

**ALASKA**

**Physical and Human Geography, Economy  
and Land Management of the 49th State**

by

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## Alaska

When it became the 49th state of the United States on Jan. 3, 1959, Alaska increased the nation's size by nearly 20 percent. The new area included vast stretches of unexplored land and untapped resources. When Secretary of State William H. Seward negotiated its purchase from Russia in 1867, however, Alaska was known as Seward's Folly. Its settlement and exploitation have been hindered by its distance from the rest of the nation and by geographic and climatic impediments to travel and communications; Alaska continues to be the country's last frontier. More than half of the state's inhabitants live in the Greater Anchorage area. The capital is Juneau, 573 miles (922 kilometres) to the southeast in the panhandle region.

Alaska lies at the extreme northwest of the North American continent and is the largest peninsula in the Western Hemisphere. Its 591,004 square miles (1,530,700 square kilometres) include some 15,000 square miles of fjords and inlets, and its three faces to the sea have about 34,000 miles (54,400 kilometres) of indented tidal coastline and 6,600 total miles of coast fronting the open sea. It borders the Arctic Ocean on the north and northwest, the Bering Strait and the Bering Sea on the west, and the Pacific Ocean and Gulf of Alaska on the south. The land boundaries on the east cut across some 1,150 miles of high mountains to separate the state from the Canadian Yukon Territory and British Columbia province. Rimming the state on the south is one of the Earth's most active earthquake belts. In the Alaska Range north of Anchorage, Mount McKinley, at 20,320 feet (6,194 metres), is the highest peak in North America.

The question of development versus preservation has been heightened by commercial and ecological uses of land: the Alaska Highway gas-pipeline project, native Alaskans' land claims, noncommercial whaling by native peoples, and related matters. The conflicts between con-

servationists and petroleum companies over the Trans-Alaska Pipeline, which runs from the oil-rich North Slope on the Arctic Ocean to Valdez in the south, was a continuation of the century-long effort to find a balance between conservation and development in this enormous land.

### PHYSICAL AND HUMAN GEOGRAPHY

**The land.** The immense area of Alaska has a great variety of physical characteristics. Nearly one-third of the state lies within the Arctic Circle and has perennially frozen ground (permafrost) and treeless tundra. The southern coast and the panhandle at sea level are fully temperate regions. In these latter and in the adjoining Canadian areas, however, lies the world's largest expanse of glacial ice outside Greenland and Antarctica. Off the extreme western end of the Seward Peninsula, Little Diomed Island, part of Alaska, lies in the Bering Strait only 2.5 miles (four kilometres) from Soviet-owned Big Diomed Island; both countries have shown a tacit tolerance of unintentional airspace violations, which are common in bad weather.

**Relief.** Alaska is composed of nine distinct physiographic and environmental regions. Much of the mainland panhandle region, a narrow strip of land 25 to 50 miles wide lying east and south of the St. Elias Mountains, is composed of the Boundary Ranges. There are several large icefields, and the peaks include Mount St. Elias (18,009 feet), from whose summit the Alaska-Yukon border swings due north. The western extension of this mountain chain is the Chugach Range, a giant arc at the northernmost edge of the Gulf of Alaska. Many remote valleys and high ridges are still unexplored, and the relief and glaciation inhibit exploitation. The coast is characterized by frequent and intense oceanic storm systems that have produced dense rain forests on the coastal mountain flanks. In the valleys rivers produce devastating annual floods often associated with excessive snowmelt and glacial meltwaters.

The region of the south coastal archipelago and the Gulf

The panhandle region

of Alaska islands includes the Alexander Archipelago in the panhandle region, with 11,000 islands, plus Kodiak Island and its satellites south of Cook Inlet. These islands, extensions of the southern region, are lower, less rugged, and less glaciated. All receive heavy rain and are affected by waters warmed by the Kuroshio Current.

The Aleutian region includes the narrow Alaska Peninsula, which forms the south shoreline of Bristol Bay, and the 1,100-mile-long Aleutian chain that separates the North Pacific from the Bering Sea. The chain includes 14 large islands, 55 significant but smaller ones, and thousands of islets. The largest are Unimak, Unalaska, and Umnak. On the occasionally clear summer days, active volcanoes and such glacier-covered peaks as symmetrical Shishaldin Volcano (9,372 feet [2,857 metres]) on Unimak can be seen. Such magnificent views represent the Aleutians at their scenic best. Usually, however, the weather is wet and stormy, the winds horizontal and cutting, and the fog all-pervading.

The broad Alaska Range region connects the Aleutian Range across the southern third of mainland Alaska to the Wrangell Mountains, which abut against the vast complex of the St. Elias Mountains. The Wrangell Mountains have large active volcanoes and high valley glaciers. The flanks of this subarctic range are largely tundra-covered.

The low-lying interior basin region between the Alaska Range in the north and the Chugach-Wrangell-St. Elias mountains to the south and east enjoys a relatively temperate climate. The lower valleys contain good farmlands, and it is there that most of the people of Alaska live.

The central plains and tablelands of interior Alaska constitute a vast region west and north of the Alaska Range; they reach as far north as the Brooks Range. The area is rolling and dissected by numerous streams tributary to the Yukon and Kuskokwim rivers. The plains extend from the Canadian border to Norton Sound, the Seward Peninsula, the Yukon delta, and south to the northern rim of Bristol Bay on the Bering Sea. The region is characterized by river flats and truncated upland tablelands. With abundant game, it is an important nesting ground for waterfowl, including great numbers of migrating birds.

A major mountain chain running west to east in the area north of the central plains and extending from the sea nearly to the Yukon border, the Brooks Range gradually slopes northward to a narrow linear coastal plain bordering the Arctic Ocean and westward to lower hills north

of Kotzebue Sound. There are a few high Arctic glaciers, and the area is semiarid. The lower flanks and valleys are tundra-covered, with permafrost features.

The coastal lowland north of the Brooks Range, sometimes called the North Slope, is the home of great herds of caribou. The environment is truly polar, with the sea waters along the coast frozen eight months of the year and the ground permanently frozen except for a thin zone of summer melting. It is treeless, and, in summer, grasses and Arctic alpine flowers abound. The National Petroleum Reserve-Alaska is located in the western sector, while the Prudhoe Bay oil fields and part of the Arctic National Wildlife Refuge occupy the eastern sector.

The islands of the Bering Sea represent a small but unique Arctic maritime environment, typified by St. Lawrence, Nunivak, and St. Matthew islands and the Pribilof group. These tundra-covered islands are surrounded by sea ice in winter and serve as protected refuges for the world's largest herds of fur-bearing seals and sea otters, as well as sea lions and walrus. A large herd of domesticated reindeer is tended by Eskimos on Nunivak Island.

*Climates.* Five general climatic zones may be delineated in Alaska, excluding the great mountain ranges.

Southern coastal and southeastern Alaska, the Gulf of Alaska islands, and the Aleutians have average temperature ranges in the summer of 40° to 60° F (4° to 16° C) and in the winter of 40° to 20° F (4° to -7° C). Rainfall varies locally from 60 to 160 inches (1,525 to 4,065 millimetres), and the panhandle and southern islands are covered with Sitka spruce, hemlock, and other evergreens. The Cordova-Valdez region and parts of the west central panhandle have the state's highest precipitation, 220 inches or more. At Valdez 200 inches of snow is not uncommon. Precipitation is less in the Aleutians, but even there about 250 rainy days occur annually.

The interior basin ranges from 45° to 75° F (7° to 24° C) in summer and 20° to -10° F (-7° to -23° C) in winter. The region is drier than the coast and only slightly colder in winter, with Anchorage receiving about 15 inches (380 millimetres) of precipitation annually. The pleasant conditions and proximity to the sea have helped to make the area the centre of the state's population.

The Aleutians and coast of the Bering Sea have summer temperatures of 40° to 60° F (4° to 16° C) and winter temperatures of 20° to -10° F (-7° to -23° C). Tempering influences of the Pacific dissipate north of the Pribilof Islands, and Arctic sea ice often reaches this area.

The central plains and uplands range from 45° to 75° F (7° to 24° C) in the summer and -10° to -30° F (-23° to -34° C) in the winter. Average rainfall is 10 to 20 inches, though less than 10 inches is common.

The ameliorating effects of the Arctic Ocean keep temperatures of the North Slope at 35° to 55° F (2° to 13° C) in the summer and -5° to -20° F (-21° to -29° C) in the winter—less severe than those of the interior plains. About five inches of precipitation nonetheless remain on the ground as snow for some eight months of the year. The 24-hour sunlight of summer can produce strong buildups of radiant energy, sending temperatures to 90° F (32° C). The deep chill of winter, however, maintains the permafrost character of the High Arctic zone. Ice clogs the northern coast nine months of the year, while ice fog frequently extends southward to Fairbanks.

*Settlement patterns.* A large percentage of Alaskans live in the southern interior basins around Anchorage; most of the remainder live in the interior plains around Fairbanks or in the panhandle region, where Juneau is the major city and the administrative centre of the state. Tiny pockets of people are scattered in small villages, the most sparsely occupied being the Arctic plains, the Bering shores, and the Aleutians. Many frontier conditions persist: a male-to-female ratio of 5 to 1 in 1910 has been reduced to near equality, but in many places bars are as numerous as churches.

*The people.* English, Russian, Spanish, and French place-names reflect early European exploration, but equally prominent are dozens of names from the pre-Western era. The name Alaska itself is derived from the Aleut *alaska* and the Eskimo *alakshak*, both meaning "mainland."

Population  
distribution

Native  
population and  
cultures

Long before Bering's voyages the Tlingit Indians lived in the southern and southeastern coastal area; the Aleuts on the Aleutian Islands and the Alaska Peninsula; and the Eskimos on the Bering shore and the Arctic Ocean coast. The interior natives were the Tinneh Indians, whose language was Athabascan, that of the Plains Indians of the interior continent to the south. The Indian groups are presumably descendants of the earliest immigrants across the Bering Land Bridge from Asia, perhaps more than 15,000 years ago, and they reflect the migratory wave that reached as far as the southern extremity of South America as early as 10,000 years ago. Eskimos and Aleuts appear to be much later immigrants, having arrived, probably in boats made of animal skins, perhaps 8,000 to 3,000 years ago. All groups have been involved in the debates and adjudications over public land grants.

The first wave of immigration from the "South 48"—which occurred in the decade before World War I as an aftermath of the gold rush—was a response to Alaska's initial concentration on its mineral, fish, and timber resources. The discovery of oil fields and the emergence of Alaska as an international air crossroads added impetus to the influx of the 1940s and '50s and construction of the Trans-Alaska Pipeline to that of the 1960s and '70s. By 1980 only about 20 percent of the white population of the state was born in Alaska.

Of the current population about one-seventh are Eskimos, Aleuts, and Indians. The remaining citizenry include military personnel and their families and a melting pot of mixed American, Russian, Filipino, Japanese, Chinese, and other nationalities.

**The economy.** The Alaskan economy is conditioned strongly by the state's frontier stage of development, but its formerly inadequate tax base for state and municipal growth ended with the development of the North Slope oil fields. High costs of labour and transportation and complicated environmental and land-use constraints still tend to discourage outside investment. Nonetheless, development of the state's natural resources has assisted markedly in the transition from a federal military to a commercial self-supporting economic base.

**Government.** Alaska's economy has been dominated by government since territorial days. From 1940 to 1960 the federal government invested nearly \$2,000,000,000 in the development of military bases in Alaska. Nothing else in Alaska's history has produced such long-term results, bringing thousands of residents into the territory and creating jobs and a vast array of transportation and communications facilities extending to remote corners of the state. Combined with state and local government, the defense installations continue to add much to Alaska's economy.

**Agriculture.** Only a small sector of Alaska's economy is agricultural, but a viable in-state market is still under development. More than 3,000,000 acres (1,200,000 hectares) of tillable land are available for farming, but much clearing has yet to be done. Most acreage is near Anchorage and on the Kenai Peninsula, though there is some near Fairbanks, and stock ranching is practiced on Kodiak and Unimak islands. As a result, all farm products are sold locally and most foods must be imported, tremendously increasing the cost of living. Closure of the Homestead Act, ending settlement of the native land claims issue, has further curtailed development of new land. In spite of a short growing season, the long hours of summer sunlight are adapted to the production of oats, barley, potatoes, hay, and cool-climate vegetables. Livestock and greenhouse crops are also successful.

**Fishing, forestry, and furs.** Alaska's most constant source of revenue is derived from fishing. Fish are found mostly in waters off the southern coasts, salmon being of especial importance. The centre of the world's salmon-packing industry is at Ketchikan, on Kodiak Island, and at Bristol Bay ports in the southern Bering Sea. Fleets also bring in quantities of herring, cod, pollack, and halibut, as well as Dungeness, king, and Tanner crabs. International fishing of Alaska's waters is regulated by the 200-mile-wide exclusive economic zone and the U.S.-Canadian Pacific Salmon Treaty (1985), which assigns ownership of fish to the country in which they spawn.

Salmon  
industry

Most of Alaska's timber resources are in the Tongass and Chugach national forests, in the panhandle and on the southern coast, respectively. Timber is produced mainly for export to Asia, with the pulp of Ketchikan and Sitka exported to Japan.

Pribilof sealskins represent more than half of the state's annual fur production. Other furs, largely from controlled farms, are processed as well. The production of reindeer hides from a herd on Nunivak Island is managed by the Alaska Native Association.

**Power.** Alaska's immense waterpower reserve is virtually untapped. The largest project is at Lake Eklutna, near Anchorage. A hydroelectric development near Juneau delivers power to the panhandle area, and another project on the Kenai Peninsula is planned to deliver power to the central and southern regions. Most other communities depend on diesel and coal plants to produce much of the required municipal power.

**Mining.** Petroleum was first extracted and refined between 1917 and 1933, but the development of the Kenai oil field in 1961 made the petroleum and natural gas industry Alaska's most important mineral production. Oil seeps were known as early as the 1880s in the North Slope region, which today has become a field of major economic importance to both the state and the nation. Alaska ranks second only to Texas in oil production.

Since 1880 hard-rock ore minerals have been mined in Alaska, about 95 percent of which yield gold, copper, zinc, and silver. Prospecting continues, with modern scientific technology and aerial exploration. The areas of maximum mineral potential lie in the panhandle, the Chugach and Alaska ranges, and the Seward Peninsula at locations unlimited by environmental regulation.

Alaska's gold production declined drastically after World War II, but the mining of gold especially and of zinc, silver, and lead began to rebound in the 1980s. Copper mining as a major industry ended with the closing of the Kennecott Mine in 1938, although there are new prospects elsewhere. Coal has remained an important industry. Another important activity is the extraction of sand, gravel, and clay to serve the construction industry.

**Tourism.** Alaska has had an upsurge of tourism. Travelers arrive mainly by air or sea and can now cover large areas by airplane and road. The influx is partly the result of the 500-passenger, 100-car ferries that operate as the Alaska Marine Highway. One ferry system connects Kodiak with mainland Seward and the Alaska Railroad, another links Cordova and Valdez, and a third serves panhandle communities from Ketchikan to Skagway, with service also from Prince Rupert, British Columbia, and Seattle, Wash.

**Transportation.** High costs of transportation continue to sap Alaska's economic development, largely because the major transportation links, both internal and external, are by air, which provides the fastest way to cross Alaska's great distances and formidable terrain. Two dozen airlines serve Alaska, with daily service for passengers and cargo from the South 48 and Canada, Europe, Hawaii, Korea, and Japan. Some 800 airfields, seaplane bases, and emergency strips are in use, and few villages are without service at least by bush pilots. Most of the state's roads are surfaced. The Alaska Highway and its Haines and Skagway cutoffs connect Alaska's internal road network to the outside and provide relatively easy access for tourists. A 416-mile (669-kilometre) haul road from Fairbanks to Prudhoe Bay connects with the existing highway system to provide an overland route from the ice-free southern ports to the Arctic Ocean. The public, however, is restricted to the southern half of this highway and may use it only in the summer.

The government-owned Alaska Railroad runs for about 500 miles (800 kilometres), linking Seward, Anchorage, and Fairbanks. Ocean shipping connects Seattle, Vancouver, and the trans-Canada railhead of Prince Rupert to towns in the panhandle and westward to Cordova, Valdez, Seward, and Kodiak. Ocean vessels also run during the ice-free midsummer months to Nome and Barrow and to the oil regions of the Arctic coast. A natural gas pipeline connects the Kenai gas fields and Anchorage, and the

Trans-  
portation  
networks

Trans-Alaska Pipeline delivers North Slope oil to ice-free tanker terminals at Valdez.

In the mid-1950s the Alaska Communication Cable was installed between Seattle and Alaska. Radio telephones connect all interior communities.

**Administration and social conditions.** *Government.* The state constitution was adopted in 1956. The governor and lieutenant governor are the only executive officers and are elected for four-year terms. The 40-member House of Representatives and 20-member Senate are elected for terms of two and four years, respectively. The Supreme Court has a chief justice and four associate justices. A three-member court of appeals was established in 1980. There are four district courts. A single federal district court sits alternately in Juneau, Anchorage, Fairbanks, and Nome.

Public financing is implemented through various personal income, property, sales, and business taxes, including petroleum-based severance taxes and mining rents and royalties. As a part of the Act of Admission, Congress granted Alaska certain revenues from the sale of furs and of federal lands.

State and borough governments have difficulty in providing the usual range of services because of the limited extent of the economy and a high unemployment rate. The vast area and the difficult terrain increase these problems.

The U.S. Bureau of Indian Affairs (BIA) assists Alaska's natives in achieving economic and social self-sufficiency. Despite a number of helpful programs, many of Alaska's natives suffer from unemployment, low income, and poverty. The native peoples were educated first by missionary groups, though by the time of statehood the BIA had assumed most of the responsibility for education. Funds are provided for vocational training and the development of job opportunities and for welfare, social work, and medical and health needs. The BIA also assists natives in organizing their villages under federal and state laws. Some oil revenues from native lands have been applied in self-help programs. Settlement of the native land claims in 1971 improved their economic plight by placing 44,000,000 acres of federal land into the native entitlement.

**Education.** Education is compulsory through the eighth grade or until age 16 and is administered by a state board and a commissioner of education. Correspondence study is available for high school work through the State Department of Education. There are several federal schools on military bases. The University of Alaska, founded as a land-grant institution in 1917, operates campuses at Fairbanks, Anchorage, and Juneau. There are several community colleges, including those at Sitka, Ketchikan, Kenai, and Valdez. Alaska Pacific University in Anchorage, Alaska Bible College in Glennallen, and Sheldon Jackson College in Sitka are private institutions.

**Health and welfare.** The elderly, dependent children, and the blind are aided by the state, and a special fund benefits sick and disabled fishermen. The state also operates a psychiatric hospital, a tuberculosis treatment centre, a youth camp, and a prison.

Medical and health clinics and hospitals available to the general public are provided by municipal and borough governments or private agencies, or are run as church-operated facilities. Health standards have been raised markedly since 1950 through visits by U.S. Public Health Service nurses and doctors to the remote villages. The large number of airfields, the radio communications network, and the extensive use of bush pilots operating throughout the state make it possible for most persons, even in the remote villages, to reach medical facilities when there is serious need. There are modern hospitals located in Fairbanks, Anchorage, Juneau, and Ketchikan.

**Cultural life.** Alaska's past, including the arts and crafts of its native peoples, is a major influence in Alaskan culture. Juneau is the site of the state's historical library and state museum. The university has a large museum, as do other communities, including Sitka, Haines, Valdez, and Nome. Eminent Alaskan artists have included both whites and Eskimos. Native ivory and wood carvings are well known, and the nearly lost art of totem carving has been revived in part through private and public stimulus.

Wildlife refuges and ranges abound throughout Alaska,

with more than 77,000,000 acres managed by the U.S. Fish and Wildlife Service. The federal Bureau of Land Management also holds about 25,000,000 acres for water-power development.

In 1980, more than 104,000,000 acres were designated for national parks, preserves, wildlife refuges, and wilderness areas, adding to the 7,500,000 already so established. The Alaskan national parks are notably spectacular. Denali (formerly Mount McKinley) National Park and Preserve (1917) has an abundance of wildlife, including brown and grizzly bears, caribou, and moose. Katmai National Park and Preserve (1918), on the Alaska Peninsula, includes the Valley of Ten Thousand Smokes, an area of active volcanoes that in 1912 produced one of the world's most violent eruptions. Glacier Bay National Park and Preserve (1925) has magnificent fjords, as well as glaciers that have retreated extensively in the 20th century. Sitka National Historic Park (1910), with a large totem pole collection, commemorates the stand of the Tlingits against early Russian settlers. The Tongass and Chugach national forests in the southeast and south central regions, respectively, are also federal public land reserves. The U.S. Department of the Interior has continued to study the need for withdrawing further regions from public domain into reserves.

The sporting industry, including guide and outfitter services and boat charters, continues to be a colourful activity. Alaska provides the nation's only significant Arctic wilderness, and much research is done in glacier, mountain, tundra, atmospheric, ionospheric, and polar oceanography fields by federal, state, university, and private agencies. For example, the University of Alaska carries out extensive research on Arctic problems through its Geophysical Institute, Institute of Marine Science, Institute of Arctic Biology, and other groups. Since 1946 the Juneau affiliate of the Foundation for Glacier and Environmental Research, in cooperation with the National Science Foundation, the University of Idaho, and the University of Alaska, has sponsored a glaciologic and environmental research and field sciences training program on the Juneau Icefield.

## HISTORY

**Explorations.** As early as 1700, native peoples of Siberia reported the existence of a huge piece of land lying due east. An expedition appointed by the Russian tsar and led by a Danish mariner, Vitus Bering, in 1728 determined that the new land was not linked to the Russian mainland, but because of fog it failed to locate North America. On Bering's second voyage, in 1741, the peak of Mount St. Elias was sighted, and men were sent ashore. Sea otter furs taken back to Russia opened a rich fur commerce between Europe, Asia, and the North American Pacific Coast during the ensuing century.

**Early settlement.** The first European settlement was established in 1784 by Russians at Three Saints Bay, near present-day Kodiak. It served as Alaska's capital until 1806, when the Russian-American Company, organized in 1799 under charter from the emperor Paul I, moved its headquarters to richer sea otter grounds in the Alexander Archipelago at Sitka. The company governed Alaska until its purchase by the United States in 1867. Alaska's first governor (then termed chief manager), Aleksandr Baranov, was an aggressive administrator whose severe treatment of the native Indians and Eskimos led in 1802 to a massacre at Sitka.

A period of bitter competition among Russian, British, and American fur traders was resolved in 1824 when Russia granted equal trade rights for all. The near extinction of the sea otter and the political consequences of the Crimean War (1853-56) were factors in Russia's willingness to sell Alaska to the United States. The Russian minister made a formal proposal in 1867, and, after much public opposition, the purchase was approved by the U.S. Congress and the U.S. flag was flown at Sitka on Oct. 18, 1867.

**Political growth.** As a U.S. possession Alaska was governed by military commanders for the War Department until 1877. During these years there was little internal development, but a salmon cannery built in 1878 was the beginning of what became the largest salmon industry in the world. In 1884 Congress established Alaska as a judi-

National parks and wilderness preserves

Native welfare

Russian pioneering

cial land district, federal district courts were established, and a school system was initiated.

Establishment of the territory

In 1906 the first representative to Congress, a nonvoting delegate, was elected, and in 1912 Congress established the Territory of Alaska, with an elected territorial legislature. Alaskans voted in favour of statehood in 1946 and adopted a constitution in 1955. Congressional approval of the Alaska statehood bill in 1958 was followed by formal entry into the Union in 1959.

**Mining booms.** Other significant events in Alaska's history included early gold discoveries on the Stikine River in 1861, at Juneau in 1880, and on Fortymile Creek in 1886, and later the stampede to the Atlin and Klondike placer goldfields of adjoining British Columbia and Yukon Territory in 1897-1900. Gold discoveries followed at Nome in 1898 and at Fairbanks in 1903. The gold rush made Americans aware of the economic potential of this previously neglected land. The great hard-rock gold mines in the panhandle were developed, and in 1898 copper was discovered at McCarthy. Gold dredging in the Tanana River valley was begun in 1903 and continued until 1967.

**Economic growth.** A dispute between the United States and Canada over the boundary between British Columbia and the Alaska panhandle was decided by an Alaska Boundary Tribunal in 1903. The U.S. view that the border should lie along the crest of the Boundary Ranges was accepted and boundary mapping was completed in 1913. Between 1898 and 1900 a narrow-gauge railroad was built across White Pass to link Skagway and Whitehorse in the Yukon, and shortly afterward the Cordova-McCarthy line was laid up the Copper River. Another railway milestone, and the only one of these still operating, was the 538-mile Alaska Railroad connecting Seward with Anchorage and Fairbanks in 1923. In 1935 the government encouraged a farming program in the Matanuska valley near Anchorage, and dairy herds and crop farming became established there, as well as in the Tanana and Homer regions.

In 1942, during World War II, Japanese forces invaded Agattu, Attu, and Kiska islands in the Aleutian chain and bombed Dutch Harbor on Unalaska. This aggression prompted the construction of large airfields as well as the Alaska Highway linking Dawson Creek, British Columbia, and Fairbanks with more than 1,500 miles (2,400 kilometres) of road. Both proved later to be of immense value in the commercial development of the state.

During the 20th century nearly 40 earthquakes measuring at least 7.25 on the Richter scale have been recorded in Alaska. The devastating earthquake on March 27, 1964 (8.4 on the Richter scale), affected the northwestern panhandle and the Cook Inlet areas, destroying parts of Anchorage; a tsunami that followed wiped out Valdez; the coast sank 32 feet (9.75 metres) at Kodiak and Seward; and a 16-foot coastal rise destroyed the harbour at Cordova.

Discovery of oil

Oil and natural gas discoveries in the Kenai Peninsula and offshore drilling in Cook Inlet in the 1950s created an industry that by the 1970s ranked first in the state's mineral production. In the early 1960s a pulp industry began to utilize the forest resources of the panhandle. Major paper-pulp mills were constructed at Ketchikan and Sitka, largely to serve the Japanese market. The discoveries in 1968 of petroleum on lands fronting the Arctic Ocean gave promise of relief for Alaska's economic lag, but problems of transportation across the state and to the South 48 held up exploitation of the finds. In 1969 a group of petroleum companies paid the state nearly \$1,000,000,000 in oil-land revenues, but the proposed pipeline across the eastern Brooks Range, interior plains, and southern ranges to Valdez created heated controversies among industry, government, and conservationists. In November 1973 a bill passed the U.S. Congress that made possible construction of the pipeline, which began in the following year. The completed 48-inch (122-centimetre) pipeline, 789 miles (1,262 kilometres) long, came into operation on June 20, 1977. As a result, oil flows freely from the Prudhoe Bay oil field on the Arctic coast to the ice-free harbour at Valdez, whence tankers transport it to U.S. West Coast ports. Further development of Alaska's petroleum reserves depends upon economic factors and the issue of high production

costs in the hostile Arctic environment. In 1989 the oil tanker *Exxon Valdez* ran off course in Prince William Sound, causing the most disastrous oil spill in North American history and inflicting incalculable damage on the area's marine ecology and local economy. (M.M.M.)

