Integrated watershed planning for freshwater sustainability on Salt Spring Island, BC, Canada

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Integrated Watershed Planning for Freshwater Sustainability
Salt Spring Island, BC, Canada

Session Presentation
Achieving an Integrated Watershed Approach for Freshwater Ecosystems in the Salish Sea

Salish Sea Ecosystems Conference
Seattle, Washington
Wednesday 4 April 2018

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Salt Spring Island Watershed Protection Alliance
Islands Trust
Integrated Watershed Planning for Freshwater Sustainability
Salt Spring Island, BC, Canada
Islands Trust Object

“To preserve and protect the islands trust area and its unique amenities and environment for the benefit of residents of the trust area and of the province generally, in cooperation with municipalities, regional districts, improvement districts, other persons and organizations and the Government of British Columbia.”
Salt Spring Island Watershed Protection Alliance
Member Agencies

Islands Trust
Land-use Planning
Zoning and Official Community Planning

Ministry of Environment and Climate Change Strategy
Effective protection, management and conservation of water, land, air and living resources.

Ministry of Forests, Lands, and Natural Resources
Surface Water and Groundwater Quantity Licensing

Ministry of Health
Water Quality Licensing

Capital Regional District
Water and Environmental Services

North Salt Spring Waterworks Improvement District
Water Purveyor and Largest Improvement District in the Province

Other Water Commissions
Drinking Water Purveyors
Framework for freshwater resource management

Considers both human and ecosystem needs

Integrated planning and policy development

Implementation by member agencies

Advise on policies of regional, local and provincial government organizations

Coordinate the implementation of those policies.
Changing Climate: More Rain in Winter
Salt Spring Island, BC, Canada

Capital Regional District
Projected Change in 20-Year Annual Maximum One Day Precipitation
CMIP5 Ensemble RCP85 (2041-2070)

Top 10 Wettest Days in Seattle, 1948-2013

<table>
<thead>
<tr>
<th>Rank</th>
<th>Date</th>
<th>Precipitation (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Oct. 20, 2003</td>
<td>5.02</td>
</tr>
<tr>
<td>2</td>
<td>Dec. 3, 2007</td>
<td>3.77</td>
</tr>
<tr>
<td>3</td>
<td>Nov. 20, 1959</td>
<td>3.41</td>
</tr>
<tr>
<td>4</td>
<td>Nov. 6, 2006</td>
<td>3.29</td>
</tr>
<tr>
<td>5</td>
<td>Feb. 8, 1996</td>
<td>3.06</td>
</tr>
<tr>
<td>6</td>
<td>Nov. 25, 1998</td>
<td>3.04</td>
</tr>
<tr>
<td>7 (tie)</td>
<td>Jan. 18, 1986</td>
<td>2.98</td>
</tr>
<tr>
<td>7 (tie)</td>
<td>Feb. 9, 1951</td>
<td>2.98</td>
</tr>
<tr>
<td>9</td>
<td>Nov. 9, 1990</td>
<td>2.95</td>
</tr>
<tr>
<td>10</td>
<td>Nov. 24, 1990</td>
<td>2.93</td>
</tr>
</tbody>
</table>

450mm 18 inches
100 mm 4 inches
St. Mary Lake Level

Updated to March 21, 2018

Lake level on Mar 21/18 was 40.783 m asl
How over-pumping can impact neighbours and streams

Salt water intrusion

Well not affected
Well goes dry
Well is over-pumped
Stream goes dry
Lowered watertable
Original watertable
Sand and gravel
Fresh water
Salty water
Original boundary
Advanced saltwater boundary
Fresh groundwater
Salty groundwater
## Saltspring Island Overview

### Overview:

- **6 mapped aquifers**
- **3 x sand and gravel**
- **3 x fractured bedrock**
- **30 observation wells**

### Productivity & Development:

<table>
<thead>
<tr>
<th></th>
<th>Sand &amp; Gravel</th>
<th>Bedrock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Development</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Vulnerability</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

### Well Records:

- **278** as of 2000

### Mean Depth:

- **> 200 ft**

### Mean Yield:

- **~6.5 USGPM**

### Issues:

- Saltwater intrusion
- Low Yields
- Dissolved minerals (As)
Domestic and Agricultural Water Demand Modelling
Salt Spring Island, BC, Canada
Overview:

- 6 mapped aquifers
- 3 x sand and gravel
- 3 x fractured bedrock
- 30 observation wells

Sand & Gravel

- Productivity: Low
- Development: Moderate
- Vulnerability: Moderate

Bedrock

- Productivity: Low
- Development: Moderate
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