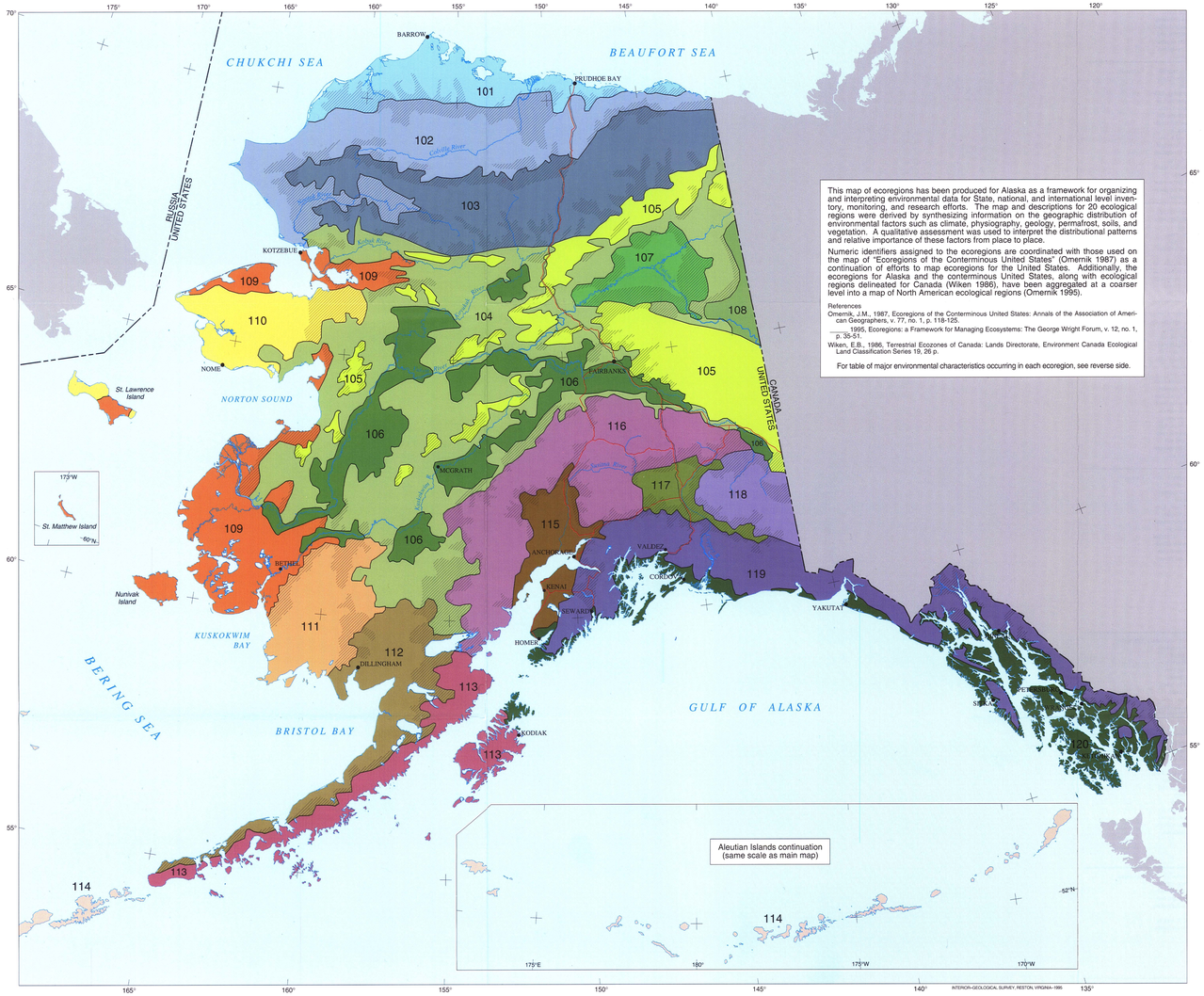
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

ECOREGIONS OF ALASKA

By Alisa L. Gallant[1], Emily F. Binnian[2], James M. Omernik[3], and Mark B. Shasby[4]

1995

Professional Paper 1567
Plate 1

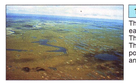


This map of ecoregions has been produced for Alaska as a framework for organizing and interpreting environmental data for State, national, and international level inventory, monitoring, and research efforts. The map and descriptions for 20 ecological regions were derived by synthesizing information on the geographic distribution of environmental factors such as climate, physiography, geology, permafrost, soils, and vegetation. A qualitative assessment was used to interpret the distributional patterns and relative importance of these factors from place to place.

Numeric identifiers assigned to the ecoregions are coordinated with those used on the map of "Ecoregions of the Conterminous United States" (Omernik 1987) as a continuation of efforts to map ecoregions for the United States. Additionally, the ecoregions for Alaska and the conterminous United States, along with ecological regions delineated for Canada (Wiken 1986), have been aggregated at a coarser level into a map of North American ecological regions (Omernik 1995).

References
Omernik, J.M., 1987, Ecoregions of the Conterminous United States: Annals of the Association of American Geographers, v. 77, no. 1, p. 118-125.
_____ 1995, Ecoregions: a Framework for Managing Ecosystems: The George Wright Forum, v. 12, no. 1, p. 35-51.
Wiken, E.B., 1986, Terrestrial Ecozones of Canada: Lands Directorate, Environment Canada Ecological Land Classification Series 19, 26 p.

For table of major environmental characteristics occurring in each ecoregion, see reverse side.



101 Arctic Coastal Plain — *50,000 sq km*

The northernmost ecoregion is bounded on the north and the west by the Arctic Ocean and stretches eastward nearly to the international boundary between Alaska and the Yukon Territory, Canada. The poorly drained, treeless coastal plain rises very gradually from sea level to the adjacent foothills. The region has an arctic climate, and the entire area is underlain by thick permafrost. Because of poor soil drainage, wet graminoid herbaceous communities are the predominant vegetation cover, and numerous thaw lakes dot the region.

102 Arctic Foothills — *124,000 sq km*

This ecoregion consists of a wide swath of rolling hills and plateaus that grades from the coastal plain on the north to the Brooks Range on the south. The east-west extent of the ecoregion stretches from the international boundary between Alaska and the Yukon Territory, Canada, to the Chukchi Sea. The hills and valleys of the region have better defined drainage patterns than those found in the coastal plain to the north and have fewer lakes. The area is underlain by thick permafrost and many ice-related surface features are present. The region is predominantly treeless and is vegetated primarily by mesic graminoid herbaceous communities.

103 Brooks Range — *134,000 sq km*

This ecoregion consists of several groups of rugged, deeply dissected mountains carved from uplifted sedimentary rock. The region traverses much of the east-west extent of northern Alaska, from the Canadian border to within 100 km of the Chukchi Sea. Elevation of mountain peaks ranges from 800 m in the relatively low Baird Mountains in the west to 2,400 m in the central and eastern Brooks Range. Pleistocene glaciation was extensive, and small glaciers persist at elevations above 1,800 m. An arctic climatic regime and unstable hillslopes maintain a sparse cover of dwarf scrub vegetation throughout the mountains, though some valleys provide more mesic sites for graminoid herbaceous communities.

104 Interior Forested Lowlands and Uplands — *269,000 sq km*

This ecoregion represents a patchwork of ecological characteristics. Regionwide unifying features include a lack of Pleistocene glaciation, a continental climate, a mantling of undifferentiated alluvium and slope deposits, a predominance of forests dominated by spruce and hardwood species, and a very high frequency of lightning fires. On this backdrop of characteristics is superimposed a finer grained complex of vegetation communities resulting from the interplay of permafrost, surface water, fire, local elevational relief, and hillslope aspect.

105 Interior Highlands — *115,000 sq km*

This discontinuous ecoregion is composed of rounded, low mountains, often surmounted by rugged peaks. The highlands primarily sustain dwarf scrub vegetation and open spruce stands, though graminoid herbaceous communities occur in poorly drained areas. Mountains in most parts of this region rise to at least 1,200 m, and many rise higher than 1,500 m. Most of the higher peaks were glaciated during the Pleistocene epoch.

106 Interior Bottomlands — *103,000 sq km*

This ecoregion is composed of flat to nearly flat bottomlands along larger rivers of interior Alaska. The bottomlands are dotted with thaw and oxbow lakes. Soils are poorly drained and shallow, often over permafrost. Predominant vegetation communities include forests dominated by spruce and hardwood species, tall scrub thickets, and wetlands.

107 Yukon Flats — *33,000 sq km*

This ecoregion is a relatively flat, marshy basin floor in east central Alaska that is patterned with braided and meandering streams, numerous thaw and oxbow lakes, and meander scars. Surrounding the basin floor is a variable band of more undulating topography with fewer water bodies. In many respects, the ecoregion is similar to the Interior Bottomlands Ecoregion, but differs in climatic characteristics. Temperatures tend to be more extreme; summers are warmer and winters are colder than in other areas of comparable latitude. The ecoregion also receives less annual precipitation than the Interior Bottomlands. Forests dominated by spruce and hardwood species, tall scrub communities, and wet graminoid herbaceous communities are the predominant vegetation types.

108 Ogilvie Mountains — *11,000 sq km*

This ecoregion, along the eastern edge of Alaska, consists of flat-topped hills eroded from a former plain and broad sediment slopes built up from mountains that are much subdued from their former stature. Karst topography is common. Mesic graminoid herbaceous communities and tall scrub communities are widespread throughout the region. Forest communities occupy lower hillslopes and valleys.

109 Subarctic Coastal Plains — *91,000 sq km*

This ecoregion mainly includes coastal plains of the Kotzebue Sound area and the Yukon and Kuskokwim River delta area. Flat, lake-dotted coastal plains and river deltas are characteristic of the region. Streams have very wide and serpentine meanders. Soils are wet and the permafrost table is shallow, providing conditions for wet graminoid herbaceous communities, the predominant vegetation type. The region is affected by both marine and continental climatic influences.

110 Seward Peninsula — *47,000 sq km*

Some of the oldest geologic formations in Alaska provide a backdrop for this predominantly treeless ecoregion. Mesic graminoid herbaceous and low scrub communities occupy extensive areas. The ecoregion is surrounded on three sides by water, yet this has little ameliorating effect on the climate. Winters tend to be long and harsh and summers short and cool.

111 Ahklun and Kilbuck Mountains — *51,000 sq km*

Located in southwestern Alaska off Bristol and Kuskokwim Bays, this ecoregion is composed of steep, sharp, often ringlike groupings of rugged mountains separated by broad, flat valleys and lowlands. The mountains were glaciated during the Pleistocene epoch, but only a few small glaciers persist. Dwarf scrub communities are the predominant vegetation cover in the mountains. Tall scrub and graminoid herbaceous communities are common in valleys and on lower mountain slopes. Valley bottoms may support stands of spruce and hardwood species.

112 Bristol Bay-Nushagak Lowlands — *61,000 sq km*

This lowland ecoregion is located in southwestern Alaska off Bristol Bay. The region has rolling terrain, formed from morainal deposits. Soils of the lowlands are somewhat better drained than soils of the Subarctic Coastal Plains Ecoregion. Dwarf scrub communities are widespread, but large areas of wetland communities occur. Lakes are scattered throughout the lowlands, but are not nearly as numerous as in the Subarctic Coastal Plains.

113 Alaska Peninsula Mountains — *48,000 sq km*

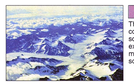
This ecoregion is composed of rounded, folded and faulted sedimentary ridges intermittently surmounted by volcanoes. The mountains were heavily glaciated during the Pleistocene epoch. A marine climate prevails, and the region is generally free of permafrost. Many soils formed in deposits of volcanic ash and cinder over glacial deposits and are highly erodible. Vegetation cover commonly consists of dwarf scrub communities at higher elevations and on sites exposed to wind, and low scrub communities at lower elevations and in more protected sites.

114 Aleutian Islands — *12,000 sq km*

This ecoregion in southwestern Alaska is composed of a chain of sedimentary islands (eroded from older volcanic formations) that are crowned by steep volcanoes. Maritime climate prevails. The region is south of the winter sea ice pack and is generally free from permafrost. Vegetation cover mainly consists of dwarf scrub communities at higher elevations and on sites exposed to wind, and of graminoid herbaceous communities in more protected sites.

115 Cook Inlet — *28,000 sq km*

Located in the south central part of Alaska adjacent to the Cook Inlet, the ecoregion has one of the mildest climates in the State. The climate, the level to rolling topography, and the coastal proximity have attracted most of the settlement and development in Alaska. The region has a variety of vegetation communities but is dominated by stands of spruce and hardwood species. The area is generally free from permafrost. Unlike many of the other nonmontane ecoregions, the Cook Inlet Ecoregion was intensely glaciated during the Pleistocene epoch.



116 Alaska Range — *117,000 sq km*

The mountains of south central Alaska, the Alaska Range, are very high and steep. This ecoregion is covered by rocky slopes, icefields, and glaciers. Much of the area is barren of vegetation. Dwarf scrub communities are common at higher elevations and on windswept sites where vegetation does exist. The Alaska Range has a continental climatic regime, but because of the extreme height of many of the ridges and peaks, annual precipitation at higher elevations is similar to that measured for some ecoregions having maritime climate.

117 Copper Plateau — *17,000 sq km*

This ecoregion in south central Alaska occupies the site of a large lake that existed during glacial times. The nearly level to rolling plain has many lakes and wetlands. Soils are predominantly silty or clayey, formed from glaciolacustrine sediments. Much of the region has a shallow permafrost table, and soils are poorly drained. Black spruce forests and tall scrub, interspersed with wetlands, are the major types of vegetation communities.

118 Wrangell Mountains — *29,000 sq km*

This ecoregion consists of steep, rugged mountains of volcanic origin that are extensively covered by ice fields and glaciers. Most slopes are barren of vegetation. Dwarf scrub tundra communities, consisting of mats of low shrubs, forbs, grasses, and lichens, predominate where vegetation does occur. The climate has harsh winters and short summers.

119 Pacific Coastal Mountains — *106,000 sq km*

The steep and rugged mountains along the southeastern and south central coast of Alaska receive more precipitation annually than either the Alaska Range or Wrangell Mountains Ecoregions. Glaciated during the Pleistocene epoch, most of the ecoregion is still covered by glaciers and ice fields. Most of the area is barren of vegetation, but where plants do occur, dwarf and low scrub communities dominate.

120 Coastal Western Hemlock-Sitka Spruce Forests — *61,000 sq km*

Located along the southeastern and south central shores of Alaska, the terrain of this ecoregion is a result of intense glaciation during late advances of the Pleistocene epoch. The deep, narrow bays, steep valley walls that expose much bedrock, thin moraine deposits on hills and in valleys, very irregular coastline, high sea cliffs, and deeply dissected glacial moraine deposits covering the lower slopes of valley walls are all evidence of the effects of glaciation. The region has the mildest winter temperatures in Alaska, accompanied by large amounts of precipitation. Forests of western hemlock and Sitka spruce are widespread.

Transitional Areas

Cross-hatched portions along the ecoregion boundaries represent transitional areas sharing characteristics of two or more adjacent ecoregions. Due to the map scale and resolution, as well as to the resolution of the information used to derive the map, not all transition zones can be represented.

AUTHOR AFFILIATIONS
[1]Forest Sciences Department, Colorado State University, Fort Collins, Colorado.
Work performed under USGS Cooperative Agreement #1434-93-A-00760.
[2]Hughes STX Corporation, U.S. Geological Survey, EROS Alaska Field Office, Anchorage, Alaska.
Work performed under USGS Contract #1434-92-C-4004.
[3]Environmental Protection Agency, Environmental Research Laboratory, Corvallis, Oregon.
[4]U.S. Geological Survey, EROS Alaska Field Office, Anchorage, Alaska.

Prepared by USGS in cooperation with Colorado State University and Environmental Protection Agency

SCALE 1:5 000 000

100 0 100 200 300 400 500 KILOMETERS
100 0 100 200 300 MILES

Albers Equal Area Projection
Standard Parallels: 55°N, 65°N

ROADS
TRANS-ALASKA PIPELINE
INTERNATIONAL BOUNDARY

INTERIOR–GEOLOGICAL SURVEY, RESTON, VIRGINIA–1995