

Building Resilience By Thinking Regionally

Water Finance Forum

Session 5: Financing Sustainable and Resilient Infrastructure –
Utility Perspectives

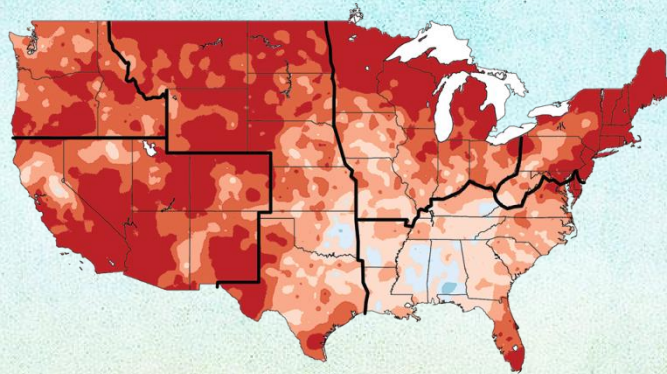
Terese (T.C.) Richmond

Portland, Oregon

March 31, 2016

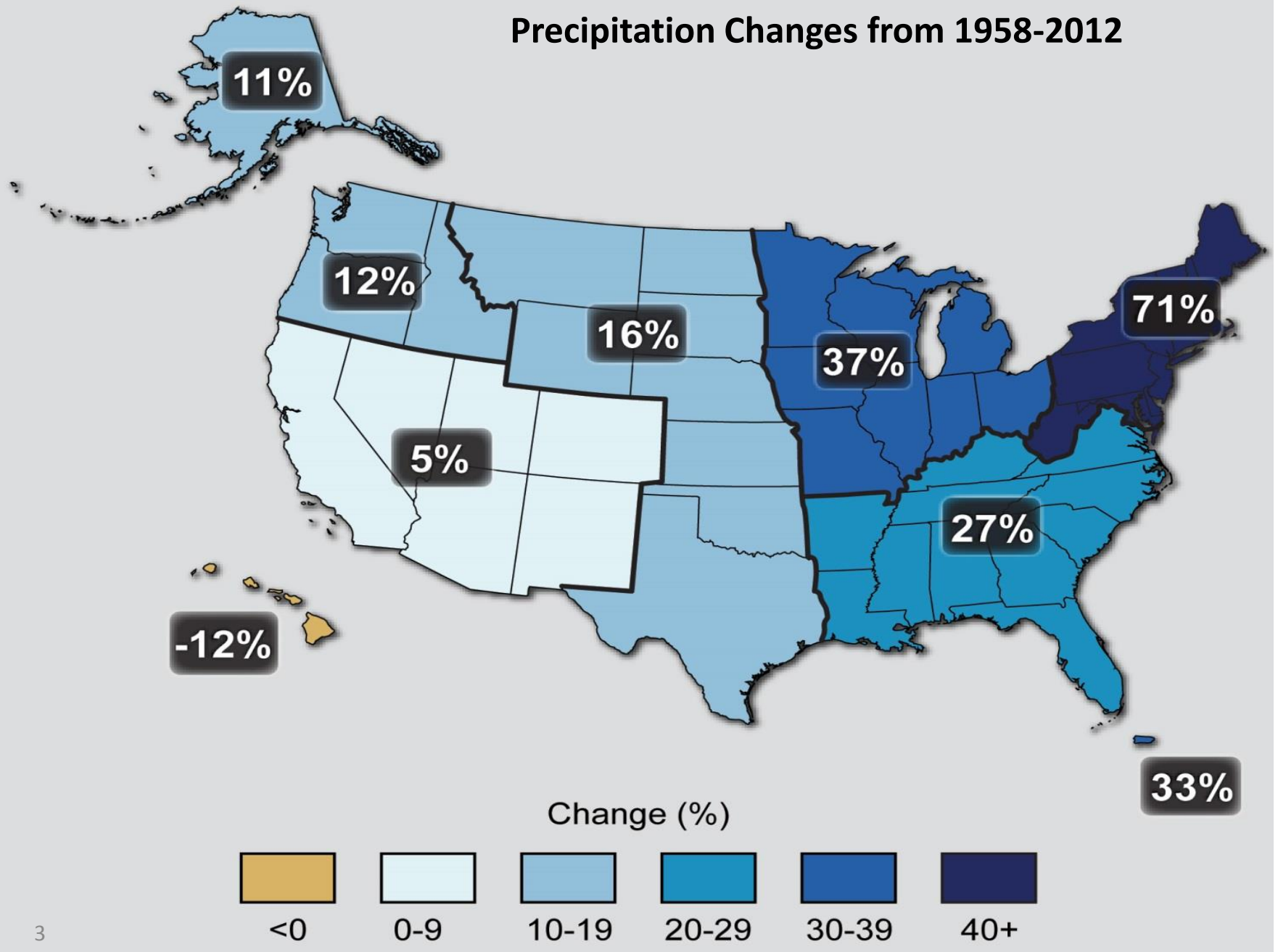
Third National Climate Assessment

Climate Change Impacts in the United States

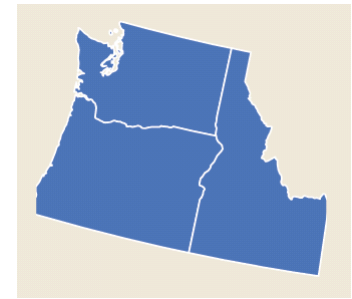


T.C. Richmond, Van Ness Feldman
National Climate Assessment: Vice-Chair of Federal Advisory Committee and
author Water Resources Chapter

Precipitation Changes from 1958-2012



Key Messages from the Northwest Region



- 1. Changes in the timing of streamflow related to changing snowmelt are already observed and will continue, reducing the supply of water for many competing demands and causing far-reaching ecological and socioeconomic consequences.**
- 2. In the coastal zone, the effects of sea level rise, erosion, inundation, threats to infrastructure and habitat, and increasing ocean acidity collectively pose a major threat to the region.**
- 3. The combined impacts of increasing wildfire, insect outbreaks, and tree diseases are already causing widespread tree die-off and are virtually certain to cause additional forest mortality by the 2040s and long-term transformation of forest landscapes. Under higher emissions scenarios, extensive conversion of subalpine forests to other forest types is projected by the 2080s.**
- 4. While the agriculture sector's technical ability to adapt to changing conditions can offset some adverse impacts of a changing climate, there remain critical concerns for agriculture with respect to costs of adaptation, development of more climate resilient technologies and management, and availability and timing of water.**



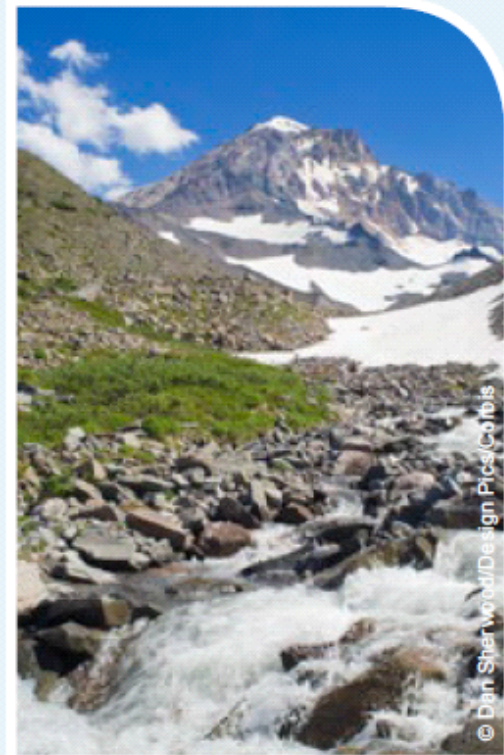


3 WATER RESOURCES

KEY MESSAGES

Climate Change Impacts on the Water Cycle

1. Annual precipitation and river-flow increases are observed now in the Midwest and the Northeast regions. Very heavy precipitation events have increased nationally and are projected to increase in all regions. The length of dry spells is projected to increase in most areas, especially the southern and northwestern portions of the contiguous United States.
2. Short-term (seasonal or shorter) droughts are expected to intensify in most U.S. regions. Longer-term droughts are expected to intensify in large areas of the Southwest, southern Great Plains, and Southeast.
3. Flooding may intensify in many U.S. regions, even in areas where total precipitation is projected to decline.
4. Climate change is expected to affect water demand, groundwater withdrawals, and aquifer recharge, reducing groundwater availability in some areas.
5. Sea level rise, storms and storm surges, and changes in surface and groundwater use patterns are expected to compromise the sustainability of coastal freshwater aquifers and wetlands.
6. Increasing air and water temperatures, more intense precipitation and runoff, and intensifying droughts can decrease river and lake water quality in many ways, including increases in sediment, nitrogen, and other pollutant loads.



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NCA Water Resources Key Messages (cont'd)

Climate Change Impacts on Water Resources Use and Management

7. Climate change affects water demand and the ways water is used within and across regions and economic sectors. The Southwest, Great Plains, and Southeast are particularly vulnerable to changes in water supply and demand.
8. Changes in precipitation and runoff, combined with changes in consumption and withdrawal, have reduced surface and groundwater supplies in many areas. These trends are expected to continue, increasing the likelihood of water shortages for many uses.
9. Increasing flooding risk affects human safety and health, property, infrastructure, economies, and ecology in many basins across the United States.

Adaptation and Institutional Responses

10. In most U.S. regions, water resources managers and planners will encounter new risks, vulnerabilities, and opportunities that may not be properly managed within existing practices.
11. Increasing resilience and enhancing adaptive capacity provide opportunities to strengthen water resources management and plan for climate change impacts. Many institutional, scientific, economic, and political barriers present challenges to implementing adaptive strategies.

Water Resources Resilience

Key Message 11: Adaptation Opportunities and Challenges

Increasing resilience and enhancing adaptive capacity provide opportunities to strengthen water resources management and plan for climate change impacts.

Many institutional, scientific, economic, and political barriers present challenges to implementing adaptive strategies.

In addition to physical adaptation, capacity-building activities can build knowledge and enhance communication and collaboration within and across sectors.^{1,167,169} In particular, building networks, partnerships, and support systems has been identified as a major asset in building adaptive capacity (Ch. 26: Decision Support; Ch. 28: Adaptation).¹⁷⁰

Chapter 39.106 RCW (“JMUSA”)

- Joint Municipal Utility Service Agreement may be formed by two or more members to perform or provide any or all utility services that all of its members, other than the tribal government members, perform or provide.
- Authorities are municipal corporations.

What entities can form a Joint Municipal Authority?

“**Member**” means a city, town, county, water-sewer district, public utility district, other special purpose district, municipal corporation, or other unit of local government of this or another state that provides utility services, and any Indian tribe recognized as such by the United States government, that is a party to an agreement forming an authority.

What utility services can be provided by a Joint Municipal Authority?

"Utility services" means: the provision of retail or wholesale water supply and water conservation services; the provision of wastewater, sewage, or septage collection, handling, treatment, transmission, or disposal services; the provision of point and nonpoint water pollution monitoring programs; the provision for the generation, production, storage, distribution, use, or management of reclaimed water; and the management and handling of storm water, surface water, drainage, and flood waters.

What is its potential?

- As a model for governance
- Consolidate one or more water utility functions in a single new entity to provide essential public services
- Regionalize supply planning and implementation



- City of Bellevue
- City of Issaquah
- City of Kirkland
- City of Redmond
- Sammamish Plateau
Water & Sewer District
- Skyway Water & Sewer District
- City of Tukwila

1999 - formed as a nonprofit corporation providing water to almost 400,000 residents and more than 22,000 businesses. Membership is open to any public water utility in the Puget Sound region.

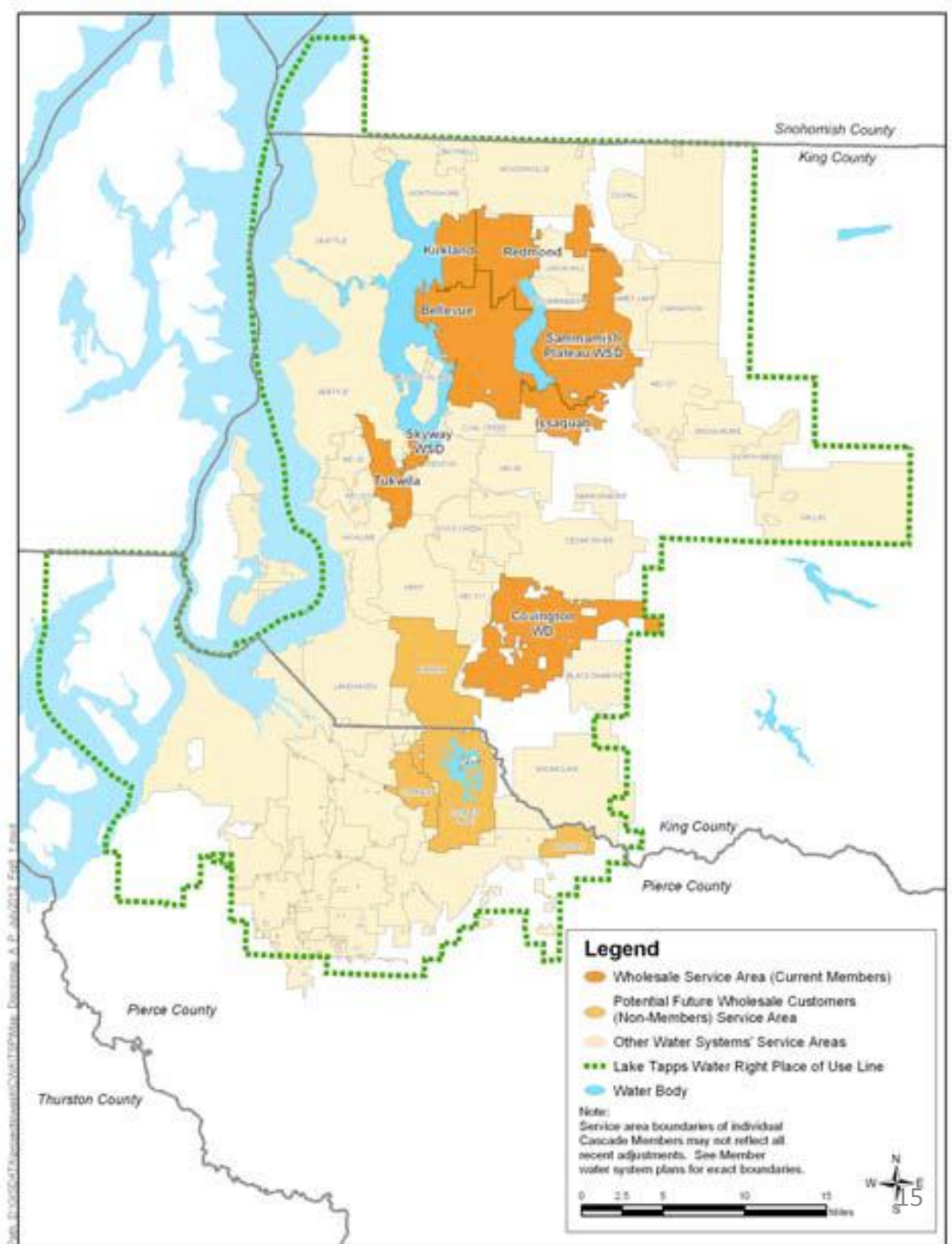
2012 – transitioned to a municipal corporation under JMUSA



Service Area

Sources of water:

- Seattle Contract,
- Tacoma Contract,
- Lake Tapps



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map of lake tapps washington

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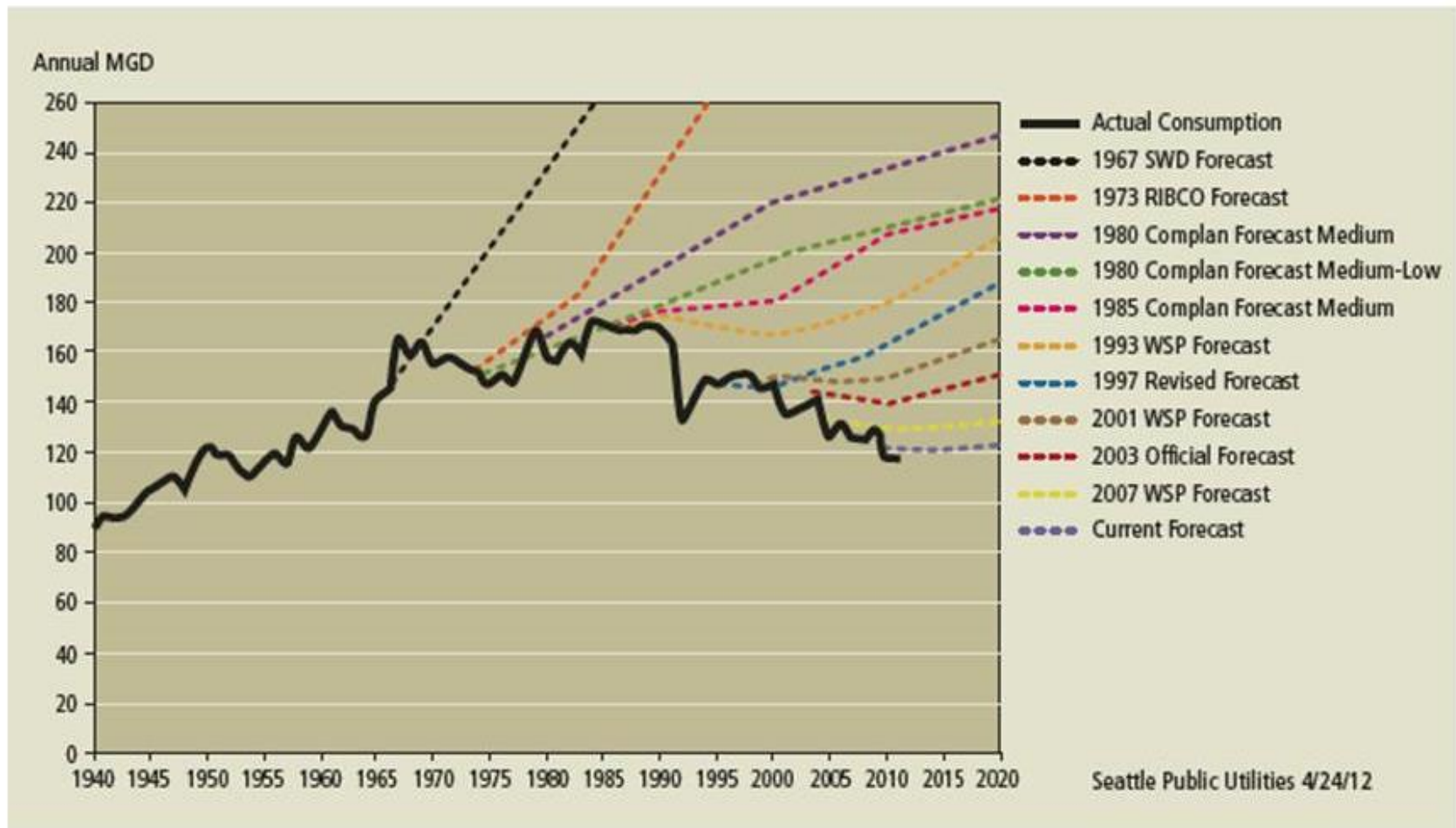
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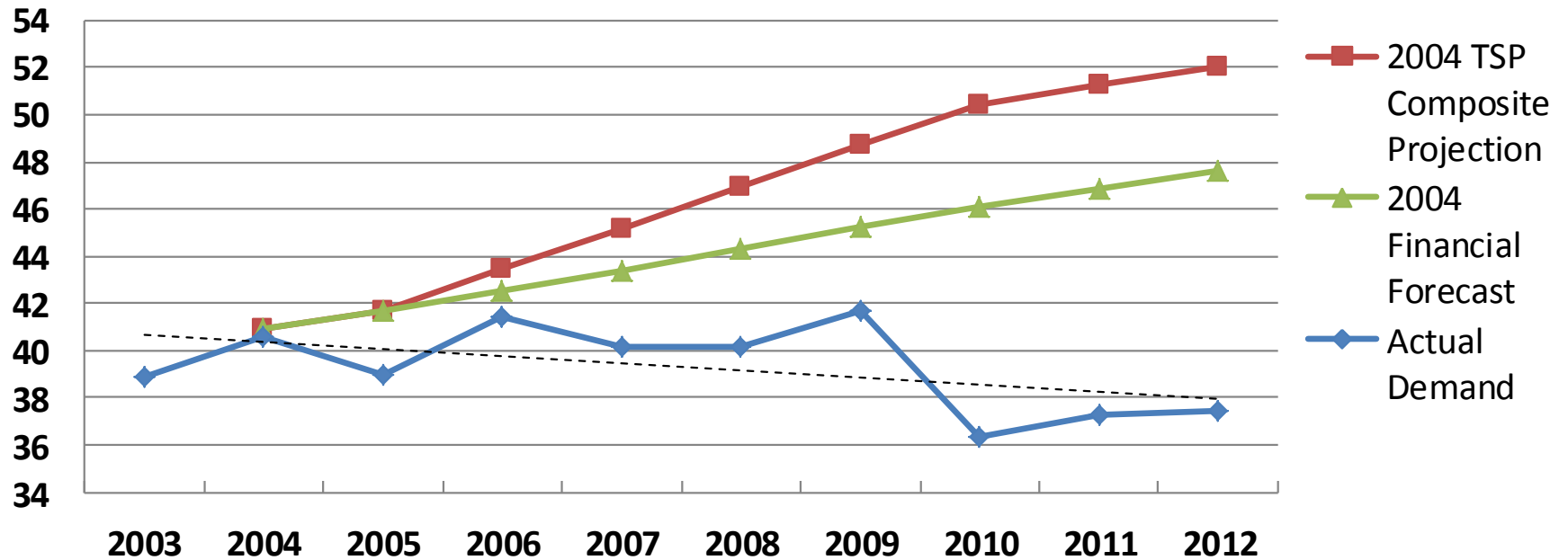
Windows taskbar icons: Internet Explorer, Google Chrome, VLC, OneDrive, Word, PowerPoint, Skype, and others.

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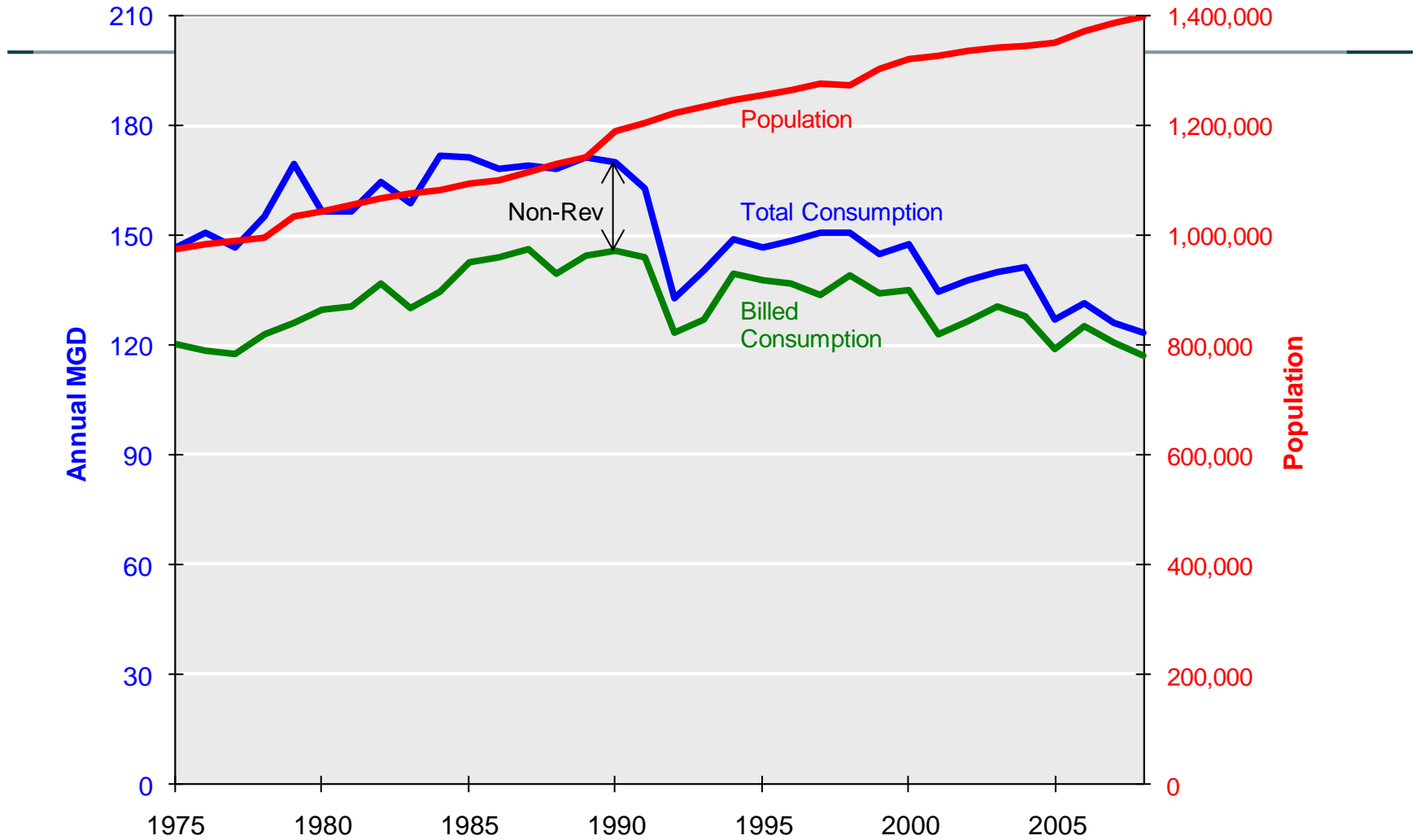
Shifting Water Demand Forecasts



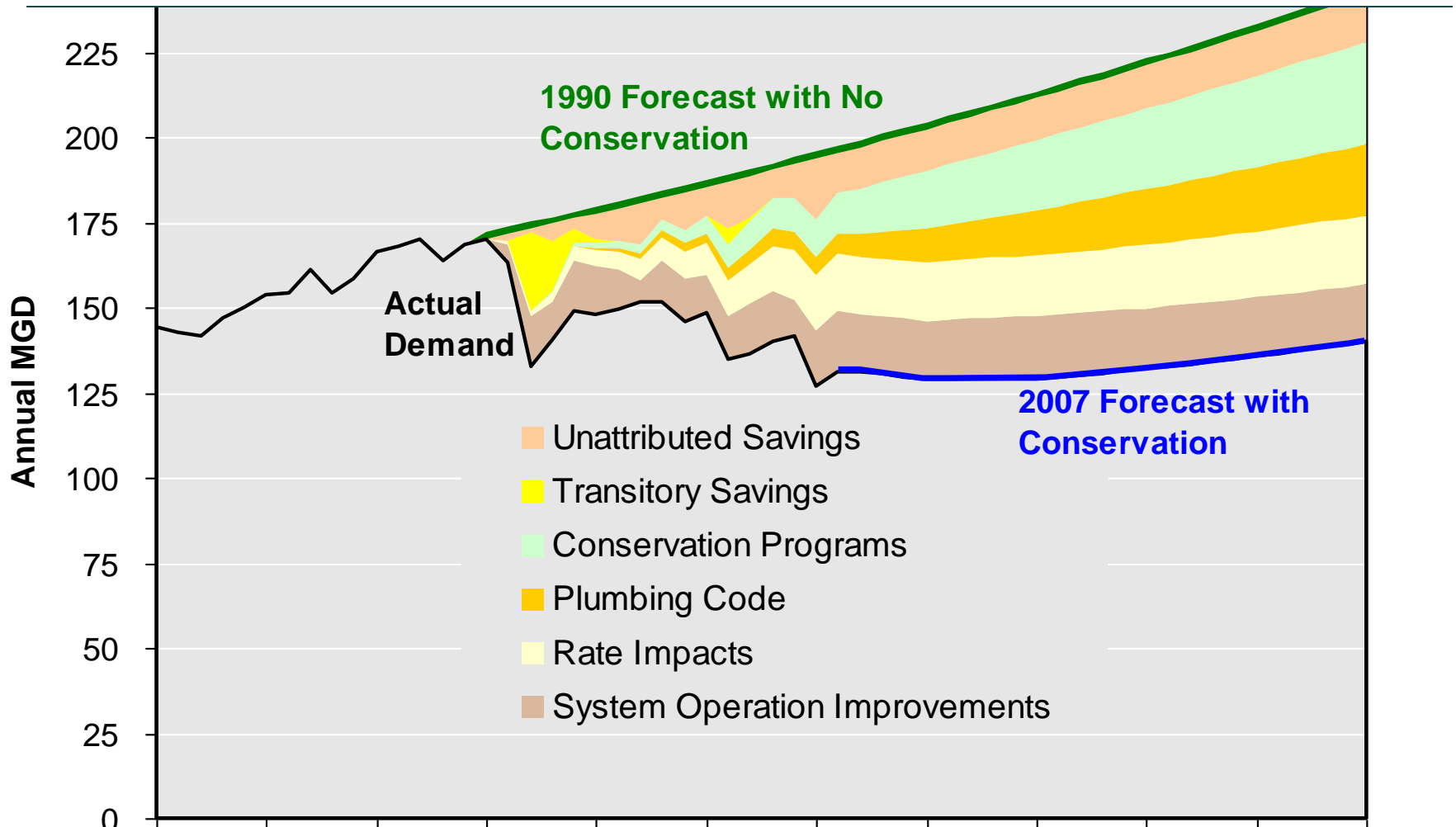
Cascade Average Daily Demand (mgd)



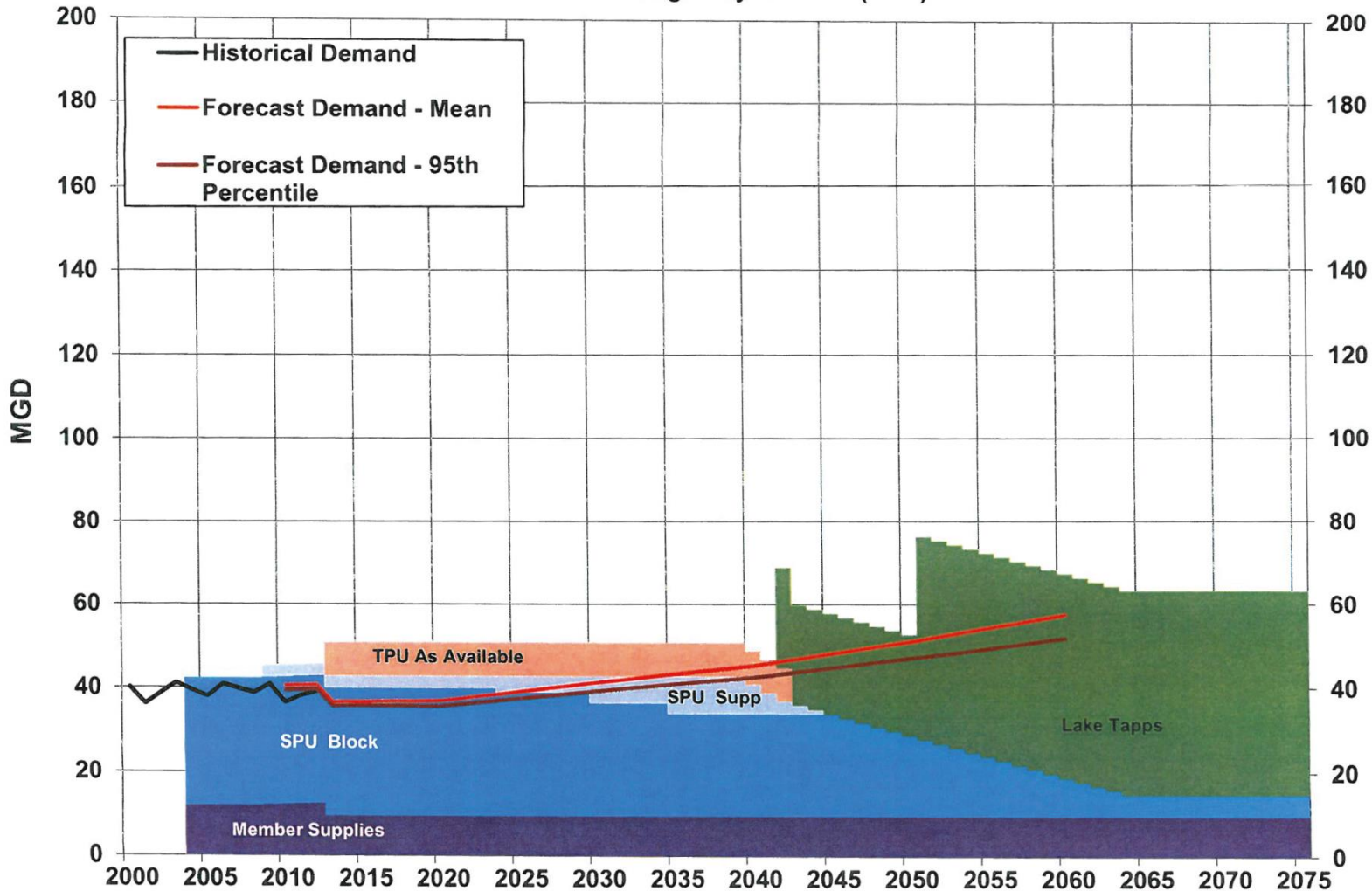
Growth in Population & Water Consumption



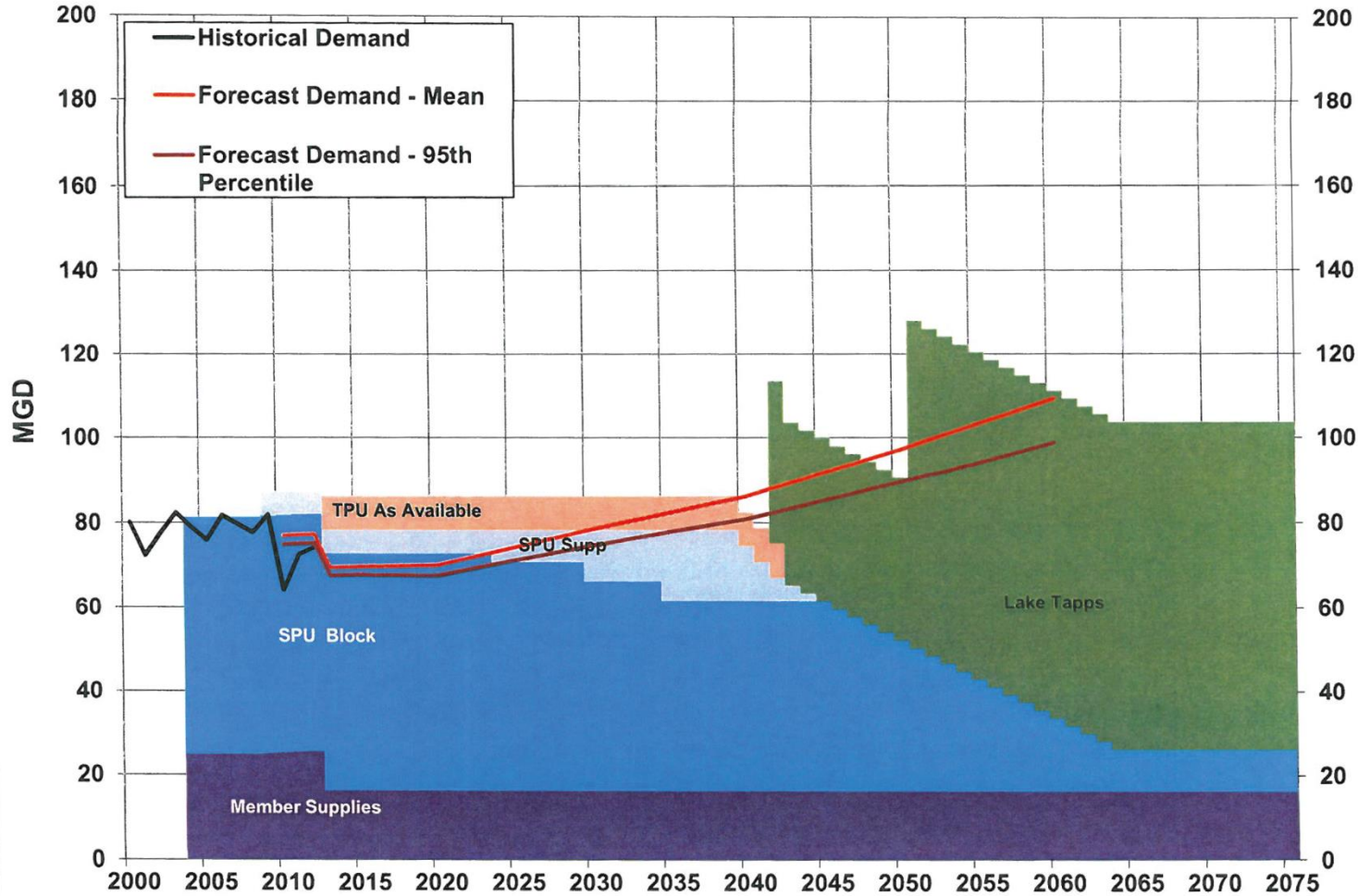
Impact of All Forms of Conservation on Past and Forecast Water Demand



Cascade Supply Portfolio Restructured SPU and TPU Agreements 2013 Average Day Demand (ADD)



Cascade Supply Portfolio Restructured SPU and TPU Agreements 2013 Maximum Week Demand (MWD)



Cascade Rates

Cascade's Member Charges (Rates)

- Based on System Financial Requirements
 - Operating and Maintenance (Lake Tapps)
 - Capital Improvement
 - Capital Repair, Rehabilitation and Replacement
 - Fiscal Policies
- Key Fiscal Policies and Objectives
 - Increased commitment of Regional Capital Facilities Charge (RCFC) revenues to construction rather than debt service
 - Maintain cash reserves and financial performance (e.g. bond coverage) standards
 - Meet planned near-term capital needs without additional debt
 - 5 year rate smoothing
- Key Rate Drivers
 - Growth and RCFC revenue
 - Lake Tapps capital and operating costs
 - Seattle wholesale costs

Cascade's Regional Capital Facilities Charge (RCFC)

- Based on System Capital Assets
 - Existing Assets
 - 30 Year Planned Capital Investments
- Timing of Lake Tapps Development is Critical
 - RCFC declines with Lake Tapps outside the 30 year horizon
 - RCFC increases moderately with Lake Tapps within the 30 year horizon

Water Supply Forum

- ❑ Voluntary organization comprised of representatives from public water supply systems and local governments from King, Pierce and Snohomish Counties Water in Central Puget
- ❑ The four major water utilities include Seattle Public Utilities, Everett Water, Tacoma Water and Cascade Water Alliance.
- ❑ Together these utilities serve 1.8 million people over 1,200 square miles. They serve 60 cities, three bustling international ports, and world business headquarters including Boeing, Weyerhaeuser, Starbucks, Amazon and Microsoft.
- ❑ To develop detailed plans to help the region better prepare for the impacts of significant system stresses and ensure future water supply resiliency. Standards were set for restoring service water and developing mitigation factors.

Forum's Resiliency Project

- Forum member utilities worked across jurisdictional boundaries, sharing technical and scientific expertise in engineering, planning and science disciplines
 - to evaluate water supply risks facing the central Puget Sound region and
 - to identify opportunities to improve the region's resilience to these risks

- The results of this technical and science-based work and the next steps will be unveiled March 31, 2016 in a workshop/symposium to key decision makers and elected officials for support and action on next steps.

Forum's Resiliency Project initial findings include:

Earthquake: The Puget Sound region is susceptible to earthquake hazards produced predominately by three shallow crustal faults and a deep subduction zone. Economic impacts could be \$1 to \$3 billion.

Water Quality: Disruption to the continued delivery of safe and acceptable drinking water from a variety of risks like wildfires, supply chain disruption, adverse weather, volcanic eruption, accidental contamination and others.

Drought: Dry conditions reduce water availability to meet normal instream and out of stream water needs as well as demands for municipal water supply.

Climate Change: Impacts to the water cycle, sea levels, water temperature, snowpack, frequency and intensity of rainfall events on groundwater, surface water supplies, and the migration of people, water quality and wildfire were examined. The findings indicate water availability may be reduced, fire danger may be increased, groundwater might remain stable compared to water supply and there is a continued need for water quality management strategies.

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