

# WATER RESOURCES



## BAINBRIDGE ISLAND COMPREHENSIVE PLAN ELEMENT 2004 GOALS

Bainbridge Island has elected to add this as an **optional element**. It is not required by the WA Growth Management Act (GMA). By doing so they have self-imposed a duty and must now act consistently with this element, independent of other state mandated GMA obligations.

The water resources element advances policies for general water resource management, groundwater protection, drinking water, sanitary sewage disposal, storm and surface water management, and monitoring and public education.

Goal 1- **Protection of water resource** is of primary importance to the Island. Therefore the goal is to manage the water resources for present and projected land uses, recognizing Island water resources are the sole supply and that:

- Degradation of groundwater quality and quantity is not allowed
- Water supplies and systems are efficiently utilized
- **Long-term sustainability** of the Island water resources is maintained
- Water needs of new development approved under the Comp Plan are adequately met
- Adequate data of the water resource is available

Goal 2- Ensure that **sewage** is collected, treated, and disposed of properly to prevent public health hazards and pollution of groundwater, and surface water, including waters of the Puget Sound, and to promote recharge of the water of Puget Sound.

Goal 3- **Stormwater runoff** shall be managed comprehensively to:

- Protect property from flooding and erosion
- Protect streams and shorelines from erosion and sedimentation to avoid the degradation of environmental quality and natural system aesthetics
- Protect the quality of groundwater, surface water, and the waters of Puget Sound
- Provide recharge of groundwater where appropriate

## PLANNING QUESTIONS TO GUIDE EVALUATION OF THE CLIMATE VULNERABILITY OF THE WATER RESOURCES ELEMENT:

- Do we understand fully how current precipitation patterns impact water resource, wastewater systems, and stormwater management? If **precipitation** were to increase, decrease, or change in intensity and duration of events would it affect our water resources? How?
- If **sea level** were to rise would it affect our water resources? How?
  - Do current **tides** have an impact on coastal lands, shoreline stability, and infrastructure in the coastal zone?
  - Do we know where vulnerable systems are located?
  - How would sea level rise affect our groundwater/drinking water supply?
- If average seasonal **temperatures** were to shift would it affect our transportation system or patterns? How? Are there currently any seasonal/temperature related impacts? Do isolated high-heat or cold days have an effect?
- What is **the timeframe for which the Island should plan** to protect and maintain sufficient groundwater resources?
  - If that timeframe is longer than the time horizon of this Comprehensive Plan update, then should we conduct appropriate analysis and modeling so that we understand, as best we can, what state the resource is likely to be in 50 years? 100 years? (to match the lifespan of infrastructure being informed by this plan)
  - Future climate conditions (changing precipitation, temperatures, and sea level rise) can be used to project a water budget and understand the potential for saltwater intrusion to affect the water supply.
- The **Shoreline Management Program** plan also deals with water resources in the nearshore. Climate change impacts are not addressed or planned for in the Shoreline Master Plan. Is there a place where this comprehensive plan element can address what the Shoreline Master Plan could not? Should it?
- Does the City's **Critical Areas Ordinance**, which has a role to play in water resources protection, need to be reviewed under the climate lens? Is there anything that can be done in the Critical Areas Ordinance that will help reduce the impacts of anticipated climate change?
- Do the **2004 GOALS** give us a clear directive to enact local policy and regulation so that we can adapt to the anticipated impacts of climate change, or should they be amended?
- Under current climate conditions are there any locations on the Island that are currently nearing or exceeding allowed discharge per sanitary or stormwater permits? What are the current concerns and will they be exacerbated by expected future climate?

CLIMATE IMPACT	WATER RESOURCE IMPLICATION
<p>Precipitation →</p> <p><i>changing patterns and extremes, longer duration, and greater intensity</i></p>	<ul style="list-style-type: none"> <li>• More intense and frequent storms or heavier rainfall events can cause stormwater inundation and localized flooding, chronic flooding, non-infiltrated run off (degrading water quality), erosion and landslides.</li> <li>• Stormwater systems may be undersized and new development may have to accommodate greater flows.</li> <li>• Undersized stormwater systems and flood events lead to runoff that may degrade water quality.</li> <li>• Changes in precipitation patterns will lead to changes in groundwater recharge rates (i.e., more intense events of shorter duration will decrease recharge; rather it will simply run off before it has a chance to infiltrate).</li> <li>• Discharge compliance of sanitary and stormwater discharge may be affected.</li> </ul>
<p>Temperature →</p> <p><i>more extremes and prolonged summer highs</i></p>	<ul style="list-style-type: none"> <li>• Increases in temperature results in: <ul style="list-style-type: none"> <li>○ increased water use/extraction rates</li> <li>○ rising surface water temperature that may affect aquatic species (e.g. salmon)</li> <li>○ increased evaporation rates that will affect surface habitat and groundwater recharge rates</li> <li>○ diminished water quality</li> </ul> </li> </ul>
<p>Vegetation Changes →</p> <p><i>shifts will occur in habitat suitability as a factor of changing temperature and precipitation</i></p>	<ul style="list-style-type: none"> <li>• Species composition in natural areas will change as precipitation and temperature changes.</li> <li>• Changes in water retention/recharge will affect wetland ecosystem functions, and result in the loss of riparian buffer function or composition.</li> <li>• Changing vegetation may require more water, alter the hydrograph or limit groundwater recharge.</li> </ul>
<p>Sea Level Rise →</p> <p><i>Projected Mean</i>  2030: +2.6 in. (+/- 2.2 in)  2050: +6.5 in. (+/- 4.1 in)  2100: +24.3 in. (+/- 11.5 in)</p>	<ul style="list-style-type: none"> <li>• Changes to coastal zone resources and shoreline stability <ul style="list-style-type: none"> <li>○ Shoreline instability and potential land loss can affect water pumping stations, sewer/septic and stormwater infrastructure as well as water supply wells.</li> </ul> </li> <li>• There is a risk of saltwater inundation of some aquifers (intrusion) and surface waters (overwash and increased tidal ranges).</li> </ul>
<p>Slope Stability →</p> <p><i>sea level changes and precipitation patterns will compromise once stable slopes</i></p>	<ul style="list-style-type: none"> <li>• As vegetation changes and shifts there could be a loss of flora or addition of new species that alter slope stability. Slope failure may impact water infrastructure and negatively affect wetland ecosystem function.</li> <li>• Die-back and loss of root systems supporting slopes could lead to instability in highly vulnerable areas.</li> </ul>
<p>Ocean Acidification →</p> <p><i>decreasing pH of the waters of Puget Sound</i></p>	<ul style="list-style-type: none"> <li>• This has the potential to affect stormwater discharge compliance as toxicity is affected by pH.</li> <li>• Aquatic species may be affected by acidification due to climate change.</li> </ul>
RELEVANT NON-CLIMATE DATA THAT MAY AFFECT THE GOALS OF THIS ELEMENT	
<p>Population changes →</p> <p><i>account for any anticipated increase or decrease due to climate refugees</i></p>	<ul style="list-style-type: none"> <li>• It is uncertain whether climate change will increase or decrease in population on-Island (climate migrants). <ul style="list-style-type: none"> <li>○ An increase in population will increase water use/extraction rates and require more sanitary disposal, as well as causing additional pressure on local aquatic habitat integrity.</li> </ul> </li> </ul>

