

## PART III

## PHYSICAL DESCRIPTION

Physical Regions of Washington

On the basis of surface features, Washington may be divided into eight general regions. Agricultural settlement is influenced by factors of topography, climate, soil, forest vegetation, and water resources distinctive to each of the physiographic regions. Each has become a different type of farming area as settlers have learned to adapt crops and livestock to the conditions, or have improved limitations through drainage or irrigation.

## Coastal Plains

A narrow, sandy plain with shallow bays, tidal flats, stream deltas, and low headlands lies between the coastline and the Coast Range. It extends from the Columbia River mouth almost to Cape Flattery, being widest and lowest in the Grays Harbor and Willapa Bay districts. The climate is mild and damp with a long growing season, but it is too cool, cloudy and wet for most crops. Originally this area was covered with heavy forests but much of it is now covered with woodlands. Lumbering and manufacture of wood products is the main industry. Farming is largely livestock and dairying on low uplands and drained areas in the lower Chehalis River Valley. Cranberry growing is important and well-adapted to numerous, boggy areas in the Grays Harbor and Willapa Bay sections. The shallow bays are also used for oyster culture. Fishing is common in the rivers and coastal banks.

## Coast Range

The Coast Range is an uplifted area of sedimentary and metamorphic rocks divided into the Olympic Mountains and the Willapa Hills. The Olympics tower to nearly 8,000 feet in a dome-like structure, carved deeply by rivers. These mountains have the heaviest precipitation in the state. Snowfields and heavy forest cover the mountains. Most of the wilderness area is within the Olympic National Forest and Olympic National Park, being managed for recreation, wildlife and timber. Farm settlement is limited to some foothill river plains and coastal terraces such as the Dungeness and Port Angeles districts along the Strait of Juan de Fuca. Here in the lee of the mountains, rainfall is moderate and irrigation is practiced by some livestock farmers. The Willapa Hill country is wet, heavily forested and carved into numerous narrow valleys. Logging is the main industry, combined with livestock farming in the upper Chehalis River Valley and along the banks of the Columbia River. Wet climate, hilly topography and the difficulty of clearing stump land retards agriculture.

## Willamette-Puget Sound Lowland

A broad lowland, described as a trough or valley, lies between the Coast Range and the Cascade Mountains. The northern part is the Puget Sound Lowland which has been glaciated and is occupied by the sea in the lowest sections. The continental glacier reached slightly south of Olympia. Under a warming climate it melted and geologists believe it receded about 25,000 years ago, leaving an infertile plain of moraines and outwash gravels, sands and clays known today as the Puget Glacial Drift Plain. Its rolling surface has numerous lakes and bogs.

Most of the major cities--Seattle, Tacoma, Everett, Bellingham and Olympia--have been built on moraines bordering the Sound. Rivers such as the Nooksack, Skagit, Snoqualmie, White and Puyallup have built up deltas and flood plains over the older gravelly plains. These narrow valleys are more fertile than the older glacial plains and support numerous small dairy, vegetable and berry farms. Most of the gravelly areas are wooded with a second-growth forest and are used for pastures. In the southern part of the Willamette-Puget Sound Lowland, there are two large valleys--the Cowlitz and Chehalis. They drain a low, hilly area with several flat prairies and bottom lands.

Agriculture is handicapped by poor drainage and flooding of the river deltas and plains, by heavy winter rainfall, by cloudy, but dry summers, by coarse, gravelly upland soils and by densely wooded land which is costly to clear. Advantages are mild climate and a location close to major markets for farm products such as milk, poultry and vegetables.

### Cascade Mountains

The Cascades are a wide and high topographic and climatic barrier which separates western and eastern Washington. The range is made up of sedimentary, igneous and metamorphic rocks which have been carved by glaciers and streams. High isolated volcanic cones of lava such as Mt. Adams (12,307 feet), Mt. Rainier (14,408 feet), and Mt. Baker (10,791 feet), appear upon the older Cascade rocks. The Cascade crest varies between 10,000 and 3,000 feet and is higher and more rugged in northern Washington. Roads and railroads have been built across its lower passes in central and southern Washington. The Columbia River has cut a deep gorge and the lowest pass through the barrier. The western slope is wet and heavily forested with Douglas fir. The eastern slope is drier with a less-dense pine forest. Nearly all classified as forest land, most of the area is in Federal ownership in five national forests and Mount Rainier National Park. Tree fruit farming in the eastern slope valleys of Wenatchee, Chelan, Methow, Naches, and the Columbia Gorge is most important. Sheep and cattle summer grazing on alpine grasslands is another use. Deep western slope valley bottoms such as the Skagit, Snoqualmie, Misqually, Cowlitz and Lewis also contain livestock farms. The area is vitally important as a source of water for irrigation and city drinking water and as a source of timber. Steep terrain, wet climate, short growing seasons and heavy forest vegetation are main handicaps for agriculture.

### Columbia Basin

A low plateau of old lava rocks covered with stream and wind-deposited soils extends in a series of plains, ridges, coulees and hills from the Cascades to the eastern Washington border. The area is basin-like in structure, being higher around its margins and sloping inward to low and level central plains. It has been sharply eroded by the Columbia River and its interior tributaries, the Snake, Yakima, Palouse and Spokane Rivers. The basin has sub-areas created by crustal movements and erosion.

A. The Yakima Folds are a series of hilly ridges extending from the Cascades eastward into the lower part of the basin. The Yakima and Columbia Rivers have cut gaps through the ridges, and built up plains in the troughs between them. The rich, alluvial plain of the Yakima River is an important irrigated valley.

- B. The Waterville Plateau is a tableland of thin soils overlaying basaltic rock at an elevation of 2,500 to 3,000 feet. It has gorges cut by the Columbia River and ancient glacial outwash streams once flowing in Moses and Grand Coulees. It is too high for irrigation and is used for dryland grain and livestock farming. The high plain is often called the Big Bend Country.
- C. The Channelled Scablands is a belt of dry terrain carved by ice-age rivers into a series of coulees. Bare rock is exposed in the coulees. Small plateaus between the old river channels have thin soils used for dryland farming. The Grand Coulee of this region has been developed into a major irrigation reservoir.
- D. The Palouse Hills consist of fertile deposits of wind-blown soil overlaying basaltic lava flows. After being deposited in large dunes, the formation was reshaped by streams into an intricate pattern of low, rounded hills which are tilled for wheat, barley and legumes. The hills receive 16 to 25 inches of rainfall annually and are composed of deep, porous and fertile soils. It is one of the richest farming areas of the Pacific Northwest.
- E. The Central Plains are low and relatively level expanses of soil, deposited by old streams crossing the Channelled Scablands and later by the flooding of the Yakima, Columbia, Snake and Walla Walla Rivers. Climate is desert-like (6-12 inches of precipitation per year). The lower lands of the area, the Quincy and Pasco Basins and the Walla Walla Valley, are irrigated. The Quincy Basin is a new irrigation area watered by Grand Coulee Dam.

Agricultural handicaps in Columbia Basin regions are mainly found in its dry, continental climate. Large irrigation systems built since 1900 have overcome much of the need for water on rich valley and basin soils. Dryland farming in higher areas is practiced widely, although occasional variations in rainfall, lack of snowfall, winterkill, water and wind erosion inflict damage to field crops and to livestock ranges.

#### Okanogan Highlands

A portion of the Rocky Mountains, consisting of well-eroded old granites, lavas and sedimentary rocks extends across north-central Washington. These are the Okanogan Highlands, the state's richest mineral area. Summit levels reach 4,000 to 5,000 feet with peaks exceeding 7,000 feet. Prominent north-south valleys are occupied by irrigated tree fruit and livestock farms. These are the Okanogan, Sampoil, Kettle and Colville Valleys. The Columbia River gorge through the Okanogan Highlands is occupied by the large man-made lake behind Grand Coulee Dam--Roosevelt Lake. Higher and wetter portions are forested with pine and larch and are managed for timber and for livestock ranges by the United States Forest Service and the Bureau of Indian Affairs. Cold winter temperatures, short growing seasons, dry valley climates and distance from markets are farming handicaps.

#### Selkirk Mountains

The Selkirks, a range of the Rocky Mountain system, extend into the northeast corner of Washington. The rocks are old mineralized granites and metamorphics reaching elevations of over 7,000 feet. The Pend Oreille River Valley at the

base of the Selkirks is an agricultural area of narrow bottom lands settled by livestock farmers. Nearly all of the pplands are in Kaniksu National Forest. While climate is cool and growing seasons are short, the Pend Oreille Valley has an advantage of being closely located to the Spokane metropolitan market area.

### Blue Mountains

The Blue Mountains are an uplifted and eroded plateau extending into the southeastern corner of Washington. The strata are mainly ancient crystalline rocks which contain some minerals. The highest point of the mountains in the Washington section is Diamond Peak (6,401 feet), located on the divide between the Grande Ronde, Tucannon and Touchet Rivers. These rivers, and the Walla Walla River, have cut valleys into the plateau. Extensive pine forest and grassland areas are in the highlands within Umatilla National Forest, where rainfall is 30 to 40 inches. The Snake River has cut a deep valley and gorge across the lower parts of the mountains. The area is well developed agriculturally around its northern foothills where wind-blown soils are deep and irrigation systems are used. The Walla Walla and Tucannon Valleys are rich grain, legume and livestock areas of irrigation and dry farming. Grazing is an important use of the highlands by livestock ranchers in the upper valleys.

### Topography of Skagit County

Sharp contrasts characterize the topography of Skagit County. It varies from river plains at sea level on Puget Sound to mountains of over 8,000 feet on the eastern boundary at the summit of the Cascade Range. Skagit County lies within two distinct physiographic regions which extend well beyond its boundaries. The first is the Willamette-Puget Sound Lowland which in western Skagit County consists largely of the Skagit-Samish Lowlands. The second is the Cascade Mountains and its western foothills which extend over the major part of the county.

About one-third of Skagit County is made up of valley bottomlands, low islands and river delta plains. These lowlands, which contain nearly all of the urban places, towns, rural homes and farms, are located in the western part of the county and in deep valleys which have been eroded from the Cascades by the Skagit and Sauk Rivers. The most important single landform feature is the alluvial plain of the Skagit River. It extends from Fidalgo Island and Skagit Bay northeasterly for 35 miles to Concrete. The plain is about 11 miles wide on its Puget Sound shore and gradually narrows to less than a mile at Concrete. It is low and relatively level. The river meanders through the area and floods portions of it periodically. This fertile plain of silty and sandy loams is the result of erosion and deposition by glaciers and water flowing from the high Cascades to the sea.

The lower valley plains of the Skagit and Samish Rivers are flat. Originally, they were marshy and poorly drained. One of the most extensive drainage systems in Washington formed by organized drainage districts made possible the reclaiming of large acreages for agriculture. Brackish sloughs such as Sullivan, Swinomish, Leary, Hall, Deer, Deepwater and Steamboat extend into the delta plains. Tidal flats are still extensive in area. Early pioneers, noticing the contrast of these level areas with nearby mountains, termed the tidal and delta plains as Skagit, La Conner and Samish Flats.





Interior upland and mountain features include benchlands, foothills, creek bottoms, gorges and an extensive alpine area of high ridges and peaks composed of igneous and uplifted sedimentary rocks. Approximately half of the county's area is too mountainous for agriculture and is better suited for forestry, mining, water power reservoirs, wildlife management and outdoor recreation. Most of highland Skagit County is within Mount Baker National Forest under management of the U. S. Department of Agriculture, Forest Service.

Highest elevations in the county are on the eastern boundary along the crest of the Cascade Range. Mount Logan, 9,080 feet, is the highest point. Other peaks include Dome Peak, 8,934 feet and Mount Eldorado, 8,868 feet. These mountains of granite and gneiss rock have perpetual snow and ice fields, perhaps the remnants of a large glacial system which once reached westward down the Skagit Valley to join a large ice sheet filling the Puget Sound Lowland. This alpine area has been dissected by numerous small and large tributaries of the Skagit into V-shaped valleys which carry such swift streams and rivers as Cascade, Suiattle, South Fork of the Nooksack and Baker River.

The topography of eastern Skagit County is highly favorable for the development of hydroelectric power to generate electricity for Puget Sound cities. The Baker River was dammed at Concrete by the Puget Sound Power and Light Company to form Lake Shannon, the largest freshwater body in the county. Topographic conditions have also favored mining in eastern Skagit County. The uplifted and exposed limestone formations at Concrete have been utilized by the cement industry. In earlier years, the sands and gravels of the mountain streams and the exposed rocks of the valley sides attracted prospectors for gold and other useful minerals.

### Climate

The relationship of weather and climate to agriculture is very close. The climate of any region not only accounts for the patterns of plant life that are native to the area but is an important factor in what man shall grow there. Variations in weather may either stimulate or destroy crops in the process of development. These and other factors make weather and climate basic to the overall study of agriculture for any given area.

Within a world-wide classification of climatic regions, Skagit County is located in an area which has the West Coast marine type climate. Climatologists and geographers describe this type of climate as one which is influenced by the mild, moist air flowing inland from the oceans. Because of the mountain barriers to the east and the prevailing westerly movement of ocean air, the climate is cool, cloudy and wet over most of the year. Dry air, either cold or hot, of the interior of the continent seldom invades the county because of the high barrier formed by the Cascade mountains.

The climatic pattern of the county is closely related to elevation. Temperatures, frost conditions, growing seasons and precipitation vary considerably from the shore of the Puget Sound in the west to the Cascade Mountain divide in the east. Generally speaking, conditions are warmer and drier in the western lowlands of the county while the eastern mountainous area is cooler and much wetter.

The average maximum temperature during the warmest months ranges from 70 to 80 degrees throughout the agricultural areas of Skagit County. Average temperatures during the summers are a few degrees cooler in the western part of the Skagit-Samish Lowlands than in the areas around Concrete located in the central

Table 5. Temperature Data  
Average Maximum, Average Minimum, Mean, Highest and Lowest Temperature Each Month  
Skagit County, 1931-1960

Station		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Anacortes (30' elev.)	Av. Max.	44.5	47.9	52.0	58.7	64.6	68.7	72.4	71.7	67.4	59.2	50.8	47.0	58.7
	Av. Min.	34.8	36.3	38.5	42.5	46.3	50.3	52.4	52.4	50.0	46.1	40.2	37.9	44.0
	Mean	39.7	42.1	45.3	50.6	55.5	59.4	62.4	62.1	58.7	52.7	45.5	42.5	51.4
	Highest	65	65	71	78	81	91	92	95	88	77	67	61	95
	Lowest	6	9	22	30	36	38	44	45	38	26	21	14	6
Concrete (270' elev.)	Av. Max.	42.4	47.6	53.7	62.7	69.2	72.6	78.1	77.9	72.8	62.2	49.9	44.2	61.1
	Av. Min.	30.9	32.6	35.4	39.8	45.5	49.7	52.7	52.6	49.5	44.3	37.4	34.1	42.0
	Mean	36.7	40.1	44.5	51.3	57.3	61.1	65.4	65.2	61.2	53.3	43.7	39.2	51.6
	Highest	69	74	80	91	96	101	102	102	102	102	86	74	102
	Lowest	0	1	11	25	32	35	38	41	34	21	7	10	0
Sedro Woolley (56' elev.)	Av. Max.	44.3	48.6	51.4	60.5	66.7	67.9	74.9	74.7	69.4	61.0	51.2	46.4	60.1
	Av. Min.	31.7	33.4	35.9	39.7	44.1	48.6	50.1	49.9	47.4	42.6	36.8	34.4	41.2
	Mean	38.0	41.0	44.7	50.1	55.4	59.3	62.5	62.3	58.4	51.8	44.0	40.4	50.7
	Highest	67	69	75	82	90	96	94	97	91	83	71	74	97
	Lowest	-2	8	21	26	29	34	37	36	31	20	3	4	-2

Source: U. S. Weather Bureau, Climatological Office.

Table 6. Probability of Freezing Temperatures -- Skagit County <sup>1/</sup>

STATION	TEMP. (° F.)	PROBABILITY -- SPRING					PROBABILITY -- FALL					Growing Season Mean Length (Days)
		90%	75%	50%	25%	10%	10%	25%	50%	75%	90%	
		Feb 20	Mar 4	Mar 17	Mar 30	Apr 11	Oct 26	Nov 6	Nov 18	Nov 30	Dec 11	
Anacortes	32	Feb 20	Mar 4	Mar 17	Mar 30	Apr 11	Oct 26	Nov 6	Nov 18	Nov 30	Dec 11	246
	28	—	Jan 1	Feb 4	Feb 20	Mar 6	Nov 13	Nov 25	Dec 9	—	—	308
	24	—	—	Jan 14	Feb 5	Feb 19	Nov 25	Dec 10	—	—	—	351
Sedro Woolley	32	Mar 18	Mar 30	Apr 13	Apr 26	May 9	Sep 30	Oct 11	Oct 23	Nov 5	Nov 15	193
	28	Feb 16	Feb 28	Mar 13	Mar 27	Apr 8	Oct 20	Oct 31	Nov 12	Nov 24	Dec 5	244
	24	—	Jan 1	Feb 1	Feb 16	Mar 1	Nov 7	Nov 18	Nov 30	Dec 15	—	302

Source: U. S. Weather Bureau, Climatological Office.

<sup>1/</sup> To illustrate the data in the table, we find that the 50 percent probability of a 32° spring freeze for Anacortes is March 17. But there is also a 25 percent (1 year in 4) that a 32° freeze will occur as late as March 30, and 10 percent chance as late as April 11.

Table 7. Precipitation in Inches - Skagit County

Station	Elevation (ft.)	Period of Record	Average Annual	Greatest Annual	Least Annual	Greatest Monthly	Least Monthly	Greatest Daily
Anacortes	30	1931-60	25.70	35.18	15.97	9.95	0	2.50
Concrete	270	1931-60	65.21	82.94	39.18	20.91	0	3.25
Sedro Woolley	56	1931-60	46.07	64.60	30.83	12.83	0	3.32

Source: U. S. Weather Bureau, Climatological Office.

part of the county. This difference in summer temperature is largely caused by the moderating influence of the Juan de Fuca and Rosario Straits on the adjacent land areas. Heat extremes to 102 degrees have been recorded at Concrete while recorded temperatures have not exceeded 97 degrees at Sedro Woolley and 95 degrees at Anacortes.

Winters are relatively mild in Skagit's lowland areas with minimum average temperatures ranging from 30 to 40 degrees. During a few cold winters, the thermometer has dropped to -2 at Sedro Woolley. Temperatures in the mountainous eastern portion of the county are much colder because of the elevations and distance from the mild effects of the waters in the straits.

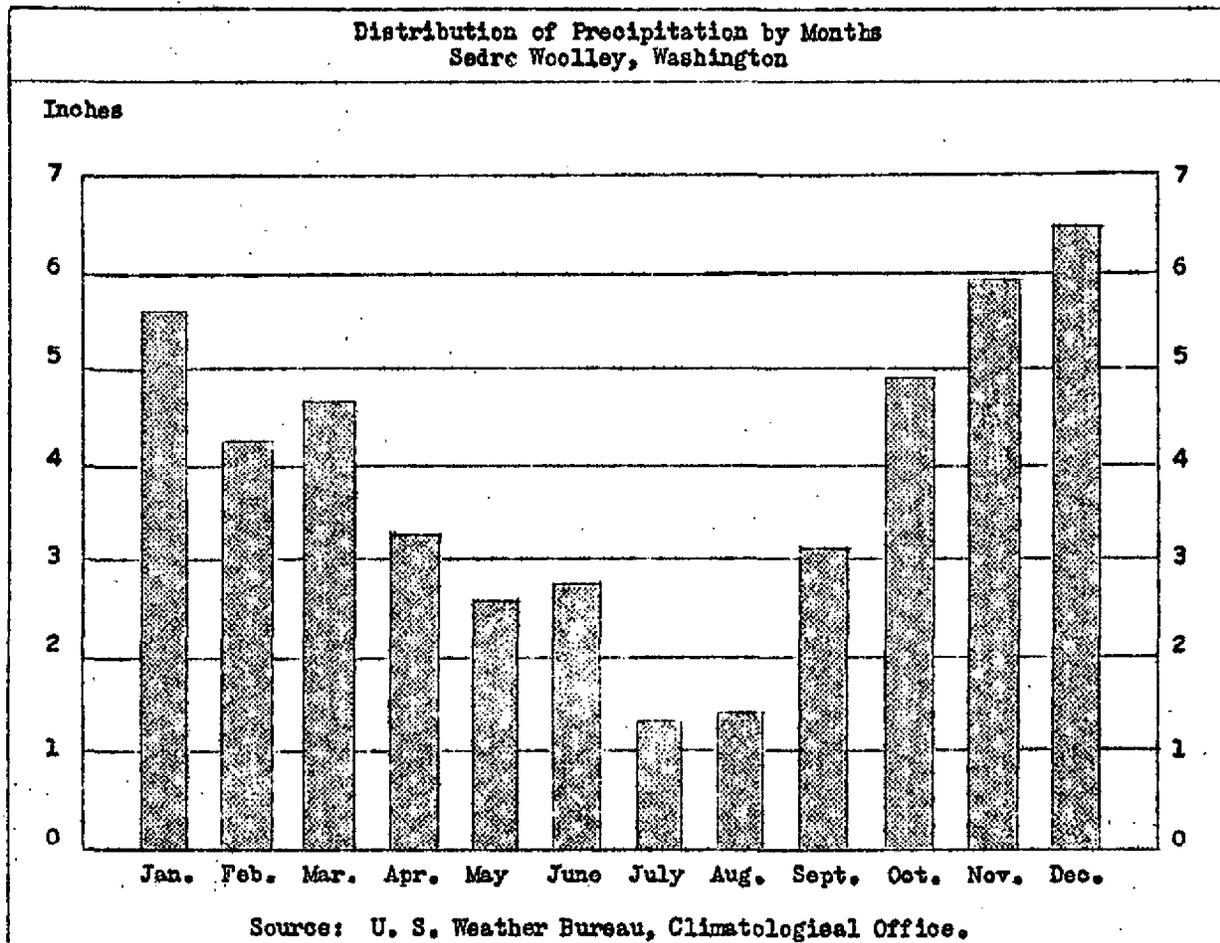


Figure 5. A graph of the rainfall at Sedro Woolley shows a long wet season from September to June and a short dry season during July and August.

Growing seasons and frost conditions vary greatly over different parts of the county. The La Conner and Samish Flats, Fidalgo, Guemes and Samish Islands are tempered by the adjacent and surrounding marine waters of Juan de Fuca and Rosario Straits. The warmth of the sea water given off to the lower layers of the atmosphere is usually sufficient to prevent frosts and heavy freezes. Banks of fogs also keep temperatures above freezing. In the interior bottomlands frosts are more frequent and severe. Heavy, cold air from the high mountain areas drains downward on calm fall and spring nights and causes heavy frosts in the lowest portions of the valleys. Some of the lower valley areas at Sedro Woolley,

Hamilton, Concrete and Rockport become frost pockets on clear nights of spring and autumn. New settlers frequently lost frost-sensitive crops in the interior lands but older pioneers came to know the local frost conditions quite well from long experience in agriculture and timed their plantings of vegetables based on their acquired knowledge. The growing season in the Skagit-Samish Lowlands is generally from mid-April to late October. This represents an average of about 200 days annually with temperatures not going below 32 degrees.

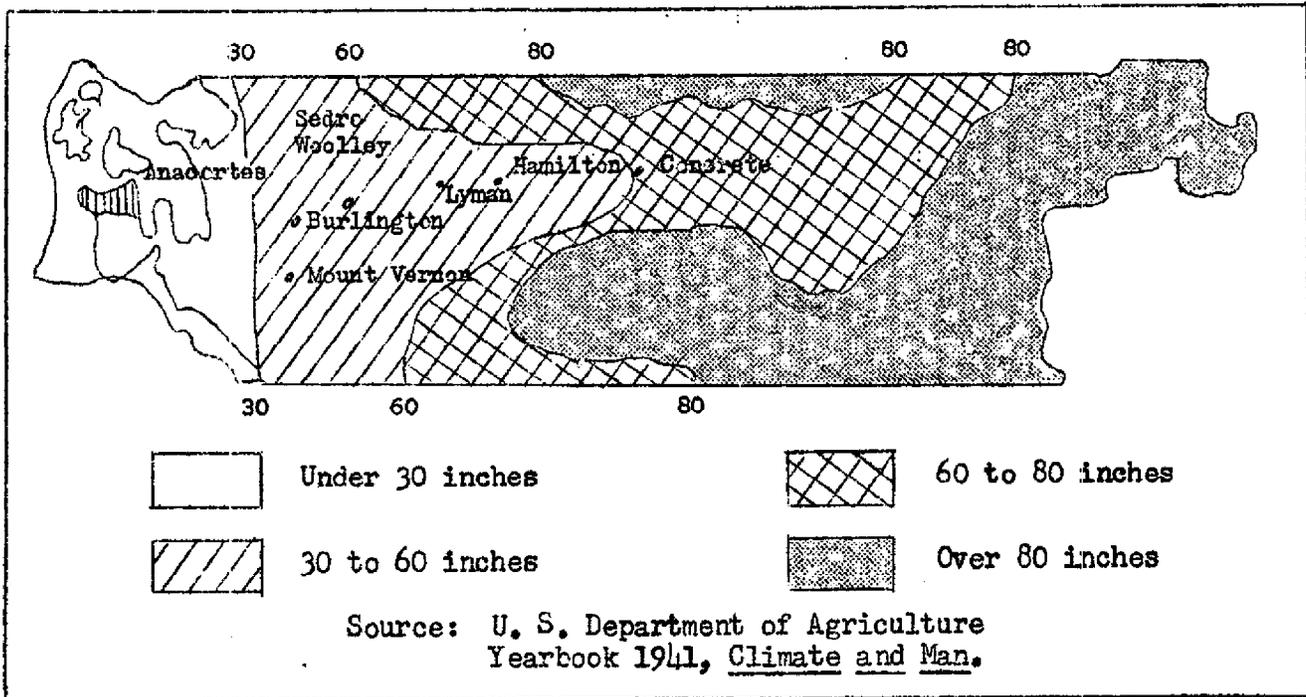


Figure 6. Distribution of Precipitation  
Skagit County

The main trend of isohyets (lines connecting points of equal precipitation) follows closely the contour lines in Skagit County. Precipitation varies from an average of about 26 inches annually at Anacortes to over 80 inches in the Cascade Mountains. Most of the precipitation in the area is brought by cyclonic storms that move in from the Pacific Ocean. Moisture is released from the air masses as they are cooled upon reaching land and particularly as they are forced to ascend the Cascade Range. Heavy winter snowfall is common to all elevations above 2,000 feet.

In winter, storms are both more numerous and more intense than in summer. The Skagit-Samish lowlands has a long wet season generally running from September to June, while only the months of July and August are relatively dry. Most of the crops grown in the county consequently do not require irrigation.

### Forests and Wildlife

Skagit County still contains large areas of the primeval forest and native animal life in the mountainous areas. Agricultural land clearing and logging have nearly eliminated dense forest of Douglas fir, western red cedar and hardwoods which once covered the low valley lands.

Even after about 85 years of steady forest cutting, Skagit County has still a rich resource of timber for sawmilling and for paper making. This has permitted a continuous source of off-farm and part-time employment for many Skagit farmers. Nearly everywhere the logging operations preceded settlement on farms. The logging industry thus aided in clearing away dense forest cover and lowering the costs of clearing and bringing the land under cultivation. According to a Forest Service survey in 1957 <sup>1/</sup>, Skagit County contained 848,186 acres of forest land of which 724,277 acres were of commercial stands. The major commercial forest types are hemlock, Douglas fir, spruce, hardwoods and pine. It was estimated that there were over 15 billion board feet of live sawtimber on the commercial forest lands in the county in 1957.

In 1957, about 47 percent of the commercial forest lands in Skagit County was owned privately. The federal government owned 36 percent mainly as Mount Baker National Forest. The remaining commercial forest lands were in state, county and municipal ownerships. Timber harvested from all ownerships in 1961 amounted to 132,611,000 board feet from nearly 6,000 acres. <sup>2/</sup> According to the Census of Agriculture, 123 Skagit farms sold \$209,669 worth of forest products off farm lands in 1959. Over 60 of these farms sold standing timber valued at \$90,383.

Washington State Game Department statistics show a valuable harvest of game and fur animal resources from Skagit County's forests, streams, lakes and farm-lands. Skagit is reputed to be one of Washington's leading sports fishing, hunting and fur trapping areas. In the 1962 season 1,920 deer were killed. In 1961, the deer kill was 2,560 and in 1954 the figure was 1,293. Over 3,800 pheasants were bagged during the 1962 season. The marshy flatlands of the Samish and Skagit Rivers are the most important waterfowl hunting grounds of western Washington, yielding nearly 60,000 ducks and geese in 1962. The Skagit River is a leading sports fishing stream, particularly for steelhead. The wild fur catch during the 1962-1963 season in Skagit County was as follows: 1,667 muskrat, 178 skunk, 160 mink, 102 opossum, 50 raccoon, 22 red fox, 22 civet cat, 15 otter, 9 weasel, 6 bobcat, 4 marten and 1 coyote.

### Land Classification and Soils

Land of Skagit County has been divided into eight broad classes and the soil classified into 58 series which are further subdivided into 113 different soil types. <sup>3/</sup> The delta plains of the Skagit and Samish Rivers extending from Mount

<sup>1/</sup> U.S.D.A., Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. Forest Survey Report No. 133, Forest Statistics for Skagit and Whatcom Counties, Washington. 1959.

<sup>2/</sup> State of Washington, Department of Natural Resources, Olympia, Washington, Third Biennial Report. 1960-1962.

<sup>3/</sup> Information on Skagit County land and soils has been obtained from two published sources: (1) Warren A. Starr and L. C. Wheeting, Land Capability Methods For Conserving Washington Soils, Washington Agricultural Experiment Stations, Washington State College, Pullman, Washington. (2) State Council For Highway Research, Soils of Skagit County, State of Washington Engineering Soils Manual, Olympia, 1955.

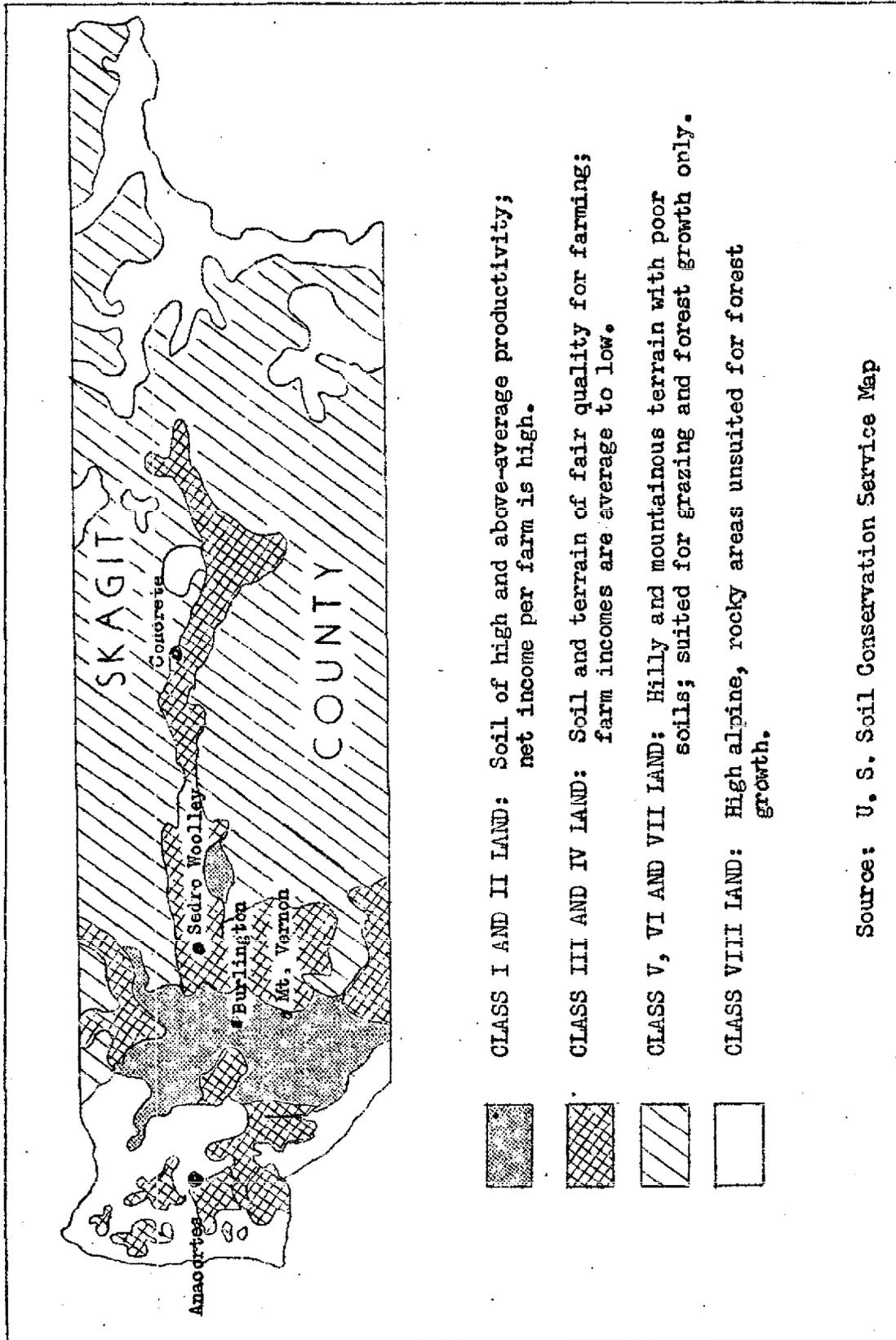


Figure 7. General Quality of Land in Skagit County

Vernon and Burlington to Puget Sound contain the largest area of Class I land and fertile alluvial soils in western Washington.

Over 17,000 acres of Class I land are located in the Skagit delta southwest of Mount Vernon and in another section northwest of Burlington. This fertile land of highest value and yield is made up of the following soils: Puget Series (loam, fine sandy loam, silt loam and silty clay loam) and Puyallup Series (fine sandy loam, silt loam and loam). These soils are alluvial materials of fine texture derived from a wide variety of rocks deposited by streams having their sources in the Cascade Mountains. The soils are level and deep but are acid and deficient in lime and have to be treated with limestone for fullest capability to yield crops. In 1959, 139 farm operators applied nearly 9,700 tons of lime or liming materials to almost 5,000 acres of farmland.

Approximately 20,000 acres of Class II land are located in the western Skagit County lowlands. Soils in this land class are somewhat less productive than those of Class I, but have better than average productivity. They have more drainage difficulty and less desirable soil texture. Along the Skagit and Samish Rivers are the moist, thinner and coarser alluvial soil series: Samish silt and clay loams, Snohomish silt loam, Lummi silt and clay loams and Lynden sandy loam.

Class III land includes over 20,000 acres of sloping, rolling and narrow bottomland, mainly found in the area from Burlington east to Hamilton. It is fair farming land but is handicapped by poor drainage, coarser texture of top soil or by degree of slope. Farms of average income are generally found on this land. Its principal soil series include Cokedale silt loam, Bow silt loam and gravelly loam, Bellingham clay, clay and silty loam, Pilchuck fine sand, gravelly sand and sandy loam, and Sultan loams.

Land Classes IV and V contain less favorable terrain and poorer soils for farming. A high proportion of soils in such areas are droughty, infertile, steep in slope or are poorly drained. There are over 25,000 acres of such land in Skagit County being used for small part-time farms, pastures and farm woodlots. They are located in hilly uplands and on the off-shore islands of the western section. Also included are the upper bottom lands of the Skagit, Samish and Sauk Rivers. Important soil series and types found in these hilly uplands and mountain bottom lands include the following: Alderwood gravelly loam, Belfast silt loam, Cathcart loam, Coveland loams, Everett sandy loams, Skykomish loams, Sauk loam and Fidalgo loams.

Over half of Skagit County is in mountainous Land Classes V, VI and VIII. These are not suited for cultivation because of steep slope and stony soils. Some portions adjoining bottomland farms are used for orchards and pastures. Most of this land is within Mount Baker National Forest. In general, all land above 1,000 feet elevation surrounding the valley plains of the Skagit and Samish Rivers falls into these groups. Soil series important for forest growth include the following gravelly and stony loams: Heisler, Marblemount, Oso and Schnorbush.

Table 8. Number of Farms, Land in Farms and Value of Livestock and Crops Sold Off Farms, Washington Counties - 1959

County	Number of Farms	All Land in Farms (acres)	Value of all Crops Sold Off Farms (dollars)	Value of all Livestock and their Products Sold Off Farms (dollars)
Adams	786	1,076,960	21,055,532	3,547,300
Asotin	325	364,405	2,589,582	1,179,464
Benton	1,281	562,809	12,912,165	3,958,996
Chelan	1,636	215,646	16,877,563	660,083
Clallam	724	68,739	706,055	2,858,512
Clark	2,778	188,479	3,020,725	8,222,499
Columbia	333	359,134	9,778,027	1,148,786
Cowlitz	1,014	80,176	1,022,291	2,808,884
Douglas	935	1,012,561	12,985,276	1,067,743
Ferry	283	298,247	396,384	931,057
Franklin	742	590,027	10,305,160	3,596,711
Garfield	274	344,094	6,871,789	898,109
Grant	1,497	1,075,642	26,083,038	12,555,694
Grays Harbor	896	99,529	924,067	2,639,777
Island	493	38,702	515,863	1,909,572
Jefferson	266	35,123	212,568	758,107
King	2,952	114,719	6,240,212	14,298,190
Kitsap	906	29,776	437,819	1,374,547
Kittitas	905	580,035	2,961,833	10,945,370
Klickitat	741	960,614	3,859,102	3,083,797
Lewis	2,230	255,012	1,893,636	7,935,581
Lincoln	959	1,422,981	21,035,259	3,253,383
Mason	328	35,518	202,594	728,250
Okanogan	1,762	2,048,406	10,681,584	5,723,537
Pacific	499	53,348	819,224	1,086,617
Pend Oreille	366	124,239	265,001	1,222,488
Pierce	2,535	153,363	4,928,685	10,850,000
San Juan	209	45,707	91,694	595,403
Skagit	1,740	141,770	6,722,958	9,167,984
Skamania	177	20,177	283,595	259,736
Snohomish	2,919	148,604	2,788,695	12,899,240
Spokane	2,990	822,008	15,091,158	8,403,816
Stevens	1,608	803,776	3,836,457	5,676,015
Thurston	1,220	142,170	1,952,408	5,836,930
Wahkiakum	302	26,299	174,415	1,052,642
Walla Walla	981	822,729	19,957,499	4,228,801
Whatcom	3,151	185,045	3,943,630	17,706,625
Whitman	1,824	1,485,709	43,632,434	7,398,484
Yakima	6,010	1,884,694	75,760,207	32,919,536
State Total	51,577	18,716,972	353,816,184	215,388,266

Source: U. S. Census of Agriculture, 1959.