Climate Change Adaptation & Resiliency

Focus Area: **Environment & Public Health**
Strategic Objective: **Anticipate, adapt to change**
Owner: **Paul Fleming, Corporate Asset Management Division**

Summary of proposed action

Improve SPU's ability to anticipate changing climatic conditions, enhance our understanding of the implications of these conditions on SPU's built and natural infrastructure and services, and develop adaptation strategies to address those implications. If implemented, this proposal will:

- Assess climate impacts on the drainage & wastewater and drinking water systems, including the watersheds;
- Identify and evaluate potential adaptation options for addressing the potential impacts;
- Create a corporate-wide approach to climate adaptation and mainstream it into SPU's practices and plans.

Description of the problem this action solves

Changes in the timing and intensity of rainfall and snowpack accumulation may dramatically affect SPU's built and natural utility infrastructure, and the reliability of the services that depend upon those systems. Sea level rise also has implications for the location and functioning of SPU's infrastructure, especially storm and sewer pipes and pump stations.

While we have enhanced our understanding over the past several years of the implications of climate change on SPU's systems, we have an incomplete and inadequate understanding of those implications. There is considerable uncertainty regarding the exact nature, magnitude and timing of those climate impacts; this uncertainty challenges SPU's ability to implement appropriate management and adaptation strategies. Continuing to strengthen and enhance our understanding of climate change will enable us to make sound infrastructure investments and develop resilient utility systems that support the reliability of the overall system, our services, and ultimately, Seattle's livability.

More detailed description of the proposed action

As described below, this proposal builds on existing work to complete two evaluations leading to specific recommendations for both the Drainage & Wastewater and Drinking Water lines of business. Funding also is provided for a significant infrastructure project to increase our capacity to store water in the Cedar River Watershed. The following proposed activities build on existing practices[1] to help us adapt to climate-related threats and continue to meet our customers' expectations for service levels into the future.

Drainage and Wastewater

- Identify precipitation thresholds for basins not influenced by Puget Sound tides. This identifies how sensitive our piped drainage and wastewater network is to changes in precipitation,
- Evaluate a portfolio of adaptation strategies (operational, maintenance, new or renovated infrastructure, etc.) that can be implemented to improve preparedness for increased frequency and severity of urban flooding and sewer back-ups,
- Integrate storm forecasting capabilities (meteorological forecasting, pre-storm planning, operational preparedness, real-time responses, post-storm evaluation, and ongoing data collection and analysis).

[1] Current climate-related activities include: obtaining and using the next generation of climate projections, improving storm event forecasting capabilities, collaborating with other City departments, interacting climate considerations in SPU's capita; planning, and participating in water-industry and federal government climate initiatives.

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Drinking Water

- Evaluate a portfolio of adaptation strategies (operational, maintenance, new or renovated infrastructure, etc.) so we can address climate-related water infrastructure vulnerabilities in the 2019 Water System Plan. Areas of study will include: climate-driven changes to the hydrology of our water supply, alternative water sources, storage, and delivery strategies.
- Evaluate climate-related vulnerabilities of the Tolt and Cedar watershed ecosystems (including water supply, forest fires, habitat, and wildlife) and develop adaptation strategies. Fund 0.2FTE for this work.
- Make improvements to the overflow dike separating Masonry Pool and Chester Morse Lake in the Cedar Watershed and modifying reservoir operations will increase our ability to manage flood events, water storage, and downstream flow concerns related to changing precipitation patterns.

SPU-wide – Institutionalize best practices.

- Integrate climate considerations into SPU's asset management and comprehensive planning processes,
- Establish an internal price of carbon to use in project evaluation and planning,
- Update climate change projections in 2019 to keep SPU's climate impacts assessment current and provide a common climate framework across SPU,
- Develop a formal planning and reporting mechanism to track assumptions and results.

Implementation plan and timeline

	2015	2016	2017	2018	2019	2020
Non-tidal basin study (DWW Climate Resiliency Study)	x					
DWW adaptation study and evaluation		x	x	x		
Weather forecasting and integration into planning & analysis	x	x				
Annual data review and update	x	x	x	x	x	x
Adaptation strategies for the drinking water system and watersheds	x	x	x	x	x	X
Watershed vulnerabilities studies	x	x				
Best practices	x	x	x			
Planning and reporting	x		x		x	

Budget and FTE Changes (in $000s)

Fund: Drainage & Wastewater AND Drinking Water Funds

	2015	2016	2017	2018	2019	2020	Total
O&M Labor	20	20	20	20	20	20	**$120**
O&M Non-Labor	610	650	100	100	100	40	**$1,600**
O&M Subtotal	***630***	***670***	***120***	***120***	***120***	***60***	***$1,720***
CIP	1,480	2,053					**$3,533**
Total O&M and CIP	***$2,110***	***$2,723***	***$120***	***$120***	***$120***	***$60***	***$5,253***
FTE	0.2	0.2					

Plan for evaluating success or progress

- This proposal includes developing reporting metrics in 2015.