Water System Resiliency

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Water Supply Forum

Resiliency Study

Resiliency is the ability to reduce the impacts of and recover rapidly from disruptive events.

Study analyzed resiliency from four potential threats:

- Earthquake
- Water Quality
- Climate Change
- Drought

RESILIENCY FOLLOWING AN EARTHQUAKE

Forum selected 4 risk scenarios:

- Cascadia Subduction Zone 9.0 (500 year event)
- South Whidbey Island Fault 7.4 (2,700 year event)
- Seattle Fault 6.7 (1,000 year event)
- Tacoma Fault 7.1 (4,500 year event)

Large earthquake could cause up to 6,000 distribution system breaks, producing water outages and economic impacts.

Could take up to 60 days to restore water at winter demands

Potential direct and indirect economic losses from water outages could exceed $2 billion.

Proactive steps:

- Coordinate emergency water delivery
- Improve seismic design standards
- Implement repair plans

THIS COULD HAPPEN HERE...

- Like Seattle/Tacoma, Kobe, Japan is a port city
- Similar geology to Puget Sound
- Over 6,000 people died
- Over 60 days of water outages
- Economic loss of over $150 Billion

1995 KOBE JAPAN EARTHQUAKE

photo source: Don Ballantyne

2005 HURRICANE KATRINA, NEW ORLEANS

photo source: Don Ballantyne

THIS COULD HAPPEN HERE...

- Like Seattle/Tacoma, New Orleans, LA is a port city
- 1,245 people died
- After 2 weeks, only 30% of drinking water facilities were operational
- Seattle/Tacoma are susceptible to storms/tsunamis

RESILIENCY FOLLOWING IMPACT TO WATER QUALITY

Severe risks to water quality in the region include:

- Wildfire
- Severe adverse weather
- Volcanic hazards
- Earthquakes
- Accidental contamination

Proactive steps:

- Implement backup water supplies

RESILIENCY IN RESPONSE TO CLIMATE CHANGE

Climate change could lead to reduced snowpack and streamflows, warmer water temperatures, and increased fire danger

Water availability may be greatly reduced; most significant impacts could occur post-2035/2050

Groundwater resources are likely to be more robust than surface water

Proactive Step:

- Assess long-term operation/infrastructure needs

Water supply evaluations suggest that Seattle, Everett, and Tacoma would have sufficient supply to meet not only existing, but also 2035 forecasted hot, dry summer demand levels if the worst drough on record (1987) repeated itself.

The drought resiliency assessment was performed in 2015, which coincidentally turned out to be a State-wide drought year.

Analysis of the 2015 drought found that water supply impacts were similar to, but not quite as severe as, the 1987 drought.

SPU's Chester Morse Reservoir (North Bend) during drought conditions

Photo Source: SPU

RESILIENCY FOLLOWING A DROUGHT

Reduced precipitation and snowpack or extended warm dry periods may limit availability to meet needs.

Groundwater sources are less vulnerable to a single-year drought than surface water.

Seattle Public Utilities, Everett Public Works, and Tacoma Water would have enough supply to meet 2035 forecast of hot, dry summer demand levels if the worst drought reoccurred.

Proactive step:

- Coordinate activation of water shortage contingency plans

Water Supply Forum - Next Steps

Perform outreach on Resiliency Study

- Key decision makers / political leaders / opinion leaders
- Internal outreach
- Stakeholder outreach
- Public outreach
- Training

Implement Phase 2 of Resiliency Project

- Development of criteria to mitigate risks
- Focus on earthquake and water quality

Bellevue's Efforts to Increase Resiliency

Groundwater Supply Analysis

Distribution System Seismic Resiliency Analysis

Water Storage Improvements

Seismic Reinforcing of Water Reservoirs

Mutual Aid Agreements for Potential Water Quality Incidents

QUESTIONS