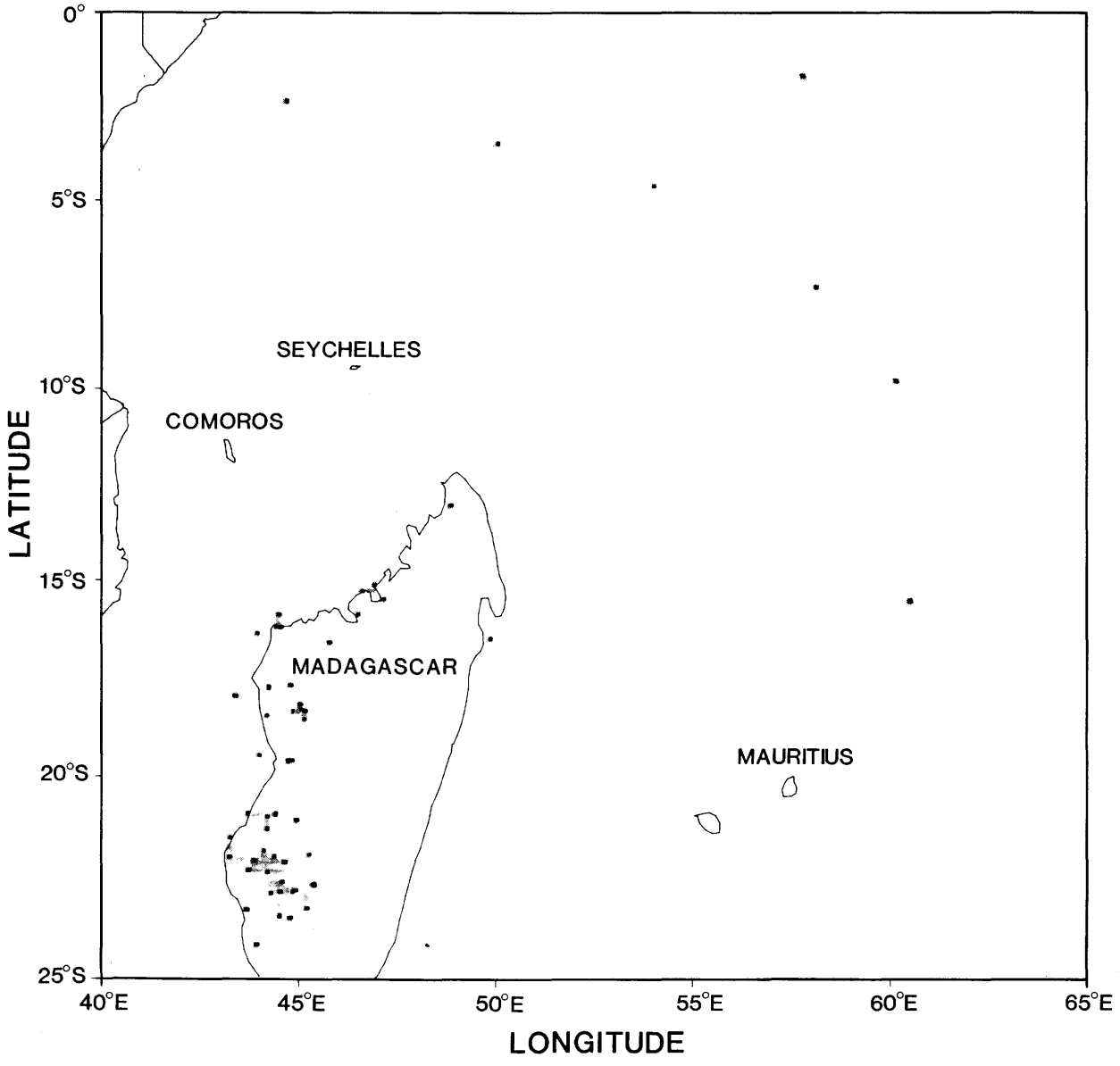
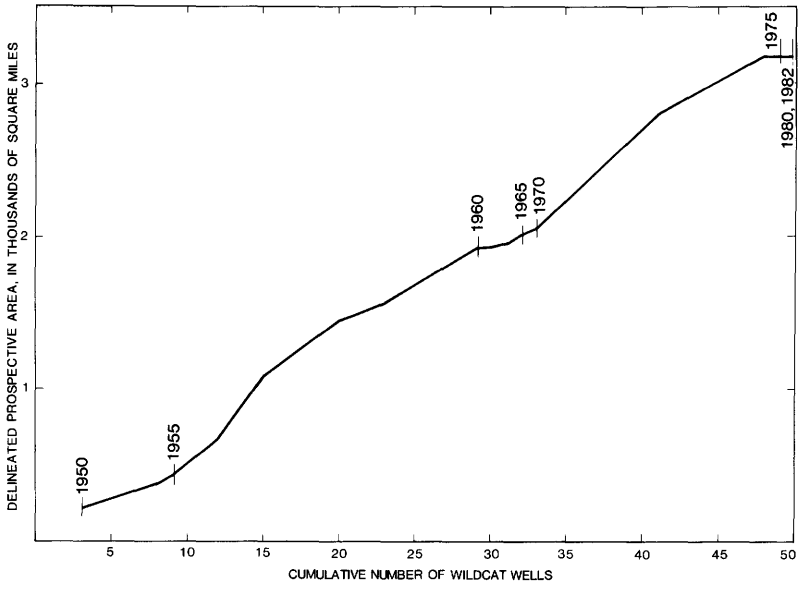


FIGURE 43.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Madagascar, Mauritius, Seychelles, and Comoros, Africa.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi^2
Madagascar	227,800
Mauritius	809
Seychelles	156
Comoros	820
Total	229,585

Delineated prospective area through 1982: 3,157 mi^2

Explored area through 1982: 640 mi^2

Wildcat wells through 1982: 49

Current growth in delineated prospective area per wildcat: 31 mi^2

Reported discoveries of recoverable crude oil through 1982: Field sizes not available

FIGURE 43.—Continued.

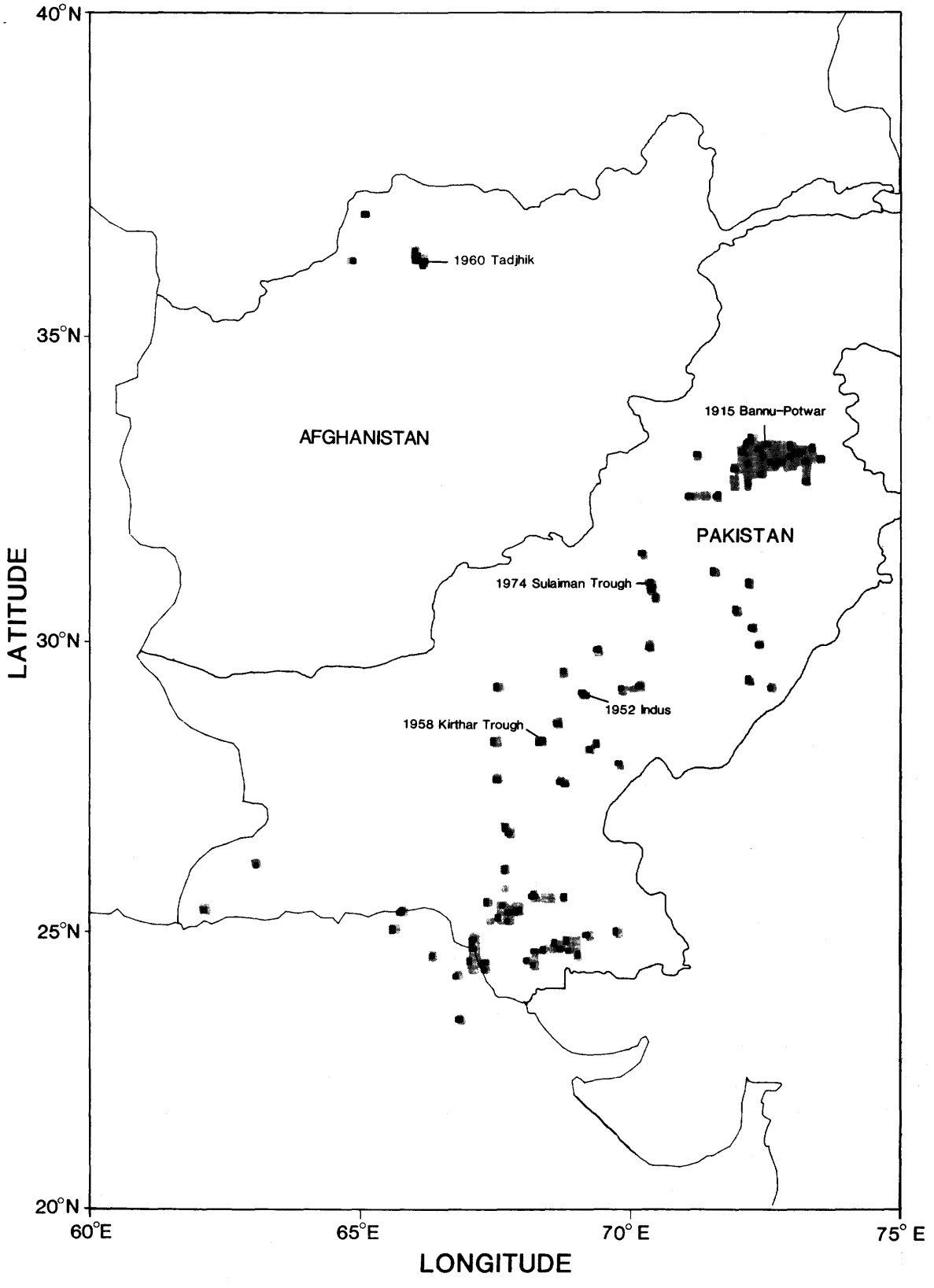
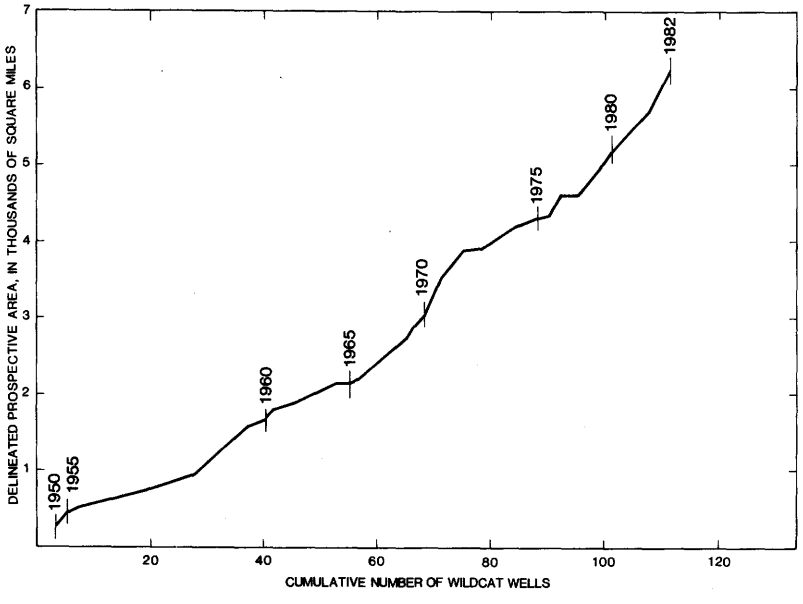


FIGURE 44.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Afghanistan and Pakistan, Asia.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi²
Afghanistan	250,000
Pakistan	310,236
Total	560,236

Delineated prospective area through 1982: 6,242 mi²

Explored area through 1982: 1,333 mi²

Wildcat wells through 1982: 111

Current growth in delineated prospective area per wildcat: 55 mi²

Reported discoveries of recoverable crude oil through 1982: 0.2×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.039 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 44.—Continued.

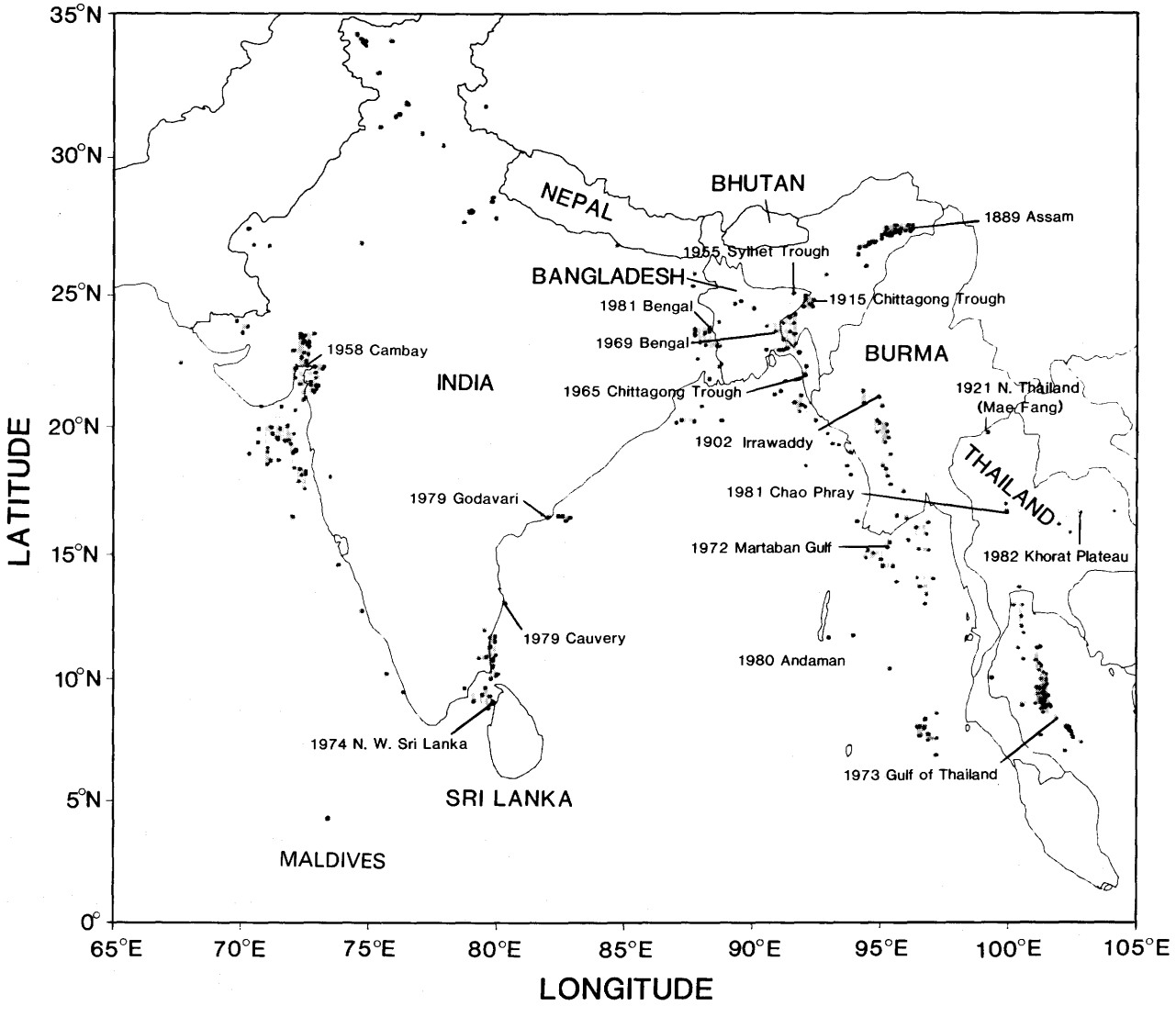
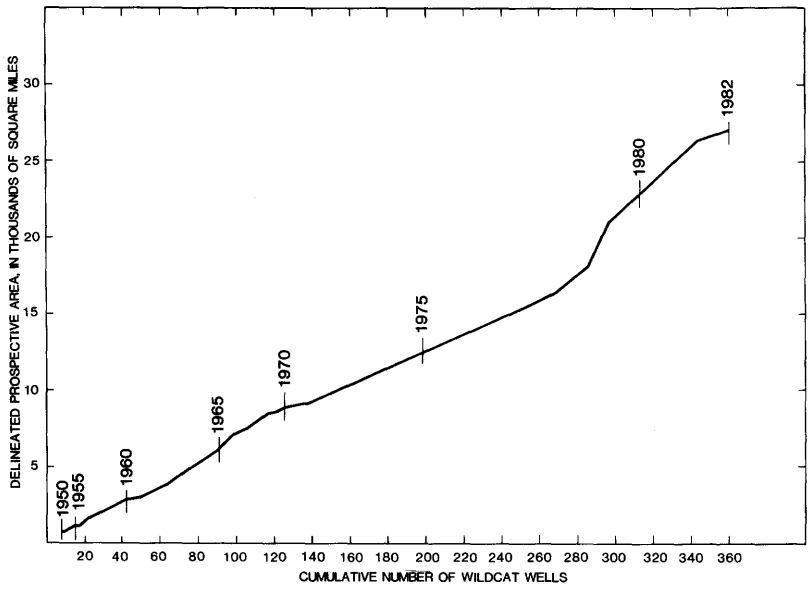


FIGURE 45.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Maldives, India, Bangladesh, Burma, Thailand, Sri Lanka, Nepal, and Bhutan, Asia. Some explored area is shown for the Maldives, although the islands themselves were not drawn by Disspla.

Growth in delineated prospective area, 1950–82



Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in this country	Cumulative discoveries in this province in this country through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields*
India			
Assam	1889	540	729
Cambay	1958	2,618	2,800
Total		3,158	3,529
Burma			
Irrawaddy	1902	475	528
Thailand			
Gulf of Thailand	1973	140	350

*Incomplete.

Exploration data

Country	Land area, mi²
Maldives (not shown)	115
India	1,246,880
Bangladesh	54,501
Burma	261,789
Thailand	198,242
Sri Lanka	25,332
Nepal	54,000
Bhutan	19,300
Total	1,860,159

Delineated prospective area through 1982: 26,923 mi^2

Explored area through 1982: 4,861 mi^2

Wildcat wells through 1982: 359

Current growth in delineated prospective area per wildcat: 117 mi^2

Reported discoveries of recoverable crude oil through 1982: 6.3×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.236 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 45.—Continued.

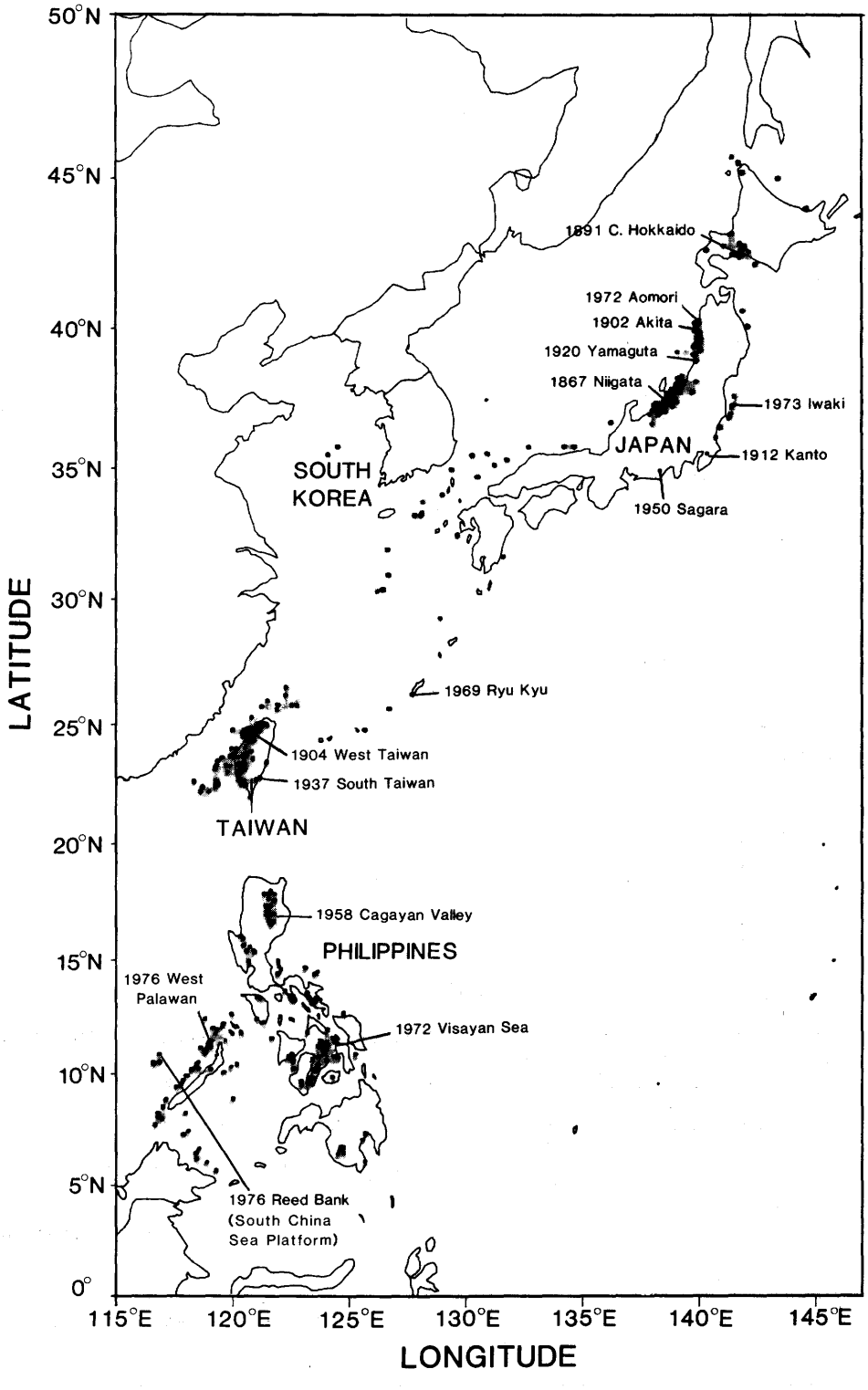
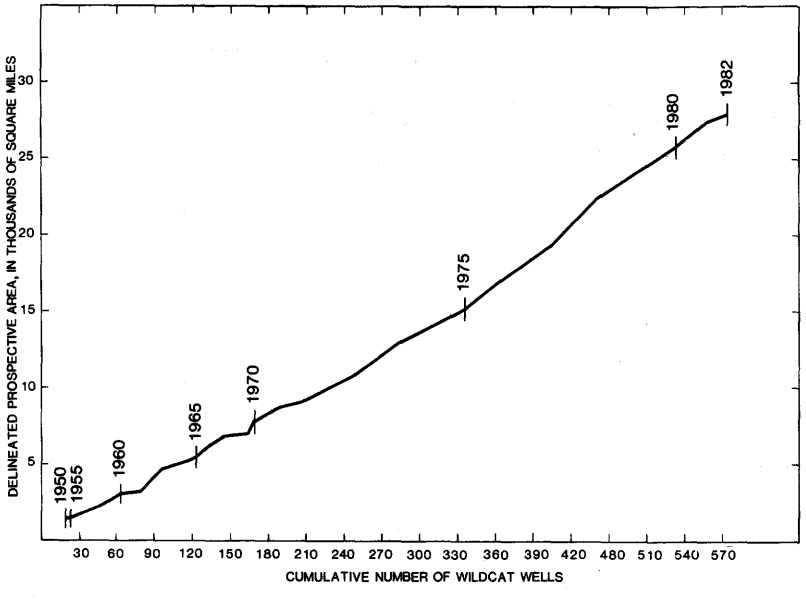


FIGURE 46.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Taiwan, Philippines, Japan, and South Korea, Asia.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi²
Taiwan	13,890
Philippines	114,830
Japan	141,529
South Korea	36,600
Total	306,849

Delineated prospective area through 1982: 28,367 mi²

Explored area through 1982: 6,020 mi²

Wildcat wells through 1982: 563

Current growth in delineated prospective area per wildcat: 54 mi²

Reported discoveries of recoverable crude oil through 1982: 0.1×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.005 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 46.—Continued.

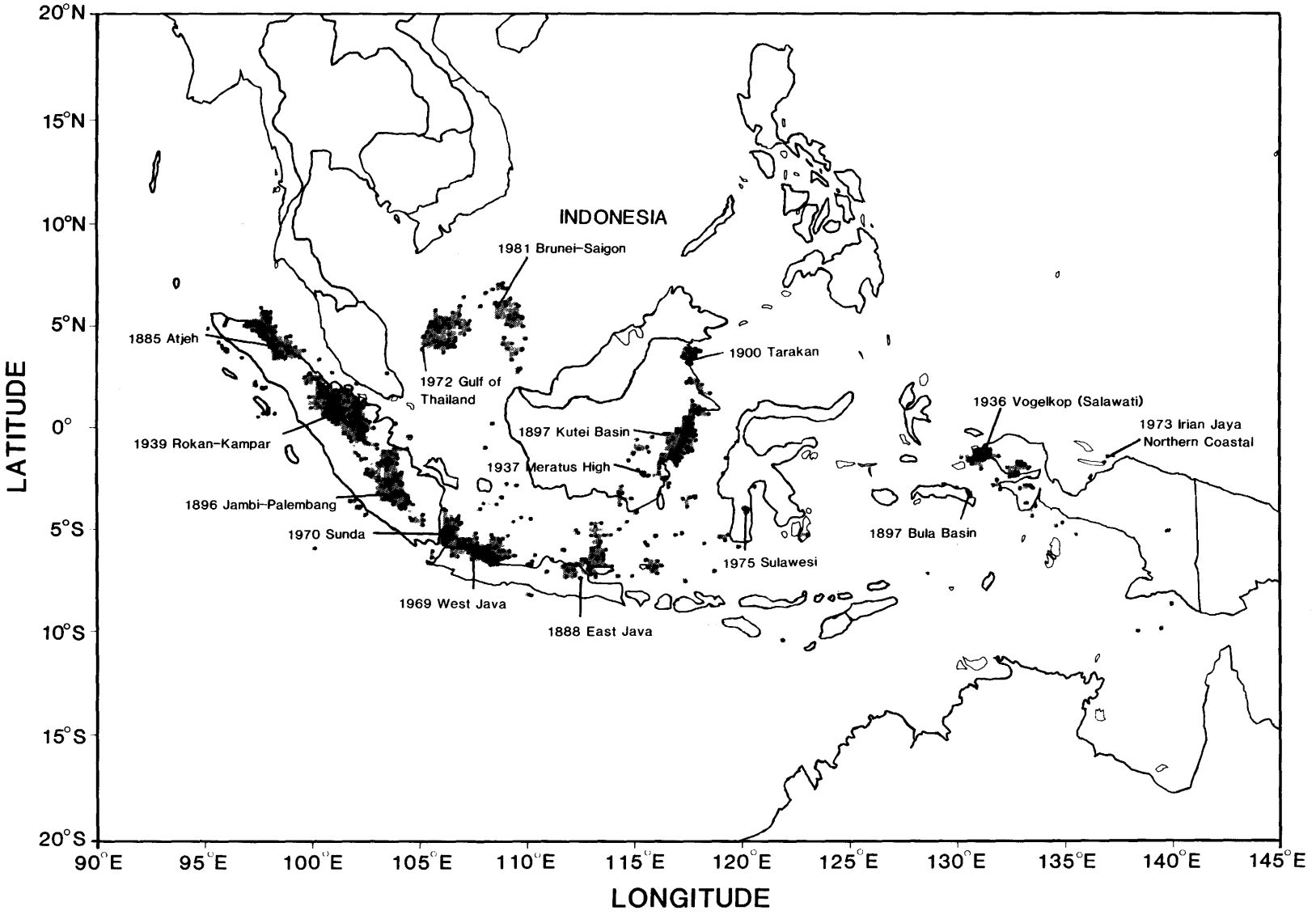
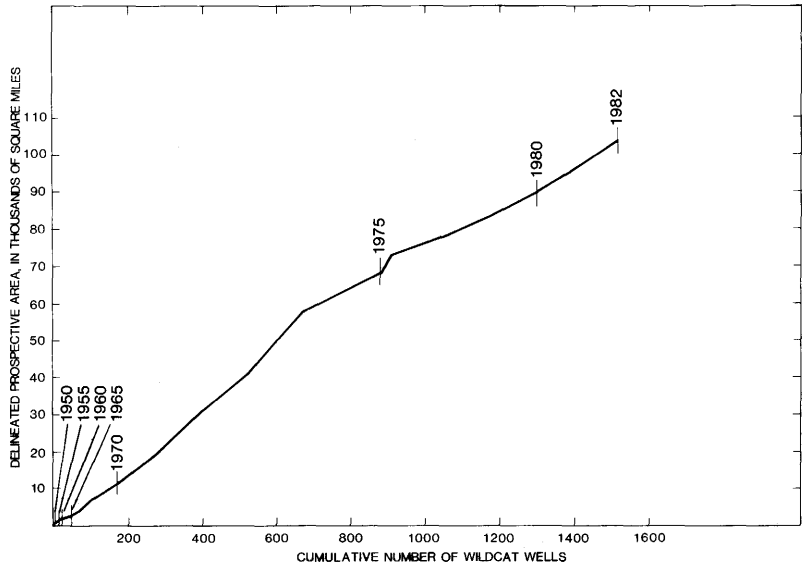


FIGURE 47.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Indonesia, Asia. Data for East Timor are not included here. See figure 48.

Growth in delineated prospective area, 1950–82



Exploration data

Land area: 580,000 mi^2

Delineated prospective area through 1982: 103,464 mi^2

Explored area through 1982: 16,669 mi^2

Wildcat wells through 1982: 1,514

Current growth in delineated prospective area per wildcat: 67 mi^2

Reported discoveries of recoverable crude oil through 1982: 19.6×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.189 \times 10^6 \text{ bbl/mi}^2$$

Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in Indonesia	Cumulative discoveries in this province in Indonesia through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Atjeh	1885	235	448
Jambi-Palembang	1896	862	1,304
Kutei	1897	3,236	3,375
Tarakan	1900	310	324
Vogelkop	1936	482	661
Meratus	1937	120	120
Rokan-Kampar	1939	9,525	10,190
West Java	1969	1,002	1,056
Sunda	1970	1,546	1,657
Gulf of Thailand	1972	392	462
Total		17,710	19,597

FIGURE 47.—Continued.

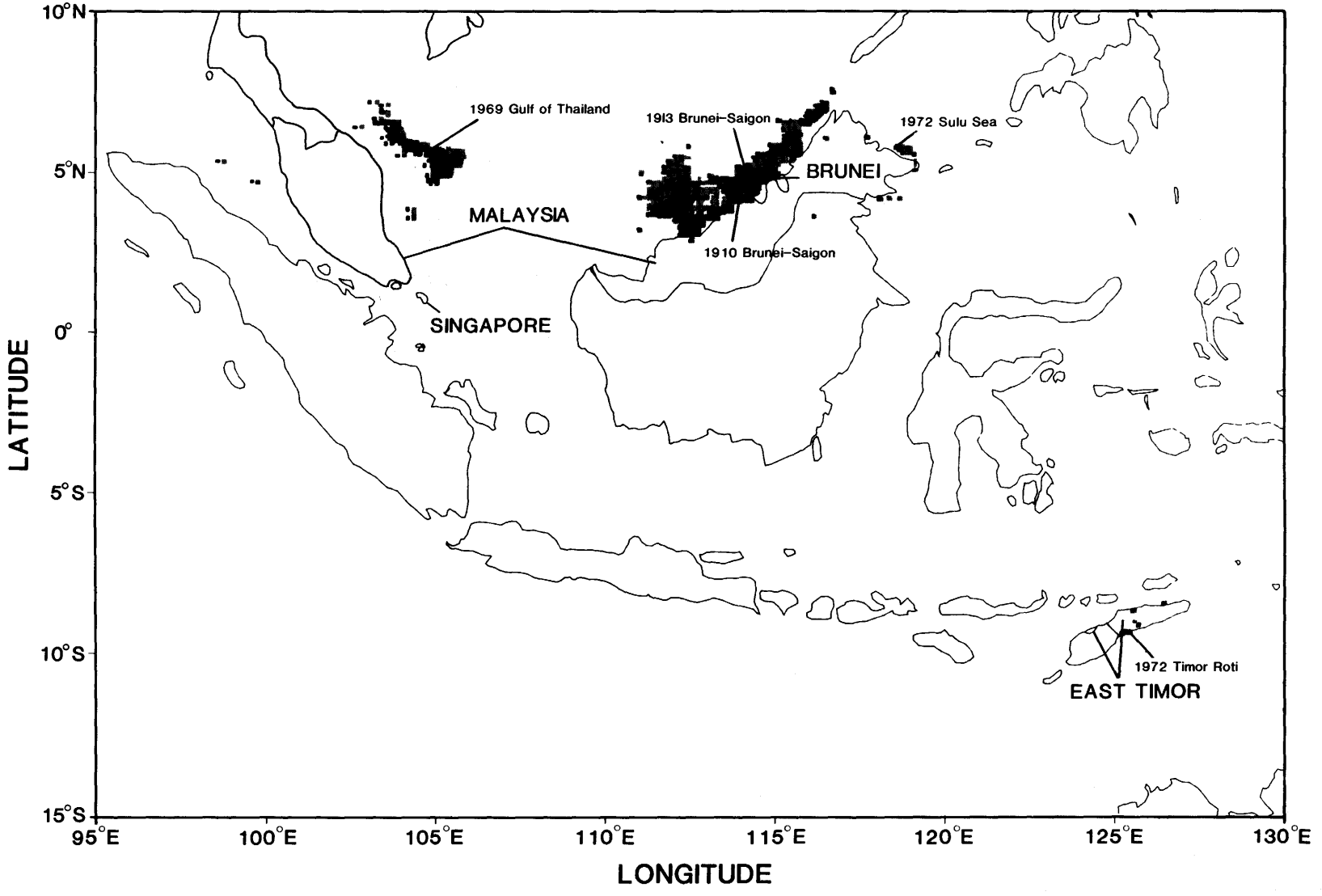
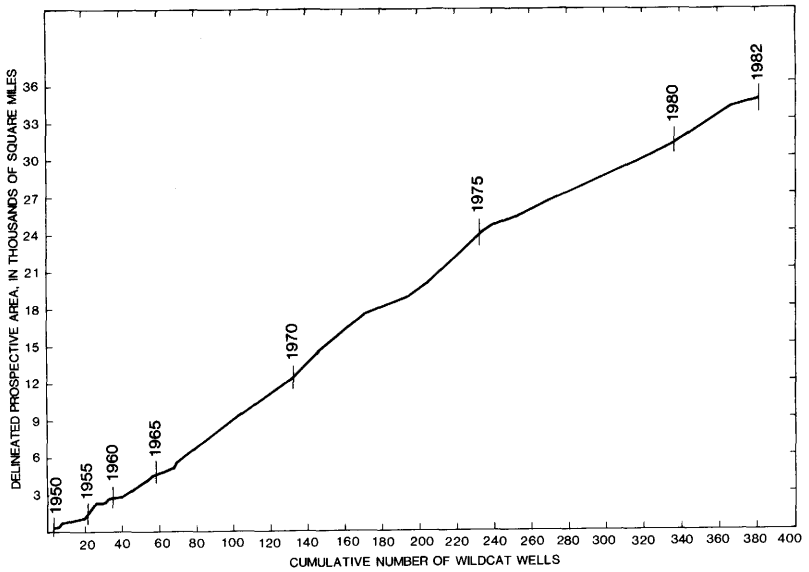


FIGURE 48.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Malaysia, Brunei, East Timor, and Singapore, Asia. East Timor is treated separately here although it is part of Indonesia.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi²
Malaysia	126,310
Brunei	2,220
East Timor	7,330
Singapore	220
Total	136,080

Delineated prospective area through 1982: 34,566 mi²

Explored area through 1982: 4,732 mi²

Wildcat wells through 1982: 381

Current growth in delineated prospective area per wildcat: 72 mi²

Reported discoveries of recoverable crude oil through 1982: 6.6×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.191 \times 10^6 \text{ bbl/mi}^2$$

Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in this country	Cumulative discoveries in this province in this country through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields*
Malaysia			
Brunei-Saigon	1910	755	1,079
Gulf of Thailand	1969	520	520
Total		1,275	1,599
Brunei			
Brunei-Saigon	1913	3,050	3,050

*Incomplete.

FIGURE 48.—Continued.

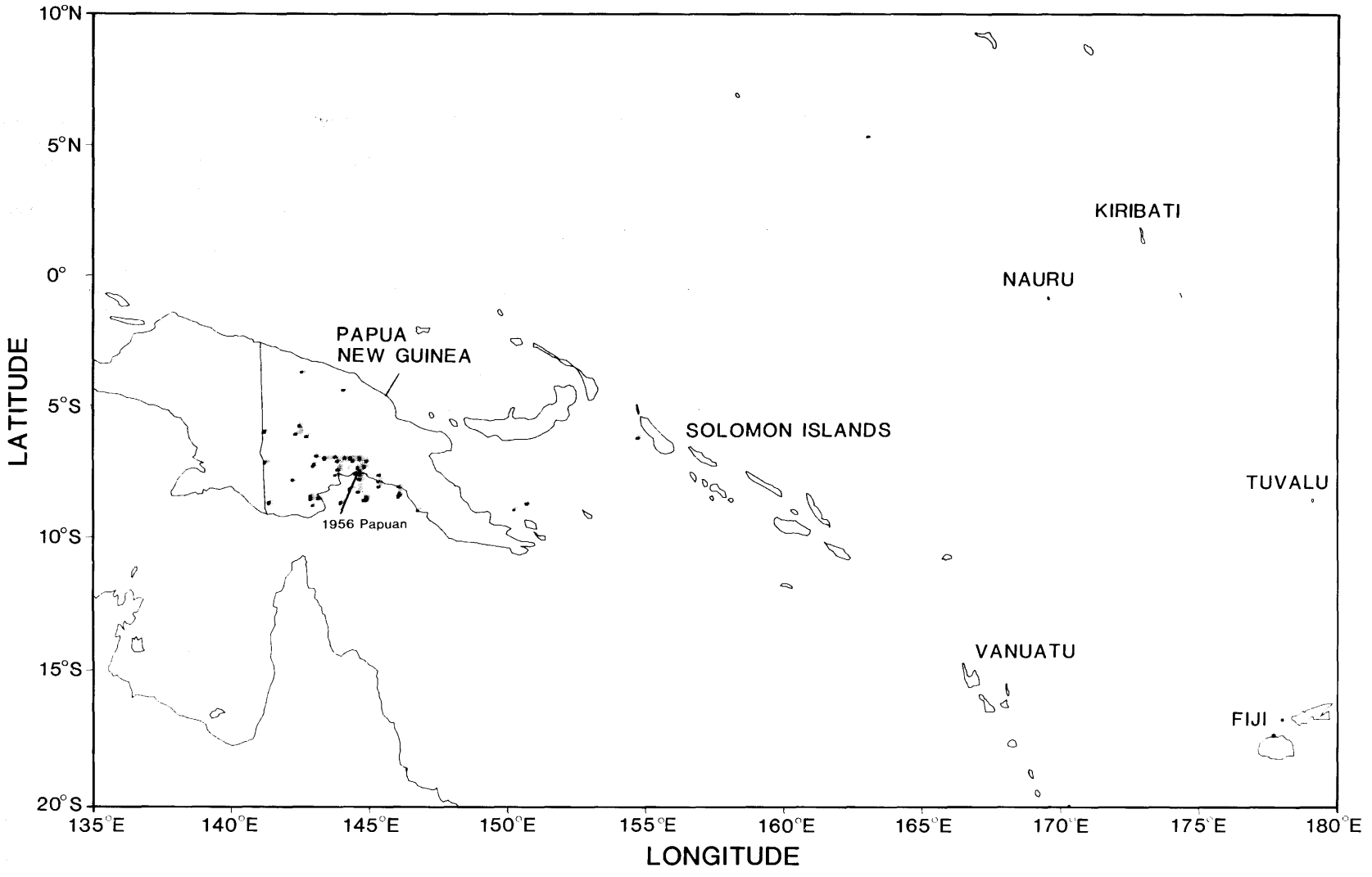
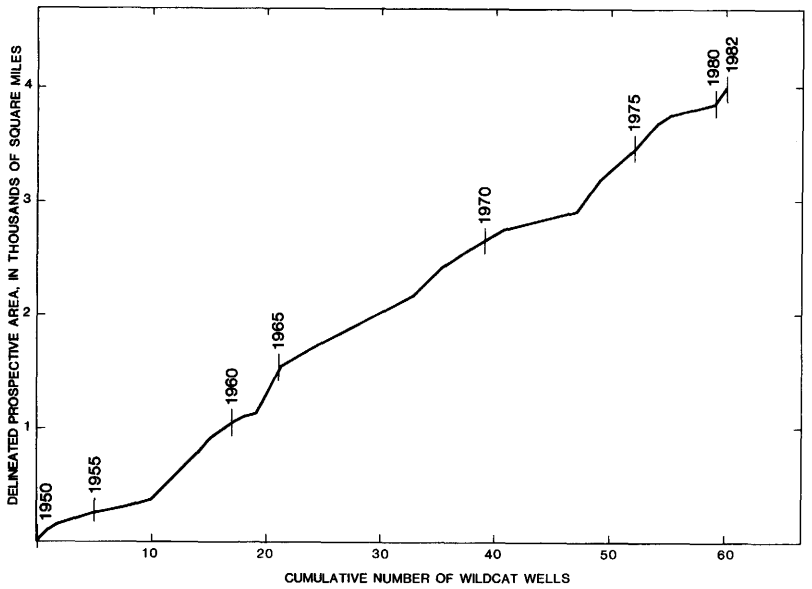


FIGURE 49.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Papua New Guinea and Oceania, southwestern Pacific. For this report, Oceania is considered to consist of Vanuatu (formerly New Hebrides), Tonga, Solomon Islands, Fiji, Nauru, Kiribati, Tuvalu, and Western Samoa. Because Tonga and Western Samoa are east of the area mapped and have no reported wells, they are not shown.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi^2
Papua New Guinea*	182,700
Vanuatu	5,700
Tonga (not shown)	270
Solomon Islands	11,458
Fiji	7,040
Nauru	8
Kiribati	266
Tuvalu	10
Western Samoa (not shown)	1,133
Total	208,585

Delineated prospective area through 1982: 3,982 mi^2

Explored area through 1982: 638 mi^2

Wildcat wells through 1982: 60

Current growth in delineated prospective area per wildcat: 66 mi^2

Reported discoveries of recoverable crude oil through 1982: Field sizes not available

*Land area for Papua New Guinea is from "Webster's New Collegiate Dictionary" (G. & C. Merriam Company, 1975).

FIGURE 49.—Continued.

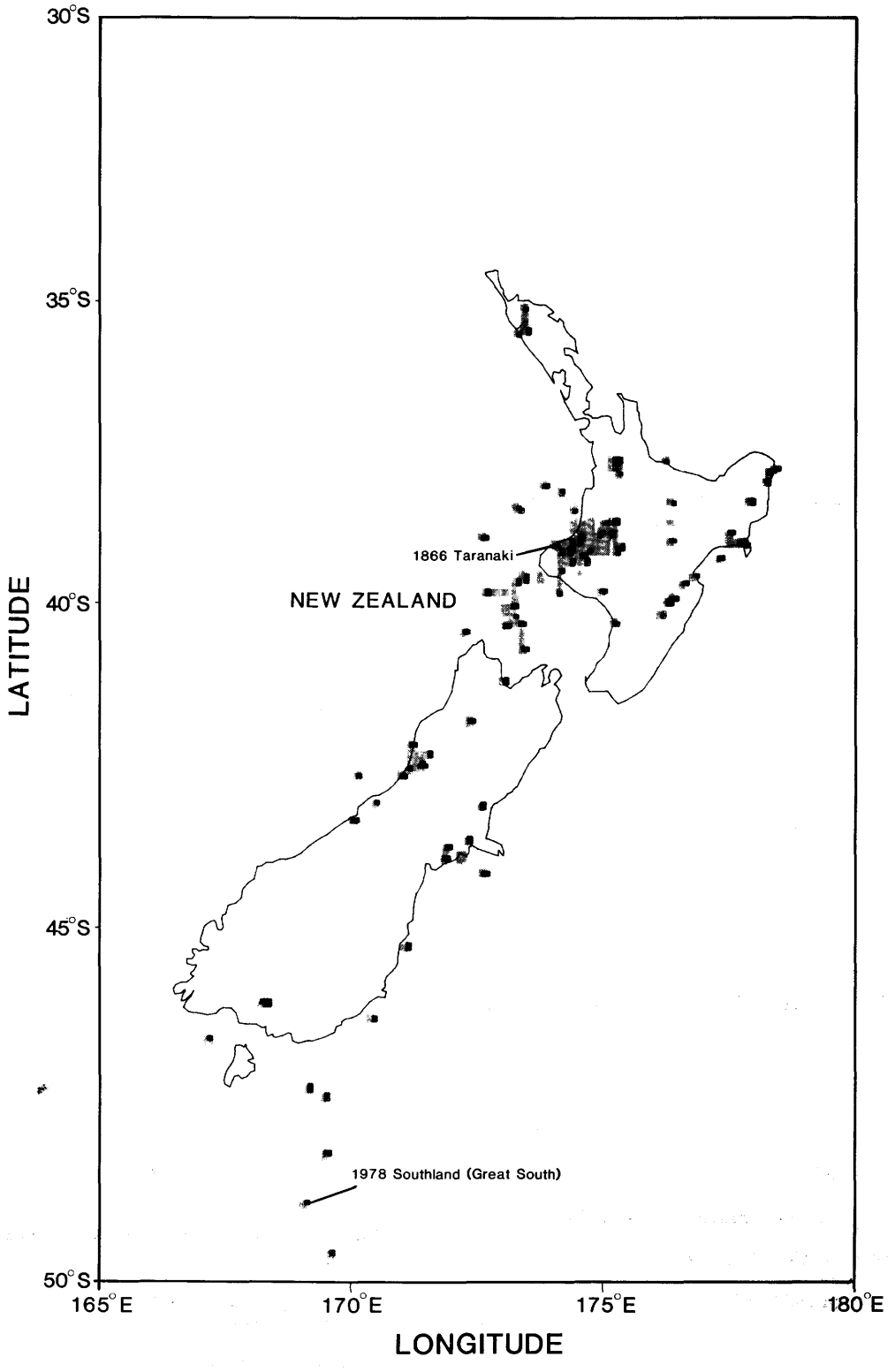
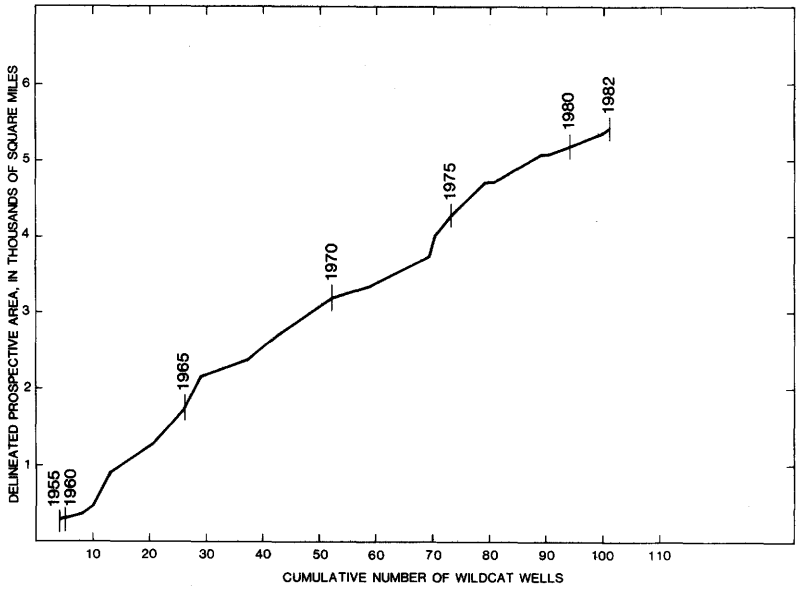


FIGURE 50.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of New Zealand, southwestern Pacific.

Growth in delineated prospective area, 1950–82



Exploration data

Land area: 103,416 mi^2

Delineated prospective area through 1982: 5,406 mi^2

Explored area through 1982: 1,228 mi^2

Wildcat wells through 1982: 101

Current growth in delineated prospective area per wildcat: 54 mi^2

Reported discoveries of recoverable crude oil through 1982: 0.02×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.004 \times 10^6 \text{ bbl/mi}^2$$

FIGURE 50.—Continued.

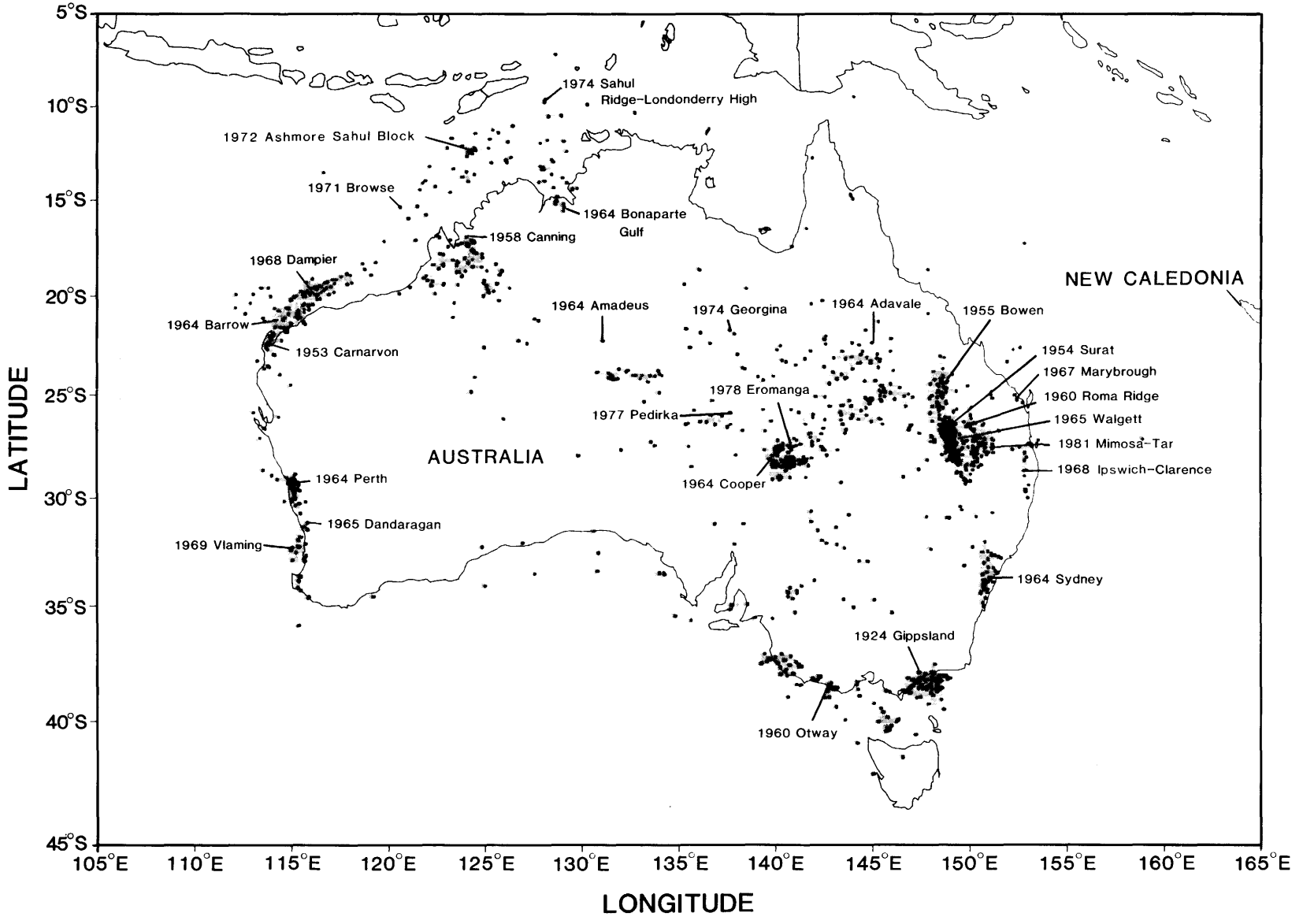
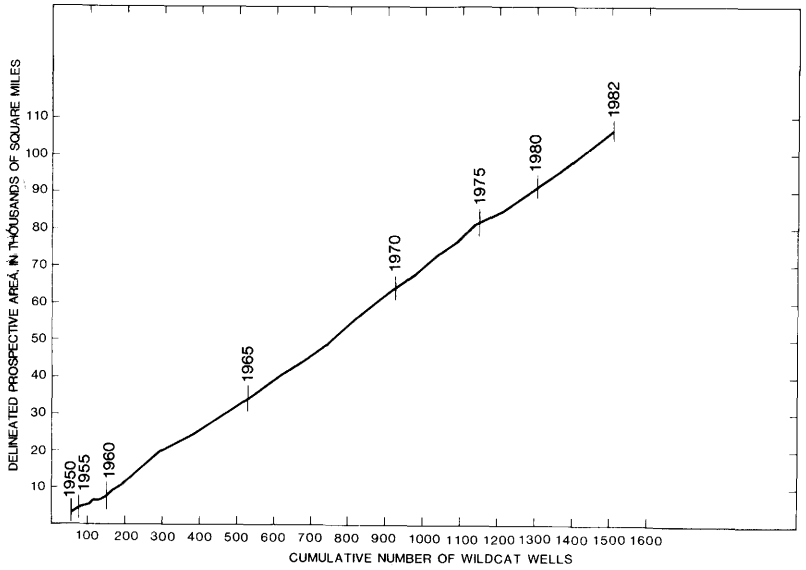


FIGURE 51.—Delineated prospective areas (gray), explored areas (black), and known petroleum provinces of Australia and New Caledonia, southwestern Pacific. New Caledonia is treated separately here although it is an overseas territory of France.

Growth in delineated prospective area, 1950–82



Exploration data

Country	Land area, mi^2
Australia	2,974,581
New Caledonia	7,200
Total	2,981,781

Delineated prospective area through 1982: 106,094 mi^2

Explored area through 1982: 17,147 mi^2

Wildcat wells through 1982: 1,504

Current growth in delineated prospective area per wildcat: 78 mi^2

Reported discoveries of recoverable crude oil through 1982: 3.7×10^9 bbl

$$\text{Richness} = \frac{\text{total discoveries}}{\text{total delineated prospective area}}$$

$$= 0.035 \times 10^6 \text{ bbl/mi}^2$$

Significant petroleum provinces

Significant petroleum province	Year of first discovery in this province in Australia	Cumulative discoveries in this province in Australia through 1982, in millions of barrels	
		in 100-million-barrel fields	in all fields
Gippsland	1924	2,894	3,015
Barrow	1964	304	316
Total		3,198	3,331

FIGURE 51.—Continued.

APPENDIX

APPENDIX, DEFINITIONS OF DELINEATED PROSPECTIVE AREA AND EXPLORED AREA

The delineated prospective area may be generally defined as the area of all points surrounded by wells that are not too far away. Specifically, a point is in the delineated prospective area if there is a well in each of the four quadrants of a square, centered at the point and having sides 40 miles long parallel to the longitude and latitude grid lines. The explored area is that area of points that are in the delineated prospective area and are also within 2 miles of a well.

In order to calculate and locate the delineated prospective areas for mapping, discrete versions of the above definitions were used. The first step was determining which points from a grid of points were in the delineated prospective area. The grid of points considered had a spacing between points of about 2.8 miles. A point was selected as being in the prospective area if it had four directional conditions satisfied. The four directional conditions are northeast, northwest, southeast, and southwest. For example, in figure A1, the point P will have its northeast condition satisfied if there is a well inside the dashed square. The dashed square in figure A1 reaches one grid spacing to the south and west of the point P and enough (eight) grid spacings to the east and north to just exceed 20 miles. In figure A2, the point P will have its northwest condition satisfied if there is a well inside the dashed square. The squares that must contain a well for the southeast and southwest conditions to be satisfied are shown in figures A3 and A4, respectively.

The second step was to use the grid points in the delineated prospective area to determine what should be plotted on a map. Each grid point in the delineated prospective area was considered to represent a square centered at the grid point and having sides equal to the grid spacing. The vertices of these squares were plotted on the maps in text figures 14–51. In figure A5, the triangles represent wells and the dots represent those grid points that are in the delineated prospective area. Figure A6 shows the pattern of points that would be plotted on a map of the delineated prospective area.

The third step is to identify the explored area, those grid points in the delineated prospective area within 2 miles of a well. In the fourth step, these grid points are also considered to represent squares, each centered at a grid point and having sides equal to the grid spacing. Their vertices constituted the explored area plotted in figures 14–51. Figure A7 shows the pattern of points that would be plotted on a map of the area explored by the wells shown in figure A5.

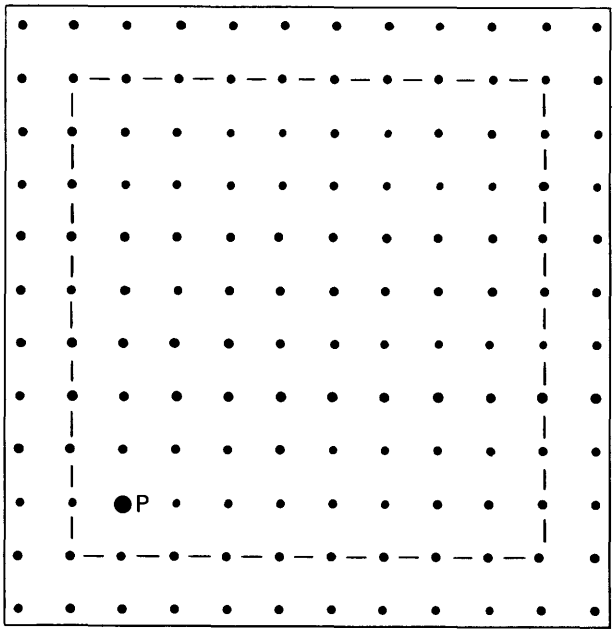


FIGURE A1.—Point P has its northeast condition satisfied if there is a well within the dashed square. The dashed square reaches one grid spacing to the south and west of the point P and enough grid spacings to the east and north to just exceed 20 miles.

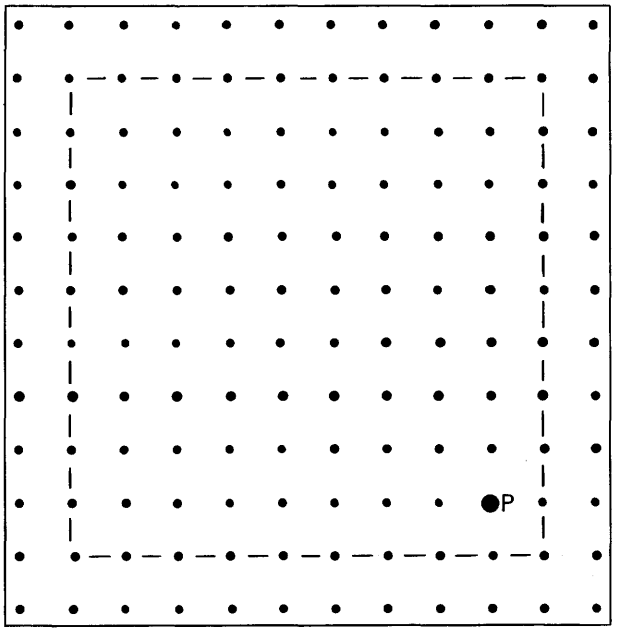


FIGURE A2.—Point P has its northwest condition satisfied if there is a well within the dashed square. The dashed square reaches one grid spacing to the south and east of the point P and enough grid spacings to the west and north to just exceed 20 miles.

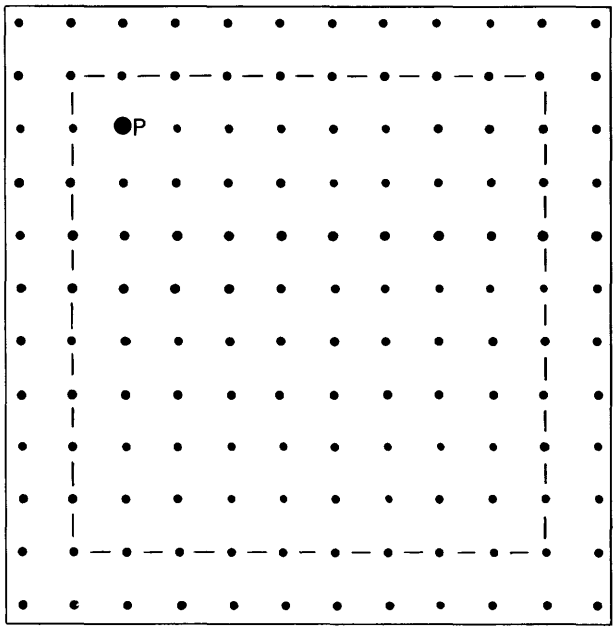


FIGURE A3.—Point P has its southeast condition satisfied if there is a well within the dashed square. The dashed square reaches one grid spacing to the north and west of the point P and enough grid spacings to the south and east to just exceed 20 miles.

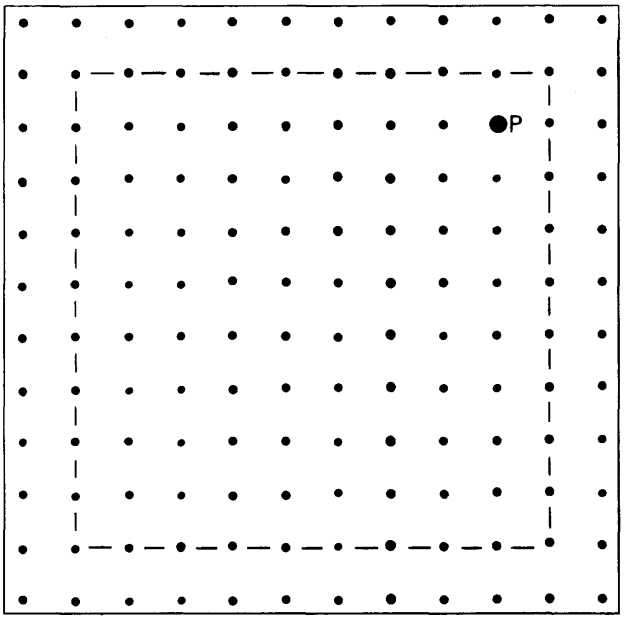


FIGURE A4.—Point P has its southwest condition satisfied if there is a well within the dashed square. The dashed square reaches one grid spacing to the north and east of the point P and enough grid spacings to the south and west to just exceed 20 miles.

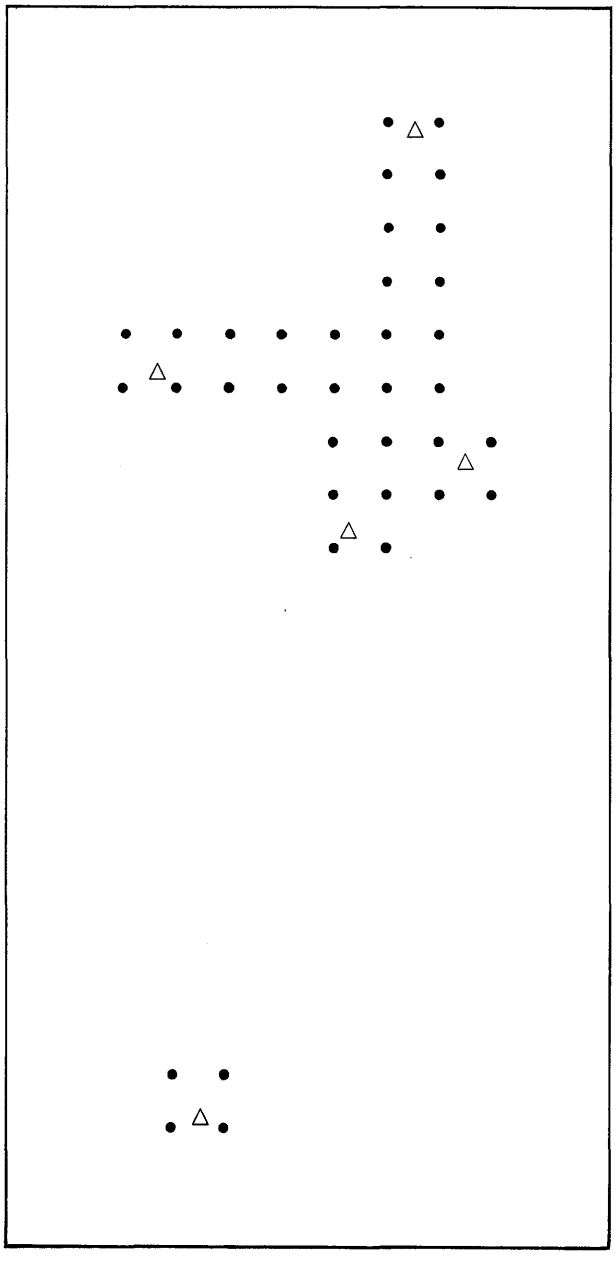


FIGURE A5.—Example pattern of wells (triangles) and grid points (dots) within the delineated prospective area. The grid points are about 2.8 miles apart.

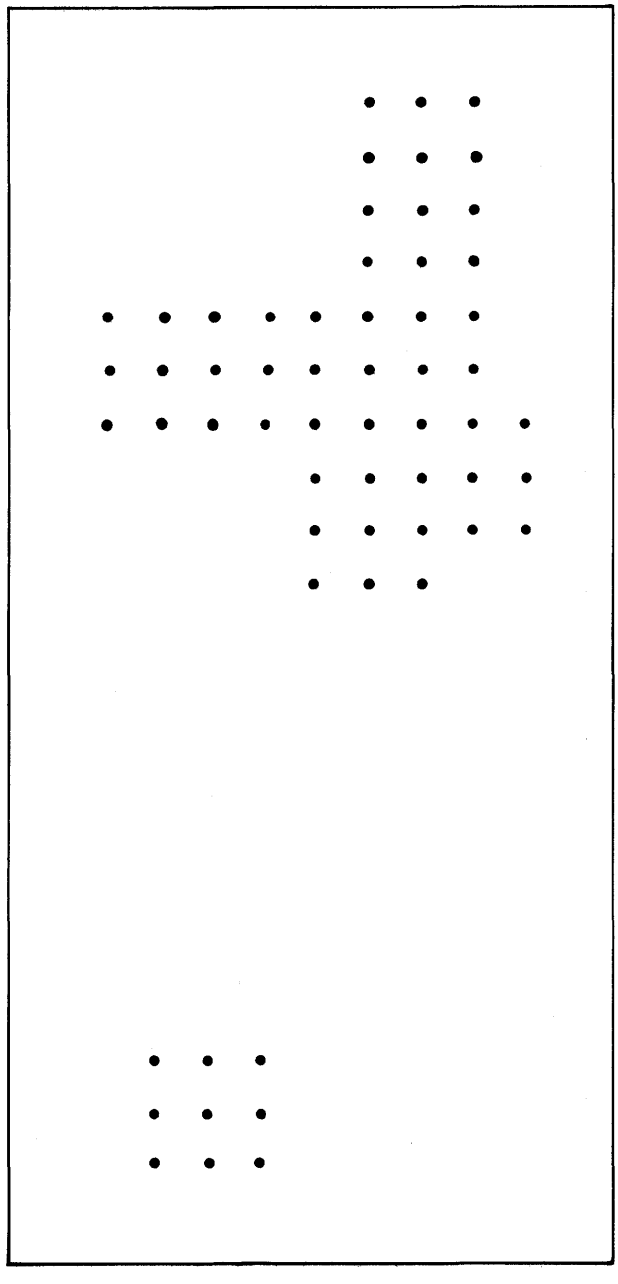


FIGURE A6.—Pattern of points to be plotted on a map of the delineated prospective area if the wells and grid points within the delineated prospective area are as shown in figure A5.

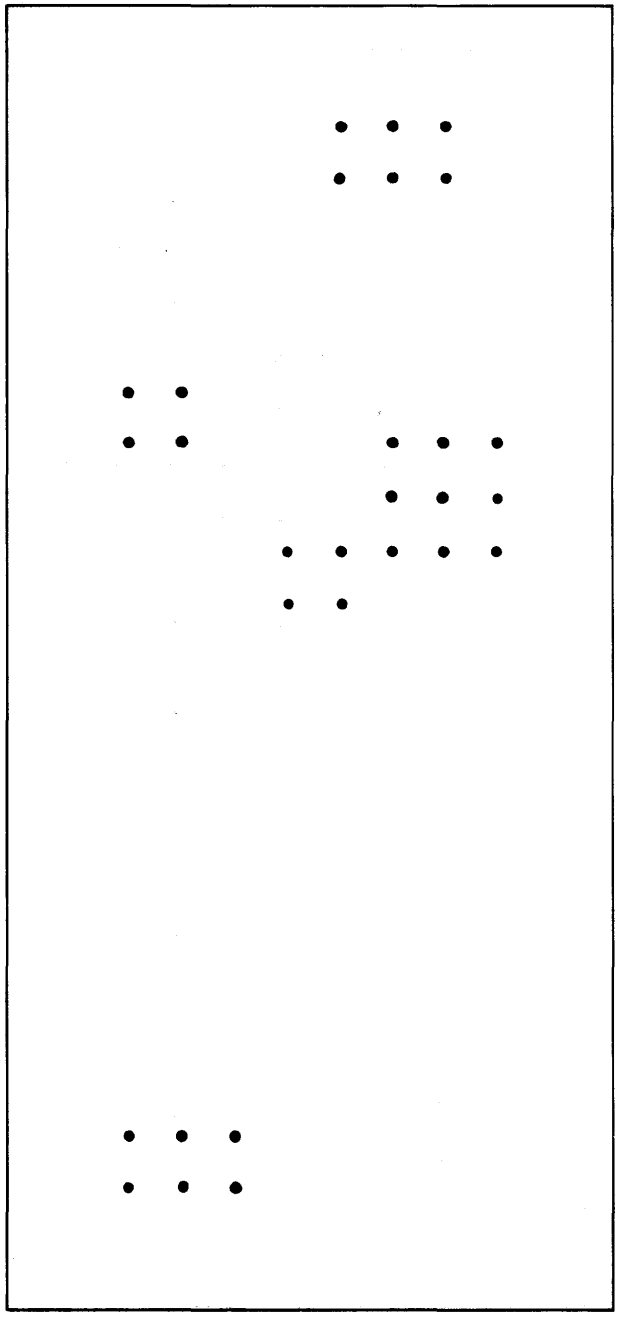


FIGURE A7.—Pattern of points to be plotted on a map of the explored area if the wells and grid points within the delineated prospective area are as shown in figure A5.

*U.S. G.P.O. 1987-181-407:60018