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Groundwater and Surface-Water Data Collection for Mason County, Western Washington, 2016–18

Data Series 1106

U.S. Department of the Interior
U.S. Geological Survey

Cover: Wellhead at U.S. Geological Survey site 20N/03W-31J01 near Shelton, Mason County, Washington, February 23, 2018.

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U.S. Department of the Interior
DAVID BERNHARDT, Acting Secretary

U.S. Geological Survey
James F. Reilly II, Director

U.S. Geological Survey, Reston, Virginia: 2019

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Conversion Factors

U.S. customary units to International System of Units

Multiply	By	To obtain
	Length	
inch (in.)	2.54	centimeter (cm)
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
acre	4,047	square meter (m^2)
square mile (mi^2)	2.590	square kilometer (km^2)
	Flow rate	
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

$$°F=(1.8×°C)+32.$$

Datums

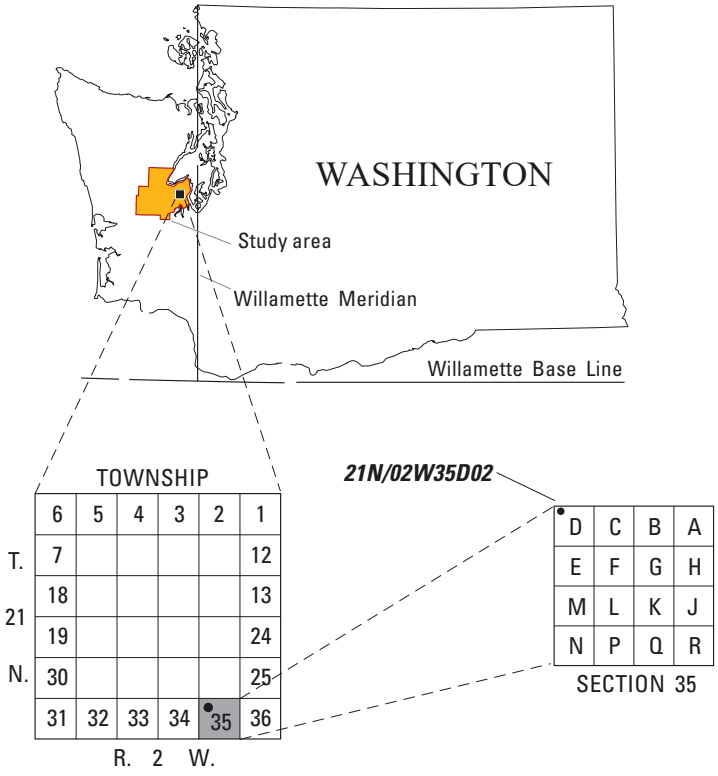
Vertical coordinate information is referenced to the North American Vertical Datum of 1988 (NAVD 88).

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Altitude, as used in this report, refers to distance above the vertical datum.

Well-Numbering System

In Washington, wells are assigned numbers that identify their location in a township, range, section, and 40-acre tract. For example, well number 21N/02W-35D02 indicates that the well is in township 21 north of the Willamette Base Line, and range 2 west of the Willamette Meridian. The numbers immediately following the hyphen indicate the section (35) in the township, and the letter following the section (D) gives the 40-acre tract of the section. The two-digit sequence number (02) following the letter indicates that the well was the second one inventoried in that 40-acre tract. In the illustrations of this report, wells are identified individually using only the section and 40-acre tract, such as 35D02. The townships and ranges are shown on the map borders.



Groundwater and Surface-Water Data Collection for Mason County, Western Washington, 2016–18

By Alison E. Tecca and Lonna M. Frans

Abstract

Groundwater levels and surface-water flow measurements were collected from August 2016 to September 2018 to provide the Mason Conservation District and other stakeholders with basic knowledge of existing water resources in Mason County, Washington. Additionally, the data were collected with the intent of contributing to informed decision making about groundwater use, management, and conservation throughout the county and for future inclusion in a groundwater model. Data were collected and compiled for 130 sites—110 wells and 20 miscellaneous surface-water discharge sites. In spring 2016, field reconnaissance was conducted to locate suitable locations for baseflow discharge measurements to be used for estimating groundwater contribution to surface flow. In summer 2016, a field inventory of wells was conducted to acquire locational data and to assess the suitability of the wells for inclusion in a monthly groundwater-level monitoring network. Groundwater levels were measured bimonthly in the 64 wells over 2 years. Streamflow measurements were conducted two times each summer during two summers for each of the 20 surface-water sites.

Introduction

Groundwater is an important resource for domestic, commercial, and industrial use in Mason County, western Washington. In late summer and early autumn, groundwater discharge maintains streamflow for many small creeks and streams throughout the county and for the numerous fish species that inhabit them. Population growth and increases in commercial and industrial activity create a high demand on water resources in the county, yet these resources are insufficiently understood. To quantify groundwater resources and to better understand the potential effects of both natural and anthropogenic influences on groundwater, U.S. Geological Survey (USGS) personnel measured groundwater levels in wells and discharge in streams from August 2016 to September 2018. In the future, these data will be integrated into a numerical groundwater-flow model to be used by water resource managers to simulate potential effects on groundwater and surface-water resources in the study area.

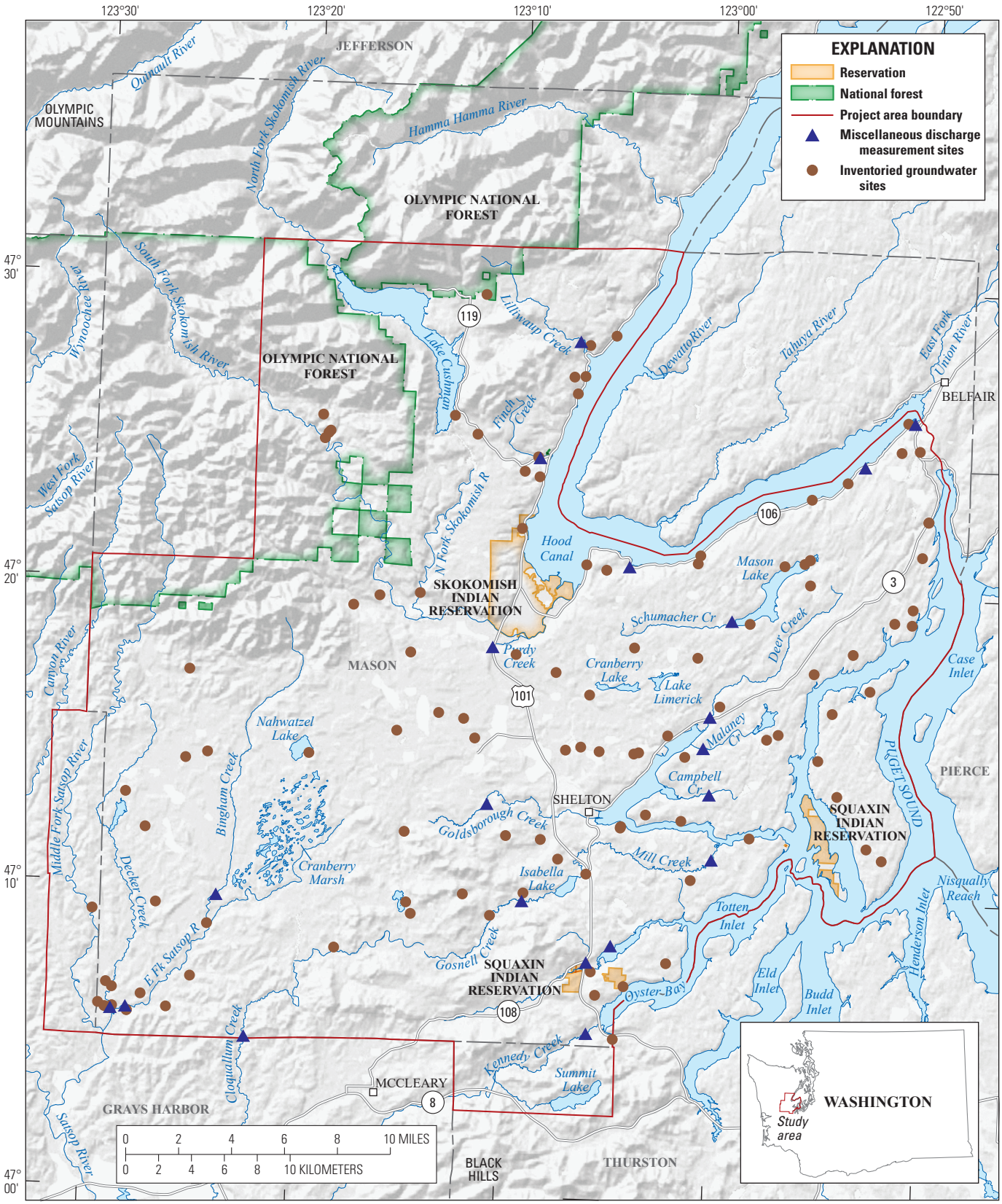
The collection of groundwater data to obtain baseline information substantially helps with efforts to monitor trends in groundwater conditions and to augment critical hydrologic data gaps in the county. Monitoring groundwater levels in conjunction with streamflow is necessary to understand groundwater and surface-water interactions.

Purpose and Scope

The purpose of this report is to list and describe the results of the groundwater and surface-water data collection effort in Mason County from August 2016 to September 2018. The topics covered in this report include introductory and background information, a description of the methods for making baseflow stream discharge measurements, and a description of the process and methods of the initial field well inventory and subsequent monthly groundwater level measurements.

Study Area

The project area occupies approximately 720 square miles in Mason County (fig. 1). In the northwestern corner of the project area and partially within Olympic National Forest, Lake Cushman, a 6.2 square mile reservoir, drains into the North Fork Skokomish River. The North and South Fork Skokomish Rivers join the main stem of the Skokomish River to form a broad, alluvium-filled valley about 9 miles from its outlet into Hood Canal. The northern boundary of the project area extends along the southern arm of Hood Canal east towards Belfair and south following the Mason County line to Totten Inlet and Oyster Bay. In the southwestern part of the county, major tributaries of the Satsop River, which flows south, originate in upland prairies and the southern foothills of the Olympic Mountains. Wetlands and springs are prominent in the study area and contribute to stream baseflow conditions in the summer months.



Base map modified from Esri (copyright 2018), U.S.Geological Survey, and other digital data. Lambert Conformal Conic projection: State Plane Washington South. North American Datum of 1983.

Figure 1. General project study area, Mason County, western Washington, 2016–18.

A major part of the study area is underlain by a northeast thickening sequence of unconsolidated Quaternary glacial and interglacial surface deposits derived from both alpine and continental glaciations. Most of these deposits contain water-bearing aquifers. Bedrock units are comprised of Tertiary basalts of the Crescent Formation with interbeds of undifferentiated marine sedimentary rock. These bedrock units are exposed in the Olympic Mountains and as outcrops to the south and southwest of the city of Shelton in the Black Hills. Due to their general impermeability, Tertiary deposits in the county contain no significant aquifers (Molenaar and Noble, 1970).

The study area has a temperate marine climate characterized by mild, wet winters and warm, dry summers, with temperature and rainfall values moderated by the Pacific Ocean and Puget Sound. Groundwater recharge is driven largely by precipitation, which averages 86.9 inches per year in the county based on 30-year normals (PRISM Climate Group, 2018).

The population of the project area is approximately 52,000 people, with about 20 percent living within the city of Shelton (Washington State Office of Financial Management, 2015).

Methods

Surface-Water Measurement Methods

Synoptic streamflow measurements were collected during baseflow conditions at 20 non-gaged locations in August and September 2016 and again in July and August 2017 to augment streamflow data from 6 active USGS streamgages in the study area (fig. 2). These data were used to quantify the amount of surface water leaving the study area and to determine baseflow amounts during low-flow conditions.

Streamflow measurements were made by USGS personnel using a FlowTracker® handheld acoustic Doppler velocimeter (ADV). When streams were too small for conditions to permit the use of an ADV, a 6-inch modified Parshall flume according to standard techniques of the USGS (Rantz, 1982). All streams were shallow and easily wadable by field personnel during the course of the measurements. Streamflow measurement data are presented in table 1 (at back of report) and stored in the USGS National Water Information System (NWIS).

The USGS assigns accuracy ratings of good, fair, or poor to streamflow measurements based on the equipment, character of the measurement section, number of observations, stability of stage, wind conditions, and the accuracy of depth and velocity measurements (Rantz, 1982, p. 179). “Good” indicates that the measurements are judged to be within 5 percent of true values, “fair” indicates that the measurements are judged to be within 8 percent of true values, and “poor” indicates that the measurements are judged not to be within 8 percent of true values.

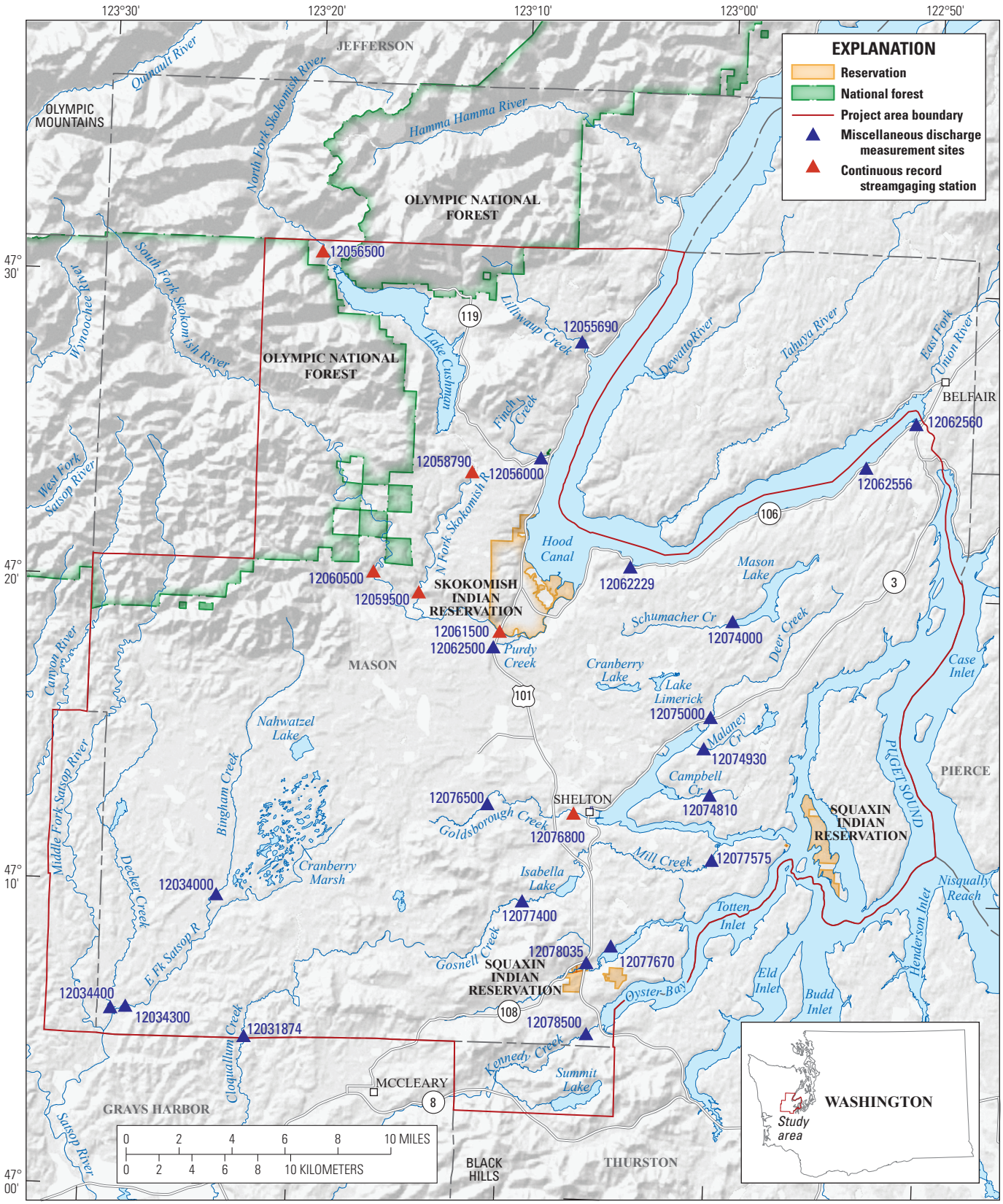
Groundwater Measurement Methods

Available well records were compiled, and sites were located in the field during summer 2016. Well selection was generally based on the availability of a drillers’ report for the well (obtained from the Washington Department of Ecology or other sources), the availability of lithologic and construction information on the drillers’ report, and permission from the owner or tenant to repeatedly visit the site. At the time of inventory, the groundwater level was measured, if accessible, and a field form was completed noting the location from GPS units, well construction information, and water level at each site. The depth to water in wells was measured following USGS procedures outlined in the USGS Techniques and Method report 1-A1 “Groundwater Technical Procedures of the U.S. Geological Survey” (Cunningham and Schalk, comps., 2011). This report provides detailed, illustrated instructions for the implementation of common field methods for collecting groundwater data.

Global Positioning System (GPS) hand-held units were used during the inventory to determine the latitude and longitude of each site. The locations of wells as determined by GPS were documented with latitude and longitude values reported in ddmmss.ss (degrees, minutes, decimal seconds). The latitude and longitude were read and recorded on the field sheet after water-level measurements were completed to give sufficient time for GPS readings to stabilize. Values between the GPS unit and those recorded on the field sheet were double-checked before departing the site. A sketch map showing location of the well was made on the field sheet. This map is intended for future visits and can include measured distances (vehicle odometer) from road intersections and estimated or paced distances from identifiable site features (such as, buildings, driveways, creeks, or fences).

Land-surface altitudes for each well were obtained from a digital elevation model with 10-square-meter cells using the latitude and longitude for each site. Information for all wells was entered in the USGS National Water Information System database (https://waterdata.usgs.gov/).

Water levels in wells were measured with steel or electronic tapes. All measurements were confirmed—taken twice, with at least 3 minutes between measurements. The confirmation measurement needed to be within 0.02 feet to be considered a static water-level measurement. If the initial measurements were not in agreement, additional measurements were made until the water level status was determined (for example, recovering or pumping).



Base map modified from Esri (copyright 2018), U.S.Geological Survey, and other digital data. Lambert Conformal Conic projection: State Plane Washington South. North American Datum of 1983.

Figure 2. Surface-water site locations, Mason County, western Washington, 2016–18.

Of the roughly 110 wells inventoried, 64 wells with measurable water levels were selected for a monthly groundwater-monitoring network run by USGS personnel. The project wells were monitored bi-monthly, with approximately one half of the wells visited each month and the other half visited the next month. All hydrologic data collected during this study was compiled and entered into the USGS National Water Information System (NWIS) database (https://waterdata.usgs.gov/).

Results

The primary components of this investigation included a field inventory of wells, establishing a monthly groundwater-level monitoring network and measuring stream discharge under baseflow conditions.

Streamflow Measurements

Synoptic stream baseflow discharge measurements were collected at 20 non-gaged locations in August and September 2016 and again in July and August 2017 to augment streamflow data from 6 active USGS gaging stations currently operating in the study area (fig. 2). These data were used to quantify the amount of baseflow in streams (table 1).

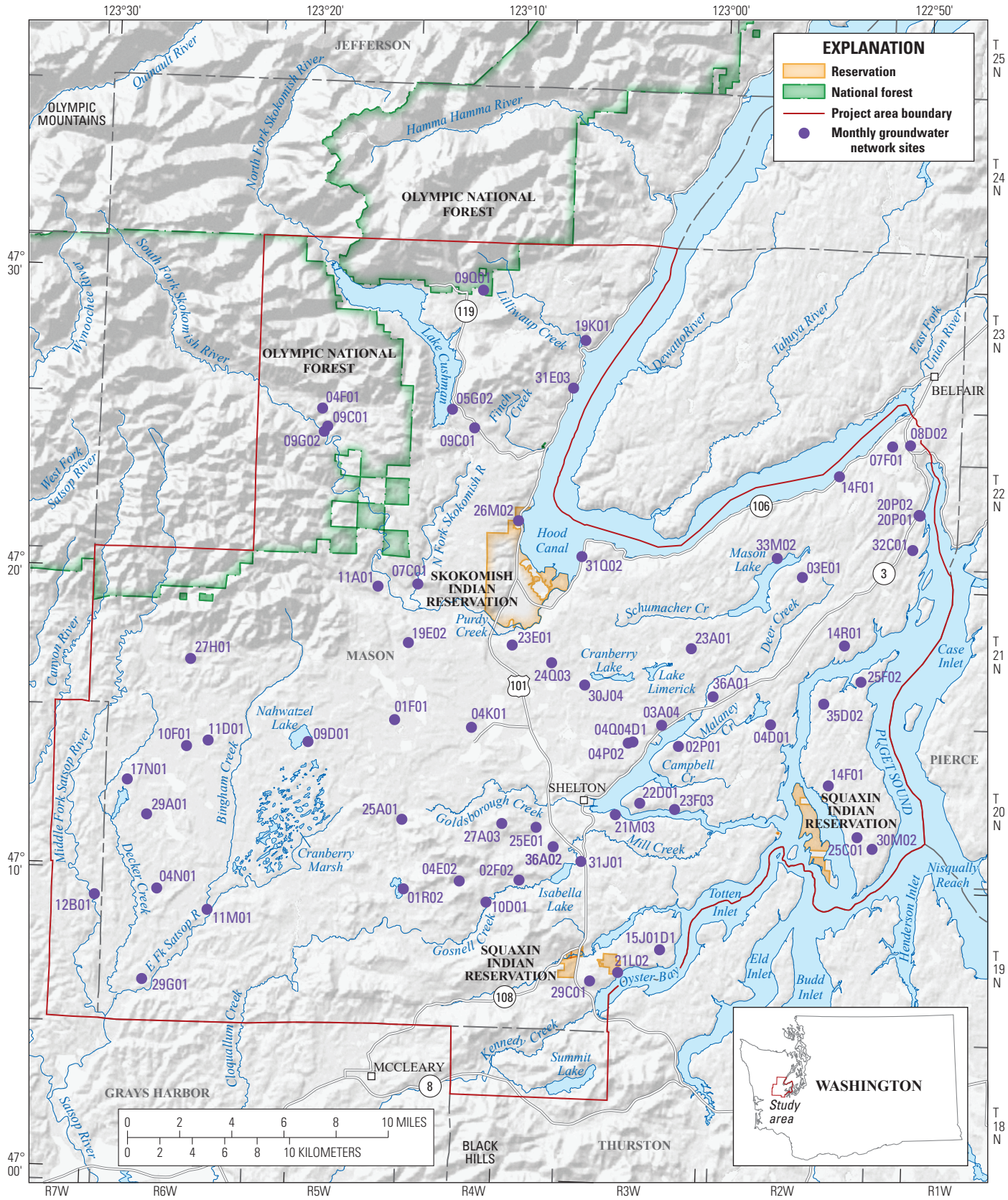
A large variety of sites were measured with measured discharge ranging from 0.01 cubic feet per second at the Little Skookum inlet tributary (Little Skookum Inlet Trib nr mouth nr Kamilche, WA; U.S. Geological Survey site 12077670) to 167 cubic feet per second in the East Fork Satsop River (EF Satsop River at Shafer St Park nr Satsop, WA; U.S. Geological Survey site 12034300). Discharge values were generally higher in 2017 than in 2016 for the same sites.

Groundwater Network

In summer 2016, a field inventory was conducted to locate potential sites and to acquire site data, including measuring depth to water in as many wells as possible. The location and associated information for wells in the county were obtained from past reports and the Washington Department of Ecology. The intent of the field inventory was to collect data from wells evenly distributed throughout the county. This was not possible in all areas because of lack of development of some areas, or lack of permission to access some sites. Locations of the inventoried wells are shown in figure 1.

After completion of the well inventory, 64 of the field-located wells were selected for use in a monthly groundwater-level monitoring network. Starting in August 2016, the USGS established a monthly network, and USGS personnel measured the wells through September 2018 (table 2 [at back of report] and fig. 3).

The monthly monitoring wells ranged in depth from 35 to 678 feet below land surface. The depths to water ranged from about 298 feet below land surface to 0.3 feet above land surface. Hydrographs are presented for wells 22N/05W-09G02 and 20N/03W-04Q04D1 as examples of some of the variation in water levels that were collected (fig. 4).



Base map modified from Esri (copyright 2018), U.S.Geological Survey, and other digital4data. Lambert Conformal Conic projection: State Plane Washington South. North American Datum of 1983.

Figure 3. Groundwater site locations, Mason County, western Washington, 2016–18.

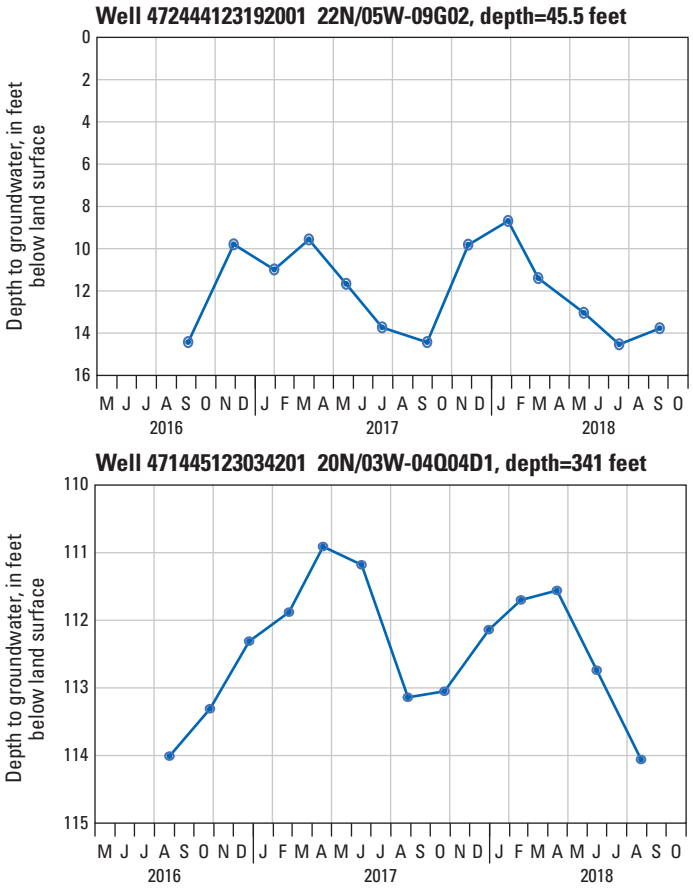


Figure 4. Examples of hydrographs for monthly water-level wells, Mason County, western Washington, 2016–18.

Summary

Groundwater and surface-water data were collected from August 2016 to September 2018 to provide the Mason Conservation District and other stakeholders basic knowledge of existing water resources in Mason County, Washington. Additionally, the data were collected with the intent of contributing to informed decision making about groundwater use, management, and conservation throughout the county. Data were collected and compiled for 130 total sites—110 wells and 20 surface-water sites. In spring 2016, a field reconnaissance was done to locate suitable locations for baseflow discharge measurements to be used for estimating groundwater contribution to surface flow. In summer 2016 a field inventory of wells was conducted to acquire locational data and to assess the suitability of the wells for inclusion in a monthly groundwater-level monitoring network. Water levels were measured bimonthly in the 64 wells over two years. Streamflow measurements were made 2 times each summer over 2 summers for each of the 20 streams.

Acknowledgments

The USGS gratefully acknowledges the Mason County landowners who allowed access to their lands and wells and who shared their knowledge about the water resources of the area.

References Cited

Cunningham, W.L., and Schalk, C.W., comps., 2011, Groundwater technical procedures of the U.S. Geological Survey: U.S. Geological Survey Techniques and Methods 1–A1, 151 p. [Also available at https://pubs.usgs.gov/tm/1a1/]

Molenaar, Dee, and Noble, J.B., 1970, Geology and related ground-water occurrence, southeastern Mason County, Washington: Washington Department of Water Resources Water Survey Bulletin no. 29, 145 p.

PRISM Climate Group, 2018, PRISM climate data: Oregon State University, accessed September 2018 at http://prism.oregonstate.edu.

Rantz, S.E., 1982, Measurement and computation of streamflow: U.S. Geological Survey Water Supply Paper 2175, 2 v., 631 p., https://pubs.usgs.gov/wsp/wsp2175/.

Washington State Office of Financial Management, 2015, Washington data & research— Population and demographics—GIS data: Washington State Office of Financial Management, accessed 2015 at http://www.ofm.wa.gov/pop/geographic/default.asp.

Table 1. Miscellaneous discharge measurements, Mason County, western Washington, 2016–18.

[**Latitude and Longitude:** Latitude and longitude at site in decimal degrees referenced to North American Datum of 1983. **Abbreviations**: ft^3/s, cubic foot per second; ft, foot; ft/s, foot per second; ft^2, square foot; –, no data]

Local name	Site No.	Latitude	Longitude	Measurement date	Discharge (ft^3/s)	Width (ft)	Area (ft^2)	Mean stream velocity (ft/s)	Measurement rating
Cloquallum Creek near county line near Elma, WA	12031874	47.084	-123.371	08-29-16	6.54	12.5	3.93	1.66	Fair
				09-28-16	7.35	25.0	8.28	0.89	Good
				07-26-17	15.9	33.0	16.2	0.98	Good
				09-01-17	10.9	16.3	14.7	0.74	Good
Bingham Creek near Matlock, WA	12034000	47.159	-123.401	08-29-16	22.6	31.0	20.3	1.12	Good
				09-28-16	17.5	30.5	19.0	0.92	Good
				07-26-17	49.7	50.0	60.7	0.82	Good
				09-01-17	34.4	50.0	66.7	0.52	Good
East fork Satsop River at Schafer State Park near Satsop, WA	12034300	47.098	-123.467	08-29-16	87.8	59.9	40.5	2.17	Good
				09-28-16	87.8	78.0	58.2	1.51	Good
				07-26-17	167	88.0	80.4	2.08	Good
				09-01-17	130	89.0	61.8	2.10	Good
Decker Creek near mouth near Satsop, WA	12034400	47.097	-123.479	08-29-16	50.7	44.0	28.6	1.77	Good
				09-28-16	45.8	43.0	31.6	1.45	Good
				07-26-17	99.9	55.2	49.1	2.03	Good
				09-01-17	80.5	55.2	45.3	1.78	Good
Lilliwaup Creek below Bridal Veil falls near Lilliwaup, WA	12055690	47.470	-123.119	08-31-16	11.4	36.6	13.7	0.83	Fair
				09-26-16	10.8	38.0	24.6	0.44	Fair
				07-28-17	20.1	35.1	15.8	1.27	Good
				08-30-17	12.9	36.0	18.9	0.68	Good
Finch Creek at Hoodsport, WA	12056000	47.405	-123.149	08-31-16	3.88	16.4	3.68	1.06	Poor
				09-26-16	2.81	6.40	5.10	0.55	Good
				07-28-17	10.6	13.0	5.24	2.03	Good
				08-30-17	3.74	10.3	3.12	1.20	Good
Hood Canal tributary No. 7 at Hwy 106 near Union, WA	12062229	47.347	-123.074	08-30-16	1.37	9.50	1.43	0.96	Poor
				09-29-16	1.19	5.40	1.22	0.98	Fair
				07-28-17	4.04	6.10	2.06	1.96	Fair
				08-31-17	2.07	7.80	3.60	0.58	Good
Purdy Creek near Union, WA	12062500	47.301	-123.182	08-31-16	9.11	9.30	3.87	2.36	Fair
				09-26-16	2.60	5.60	2.24	1.16	Fair
				07-27-17	12.1	11.2	5.60	2.17	Good
				08-30-17	12.1	10.0	5.49	2.21	Good
Hood Canal tributary No. 15 at Hwy 106 near Belfair, WA	12062556	47.405	-122.887	08-30-16	2.25	11.0	2.15	1.05	Fair
				09-29-16	1.76	9.20	2.35	0.75	Fair
				07-28-17	2.08	6.50	1.80	1.15	Fair
				08-31-17	1.33	11.2	5.07	0.26	Fair
Lake Deveraux outlet at Hwy 106 near Belfair, WA	12062560	47.430	-122.847	08-31-16	0.02	–	–	–	Poor
				09-27-16	0.02	–	–	–	Poor
				07-24-17	0.04	–	–	–	Poor
				08-31-17	0.02	–	–	–	Poor

Table 1. Miscellaneous discharge measurements, Mason County, western Washington, 2016–18.—Continued

Local name	Site No.	Latitude	Longitude	Measurement date	Discharge (ft^3/s)	Width (ft)	Area (ft^2)	Mean stream velocity (ft/s)	Measurement rating
Shumocher Creek (headwaters of Sherwood Creek) near Union, WA	12074000	47.319	-122.990	08-30-16	8.66	18.2	7.41	1.17	Good
				09-27-16	6.91	18.5	7.63	0.91	Good
				07-28-17	14.1	19.6	13.9	1.02	Good
				08-31-17	11.1	20.3	12.6	0.88	Good
Campbell Creek near Agate, WA	12074810	47.224	-123.004	08-30-16	1.20	6.50	–	–	Poor
				09-27-16	0.90	7.50	4.30	0.21	Good
				07-25-17	1.71	6.30	2.28	0.75	Good
				08-28-17	1.10	6.20	2.14	0.52	Good
Malaney Creek at Agate Road near Agate, WA	12074930	47.249	-123.010	08-30-16	0.59	5.60	0.80	0.74	Poor
				09-27-16	0.34	–	–	–	Poor
				07-25-17	1.57	4.70	1.28	1.22	Fair
				08-28-17	0.98	4.30	1.17	0.83	Fair
Deer Creek near Shelton, WA	12075000	47.267	-123.005	08-30-16	21.1	20.0	15.2	1.39	Fair
				09-27-16	21.3	19.0	15.4	1.38	Good
				07-25-17	25.7	26.3	39.0	0.66	Poor
				08-28-17	21.7	28.4	41.6	0.52	Poor
Goldsborough Creek near Shelton, WA	12076500	47.215	-123.182	08-29-16	21.6	29.6	12.6	1.72	Poor
				09-26-16	21.3	31.0	32.0	0.66	Fair
				07-27-17	28.5	33.8	36.6	0.78	Fair
				08-29-17	22.8	33.3	33.5	0.68	Good
Gosnell Creek at West Bolling Road near Shelton, WA	12077395	47.157	-123.170	08-31-16	9.48	12.9	–	–	Good
				09-28-16	9.65	11.5	5.35	1.81	Good
				07-27-17	15.7	15.6	9.67	1.63	Good
				08-29-17	13.2	15.1	8.30	1.59	Good
Mill Creek at Arcadia Road near Shelton, WA	12077575	47.188	-123.001	08-30-16	5.81	22.9	7.98	0.73	Poor
				09-27-16	12.3	26.5	17.5	0.70	Poor
				07-27-17	21.2	26.4	15.2	1.39	Good
				08-29-17	16.8	24.3	12.2	1.38	Good
Little Skookum Inlet tributary near mouth near Kamilche, WA	12077670	47.140	-123.080	08-26-16	0.04	–	–	–	Poor
				09-26-16	0.01	–	–	–	Poor
				07-24-17	0.69	–	–	–	Poor
				08-30-17	0.04	–	–	–	Poor
Little Skookum Creek at Hwy 108 at Kamilche, WA	12078035	47.130	-123.099	08-29-16	0.14	5.60	1.30	0.11	Poor
				09-28-16	0.02	–	–	–	Poor
				07-27-17	0.65	6.40	2.09	0.31	Fair
				08-29-17	0.60	7.10	2.36	0.25	Fair
Kennedy Creek near New Kamilche, WA	12078500	47.092	-123.097	08-29-16	3.55	14.3	4.19	0.85	Poor
				09-26-16	3.96	13.3	5.14	0.77	Poor
				07-26-17	8.88	6.71	3.34	2.66	Good
				08-28-17	6.47	6.00	2.78	2.33	Fair

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.

[**Latitude and Longitude**: Latitude and longitude at site in decimal degrees referenced to North American Datum of 1983. **Land-surface altitude**: Land-surface altitude at site in feet above North American Vertical Datum of 1988. **Groundwater level status**: G, nearby flowing; P, pumping; R, recently pumped; S, nearby pumping; T, nearby recently pumped; no code implies a static groundwater level. **Groundwater level method**: S, steel tape; T, electric tape; V, calibrated electric tape. **Abbreviation**: ft, foot]

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
19N-06W-29G01	470619123271701	47.105	-123.455	11-17-03	180	227	09-08-16	26.46		V
							10-24-16	21.73		T
							12-21-16	22.18		T
							02-28-17	22.64		T
							05-05-17	22.84		T
							06-26-17	24.74		V
							09-01-17	27.15		V
							10-30-17	22.65		V
							01-05-18	22.63		V
							02-20-18	22.76		V
							04-24-18	22.14		V
							06-27-18	25.11		V
							08-30-18	27.49		V
19N-03W-29C01	470645123052701	47.113	-123.091	06-07-88	303	364	08-22-16	171.28		T
							10-28-16	171.77		T
							12-27-16	168.53		T
							02-27-17	167.20		T
							04-21-17	165.78		T
							06-23-17	167.79		V
							08-31-17	172.06		V
							10-27-17	173.17		V
							01-3-18	170.42		V
							02-23-18	168.63		V
							04-20-18	168.95		V
							06-26-18	170.34		V
							08-29-18	177.87	R	V
19N-03W-21L02	470704123040501	47.118	-123.068	05-18-01	422	152	08-22-16	75.81	S	T
							10-28-16	70.89		T
							12-27-16	69.96		T
							02-27-17	68.29		T
							04-21-17	67.66		T
							06-23-17	68.00		V
							08-31-17	69.51		V
							10-27-17	70.62		V
							01-03-18	69.54		V
							02-23-18	68.61		V
							04-20-18	68.24		V
							06-26-18	68.80		V
							08-29-18	70.12		V

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
19N-03W-15J01D1	470752123020501	47.131	-123.035	07-24-93	134.6	169	08-22-16	105.40		T
							10-28-16	105.28		T
							12-27-16	105.40		T
							02-27-17	104.92		T
							04-21-17	105.30		T
							06-23-17	105.00		V
							08-31-17	105.06		V
							10-27-17	105.13		V
							01-03-18	105.01		V
							02-23-18	104.87		V
							04-20-18	104.40		V
							06-26-18	104.23		V
							08-29-18	103.88		V
19N-06W-11M01	470842123241301	47.145	-123.404	11-17-99	50	234	09-08-16	6.33		V
							10-24-16	4.41		T
							12-21-16	3.46		T
							02-28-17	3.81		T
							05-05-17	3.80		T
							06-26-17	5.21		V
							09-01-17	6.11		V
							10-30-17	6.10		V
							01-05-18	3.49		V
							02-20-18	3.68		V
							04-24-18	3.54		V
							06-27-18	5.74		V
							08-30-18	6.29		V
19N-07W-12B01	470904123294401	47.151	-123.496	05-08-07	56	204	08-25-16	23.86		S
							10-24-16	21.21		T
							12-21-16	21.27		T
							02-28-17	22.18		S
							05-05-17	22.28		S
							06-26-17	23.15		S
							09-01-17	23.77		S
							10-30-17	23.12		S
							01-05-18	21.66		S
							02-20-18	22.10		V
							04-24-18	22.24		S
							06-27-18	24.06		S
							08-30-18	24.22		S
19N-04W-10D01	470916123103701	47.154	-123.177	07-05-94	97	167	08-25-16	8.53	R	T
							10-27-16	3.67		T
							12-22-16	2.38		T
							02-24-17	2.11		T
							04-24-17	2.39		T
							07-03-17	4.71		V
							09-01-17	6.72		V
							10-31-17	5.94		V
							01-03-18	2.22		V
							02-22-18	2.91		V
							04-19-18	2.12		V
							06-28-18	5.59		V
							08-24-18	8.47	P	V

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
19N-06W-04N01	470921123264301	47.156	-123.445	07-09-99	61	295	08-05-16	35.57		V
							08-23-16	42.02	P	T
							10-24-16	19.12		T
							12-21-16	19.83		T
							02-28-17	21.65		T
							05-05-17	23.02		T
							06-26-17	30.76	R	V
							09-01-17	33.90	R	V
							10-30-17	34.41		V
							01-05-18	19.01		V
							02-20-18	22.49		V
							04-24-18	20.00		V
							06-27-18	32.67	R	V
							08-30-18	36.71		V
19N-05W-01R02	470937123144101	47.160	-123.245	06-03-95	55	513	08-24-16	54.67	P	T
							10-27-16	26.54		T
							12-22-16	18.13		T
							02-24-17	17.24		T
							04-24-17	18.41		T
							07-3-17	25.93		V
							08-30-17	37.98		V
							10-31-17	38.79		V
							01-03-18	17.26		V
							02-22-18	18.73		V
							04-19-18	17.70		V
							06-28-18	30.67		V
							08-24-18	40.24		V
19N-04W-04E02	470956123115801	47.166	-123.199	10-05-01	340	397	08-22-16	13.76		T
							10-27-16	7.05		T
							12-22-16	7.28		T
							02-24-17	13.24	R	T
							04-24-17	6.30		T
							07-03-17	11.76		V
							09-01-17	18.50		V
							10-31-17	12.27		V
							01-03-18	10.37		V
							02-22-18	9.93		V
							04-19-18	13.16	R	V
							06-28-18	19.35		V
							08-24-18	19.21		V
19N-04W-02F02	471002123090301	47.167	-123.151	06-15-00	90	162	08-22-16	19.01		T
							10-27-16	17.82		T
							12-22-16	6.50		T
							02-24-17	3.85		T
							04-24-17	3.73		T
							07-03-17	12.63		V
							08-31-17	17.56	R	V
							10-31-17	19.12		V
							01-03-18	7.51		V
							02-22-18	5.22		V
							04-19-18	7.33		V
							06-28-18	14.59		V
							08-24-18	18.76		V

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
20N-03W-31J01	471043123060301	47.179	-123.101	05-05-97	119.6	135	08-25-16	25.89		T
							10-27-16	25.04		T
							12-27-16	23.80		T
							02-27-17	21.84		T
							04-21-17	19.59		T
							06-23-17	22.30		V
							08-31-17	25.08		V
							10-27-17	25.03		V
							01-02-18	23.59		V
							02-23-18	21.32		V
							04-20-18	21.29		V
							06-26-18	23.89		V
							08-29-18	26.27		V
20N-04W-36A02	471111123072601	47.186	-123.124	01-19-99	246	281	08-24-16	164.31		T
							10-27-16	161.24		T
							12-22-16	160.03		T
							02-24-17	159.39		T
							04-24-17	158.90		T
20N-01W-30M02	471129122514801	47.191	-122.864	7-11-77	309	262	09-22-16	226.66		T
							11-29-16	226.40		T
							01-26-17	226.77		T
							03-30-17	226.49		T
							05-25-17	226.28		V
							07-21-17	229.98	R	V
							10-02-17	226.09		V
							11-20-17	225.27		V
							01-24-18	225.36		V
							05-31-18	225.89		V
							07-26-18	227.12	R	V
20N-02W-25C01	471148122523701	47.197	-122.877	04-04-12	260	242	09-23-16	177.53		T
							11-29-16	175.93		T
							01-26-17	176.68		T
							03-30-17	176.62		T
							05-25-17	175.29		V
							07-21-17	174.32		V
							10-03-17	173.67		V
							11-20-17	173.64		V
							01-24-18	173.70		V
							03-20-18	173.97		V
							05-31-18	173.49		V
							07-26-18	173.49		V
							09-27-18	173.45		V

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
20N-04W-25E01	471148123081801	47.197	-123.138	03-18-99	65	86	08-24-16	8.12		T
							10-27-16	4.16		T
							12-27-16	2.57		T
							02-27-17	1.58		T
							04-21-17	0.80		T
							06-23-17	4.09		V
							08-31-17	7.09		V
							10-27-17	6.02		V
							01-02-18	2.05		V
							02-23-18	2.00		V
							04-20-18	1.80		V
							06-26-18	5.99		V
							08-29-18	8.35		V
20N-06W-29A01	471148123272001	47.197	-123.456	08-16-07	35	349	08-23-16	11.93		T
							10-24-16	2.61		T
							12-21-16	0.03		T
							02-28-17	0.34		T
							05-05-17	0.41		T
							06-26-17	1.59		V
							09-01-17	7.32		V
							10-30-17	9.26		V
							01-05-18	-0.01		V
							02-20-18	0.31		V
							04-24-18	0.44		V
							06-27-18	3.11		V
							08-30-18	11.00		V
20N-04W-27A03	471154123095901	47.198	-123.166	09-02-98	100	366	08-24-16	70.26		T
							10-28-16	72.71		T
							12-27-16	72.14		T
							02-28-17	70.87	R	T
							04-21-17	65.79		T
							06-20-17	65.71		V
							08-31-17	68.69		V
							10-27-17	71.08		V
							01-02-18	72.03		V
							02-23-18	70.10		V
							04-20-18	69.16		V
							06-26-18	69.34		V
							08-29-18	77.18	P	V
20N-05W-25A01	471155123145201	47.199	-123.248	06-19-93	80	250	08-05-16	7.00		V
							08-23-16	7.18		T
							10-25-16	3.46		T
							12-27-16	2.54		T
							02-27-17	2.79		T
							04-21-17	2.70		T
							06-20-17	5.06		V
							08-31-17	6.91		V
							10-27-17	5.68		V
							01-02-18	2.38		V
							02-23-18	3.22		V
							04-20-18	2.67		V
							06-21-18	6.24		V
							08-29-18	7.21		V

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
20N-03W-21M03	471219123042701	47.205	-123.074	07-10-92	59	21	08-25-16	.83		T
							10-27-16	.89		T
							12-27-16	.89		T
							02-27-17	.88		T
							04-21-17	.92		S
							06-23-17	.88		S
							08-31-17	.90		S
							10-27-17	.86		S
							01-04-18	.92		S
							02-23-18	.71		S
							04-20-18	.91		S
							06-26-18	.91		S
							08-29-18	.92		S
20N-03W-23F03	471233123013401	47.209	-123.026	12-12-96	53.6	42	09-23-16	28.36		T
							12-01-16	27.68		T
							01-26-17	26.66		T
							03-30-17	24.52		T
							05-25-17	25.54		V
							07-20-17	27.13		V
							10-03-17	28.08		V
							11-20-17	28.06		V
							01-24-18	25.45		V
							03-20-18	26.12		V
							05-31-18	26.72		V
							07-26-18	28.07		V
							09-27-18	28.39		V
20N-06W-17N01	471256123282101	47.216	-123.472	05-15-07	63	367	08-23-16	6.74		T
							10-24-16	2.37		T
							12-21-16	1.39		T
							02-28-17	1.89		T
							05-05-17	1.87		T
							06-26-17	2.60		V
							09-01-17	4.87		V
							10-30-17	5.12	R	V
							01-05-18	1.42		V
							02-20-18	1.75		V
							04-24-18	2.04		V
							06-27-18	3.49		V
							08-30-18	6.54		V
20N-02W-14F01	471330122540601	47.225	-122.902	05-17-13	85	152	11-29-16	59.42	P	T
							01-26-17	28.49		T
							03-30-17	25.87	R	T
							05-26-17	27.70	P	T

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
20N-03W-22D01	471355123502501	47.212	-123.055	07-17-75	131	116	09-23-16	80.49		T
							12-01-16	79.04		T
							01-26-17	78.77		T
							03-30-17	77.63		T
							05-26-17	78.20		T
							07-20-17	79.77		V
							10-03-17	79.99		V
							11-20-17	79.17		V
							01-24-18	78.80		V
							03-22-18	78.26		V
							05-31-18	79.35		V
							07-26-18	80.76		V
							09-27-18	80.66		V
20N-06W-10F01	471407123253101	47.235	-123.425	12-18-93	65	432	08-23-16	46.41		T
							10-24-16	9.69		T
							12-21-16	7.99		T
							02-28-17	8.74		T
							05-05-17	9.37		T
							06-26-17	15.94		V
							09-01-17	36.57		V
							10-30-17	30.34		V
							01-05-18	8.28		V
							02-20-18	8.63		V
							04-24-18	9.00		V
							06-27-18	27.29		V
							08-30-18	45.15		V
20N-06W-11D01	471420123242801	47.239	-123.408	09-13-02	232	458	08-23-16	55.32		T
							10-24-16	61.71		T
							12-21-16	57.34		T
							02-28-17	52.64		T
							05-05-17	48.44		T
							06-26-17	47.86		V
							09-01-17	61.64		V
							10-30-17	57.12		V
							01-05-18	63.20		V
							02-20-18	57.82		V
							04-24-18	55.48		V
							06-27-18	53.82		V
							08-30-18	55.18		V
20N-05W-09D01	471424123193501	47.240	-123.326	08-15-94	60	480	08-24-16	27.28		T
							10-24-16	21.51		T
							12-21-16	17.22		T
							02-28-17	17.60		T
							05-05-17	15.43		T
							06-26-17	21.29		V
							09-01-17	25.83	R	V
							10-30-17	25.54		V
							01-05-18	17.89		V
							02-20-18	15.93		V
							04-24-18	17.32		V
							06-27-18	24.04		V
							08-30-18	27.20		V

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
20N-03W-02P01	471439123012901	47.244	-123.025	12-28-92	59	162	09-21-16	31.08		T
							11-30-16	21.58		T
							01-24-17	21.38		T
							03-27-17	20.72		T
							05-24-17	21.89		V
							07-20-17	26.01	R	V
							09-28-17	28.46		V
							11-30-17	21.71		V
							01-25-18	22.99	P	V
							03-19-18	21.82		V
							05-29-18	23.01		V
							07-23-18	26.31		V
							09-24-18	30.17	R	V
20N-03W-04P02	471443123035601	47.245	-123.066	11-16-05	70	201	08-25-16	21.95		T
							10-27-16	17.49		T
							12-23-16	17.66		T
							02-27-17	17.91		T
							04-21-17	17.74		T
							06-20-17	19.25		V
							08-31-17	21.21		V
							10-27-17	22.27	R	V
							01-02-18	17.49		V
							02-23-18	18.29		V
							04-20-18	17.69		V
							06-29-18	20.47		V
							08-29-18	23.51	R	V
20N-03W-04Q04D1	471445123034201	47.246	-123.062	02-01-95	341	200	08-25-16	114.01		T
							10-27-16	113.31		T
							12-27-16	112.31		T
							02-27-17	111.88		T
							04-21-17	110.91		T
							06-20-17	111.18		V
							08-31-17	113.14		V
							10-27-17	113.05		V
							01-04-18	112.14		V
							02-23-18	111.70		V
							04-20-18	111.56		V
							06-21-18	112.74		V
							08-29-18	114.06		V
20N-04W-04K01	471504123113701	47.251	-123.194	03-30-98	115	319	08-26-16	38.84		T
							10-25-16	34.51		T
							12-22-16	27.44		T
							02-24-17	24.24		T
							04-24-17	22.47		T
							06-30-17	28.91		V
							08-30-17	36.41		V
							10-31-17	40.82		V
							01-03-18	28.10		V
							02-22-18	25.17		V
							04-19-18	25.30		V
							06-28-18	34.25		V
							08-24-18	39.43		V

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
20N-05W-01F01	471514123152401	47.254	-123.257	04-12-94	50	405	08-24-16	26.80		T
							10-27-16	24.20		T
							12-27-16	17.54		T
							02-27-17	15.91		T
							04-21-17	15.11		T
							06-20-17	19.01		V
							08-31-17	24.68	R	V
							10-27-17	27.87		V
							01-02-18	17.90		V
							02-23-18	16.41		V
							04-20-18	16.56		V
							06-21-18	21.67		V
							08-29-18	27.85		V
20N-03W-03A04	471520123022001	47.256	-123.039	07-21-06	140	97	09-21-16	7.93		T
							11-30-16	19.28	R	T
							01-24-17	6.57		T
							03-27-17	4.84		T
							05-24-17	4.46		V
							07-19-17	5.55		V
							09-28-17	6.11		V
							11-30-17	5.69		V
							01-25-18	4.66		V
							03-19-18	5.39		V
							05-29-18	5.77		V
							07-23-18	6.99		V
20N-02W-04D01	471528122570001	47.258	-122.950	09-06-12	142	223	09-23-16	67.44		T
							11-29-16	66.57		T
							01-26-17	64.50		T
							03-30-17	59.99		T
							05-25-17	60.37		V
							07-30-17	63.00		V
							10-3-17	65.98		V
							11-20-17	67.25		V
							01-24-18	63.02		V
							03-20-18	62.08		V
							05-31-18	63.26		V
							07-26-18	65.21		V
							09-27-18	67.46		V
21N-02W-35D02	471613122542601	47.270	-122.907	8-18-10	174	145	09-22-16	118.78		T
							11-29-16	118.32		T
							01-26-17	118.43		T
							03-30-17	117.69		T
							05-25-17	117.58		V
							07-21-17	118.10		V
							10-02-17	118.24		V
							11-20-17	117.74		V
							01-24-18	117.18		V
							03-20-18	117.48		V
							05-31-18	117.73		V
							07-26-18	118.65		V
							09-27-18	117.70		V

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
21N-03W-36A01	471620122595201	47.272	-122.998	6-13-05	160	142	09-21-16	111.25		T
							12-01-16	109.93		T
							01-24-17	109.75		T
							03-27-17	108.74		T
							05-24-17	109.33		V
							07-20-17	111.07		V
							09-28-17	110.97		V
							11-30-17	109.68		V
							01-25-18	109.06		V
							03-19-18	109.53		V
							05-29-18	110.63		V
							07-23-18	112.84		V
							09-24-18	111.58		V
21N-03W-30J04	471636123060901	47.277	-123.103	8-16-06	188	324	09-20-16	104.78		T
							12-1-16	103.33		T
							01-26-17	99.78		T
							03-27-17	96.83		T
							05-24-17	98.21		V
							07-19-17	101.53		V
							09-27-17	103.09		V
							11-30-17	103.24		V
							01-25-18	100.35		V
							03-19-18	99.98		V
							05-29-18	101.58		V
							07-23-18	103.19		V
							09-24-18	104.71		V
21N-02W-25F02	471659122523901	47.283	-122.877	07-25-12	151	47	09-22-16	59.39		T
							11-29-16	58.52		T
							01-26-17	58.37		T
							03-30-17	57.49		T
							05-25-17	58.15		V
							07-21-17	59.37		V
							10-02-17	59.11		V
							11-20-17	58.45		V
							01-24-18	57.34		V
							03-20-18	58.01		V
							05-31-18	58.68		V
							07-26-18	59.72		V
							09-27-18	59.08		V
21N-06W-27H01	471701123252801	47.284	-123.424	11-5-92	67.75	625	08-29-16	57.42		T
							10-24-16	46.74		T
							12-21-16	46.67		T
							02-28-17	48.17		T
							05-05-17	48.39		T
							06-26-17	49.29		V
							09-01-17	54.47		V
							10-30-17	48.57		V
							01-05-18	47.56		V
							02-20-18	48.18		V
							04-24-18	47.92		V
							06-27-18	51.18		V
							08-30-18	59.46		V

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
21N-04W-24Q03	471718123074801	47.288	-123.130	02-14-06	300	361	08-25-16	216.62		T
							10-25-16	217.76		T
							12-22-16	216.66		T
							02-24-17	215.40		T
							04-24-17	212.68		T
							06-30-17	213.29		V
							08-30-17	215.25		V
							10-31-17	216.85		V
							01-03-18	216.59		V
							02-22-18	215.42		V
							04-19-18	215.02		V
							06-28-18	215.72		V
							08-24-18	217.42		V
21N-04W-19E02	471749123145101	47.297	-123.247	06-14-07	218	500	08-29-16	182.98		T
							10-25-16	193.27		T
							12-22-16	179.48		T
							02-24-17	166.07		T
							04-24-17	150.32		T
							06-30-17	162.25		V
							08-30-17	177.49		V
							10-31-17	189.49		V
							01-03-18	182.71		V
							02-22-18	164.90		V
							04-19-18	168.03		V
							06-28-18	173.90		V
							08-24-18	185.42		V
21N-04W-23E01	471751123094601	47.297	-123.163	11-21-08	257	385	08-29-16	200.66		T
							10-25-16	203.42		T
							12-22-16	204.80		T
							02-24-17	201.78		T
							04-24-17	196.63		T
							06-30-17	196.03	P	V
							08-30-17	199.00		V
							10-31-17	202.22		V
							01-03-18	204.25		V
							02-22-18	203.01		V
							04-19-18	199.72		V
21N-03W-23A01	471755123010001	47.299	-123.017	03-29-07	118	263	08-05-16	60.33		T
							09-20-16	62.79		T
							12-01-16	56.57		T
							01-27-17	53.41		T
							03-29-17	48.35		T
							05-30-17	51.30		T
							08-01-17	60.69	P	V
							09-29-17	60.01		V
							11-28-17	58.06		V
							01-26-18	52.54		V
							03-22-18	52.83		V
							06-1-18	54.54		V
							07-24-18	60.00		V
							09-27-18	62.46		V

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
21N-02W-14R01	471810122533101	47.303	-122.892	10-22-10	193	186	09-22-16	151.96		T
							11-28-16	151.78		T
							01-27-17	151.29		T
							03-28-17	150.97		T
							05-26-17	150.50		T
							07-28-17	151.17		V
							09-28-17	151.32		V
							11-22-17	151.05		V
							01-29-18	150.73		V
							03-20-18	150.83		V
							05-30-18	151.02		V
							07-25-18	151.64		V
							09-25-18	151.83		V
21N-05W-11A01	471939123162601	47.328	-123.274	04-04-07	44	119	09-20-16	9.06		T
							11-30-16	6.24		T
							01-24-17	6.83		T
							03-27-17	6.29		T
							05-24-17	7.74		V
							07-19-17	8.84	R	V
							10-02-17	9.34		V
							11-30-17	6.27		V
							01-25-18	4.93		V
							03-19-18	8.08		V
							05-29-18	9.37		V
							07-23-18	9.14		V
							09-24-18	9.24		V
21N-04W-07C01	471946123142901	47.330	-123.241	07-10-14	80	79	08-29-16	14.10		T
							10-25-16	9.14		T
							12-22-16	12.18		T
							02-24-17	10.50		T
							04-24-17	12.07		T
							06-30-17	13.51		V
							08-30-17	14.07		V
							10-31-17	13.38		V
							01-03-18	12.29		V
							02-22-18	12.88		V
							04-19-18	12.34		V
							06-28-18	13.72		V
							08-24-18	14.19		V
21N-02W-03E01	472024122554001	47.340	-122.928	05-21-09	167	239	09-23-16	115.55		T
							11-28-16	115.05		T
							01-27-17	114.88		T
							03-28-17	141.78		T
							05-26-17	112.10		T
							07-28-17	112.85		V
							09-28-17	113.50		V
							11-27-17	113.87		V
							01-25-18	112.92		V
							03-20-18	112.86		V
							05-30-18	113.05		V
							07-25-18	114.08		V
							09-25-18	114.93		V

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
22N-03W-31Q02	472052123063001	47.348	-123.108	11-10-08	133	13	09-20-16	4.34		T
							11-29-16	3.91		T
							01-27-17	4.59		T
							03-29-17	4.89		T
							05-30-17	6.20		T
							07-31-17	5.83		V
							09-29-17	4.79		V
							11-28-17	3.94		V
							01-25-18	4.35		V
							03-23-18	5.71		V
							06-1-18	7.65	G	V
							07-24-18	7.11		V
							09-26-18	6.56		V
22N-02W-33M02	472101122565601	47.350	-122.949	08-01-12	141	263	09-22-16	75.07		T
							11-28-16	73.68		T
							01-27-17	72.79		T
							03-28-17	68.95		T
							05-26-17	66.10		T
							07-28-17	67.55		V
							09-28-17	69.74		V
							11-27-17	70.63		V
							01-25-18	68.59		V
							03-20-18	68.86		V
							05-30-18	69.32		V
							07-25-18	71.58		V
							09-25-18	73.98		V
22N-01W-32C01	472125122501801	47.357	-122.838	05-13-05	140	114	09-22-16	85.70		T
							11-28-16	84.56		T
							01-27-17	83.43		T
							03-28-17	81.08		T
							05-26-17	81.20		T
							07-28-17	83.23		V
							09-28-17	84.56		V
							11-22-17	84.65		V
							01-29-18	82.11		V
							03-20-18	82.33		V
							05-30-18	83.03		V
							07-25-18	84.63		V
							09-25-18	85.85		V
22N-04W-26M02	472159123094001	47.367	-123.161	06-25-02	112	63	09-21-16	7.43	R	T
							12-01-16	5.13		T
							01-27-17	4.29		T
							03-29-17	0.90		T
							05-30-17	-0.30		T
							07-31-17	0.85		V
							10-02-17	14.23		V
							11-28-17	3.80		V
							01-26-18	3.43		V
							03-23-18	3.14		V
							06-01-18	5.00	R	V

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
22N-01W-20P01	472235122495901	47.376	-122.834	04-01-61	70	22	09-22-16	5.35		T
							11-28-16	5.38	R	T
							01-27-17	6.74	R	T
							03-28-17	5.49		T
							05-25-17	6.11		V
							07-24-17	7.11		V
							09-28-17	5.99	R	V
							11-22-17	3.87		V
							01-29-18	4.78		V
							03-22-18	5.41		V
							05-30-18	6.82		V
							07-25-18	7.60		V
							09-25-18	7.36		V
22N-01W-20P02	472240122495501	47.376	-122.834	08-22-77	69	21	09-22-16	5.81		T
							11-28-16	6.07	R	T
							01-27-17	5.87		T
							03-28-17	6.49		T
							05-25-17	7.11		V
							07-24-17	7.98		V
							09-28-17	6.47	R	V
							11-22-17	4.11		V
							01-29-18	5.51		V
							03-22-18	6.18	R	V
							05-30-18	7.73	R	V
							07-25-18	8.41		V
							09-25-18	8.17		V
22N-02W-14F01	472348122535401	47.397	-122.900	05-29-75	97	18	09-22-16	12.52		T
							11-28-16	10.29		T
							01-30-17	12.14		T
							03-28-17	10.77		T
							05-26-17	12.80		T
							07-31-17	12.17		V
							09-28-17	11.77		V
							11-27-17	10.53		V
							01-29-18	10.08		V
							03-23-18	12.27		V
							05-30-18	13.24		V
							07-24-18	12.65		V
							09-25-18	13.39		V
22N-05W-09G02	472444123192001	47.412	-123.322	03-16-88	45.5	572	09-20-16	14.43		T
							11-30-16	9.80		T
							02-1-17	10.99		T
							03-27-17	9.57		T
							05-24-17	11.67		V
							07-19-17	13.73		V
							09-27-17	14.43		V
							11-30-17	9.82		V
							01-31-18	8.69		V
							03-19-18	11.40		V
							05-29-18	13.04		V
							07-23-18	14.53		V
							09-24-18	13.77		V

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
22N-01W-07F01	472450122512701	47.414	-122.857	06-06-14	42	308	09-22-16	28.46		T
							11-28-16	23.74		T
							01-30-17	16.14		T
							03-28-17	13.34		T
							05-25-17	17.90		T
							07-24-17	23.65		V
							09-28-17	27.13		V
							11-22-17	27.47		V
							01-25-18	14.30		V
							03-22-18	18.93		V
							05-30-18	21.39		V
							07-25-18	25.59		V
							09-25-18	28.17		V
22N-01W-08D02	472454122503401	47.415	-122.843	09-01-81	678	299	09-22-16	281.56		T
							11-28-16	269.26		T
							01-30-17	280.90		T
							03-28-17	275.41		T
							07-31-17	298.08		V
							09-28-17	287.64		V
							11-27-17	270.13		V
							01-29-18	277.82		V
							03-23-18	273.25		V
							05-30-18	285.81	R	V
							09-25-18	272.97		V
22N-05W-09C01	472455123191001	47.415	-123.320	10-31-03	163	598	09-20-16	22.20		T
							11-30-16	19.23		T
							02-01-17	20.29		T
							03-27-17	19.12		T
							05-24-17	20.09		V
							07-19-17	21.27		V
							09-27-17	22.01		V
							11-30-17	19.39		V
							01-31-18	18.87		V
							03-19-18	20.81		V
							05-29-18	21.33		V
							07-23-18	22.04		V
							09-24-18	22.26		V
22N-04W-09C01	472502123115801	47.417	-123.199	09-05-89	160	697	09-21-16	-0.06		T
							12-01-16	20.53	R	T
							01-30-17	0.01		T
							03-29-17	2.49	R	T
							05-30-17	0.10	P	T
							08-01-17	45.94	R	V
							09-29-17	7.01		V
							12-01-17	0.04		V
							01-31-18	0.05		V
							03-30-18	7.07	R	V
							06-01-18	5.77		V
							07-24-18	0.14		V
							09-26-18	0.12		V

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
22N-05W-04F01	472531123192701	47.425	-123.324	03-25-97	121	795	09-20-16	104.75		T
							11-30-16	93.90		T
							02-01-17	99.08		T
							03-27-17	95.84		T
							05-24-17	102.60		V
							07-19-17	103.28		V
							09-27-17	104.26		V
							11-30-17	94.54		V
							01-31-18	95.10		V
							03-19-18	102.30		V
							05-29-18	103.35		V
							07-23-18	104.05		V
							09-24-18	104.66		V
22N-04W-05G02	472537123130501	47.427	-123.218	04-20-88	115	757	09-21-16	20.34		T
							12-01-16	21.30		T
							01-30-17	34.18		T
							03-29-17	18.06		T
							05-30-17	12.30		T
							08-01-17	11.27		V
							09-29-17	20.06		V
							12-01-17	19.28		V
							01-31-18	29.61		V
							03-30-18	26.11		V
							06-01-18	11.85		V
							07-24-18	14.74	R	V
							09-26-18	18.65		V
23N-03W-31E03	472628123071101	47.441	-123.120	11-30-90	56	16	09-21-16	10.18		T
							12-01-16	5.30		T
							01-31-17	6.30		T
							03-29-17	5.12		T
							05-30-17	9.90		T
							07-31-17	11.69		V
							09-29-17	10.77		V
							11-28-17	4.52		V
							01-26-18	4.41		V
							03-30-18	8.19		V
							06-01-18	10.94		V
							07-24-18	12.29		V
							09-27-18	11.59		V
23N-03W-19K01	472804123063901	47.468	-123.111	08-10-00	103	173	09-21-16	51.20		T
							12-01-16	50.22		T
							01-26-17	50.06		V
							01-27-17	50.44		T
							03-29-17	49.92		T
							05-30-17	50.50		T
							07-31-17	92.00	R	V
							09-29-17	50.99		V
							11-28-17	50.27		V
							01-26-18	50.06		V
							03-23-18	50.53		V
							06-01-18	51.93		V
							07-24-18	52.60		V
							09-26-18	53.46	R	V

Table 2. Measured monthly groundwater levels, Mason County, western Washington, 2016–18.—Continued

Local well No.	Site No.	Latitude	Longitude	Date of well construction	Well depth (ft)	Land-surface altitude (ft)	Measure-ment date	Groundwater level (feet below land-surface)	Groundwater level	
									Status	Method
23N-04W-09Q01	472937123114601	47.494	-123.196	04-09-16	36.5	851	09-21-16	17.70		T
							12-01-16	3.99	T	T
							01-30-17	5.93		T
							03-29-17	3.84		T
							05-30-17	7.60		T
							08-01-17	11.59		V
							09-29-17	16.08		V
							11-28-17	3.67		V
							01-26-18	3.21		V
							03-23-18	7.27		V
							06-01-18	8.64		V
							07-24-18	12.61		V
							09-26-18	17.27		V

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