Island Center Subarea Planning Process
Steering Committee
Regular Meeting Minutes
November 7, 2018

Call to Order (Attendance, Agenda, Ethics)
Review & Approve Minutes – October 3,2018
Review Existing Conditions Material
Public Comment
Adjourn

Call to Order (Attendance, Agenda, Ethics)
Chair Maradel Gale called the meeting to order at 6:33 PM. Steering Committee Members in attendance were Scott Anderson, Michael Loverich, Sam Marshall, Micah Strom and John Decker. Asaph Gossler, Donna Harui and Mark Tiernan were absent and excused. Jane Rein (Design Review Board), Sarah Blossom (City Council) and City Consultant John Owens (Makers Architecture and Urban Design) were present. City Staff present were Planning Director Gary Christensen, Engineering Manager Mike Michael, Long Range Senior Planner Jennifer Sutton and Administrative Specialist Jane Rasely who monitored recording and prepared minutes.

New members Sam Marshall and John Decker introduced themselves. The agenda was reviewed. There were not any changes in status. Micah Strom disclosed that his company was in the process of purchasing the land their business was on.

Review & Approve Minutes – October 3, 2018

> **Motion:** Move to accept minutes as distributed.
> **Strom/Anderson:** Passed unanimously

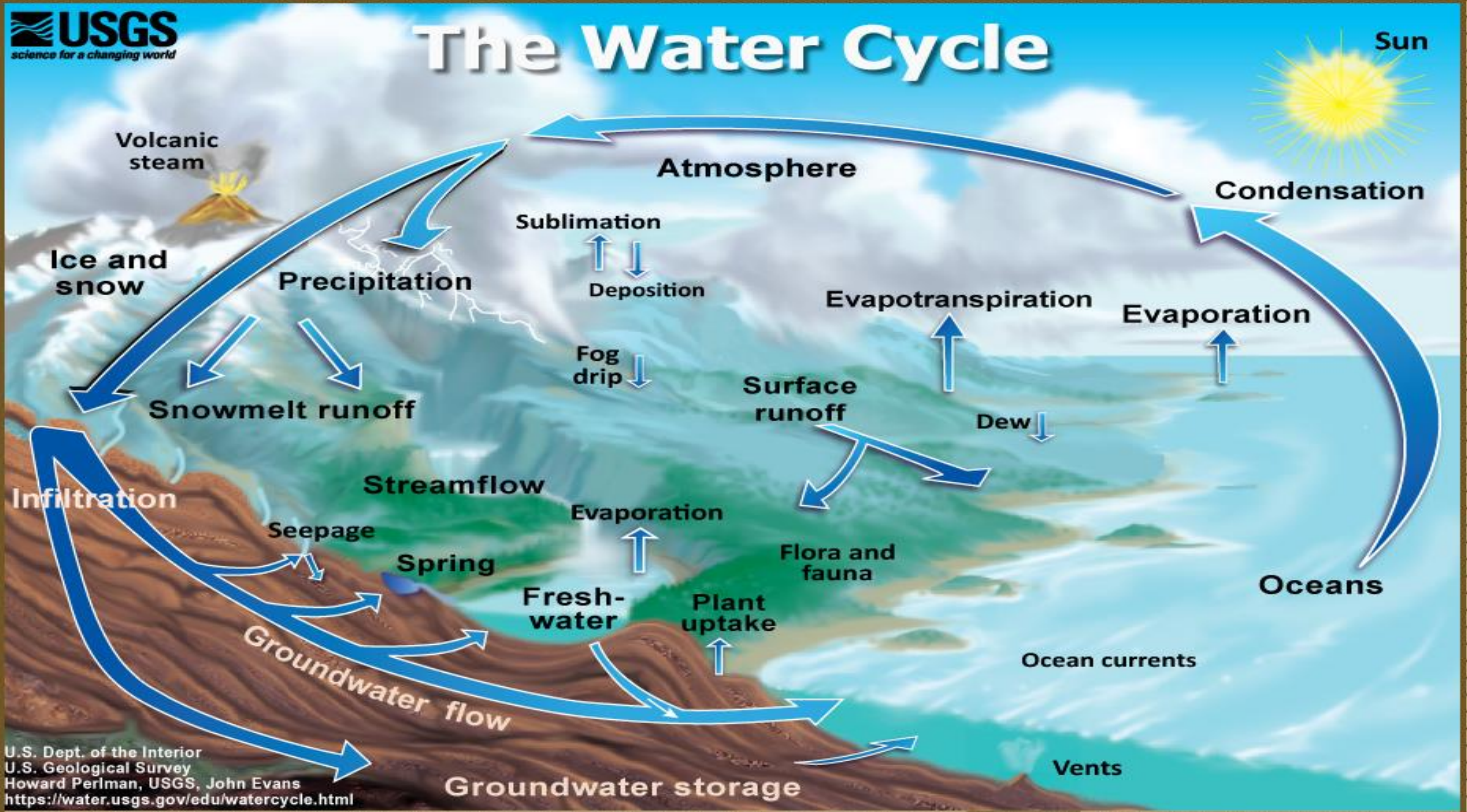
WATER PRESENTATION
Engineering Manager Mike Michael provided a presentation on water (see attached).

ISLAND CENTER SUBAREA PLAN DRAFT EXISTING CONDITIONS SUMMARY
City Consultant John Owens presented the summary report. Steering Committee members offered up comments and changes they would like.

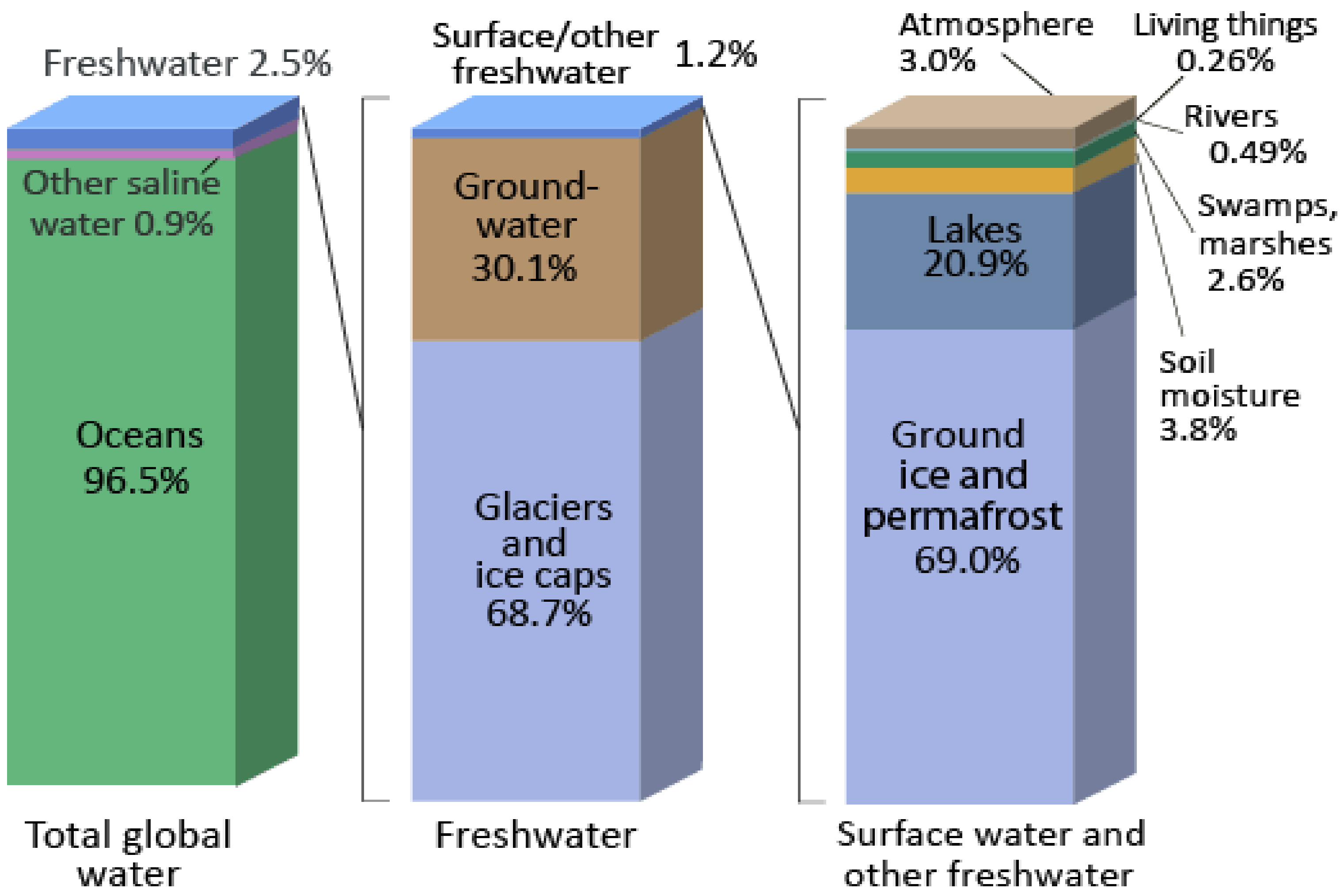
Future meeting scheduled for November 20, 2018. Agenda to include a continued discussion of Draft Existing Conditions Summary and Setting Goals.

Public Comment
None.

Adjourn
The meeting adjourned at 8:32 PM.


USGS
science for a changing world
The Water Cycle
Sun
Volcanic steam
Atmosphere
Condensation
Sublimation
Deposition
Ice and snow
Precipitation
Evapotranspiration
Evaporation
Fog drip
Surface runoff
Snowmelt runoff
Dew
Streamflow
Infiltration
Evaporation
Seepage
Spring
Flora and fauna
Fresh-water
Plant uptake
Oceans
Groundwater flow
Ocean currents
Vents
Groundwater storage
U.S. Dept. of the Interior
U.S. Geological Survey
Howard Perlman, USGS, John Evans
https://water.usgs.gov/edu/watercycle.html

Where is Earth's Water?



Source: Igor Shiklomanov's chapter "World fresh water resources" in Peter H. Gleick (editor), 1993, Water in Crisis: A Guide to the World's Fresh Water Resources.
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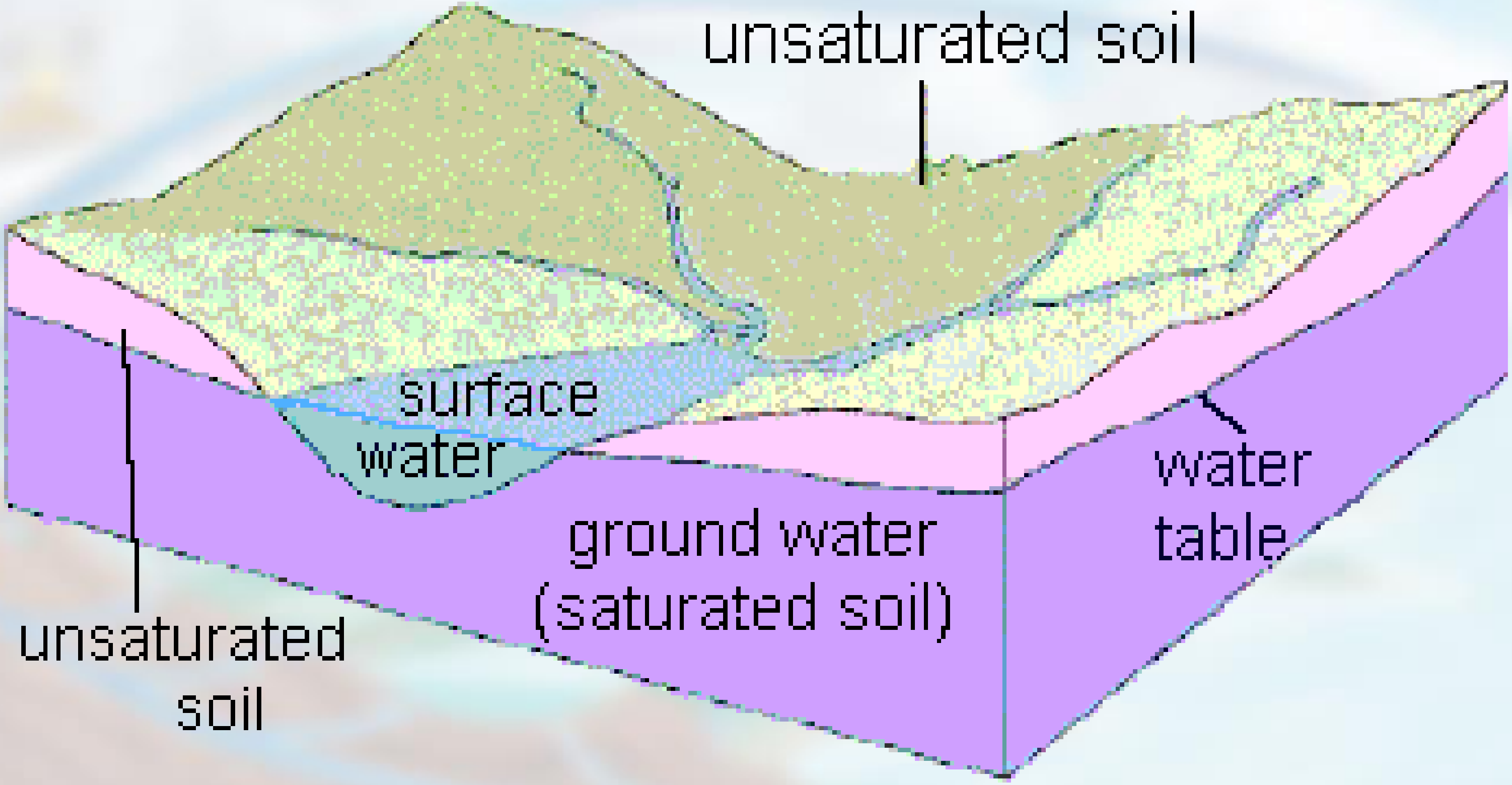
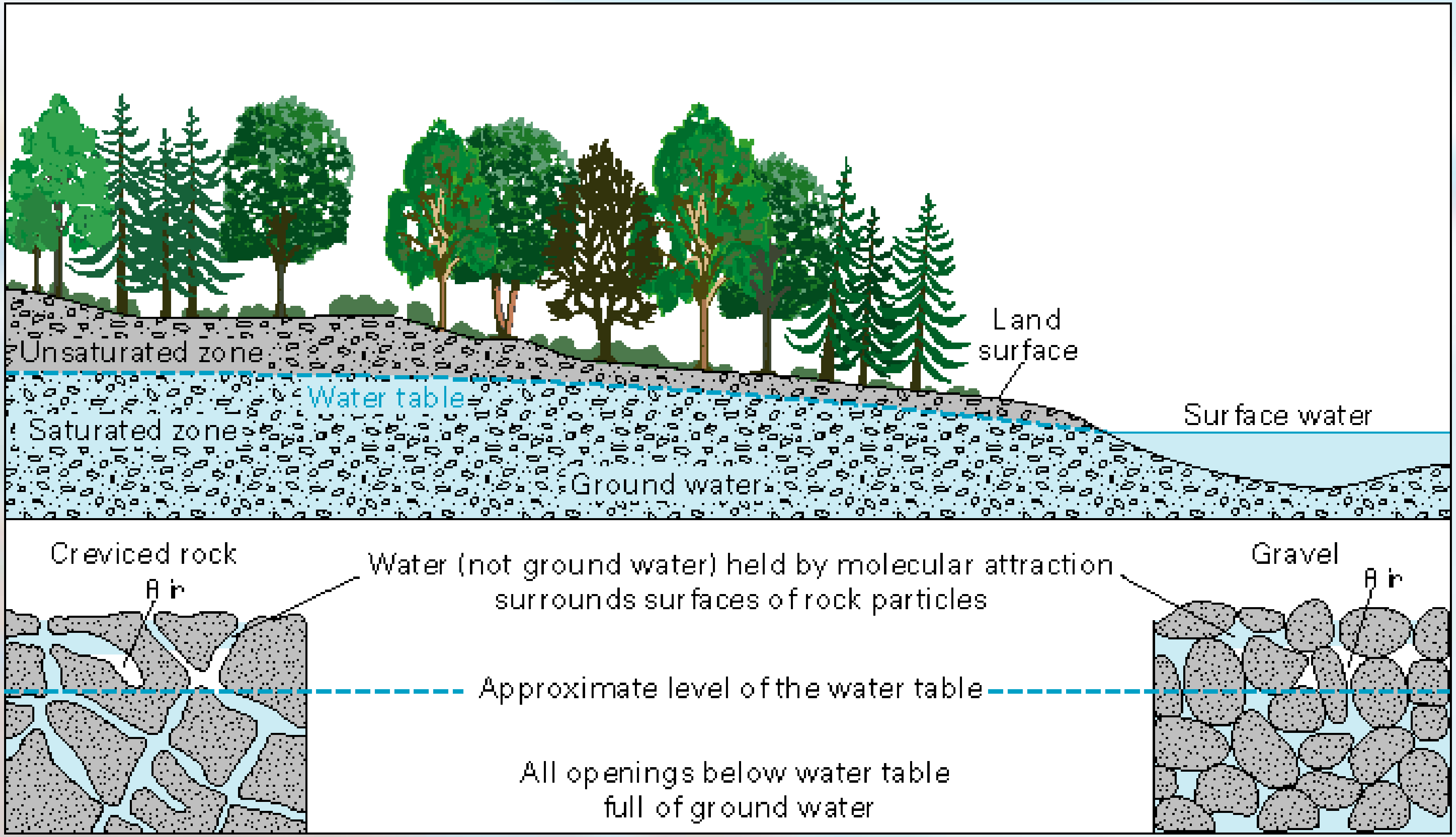

unsaturated soil
surface
water
water
table
ground water
(saturated soil)
unsaturated
soil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Gravel
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Approximate level of the water table
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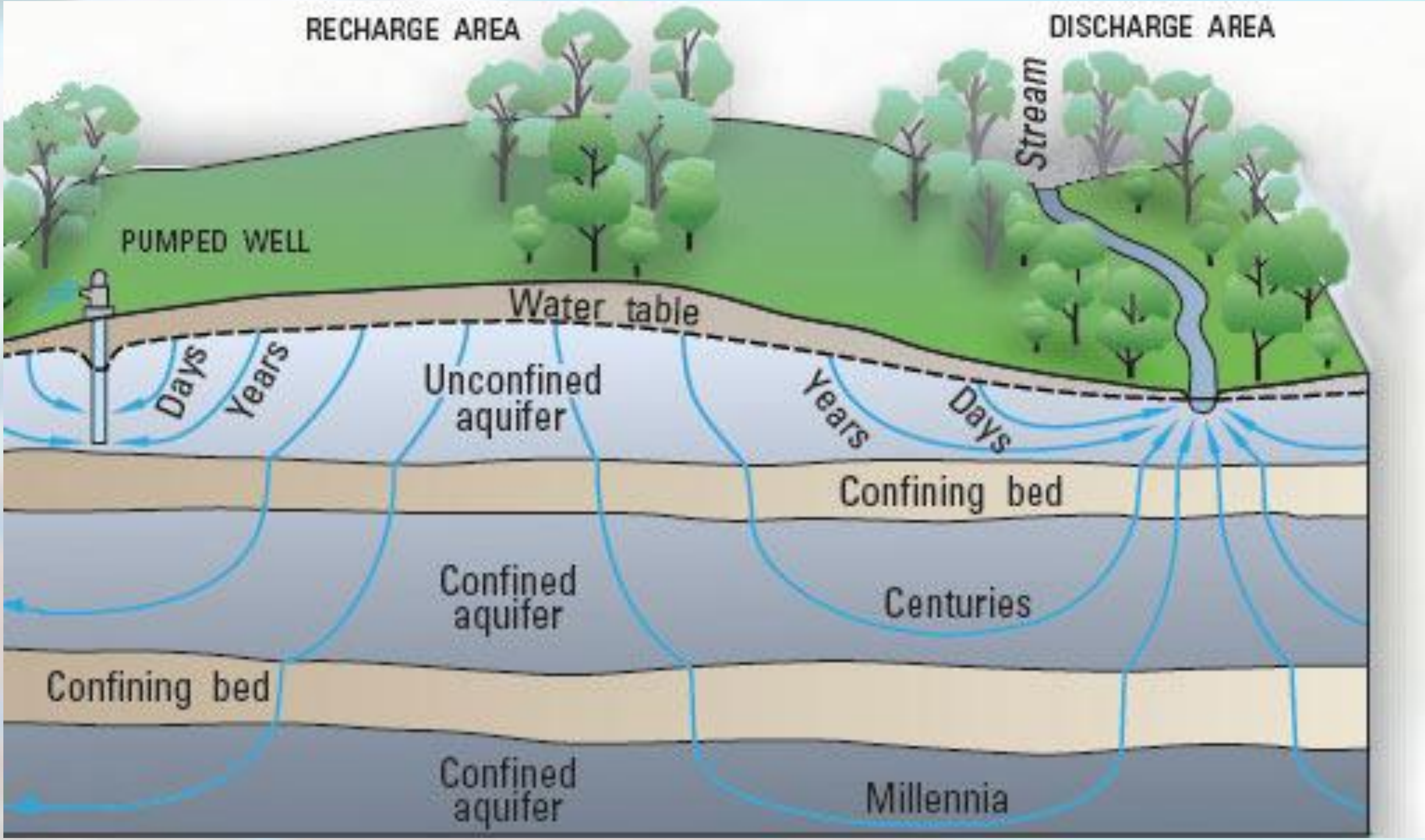
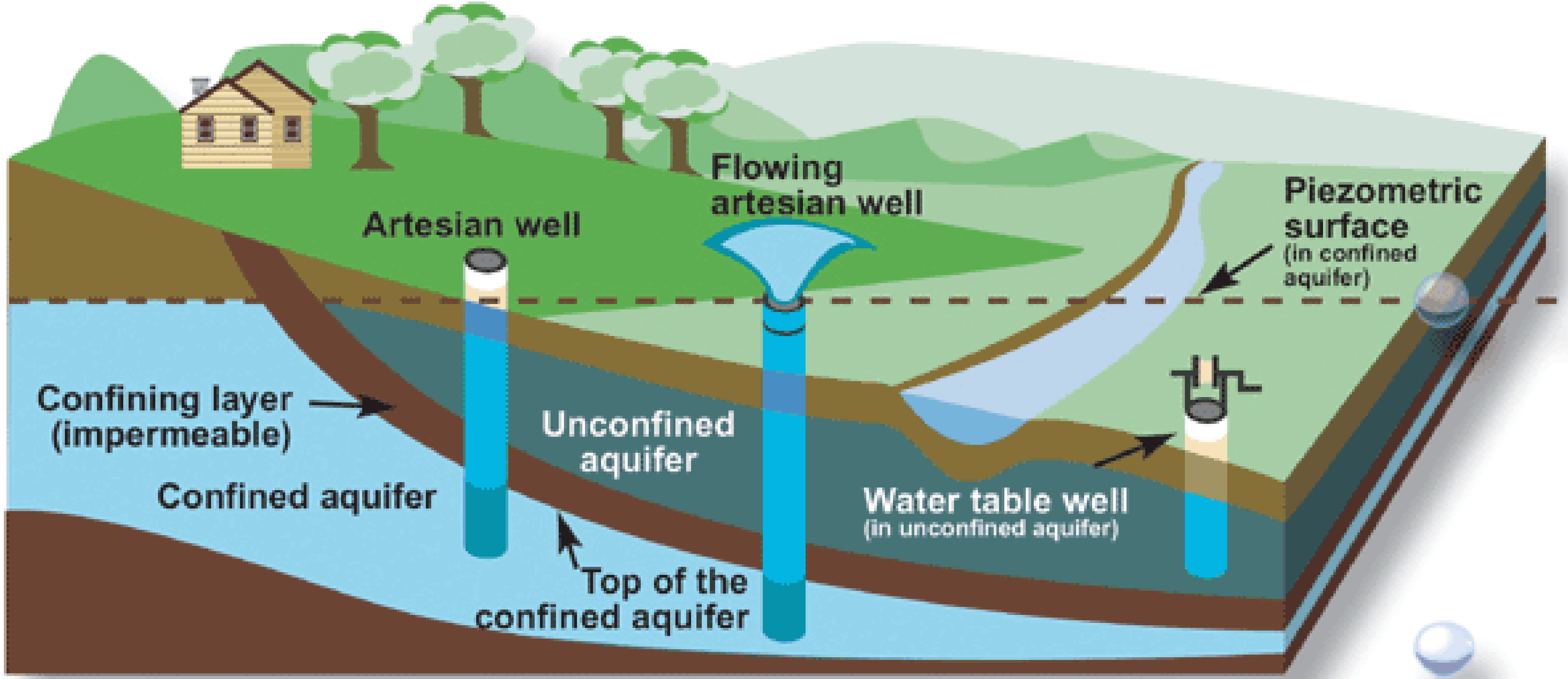

RECHARGE AREA
DISCHARGE AREA
Stream
PUMPED WELL
Water table
Days
Years
Unconfined aquifer
Years
Days
Confining bed
Confined aquifer
Centuries
Confining bed
Confined aquifer
Millennia

Aquifers and wells



Source: Environment Canada

What is a sole source aquifer?

EPA defines a sole source aquifer (SSA) as one where:

•The aquifer supplies at least 50 percent of the drinking water for its service area

•There are no reasonably available alternative drinking water sources should the aquifer become contaminated

Bainbridge Island is designated a SSA by EPA.

Table 1. Hydrogeologic unit labels and terminology used in this study and surrounding areas.

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QC1pi</td><td>Lawton Clay / Olympia Nonglacial Interval</td></tr>
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Qg4m, marine/glaciomarine deposits</td><td>GMA, glaciomarine aquifer system</td><td rowspan="4">QU, Undifferentiated deposits</td></tr>
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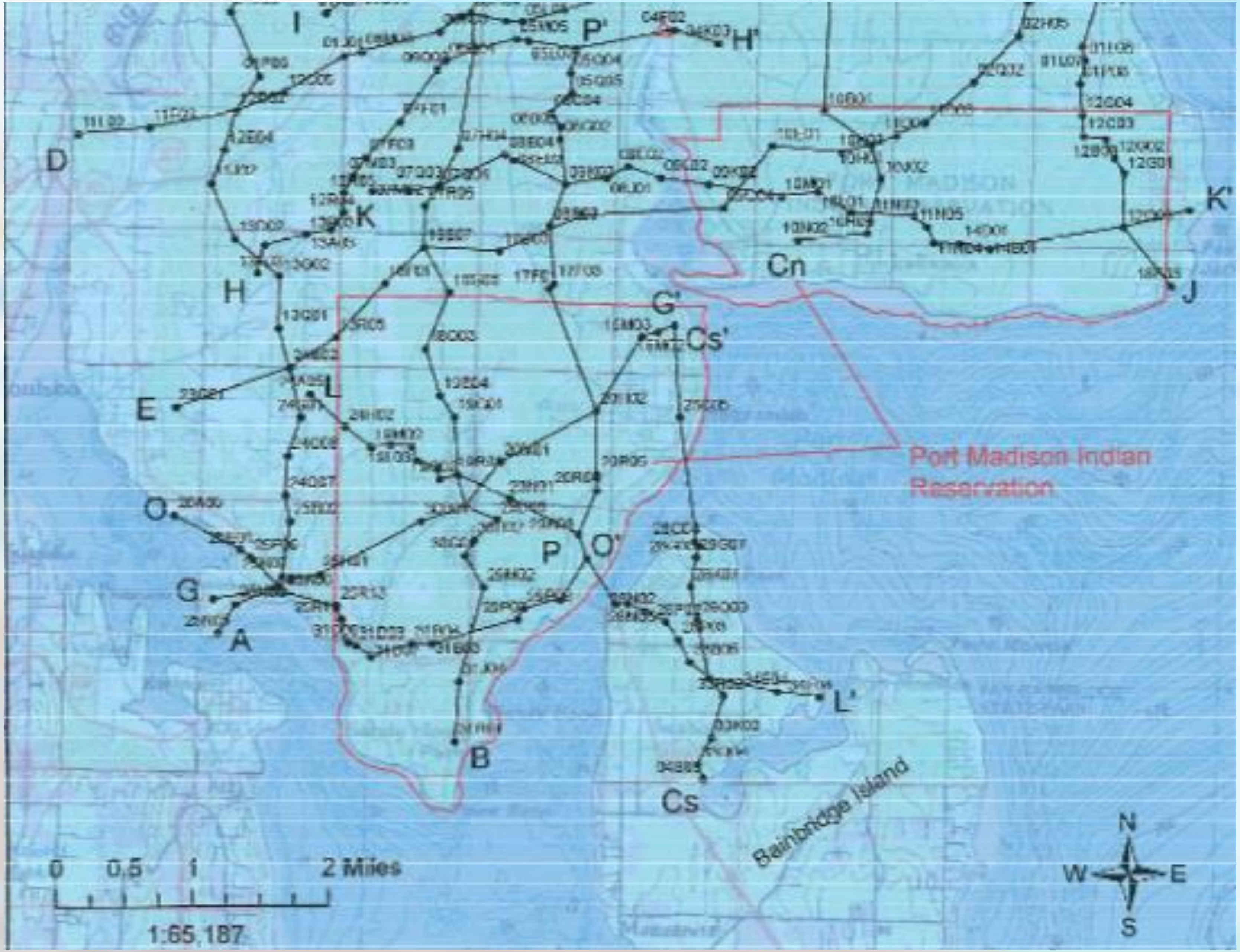
<tr><td>Qg5, 5th glacial deposits</td><td>FBA, Fletcher Bay Aquifer</td></tr>
<tr><td>Qn6, ancient nonglacial deposits</td><td>C5, confining unit</td></tr>
</table>

Squamish report US bureau of Reclamation 2005



Port Madison Indian Reservation
Bainbridge Island
0 0.5 1 2 Miles
1:65,187
N
W
E
S

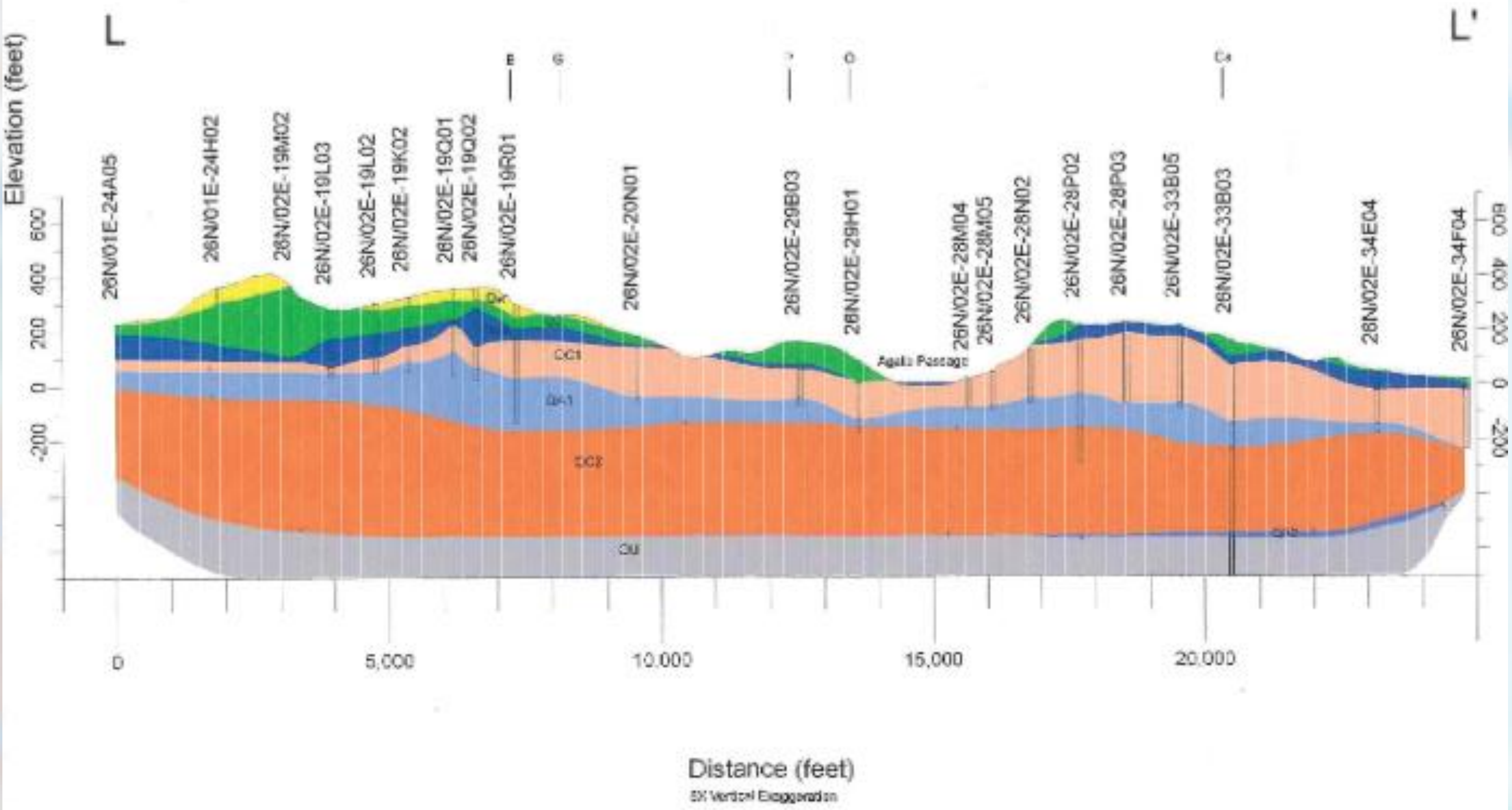


Figure 17. Section L - L'

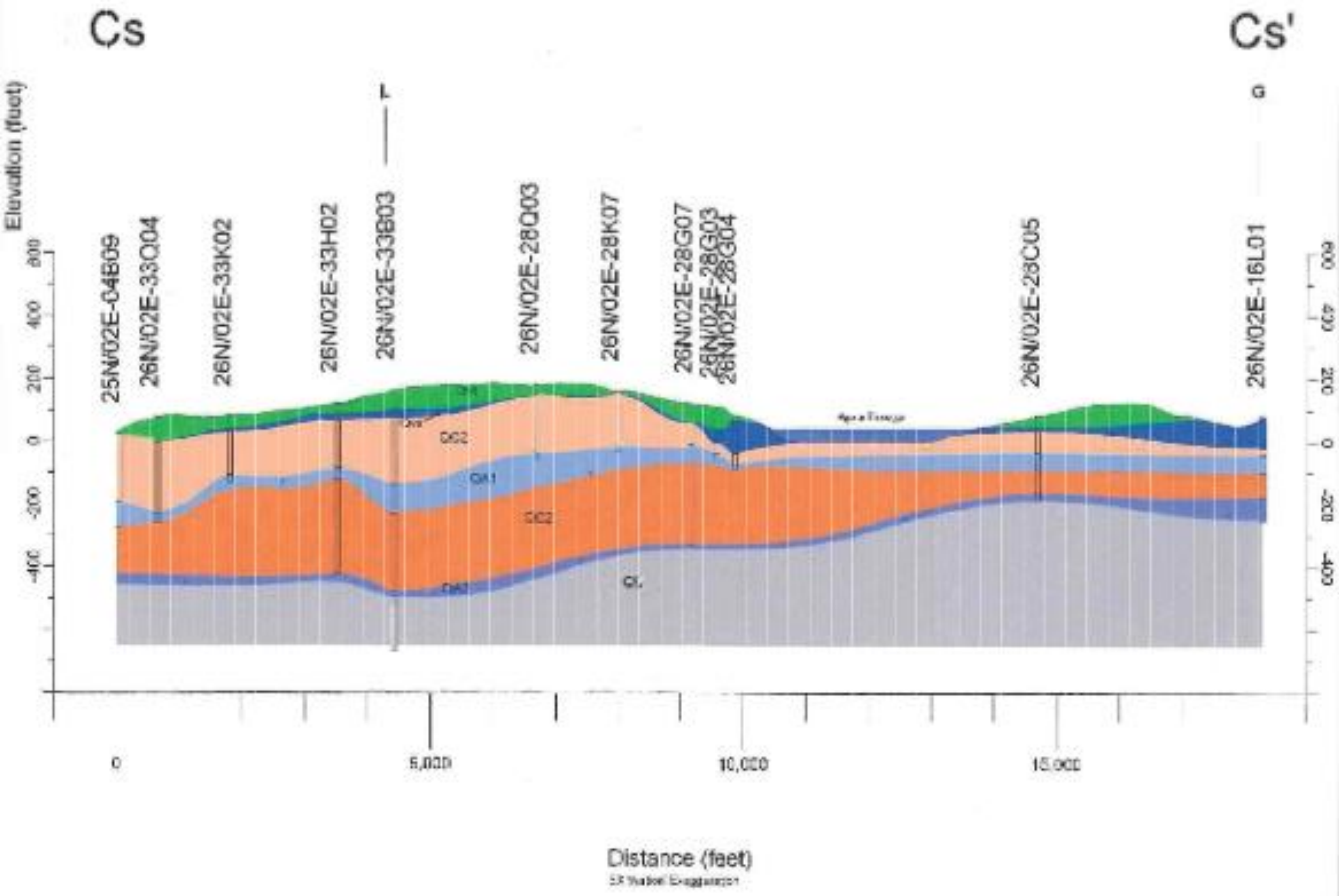
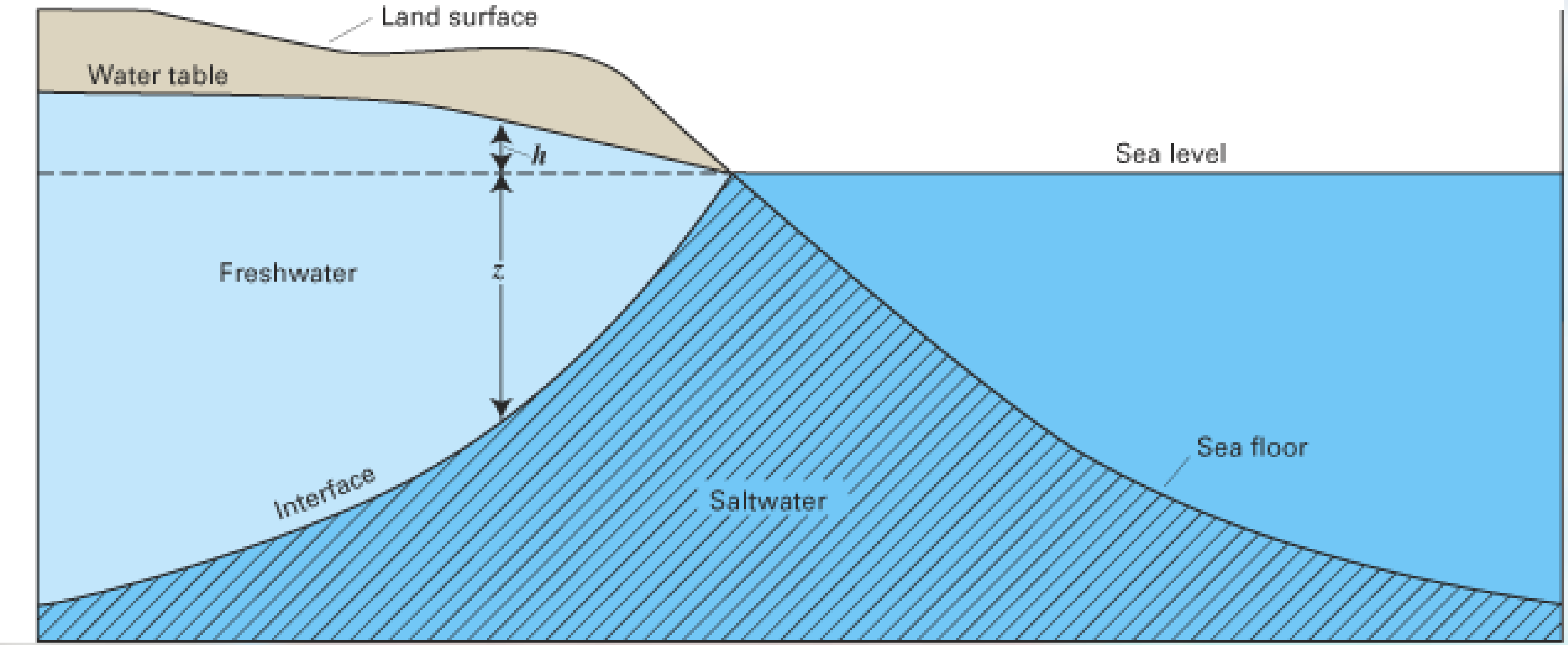


Figure 7. Section Cs - Cs'

What about saltwater intrusion?

What is it?



GROUNDWATER MONITORING PROGRAM
EARLY WARNING LEVEL ASSESSMENT
(2017)

Groundwater Management Program

Prepared by

Cami Apfelbeck
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M.S. Geological Sciences

Christian Berg
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City of Bainbridge Island
Public Works
Water Resources Program

July 2018

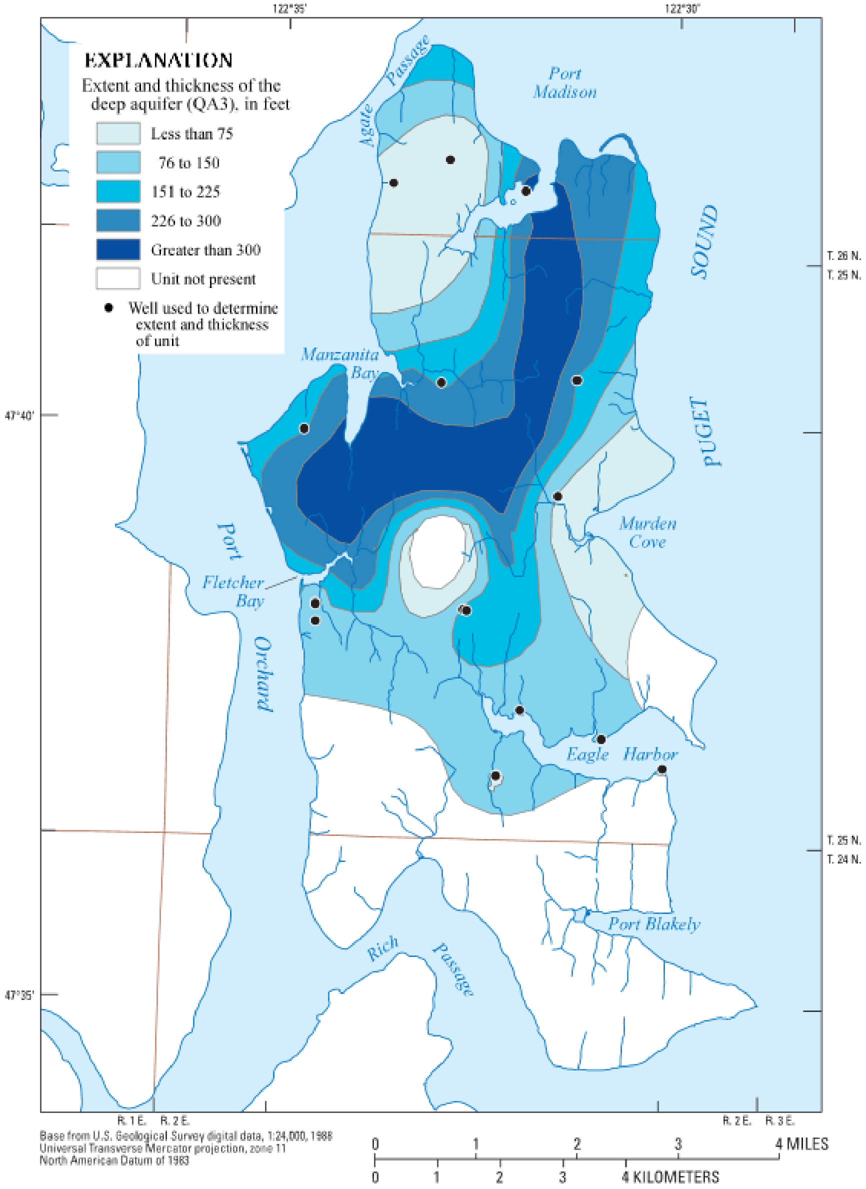

Figure 17. Extent and thickness of the deep aquifer (QA3), Bainbridge Island, Washington.

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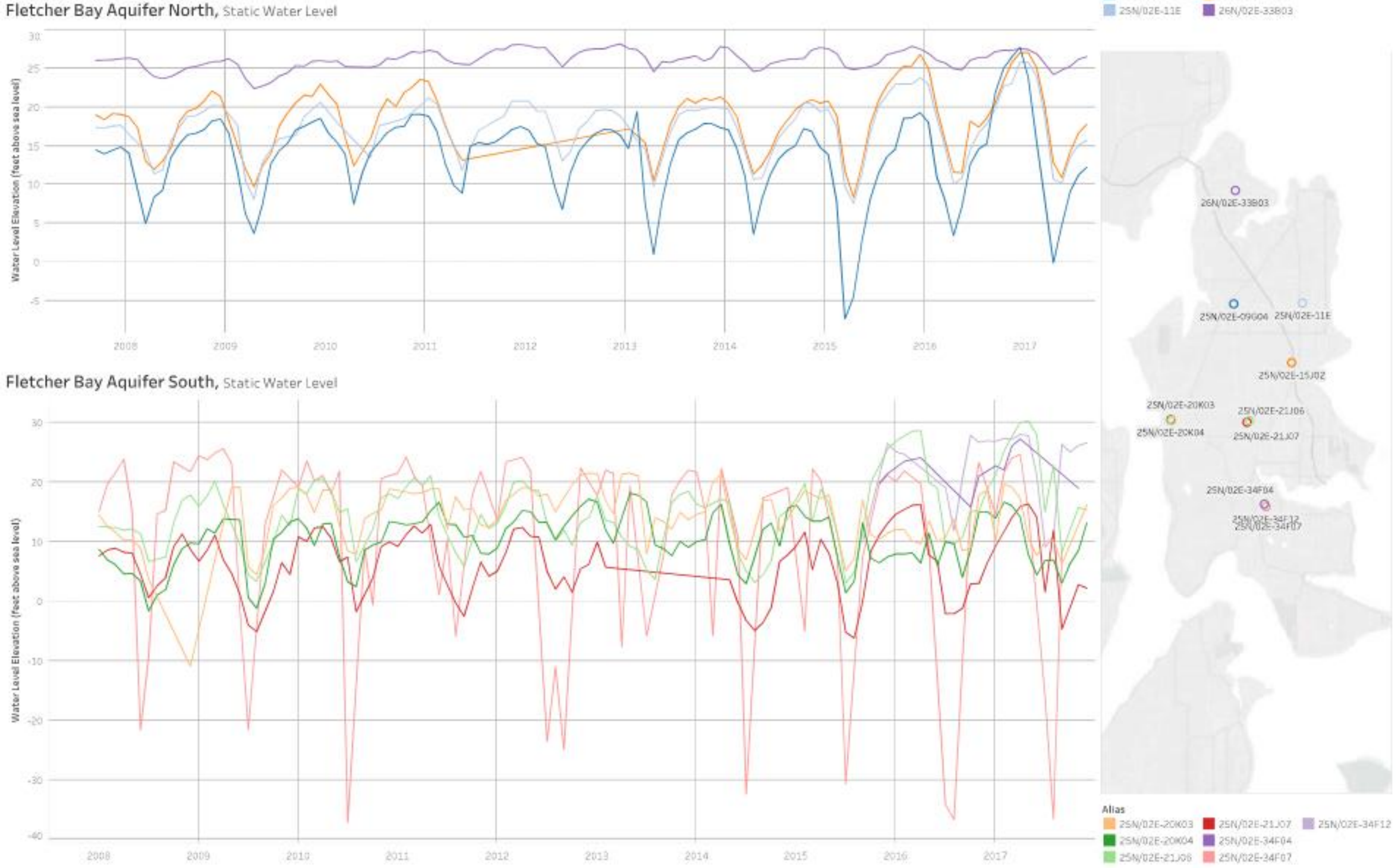
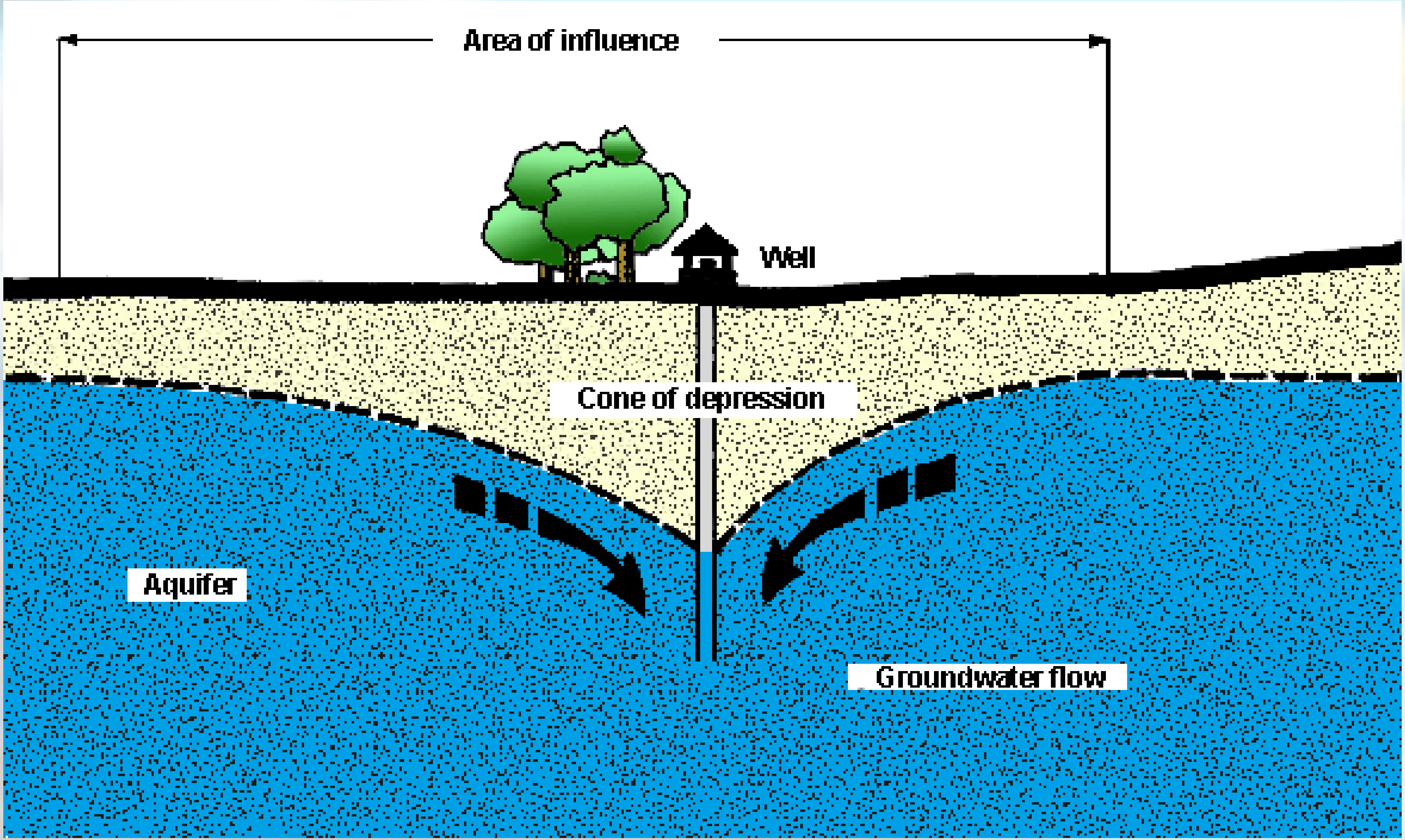
		QA1, Sea-level aquifer	Lower Whidbey
Qg3, 3rd glacial deposits/sea-level aquifer	SLA, sea level aquifer	QC2, Lower confining unit	Double Bluff Glaciation
		QA2, Deep aquifer	
Qn4, 3rd nonglacial deposits	C3, confining unit	QC3, Basal confining unit (grouped with QU in this study)	
Qg4, 4th glacial deposits/deep aquifer Qg4m, marine/glaciomarine deposits	GMA, glaciomarine aquifer system		Older glacial and nonglacial intervals
Qn5, 4th nonglacial deposits	C4, confining unit	QU, Undifferentiated deposits	
Qg5, 5th glacial deposits	FBA, Fletcher Bay Aquifer		
Qn6, ancient nonglacial deposits	C5, confining unit		

Squamish report US bureau of Reclamation 2005

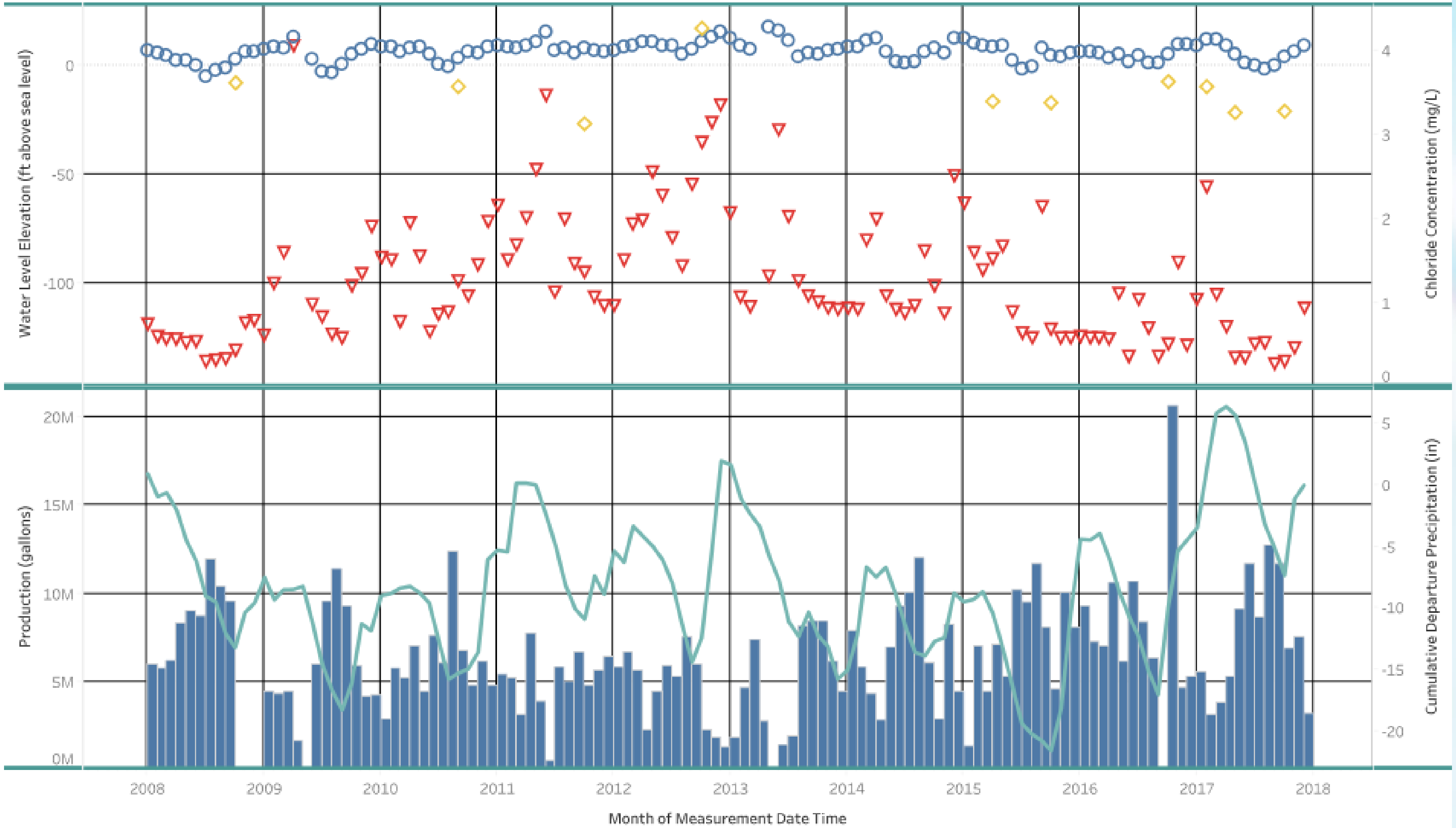
Figure 9.


Fletcher Bay Aquifer North, Static Water Level
Water Level Elevation (feet above sea level)
30
25
20
15
10
5
0
-5
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Alias
25N/02E-09G04
25N/02E-15J02
25N/02E-11E
26N/02E-33B03
26N/02E-33B03
25N/02E-09G04
25N/02E-11E
25N/02E-15J02
25N/02E-20K03
25N/02E-21J06
25N/02E-20K04
25N/02E-21J07
25N/02E-34F04
25N/02E-34F12
25N/02E-34F07
Fletcher Bay Aquifer South, Static Water Level
Water Level Elevation (feet above sea level)
30
20
10
0
-10
-20
-30
-40
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Alias
25N/02E-20K03
25N/02E-21J07
25N/02E-34F12
25N/02E-20K04
25N/02E-34F04
25N/02E-21J06
25N/02E-34F07



Area of influence
Well
Cone of depression
Aquifer
Groundwater flow

Well Summary - Fletcher Bay PW (FBA Aquifer)

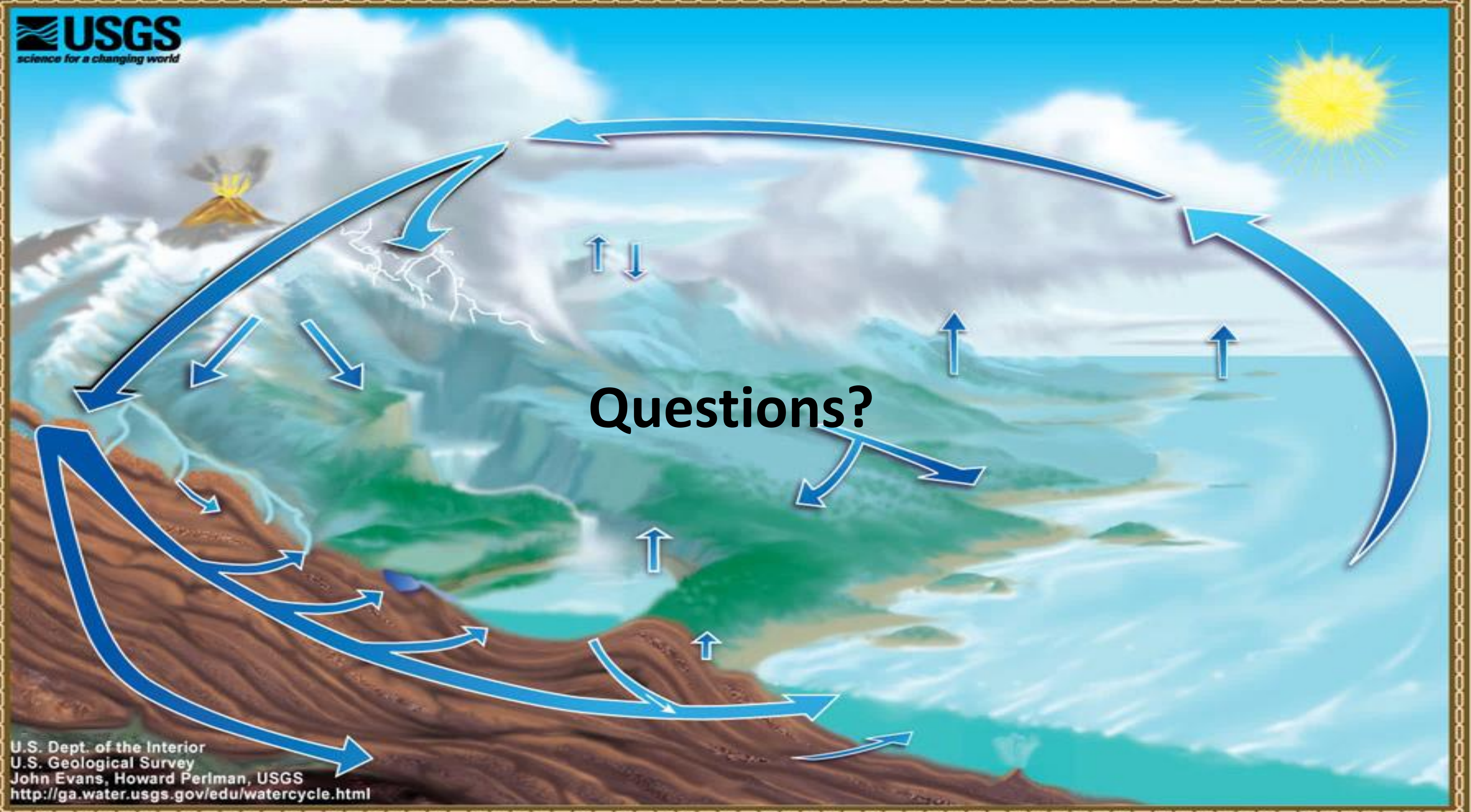


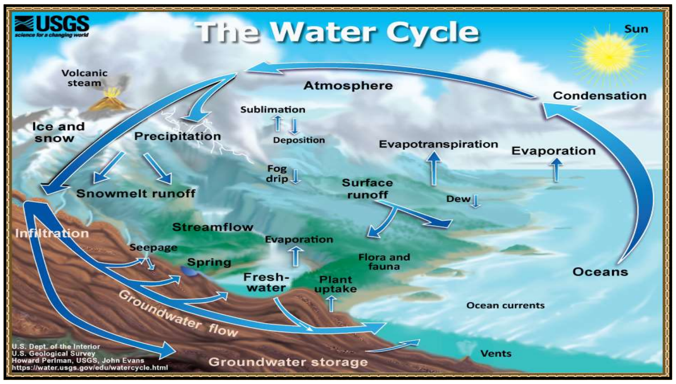
This chart displays a summary of water level data presented as a monthly average.
Static water level data for Fletcher Bay PW spans 10 years, which included a maximum data collection gap (in months) of: 2.6. Estimated static water level trend is 0.11 (ft/year).
Water level trend calculations are based on an ordinary least squares (OLS) fit to the monthly average of all static water level data.
Cumulative Departure Precipitation (CDP) represents the running total of monthly differences from the average over the period. Downward trending sections typically indicate drier periods with lowered recharge, while upward trending segments indicate wetter than average periods with greater recharge.

Water Level Measurement Status
- ○ Static Water Level
- ▽ Water level influenced by pumping

Chloride Results
- ◇ Chloride Concentration

Questions?


USGS
science for a changing world
U.S. Dept. of the Interior
U.S. Geological Survey
John Evans, Howard Perlman, USGS
http://ga.water.usgs.gov/edu/watercycle.html


USGS
The Water Cycle
Sun
Volcanic steam
Atmosphere
Condensation
Ice and snow
Precipitation
Sublimation
Deposition
Evapotranspiration
Evaporation
Fog drip
Surface runoff
Dew
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Streamflow
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Spring
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Vents
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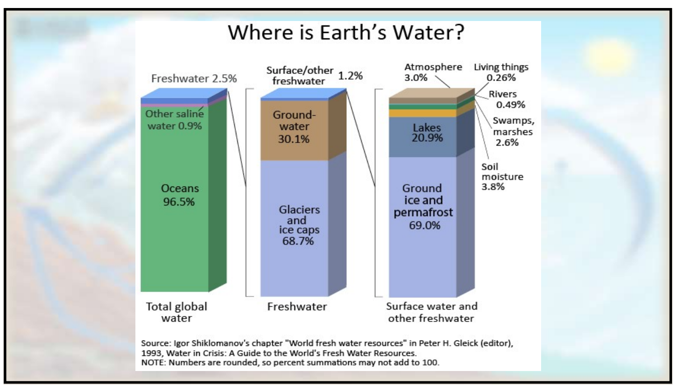
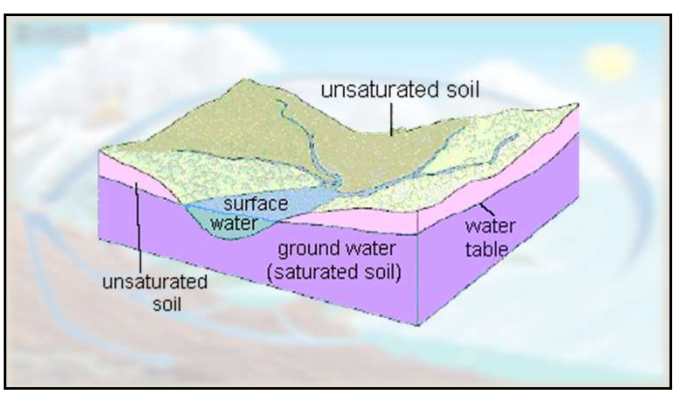
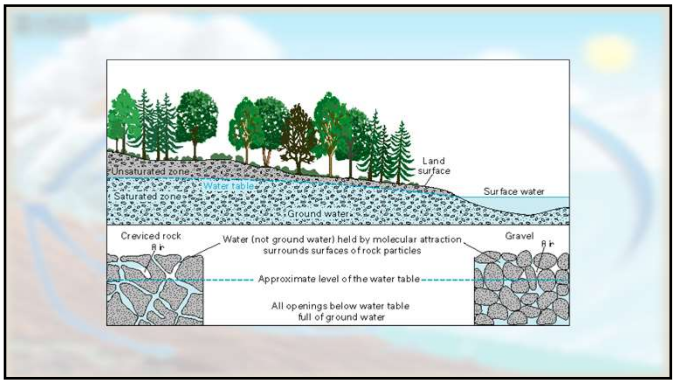

Where is Earth's Water?
Freshwater 2.5%
Other saline water 0.9%
Oceans 96.5%
Total global water
Surface/other freshwater 1.2%
Ground-water 30.1%
Glaciers and ice caps 68.7%
Freshwater
Atmosphere 3.0%
Living things 0.26%
Rivers 0.49%
Swamps, marshes 2.6%
Lakes 20.9%
Soil moisture 3.8%
Ground ice and permafrost 69.0%
Surface water and other freshwater
Source: Igor Shiklomanov's chapter "World fresh water resources" in Peter H. Gleick (editor), 1993, Water in Crisis: A Guide to the World's Fresh Water Resources.
NOTE: Numbers are rounded, so percent summations may not add to 100.


unsaturated soil
surface water
water table
ground water
(saturated soil)
unsaturated soil


Unsaturated zone
Land surface
Water table
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Gravel
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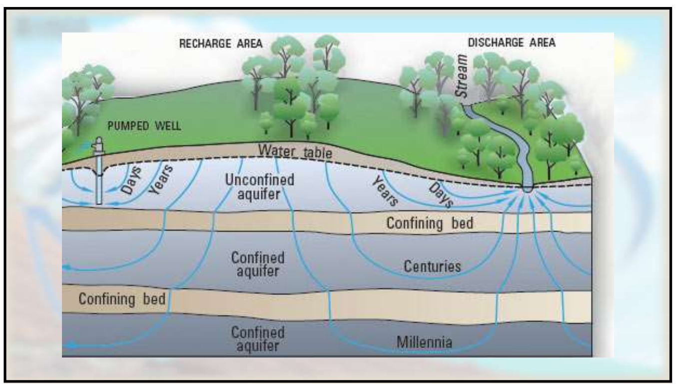
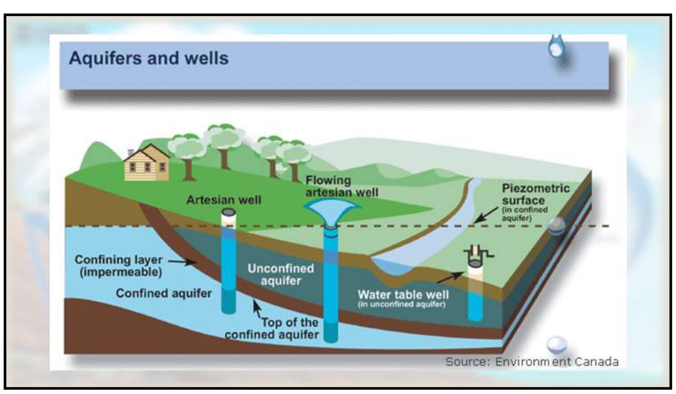

RECHARGE AREA
DISCHARGE AREA
Stream
PUMPED WELL
Water table
Days
Years
Unconfined aquifer
Years
Days
Confining bed
Confined aquifer
Centuries
Confining bed
Confined aquifer
Millennia


Aquifers and wells
Flowing artesian well
Artesian well
Piezometric surface (in confined aquifer)
Confining layer (impermeable)
Unconfined aquifer
Confined aquifer
Water table well (in unconfined aquifer)
Top of the confined aquifer
Source: Environment Canada

What is a sole source aquifer?

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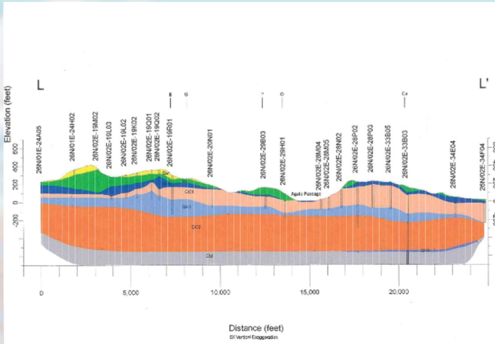


Figure 17. Section L - L'

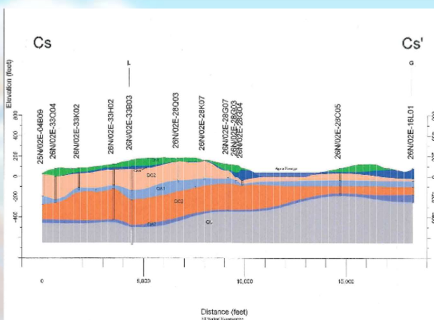
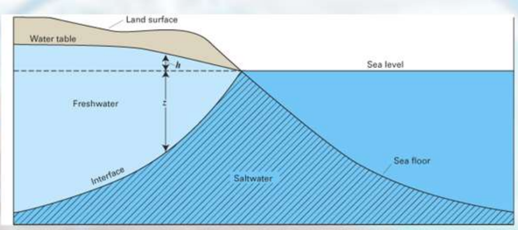


Figure 7. Section Cs - Cs'

What about saltwater intrusion?

What is it?



GROUNDWATER MONITORING PROGRAM EARLY WARNING LEVEL ASSESSMENT (2017)

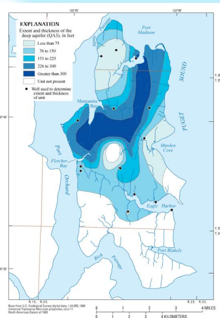
Groundwater Management Program

Prepared by
Cami Apfelbeck
Water Resources Specialist,
M.S. Geological Sciences

Christian Berg
Water Resources Technician
B.A. Environmental Studies

City of Bainbridge Island
Public Works
Water Resources Program

July 2018



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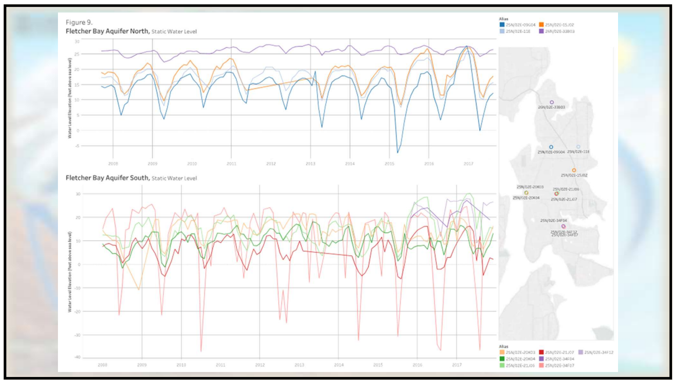
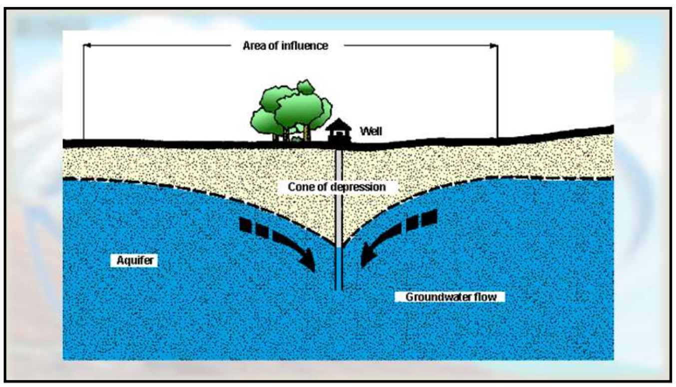


Figure 9.
Fletcher Bay Aquifer North, Static Water Level
Fletcher Bay Aquifer South, Static Water Level


Area of influence
Well
Cone of depression
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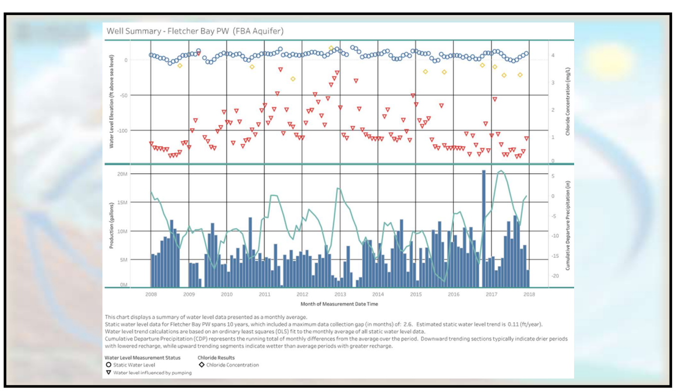
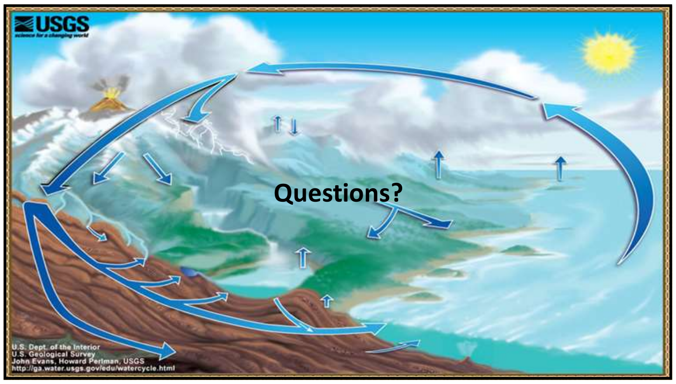
Groundwater flow


Well Summary - Fletcher Bay PW (FBA Aquifer)
Production (gallons)
Cumulative Departure Precipitation (in)
Month of Measurement Date Time
This chart displays a summary of water level data presented as a monthly average.
Static water level data for Fletcher Bay PW spans 10 years, which included a maximum data collection gap (in months) of: 2.6. Estimated static water level trend is 0.11 (ft/year).
Water level trend calculations are based on an ordinary least squares (OLS) fit to the monthly average of all static water level data.
Cumulative Departure Precipitation (CDP) represents the running total of monthly differences from the average over the period. Downward trending sections typically indicate drier periods with lowered recharge, while upward trending segments indicate wetter than average periods with greater recharge.
Water Level Measurement Status
Static Water Level
Water level influenced by pumping
Chloride Results
Chloride Concentration


USGS
science for a changing world
Questions?
U.S. Dept. of the Interior
U.S. Geological Survey
John Evans, Howard Perlman, USGS
http://ga.water.usgs.gov/edu/watercycle.html

CITY OF
BAINBRIDGE ISLAND

Island Center Subarea Planning Process Steering Committee Meeting

November 7, 2018 6:30 – 8:30 PM

PLEASE PRINT

Name	Phone/E-Mail	Join ListServ Yes/No	Would like to speak	Subject
Robert Dashiell	vadimagos@aol.com		Maybe	Water
LINDA MALLIN		YES		
Chad VerHoeven		no	no	
Malcolm Gander	malcolmgander@comcast.net			
Beth Cottenden	on list.			