



qathet
REGIONAL DISTRICT

qathet Regional District Savary Island Groundwater Resource Assessment

Project Overview
September 11, 2024



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ASSESSMENT & PROTECTION OF GROUNDWATER



Context – why this study?

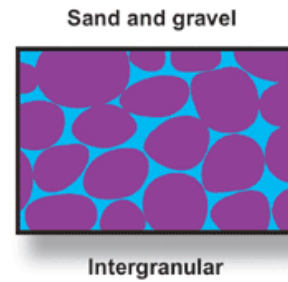
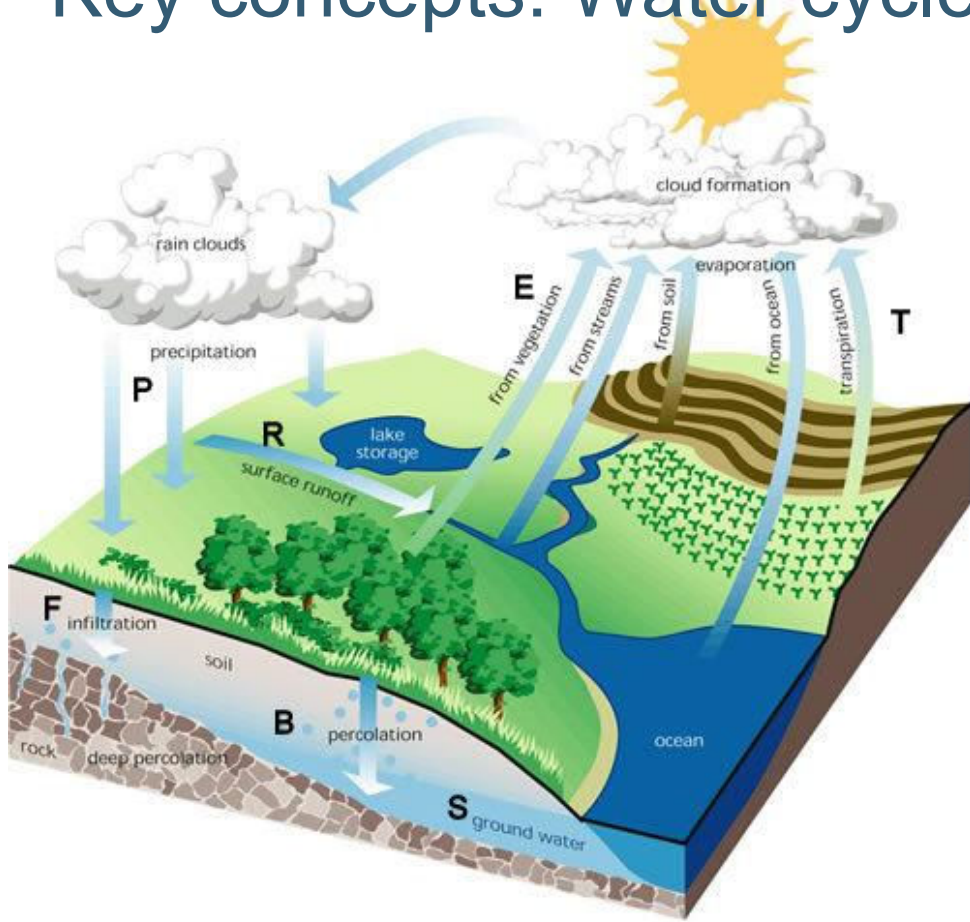
- Savary Island has limited surface water sources (no major lakes or rivers)
- Groundwater from wells is the main water source
- This sand strip island forms an aquifer that is highly vulnerable to natural hazards including erosion and sea level rise, and human impacts from land use
- Carrying capacity and aquifer protection measures are important to consider in land use planning
- The results of the study will assist qathet Regional District with revision of the Savary Island Community Plan

Photo: L. Johnson

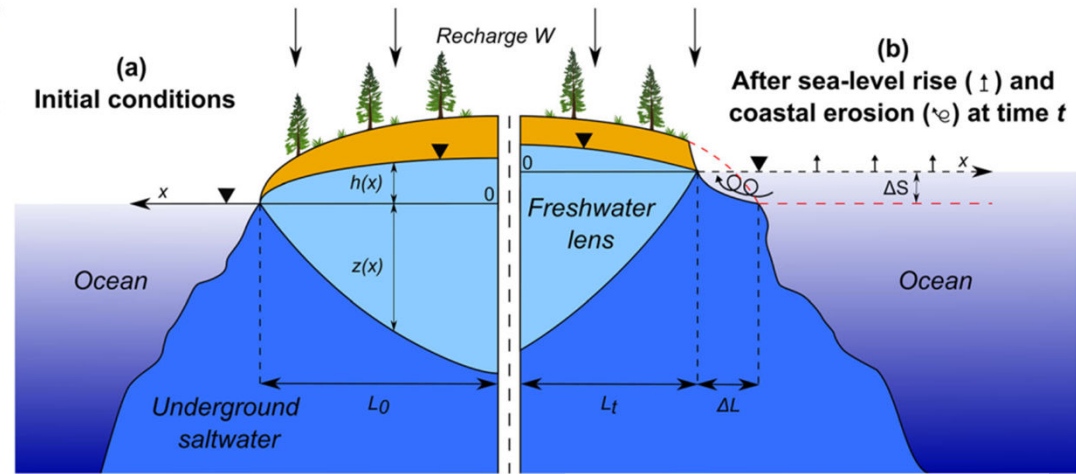


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Key concepts: Water cycle and island aquifers



Unconsolidated aquifers



(Chesnaux et al 2021)

Water Cycle/Balance Schematic [Source: FISRWG 1998
<https://earth.boisestate.edu/drycreek/education/watershed-water-balance/>]

Key questions



What are the current conditions in Savary Island aquifers?



How does land use affect water quality and quantity?



What can we do to preserve and protect freshwater resources on the island?



Project scope & timeline



Phase 1: Compile and update water-related information

- Update map of water sources
- Gather existing monitoring & land use data
- Collect current field data (groundwater levels, field water quality e.g. electrical conductivity)
- Prepare hydrogeologic model of island aquifers

August – September



Phase 2: Groundwater quantity and quality assessment

- Develop water balance for island (water availability vs demand)
- Assess impacts of climate change on the water balance
- Evaluate aquifer vulnerability to contamination from the land surface
- Assess sea water intrusion hazard and impact

October-November

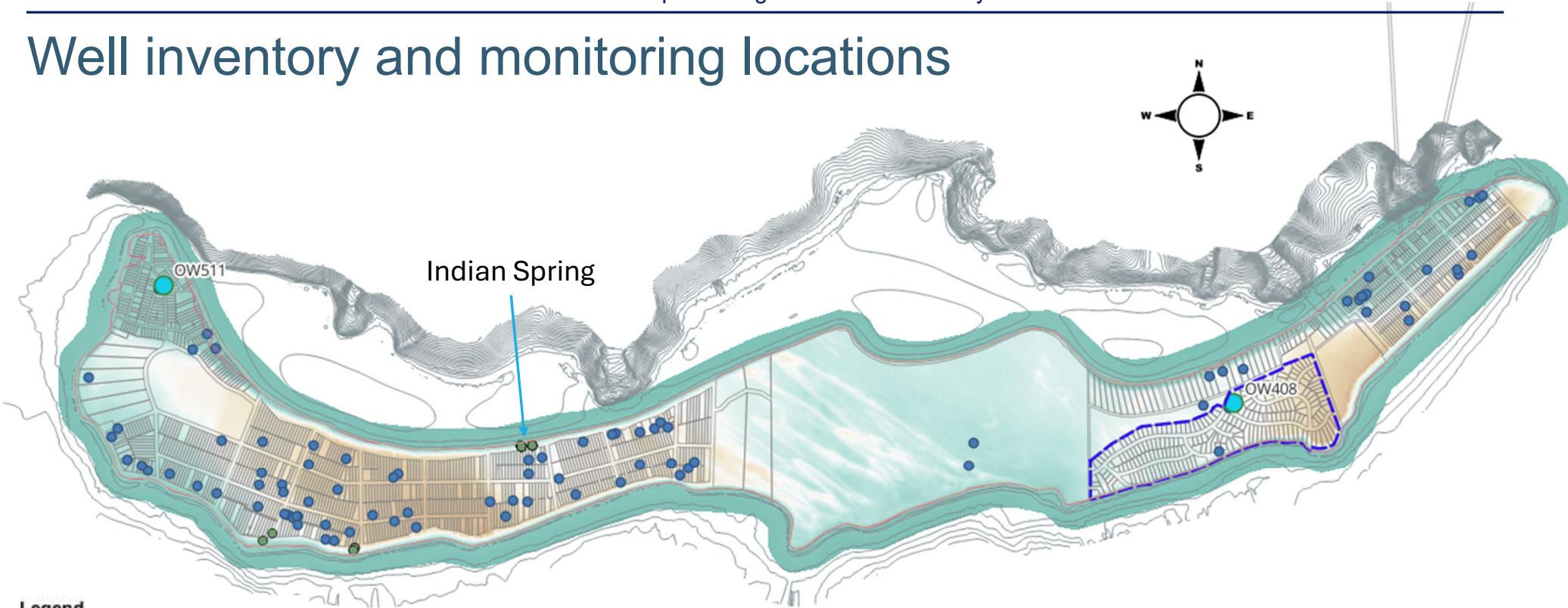


Phase 3: Develop an aquifer protection plan and monitoring strategy

- Identify target areas and methods to expand the water monitoring network
- Determine planning & other measures to help preserve and protect water resources on the island

December 2024

Well inventory and monitoring locations



Legend

- BC Cadastral Parcels
- BC Provincial Observation Wells
- Registered well (GWELLS Database)
- SSID Service Area
- Water licenses

Savary Island DEM LIDAR1m

Elevation (masl)
50.77993
-0.938578

Groundwater Wells & Aquifers database: 90 registered wells

Actual number of wells much higher

Updated well inventory will help to understand the aquifer & develop a 3-D model



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Types of wells on the island



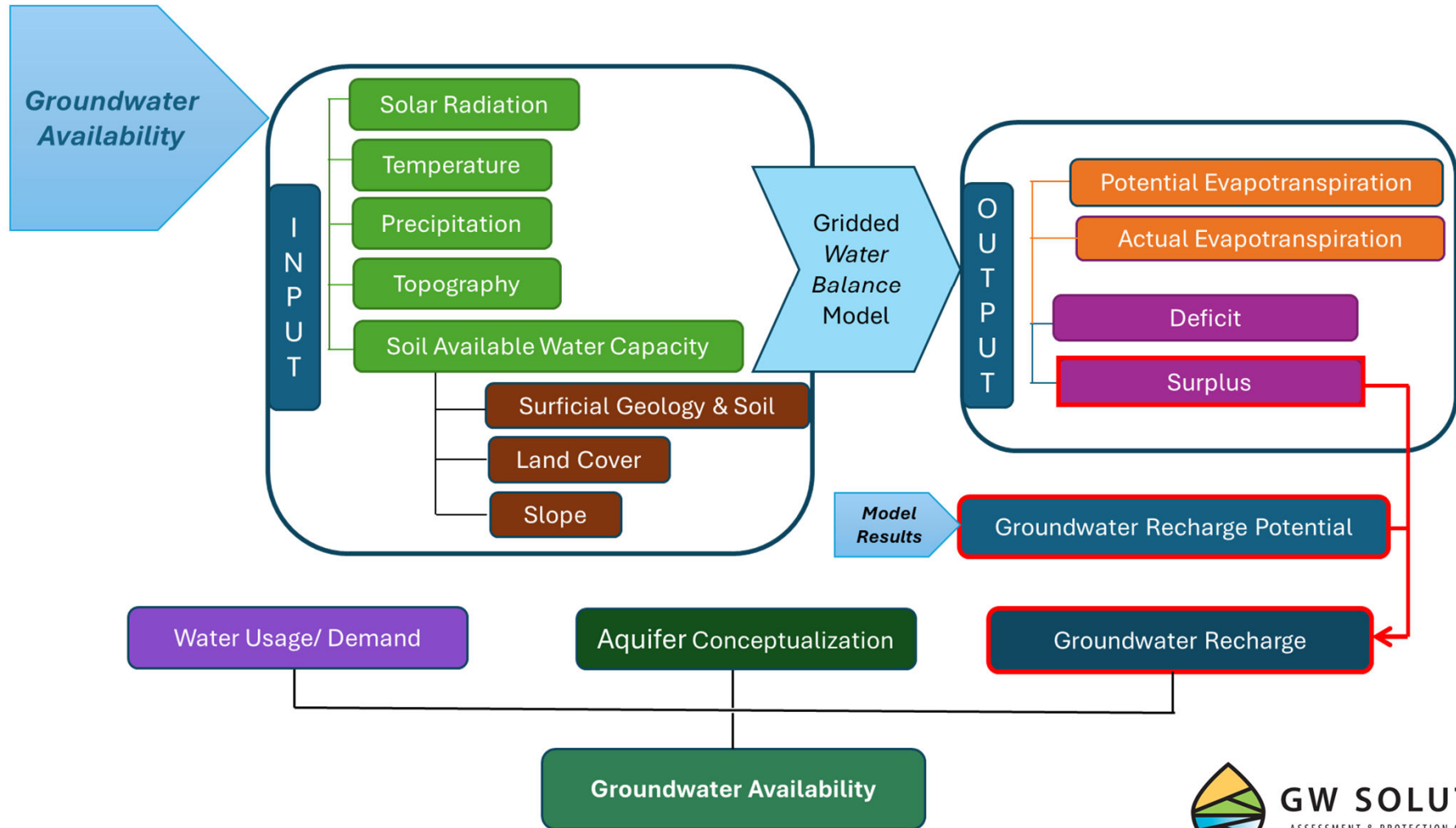
Excavated (dug) wells are typically larger in diameter and shallow, with sides made of cement or wood cribbing

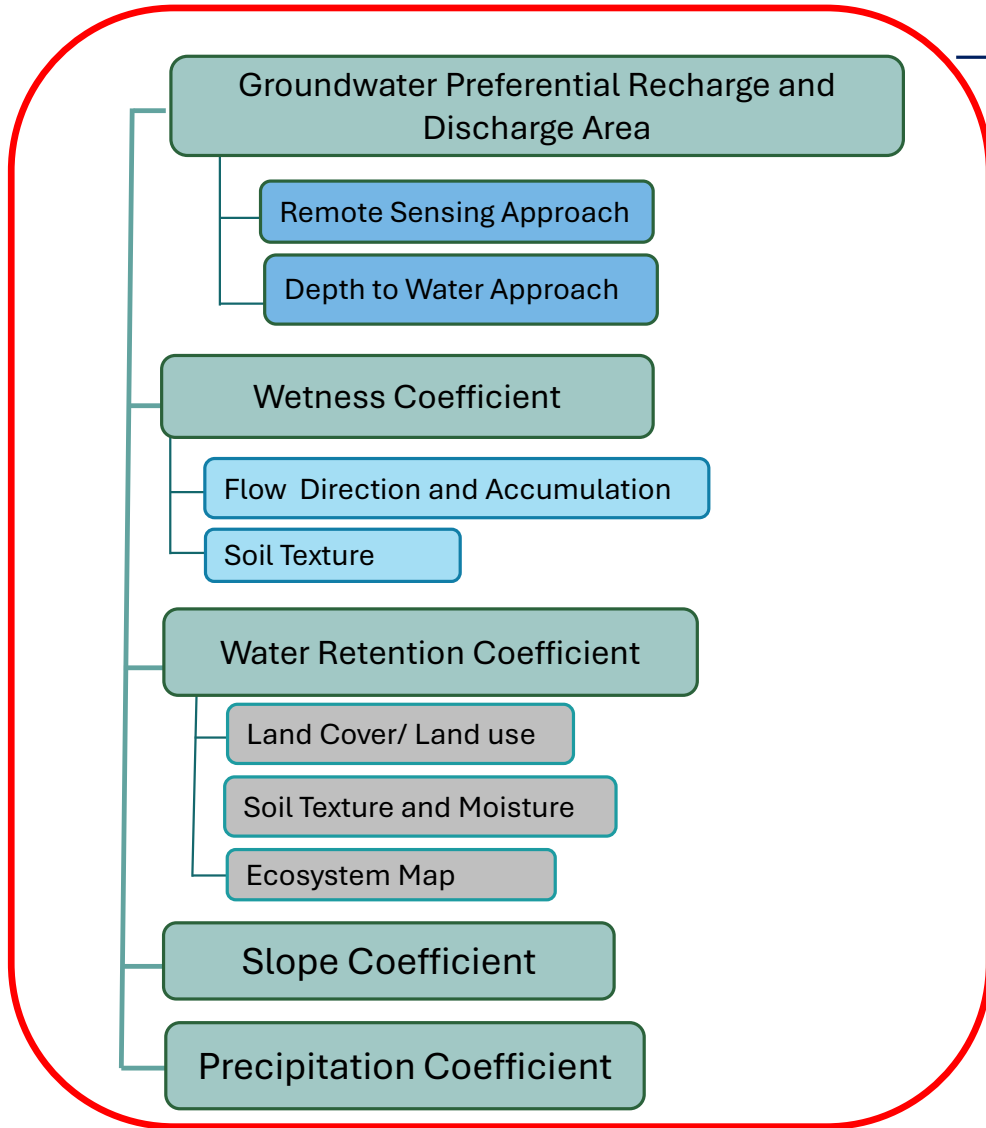


Drilled wells for household use are usually 6 inches in diameter with a steel casing and are usually deeper than dug or driven wells



Sand point (driven) wells are constructed using a cylindrical pipe with a screened/perforated section and pointed end that is hammered into the ground. They are usually shallower than drilled wells, with a smaller diameter steel casing (e.g. 2 inches)



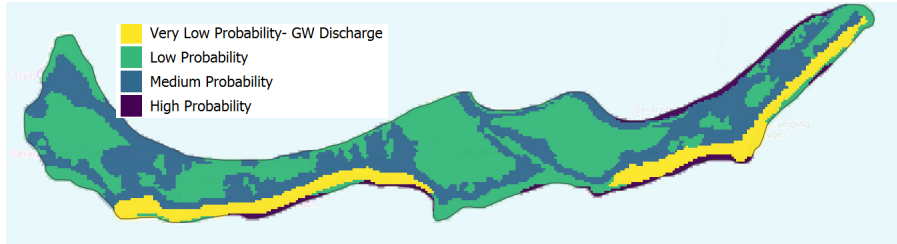


Groundwater Recharge Potential

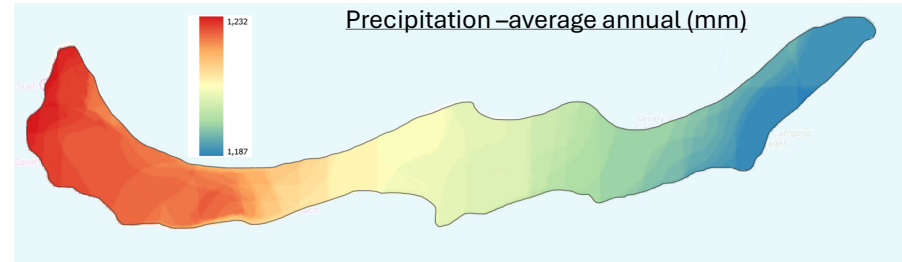


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Groundwater Preferential Recharge and Discharge Areas



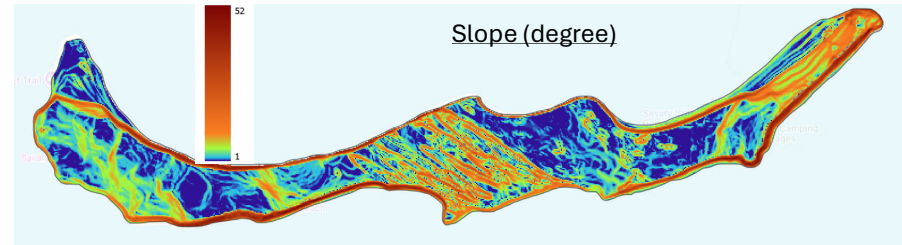
Precipitation –average annual (mm)



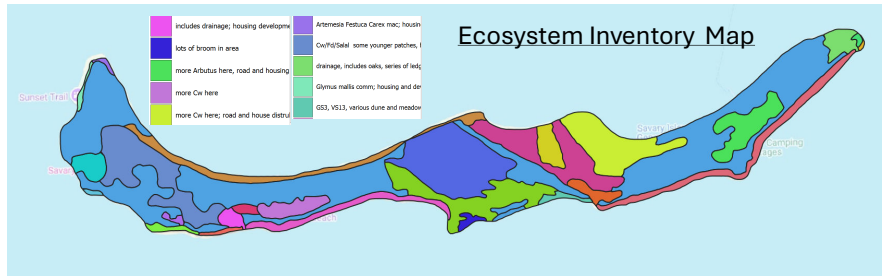
Land Cover/ Land use



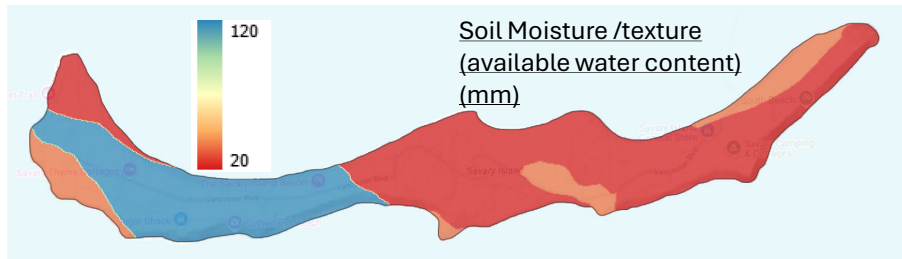
Slope (degree)



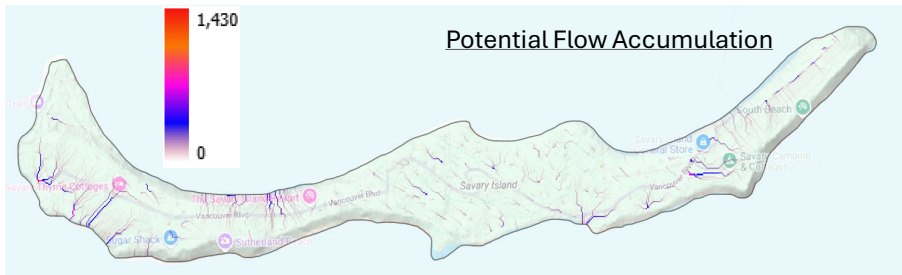
Ecosystem Inventory Map



Soil Moisture /texture (available water content) (mm)



Potential Flow Accumulation



Next steps and opportunities

Help us understand current groundwater conditions on Savary Island

Online survey

September 11 – October 15

Field survey

September 21-24, 2024

For further details and to participate see the qRD project website:

https://www.qathet.ca/current_project/savarygroundwater/



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Photo: L. Johnson

Seeking volunteers!

Help us understand current groundwater conditions on Savary Island - **field survey September 21-24, 2024**

During the site visits we will:

- Collect spatial coordinates and document the details of your water source
- Measure groundwater levels and
- Collect samples for field or laboratory analysis of groundwater quality

If you are interested, please fill out the form on the qRD groundwater project website:

https://www.qathet.ca/current_project/savarygroundwater/

Email: planning@qathet.ca by September 18, 2024.



Discussion – What water questions are important to you?



What are the current conditions in Savary Island aquifers?



How does land use affect water quality and quantity?



What can we do to preserve and protect freshwater resources on the island?



Savary Island water management areas

Indian Point -
DL1377 North

qRD Electoral Area A

East Island/
Keeper Bay
- DL1372

Savary Lane -
DL1373 North

Savary Shores -
DL1373 South

West Island - DL1377 South



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GW Solutions is a hydrogeology consulting firm based in Nanaimo BC. We use advanced tools and knowledge to help our clients understand groundwater, aquifers, and the interconnection between surface water and groundwater, and to identify solutions to water problems

- Mapping of aquifers and water resources
- Groundwater exploration and water supply development (siting, drilling and testing of water wells)
- Modelling (conceptual, 3D, numerical)
- Technical review of major projects (e.g. mines)
- Working with remote and First Nations communities to understand and manage water in their territories

Website: <https://www.gwsolutions.ca/>



Photo: S. Barroso