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U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Unified Ecoregions of Alaska: 2001

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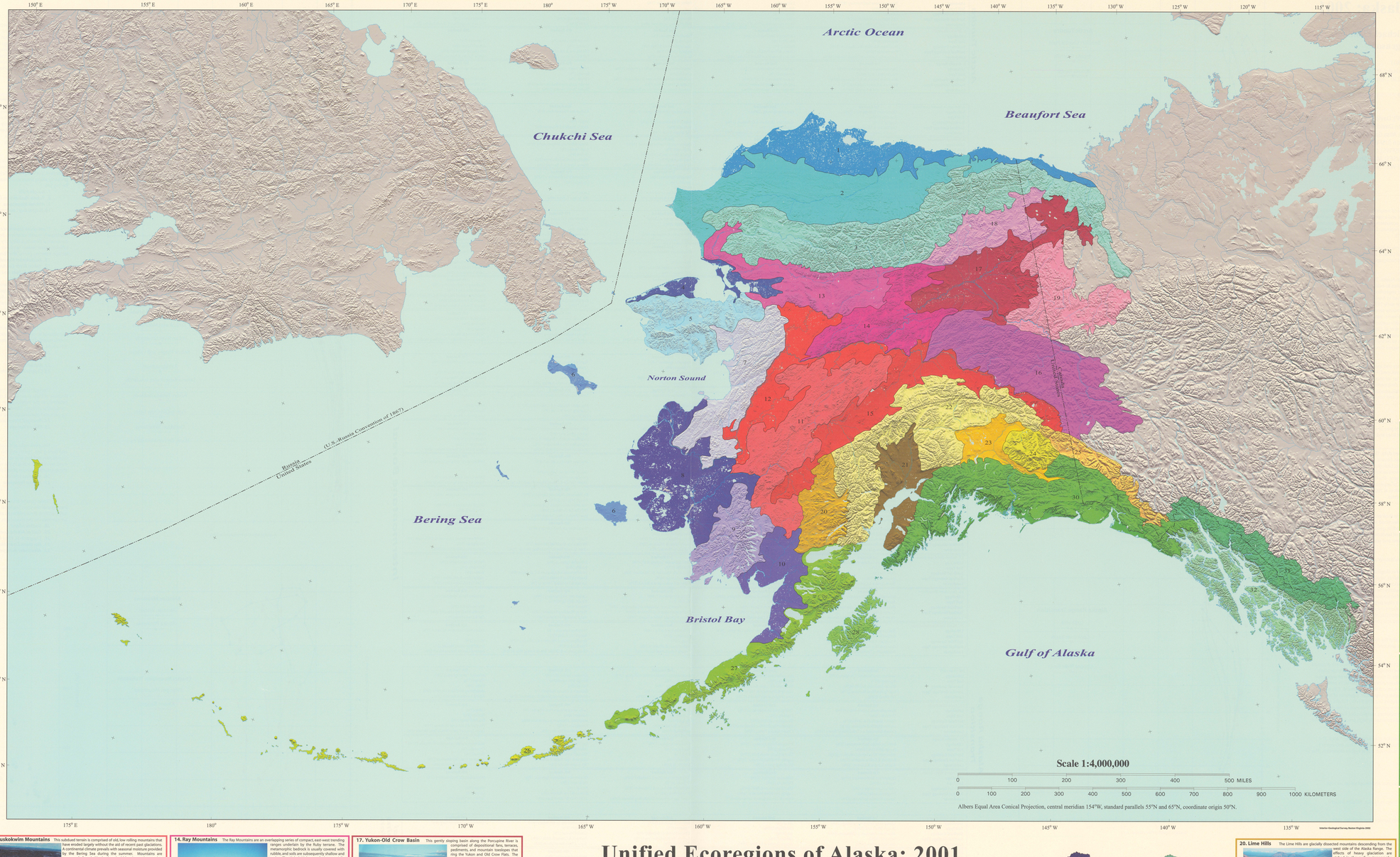

Scale 1:4,000,000

0 100 200 300 400 500 MILES

0 100 200 300 400 500 600 700 800 900 1000 KILOMETERS

Albers Equal Area Conical Projection, central meridian 154°W, standard parallels 55°N and 65°N, coordinate origin 50°N.

Interior-Ecological Survey, Boston Virginia 2002

1. Beaufort Coastal Plain
2. Brooks Foothills
3. Brooks Range
4. Kotzebue Sound Lowlands
5. Seward Peninsula
6. Bering Sea Islands
7. Nulato Hills
8. Yukon-Kuskokwim Delta
9. Ahklun Mountains
10. Bristol Bay Lowlands
11. Kuskokwim Mountains
12. Yukon River Lowlands
13. Kobuk Ridges and Valleys
14. Ray Mountains
15. Tanana-Kuskokwim Lowlands
16. Yukon-Tanana Uplands
17. Yukon-Old Crow Basin
18. Davidson Mountains
19. North Ogilvie Mountains
20. Lime Hills
21. Cook Inlet Basin
22. Alaska Range
23. Copper River Basin
24. Wrangell Mountains
25. Kluane Ranges
26. Aleutian Islands
27. Alaska Peninsula
28. Kodiak Island
29. Gulf of Alaska Coast
30. Chugach-St. Elias Mountains
31. Northern Coast Mountains
32. Alexander Archipelago
International Boundary
Ecoregion Boundary

Polar
Arctic Tundra
Arctic Coastal Plain
Arctic Foothills
Brooks Range
Bering Tundra
Kotzebue Sound Lowlands
Seward Peninsula
Bering Sea Islands
Bering Taiga
Nulato Hills
Yukon-Kuskokwim Delta
Ahklun Mountains
Bristol Bay Lowlands
Aleutian Meadows
Alaska Peninsula
Interior Forested
Intermontane Boreal
Kuskokwim Mountains
Yukon River Lowlands
Yukon-Tanana Uplands
Kobuk Ridges and Valleys
Ray Mountains
Tanana-Kuskokwim Lowlands
Lime Hills
Cook Inlet Basin
Alaska Range
Copper River Basin
Alaska Range-Transition
Wrangell Mountains
Kluane Ranges
Coastal Mountains Transition
Coastal Rainforests
Kodiak Island
Gulf of Alaska Coast
Chugach-St. Elias Mountains
Northern Coast Mountains
Alexander Archipelago
Non-forested
Cold & Dry
Forested
Warm & Wet
Boreal
Dry, Large Seasonal Temperature Flux, & Fire
Maritime
Wet, Restricted Seasonal Temperature Flux, & Wind Disturbance

This figure shows the climatic and environmental relationships between the 32 Ecoregions and the eight Level 1 groups.

20% TOTAL RECOVERED FIBER

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ABR
environmental research & services

The Alaska Natural Heritage Program

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Agriculture and Agri-Food Canada

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Yukon
science for a changing world

USGS
science for a changing world

1. Beaufort Coastal Plain This treeless, wind-swept plain gradually ascends from the Beaufort Sea coast southward to the foothills of the Brooks Range. This flat to undulating coastal plain is underlain by unconsolidated deposits of marine, fluvial, glaciofluvial, and eolian origin and lacks bedrock control. A dry, polar climate dominates throughout the year, with short, cool summers and long, cold winters. Proximity to the Arctic Ocean ensures that temperatures remain cool, frequently fog-ridden, in summer. Annual precipitation is low and falls mostly as snow during the winter. Due to low temperatures, permafrost is continuous across the region, except under large rivers and thaw lakes. Permafrost and frost processes contribute to a large variety of surface features such as pingos, ice-wedge polygons, and oriented thaw lakes. The presence of permafrost prevents surface drainage so soils are typically saturated and have thick organic horizons. Due to the abundance of thaw lakes (covering up to 50% of the surface) and saturated soils, nearly the entire region supports wetland communities. Vegetation is dominated by wet sedge tundra in drained lake basins, swales, and floodplains, and by tussock tundra and sedge-*Dryas* tundra on the uplands. Shrubs (willows, birches, and alders) become progressively more abundant and taller most of the area is poorly integrated, there are numerous large, braided rivers that originate in the Brooks Range and drain northward crossing the coastal plain. Anadromous arctic cisco, broad whitefish, least cisco, and Dolly Varden char overwinter in these larger rivers and migrate to nearshore waters for the summer. Smaller streams often dry up or freeze completely during the winter. The coastal plain supports large caribou herds and is an important calving area. Important herbivores include muskoxen, lemmings, and arctic ground squirrels, while common predators include arctic foxes, gray wolves, and brown bears. Polar bears occasionally den on the coastal plain. The region also is important for breeding birds, including a wide variety of shorebirds, ducks, geese, swans, and passerines.

2. Brooks Foothills Gently rolling hills and broad exposed ridges form the northern flank of the Brooks Range. Narrow alluvial valleys and glacial moraines and outwash are interspersed among long linear ridges, buttes, and mesas comprised of tightly-folded sedimentary rocks. Most of the surface is mantled with colluvial and eolian deposits. A dry polar climate dominates the land, but is somewhat warmer and wetter than the Beaufort Coastal Plain. The surface is underlain by continuous permafrost, except for some frost-related periglacial features, such as solifluction lobes and stone stripes, are common. Because the permafrost impedes drainage, soils in the active layer are usually saturated and have fairly thick organic horizons. The lower foothills tend to be basic, whereas the upper foothills are frequently acidic. Many braided streams and rivers with highly variable seasonal discharge are present, their clear waters teeming with arctic char and arctic grayling. Lakes are infrequent. Some streams freeze solid to their bottoms, causing large aufeis deposits to form. In summer, these ice surfaces provide refuge for caribou from voracious mosquitoes. Vegetation is dominated by vast expanses of mixed shrub-sedge tussock tundra, interspersed with willow thickets along rivers and small tall-shrub communities. Dryas tundra on ridges. Calcareous areas support sedge-dryas tundra. The area is important to caribou, muskox, arctic ground squirrels, peregrine falcons, gray wolves, and brown bears.

3. Brooks Range This east-west trending range represents the northern extension of the Rocky Mountains, and includes the Brooks Range and Arctic and Kobuk mountains. Numerous accreted terranes of Paleozoic and Mesozoic Arctic Alaska underlie most of this range, ending at the Kobuk-Malamute fault system along its southern boundary. The high central portion possesses steep angular summits of sedimentary and metamorphic rock draped with rubble and scree. To the west and east, the topography becomes less rugged, for instance the Richardson Mountains have flat-topped summits flanked by stepped slopes reflecting benches of resistant rock. High-energy streams and rivers cut through narrow ravines with steep gradients, creating a distinctly incised drainage pattern into the terrain. During the Pleistocene, mountain glaciers coalesced to cover the higher portions of the range. Here only a few remnants in the form of small cirque glaciers still exist. Permafrost is contiguous except in some areas on the south side. The Richardson Mountains were ice-free during the last ice age and blocked the continental ice sheet advance from the east. The dry polar climate has short, cool summers and long, cold winters; and air temperatures decrease rapidly with rising elevation. Valleys and lower mountain slopes on the north side of the range are covered by mixed shrub-sedge tussock tundra with willow thickets along rivers and streams. Alpine tundra and barrens dominate at higher elevations along the entire crest of the range. On the south side, lower mountain slopes and valleys possess sedge tussocks and shrubs. The arctic tree line skirts across the range in Canada and is restricted to the south side of the range in Alaska. Here, sparse conifer-birch forests and tall shrublands occur in larger valleys. Dall sheep, gray wolves, brown bears, caribou, muskox, and caribou inhabit the mountains. Arctic grayling are found in groundwater fed springs and streams.

4. Kotzebue Sound Lowlands Native Americans probably took their first footsteps onto the North American continent in this region. This coastal tundra ecoregion, which has also served as a conduit for the migration of many animal and plant species. Shaped by past sea level fluctuations, the land was once connected to Siberia and formed a part of a large unglaciated area called Beringia during glacial periods when water was locked in continental ice sheets and sea levels were low. During warm climatic periods, however, the region has been inundated by marine transgressions. Today, it is a low, rolling landscape underlain by deltas, and low-lying glacial till is limited to a rim of lowlands surrounding the Kotzebue Sound. Much of the area is blanketed by thick loess blown off nearby outwash plains during glacial periods. Because of the moist polar climate and fine-grained sediments, permafrost is continuous with high ice content. Thawing permafrost is widespread, creating a thaw-lake cycle that forms a diverse mosaic of wetlands including marshes, wet meadows, riparian shrublands, and interwining ridges with tussock tundra as lakes form and drain, and ground ice aggregates in the exposed sediments. Scattered forest patches occur along rivers in the eastern portion of the region. Drainages tend to be poorly integrated because of the thaw lakes. During short summers, the Bering Straits are free of pack ice, allowing storms and offshore currents to create extensive barrier islands and beach ridges along the coast. The abundant wetlands are important nesting and staging areas for millions of migratory waterfowl and shorebirds. The region supports all five salmonid species as well as sheefish, arctic grayling, and arctic char. Bears, caribou, snowy owls, arctic foxes, and Alaska hares are common, while ribbon seals are often observed along shorelines.

5. Seward Peninsula This cold, wind-swept landmass jutting out into the Bering Sea represents the southernmost haunt of polar bears on mainland Alaska. Glaciated mountains composed of volcanic rocks intertwine to form a landscape mosaic of coastal lowlands, expansive convex hills with scattered broad valleys, and small, isolated groups of rugged mountains. Vegetation is principally tundra, with alpine *Dryas*-lichen tundra and barrens at high elevations and moist sedge-tussock tundra at lower elevations. Patches of low-growing ericaceous and willow-birch shrubs occur on better-drained areas. Permafrost is continuous, but ranges from thin to moderately thick. Ice-related features such as pingos and patterned ground (raised polygons outlined by rock-filled troughs) are present. The climate is best classified as moist polar. The Chukchi Sea and Bering Strait afford very little climatic moderation since ice spans these waters over much of the year allowing direct passage of bitterly cold air from Siberia. Persistent cold, windy conditions occur in the winter and fog blankets the coastlines in the summer. At its height, Pleistocene glaciation covered only the highest mountains. Back then the peninsula was part of an important ice-free migration corridor between North America and Asia. Strong ecological affinities to Asia remain to this day with the presence of Eurasian birds (gray-headed chickadee, yellow and white wagtails, bluethroat), fishes (Alaska blackfish), and flora. Streams occupy all larger valleys, and many lakes lie in broad inland valleys. Coastal plains have dense concentrations of lakes and ponds that support many species of nesting birds (including spectacled eiders, turnstones, and the rare arctic loon). Bears, caribou, snowy owls, arctic foxes, and Alaska hares are common, ribbon seals and walruses are often observed along shorelines and adjacent ice floes.

6. Bering Sea Islands These rocky volcanic islands are scattered throughout shallow portions of the Bering Sea. Here, a peculiar mix of polar and maritime climates exist, dependent on season. In winter, cold, dry polar air from Siberia. These conditions are replaced by cool, moist maritime conditions after spring ice breakup. Thin to moderately thick permafrost underlies mainly thin, rocky soils. At the height of the Pleistocene glaciation, these islands were mere hills within a vast seabed plain of the Bering Land Bridge. Not surprisingly, life on these islands today possesses affinities to both North America and Asia. Moist tundra communities of sedges, grasses, low shrubs, and forbs are surrounded by rocky cliffs and shorelines. Millions of seabirds (cormorants, kittiwakes, murres, puffins, and auklets) and marine mammals (northern fur seals, Steller sea and sea lions) inhabit these rocky outcrops during the summer. Wintering flocks of rare spectacled eiders congregate in small polynyas (or openings) in the sea ice south of St. Lawrence Island.

7. Nulato Hills These low rolling hills are the remains of an ancient mountain range after extended periods of downcutting, weathering, and erosion. East of Norton Sound, these hills ripple inland in a southwest-northwest orientation with streams flowing in intervening valleys. Due to their modest elevation, most of these hills have been spared from recent glaciations and were part of the ice-free Beringia corridor linking North America and Asia. The climate is continental, but as moist polar. The Bering Sea affords some climatic moderation; however, at this latitude, ice spans the sea early every winter, allowing direct passage of bitterly cold Siberian air. Permafrost is continuous but ranges from thin to moderately thick. Ecological affinities to Asia exist to this day with the presence of Eurasian birds (gray-headed chickadee, yellow and white wagtails, bluethroat), fishes (Alaska blackfish), and flora. Vegetation patterns generally follow the terrain, with *Dryas*-lichen and sedge-ericaceous shrub tundra on hilltops, grading into short, then tall, willow-birch-alder shrublands and eventually spruce and birch woodlands at progressively lower elevations. Moose, brown bears, caribou, Dall sheep, gray wolves, arctic foxes, snowshoe hares and wolverines comb the coastline, and huge summer runs of pink salmon ascend the Unalakleet drainage.

8. Yukon-Kuskokwim Delta The Yukon and Kuskokwim Rivers nourish this vast, marshy delta as they fan out to meet the Bering Sea. The delta was formed from a combination of alluvial deposition from the two large rivers and from stabilization of sea levels after an initial rapid rise during deglaciation. The unconsolidated sediments are comprised principally of marine tidal muds, beach deposits, and alluvium. Isolated basalt hills and volcanic cinder cones jut up in places. The climate is moist polar ameliorated somewhat by the Bering Sea. At this latitude, sea ice spans the Bering Sea every winter allowing direct passage of cold Siberian fronts. Permafrost is discontinuous, moderately thick to thin, and ice-related features are common. Poor drainage caused by the permafrost contributes to shallow organic soils. Thermokarst lakes are abundant across the delta. Many low-gradient streams meander dynamically across the surface. Coastal vegetation is dominated by highly productive brackish marshes and wet meadows. Inland, permafrost-dominated landscapes support low birch-ericaceous shrubs and sedge-tussock and sedge-moss bogs. Willow thickets occur along rivers and on better-drained slopes. The diverse and abundant wetlands support exceptional populations of waterfowl (including brant, emperor geese, and tundra swans), sandhill cranes, and shorebirds (Sabines' gulls, black turnstones, western sandpipers). Whales, walruses, and bearded and ribbon seals patrol its shore while black bear, moose, and gray wolves roam the land. Arctic char, shefish, and all five species of North American Pacific salmon are common fishes in rivers, streams, and surrounding sea.

9. Ahklun Mountains This coastal group of rugged steep-walled mountains spans two extensive wetland complexes (Yukon-Kuskokwim Delta and Bristol Bay Lowlands) along the southern Bering Sea. Here strongly deformed sedimentary and volcanic rocks are cut by great northeast-trending faults, including portions of the Denali fault. During the Pleistocene, mountain glaciers coalesced and flowed into the surrounding lowlands, but south side of the mountains, these valleys subsequently filled with water forming large "fingers" lakes. These lakes now resident rainbow trout and nurture abundant runs of sockeye (red) salmon during the summer. Mountain soils have formed in very stony and gravelly colluvium over bedrock, whereas valley soils have formed in glacial till. Dwarf shrub-lichen tundra dominates mountain crests and upper slopes where permafrost is discontinuous. Shrubs (willows, birches, and alders) become progressively more abundant and taller at lower elevations as permafrost becomes more frequent. In valleys, shrublands are punctuated by sedge-tussock tundra habitats (on very wet areas) and mixed forests. Moose, beavers, and arctic hares are common. Bears, caribou, and wolves frequent the mountains. Waterfowl and shorebirds nest on the beaches while seabirds patrol the skies. The climate is moist polar with some moderation by the Bering Sea. At this latitude, ice normally spans the Bering Sea in winter, allowing access for cold Siberian air.

10. Bristol Bay Lowlands This flat to gently rolling lowland is mainly comprised of glacial till and outwash deposited by various Pleistocene glaciations of the Alaska Peninsula, Aleutian Range, and the Alaskan Range. This basin is underlain with mixes of glacial, alluvial, and marine sediments all coated variegated in varying amounts of loess. Regardless of substrate, these lowlands contain large concentrations of lakes, ponds, meandering rivers, and wetlands that serve as important staging and migratory areas for an abundance of waterfowl. This habitat supports the largest runs of sockeye salmon in the world, which, in turn, sustains large populations of brown bears. Permafrost is discontinuous and occurs in scattered isolated masses. Wet organic soils support low and dwarf shrub communities of willow, birch, and alder. Mosses and lichens are abundant ground covers. The climate is maritime polar with substantial moderation by the Bering Sea and the north Pacific Ocean. At this latitude, ice occasionally spans the Bering Sea in winter admitting cold Siberian air.

11. Kuskokwim Mountains This subdued terrain is comprised of old, low rolling mountains that have eroded largely without the aid of recent past glaciations. A continental climate prevails with seasonal moisture provided by the Bering Sea during the summer. Mountains are composed of eroded bedrock and rubble, whereas intervening valleys and lowlands are composed of undifferentiated sediments. Thin to moderately thick permafrost underlies most of the area. Boreal forests dominate grading from white spruce, white birch, and trembling aspen on uplands to black spruce and tamarack in lowlands. Tall willow, birch, and alder shrublands occur on recent burns and avalanche chutes and where forest fires burned in the recent past. Rivers meander through this undulating landscape following fault lines and highly eroded bedrock seams. These mountains support abundant moose, bears, beavers, and scattered caribou herds.

12. Yukon River Lowlands An expansive wetland system is associated with the lower stretches of the Yukon and Koyukuk Rivers in western Alaska. Although this area was unglaciated, meltwater flushes deposited vast quantities of sediment within these riverine corridors during the Pleistocene. Today, these unconsolidated deposits of fluvial origin underlie these floodplains and adjacent lowlands. A seasonally moist continental climate prevails with cool, moist summers and cold, dry winters. Permafrost is absent along the younger floodplains, but is thin, discontinuous, and relatively "warm" on the abandoned floodplains in the adjacent lowlands. Poor drainage caused by permafrost contributes to the prevalence of wet, organic-rich soils. Collapse-scar lakes are common features there thawing permafrost has occurred. Water levels drop in the Yukon River and its tributaries in early fall during freezeup and remain low until spring breakup when the region is inundated by snowmelt runoff. This extensive wetland complex provides critical habitat and supports migratory stands of white spruce and balsam poplar. Active floodplains support tall stands of alders and willows. Robust wet sedge meadows and aquatic vegetation reside in oxbow lakes and sloughs. Better-drained floodplain terraces support dense, tall willow-dominated lowlands support black spruce woodlands, birch-ericaceous shrublands, and sedge-tussock bogs. Many flat organic surfaces are pockmarked with dense concentrations of lakes and ponds. These areas support large populations of moose and black bear, the oxbow sloughs and thaw ponds support abundant waterfowl, and the lowland forests are important to furbearers. The large rivers support important runs of chinook, chum, and coho salmon. This unit is distinguished from the Tanana-Kuskokwim Lowlands by having lower elevations, a slightly wetter climate, and more robust vegetation.

13. Kobuk Ridges and Valleys A series of parallelling ridges and valleys radiate southward from the Brooks Range. This diagnostic feature is created by a series of northeast-trending faults and intercoding troughs. This area was overridden by the Laurentide ice sheet during the last ice age, but numerous cirques and moraines originate in the Brooks Range. The broad valleys are lined with alluvial and glacial sediments whereas the intervening ridges are covered with rubble. This is mirrored by discontinuous permafrost underlies most of the area. A dry continental climate prevails with long cold winters and short cool summers. Frigid conditions are reinforced during the winter as the valleys serve as cold-air drainages for the Brooks Range. Forests and woodlands dominate much of the valley bottoms and lower mountain slopes with white spruce in western portions of the unit and black spruce, white birch, and trembling aspen on well-drained uplands. Tall and dwarf shrublands of willows, birch, and alder communities occur on ridges. Trees become increasingly sparse, less robust, and restricted to lower elevations in the west where forests are slowly invading along rivers and streams (e.g., lower Noatak River).

14. Ray Mountains The Ray Mountains are an overlapping series of compact, east-west trending ranges underlain by the Ruby terrane. The metamorphic bedrock is usually covered with rubble, and soils are subsequently shallow and rocky. The Kobuk-Malamute fault essentially separates the Ray Mountains from the Brooks Range to the north. The area was largely unglaciated during Pleistocene ice ages, except for alpine glaciers that capped the highest peaks. Permafrost is generally discontinuous, but ranges from thin to moderate thickness. The climate is strongly continental with dry, cold winters and somewhat moist, warm summers. The vegetation is dominated by black spruce woodlands, while white spruce, birch, and aspen usually are restricted to warmer, more mesic habitats. Floodplains are dominated by white spruce, balsam poplar, alders, and willows. Shrub birch and *Dryas*-lichen tundra prevail at higher elevations. Forest fires occasionally occur in this region. Caribou, moose, snowshoe hares, ptarmigan, and grouse are important habitat for arctic grayling and of minor importance to king, chum, and coho salmon. Moose, brown bears, gray wolves, red fox, lynx, and martem are common.

15. Tanana-Kuskokwim Lowlands This alluvial plain slopes gently northward from the Alaska Range. The undifferentiated sediments of fluvial and glaciofluvial origin are capped by varying thicknesses of eolian silts and organic soils. Thin to moderately thick permafrost occurs in some areas. A dry continental climate prevails with cool summers and cold winters. Even though a rain shadow exists due to the neighboring Alaska Range, wet organic soils are abundant due to the gentle floodplains, patches of impermeable permafrost, and poor drainage. Permafrost is discontinuous and thin, and temperatures are near the melting point. Collapse-scar bogs and fens are found on most of the area, but occasionally is thawing permafrost are frequent and related thermokarst lakes and drained lake basins are common. Lowland forests and woodlands are common in gravel deposits. Boreal forests dominate the landscape with black spruce in bogs, white spruce and balsam poplar along floodplains, and trembling aspen on south-facing slopes. The floodplains support tall willow and alder communities on wetter drainageways. Tall willow, birch, and alder communities also occur. Fire rates are frequent. A strong continental climate prevails with long, cold winters and short, cool summers. These mountains are home to moose, bears, wintering caribou, and various furbearers.

16. Yukon-Tanana Uplands These broad, rounded mountains of moderate height are underlain by the metasedimentary Yukon-Tanana terrane. This terrane is a composite of transported rock blocks that includes former volcanic island arcs and continental shelf deposits. Most surfaces are comprised of bedrock and coarse rubble on ridges, colluvium on mountainsides, and silty alluvium in valley bottoms. The region is underlain by discontinuous permafrost on north-facing slopes and valley bottoms. In valley bottoms, permafrost is thin, ice-rich, and relatively "warm." Vegetation is dominated by white spruce, birch and aspen on south-facing slopes, black spruce on north-facing slopes, and black spruce woodlands and tussock and scrub bogs in valley bottoms. Floodplains of headwater streams support white spruce, balsam poplar, alder, and willows. Above treeline, low birch-ericaceous shrubs and *Dryas*-lichen tundra dominate. This area has the highest incidence of lightning strikes in Alaska. Fires are frequent on south-facing slopes and valley bottoms. Caribou, moose, snowshoe hares, ptarmigan, and grouse are important habitat for furbearers. Caribou, moose, snowshoe hares, ptarmigan, marten, lynx, and beaver inhabit this area from October to May and cool, short summers. Brown bears, wolverine, Dall sheep, caribou, lemmings, and phaes are common inhabitants of these mountains.

17. Yukon-Old Crow Basin This gently sloping basin along the Porcupine River is composed of unconsolidated fine-grained, permafrost-dominated sediments of fluvial origin. Rising the Yukon and Old Crow Flats. The surfaces surrounding the flats are largely unglaciated, and products of millions of years of weathering of the surrounding mountains. Here, deep deposits of colluvial, alluvial, and eolian origin are underlain by continuous masses of permafrost. The marshy flats have developed in deep alluvial and lacustrine deposits. Permafrost is somewhat moist, warm summers. The poorly drained flats and terraces harbor vast wetlands pockmarked with dense concentrations of thaw lakes and ponds. On the flats, water levels of lakes are often maintained by spring flooding rather than precipitation. Active fluvial processes are etched throughout the topography featuring deltas, terraces, and floodplains. Opaque with glacial silt and mammoth mud, the Yukon River forms an aquatic maze of islands, sandbars, meander sloughs, and oxbow lakes as it crisscrosses the lower flats. The rich aquatic habitats support tremendous populations of nesting waterfowl (in the millions!) and other migratory birds and an abundance of moose, bears, furbearers, northern pike, and salmon. A dry continental climate prevails with cool summers and cold, seasonal temperature. Arctic highpressure systems prevail during the winter bringing clear and frigid weather. In contrast, summers are wet as frequent storms and cool air drainage from wet areas produce frequent fogs and grass marshes and low shrub swamps to open black spruce forests to closed spruce-aspen-birch forests on better-drained uplands. Summer forest fires are common.

18. Davidson Mountains Along the south flank of the eastern Brooks Range lie rugged mountains dissected by broad floodplains of the Yukon River. These mountains are shaped by course rubble, whereas river valleys and floodplains are lined with unconsolidated glacial and alluvial sediments. Continuous permafrost from thin, ice-rich to thick, ice-poor, but most of the area, but occasionally is thawing permafrost are frequent and related thermokarst lakes and drained lake basins are common in lowland forests and on steep south facing slopes. Boreal forests cover much of the terrain with black spruce in bogs; white spruce and balsam poplar along floodplains; and trembling aspen on uplands. Tall willow, birch, and alder communities also occur. Fires are frequent on south-facing slopes. The mountains support numerous moose, black bears, porcupines, trumpeter swans, and numerous other waterfowl.

19. North Ogilvie Mountains This terrain consists of flat-topped hills and eroded mountains of the Tintina Trench. This area represents the western extent of the North America stable platform onto which Paleozoic sediments of the Mackenzie and Arctic Ocean basin attached. Sedimentary rocks, especially limestone, underlie most of the area. Rolling hills and upper slopes are often blanketed with angular, frost-shattered rock outcrops (resembling tombstones) known locally as "rock glaciers," which are characteristic of an unglaciated area that has undergone long periods of erosion. Shallow soils have developed in rocky colluvium on mountainsides where landslides, debris flows, and soil creep frequently occur. On lower slopes, soils are deeper, more moist, and underlain by extensive permafrost. Low shrub tundra of willow, alder, and birch and aspen and spruce woodlands occur at lower elevations. These mountains are the source of many streams that eventually feed the Porcupine, Yukon, and Peel Rivers. Lakes are relatively rare. A strong continental climate prevails, with prolonged frigid winters lasting from October to May and cool, short summers. Brown bears, wolverine, Dall sheep, caribou, lemmings, and phaes are common inhabitants of these mountains.

20. Lime Hills The Lime Hills are glacially dissected mountains descending from the west side of the Alaska Range. The effects of heavy glaciation are etched in the surface topography through a repeated sequence of sharp mountain ridges with deep headwalls and broad U-shaped valleys. Many of the ridges in these mountains are capped with colluvial rubble, while the valleys contain glacial moraines and outwash with some alluvial deposits along rivers. The continental climate is moderated somewhat by maritime influences of the Bering Sea and north Pacific Ocean. The area is underlain by isolated masses of permafrost. Vegetation is predominantly alpine tundra and barrens of lichens, prostrate willows, and ericaceous shrubs. Taller shrub communities occur at mid elevations. White spruce is found on lower slopes and valleys along the eastern boundary. Alpine and subalpine habitats support an abundance of Dall sheep, mountain goats, brown bears, caribou, moose, gray wolves, and wolverines.

21. Cook Inlet Basin This gently-sloping lowland was buried by ice and flooded by proglacial lakes several times during the Pleistocene epoch. Consequently, the basin floor is comprised of fine-textured lacustrine deposits ringed by coarse glacial outwash. The cool maritime climate supports lakes, ponds, and wetlands that attract large numbers of waterfowl (including trumpeter swans) and shorebirds. Dolly Varden and rainbow trout occur in fresh waters. Several river systems support recovering salmon runs and resultant bear and raven populations. Historically, the region supported large salmon runs, but overfishing and habitat degradation have reduced runs to remnant populations. Extensive wetlands are dominated by sedge-grass marshes and coastal meadows. Boreal forests of white and Sitka spruce, aspen, and birch grow on better-drained soils. Alaska blackfish occur in tidal streams and sloughs. Beluga whales, orcas, seals, and sea otters patrol these waters. At the head of Cook Inlet, tidal bores of 30 feet are common. Extensive tidal flats are dominated by eelgrass beds and salt-tolerant communities of sedges, grasses, and low shrubs grow which, in turn, support Dall sheep, mountain goats, brown bears, caribou, wolverines, and gray wolves.

22. Alaska Range A series of accreted terranes conveyed from the Pacific Ocean fused to form this arcing mountain range. In turn, these towering mountains harbor a complex mix of folded, faulted, and deformed sedimentary rocks. Landslides and avalanches frequently scour these steep, sculpted slopes. Discontinuous permafrost underlies shallow and rocky soils. Because of the Alaska Range's height, a cold continental climate prevails and much of the area is a true alpine environment. Extensive glaciers and ice fields blanket the mountains with rolling till lowlands occur where continental and piedmont glaciers overrode the land. High, steep-sided, angular mountains (i.e., former nunataks), some still sporting alpine glaciers, occur above the reach of these overriding glaciers. Numerous braided streams drain the ice sheets, together with tectonic movements, have both raised and lowered marine terraces, giving rise to rich coastal terrace complexes. A cold continental climate dominates with minor seasonal temperature variation and extended periods of overcast clouds, fog, and precipitation. Snow, though heavy in the mountains, is relatively light in the lowlands. Lush, herb-dominated communities of sedges, grasses, and forbs mantle the coastal lowlands. Alpine tundra exists at higher elevations. The climate is a cool, wet maritime with minimal seasonal temperature variation and extended periods of overcast clouds, fog, and precipitation. A seemingly endless stream of moisture blows in during the fall from repeated lows sweeping eastward along the Aleutians. These islands are entirely free of permafrost. Offshore waters are rich with deepwater fish, such as halibut and cod, and marine mammals, including sea otters, Steller's sea lions, and a variety of whales. Small, swift rivers and streams radiating from the highlands harbor abundant salmon runs. These runs funnel tremendous amounts of nutrients to these islands and help support populations of the largest land carnivore in the world, the Kodiak brown bear. Puffins and auklets nest on the islands' rocky shoreline cliffs.

23. Copper River Basin This mountain basin lies within the former bed of Glacial Lake Ahtna on fine-textured lacustrine deposits reaped by coarse glacial till. The basin is a large wetland complex underlain by thick, discontinuous permafrost and pockmarked with thaw lakes and ponds. A mix of low shrubs and black spruce forests and woodlands grows on the wet organic soils. In addition, large glacial rivers with wide, gravelly, braided floodplains dissect the basin and support large cottonwood, willow, and alder stands and expansive barren areas. Spring floods are common along drainages. Arctic grayling, burbot, and anadromous sockeye salmon are common fishes. Black and brown bears, caribou, wolverines, and ruffed grouse are present throughout these wetland habitats. The climate is strongly continental with steep seasonal temperature variation. The basin acts as a cold-air sink, and winter temperatures can be bitterly cold.

24. Wrangell Mountains This volcanic cluster of towering, ice-clad mountains is at the northwest edge of the St. Elias Mountains. This exceedingly steep, rugged terrain is the result of the ongoing collision of the Pacific and North American tectonic plates. Here, relatively recent volcanic flows and debris form a discontinuous permafrost zone. The Wrangell Mountain possess a peculiar mix of climates because of their size and geographic location (i.e., on the interior side of coastal mountains). The sheer height of the Wrangell Mountains allows interception of moisture-laden air emanating from the north Pacific Ocean. The abundant maritime snows feed extensive icefields and glaciers interspersed by sharp mountain ridges with peaks called nunataks poke up through a repeated sequence of dull gray ridges draped with rock shard slopes and patches of glaciers. Toward the interior grades to dry continental at lower elevations where the Wrangell Mountains abut the cold-air basins of the Copper River. Shrublands of willow and alder with scattered spruce woodlands ring the lower slopes. Open and cottonwood grove along larger drainages. The Wrangell Mountains are highly dynamic due to active volcanism, avalanches, landslides, glaciers, and stream erosion. Soils are thin and stony and underlain by discontinuous permafrost. Its best-known denizen, the Dall sheep, roams throughout the area along with mountain goats, brown bears, caribou, wolverines, and gray wolves.

25. Kluane Ranges The Kluane Ranges encompass the drier interior portion of the St. Elias Mountains spanning from the ablation zone (area where glacial ice melts faster than it accumulates) eastward to a fault line scars along the Shakwak Valley. It is generally ice-free except for occasional glaciers extending from the St. Elias icefields. The area has a dry continental climate. It lies within a partial rain shadow of the St. Elias Mountains whereby moisture from the Pacific Ocean is effectively wrung from the atmosphere as weather systems pass over the coastal mountains. Deformed sedimentary and volcanic rocks of the Wrangellia and Alexander terranes underlie this area. The high-relief topography has been exposed to mass wasting, stream erosion, and glacial scouring. Thin and rocky soils have developed in the colluvial veneer that covers most surfaces. Swift streams cascade down steep mountainsides where scree movement, rock falls, landslides, and soil creep occur. Permafrost is discontinuous with the presence of frost action features such as solifluction lobes, ice-wedge networks, and patterned ground. Vegetation is principally alpine tundra and barrens of lichens, prostrate willows, and ericaceous shrubs. Taller shrub communities occur at mid elevations. White spruce is found on lower slopes and valleys along the eastern boundary. Alpine and subalpine habitats support an abundance of Dall sheep, mountain goats, brown bears, caribou, moose, gray wolves, and wolverines.

26. Aleutian Islands These fog-shrouded islands represent volcanic summits of a submarine ridge extending from the Alaska Peninsula to the Kamchatka Peninsula. The Aleutian Island arc and deep sea trench are products of the Pacific plate subducting, or descending, beneath the North American plate. Many of the islands support active or recently active areas in the world. The topography features glaciated and rubble-strewn volcanic cones indented with fjords and bordered by sea cliffs or wave-beaten platforms. These islands are covered by volcanic-ash soils, and dissected radially by short, swift streams. A cool maritime climate with abundant year-round precipitation prevails over these permafrost-free islands. Terrestrial warming is subdued by incessant cold ocean winds and perpetual overcast clouds and fog which limits solar insolation. The flora is a blend of species from two continents, grading from Asian to North American affinities from west to east. Mountain flanks and coastlines are covered with a mosaic of alpine tundra, shrublands, and grasslands with ericaceous heath, *Dryas*-lichen, and grass communities. Alpine tundra and glaciers are on mountains. This island chain demarcates the southern boundary of the Bering Sea and is important for marine mammals (northern fur seals, Steller sea lions, and sea otters), waterfowl (Aleutian Canada geese, emperor geese), and seabirds (various species of auklet, red-legged kittiwakes). With their vast numbers, seabirds are important nutrients suppliers by splattering these islands with guano.

27. Alaska Peninsula The Aleutian Range serves as the spine of this peninsula, which divides Bristol Bay from the north Pacific Ocean. The Alaska Peninsula narrows progressively toward the southwest as the range becomes increasingly submerged. The folded and faulted sandstone bedrock is dotted with symmetrical cinder cones clad with ice, pumice, and volcanic ash. Earthquakes are common and some of the most active volcanoes on the continent are found here. Pleistocene glaciers produced strongly contrasting topographies along this peninsula with smooth glacial moraines and colluvial shields on the north side and rugged deeply cut floodlands on the south side. In turn, meltwater streams flowing northward have low-energy, shallow channels, whereas those flowing southward have high-energy, deeply incised channels. Along the north side, huge lakes have filled behind young glacial moraines that act as dams. The peninsula is free of permafrost. Offshore sea ice occasionally forms in Bristol Bay, demarcating the northern extent of sea otters. The coastline habitat supports numerous shorebirds and sea mammals. Many Steller sea lion rookeries and haul-outs are present. Large populations of brown bears survive on abundant pink, chum, and silver salmon runs. A cool, maritime climate prevails with moderate seasonal temperatures, abundant precipitation, frequent fog, and overcast skies. Vegetation is predominantly alpine tundra and grasslands with willow birch, and interspersed with ericaceous-heath and *Dryas*-lichen communities. Alpine tundra and glaciers are on mountaintops.

28. Kodiak Island This rugged, fjord-carved island complex is a geologic extension of the Chugach Mountains with a similar suite of folded and faulted sedimentary rocks of Pacific origin. During past glaciations, a solid ice sheet spanned the Shelikof Strait connecting the island group with the mainland. Ice engulfed most of the islands except for the highest mountains (nunataks) and some seaward coastal plains that provided refugia for plant and animal life. Today, high sharp peaks with cirque glaciers and low rounded ridges overlap glacially scoured valleys covered with till or lacustrine deposits. Large terminal moraines lie offshore where many former glaciers extended onto the continental shelf. The flora of this island group is still recovering from the last glaciation. For instance, trees did not survive the last Pleistocene glaciation, and only recently have they expanded their range grades to dry continental at lower elevations where the Wrangell Mountains abut the cold-air basins of the Copper River. Shr