

WRITTEN TESTIMONY OF  
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HEARING ON  
“A NATIONAL CLIMATE SERVICE”

BEFORE THE  
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COMMITTEE ON SCIENCE AND TECHNOLOGY COMMITTEE  
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**Introduction**

Good morning Chairman Baird, Ranking Member Inglis and Members of the Subcommittee. Thank for this opportunity to testify before your committee today. My name is Paul Fleming, I am the Manager of the Climate and Sustainability Group at Seattle Public Utilities (SPU). SPU provides reliable drinking water to 1.3 million people in the greater Seattle area, and provides sewer, drainage and solid waste services to Seattle residents. My position at SPU is responsible for developing SPU’s climate adaptation and mitigation strategies, and establishing partnerships with other utilities and research organizations in the U.S. and abroad.

SPU, like many water utilities in the US, is an active participant in numerous water sector climate change initiatives related to the management, policy and technical challenges and research needs that arise from the projected impacts of climate change. We are one of the founding members of the Water Utility Climate Alliance (WUCA), a group of eight urban water suppliers that collectively provide drinking water services to nearly 36 million people. WUCA is currently funding two projects: one on decision support systems for the water sector and another on an assessment of climate modeling. SPU is also active in the climate change initiatives of the Association of Metropolitan Water Agencies, the American Water Works Association and the International Water Association. SPU is currently advising both the Water Research Foundation and the Water Environment Research Foundation as they develop their climate change research agendas for the drinking water and clean water sectors respectively and continue their leadership roles in supporting emerging research. We are also reaching out to utilities and researchers in an effort to glean best practices from other parts of the world. This engagement with multiple

entities reflects SPU's belief in the importance of climate change for the water sector and our commitment to continually enhance our institutional capacity to prepare for the implications of climate change. This depth of engagement, understanding and commitment is common to varying degrees amongst numerous large water utilities in the U.S.

The City of Seattle has made addressing climate change a top priority. Our mayor, Greg Nickels, has been the leader in an effort to engage other mayors across the political spectrum on the issue of climate change and the need to take local actions. In addition, the City's municipally-owned electric utility, Seattle City Light, will likely see significant impacts to its hydropower-based operations as climate change affect our region. They support my testimony here today.

Today, I will highlight some of the existing federal monitoring and forecasting services Seattle relies on for water supply system operations and planning, describe how we use these services to help ensure that we meet our responsibilities and policy objectives and describe attributes that we would like to see in a National Climate Service.

### **Seattle's use of Federal Monitoring and Forecasting Services**

Seattle's water supply is derived from two watersheds located in the Central Cascade Mountains in Washington State: the Cedar River and Tolt River Watersheds. These watersheds receive precipitation in the form of rain and snow. Seattle manages these watersheds, the Cedar and Tolt Rivers, and our mountain-based reservoirs, to achieve the following objectives:

- Water supply for people
- Instream flows for aquatic species
- Flood management
- Dam safety
- Water quality

Given the dynamic nature of managing our water supply system, with our multiple objectives, capricious weather and the need to balance immediate and short term issues with longer term planning horizons, it is critical that we have access to real-time monitoring and forecasting information. Seattle relies on several federal agency monitoring and forecasting services to help inform our decision-making. These services include, but are not limited to:

- US Geological Survey's (USGS) stream gages
- Natural Resources Conservation Service's (NRCS) SnoTel sites

- National Oceanic and Atmospheric Administration's (NOAA) National Weather Service's weather observations and daily and mid range weather forecasts,
- NOAA's Climate Prediction Center's 30-90 day and multi-seasonal climate outlooks
- NOAA's Remote Sensing of Snowcover

Seattle uses these services and others for operational planning at multiple time scales, from day to day to several months out, to manage our rivers and reservoirs in order to meet our objectives. USGS gages are used to help us comply with our landmark Cedar River Habitat Conservation Plan and to protect salmon habitat and salmon redds on the Cedar River. The National Weather Service's general weather forecasts inform our reservoir operations and help us time releases of water. NRCS's SnoTel sites provide us with estimates of snowpack which we can use to project how much water is embedded in the snow blanketing the hills in our watersheds. These services are our eyes and ears on the ground as well as the binoculars peering over the horizon.

These services also serve as an authoritative and credible source of information, which is critical for the type of collaborative resource management decision-making that we engage in on a regular basis.

In addition to using these services, Seattle provides financial and in-kind support for some of them. The Tolt and Cedar River Basins are extensively gauged and networked, partially as a result of a cooperative funding arrangement between SPU, Seattle City Light and USGS. In 2009, SPU will contribute roughly \$125,000 towards this arrangement. We greatly appreciate this arrangement and the excellent work of the Tacoma, Washington Office of the USGS. For the NRCS's SnoTel program, we provide in-kind surveying of the land where their equipment is located. We have invested in these systems and appreciate and depend on continued federal support for them.

Another federal service we have used is NOAA's Regional Integrated Sciences and Assessment (RISA) program. In the Pacific Northwest, the RISA program is represented by the University of Washington Climate Impacts Group (UW-CIG). UW-CIG has been instrumental in helping to elevate the issue of climate change in the central Puget Sound region and Washington State. The research UW-CIG has conducted has greatly advanced the region's ability to understand how climate change is projected to affect different sectors of the region and state. Seattle benefited directly from engaging with the UW-CIG to conduct two studies within the past five years on how climate change is projected to affect the hydrology of the watersheds where we operate.

The most recent study we completed involved the creation of three climate scenarios that were based on three Global Climate Models (GCMs) coupled with two emission scenarios and downscaled to the central Puget Sound region. The three scenarios projected decreases in our water supply ranging from 6% to 21% by 2050 due to climate change. Given this projected range of impacts, we then developed initial adaptation strategies and evaluated their

effectiveness in offsetting the reductions in supply. The first strategies we've evaluated were "no-regrets" strategies: operational adjustments that are low to no-cost, enhance our operational flexibility and which could be implemented quickly. By deploying this initial portfolio of strategies we estimated we could offset the impacts of climate change in two out of the three climate scenarios.

This assessment also reinforced the role of water conservation as an essential component of our climate change strategy. Since 1984, our total water consumption has declined by 28% while population has grown by 26%. As a result, water consumption per capita is 43% less than it was a year ago. This has been due to the combined effects of higher water rates (and a seasonal and inclining block rate structure), the Washington State plumbing code, over two decades of aggressive conservation programs, and improved system operations. We are also committed to saving an additional fifteen million gallons a day (mgd) through conservation programs over the next 20 years. By 2030, we project that water demand will still be less than it was in 1965 even though we'll be serving 80% more people.

This engagement with the research community has strengthened Seattle's knowledge of the implications of climate change, stimulated our development of initial adaptation strategies and enhanced our institutional capacity. We look forward to continued interaction with UW-CIG, federal agencies and the research community as a whole in the co-production of knowledge.

## **A National Climate Service**

It is often noted that water utilities are on the "front lines" of, or "first responders" in, the battle against climate change. While this characterization is apt, it doesn't fully capture the breadth of activities the water sector pursues in operating and managing our systems and in identifying and preparing for the impacts of climate change. To continue with the martial metaphor, we're not just on the front lines, but we're also in the war room gleaning intelligence data from original research and reconnaissance we have conducted; we're often using satellite data to determine how much resources (e.g. water) we have to utilize; we're assessing threat levels through vulnerability assessments, developing new tools to counter those threats, and building alliances to share information and resources. The broad spectrum of strategic and tactical activities that the water sector is engaged in illustrate that we take the issue of climate change seriously and that we have the capability to do a lot of work. We need, however, the support of, and continued collaboration with, the federal government and welcome an integrated and user-driven National Climate Service that hastens our ability to identify and prepare for the impacts of climate change.

As an active user of several federal services and as a partner and collaborator with numerous federal programs, Seattle believes there are potentially great benefits associated with the creation of a National Climate Service. Having extensive experience with NOAA's RISA program, we view that as a potential model, particularly given its distributed geographic structure. Such a

structure has the potential of establishing strong linkages between the research community and the relevant sectors in a given region and creating tailored research and services that help to address a region's needs. If it were to serve as a potential framework for a NCS, the RISA model, however, would need to be strengthened and expanded along the following lines:

- Involve multiple federal agencies in the provision of services. The water sector uses the services of, interacts with and is regulated by several agencies. Having multiple agencies involved in the NCS and viewing it as an authoritative source of climate information would facilitate our interactions with these agencies.
- Involve multiple sectors in the development and implementation of programs and services provided by the NCS. As I have noted before, the water sector is engaged on the issue of climate change and is enhancing its capacity to understand and prepare for the impacts. The NCS should recognize this capacity and view the water sector not just as an end-user but as a collaborator as well. This is particularly salient with respect to vulnerability assessments, where a utility's tacit knowledge of its system operations can "ground truth" the assessment and identify and evaluate the effectiveness of operational adjustments. Such an emphasis could also help to complement the current university context for RISA program delivery.
- Ensure there is consistency across the distributed structure by establishing a common set of goals, objectives, and tenets across the country so that the NCS is responsive to the water sector's need for "actionable science" and that the distributed "branches" of the NCS are well coordinated.
- Increase overall funding for an NCS while maintaining and expanding, if necessary, existing monitoring networks and forecasting services. These services are essential for operations and planning today and will be even more critical in the future;
- Build upon existing partnerships that are effective in delivering services. As noted previously Seattle has established relationships with USGS and NRCS to support the ongoing operations and maintenance of stream flow and snowpack monitoring infrastructure.
- Establish a structure that allows for an option to scale the services beyond the U.S. As the federal government continues to engage internationally on climate change, there is great potential for the U.S. to assist other countries in enhancing their adaptive capacity as well as learning from them while also addressing potential national security issues. Through appropriate agreements or perhaps as part of foreign aid programs, the National Climate Service potentially could provide essential monitoring services and research for areas of the world that don't have access to such information.

## Conclusion

In closing, I want to reiterate a few points:

- Large utilities in the water sector are engaged to varying degrees in furthering our understanding of the implications of climate change and in preparing for the challenges it creates;
- We welcome additional federal collaboration that builds off of and expands existing monitoring and forecasting services and collaborative partnerships;
- Given the operational knowledge and institutional capacity of the water sector, a National Climate Service should be based on a geographically distributed but nationally coordinated structure that involves and complements the water sector's tacit knowledge and experience.

Thank you again for the opportunity to testify this morning Mr. Chairman and Members of the Committee.