San Juan County Climate Change Resiliency

Preparing for Climate Change Impacts on our Water Resources
Where does our water come from?

Rain
Climate Changes impacts In San Juan’s

- Near Normal Annual Precipitation
- Larger Fluctuations between Wet and Dry years.
- Summers will be warmer, longer and drier
Temperature Change

- Temp 4.2-5.9 % by 2050
- Largest change in summer season.
Precipitation

Expect even more pronounced variation between Dry Season and Wet Season.
Precipitation

PNW will see increase in intense precipitation events.

Types of Precipitation Throughout the Year

- 67% light rain
- 23% moderate rain
- 5% heavy rain
- 4% light snow
- 1% thunderstorms

Relative frequency of various types of precipitation over the course of a typical year.
Snowpack

SJC luckily not dependent on SNOW PACK for water storage
Sea Level Rise

This is SJC’s largest threat. Sea Level rise in the Strait of Juan De Fuca is projected to be +7” by 2050, but the possible range is 1” to 14”. (Source: UW Climate Change Report https://cig.uw.edu/resources/specialVreports/psVsok/)

(Source: National Academy of Sciences 2012)
Isostatic Rebound

Sea Level Rise is partially being mitigated by rise in land mass. More “rebound” is being recorded in Southern Puget Sound.
San Juan Challenges

Summer Population Soars in San Juan's, likely to continue

![San Juan Islands Ferry Traffic (2015)](image-url)
San Juan Challenges

Summer Population Soars    Demand for Water Follows

EWUA Production by Month

Million Gal per Month

Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec
County’s largest systems depend on surface water.

<table>
<thead>
<tr>
<th>Water System</th>
<th>Island</th>
<th>Source Type</th>
<th>Source</th>
<th>Connections</th>
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<tr>
<td>FRIDAY HARBOR, TOWN OF</td>
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<td>Surface AND Ground Water</td>
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<td>Groundwater</td>
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Reservoirs are limited
Reservoirs Drawdown in Summer

Purdue Lake Level

EWUADMS folder to Lake Levels, Precip., Overflow folder to Precips-Lake Level-Overflows.xls

<table>
<thead>
<tr>
<th>Months</th>
<th>Feet</th>
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<tr>
<td>Nov</td>
<td>18</td>
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<tr>
<td>Dec</td>
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</table>

- **2015**
- **Previous 17 year average**
Lake Erie Algae Bloom

Warmer condition encourage Algae blooms that chock water filters
Wildland Fires

“Extended Summer” = Increased Fire Risk

Fire creates adverse impacts to reservoir water quality.
Ground Water

DOE lists 5,000 wells in SJC. (1 well per 3 people!)

Historically, Winter Recharge has exceeded Annual Withdrawal, BUT....
How SJ Islanders Get Their Water

- Single User Systems: 22%
- 2 Party Systems: 2%
- Group B Systems: 19%
- Group A Systems: 57%
Precipitation Variation

- Topography impacts precipitation. SJC’s precip is lower than elsewhere in region, and varies greatly within the County.
- Lopez receives least precip.

Figure 4. Mean annual precipitation for Lopez, San Juan, Orcas, and Shaw Islands, San Juan County, Washington, 1981-90.
Ground Water

San Juan County has VERY LOW Recharge!

Less than 10% of annual rainfall becomes recharge.
Ground Water

Bedrock Wells vs Unconsolidated Wells
SJC Geology vs Recharge

- Bedrock Areas
- Glacial Fill Areas

Figure 5. Generalized surficial geology and data-collection sites for Lopez, San Juan, Orcas, and Shaw Islands, San Juan County, Washington. Surficial geology is modified from Jones (1999). Data-collection sites are summarized in Table 2.
Seawater Intrusion
Seawater Intrusion

Fig. 14-11, p. 315
Recommendations

- Provide Funding to maintain and improve the County’s Existing Groundwater Monitoring capacity
- Expand the County’s Groundwater Monitoring capacity
- Quantify Agricultural water use
- Water system rates should encourage conservation
- Outdoor Water Use on Residential lots can be significant.
- Water Use Efficiency.
- Water systems should be operated by certified water system operators
- Data Management Capacity:
- On Site Grey Water Reuse.
- Predicting Sea Level Change
Outdoor Water Use

**Zone B Water Use July 2015**

- 15 Users (6%) exceeded 2x the base allotment (30,000 gal/qtr). This 6% used 26.5% of the water in this study group.
- 174 of 241 (72%) use less than 15,000/qtr.
- 15,000 gal/quarter is water included in base rate.
Smart Meters
Smart Meters

Source: Benjamin D. Inskeep and Shahzeen Z. Attari
Water Use Efficiency

- Water systems can do better
- Group B Code should include WUE tracking.
Bring Ag. to the Table

Where the Water Goes in US

- agriculture 70%
- industrial 22%
- domestic 8%
We can do with less!
SJC uses less water!
Are We Going To Run Out of Water?

- Unlikely, water is just too important. People will find a way.
- Local “high risk” areas exist, especially on Lopez.
- We can maintain our lifestyle while using much less water.
- Climate Change will impact the San Juan’s water resources less than many other areas.
- WA and SJC could be desirable destination of “Climate Refugees”? 
What the County Can Do?

- Require meters on ALL sources.
- Collect Data on water use.
- Set water use efficiency standards for Group B water systems to work towards.
- Study Ag’s water use.
- Identify areas that contribute most to aquifer recharge and protect them.
- Hire/Contract Hydrogeologist
- Form&Fund “Clean Water District”
- Continue to monitor Lopez and other areas at risk of seawater intrusion.
- Support Greywater reuse rulemaking.
What Individuals Can Do?

- Meter your use.
- Record your meter use.
- Set goals for your ongoing water use.
- Monitor your well’s water level.
- Aggressively fix leaks.
- Use outdoor water wisely.
- Replace your toilet.