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 at 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 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, 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 season, 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 uplands 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.

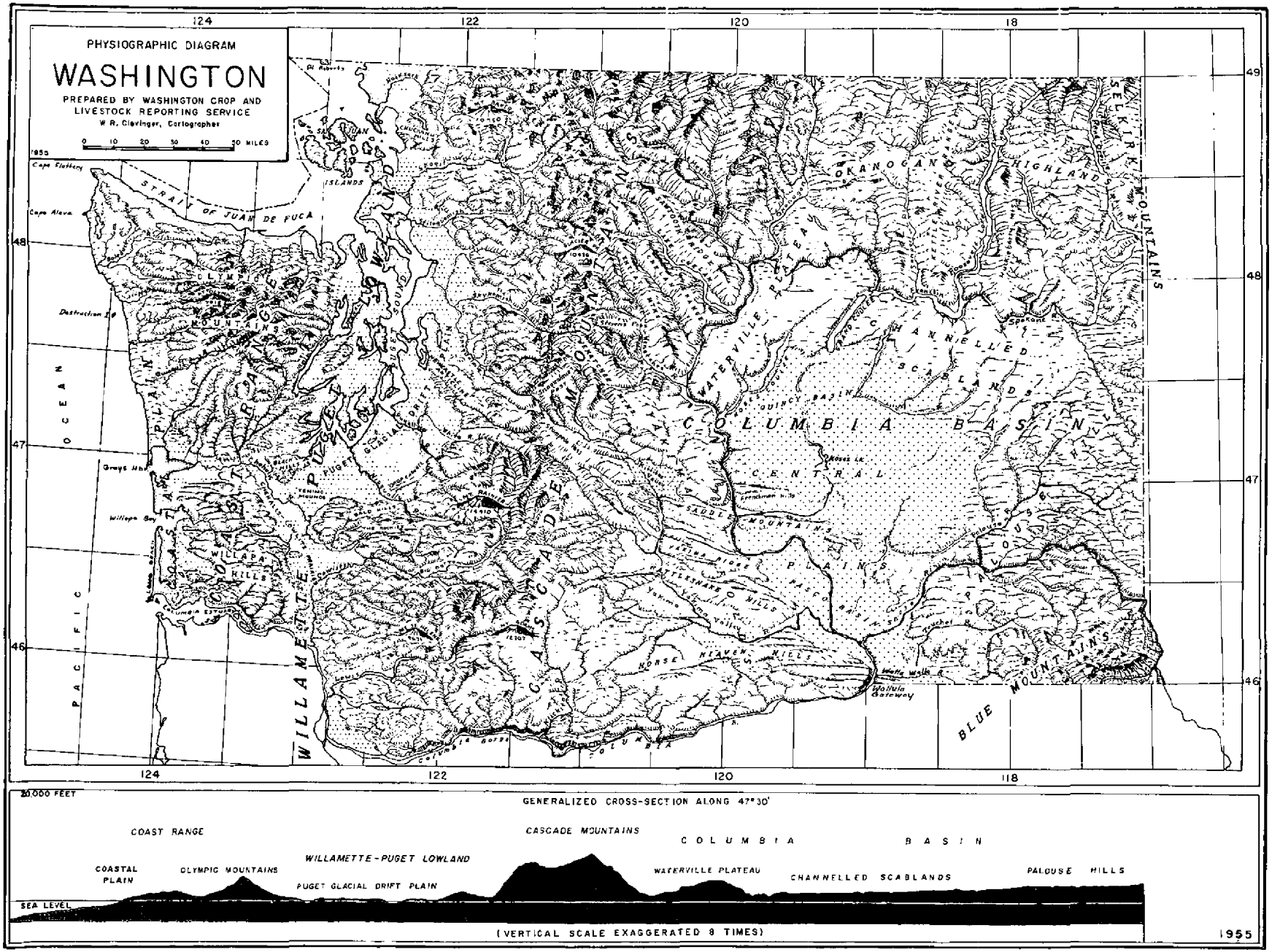
Topography of Grays Harbor County

Sharp contrasts characterize the topography of Grays Harbor County. Relief varies from coastal plains at sea level to elevations well over 4,000 feet in the northeastern part of the county. Grays Harbor County lies within two distinct physiographic regions which extend well beyond its political boundaries. The first is the Coastal Plains which lies between the Coast Range and the coastline. The second is the Coast Range which extends over the major part of the county. Within Grays Harbor County, the Coast Range is divided into the Olympic Mountain foothills in the north and the Willapa Hills to the south.

The Coastal Plains within Grays Harbor County include sandy, level lands, shallow bays, tidal flats, stream deltas and low headlands. The Plain is fairly narrow except in the southwestern part of the county around Grays Harbor. The harbor is protected by two sand spits--Point Chehalis and Point Brown. These spits were created from sediments brought into the harbor by the Chehalis River.

The Chehalis River flows through the Coast Range after entering the county at its southeastern corner. The Chehalis is an antecedent stream in that it existed previous to the uplifting of the area and maintained itself as the mountains were formed. The Chehalis River Valley and its tributary valleys of the Wishkah and Wynoochee Rivers are the key agricultural areas in Grays Harbor County. The coastal plains, flood plains, river terraces and river bottomlands of southern Grays Harbor County form the western portion of an agricultural region centered at the foot of Puget Sound in a trough between the Coast Range and Cascades known as the Puget Sound Lowland Prairies. The Puget Sound Lowland Prairies portion contains nearly all of the urban places, towns, rural homes and farms of the county.

The Coast Range with its rolling, hilly and mountainous terrain covers most of Grays Harbor County. Forest regrowth or recently cut-over land and erosion caused by heavy rainfall characterize the Coast Range within the county. Uplands extend from lower benchlands near the Chehalis River, the harbor and ocean shorelines northward toward the summit of the Olympic Mountains located in Jefferson County. The northern half of Grays Harbor County lies almost entirely in the


PHYSIOGRAPHIC DIAGRAM
WASHINGTON
PREPARED BY WASHINGTON CROP AND LIVESTOCK REPORTING SERVICE
W. R. Clevinger, Cartographer
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WILLAMETTE-PUGET LOWLAND
PUGET GLACIAL DRIFT PLAIN
PUGET SOUND
CASCADE MOUNTAINS
OKANOGAN HIGHLAND
SELKIRK MOUNTAINS
WATERVILLE PLATEAU
COLUMBIA BASIN
CHANNELLED SCABLANDS
CENTRAL
SADDLE MOUNTAINS
PLAINS
PALOUSE HILLS
BLUE MOUNTAINS
Spokane
Yakima
Wallula Gateway
Grays Harbor
Willapa Bay
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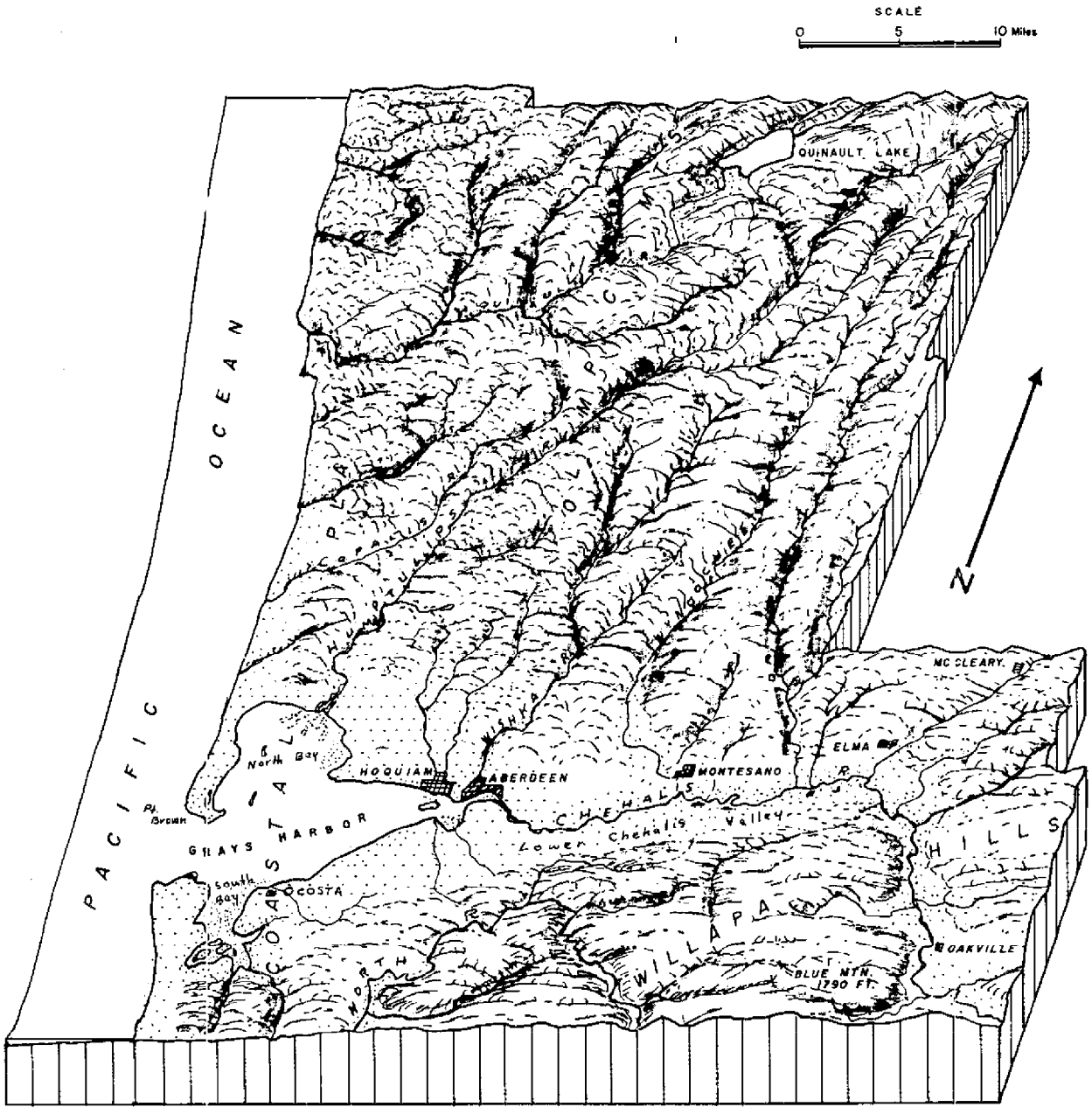
Cape Flattery
Cape Alava
20,000 FEET
GENERALIZED CROSS-SECTION ALONG 47°30'
COAST RANGE
CASCADE MOUNTAINS
COLUMBIA BASIN
COASTAL PLAIN
OLYMPIC MOUNTAINS
WILLAMETTE-PUGET LOWLAND
PUGET GLACIAL DRIFT PLAIN
WATERVILLE PLATEAU
CHANNELLED SCABLANDS
PALOUSE HILLS
SEA LEVEL
(VERTICAL SCALE EXAGGERATED 8 TIMES)
1955

TOPOGRAPHIC DIAGRAM

GRAYS HARBOR COUNTY



WASHINGTON CROP AND LIVESTOCK REPORTING SERVICE

W.R. CLEVINGER

foothills of the Olympics. Numerous streams flow southward out of this area into the sea, the harbor or the Chehalis River. The southern part of the county is in low foothills of the Willapa Hills which reach elevations of 1,790 feet in the upper North River area. Hilly topography, forest vegetation and poor drainage seriously limit the amount of land suitable for cultivation or grazing in both the Olympic foothills and the Willapa Hills.

Climate

The relationship of weather and climate to agriculture is very close. The climate of any region not only accounts for the patterns of flora that are native to the area but is an important factor in what man shall grow. 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, Grays Harbor County is located in an area which has the West Coast Marine type climate. Climatologists and geographers describe this type of climate as a temperate, rainy climate with warm summers. A distinct reduction in precipitation during the summer months also characterizes this type of climate. Grays Harbor, located on the west coast in a belt of cyclonic storms, receives ample rainfall from maritime polar air masses and has rather moderate temperature variations because of the proximity to the oceans from which the easterly moving air masses tend to drift landward. Because the continental polar air masses tend to move eastward, they rarely drift westward to visit the west coasts. Hence, severe dry-cold conditions are uncommon.

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

Station	Fahrenheit	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Aberdeen	Av. Max.	45.5	49.0	52.0	57.9	63.0	66.4	69.7	70.2	69.1	62.0	52.4	47.5	58.8
(12'	Av. Min.	33.9	34.6	36.0	39.4	43.5	47.7	50.4	51.0	48.2	43.4	38.0	36.2	41.9
elev.)	Mean	39.7	41.8	44.1	48.7	53.3	57.1	60.1	60.6	58.7	52.7	45.2	41.9	50.3
1931-60	Highest	66	70	79	84	92	101	104	97	97	85	69	62	104
	Lowest	6	8	21	25	29	34	37	39	33	19	11	16	6
Grayland	Av. Max.	47.6	50.0	51.6	55.9	60.0	63.3	66.3	67.0	67.2	61.2	54.2	50.0	57.9
(15'	Av. Min.	35.9	37.0	36.1	39.9	43.6	47.9	49.8	49.8	47.6	44.4	38.8	37.9	42.4
elev.)	Mean	41.8	43.5	43.9	47.9	51.9	55.6	58.1	58.4	57.4	52.8	46.5	44.0	50.2
1953-62	Highest	68	67	73	83	84	94	96	90	92	81	68	64	96
	Lowest	11	17	22	27	27	37	37	37	34	29	12	19	11
Oakville	Av. Max.	44.8	48.9	53.1	60.9	67.2	71.9	77.5	76.8	72.8	62.2	51.4	46.5	61.2
(130'	Av. Min.	32.0	33.1	35.0	38.1	42.2	46.3	49.8	50.1	46.4	42.2	36.5	35.0	40.6
elev.)	Mean	38.4	41.0	44.1	49.5	54.7	59.1	63.7	63.5	59.6	52.2	44.0	40.8	50.9
1931-60	Highest	66	72	77	89	97	98	105	102	97	86	74	66	105
	Lowest	0	4	13	22	22	32	35	34	29	20	3	11	0
Quinault	Av. Max.	44.1	47.2	51.9	59.7	66.2	69.9	75.6	75.0	70.2	60.2	49.5	45.4	59.6
R.S.	Av. Min.	34.6	34.9	36.5	39.8	44.2	48.1	51.0	51.5	49.4	44.9	38.3	36.2	42.5
(220'	Mean	39.4	41.1	44.2	49.8	55.3	59.0	63.3	63.3	59.8	52.6	43.9	40.8	51.1
elev.)	Highest	64	68	74	86	90	102	104	100	96	82	68	65	104
1931-60	Lowest	12	13	16	27	31	36	40	41	35	24	13	17	12

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

Grays Harbor County has relatively cool summers. Temperatures average from 58 to 64 degrees Fahrenheit in July and August, according to records from weather stations located both near the coast and in the interior of the county. The average maximum temperature during the warmest months ranges from 66 to 77 degrees throughout the agricultural areas of the county. Only occasionally are there periods of excessive heat. Temperature readings of 104 degrees Fahrenheit at Aberdeen and 105 degrees Fahrenheit at Oakville have been recorded.

Winters are mild in Grays Harbor County. Nearness to the ocean makes for a small annual temperature range between summer and winter. Mean temperatures average between 38 and 44 degrees Fahrenheit in December and January over the populated areas of the county while average minimum temperatures range from 32 to 38 degrees Fahrenheit. During a few unusually cold winters, the thermometer has dropped to zero at Oakville.

Table 5. Probability of Freezing Temperatures -- Grays Harbor County 1/

STATION	TEMP. (°F.)	PROBABILITY — SPRING					PROBABILITY — FALL					Growing Season Mean Length (Days)
		90%	75%	50%	25%	10%	10%	25%	50%	75%	90%	
Aberdeen	32	Mar 25	Apr 5	Apr 19	May 2	May 14	Oct 2	Oct 12	Oct 25	Nov 6	Nov 17	189
	28	Feb 20	Mar 4	Mar 17	Mar 31	Apr 12	Oct 31	Nov 11	Nov 23	Dec 6	Dec 18	251
	24	---	---	Feb 3	Feb 20	Mar 3	Nov 21	Dec 3	Dec 27	---	---	327
Oakville	32	Apr 13	Apr 25	May 9	May 22	Jun 3	Sep 17	Sep 28	Oct 10	Oct 22	Nov 2	154
	28	Mar 2	Mar 14	Mar 28	Apr 11	Apr 22	Oct 9	Oct 20	Nov 1	Nov 13	Nov 24	218
	24	---	Feb 6	Feb 25	Mar 12	Mar 25	Nov 3	Nov 15	Nov 29	Dec 21	---	277

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 Aberdeen is April 19. But there is also a 25 percent chance (1 year in 4) that a 32° freeze will occur as late as May 2, and 10 percent chance as late as May 14.

The length of the growing season in the county becomes shorter moving inland from the coast since land areas adjacent to large bodies of water have more immunity from frost and freezing temperatures than do interior locations. Growing season in the county varies from 154 days at Oakville to 189 days at Aberdeen. The length of the growing season is the average number of days between the last occurrence of a 32 degrees freeze in the spring and the first such occurrence in the fall. The season generally runs from April 19 to October 25 at Aberdeen while at Oakville it begins around May 9 and ends on or about October 10. Although the growing season is sufficiently long for growing crops, general coolness and low percentage of sunshine slow the rate of crop growth. The cooler air temperatures reduce evaporation and produce a very damp, humid climate with much cloud cover. Sunshine and warmer temperatures during mid-summer are reduced by coastal fogs. These fogs frequently flow up the Chehalis River estuary and over Willapa Bay from ocean fog banks which build up during the summer off the California, Oregon and Washington coast.

Temperature conditions in Grays Harbor County are good for grass farming and dairying, but only fair for making hay or for growing crops which need abundant

sunshine and warmth to mature properly. Frosts in the coastal bogs are hazardous to the area's cranberries during the bloom stage in the spring and before harvest in the fall.

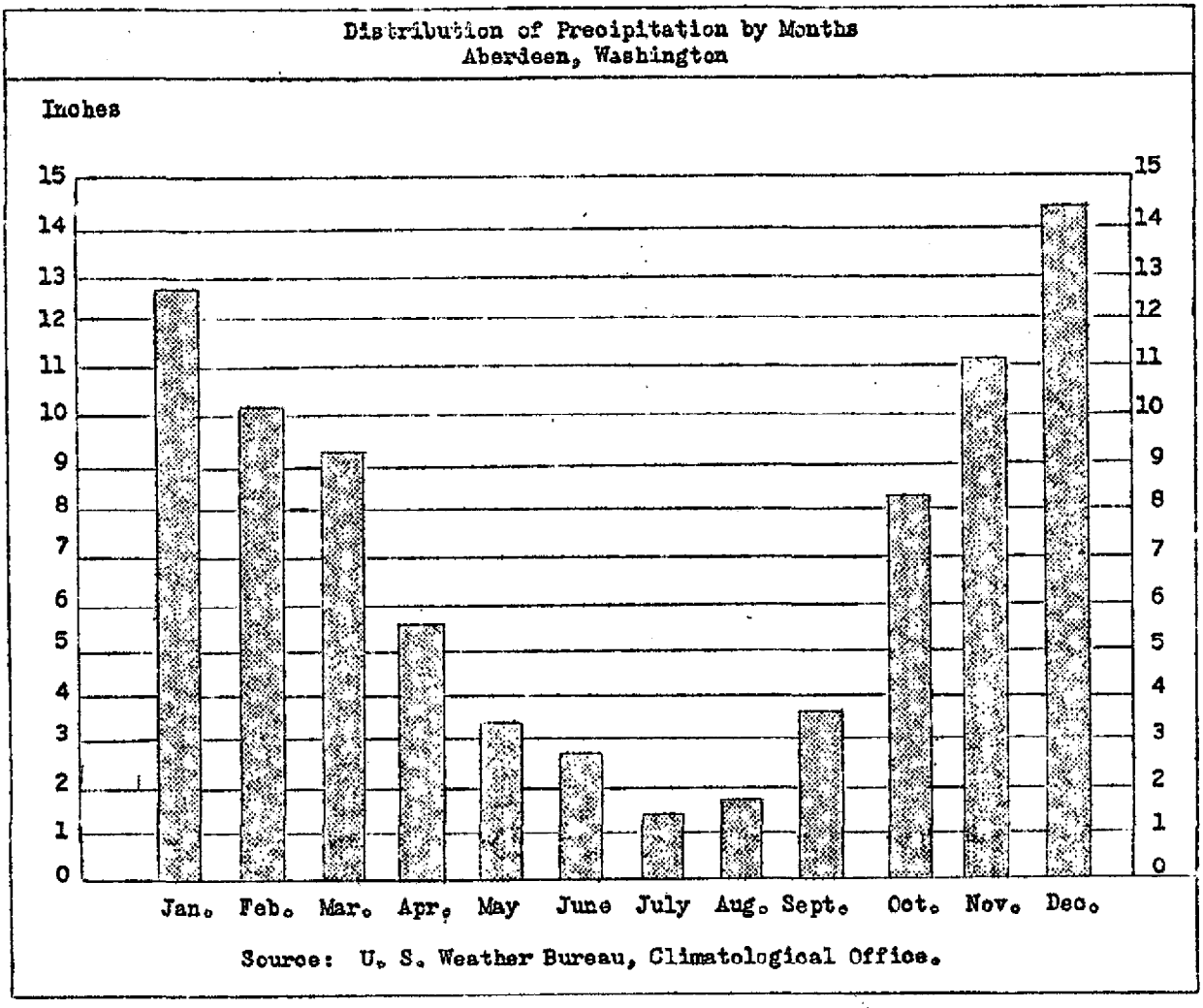


Figure 5. Distribution of Precipitation by Months
Aberdeen, Washington

The precipitation pattern in Grays Harbor County is closely related to elevation and exposure. The Coast Range influence upon rainfall and snow is extremely marked. An average annual precipitation of over 130 inches falls in the Olympic Mountains and the Willapa Hills as easterly moving air is forced up over these topographic features throughout the year. Lower points such as Aberdeen, located near the coast, receives an average of 84.54 inches of precipitation per year while Oakville, situated inland and in somewhat of a rain shadow, receives a mean of 54.55 inches.

Summers are relatively dry in the county because the oceanic subtropical high is more strongly developed and moves farthest north during this period bringing enough arid influence to produce a distinct decrease in summer rainfall. Also, the land being warmer than the ocean surface in summer causes the maritime air flowing inland from the Pacific to become heated rather than cooled. When air is

warmed it expands and can hold more moisture resulting in less rainfall during the dummer. Fog banks moving inland during mid-summer, however, frequently drop a fine drizzle.

The comparatively dry summers create a forest fire hazard. Farmers are often employed seasonally in protecting forest lands which make up most of the county's area.

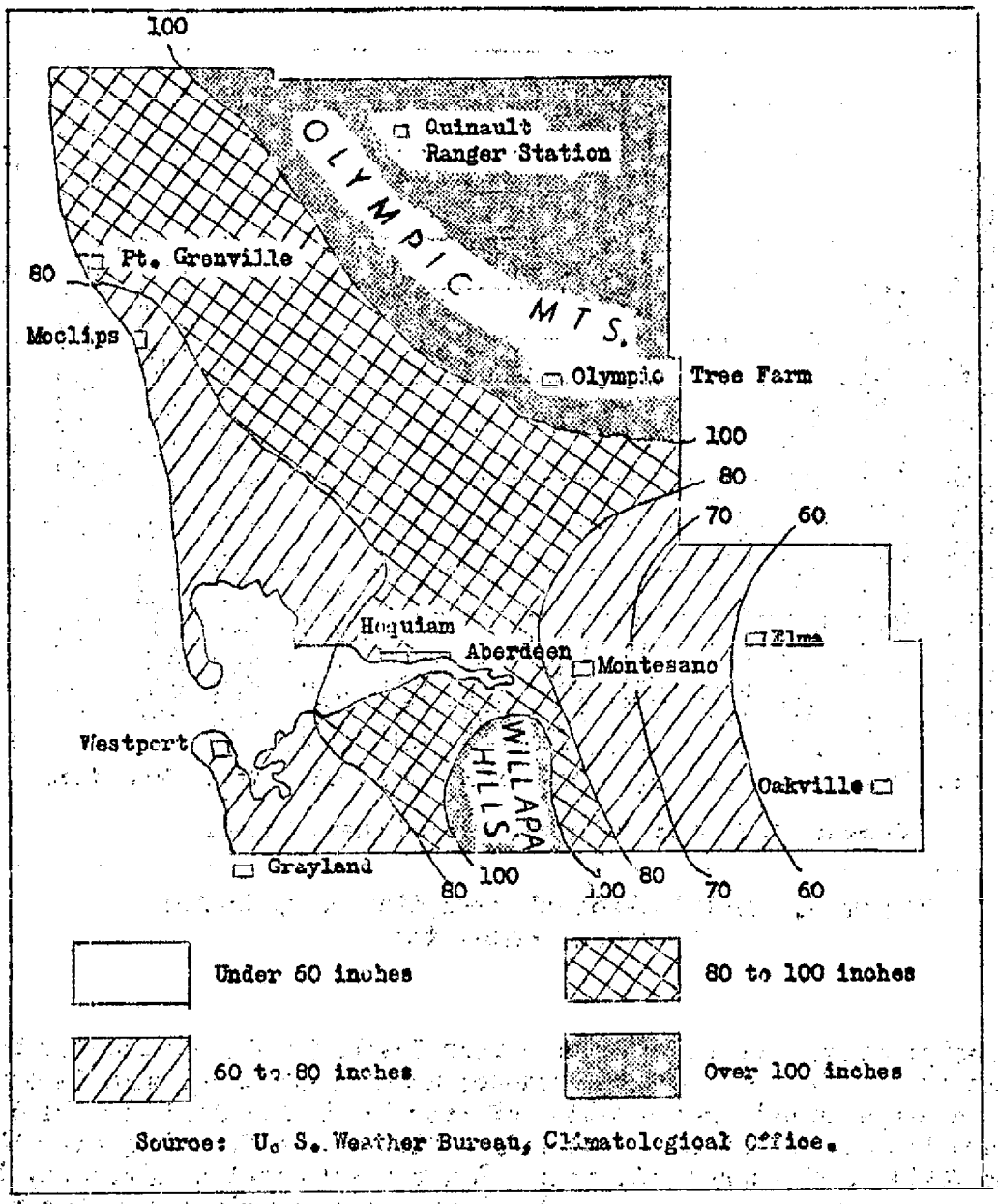


Figure 6. Distribution of Precipitation
Grays Harbor County

Table 6. Precipitation in Inches - Grays Harbor County

Station	Elevation (ft.)	Period of Record	Average Annual	Greatest Annual	Least Annual	Greatest Monthly	Least Monthly	Greatest Daily
Aberdeen	12	1931-60	84.54	113.49	58.21	35.70	.04	5.25
Grayland	15	1953-62	76.40	83.51	62.88	16.97	.12	3.50
Oakville	130	1931-60	54.55	73.51	34.10	27.89	0	4.31
Quinault RS	220	1931-60	134.43	169.22	94.61	50.39	T	12.00

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

Table 7. Precipitation for Selected Stations by Months
Grays Harbor County

Station	Average Monthly Precipitation (inches												Annual Total (inches)
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Aberdeen	12.70	10.23	9.19	5.56	3.42	2.70	1.51	1.79	3.71	8.13	11.09	14.50	84.54
Grayland	11.10	9.43	8.32	5.59	3.06	2.66	1.38	2.14	3.25	7.60	10.82	11.07	76.40
Oakville	8.49	6.56	5.70	3.34	2.28	1.86	.65	1.10	2.25	5.46	7.42	9.44	54.55
Quinault RS	19.95	15.94	14.22	9.98	5.90	4.31	2.60	2.79	6.00	13.25	17.52	22.75	134.43

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

Forest and Wildlife

Grays Harbor County has a combination of physical conditions highly favorable for the growing of forest crops. The original forest stands, among the heaviest in the Pacific Northwest, covered all but a very small part of the county's land area. After a century of white settlement, including several decades of large-scale logging, a forest inventory in 1951 classified 1,132,000 acres or approximately 93 percent of the total county area as forest land 1/. About 97 percent of the forest land was classes as commercial, i.e., physically capable of producing usuable crops of wood and not withdrawn from timber utilization. Major commercial forest types include Western hemlock, Douglas fir, Western red cedar and Pacific silver fir. It was estimated that there were nearly 21 billion board feet of live sawtimber on commercial forest lands in the county in 1951.

In 1951, about 60 percent of the commercial forest lands in Grays Harbor County was owned privately. The federal government owned 13 percent in national forests while about 15 percent of the commercial forests were in Indian ownerships The remaining commercial forest lands were the property of the state and other governmental ownerships. Timber harvested from all ownerships in 1961 amounted to 393,500 million board feet from 10,369 acres 2/. Grays Harbor County ranked third in the state in volume of timber harvested in 1961.

Much of the agriculture in the county was developed by men who were mainly employed in logging and lumbering in numerous mills and camps of the Grays Harbor region. As the timber was logged, farms were developed on the cut-over land. Management and harvesting of timber have permitted a continuous source of off-farm

1/ U. S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. Forest Statistics for Grays Harbor, Washington. (Mimeographed) Portland, Oregon, 1953.

2/ State of Washington, Department of Natural Resources, Olympia, Washington, Third Biannial Report. 1960-1962.

and part-time employment. Today, farm forestry is an important part of the county's agricultural economy. According to the Census of Agriculture, 102 Grays Harbor County farms sold $408,044 worth of forest products off farm lands in 1959. Over 60 of these farms sold standing timber valued at $129,380.

The county abounds in wildlife from seashores to high mountains. Salt water fishing and clam digging attract the tourist and sportsman to Grays Harbor's beaches. The Chehalis, Satsop, Wynoochee and Humptulips Rivers all provide good steelhead trout fishing for those so inclined. Hunters find farmland pastures and woodlands in the Chehalis Valley good pheasant and grouse areas. Many elk and deer roam the county's forested uplands. The county also has a rich wild fur resource. The wild fur catch during the 1962-1963 season in Grays Harbor County was as follows: 1,027 muskrat, 84 mink, 151 raccoon 61 otter, 3 red fox, 8 skunk, 43 civet cat, 2 weasel, 12 bobcat and 36 coyote. 1/

Land Classification and Soils

Land in Grays Harbor County has been divided into six classes of use by the Agricultural Experiment Stations, Washington State University and the U. S. Soil Conservation Service. The primary area of above-average farmland (Class I and II land) in the county is located in the lower Chehalis River Valley from Oakville to Montesano. Bottom land and lower terraces which are well-drained and not subject to seasonal flooding contain alluvial soils of fine texture and good depth. Most of the valley soils are of the Chehalis loam series which were stream deposited and are silty and sandy. Main deficiency of the soils is their acidity caused by the area's heavy rainfall which has leached away soluble minerals such as calcium and phosphorous. Most of this deficiency is corrected by the application of lime. The Wynoochee Valley, which joins the Chehalis at Montesano, has an important area of Class I and II land of alluvial Chehalis series soils. Class II land is also found in the lower Satsop Valley near Elma. The Grayland district inland from the sandy, coastal beaches contains a small area of Class I and II land. Soil in this district is sandy peat and muck soils with poor drainage but was given a high economic classification because of its suitability for cranberry culture.

Class III, IV and V land of average to fair productivity is found on the side slopes of the Chehalis Valley and in upper valleys of the Satsop, Wynoochee, Wishkah, Hoquiam and Humptulips Rivers. Soils are of the forest type and are varied in depth and texture. They are generally deficient in calcium and phosphorous and become dry in summer. Most of this land is used as unimproved or woodland pasture because it is not feasible to clear or to cultivate.

Class VI land covers about 85 percent of the county. Included in this classification are lands containing cut-over stumps, young regrowth forest and virgin forest not suitable for agriculture. The forest soils rate high in timber productivity but usually low for farm crop production. Rugged topography and high cost of clearing also discourage further conversion of forest land to farm use. Upland areas contain the Melbourne series of gravelly loam forest soils which are dry in summer and deficient in lime. The major area of this type land is found in the northern half of county within Olympic National Forest, Olympic National Park and Quinault Indian Reservation. The Willapa Hills in the southern part of the county

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1/ State of Washington, Department of Game.

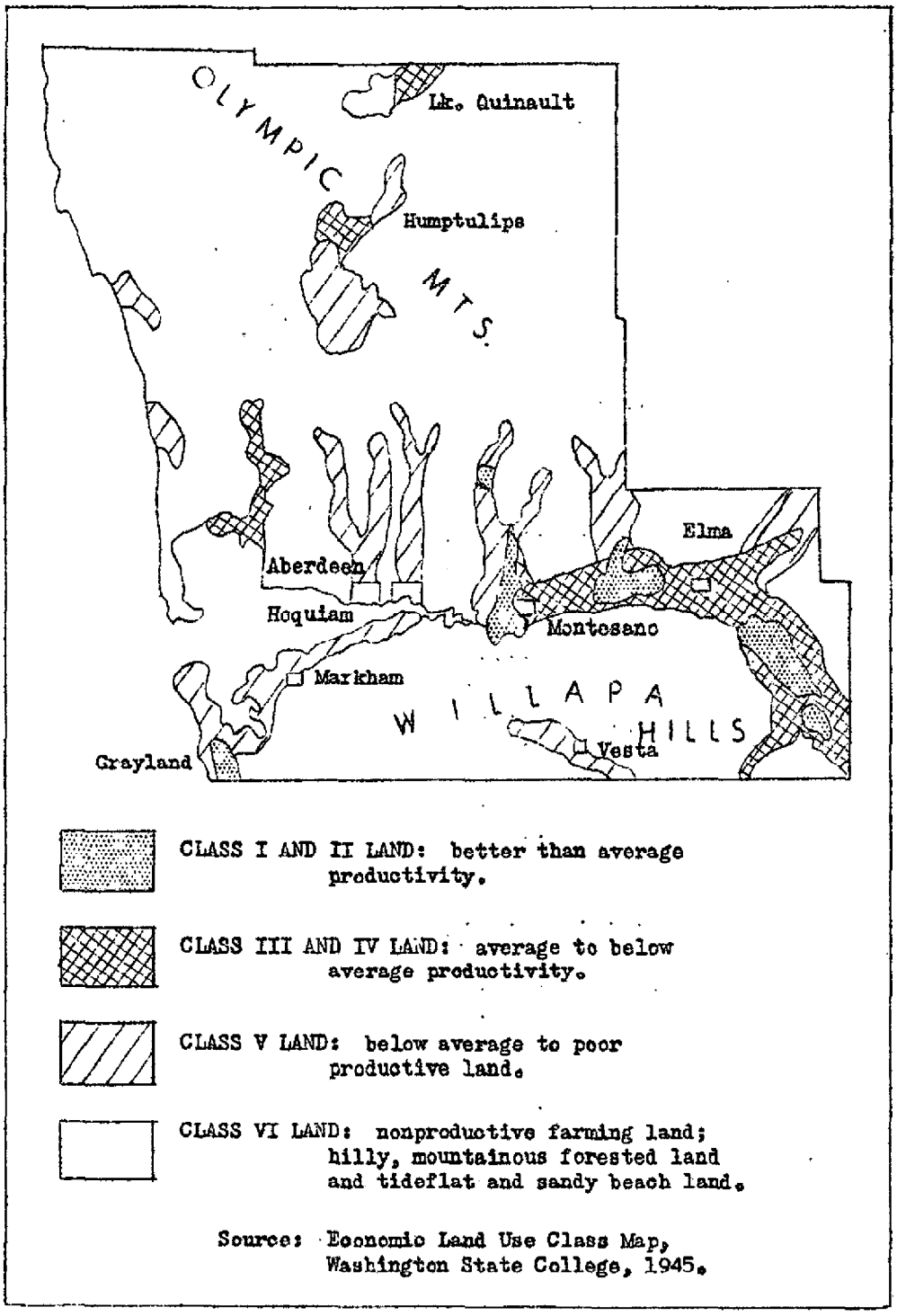

Figure 7. General Quality of Land in Grays Harbor County

also has the same land classification. Another type of Class VI land is the beaches and tideflats of the coastline where the soils are too sandy and/or brackish for growing crops.

Table 8. Grays Harbor County's Rank Compared With Other Washington Counties, 1959

Item Compared	Rank	Quantity
General		
Land area	15	1,229,440 acres
Number of farms	23	896 farms
Land in farms-percent	35	8.2 percent
Average size of farms	26	111.1 acres
Cropland harvested	28	18,632 acres
Irrigated land in farms	25	4,450 acres
Rural farm population (1960)	23	2,656 persons 1/
Total county population (1960)	12	54,465 persons 1/
Cash farm income		
Value of all farm products sold	29	3,563,844 dollars
Value of livestock sold	24	2,639,777 dollars
Value of crops sold	28	924,067 dollars
Livestock on farms		
All cattle and calves	22	18,911 head
Milk cows	11	6,884 head
Hogs	34	524 head
Chickens	17	46,809 birds
Horses and mules	31	367 head
Sheep and lambs	35	348 head
Dairy and poultry products sold		
Value of dairy products sold	13	1,637,308 dollars
Whole milk sold	13	40,276,389 pounds
Value of poultry products sold	17	227,251 dollars
Chickens sold	15	116,962 birds
Eggs sold	20	420,002 dozen
Important crops harvested		
Cranberries	2	260 acres 2/
Grass silage	5	5,194 acres
Green peas	9	1,022 acres
Clover-timothy	10	8,004 acres
Wild hay cut	14	1,324 acres

1/ U. S. Census of Population, 1960.
2/ Statistical Reporting Service, USDA.

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