

## WASHINGTON.

### TRIANGULATION STATIONS.

**Blalock Island, Pasco, and Prosser quadrangles.**

**BENTON, FRANKLIN, AND KLICKITAT COUNTIES.**

During the season of 1906 C. F. Urquhart and A. I. Oliver extended triangulation over the above-named quadrangles. Positions were originally computed on Spokane datum (see Bulletin 440), but a correction of 3.1'' has been added to all latitudes and 7.6'' subtracted from all longitudes to reduce them to approximate North American datum.

#### ALDER, KLICKITAT COUNTY, WASH.

Station is on highest point of ridge just north of Columbia River and about 1 mile west from Alder Creek. It can be reached by road from Mr. Warner's ranch. The road crosses ridge about 0.25 mile west from station. Point is 2 miles from Warner's ranch and 6 miles from Castle Rock post office, at which point there is a ferry across Columbia River.

Signal: A quadripod supporting two targets of black cloth at right angles to each other.

Station mark: An aluminum tablet set in solid rock under center of signal. There is a cairn 4 feet in diameter and 2-5 feet high over tablet.

[Latitude 45° 51' 00.89''. Longitude 119° 56' 21.48'']

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Mule.....	128 49 59.95	308 34 30.47	4.5525585
Horse.....	189 22 28.19	9 25 36.30	4.5371674
Bender.....	213 13 26.58	33 29 41.38	4.7237848
Irrigon.....	246 07 19.92	66 23 47.98	4.5104470
Granite.....	292 42 51.96	113 02 01.61	4.5752815
Gleason.....	315 22 37.42	135 44 26.02	4.7524983
Ione.....	346 55 06.35	166 40 37.53	4.6370650

#### BENDER, BENTON COUNTY, WASH.

On high point of ridge in Horseheaven country overlooking Yakima River, about 10 miles east of Prosser. The third grade east from Prosser goes within 2 miles (south-west) of station.

Signal: A quadripod supporting two black targets at right angles to each other.

Station mark: An aluminum tablet, triangulation, set in 15 by 15 by 24 inch rock is sunk flush with surface of ground under center of signal.

[Latitude 46° 14' 53.01". Longitude 119° 33' 47.48'']

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Alder.....	33 29 41.38	213 13 26.58	4.7237848
Horse.....	66 30 47.25	246 17 38.68	4.4075870
Hembree.....	96 01 15.58	275 29 30.34	4.7538837
Outlook.....	122 29 32.05	302 06 23.72	4.6858587
Rattlesnake.....	136 26 06.17	316 14 07.90	4.4877800
Hartman.....	173 02 34.88	353 01 28.80	4.2073143
White Bluff.....	235 09 00.07	55 22 25.60	4.4623299
Erie.....	274 39 07.61	94 49 45.02	4.2781434
Jumpoff Joe.....	295 18 13.39	115 37 01.18	4.5698130
Horseheaven.....	313 28 41.54	133 38 28.34	4.3816136
Irrigon.....	359 08 35.07	179 08 50.68	4.4938760

**HARTMAN, BENTON COUNTY, WASH.**

Station is on southeast end of Rattlesnake range of hills and was established by the Reclamation Service. It is not on the highest point of mountain but about 300 yards southeast from highest point. It is about 18 miles from Prosser and 15 from Kiowa. The nearest ranch is owned by Mrs. Houskins. Buckboard can be driven to station from this ranch.

Signal: A rock cairn about 4½ feet high with a small lumber structure over it.

Station mark: A hub.

[Latitude 46° 23' 31.17". Longitude 119° 35' 18.85'']

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Horse.....	39 21 27.44	219 09 23.95	4.5299005
Rattlesnake.....	108 03 26.79	287 52 33.85	4.3061107
White Bluff.....	268 42 52.34	88 57 24.99	4.4108398
Erie.....	310 01 59.39	130 13 43.64	4.4354534
Horseheaven.....	329 10 05.89	149 20 59.40	4.5788612
Bender.....	353 01 28.80	173 02 34.88	4.2073143

**HORSE, BENTON COUNTY, WASH.**

On high point of ridge about 6 miles west from Prosser. Grade goes up ridge from Yakima River about 2 miles east from signal and turns west, running within 1 mile of signal.

Signal: A quadrupod with two targets at right angles with black cloth on them.

Station mark: An aluminum tablet set in small rock flush with surface of ground, and under a cairn of rocks 3½ feet high and 4 feet in diameter.

[Latitude 46° 09' 21.63". Longitude 119° 51' 59.99'']

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Alder.....	9 25 36.30	189 22 28.19	4.5371674
Mule.....	70 53 43.10	250 35 02.81	4.5486626
Hembree.....	115 51 13.46	295 32 38.59	4.5648934
Snipes.....	135 24 29.24	315 14 51.07	4.3874012
Outlook.....	154 02 29.46	333 52 32.31	4.6046605
Rattlesnake.....	153 45 13.13	3 46 25.30	4.5124619
Hartman.....	219 09 23.95	39 21 27.44	4.5299005
Prosser.....	229 42 04.40	49 46 18.59	3.9956699
Bender.....	246 17 38.68	66 30 47.25	4.4075870
Horseheaven.....	278 38 38.47	99 01 32.41	4.6171032
Irrigon.....	311 03 32.91	131 16 55.23	4.5026412

**HORSEHEAVEN, BENTON COUNTY, WASH.**

On a high, flat ridge in the Horseheaven country about 16 miles southwest from Kennewick, and about 8 or 10 miles east from Horseheaven post office. To reach point from Kennewick, go up railroad to Relief, thence by road southwest to highest point of ridge.

Signal: A lumber quadripod with black and white targets.

Station mark: A triangulation tablet set in rock under center of signal.

[Latitude 46° 05' 55.63". Longitude 119° 20' 14.10".]

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Irrigon.....	49 29 48.96	229 20 19.13	4.3506138
Horse.....	99 01 32.41	278 38 38.47	4.6171032
Bender.....	133 38 28.34	313 28 41.54	4.3316136
Hartman.....	149 20 59.40	329 10 05.89	4.5788612
Erie.....	185 38 00.34	5 38 50.23	4.1788960
Jumpoff Joe.....	267 41 42.16	87 50 42.45	4.2073033

**JUMPOFF JOE, BENTON COUNTY, WASH.**

On highest point of a well-known ridge called "Jumpoff Joe." It is about 7 or 8 miles south of Kennewick, and can be seen from the town. There is a good road from Kennewick to summit of ridge, and buckboard can be driven from there to signal.

Signal: A lumber quadripod with black and white cloth on it.

Station mark: A triangulation tablet set in rock placed under center of signal.

[Latitude 46° 06' 15.94". Longitude 119° 07' 44.28".]

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Horseheaven.....	87 50 42.45	267 41 42.16	4.2073033
Bender.....	115 37 01.18	295 18 13.39	4.5698130
Erie.....	134 39 46.38	314 31 35.37	4.3118793
Richland.....	149 11 13.88	329 04 55.00	4.3413786
White Bluff.....	163 32 19.83	343 26 55.19	4.5299924
Kennewick.....	184 57 06.88	4 57 38.92	4.0427979
Pasco.....	191 45 42.35	11 48 03.40	4.3122722
Pasco water tank.....	194 24 10.88	14 26 12.11	4.1607141
Page.....	218 19 01.22	38 31 50.78	4.5651622
Lerlerc.....	242 48 43.65	63 03 55.53	4.4836530
Wallula.....	292 40 46.23	112 52 11.77	4.3461720

**KENNEWICK, BENTON COUNTY, WASH. (Not occupied.)**

Station mark: The pole in cupola on large brick schoolhouse in town of Kennewick on Northern Pacific Railroad.

[Latitude 46° 12' 12.02". Longitude 119° 06' 59.85".]

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Jumpoff Joe.....	4 57 38.92	184 57 06.88	4.0427979
Erie.....	102 25 19.27	282 16 35.77	4.2016547
Pasco.....	199 34 00.06	19 35 46.37	3.9847832

**MULE, KLICKITAT COUNTY, WASH.**

Located on northeast top of a bald ridge about 4 miles to the north of Bickleton. Bickleton is reached by wagon road from Prosser, a distance of about 30 miles. A buckboard can be taken on to point from Bickleton side. Highest top of hill is southwest of the signal 100 yards but is not more than 2 or 3 feet higher. View to the southwest is cut out by near-by mountains but the view is good in all other directions.

Signal: A mound of rock 5 feet high and centered over this is an upright timber standing 13 feet high, which carries two sheets of white cloth 4 by 6 feet at right angles to each other.

Station mark: The rock cairn.

[Latitude 46° 03' 03.73". Longitude 120° 17' 54.69".]

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Hembree.....	180 28 39.42	0 28 47.17	4.4407832
Outlook.....	198 00 19.10	13 09 05.82	4.7016233
Rattlesnake.....	218 35 47.03	38 55 42.18	4.7528853
Horse.....	250 35 02.81	70 53 43.10	4.5486626
Alder.....	308 34 30.47	128 49 59.95	4.5525585

**OUTLOOK, BENTON COUNTY, WASH.**

On a high flat-topped ridge of the Rattlesnake Mountains north from Outlook post office and near the head of Moxee Valley. It can be driven to from either the Yakima or Moxee valley. An old road crosses the ridge about 2½ miles west from signal, and from summit on road buckboard can be driven up ridge to signal.

Signal: A lumber tripod.

Station mark: A small rock cairn.

[Latitude 46° 28' 52.56". Longitude 120° 05' 45.76".]

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Mule.....	18 09 05.82	198 00 19.10	4.7016233
Hembree.....	37 15 10.71	217 06 30.69	4.4047234
Satas <sup>a</sup> .....	64 04 19.1	243 35 48.9	4.7501303
Atanum.....	96 08 53.06	275 47 18.68	4.5827464
Moxee.....	144 53 48.13	324 47 37.48	4.2762391
Rattlesnake.....	280 28 02.25	100 39 13.21	4.3029654
Bender.....	302 06 23.72	122 29 32.05	4.6858587
Horse.....	333 52 32.31	154 02 29.46	4.6046605
Sniipes.....	358 21 41.27	178 21 59.47	4.2743965

<sup>a</sup> From Ellensburg datum.

**PASCO, FRANKLIN COUNTY, WASH.**

Station is on a sagebrush hill 3 or 4 miles north of Pasco. To reach station go up road on east side of railroad track. There is one road which turns to the right and another to the left, but the road running practically straight passes within 100 yards of signal. Signal can be seen after getting about 1 mile from town.

Signal: A lumber quadripod with white and black cloth on it.

Station mark: A triangulation tablet set in rock, placed under center of signal.

[Latitude 46° 17' 06.67". Longitude 119° 04' 28.85".]

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Pasco water tank.....	5 32 03.37	185 31 46.34	3.7851985
Jumpoff Joe.....	11 43 03.40	191 45 42.35	4.3127272
Kennewick.....	19 35 46.37	199 34 00.06	3.9847832
Erie.....	73 12 14.37	253 01 41.42	4.2924577
Page.....	244 52 54.95	65 03 24.32	4.3127162
Leriere.....	285 03 03.64	105 20 55.70	4.3751992
Wallula.....	330 24 54.62	150 34 00.24	4.5179504

**ERIE, BENTON COUNTY, WASH.**

On a bald hill between Yakima River near its mouth and the Northern Pacific Railway. It is about 4 miles southwest from Richland and 10 or 12 miles west from Kennewick. Can drive to summit of hill.

Signal: A lumber quadripod with white and black targets.

Station mark: Triangulation tablet set in rock under center of signal.

Observer: C. F. Urquhart, 1906.

[Latitude 46° 14' 02.22". Longitude 119° 19' 04.94".]

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Horseheaven.....	5 38 50.23	185 38 00.34	4.1783960
Bender.....	94 49 45.02	274 39 07.61	4.2781434
Hartman.....	130 13 43.64	310 01 59.39	4.4354534
White Bluff.....	195 16 22.12	15 19 09.34	4.2731138
Pasco.....	253 01 41.42	73 12 14.37	4.2924577
Pasco water tank.....	271 05 44.67	91 15 57.56	4.2598434
Richland.....	216 52 14.92	36 54 07.34	3.7445776
Kennewick.....	282 16 35.77	102 25 19.27	4.2016547
Jumpoff Joe.....	314 31 35.37	134 39 46.38	4.3118793

**PASCO WATER TANK, FRANKLIN COUNTY, WASH. (Not occupied.)**

Station mark: Northern Pacific Railway water tank in town of Pasco.

[Latitude 46° 13' 50.08". Longitude 119° 04' 56.22".]

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Jumpoff Joe.....	14 26 12.11	194 24 10.88	4.1607141
Erie.....	91 15 57.56	271 05 44.67	4.2598434
Pasco.....	185 31 46.34	5 32 03.37	3.7851985

**PROSSER, BENTON COUNTY, WASH. (Not occupied.)**

Station mark: Center of smokestack on power plant near lower bridge on Yakima River at Prosser.

[Latitude 46° 12' 48.86". Longitude 119° 46' 08.76".]

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Horse.....	49 46 18.59	229 42 04.40	3.9956699
Rattlesnake.....	168 19 29.01	348 16 26.40	4.4253306

## RATTLESNAKE, BENTON COUNTY, WASH.

Station is on the highest point near center of Rattlesnake range, about 20 miles north-northwest from Prosser. Take the Rattlesnake road to Mr. Dyke's ranch, thence by road north to summit of ridge, thence west along ridge to signal. One high point is passed before signal is reached.

Signal: A small cairn with lumber tripod built over it.

Station mark: A triangulation tablet set in rock, 20 inches in diameter, placed under center of cairn.

[Latitude 46° 26' 53.32". Longitude 119° 50' 20.21".]

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Horse.....	3 46 25.30	183 45 13.13	4.5124619
Mule.....	38 55 42.18	218 35 47.03	4.7528852
Snipes.....	51 55 48.39	231 44 56.56	4.3886805
Hembree.....	64 56 29.51	244 36 39.68	4.5892302
Outlook.....	100 39 13.21	280 28 02.25	4.3029654
Moxee.....	122 08 55.47	301 51 33.19	4.5573767
Coal.....	169 06 23.35	349 04 25.80	4.2610327
Hartman.....	287 52 33.85	108 03 26.79	4.3061107
Bender.....	316 14 07.90	136 26 06.17	4.4877800
Prosser power plant.....	348 16 26.40	168 19 29.01	4.4253306

## SNIPES, BENTON COUNTY, WASH. (Not occupied.)

On well-known and prominent hill 2 or 3 miles west of Sunnyside.

Station mark: A cairn about 5 feet high on summit of hill.

[Latitude 46° 18' 43.62". Longitude 120° 05' 20.62".]

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Hembree.....	84 56 26.38	264 47 28.91	4.2033539
Outlook.....	178 21 59.47	338 21 41.27	4.2743965
Rattlesnake.....	231 44 56.56	51 55 48.39	4.3886805
Horse.....	315 14 51.07	135 24 29.22	4.3874012

## WHITE BLUFF, FRANKLIN COUNTY, WASH.

On the north side of and overlooking Columbia River about 16 miles above Pasco. It is first of the white bluffs going up the river. The road known as the river road from Pasco passes within 100 yards of the signal. This road goes to river about 4.5 miles from Pasco, thence up river to Richland Ferry, thence through sagebrush to river again at foot of bluff, thence up hill to signal.

Signal: A lumber quadripod with white and black cloth on it.

Station mark: A triangulation tablet set in rock placed under center of signal.

[Latitude 46° 23' 48.11". Longitude 119° 15' 13.70".]

To station—	Azimuth.	Back azimuth.	Distance.
	° ' "	° ' "	<i>Log. meters.</i>
Erie.....	15 19 09.34	195 16 22.12	4.2731138
Bender.....	55 22 25.60	235 09 00.07	4.4623299
Hartman.....	88 57 24.99	268 42 52.34	4.4108398
Page.....	276 22 16.19	96 40 32.98	4.5130690
Lerlerc.....	296 45 59.58	117 06 38.67	4.6141305
Jumpoff Joe.....	343 26 55.19	163 32 19.83	4.5299924

PRIMARY TRAVERSE.

Cape Elizabeth (30'), Hoquiam (15'), Humptulips (30'), and Ocosta (15') quadrangles.

CHEHALIS COUNTY.

The following geographic positions on North American datum were determined by primary traverse and are based upon Coast and Geodetic Survey triangulation stations Chehalis, Drummond, Flat, Langley, Lone Tree, and Tank. The work was done by L. F. Biggs in 1913.

CAPE ELIZABETH QUADRANGLE.

Along highways in southeast quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
Small bridge at logging camp, west end of, 375 feet southeast of log chute.....	47 03 20.8	124 00 00.7	.....
Two bridges, center of one farthest east.....	47 03 57.2	124 00 47.5	4, 903
Small bridge, center of.....	47 04 00.9	124 01 17.1	2, 082
Blazed tree, south edge of road on section line.....	47 04 05.7	124 01 31.1	1, 089
Small pump, south of road.....	47 04 22.0	124 02 17.2	3, 638
Bridge, 210 feet west to T road south.....	47 04 20.8	124 02 33.4	1, 139
Tulips, center of Northern Pacific Ry. track at road crossing.....	47 04 20.7	124 02 55.8	1, 555
Tps. 18 and 19 N., R. 11 W., corner secs. 3, 4, 33, and 34, 1,970 feet west of L in road.....	47 05 07.1	124 02 45.5	4, 750
T road south, 100 feet east of track at crossing.....	47 05 35.1	124 03 35.6	4, 486
Newtown post office, 1 mile northwest of, in southeast pier of bridge over Humptulips River; aluminum tablet stamped "Prim. Trav. Sta. No. 8, elevation 37 feet 1911".....	47 35 49.8	124 03 29.6	1, 549
Section X at camp (blaze not found, but fence supposed to be line). T road northeast, signboard reads: Copalis, 5.5 miles; Moclips, 14.5 miles; Hoquiam, 15.4 miles.....	47 06 02.1	124 03 38.8	1, 396
Copalis, Northern Pacific Ry. crossing.....	47 06 30.3	124 04 06.0	3, 419
Center of track at logging road.....	47 06 46.8	124 04 42.1-	3, 008
Notched tree, apparently section crossing.....	47 06 57.5	124 05 05.3	1, 935
Langley triangulation station, Coast and Geodetic Survey.....	47 06 58.3	124 05 53.8	3, 359
L road south, at south end of long tangent.....	47 07 00.26	124 06 46.45	8, 647
Copalis schoolhouse, 0.80 mile east of corner sections.....	47 07 07.8	124 09 05.9	9, 674
Copalis schoolhouse, 20 feet northwest of; iron post stamped "Prim. Trav. Sta. No. 9, 1911; elev. 24 feet, Wash.".....	47 06 54.9	124 09 06.1	1, 310
Small stream crossing.....	47 06 55.0	124 10 05.6	4, 117
Fisherman's tower.....	47 06 27.8	124 10 38.4	3, 577
Small stream crossing.....	47 05 58.6	124 10 27.0	3, 071
Stack on mill.....	47 05 21.7	124 10 24.0	3, 752
Mouth of creek, on north side, at high-water mark.....	47 05 20.5	124 10 13.4	743
Fisherman's tower.....	47 04 42.2	124 10 07.5	3, 900
Mail box.....	47 03 35.0	124 10 01.2	6, 829
Mail rack, U. S. G. S. No. 1.....	47 03 01.7	124 09 58.4	3, 382
Mail rack, U. S. G. S. No. 2.....	47 02 39.2	124 09 57.0	2, 291
Oyhut road, mail rack at.....	47 01 25.4	124 09 46.1	7, 510
Iron bench-mark post "Prim. Trav. Sta. No. 10".....	47 01 03.3	124 09 45.2	2, 250
	47 01 04.2	124 09 23.8	1, 483

Along Northern Pacific Railway in southeast quarter of quadrangle.

Road crossing, center of track.....	47 04 03.8	124 02 36.5	.....
Do.....	47 03 54.3	124 02 25.6	1, 226
Center of bridge.....	47 03 45.0	124 02 15.2	1, 189
Primary traverse station No. 11, elevation 17 feet.....	47 03 26.0	124 02 10.8	1, 943
Northern Pacific Ry., west end of tangent.....	47 02 41.5	124 02 11.7	4, 510
Center of bridge.....	47 01 52.2	124 01 28.8	5, 812
Chenois Creek station, center of track at.....	47 01 50.2	124 01 27.1	240
Gray Gables, road crossing 270 feet northwest of station.....	47 00 52.2	124 00 32.9	6, 976
Prim. Trav. Sta. No. 12, elevation 6 feet; iron post.....	47 00 19.6	124 00 07.7	3, 731
Center of bridge.....	47 00 14.7	124 00 09.2	506

Magnetic declination in southeast quarter of quadrangle, 23° 50' E.

## OCOSTA QUADRANGLE.

## Along highways in northwestern part of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
Box signal.....	46 59 37.1	124 09 28.9	.....
United States engineering department signal.....	46 58 14.0	124 09 37.6	8,444
Lone Tree triangulation station, Coast and Geodetic Survey.....	46 57 07.68	124 07 35.78	10,795

Magnetic declination near north border of quadrangle, 23° 40' E.

## HOQUIAM QUADRANGLE.

## Along highways in northeastern part of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
Tank triangulation station (Coast and Geodetic Survey) on southwest side of platform of water tank in southwest part of Aberdeen; station mark an iron pipe 1½ inches diameter, 9 feet long, driven 8 feet in ground.....	46 58 00.71	123 49 45.49	.....
Aberdeen, city hall, west side of main entrance, in top of corner stone; aluminum tablet stamped "Prim. Trav. Sta. No. 1, Wash., 1911".....	46 58 35.0	123 48 59.7	4,707
Aberdeen, 0.90 mile northwest of, T road.....	46 59 22.1	123 48 47.4	4,850
Aberdeen, 1.25 miles northwest of, at north end of bridge, center of Y road.....	46 59 38.3	123 48 43.1	1,662
Aberdeen, 1.65 miles northwest of, U. S. t. b. m., elevation 21 feet.....	46 59 54.3	123 48 25.5	2,033

## Along highways near Flat triangulation station.

Flat triangulation station, Coast and Geodetic Survey, on north shore of Grays Harbor, about 0.5 mile west of Hoquiam. It is 27.9 meters south of Northern Pacific Ry. track, 25 meters from and 2 feet above high-water mark. Station mark a copper tack in top of a spruce hub, 12 by 6 by 22 inches.....	46 58 45.22	123 54 13.50	.....
Hoquiam, intersection of Emerson and Lincoln streets.....	46 58 53.0	123 53 05.2	4,803
Hoquiam, 0.80 mile north of, T road west.....	46 59 35.7	123 53 05.2	4,320
Hoquiam, 1.30 miles northwest of, at mouth of Little Hoquiam River, at west end of bridge, 15 feet south of road; iron post stamped "Prim. Trav. Sta. No. 6, elevation 16, Wash., 1911".....	46 59 42.6	123 53 40.3	2,539

## Along Northern Pacific Railway in northwest quarter of quadrangle.

United States bench mark, elevation 13 feet, also primary traverse station No. 13.....	46 58 57.7	123 58 36.3	10,120
Grays Harbor city station.....	46 58 58.3	123 57 27.8	4,752
Grays Harbor city station, 0.40 mile southeast of, water column.....	46 59 01.6	123 56 58.2	2,085
Grays Harbor city station, 1.90 miles southeast of; iron post stamped "Prim. Trav. Sta. No. 14, elevation 10 feet".....	46 58 56.3	123 55 05.5	7,831

## Along highways in northeast quarter of quadrangle.

Drummond triangulation station, Coast and Geodetic Survey.....	46 57 04.26	123 51 10.98	.....
Railroad bridge, center of.....	46 57 02.3	123 51 02.3	632
Drummond triangulation station, 0.60 mile southeast of, cross-roads.....	46 56 38.0	123 50 48.3	2,647
Drummond triangulation station, 0.85 mile southeast of, center of bridge.....	46 56 26.3	123 50 40.6	1,304
Drummond triangulation station, 1.20 miles southeast of, hub at bridge.....	46 56 07.9	123 50 33.1	1,931
Drummond triangulation station, 1.90 miles southeast of, U. S. b. m. elevation 24 feet.....	46 55 53.4	123 50 24.0	1,600
Newskak schoolhouse, 1.60 miles northwest of, bridge over small stream.....	46 55 23.4	123 49 32.0	4,717
Newskak schoolhouse, 1.50 miles northwest of, t. b. m. elevation 51 feet.....	46 55 20.0	123 49 29.0	400

## HOQUIAM QUADRANGLE—Continued.

Along highways in northeast quarter of quadrangle—Continued.

Station.	Latitude.	Longitude.	Distance between stations.
Newskak schoolhouse, 1.10 miles northwest of, U. S. t. b. m. elevation 55 feet.....	° ' "	° ' "	<i>Feet.</i>
.....	46 54 59.0	123 49 19.5	2,236
Newskak schoolhouse, 0.60 mile northwest of, center of bridge....	46 54 54.5	123 49 20.0	452
Newskak schoolhouse, 0.14 mile northwest of, southwest corner of, at angle in wagon road, center of Northern Pacific R. R. track sec. 33.....	46 54 31.1	123 49 12.7	2,422
Newskak schoolhouse.....	46 54 30.7	123 49 01.6	769

Along highways between Drummond and Chehalis triangulation stations.

T. 17 N., R. 9 W., corner secs. 16, 17, 20, and 21, 0.90 mile southwest of.....	46 56 53.5	123 50 15.9	.....
T. 17 N., R. 9 W., corner secs. 16, 17, 20, and 21.....	46 57 07.9	123 49 10.3	4,782
T. 17 N., R. 9 W., corner secs. 16, 17, 20, and 21, about 0.40 mile north of, at angle in wagon road, center of Northern Pacific R. R. track.....	46 57 27.3	123 49 10.4	1,960
Chehalis triangulation station, Coast and Geodetic Survey, south side of Grays Harbor at mouth of Chehalis River, just west of South Aberdeen; station mark, iron pipe, 2½ inches in diameter, 9 feet long, set 7 feet in ground.....	46 57 33.52	123 49 10.58	630

Magnetic declination near north border of quadrangle, 24° 10' E.

## HUMPTULIPS QUADRANGLE.

Along highways in southwest quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
Aberdeen, 3.35 miles northeast of, 45 feet northeast of district schoolhouse No. 10, on west side of road; iron post stamped "Prim. Trav. Sta. No. 2, 1911-13 Wash.".....	° ' "	° ' "	<i>Feet.</i>
.....	47 00 35.9	123 48 44.2	.....
Aberdeen, 4.40 miles northeast of, center of road in front of house..	47 01 31.0	123 48 54.0	5,626
District schoolhouse No. 10, 1.25 miles northeast of, small bridge over creek.....	47 01 40.5	123 48 49.7	1,004
District schoolhouse No. 10, 2.65 miles northeast of, 200 feet north of road to A. F. Coates Logging Co., 15 feet west of road; iron bench mark post stamped "Prim. Trav. Sta. No. 3, 24, 1911, Wash.".....	47 02 29.3	123 47 33.0	7,263
District schoolhouse No. 10, 2.90 miles northeast of, center of bridge	47 02 41.0	123 47 31.3	1,190
District schoolhouse No. 10, 3.30 miles northeast of, T road east....	47 03 01.9	123 47 24.8	2,163
District schoolhouse No. 10, 3.80 miles northeast of, T road east....	47 03 20.5	123 47 02.4	2,437
District schoolhouse No. 10, 4.60 miles northeast of, T. 18 N., R. 9 W., corner secs. 2, 3, 10, and 11.....	47 04 00.2	123 46 37.5	4,375
Wishkah, in top of southwest pier of steel bridge over Wishkah River; aluminum tablet stamped "Prim. Trav. Sta. No. 4, Wash. 26, 1911".....	47 04 20.8	123 46 10.9	2,783
T. 19 N., R. 9 W., ¼ corner south side sec. 35, T road north.....	47 04 51.7	123 45 53.6	3,356
Schoolhouse No. 34, 650 feet north of, angle to west in road.....	47 05 36.8	123 45 53.2	4,569
Schoolhouse No. 34, 0.50 mile northwest of, south end of bridge....	47 05 54.4	123 46 11.4	2,175
T. 19 N., R. 9 W., ¼ corner west side sec. 26.....	47 06 09.1	123 46 31.4	2,037
T. 19 N., R. 9 W., corner secs. 22, 23, 26, and 27.....	47 06 35.3	123 46 30.9	2,646
T. 19 N., R. 9 W., ¼ corner north side of sec. 27, 50 feet southwest of Matson house (corner not positively identified).....	47 06 35.4	123 47 10.4	2,727
Matson house, 0.60 mile northwest of, saddle center of road.....	47 06 56.9	123 47 40.5	3,013
Harry Lloyd's house, 100 feet west of, 350 feet north of footbridge over river, 8 feet west of T road east; iron gas pipe 4 feet by 1½ inches, driven 3½ feet into ground.....	47 07 04.1	123 48 26.1	3,242
T. 19 N., R. 9 W., 10 feet west of Polson logging railroad, at junction of old grade to northwest, near center of sec. 19; iron post stamped "Prim. Trav. Sta. No. 6".....	47 06 58.8	123 50 41.4	9,370
Prim. Trav. Sta. No. 6, 1.50 miles northwest of, west end of long tangent at farthest point north of old railroad grade, center of cut.	47 07 31.5	123 52 26.6	7,991
Prim. Trav. Sta. No. 6, 3 miles west of, center of bridge over creek.....	47 06 35.8	123 53 45.1	7,829
Prim. Trav. Sta. No. 6, 4.25 miles southwest of, U. S. b. m. stamped "Prim. Trav. Sta. No. 16, elevation 307 ft.".....	47 05 59.8	123 55 05.3	6,640
Barnesville, 3.80 miles northeast of, Y road.....	47 04 58.7	123 55 08.8	6,196
Barnesville, 280 miles northeast of, iron bench mark post stamped "Prim. Trav. Sta. No. 15, elevation 42 feet".....	47 04 12.3	123 55 42.2	5,243
Barnesville, 2.60 miles northeast of, T. 18 N., R. 10 W., ¼ corner south side sec. 4, center of stream.....	47 04 05.7	123 55 53.5	1,030
Barnesville, 1.35 miles northeast of, center of bridge over river....	47 03 04.3	123 55 27.5	6,471
Barnesville, 0.70 mile northeast of, center of bridge.....	47 02 30.8	123 55 20.9	3,424

## Along highways in southwest corner of southwest quarter of quadrangle.

Station.	Latitude.	Longitude.	Distance between stations.
	° ' "	° ' "	Feet.
Temporary bench mark at L in road, elevation 7 feet.....	47 00 24.9	123 54 21.9	.....
Center of small bridge.....	47 00 56.3	123 54 48.0	3,667
Hoguiam, about 5 miles north of, south of junction of Humptulips-Moolips road, in top of southeast pier of bridge; aluminum tablet stamped "Prim. Trav. Sta. No. 7, elev. 10, Wash., 1911".....	47 01 52.2	123 55 17.4	6,021
District schoolhouse No. 71, center of road in front of.....	47 02 01.8	123 55 31.4	1,378
District schoolhouse No. 71, 0.54 mile northwest of, center of small bridge over creek.....	47 02 13.2	123 56 08.6	2,822
T. 18 N., R. 10 W., corner secs. 16, 17, 20, and 21.....	47 02 19.6	123 56 32.6	1,788
T. 18 N., R. 10 W., corner secs. 16, 17, 20, and 21, 0.32 mile northwest of, center of small bridge over creek.....	47 02 26.8	123 56 54.7	1,690
T. 18 N., R. 10 W., corner secs. 16, 17, 20, and 21, 1.10 miles northwest of, center of road at Y road west.....	47 02 38.9	123 57 51.2	4,101
T. 18 N., R. 10 W., corner secs. 16, 17, 20, and 21, 1.35 miles northwest of, center of T road east.....	47 02 51.6	123 57 54.5	1,309
T. 18 N., R. 10 W., corner secs. 16, 17, 20, and 21, 2.55 miles northwest of, center of bridge at old south road.....	47 03 13.3	123 59 18.5	6,216
T. 18 N., R. 10 W., corner secs. 16, 17, 20, and 21, 2.90 miles northwest of, center of small bridge over creek.....	47 03 18.7	123 59 43.8	1,840
T. 18 N., R. 10 W., corner secs. 16, 17, 20, and 21, 3 miles northwest of, center of bridge over creek.....	47 03 19.2	123 59 52.1	579

Magnetic declination near east border of southwest quarter of quadrangle,  $23^{\circ} 47'$  E.; near west border,  $24^{\circ} 34'$  E.