When It Rains It Doesn't Pour

I've reached the land of rain and mud
where flowers and trees so early bud.
It rains and rains both night and day
in Oregon, it rains always.
Oh Oregon, wet Oregon,
as through the rain and mud I run,
I look about behind around
and see the rain soak in the ground,
I look about and see it pour
and wish it wouldn't rain anymore.

Oh, Oregon girls, wet Oregon girls,
with laughing eyes and soggy curls;
They'll sing and dance both night and day
'Til some webfooter comes their way;
They'll meet him at the kitchen door
Saying "wipe your feet or come no more."

—Manuscript from the Randall U. Mills Archives,
University of Oregon

Where Currents Merge: The Maritime Northwest

by Steve Johnson

Ten thousand years ago the last great advance of ice had peaked and was declining. Most of Canada and much of the United States was covered with ice and snow. But even then the area we call the Maritime Northwest, a thin strip of land 100 miles west to east, and extending the length of British Columbia, Washington, Oregon and northern California, was relatively moist, more humid than today, and green.

The glaciers extended into Washington, but in Oregon did not reach out much beyond the higher elevations of the present Cascade mountain range. The storm track, bringing moderate marine air into the region, was eight degrees further south than it is today. The climate of western Oregon shifted accordingly and was more like the present day climate of the British Columbia coastal area.

It was this narrow strip of land that allowed the migration of tribes from the Asian continent; with its north and south running mountains, the green belt of land also allowed for the migration of plants and animals, throwing their seed forward in advance of the glaciers, like a vital dossier, keeping their DNA instructions just ahead of extinction.

The effects of the glacial activity are still visible in both Washington and Oregon. The North Cascades remain uncovered by earth, and this region is today the largest glaciated area in the continental United States. Puget Sound is the result of glacial flooding that covered a series of river valleys. The Scablands in eastern Washington are the result of a flood that emptied a lake one-half the size of Lake Michigan out over the eastern part of Washington, down the Columbia River, and up the Willamette. This same flood rushed out across Washington, through the Columbia Gorge and, at the confluence with the Willamette, was deflected up the valley, creating a lake (400 feet deep) extending as far as Junction City in Lane County.

Deposits of material transported from such floods fill the valley floors of the Maritime, creating sometimes shallow topsoil on top of undigested upper elevation material (gravels), or deposits of very fine material, known in the geological trade as "rock flour."

The Maritime has many characteristics that remain constant throughout, but there may be as much climatic variation within the region as there is between the region itself and other regions.

Coastal Region

Running north and south is a thin strip of flatland that extends between the high tide and the Coast Range. The flow of flat and rolling land on this strip is interrupted by jutting rocky headlands, made of more resistant material, laced between sand dunes and flooded river valleys, where harbors open up to the sea and most of the coastal people live.

The air off the Pacific Ocean moves

east past the flatlands through small valleys, past rounded and often cut-over hills, where alder and salmon berries and upstart Douglas firs bask in weeks and years of drizzle, and over the Coast Range. In Oregon the Coast Range mountains rise to an average of 3,000 feet, from just south of Bandon, where the Coquille River Valley is separated from the Umpqua River watershed by the beginnings of the Klamath/Siskiyou mountains, north to the Columbia River.

The Olympics

North of the Columbia River the Coast Range continues, almost merging with the Cascade Range, separated only near Longview/Kelso by the Cowlitz River which flows south into the Columbia. Further north begin the Olympics, separated from the mainland by Puget Sound, rising over 3,000 feet above the normal elevation of the Coast Range and containing the only glaciers in a coastal mountain range in the continental United States.

Siskiyou/Klamath Region

To the south of the Coast Range in Oregon, the mountains of the Coast and the Cascade ranges merge to form what the locals sometimes refer to as the country of Jefferson, a higher plateau, where mountains come down to the sea's edge and where the Eastern Oregon and Maritime blend of climate and environment create a mixed, almost New England-like forest with both hard- and softwood trees.

Valleys and Lowlands

Running mostly north and south, between the Coast Range and the Cascades, there appear many valleys and lowlands. In two of these areas, the Puget Sound lowlands and the Willamette Valley, two-thirds of the people of the entire northwest region (Oregon, Washington and Idaho) live and work.

The Puget Sound lowland is the remains of a valley which flooded as the glaciers retreated. The San Juan and Gulf islands, and the large Vancouver Island, are remnant highlands, tossed about in the water like ill-fitting picture puzzle pieces. Sew the land back together and the Puget Sound lowlands would be a river valley similar to the Willamette Valley.

South of Puget Sound lie several smaller river valleys. The largest is created by the Chehalis River, which flows west to meet the Pacific; while others, the Cowlitz, Toutle, Kalama and Lewis rivers flow to meet the Columbia. Mt. St. Helens is sentinel for the area; engineers operate, using bulldozers as surgical tools, on the damaged watersheds from the mountain's recent eruption.

Fifty miles south of Mt. St. Helens, the Columbia and Willamette Rivers come together, creating a lowland that is separated from the Tualatin Plains on the west by the Tualatin Mountains and on the east by the foothills of the Cascades. On the south the area is separated from the broader expanse of the Willamette Valley by the near convergence of the Cascade foothills and the Tualatin Mountains. This is the greater Portland area and the beginning of the Willamette Valley.

The Willamette Valley

The Willamette Valley separates the Coast Range from the Cascade Range, between the Columbia River on the north and the Siskiyou/Klamath mountains on the south. It is approximately 100 miles long and 40-50 miles wide.

The drainage area of the Willamette River is 11,000 square miles, which represents 11.7 percent of the land area of the state, while containing two-thirds of the state's residents.

It seems likely that before native Indian habitation the valley was more completely forested, filled with alders, cottonwoods and maples along streams, and lodgepole pine covering the rest.

By the time the early white explorers and settlers came to the valley, the vegetation was altered. The settlers found open prairie land. The native Indians conducted annual burnings of vast stretches of the valley, and earth records reveal that these intentional burnings dated back at least as far as 1647.

It is thought the burning was a form of game management. Deer and other animals were forced to graze on the remaining unburned areas where they could be easily hunted. Honey and grasshoppers became easier to harvest, as well as the seed of the sunflower plant and the tarweed, which was referred to by the white settlers as "wild wheat."

Early white settlers were surprised by the burning just as today's newcomers to the region are surprised by late summer air pollution from grass field and forest slash burnings:

It is probable we did not yet know that the Indians were wont to baptise the whole country with fire at the close of every summer; but very soon we were to learn our first lesson. This season the fire was started somewhere on the south Yamhill, and came sweeping through the Salt Creek Gap. All our skill and perseverance were required to save our camp. As the shades of night deepened, long lines of flames and smoke could be seen retreating before the breeze across the hills and valleys.
(Jessie Applegate, 1844)

The Willamette Valley is actually a broad flatland with several distinct sections. From the beginnings of the Siskiyou/Klamath Mountains, south of Eugene, and north of the confluence of the McKenzie and Willamette Rivers, the valley floor is narrow and flat, only occasionally interrupted by a few volcanic buttes.

Further north, near the junction of the Santiam River and the Willamette, several hills intrude on the valley floor: the Waldo Hills on the east and Eola Hills on the west. Just north of Salem the valley opens up, reaching its maximum width and flattest terrain. Here the Pudding and Molalla rivers flow into the Willamette, while from behind the Eola Hills, on the west, the Yamhill River, for a short period an important transportation river, flows east also to meet the Willamette.

Past the junction of the Yamhill River, near Newberg, the Willamette curves toward the east to skirt the southern edge of the Chehalem Mountains, a short spur of the Coast Range (1,000 feet elevation at Bald Peak), which separates the Yamhill River from the Tualatin River.

Greater Portland Area

Here, on the west, we pass into the Tualatin Plains, and into the Greater Portland area through its western gate.

The Tualatin Plains

The valley created by the Tualatin River is about 200 miles square. Today it is home to some 200,000 people. It is a microcosm of the Willamette Valley surrounded on all sides by hills and

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mountains. The settlement of the valley has spread out across the lowlands; developers, taking advantage of the "cheapest" landscape, displace farms along the way.

The Tualatin Plains are separated from the Yamhill River by the Chehalem Mountains, which act as an additional buffer from the moisture-laden storms passing through the Coast Range. At the peak of the mountains the annual average rainfall is 54-55 inches, whereas only several miles northeast near Aloha on the Tualatin Plains, the annual average rainfall is 38 inches. Compare this to downtown Portland with an annual average rainfall of 46 inches.

Oregon City

Past the junction of the Tualatin River, the Willamette Valley narrows down to a few miles in width. On the west the Chehalem and Tualatin Mountains come close to the river's edge, while on the east a ridge of the Cascades, which separates the Molalla and Clackamas river watersheds, comes close to the shore of the river as it falls 30 feet at Oregon City.

Here both salmon and settlers have come to rest; the salmon do not naturally make it past the falls, and the settlers stopped here, forming Oregon's leading city in the 1840s. But Oregon City was not destined to continue its primary role due to its restricted physical site and inaccessibility by river for larger boats.

Oregon City is the southern gateway into the Greater Portland area and, because of prevailing wind patterns, has some of the highest air pollution readings in the area.

Clackamas River

As we move downriver from Oregon City, the Tualatin Mountains begin to take hold of the landscape on the west side of the river; on the east side the Clackamas River joins the Willamette. The Clackamas passes mostly through a narrow channel, seldom given a chance to meander in its 80-mile journey.

The town of Estacada, 30 miles southeast of downtown Portland along the Clackamas River, is the last outpost before the Cascade Mountains. The climate of Estacada is a far cry from downtown Portland, with 100 fewer days in the growing season and 15 inches more annual rainfall.

Above the Clackamas on the north and south are plateaus punctuated by higher hills. On the south is an open prairie area which in former days was referred to as Horse Heaven Ridge. Just west of McIver Park is an excellent viewpoint of the brief Clackamas River Valley. To the north of the Clackamas, the westward expansion of Portland creates an incongruous mix of berry farms, tree nurseries and post World War II housing developments.

Both plateaus, especially Horse Heaven Ridge, are under the influence of the Columbia Gorge winds, and both have more rainfall and snow accumulations than the city of Portland. Gresham, for example, several hundred feet above the elevation of downtown Portland, experiences about 55 inches of rainfall annually.

Columbia Gorge

The Columbia Gorge commences graphically at Troutdale, a small community just above the Columbia River floodplain and at the confluence of the Columbia and Sandy rivers.

West of Troutdale, the east wind, as it is simply referred to, fans out over the flatlands of suburban east Portland. During January the wind can sweep through Portland, trapped between the bluffs north and east of Vancouver, Washington, and the hills of far southeast Portland (Mt. Scott, Kelly and Powell buttes), rush toward the Tualatin Mountains and (sometimes) bully its way over the Tualatin Plains and clear across the Coast Range. But more often

Bird's Eye View of Portland Area
Key to Symbols

The Greater Portland Area Map has letters which represent types of features, e.g. B stands for historic buildings, D for dams, etc. After each named feature in the list below is a letter and number. To locate the feature on the map, locate the spot on the map where the number and letter intersect, using the border as a guide.

The area described as the little Sahara (J-P, 1-3) is one of the driest areas in the Willamette Valley and has the only natural occurrence of ponderosa pine trees in the valley.

Predominant winds in this area would not normally blow the smoke in the direction illustrated on this map.

a Arboretums
Clackamas Cmy College T12
Hoyt J5
Sinclair (pvt) E6

B Buildings, Historic
Ainsworth House S10
Baker Cabin P15
Bybee-Howell House F3
Caples House, Columbia City D5
Cedar Mill P.O. (Young House) J2
Fanno House L2
Ft. Vancouver Natl. Mon. G7
Holmes House (Rose Farm) S10
John Tigard House N1
Lancaster House D6
McLoughlin House Natl Hist Site R10
Pittock House J5
Sweek House (Willowbrook) Q2
White-Kellogg House T9

D Dams
Ariel C9
Balch Creek J5
Beaver Lake T15
Oswego Lake N7-P7
Oswego Iron & Steel Co. River Dam R6
Swift Creek C14
Yale C13

F Falls and Rapids
Bonnie Falls D2
Cedar Mills Falls J2
Clackamas Rapids Q9-Q10
Clackamas Whitewater Q10-Q11
Lucia Falls D12
Marble Creek Falls C10
Moulton Falls D13
Salmon Creek Falls E13
Willamette Falls R9

g Gardens
Berry Gardens M7
Bishop's Close M8
Crystal Springs Lake (rhododendrons) K8
Eden Gardens K3
International Rose Gardens J5
Japanese Gardens J5
Klager Gardens (lilacs) D6
Leach Gardens L12
Lindum (rhododendrons) J4

G Geological Features
Carver Cliffs and Chasms P14
Cave of the Winds (pvt) D12
Coalca Pillar U7
Honey Hollow Lava Tubes J4
Sullivan Gulch Flood Channel J9-J10

h Historic Places
Ft. William site F2
Gladstone Chautauqua site P11
Lewis & Clark sites
Camp by Postoffice Lake E5
Camp at Nechakolee (Blue L) H14
Clark's St. Johns camp G4
Clark's Point of View H5
Luelling Orchard M8
Oswego Smelter Furnace N7
Pearson Airpark (Soviet Airmen's Monument) G8
Willamette Stone J4
Woodham Grist Mill D9

M Museums (except for 7 downtown)
Astronomy Center G4
Clackamas County Museum R10
Grant House, Officers' Row G8
Lelooska's Indian Museum C9
Nature House M6
OMSI K5
Trojan Visitor Center C5
Washington County Museum H1
Western Forestry Center J5

R Recreation, mainly water sports
Battle Ground Lake SP D 11
BLue Lake H15
Cathedral Park G4
Clackamette CP Q10
Cook Park (City of Tigard) P2
Daybreak CP D9
Elk Rock Island M8
Hebb CP U6
Henrici Bar D5
Izaak Walton Beach E5
Kelley Point (Port of Portland) F4
Lewisville CP D10
Marine (Vancouver) G9
Marshall Beach (pay park) E4
Mary Young SP Q9
Moulton Falls CP D13
Paradise Point SP D7
Reeder Beach (pay park) E4
Riverside CP P12
Tomahawk Island G7
Willowbar Islands E5
Wintler Park (Vancouver) G9

r Routes, Historic
Boone's Ferry Road N5
Foster Road M15
Jason Lee Trail E1
Logie Trail F1
Military Road M7
Plank Road (Canyon-Walker) J1-K4
Scholl's Ferry Road (Hy 210) M1
Taylor's Ferry Road ML7-P1

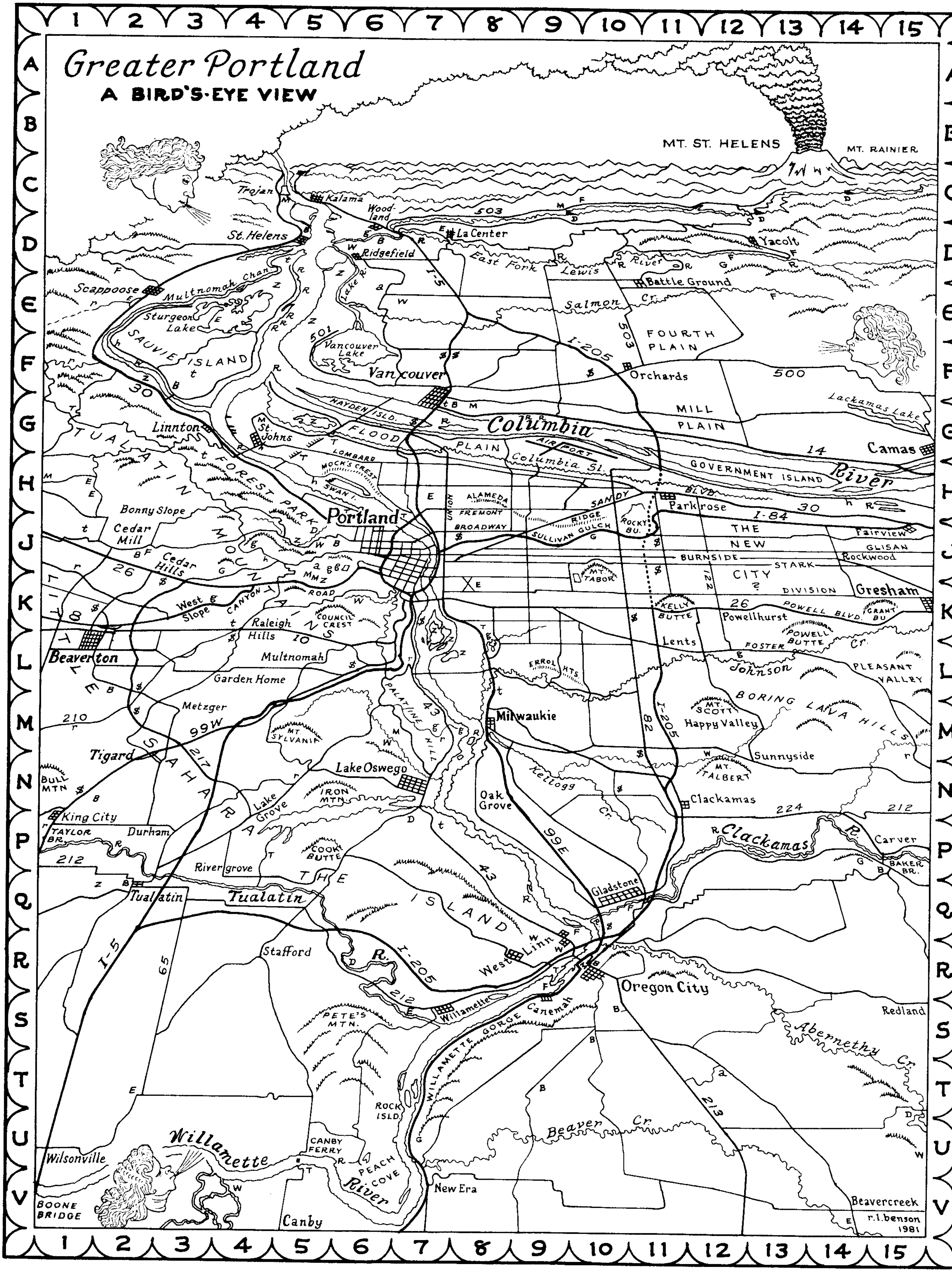
$ Shopping Malls
Beaverton (Bernard) K1
Burlingame L6
Canterbury N1
Cedar Hills K3
Clackamette Q10
Eastport Plaza K10
Gateway J11
Hazel Dell F7
Jantzen Beach G7
John's Landing-Water Tower K7
Lloyd Center J8
Mall 205 J11
North Clackamas M11
Progress L2
Raleigh Plaza L4
Vancouver Mall F10
Washington Square M2
Westwood Center N10

T Transportation
Albina Yards H7
Brooklyn Yards K8
Canby Ferry U5
Cornelius Pass Tunnel G1
Lake Yards H6
Oswego Canal P4
Peninsula Ditch (B.N.) H5
Peninsula Tunnel G5
West Linn Locks R9

t Trees
Abernethy Elm Q10
Champion Ash D5
Champion Butternut K4
Glenmorrie Street Trees P7
Milwaukie Redwoods L8
Oak Ridge Oaks F3
Presidential Grove (firs) H3
Teufel Pine J1
Vancouver Apple G7

W Wild Areas
Abernethy Creek Old-Growth U15
Camassia R9
Forest Park H4
Macleay Park J5
Marquam Gulch K6
Middle Grounds (U.S.) D6
Pudding-Molalla Delta SP V4
Mt. Scott Creek Canyon M12
Tryon Creek SP M6
Virginia Lake F2
Whipple Creek CP E7
Wilderness Park (West Linn) Q9-R9

Z Zoology
Government Island H12-H13
Hardtack Island L7
Oaks Bottom L7-L8
Pittock Bird Sanctuary J5
Rafton (cranes) F2
Ridgefield Wildlife Area (U.S.) D6
Ross Island (herons) K7
Shillapoo-Vancouver (WA game dept) E5
SIGMA (Sauvie Isld) (OR game dept) E4
Smith Lake G5
Tualatin Wetlands (Hedges Creek) Q1-Q2
Zoo K5


Greater Portland
A BIRD'S-EYE VIEW
MT. ST. HELENS
MT. RAINIER
Trojan
Kalama
Woodland
503
La Center
Yacolt
St. Helens
Ridgefield
East Fork
Lewis
River
Battle Ground
Scappoose
Multnomah Chan.
Lake R.
I-5
Salmon Cr.
Sturgeon Lake
SAUVIE ISLAND
501
Vancouver Lake
503
FOURTH PLAIN
I-205
Vancouver
Orchards
500
30
Lackamas Lake
HAYDEN ISLD.
Columbia
MILL PLAIN
Linnton
St. Johns
FLOOD PLAIN
AIRPORT
Columbia Sl.
14
Camas
TUALATIN FOREST PARK
LOMBARD
MOCK'S CREST
SWAN I.
GOVERNMENT ISLAND
River
ALAMEDA
SANDY BLVD.
Parkrose
I-84
30
Bonny Slope
Portland
FREMONT
RIDGE
ROCKY BU.
Cedar Mill
MOUNTAINS
BROADWAY
SULLIVAN GULCH
THE NEW CITY
Fairview
GLISAN
Cedar Hills
26
BURNSIDE
Rockwood
STARK
MT. TABOR
DIVISION
Gresham
122
West Slope
CANYON ROAD
KELLY BUTTE
26
POWELL BLVD.
GRANT BU.
Powellhurst
COUNCIL CREST
Raleigh Hills
10
Lents
POWELL BUTTE
FOSTER
Cr.
Beaverton
Multnomah
LITTLE
ERROL HTS.
Johnson
PLEASANT VALLEY
Garden Home
PALATINE HILL
43
BORING LAVA HILLS
Metzger
Milwaukie
MT. SCOTT
Happy Valley
210
99W
MT. SYLVANIA
82
I-205
Tigard
SAHARA
217
Sunnyside
Lake Oswego
Kellogg
MT. TALBERT
BULL MTN
IRON MTN.
Oak Grove
Clackamas
Lake Grove
224
212
King City
TAYLOR BR.
Durham
99E
Clackamas
Carver
212
COOK BUTTE
BAKER BR.
River grove
THE ISLAND
43
Gladstone
Tualatin
Tualatin
R.
I-205
Stafford
West Linn
I-5
65
Oregon City
212
Willamette
Canemah
Redland
PETE'S MTN.
WILLAMETTE GORGE
Abernethy Cr.
213
ROCK ISLD.
Beaver Cr.
Willamette
CANBY FERRY
PEACH COVE
Wilsonville
River
New Era
BOONE BRIDGE
Canby
Beavercreek
r.l.benson
1981

the winds are felt only in the Gorge, with significant differences in frequency (and strength) of the wind appearing even between Troutdale and the Portland International Airport only eight miles distant.

Columbia River Floodplain

Along the Columbia between Troutdale and the river's junction with the Willamette are the lowlands of the Columbia floodplain. Before the settlement of Portland extended its grasp, the flatland was more laced with entrenched riverwater ponds and sluggish sloughs. The wetlands, once called home by millions of malaria-carrying mosquitos, are mostly gone. The Bybee and Smith Lake area probably most resembles the previous state of the floodplain.

At the actual junction of the Willamette and Columbia lies Sauvie Island, a rich delta area that, without mountains and volcanos in the distance, could be mistaken for a midwestern farm area. The island is the largest island in western Oregon and contains the largest natural lake, Sturgeon. In the middle of Sturgeon Lake, this largest lake on the largest island, is an island—Oak Island—where large oak trees stand guarding a place where Indians came to seek spiritual awakening.

From the northwest corner of the Portland International Airport, northwest toward Sauvie Island, is the most dramatic rainfall shadow area in Portland. The average rainfall here is 38 inches, compared with 46 inches in downtown Portland.

Vancouver, Washington

The city of Vancouver, site of the earliest settlement in the region, is in a small bowl bordered on three sides by mountains. East of Vancouver several plains, like steps, ascend toward the Cascade Mountains. There are more fogs here than in the rest of the Greater Portland area and frosts have been recorded all year round.

The New City

Stretching between the actual city boundary of Portland and Gresham is Oregon's third largest (but unincorporated) city. The area is predominantly flat but gently rises from downtown Portland toward the Cascades. As moisture-laden air ascends once again it drops increasing rain on the land, resulting in slightly higher rainfall than in downtown Portland.

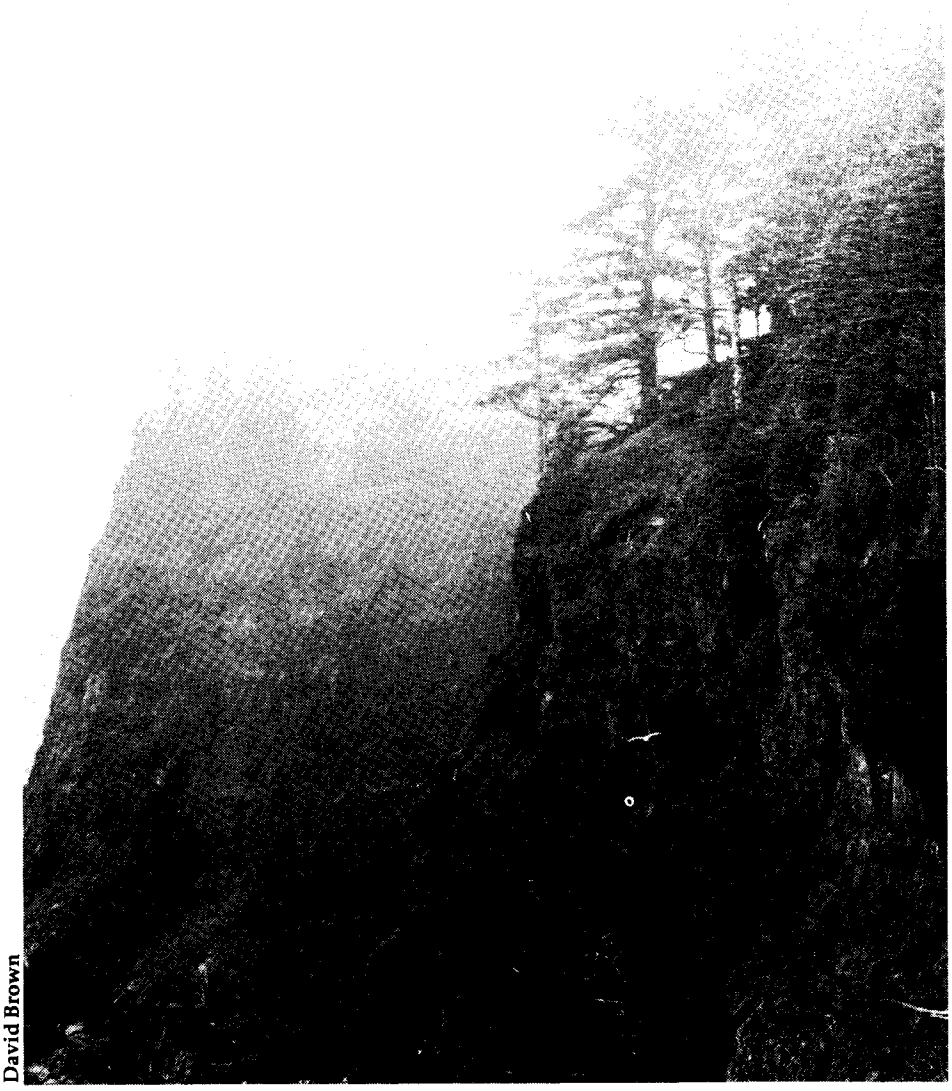
North Portland Peninsula

The Willamette River bends away from its northward flow through Portland near Sullivan's Gulch (Highway I-84), flowing from there southeast to northwest until its junction with the Columbia.

At the point where the river bends to the west, I-5 straightens out and begins its flow due north toward the Columbia. The neighborhoods to the west of I-5—Overlook, Arbor Lodge, Kenton, University Park, Portsmouth and St. Johns—are pinched between this man-made barrier (I-5), the high ridge along the Willamette (Mock's Crest), and the Columbia River floodplain.

St. Johns, the "capital" of the area, feels a world apart from Portland. In 1898 it lobbied successfully to separate from Portland, and it remained separate until 1915. Even today, St. Johns mumbles under its community breath about seceding.

Some of the area lies within the rainshadow of the Tualatin Mountains and therefore gets slightly less rainfall



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than downtown Portland.

Northeast

From the shores of the Columbia the land rises 200 feet to the ridge where the Alameda, Beaumont-Wilshire and Rose City Park neighborhoods are built.

There are few tree islands* in the northeast, except along the Alameda ridge and down 100-150 feet into the Irvington and Grant Park neighborhoods.

The lowland neighborhoods—Piedmont, Woodlawn, Concordia, Humboldt, King, Sabin, Eliot and Hollywood—are exposed to the sun with less obstruction from hills, trees and close buildings. During the summer, a Tualatin Mountain shadow resident on the west side of the Willamette experiences several hours of cooling conditions after the sun has passed behind the ridge, while the lowlands to the southeast and northeast are still in full daylight.

*Tree Island: areas with more natural or man-made expanses of vegetation.

River Bend

The Willamette River bends in two places in Portland. In the north the University Park, Arbor Lodge, Overlook and Eliot neighborhoods border Mock's Crest, where Lewis and Clark surveyed and reported on the Willamette River. The land drops down to Mock's Bottom and Swan Island, a pattern that is duplicated further south where Sellwood, Westmoreland and Brooklyn border Oaks Bottom.

At the Oaks Bottom river bend are Ross and Hardtack Islands, home of Portland's only Blue Heron Rookery. The area neighbors one of Portland's most extensive patchworks of tree islands.

Southeast Tree Islands

Oaks Bottom is separated by only a few blocks in the Sellwood neighborhood from Crystal Springs and Johnson Creek, the tree islands of Eastmoreland and Garthwick, the headwaters of Crystal Springs at Reed College, the golf course greenways of Waverley, and the parks of Eastmoreland and Johnson Creek, Tideman Johnson and Westmoreland.

There are two other notable tree island areas in southeast: Laurelhurst and Ladd's Addition. The Laurelhurst neighborhood encircles the park and its small, spring-fed lake like a large amphitheater. Under Ladd's Addition is a cleverly disguised small watershed. Old maps of Portland (1868) show many springs in lower southeast starting around 12th and Hawthorne and running south to Reed College—all now dried up or encased in metal drainage tubes.

Southeast Lowlands

Northeast Portland is separated from Southeast, according to the street grid, by Burnside, but the decisive natural feature is Sullivan's Gulch (I-84). Between southeast and northeast there is a cement maze that includes several of the city's major thoroughfares (Sandy Blvd., Broadway, I-84) and other developments (Lloyd Center, Memorial Coliseum), to create one of the heaviest air pollution areas in the city.

Southeast Portland slopes up from the river in a series of steps that are most noticeable when bicycling up or down Belmont or Hawthorne streets, and which reach out toward Mt. Tabor (the only extinct volcano in a major American city) and the hills (Boring Lava rock formations) of far southeast.

The gradual climb from the Willamette provides some parts of southeast Portland with south-facing slopes. Although the founders of Sunnyside neighborhood had only promotion in mind—"on the sunny side of the river"—the area happens to be at the center of some of the best solar real estate in the city. Far enough away from the shadow of the Tualatin Mountains, with large lots and a predominantly low-profile residential, rather than tall commercial, character, it provides good prospects for solar retrofitting of houses. Further east and south, in the Errol Heights and Lents neighborhoods, several slopes provide due south exposure to low winter sunlight and some protection from blistering east winds.

Southeast Hills

South and southeast of Mt. Tabor more hills arise: Mt. Scott and Errol Heights to the south, Kelly and Powell buttes to the southeast, and other hills which roll out toward the Clackamas River.

The hills experience more rainfall—50-54 inches compared to 46 inches in downtown Portland. Some of the area is more exposed to the east wind, while the hills also provide slight protection on the west side near Milwaukie.

Some of the highlands, especially Errol Heights, provide low and moderate income people one of the few viewtops not dominated by wealthier development.

Tualatin Ridge Shadow

At the base of the Tualatin Mountains (sometimes referred to as the West Hills) lie the neighborhoods of Linnton, Goose Hollow, Corbett, Terwilliger and Lair Hill Park. The bench between the river and the ridge is narrow at both ends (at Linnton and Corbett-Terwilliger) and at its widest in the northwest industrial area, lower northwest and downtown.

The northwest industrial area was once an extensive marshland with Guilds Lake at its center. Several small streams fed the marsh; only Balch Creek still flows, separating lower Northwest Portland from Forest Park. Other creeks included Tanner's, which crossed Burnside at about 13th, and Johnson Creek, which started in the same area as Tanner's Creek on Kings Height.

The Corbett-Terwilliger area had a similar, but smaller, marshland near the Marquam Gulch, where several springs came together, including Ennois Creek, which flowed to the Willamette near Sheridan Street.

Downtown

Downtown Portland is situated on a small hill that rises gradually up from the Willamette, rising more sharply in the south near Portland State University. The "heat island" effect of an urban environment is most noticeable here; heat from buildings and automobiles, and the slower radiating quality of cement, create a distinct micro-climate. Temperatures at night here may be 10-15 degrees warmer than at Beaverton, west of the Tualatin Mountains.

Tualatin Mountains

When the great flood of ten thousand years ago rushed into the Portland area it met only a few obstacles, such as Rocky Butte and Mt. Tabor, where it deposited undigested glacial material; rock and gravel that is now being mined at the Lavelle landfill on 82nd Avenue.

The water crashed against the Tualatin Mountain ridge but left little of the material on the steep slopes. Since then, gooshy topsoil has come to a tentative rest. It has proved to be good for gardening but often slippery for houses and roads.

Along the ridges, up the eastern slope, along small ravines and at natural benches, houses have been built. The tree islands here flow one into another. Streams, now dry most of the year, have created ravine after ravine, and the green feet of the ridge stick out into the city like headlands on the coast out into the sea.

Rainfall amounts increase from 38 inches on the floor of the Tualatin Plains on the west to 46 inches on the ridge of the mountains, with the highest amounts being recorded just slightly over the eastern side of the ridge. Clouds hang on the ridge, pretending to be fog, as storms pass through the area.

The Maritime Climate

Living in the Maritime Northwest is sometimes like living in a frog pond. The pond in the summer is a pleasant, cool place to live, and in the winter it is damp and moist.

Although the latitude is far north (Portland, for example, is at the latitude of Montreal), the Maritime has striking similarities to a sub-tropical climate like that of the southeastern United States.

Walking through a typical rain forest, like those found on the western slopes of the Coast Range, one can easily imagine the few characteristics that might be tampered with that would change our maritime region into a sub-tropical one. Raise the temperature annually 15 degrees, push the humidity level up, and create some thunderstorms rather than drizzle, and it is easy to imagine the local critters such as the alabaster salamander growing to science-fiction proportions and turning into alligators.

There are some obvious differences that help define the climatic region. The Maritime experiences its largest daily temperature range during the warm months when the skies are clear. In a sub-tropical area (and in fact over much of the eastern United States), rain pours; here it drizzles. During a typical rainy day in winter we may only get two-tenths of an inch of rain. The Maritime climate is also unique in that we receive about half of our rainfall within three months—November through January. Most regions in the United States receive more or less equal amounts of rain year-round. The humidity level of the Maritime is more comparable to the sub-tropical. However, our highest humidity levels occur at night, and our lowest levels correspond to the hottest part of the day.

Portland's Climate

Portland's climate exhibits most of the general characteristics of other inland valleys in the Maritime; cloudy and moderate. There is less fog in the Portland area than further south in the

Willamette Valley; Eugene, for example, has twice as many foggy days.

There are three primary characteristics about Portland that differentiate its climate from the more typical inland maritime valley:

1. The Columbia Gorge allows more continental air to move in from the east. In fall this creates warm and dry "east wind weather"; in winter Portland gets more than its share of transition weather such as freezing rain and "silver thaws."

2. Portland is a "heat island." The cement buildings and roads radiate heat slowly at night.

3. The major part of Portland is in a bowl surrounded by hills which trap air and pollutants, saved only by our eastern chimney—the Columbia Gorge—which draws air in and out of the bowl.

Season by Season

April—the Transition to Spring

April is the transition from winter to spring. The sky breaks up (slowly) like ice on a lake, exposing cracks and patches of blue in the quiet gray quilt. In February and March there are almost five inches of rain a month; in April two and a half inches fall. The nights are finally shorter than the days.

May and June—Gray Spring

In April about 30 percent of the winds come from the north/northwest. In May and June it is up to about 55 percent, and by July, our warmest month, over 70 percent of the winds come from the north/northwest.

June is a deadend month. The continual flow of storms coming over the Pacific since October slows down. The interior, east of the Cascades, has warmed faster, creating a thermal low in the Maritime valley regions which, like clockwork, every late afternoon and evening draws the mostly rainless Pacific air over itself like gray flannel pajamas.

July, August and September—Summer

From June to July occur some of the most dramatic changes of the year. Through the spring we average a gain of two hours of actual sunny conditions per month (except for June, which is a standstill month) and then July hits and we gain an average of 3½ hours of actual sunny conditions per day. The rainfall average for July sounds like a Chilean desert report: .39 inches for the month.

The ocean temperature is actually highest in August (low 60s). The effect of this is felt in September and October, when we experience "Indian Summer." As the sun gets lower in the horizon, the land cools off, while the Pacific Ocean, a boundless thermos, is relatively warmer and therefore draws air from east to west. By the time the air reaches the Maritime it has warmed up considerably, passing through several mountain ranges and picking up degrees while descending into lower elevations.

October—Transition to Winter

From September to November the monthly rainfall average increases over four inches. In October the amount of available sunlight decreases dramatically. In September there may be seven hours of sunny conditions per day; whereas in October the average is down to a little over four hours.

There is more fog in October (and November) and the winds, as in April, may be strong and come more or less equally from all three primary directions (south/southwest, south/southeast and north/northwest).

November, December, January—The Dead of Winter

During these months we get half of our annual average rainfall. There are about 15 hours of darkness a day and slightly less than two hours a day of sunny conditions. Over 50 percent of the winds come from the south/southeast, bringing in cold continental air from east of the Cascades. Any snow that falls in these parts is likely to fall now (six out of an average eight inches annually).

February and March—False Spring

February and March are more alike than February and January. The rainfall average per month diminishes to five inches from 6½ inches average for the previous three months. Very little snow falls (½ to 1 inch per month).

From February to April the winds take a three-quarter turn, with the dominant direction changing from south/southeast to south/southwest to north/northwest.

The gray and drizzle seems to let up for awhile sometime in February and March, but as surely as the rain it returns, and natives size up the remainder of their wood supply to make it through the gray spring.