

## PART III

## PHYSICAL DESCRIPTION

Physical Regions of Washington

On the basis of surface features, Washington may be divided into eight major 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 using the 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 regions. 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, wild-life 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 floodplains 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 bottomlands.

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, Nisqually, Cowlitz and Lewis also contain livestock farms. The area is vitally important as a watershed 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 several 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 have 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 soil 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.

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. The hills receive 16 to 25 inches of rainfall annually and have 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, Sanpoil, 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 remoteness 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 bottomlands settled by livestock

farmers. Nearly all of the uplands are in Kaniksu National Forest. While climate is cool and growing seasons are short, the Pend Oreille Valley has an advantage of being relatively in close proximity 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 Snohomish County

Sharp contrasts characterize the topography of Snohomish County. It varies from tideflats and deltas at sea level on Puget Sound to the 10,436 foot summit of Glacier Peak on the Cascade crest in the eastern part of the county. Snohomish County lies within two distinct physiographic regions which extend well beyond its boundaries. The first is the Willamette-Puget Sound Lowland which occupies a large portion of western Snohomish County. The second is the Cascade Mountains with its western foothills which extend over the major part of the county.

The entire county drains into Puget Sound by way of three rivers. The southern portion of the county drains into the Snohomish River, the central portion into the Stillaguamish River and the northern portion into the Skagit River. Near the mountains the streams are rapid with numerous cascades and waterfalls entrenched in deep, steep canyons.

Valley alluvial plains with deep soils deposited over many centuries by the Snohomish, Stillaguamish and Skykomish Rivers are the most productive agricultural regions in the county. The Snohomish and Stillaguamish Rivers have filled in parts of western Snohomish County which once was in marshes and in lakes. The Snohomish continues to fill in Possession Sound and the harbor of Everett where dredges are kept busy removing silt. Areas adjacent to the streams are subject to periodic flooding.

During the Pleistocene period, the surface of what is today the Willamette-Puget Sound Lowland was reshaped by a huge glacier. This ice sheet was joined by tributary mountain glaciers which carved out the Skykomish and upper Stillaguamish Valleys. Deep and wide beds of clay, sand and gravel were deposited over western Snohomish County as the ice receded. The result was a rolling, uneven surface of moraines, outwash plains, marshes and lakes. This feature--the Puget Glacial Drift Plain--forms a large part of western Snohomish County and contains most of the area's cities, towns and farms today.

Since the Glacial period, rivers have deposited silty and sandy material over the valley plains. Areas with alluvial soils contrast with the surrounding older, gravelly uplands. Originally, much of the bottomland along the lower Stillaguamish and Snohomish was wet and swampy. Drainage, diking and the construction of levees were necessary to reclaim these lands for agriculture. Periodic floods caused by heavy rains and snow melt in the Cascades still are a problem in the Snohomish Valley.

Foothills of the Cascade Range generally begin to rise about 15 to 20 miles eastward from the shores of Puget Sound. The north-south Cascade crest in eastern Snohomish County rises several thousand feet forming an effective climatic and transportation barrier to eastern Washington. In the south-central part of the county, however, the Skykomish Valley permits easy access to Stevens Pass--a major rail and highway route across the Cascades. Snow-capped peaks such as Falchuck, Whitehorse, Index and Three Fingers are prominent features. Glacier Peak in the northeastern part of the county is an extinct volcano 10,436 feet in elevation and the fourth highest point in the state. North of Sultan and Index in south-central Snohomish County is a mineralized region with low-grade deposits of copper, silver and gold ores. There was considerable mining activity in this region in earlier years.

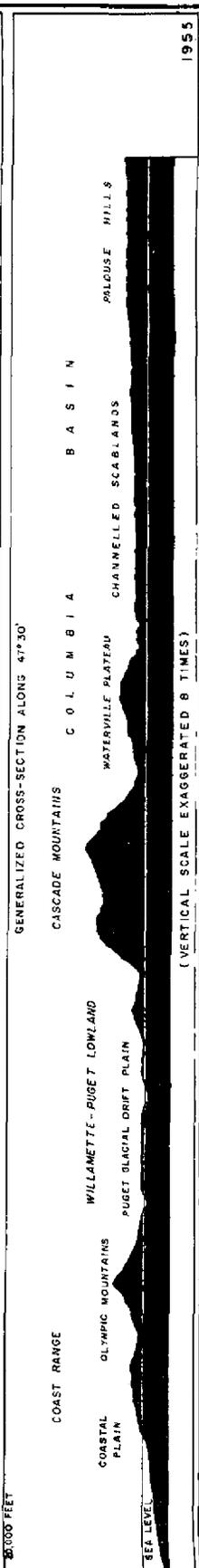
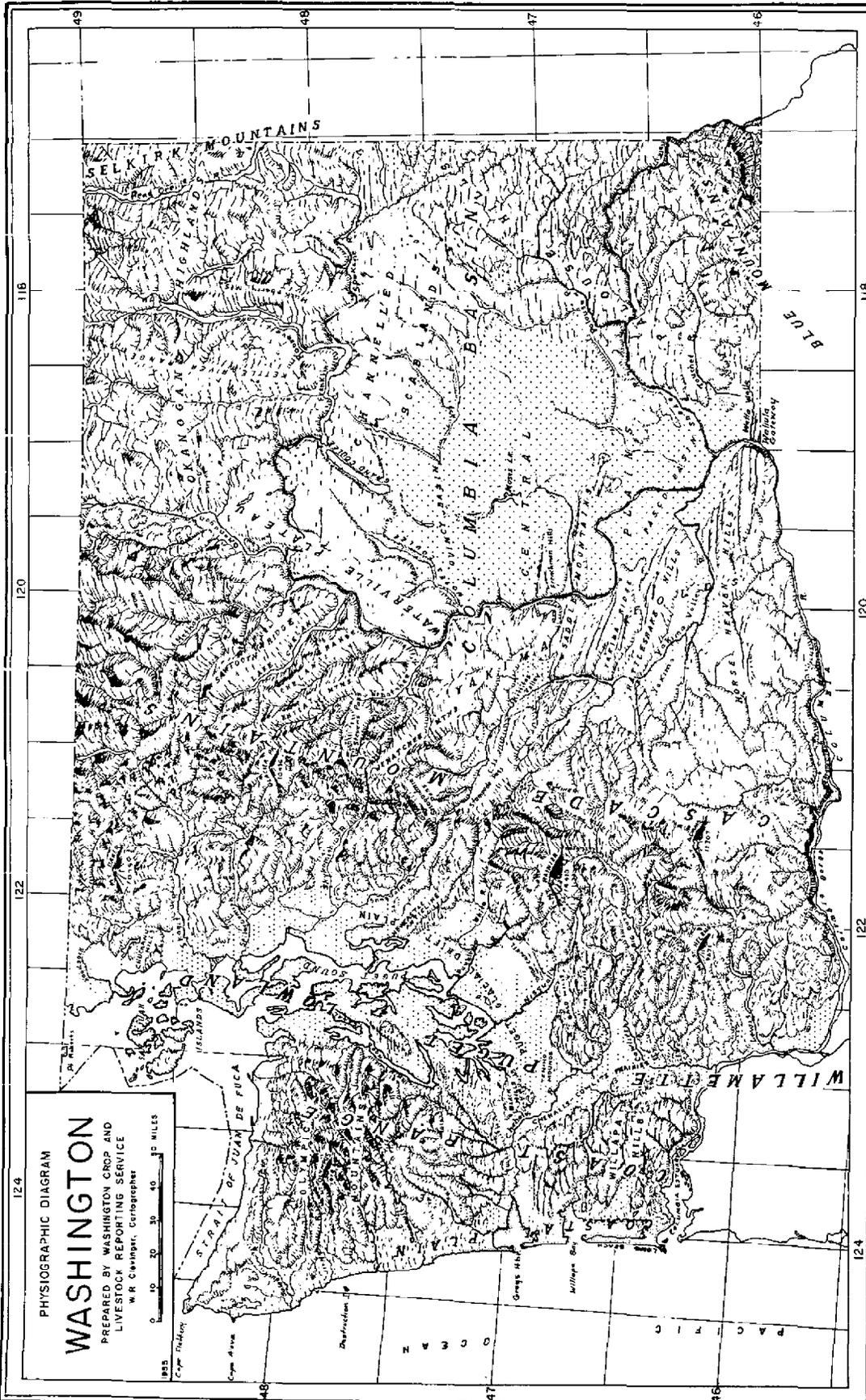
### Climate

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 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.

The climate of the western part of Snohomish County is predominantly a mid-latitude, west coast marine type with cool, dry summers, rather mild but somewhat rainy winters, moist air and a small daily range in temperature. In the rugged mountainous sections of the eastern portion of the county, the climate is more severe, with greater extremes in temperature and rainfall. 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. Some of the factors influencing the climate are terrain, elevation, distance and direction from the ocean, location with respect to the path of weather patterns moving eastward across the Pacific, and the intensity and location of the high and low pressure centers in the north Pacific.

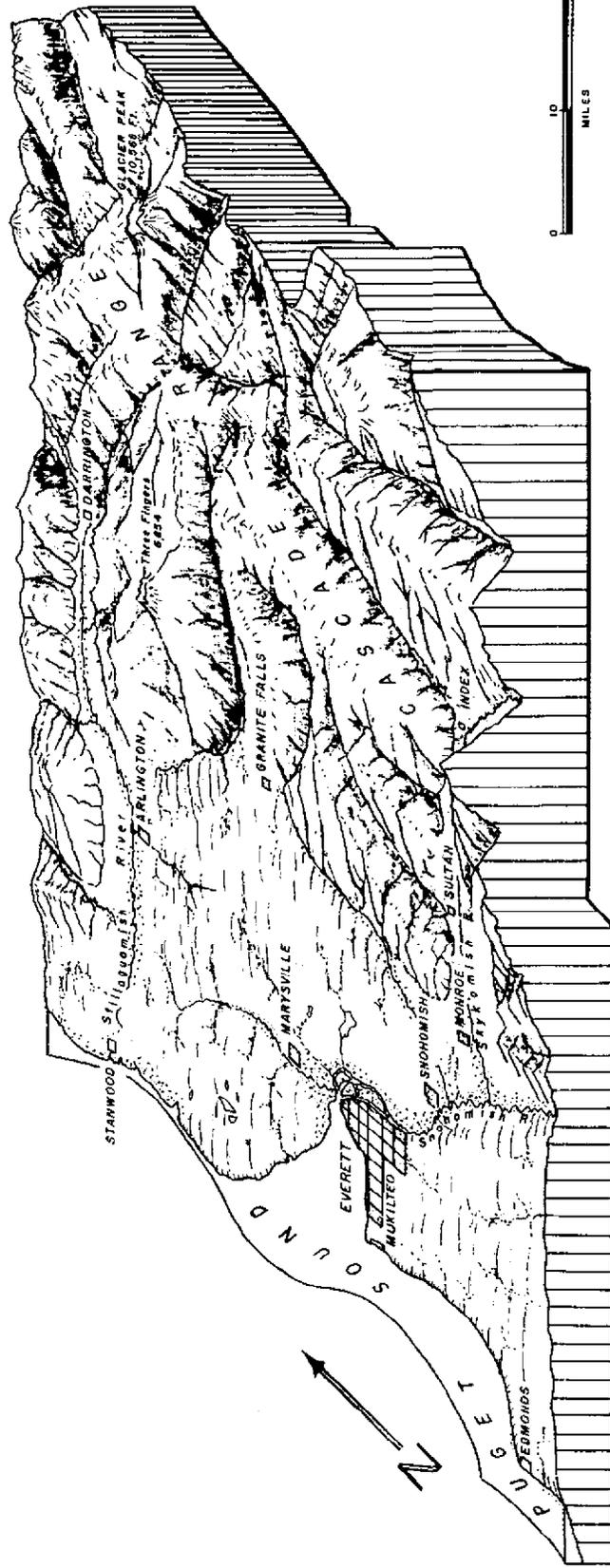
In a westerly direction and across the Puget Sound, the Olympic Mountains rise to elevations of 4,000 to 7,000 feet and protect Snohomish County from any severe winter storms moving inland. However, the wide valley between the Olympic Mountains and the Willapa Hills, the Strait of Juan de Fuca and the Strait of Georgia does permit a rather free circulation of air from over the ocean to the county.

In an easterly direction and within 15 to 30 miles from the shores of the Puget Sound, the Cascades rise to elevations of 5,000 to 7,000 feet with peaks in excess of 10,000 feet and form a north-south topographic and climatic barrier



TOPOGRAPHIC DIAGRAM

# SNOHOMISH COUNTY



WASHINGTON CROP AND LIVESTOCK REPORTING SERVICE

W. R. CLEVINGER

across the state. Rising air forced upward by the western slope of the mountains results in heavy precipitation on the windward side and near the summit. The Cascade Range also is very effective in shielding Snohomish County from the higher summer and lower winter temperatures which occur in eastern Washington.

Table 4. Temperature Data  
Average Maximum, Average Minimum, Mean, Highest and Lowest Temperature Each Month  
Snohomish County

Station		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
<u>Bothell 2N</u> (100' elev.)	Av. Max.	44.3	48.3	52.8	59.7	66.0	69.7	75.6	75.1	70.8	60.1	51.1	46.8	60.1
	Av. Min.	30.6	31.7	33.8	37.2	41.9	46.2	48.3	50.3	44.9	40.9	35.6	33.8	39.6
	Mean	37.5	40.1	43.3	48.5	54.0	58.0	61.9	62.6	57.9	50.9	43.9	40.3	49.9
	Highest	67	71	76	88	90	100	100	97	99	86	75	68	100
	Lowest	-10	-6	8	20	23	31	35	33	28	21	0	5	-10
<u>Darrington</u> (550' elev.)	Av. Max.	41.4	45.9	51.3	61.1	67.7	71.0	77.6	77.7	70.9	61.0	48.6	43.4	59.8
	Av. Min.	28.6	29.8	32.3	36.5	42.0	47.1	49.3	48.8	46.0	40.1	32.7	30.6	38.7
	Mean	35.0	37.8	41.8	48.8	54.9	59.1	63.5	63.0	58.5	50.6	40.7	37.0	49.3
	Highest	74	70	78	91	100	102	104	105	102	90	77	63	105
	Lowest	-14	-11	0	20	25	31	34	33	29	19	4	0	-14
<u>Everett</u> (99' elev.)	Av. Max.	44.7	48.1	52.6	58.8	64.2	68.1	72.4	71.7	67.4	59.8	51.2	47.0	58.8
	Av. Min.	32.5	33.9	36.5	40.4	45.1	49.7	52.3	51.9	48.3	43.7	37.6	35.5	42.3
	Mean	38.6	41.0	44.6	49.6	54.7	58.9	62.4	61.8	57.9	51.8	44.4	41.2	50.6
	Highest	72	69	76	80	88	98	93	92	88	83	73	65	98
	Lowest	1	7	10	26	29	37	41	40	33	25	8	10	1
<u>Monroe</u> (120' elev.)	Av. Max.	44.0	48.2	53.2	60.9	67.2	71.3	76.7	75.8	70.3	60.9	51.1	46.1	60.5
	Av. Min.	31.9	33.6	36.1	39.8	44.5	49.1	51.5	51.5	48.2	43.4	37.4	35.5	41.8
	Mean	38.0	40.9	44.7	50.3	55.9	60.2	64.1	63.6	59.2	52.2	44.2	40.7	51.2
	Highest	72	73	77	85	92	96	99	101	94	84	72	66	101
	Lowest	-3	-2	13	24	29	34	33	39	31	23	5	10	-3
<u>Startup</u> (170' elev.)	Av. Max.	45.0	49.4	54.1	62.0	68.4	70.2	78.0	77.7	71.9	62.4	52.8	47.5	61.8
	Av. Min.	32.2	33.8	35.6	39.5	43.7	47.4	49.1	49.2	46.5	42.2	36.9	34.7	40.9
	Mean	38.6	41.6	44.9	50.8	56.1	59.7	63.6	63.5	59.2	52.4	44.9	41.4	51.4
	Highest	67	72	80	90	96	98	103	100	98	87	78	65	103
	Lowest	-8	-4	6	23	28	32	35	37	32	19	4	11	-8
<u>Stevens Pass</u> (4,065' elev.)	Av. Max.	28.7	33.3	37.4	44.8	51.1	58.3	67.9	66.4	61.6	49.1	36.3	31.0	47.2
	Av. Min.	18.0	21.3	22.7	28.6	33.7	39.6	44.6	44.8	40.9	34.8	25.7	21.2	31.3
	Mean	23.4	27.3	30.1	36.7	42.2	49.3	56.3	55.6	51.3	42.0	31.0	27.1	39.3
	Highest	53	53	70	69	80	91	95	91	87	77	56	50	95
	Lowest	-12	-10	0	11	17	28	33	30	28	22	-2	-18	-18

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

The large high pressure region in the Pacific, which spreads northward into the Gulf of Alaska in the late spring and summer, brings a flow of air from a northwesterly direction into western Washington. This air is cooler than the surface of the land and comparatively dry, thus summer is the season with the least amount of precipitation in Snohomish County. The driest weather usually occurs between the middle of July and the middle of August. Average temperatures during the summers are a few degrees cooler along the shores of Puget Sound than in lowland areas further inland.

The difference in summer temperature is caused largely by the moderating influence of the Puget Sound on the adjacent land areas. Around Everett on the east shore of Puget Sound, average afternoon temperatures during the summer are in the mid-70's and nighttime temperatures in the 50's. At Monroe, about 15 miles inland, afternoon temperatures in the warmest summer months range between 75 to 80

degrees and nighttime temperatures drop very quickly to between 50 and 60 degrees. In the Sauk River Valley at Darrington, mid-afternoon temperatures in summer also range in the upper 70's. Cool mountain breezes in late afternoon result in rapid cooling after sunset in this area. Highest temperatures during the summer usually occur when dry easterly winds reach the county from east of the Cascades. The most serious danger of forest fires generally occurs under these conditions.

The high pressure center over the north Pacific Ocean becomes smaller and moves southward during the fall and winter, while the low pressure area, with its center near the Aleutian Islands, intensifies and also moves southward. A clockwise circulation of air around the high pressure center, and a counter-clockwise circulation around the low, brings a flow of warm and moist air into western Washington. Cooling and condensation occur as the air moves inland and rises along the slopes of the hills and mountains. This results in a rainy season beginning about October, reaching a peak in mid-winter, then decreasing in the spring. Most winter precipitation occurs as rain in the lowlands, rain and snow in the foothills and snow in the higher elevations of the Cascades.

Table 5. Probability of Freezing Temperatures -- Snohomish County 1/

STATION	TEMP. (° F.)	PROBABILITY -- SPRING					PROBABILITY -- FALL					Grow- ing Season Mean Length (Days)
		90%	75%	50%	25%	10%	10%	25%	50%	75%	90%	
<u>Bothell 2N</u>	32	Apr 18	Apr 30	May 13	May 27	Jun 7	Sep 12	Sep 23	Oct 5	Oct 17	Oct 28	145
	28	Mar 19	Mar 30	Apr 13	Apr 27	May 8	Oct 7	Oct 18	Oct 30	Nov 11	Nov 22	200
	24	Feb 7	Feb 21	Mar 8	Mar 21	Apr 2	Oct 22	Nov 2	Nov 15	Dec 1	—	252
<u>Darrington</u>	32	Apr 17	Apr 29	May 12	May 23	May 29	Sep 17	Sep 28	Oct 10	Oct 22	Nov 2	151
	28	Mar 13	Mar 26	Apr 8	Apr 19	Apr 25	Oct 5	Oct 16	Oct 28	Nov 9	Nov 20	203
	24	Feb 23	Mar 6	Mar 20	Mar 31	Apr 6	Oct 25	Nov 5	Nov 17	Nov 29	Dec 10	242
<u>Everett</u>	32	Mar 9	Mar 22	Apr 4	Apr 17	Apr 30	Oct 7	Oct 18	Oct 30	Nov 11	Nov 22	209
	28	Feb 13	Feb 26	Mar 11	Mar 24	Apr 5	Oct 25	Nov 5	Nov 18	Dec 1	Dec 18	252
	24	—	—	Jan 29	Feb 15	Feb 26	Nov 13	Nov 25	Dec 10	Dec 31	—	315
<u>Monroe 2NSW</u>	32	Mar 21	Apr 3	Apr 16	Apr 30	May 12	Sep 30	Oct 11	Oct 23	Nov 4	Nov 15	190
	28	Feb 21	Mar 5	Mar 19	Apr 1	Apr 14	Oct 22	Nov 1	Nov 13	Nov 26	—	239
	24	—	Jan 28	Feb 17	Mar 6	Mar 17	Nov 2	Nov 14	Nov 27	Dec 13	—	283

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

1/ To illustrate the data in the table, we find that the 50 percent probability of a 32° spring freeze for Everett is May 12. But there is also a 25 percent chance (1 year in 4) that a 32° freeze will occur as late as May 23, and 10 percent chance as late as May 29.

During the winter months, daytime temperatures are generally in the 40's and nighttime temperatures in the 30's around Everett. At Monroe, afternoon temperatures in the winter range from 40 to 50 degrees and nighttime readings are from 25 to 35 degrees while records from Darrington show that afternoon temperatures in the coldest months range from the mid-30's to the lower 40's and minimum readings from the mid-20's to the lower 30's.

Lowest temperatures during the winter occur when cold air from the interior of the continent moves into western Washington and a high pressure area develops over the Pacific Northwest. This condition usually results in clear skies,

northerly wind and rather dry air. Cold weather, associated with an influx of air from the interior of the continent, seldom lasts more than a few days. Snow occurs rather frequently at the beginning and end of these periods of low temperatures. However, it seldom remains on the ground more than a few days or accumulates to a depth of more than 4 to 6 inches in the lower valley along the Sound. Snowfall increases rapidly along the western slope of the Cascade Mountains, where snow depth in the higher elevations ranges from 10 to 20 feet during the latter part of the winter.

Growing seasons and frost conditions vary greatly over different parts of the county. In the vicinity of Everett along the shores of Puget Sound the growing season is around 209 days. The season generally runs from April 4 to October 30. At Monroe, the growing season usually extends from April 16 to October 23--about 190 days. In the north-central part of the county around Darrington, the season begins about May 12 and ends around October 10 (approximately 151 days). The length of the growing season is defined as the average number of days between the last occurrence of a 32 degree freeze in the spring and the first such occurrence in the fall.

The main trend of isohyets (lines connecting points of equal precipitation) follows closely the contour lines in Snohomish County. Precipitation varies from an average of about 35 inches annually at Everett to over 190 inches in the Cascade Mountains. Most of the precipitation in the area is brought by cyclonic storms that move in the Pacific Ocean. Moisture is released from the air masses as they are cooled upon reaching land and particularly as they are forced to ascent the Cascade Range.

Table 6. Precipitation by Months - Mean  
Snohomish County

Station	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Arlington 1931-60	5.20	4.69	4.28	3.09	3.08	2.05	1.14	1.37	2.55	4.68	5.63	5.72
Bothell 2N 1931-59	5.59	4.35	3.48	2.47	2.40	2.15	.81	.99	1.88	3.80	5.18	5.82
Darrington 1931-60	11.79	9.37	8.13	5.30	3.43	3.20	1.36	1.50	3.92	8.23	11.14	13.14
Everett 1931-60	4.45	3.58	3.33	2.39	2.26	2.25	.93	1.12	1.98	3.54	4.55	4.86
Monroe 1931-60	6.03	5.01	4.59	3.21	3.01	2.53	1.04	1.34	2.49	4.65	6.32	6.54
Startup 1931-61	7.59	6.31	6.26	4.74	4.32	3.89	1.70	1.77	3.72	6.72	8.40	8.73
Index 1935-55	12.52	10.00	8.84	6.79	5.06	4.39	2.13	1.86	3.34	9.25	12.16	14.13
Snohomish 1935-52	8.93	10.89	8.74	5.86	5.09	3.21	1.50	1.95	3.13	7.87	12.23	14.88
Stevens Pass	11.26	8.57	7.94	4.85	3.59	2.89	1.35	1.70	4.06	7.32	11.25	12.17

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

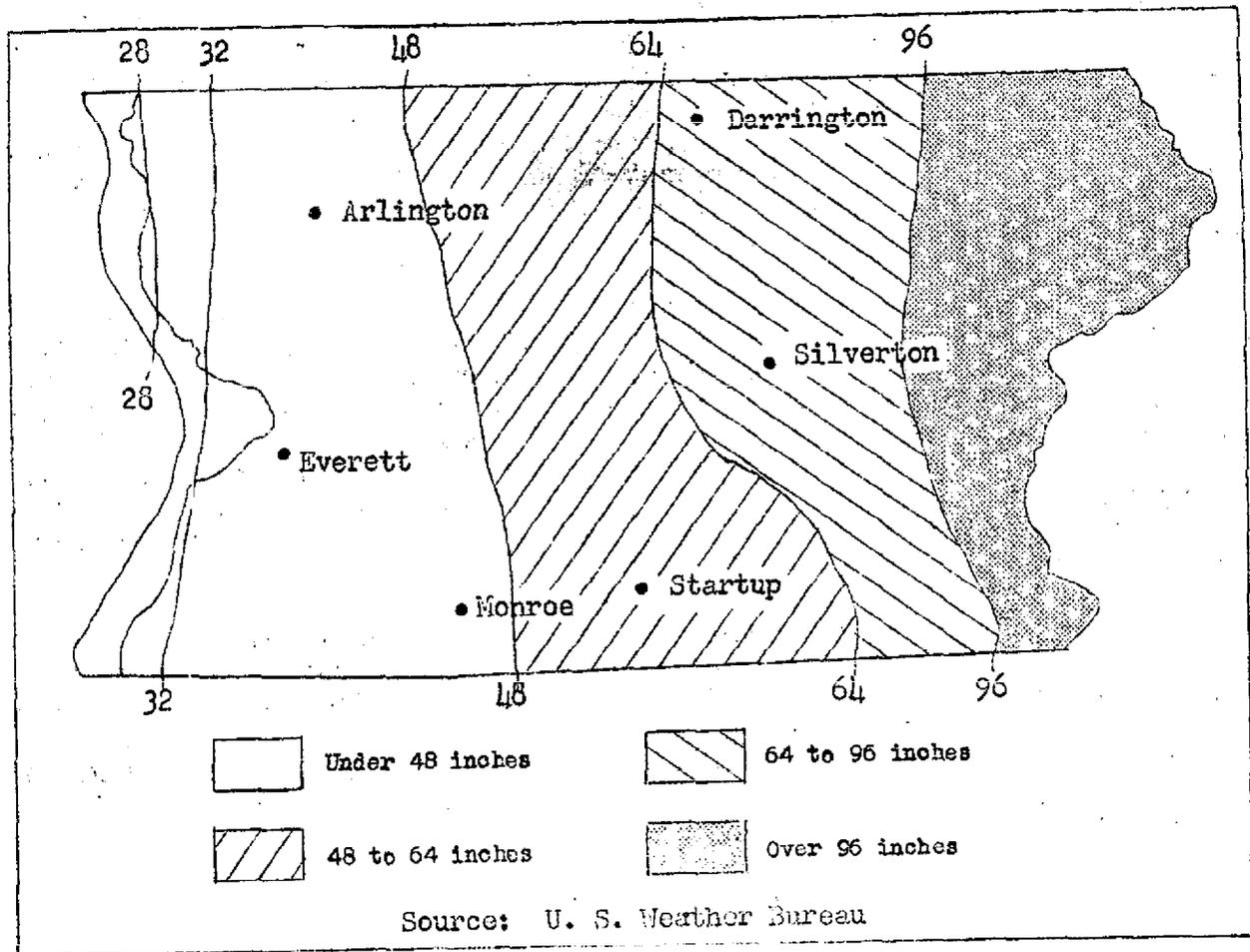


Figure 5. Distribution of Precipitation  
Snohomish County

Table 7. Precipitation in Inches - Snohomish County

Station	Elevation (ft.)	Period of Record	Average Annual	Greatest Annual	Least Annual	Greatest Monthly	Least Monthly	Greatest Daily
Monroe	110	1931-60	48.76	60.07	25.71	14.94	0	2.60
Arlington	160	1931-60	44.36	57.04	29.28	9.25	0	2.50
Darrington	550	1931-60	80.51	104.89	51.33	31.22	0	4.71
Everett	99	1931-60	35.24	50.29	22.57	10.81	0	2.28
Stevens Pass	4,055	1939-64	76.75	117.44	42.98	24.70	.02	5.51
Index	502	1935-55	90.38	—	—	20.96	.02	5.30

Source: U. S. Weather Bureau, Climatological Office

### Forests and Wildlife

Snohomish County is predominantly a forest county. The nonforest area occurs chiefly as agricultural lands in the river valleys, as townsites and as areas above timberline in the Cascade Range. According to the latest Forest Service inventory (1955), about 62 percent of the county was in commercial forest, 16 percent was in noncommercial forest and 22 percent in nonforest land. Noncommercial forest consists of unproductive areas and productive but reserved forest land.

Snohomish County's forests are typical of those in the Douglas fir subregion of western Oregon and western Washington. The three major forest types are Douglas fir, hemlock-Sitka spruce and hardwoods. In general, Douglas fir stands occur throughout the county at lower elevations. With increasing elevation these are replaced by stands of hemlock and true firs. Hardwood stands also occur at lower elevations, many having become established after the logging of the original softwood stand. One or more softwood species occur as a component on a large portion of this hardwood type acreage. Generally, red alder is the predominant hardwood species throughout the county. Other types are mainly fir-spruce with limited areas of western white pine and lodgepole pine.

Approximately 40 percent of the commercial forest land in 1955 was in Federal ownership. Ninety-four percent of this was in national forests, with one-fourth in the Snoqualmie National Forest and three-fourths in Mt. Baker National Forest. The remaining 6 percent was owned or managed by the Bureau of Indian Affairs, Department of Defense or the Bureau of Land Management. Other public land was in state, municipal and county ownerships. Timber harvested from all ownerships in 1961 amounted to 205,467,000 board feet from 8,489 acres. According to the Census of Agriculture, 223 Snohomish farms sold forest products worth \$206,601 off farm lands in 1959. Standing timber valued at \$77,242 was sold by 113 of these farms.

Washington State Game Department statistics show a valuable harvest of game and fur animal resources from Snohomish County's forests, streams, lakes and farm lands. Snohomish is reputed to be one of Washington's leading sports fishing, hunting and fur trapping areas. In the 1962 season, 1,960 deer were killed. Also in 1962, 22,860 ducks, 18,970 pheasants and 1,190 geese were taken by sportsmen. The wild fur catch during the 1962-1963 season in Snohomish County was as follows: 2,798 muskrat, 181 mink, 99 opossum, 81 raccoon, 42 marten, 40 skunk, 25 weasel, 21 civet cat, 15 red fox, 11 coyote, 8 otter and 1 bobcat.

### Land Classification and Soils

The U. S. Soil Conservation Service has classified Snohomish County land into eight broad categories according to its capability for use. The first four classes include land that can be plowed and cultivated safely, without lasting damage, if correct conservation procedures are followed. Class I land needs little special conservation treatment. Classes II, III and IV require increasing degrees of care and protection. The remaining four classes are not suited for cultivation. They need the protection afforded by a permanent cover of vegetation. Classes V, VI and VII require progressively more care even when used for grazing or forestry. Class VIII land can be used safely only for wildlife, recreation or watershed purposes.

Class I and II lands are found in the Stillaguamish and Snohomish River valleys and represent the best farming areas in the county. A belt of Class I land extends from the vicinity of Arlington to Stanwood. A zone of good Class II land is found from the city of Snohomish to Marysville. The fertile bottomlands include silt, sand and clay loams of the Puget, Pilchuck, Puyallup and Snohomish series. The Puget clay loam type covers the most area in the Class I and II lands followed by Puyallup sandy loam and Puget silt, in that order. Productive bottomlands also include peat soils which have been drained. Carbondale muck and Rifle peat are the main peat soils in the county.

Class III and IV lands cover most of western Snohomish County. These include the uplands, terraces and hilly areas above the river flood level. Generally, the

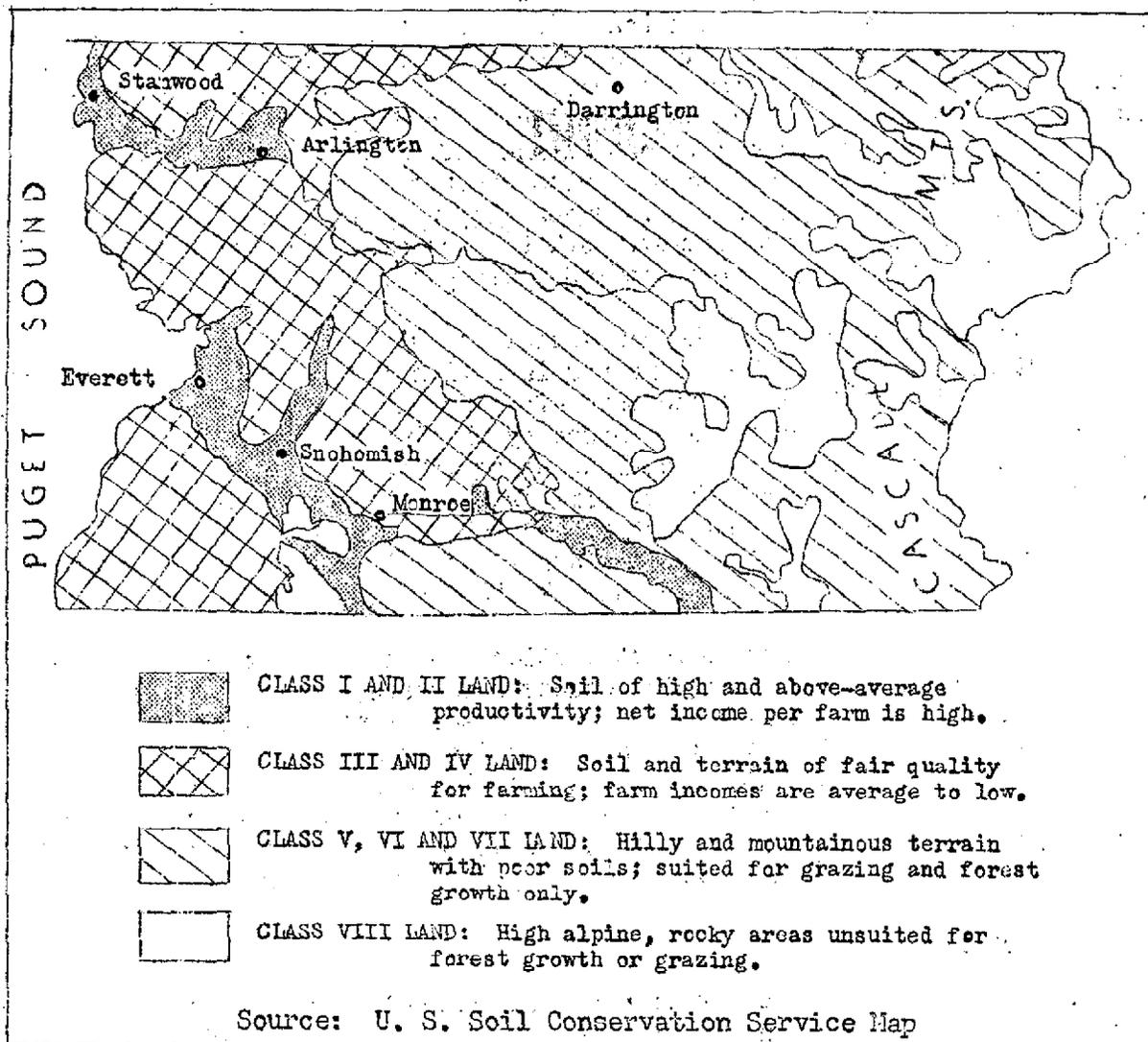


Figure 6. General Quality of Land in Snohomish County.

soils are well-drained on varying degrees of slope and are fair to poor for farming. The most common soil in the Class III and IV land is the Alderwood series, formed under forest cover on a subsoil of glacial gravel and sand. Intermixed with the Alderwood series are better farming soils such as Mukilteo and Rifle peat and Norma, Kitsap and Lynden loams which are formed in the more level areas in the vicinity of Arlington, Marysville and Granite Falls. The Everett series is extensive but is a poor farming soil because of its glacial till origin. Most of the area with the Everett soil is covered with regrowth woodland.

The amount of Class V land in Snohomish County is very minor. The major part of the county which includes the foothills of the Cascades as well as the Cascade Range itself is included in Class VI, VII and VIII lands. Farmland is limited to a few narrow valley bottoms and terraces in the Oso, Darrington, Sultan, Startup and Index districts. Some terrace soils of good quality are the Sultan loam in the Skykomish Valley and the Skykomish gravelly and sandy loams in the Skykomish and upper Stillaguamish Valleys. Generally, forest soils are well-suited for tree growth but they are located on land too steep for good pastures or cultivation.

Tidelands along the Sound and the deltas of the Stillaguamish and Snohomish Rivers cover nearly 2,000 acres in Snohomish County. The largest area of this type of land which has been reclaimed from the sea by diking and ditching is located west of Stanwood. From 5 to 10 years are required to wash out the salt before the soil is capable of producing good crops and pastures.

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
<u>SNOHOMISH</u>	<u>2,919</u>	<u>148,604</u>	<u>2,788,695</u>	<u>12,899,240</u>
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	7,398,464
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.

Farmland in Snohomish County declined after World War II. Land in farms amounted to 148,604 acres in 1959 compared with 194,687 acres in 1954. This reduction resulted not only from the change in farm definition but because farm lands went into other uses such as for urban and suburban development and for freeways and highways. In 1959, 11 percent of the county area was in farms as compared with the peak Census figure of 14 percent in 1945.

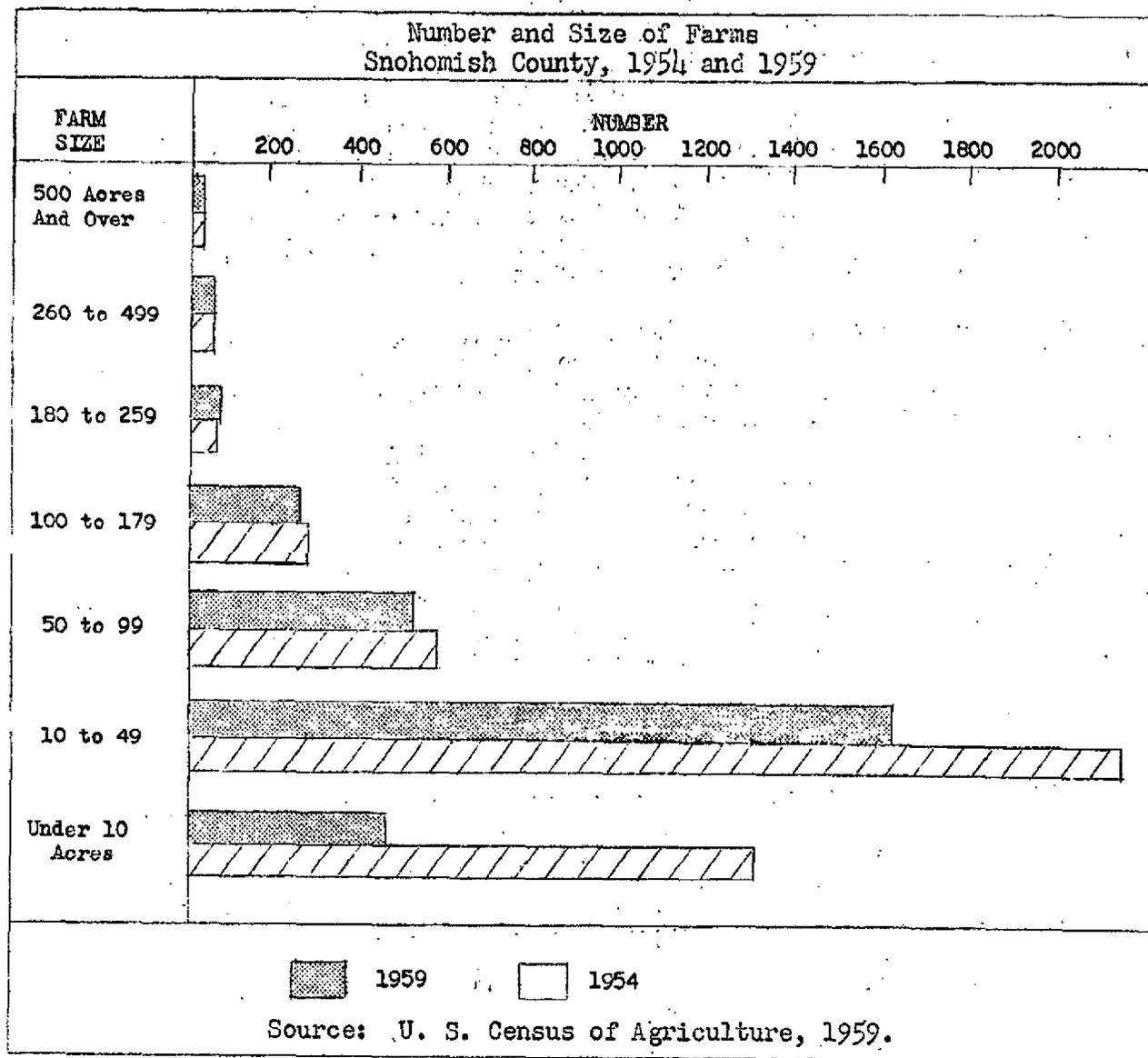


Figure 7. Number and Size of Snohomish County Farms, 1954 and 1959.

Types of Farms

Snohomish County has a variety of farm types, according to the Census of Agriculture. The most common type of farm in the county specializes in dairy products. In 1959, the Census reported that nearly 22 percent of the farms were dairy operations numbering 654 units. Next in number were livestock farms (other than poultry and dairy) which added up to 200 units or about 7 percent of the total farm figure. Poultry farms numbered 151 in 1959 and represented 5 percent of the county farm count. Fruit and nut production was the main activity for 95 farms, accounting for about 3 percent of all farms.