Letter of Intent – Climate Program Office FY 2018

Competition 3 – *Climate and Societal Interactions Part A: SARP – Extreme Events Preparedness, Planning, and Adaptation Within the Water Sector.*

Competition Manager: nancy.beller-simms@NOAA.gov. **Funding Opportunity:** NOAA-OAR-CPO-2018-2005133

Project Title: Selling water scarcity in a wet region: Using economics to spur investments in water conservation climate adaptation actions in Thurston County, Washington

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Statement of the problem:

The residents and decision makers of Thurston County are not adequately motivated to make meaningful water conservation investments today to deal with growth and climate related potable water scarcity in the coming decades.

In Thurston County, the average annual precipitation is a hefty 52 inches (NOAA National Centers for Environmental Information data – accessed June 12, 2017). Nevertheless, the Thurston County area is already experiencing water shortages associated with population and development increases, and climate change will exacerbate these shortages. Thurston County is somewhat unique in that the drinking water source of all residents of the county comes from groundwater, either from municipal sources or private wells.

With last winter's record rainfall in Thurston County, it is easy for ratepayers and decision makers to forget that groundwater capacity is not limitless. However, significant vulnerability exists across our infrastructure. Some Thurston County jurisdictions already lack adequate water rights to provide for projected growth over the next 20 years. Impacts from climate change will only exacerbate these issues.

Using the methodology from one of the NOAA climate toolkit documents, *Being Prepared for Climate Change: A Workbook for Developing Risk-Based Adaptation* Plans[1], the Thurston Regional Planning Council (TRPC) worked with University of Washington's Climate Impacts Group (CIG) to synthesize climate science for the Thurston County area, develop a vulnerability assessment, identify and prioritize climate risks, and TRPC is now developing a climate adaptation action plan for completion in 2018. This work relied heavily on the CIG study titled *State of Knowledge: Climate Change in Puget Sound*[2]. This report was supported in part by NOAA/NIDIS, and CIG is a member of NOAA's Climate Impact Research Consortium, which serves as a member of the Regional Integrated Sciences and Assessments program.

Even with this highly credible supporting work, transitioning water ratepayers and decision makers to implementation of adaptation actions is difficult. One of the challenges is the political will to invest significant real dollars today to deal with the perception that impacts will occur gradually over a prolonged period. We need to be able to answer questions about the expected return on today's investment in terms of benefits gained and costs avoided in the future. These are precisely the questions that robust cost benefit analyses (CBA) are intended to inform. The Thurston County area is an ideal test bed for the use and influence of CBA in supporting climate adaptation action implementation. The CBA effort can leverage the

[1] Climate Ready Estuaries. 2014. *Being Prepared for Climate Change: A Workbook for Developing Risk-Based Adaptation Plans.* EPA Office of Water, WA D.C. EPA 842-K-14-002.

[2] Mauger, G.S., J.H. Casola, H.A. Morgan, R.L. Strauch, B. Jones, B. Curry, T.M. Busch Isaksen, L. Whitely Binder, M.B. Krosby, and A.K. Snover. 2015. *State of Knowledge: Climate Change in Puget Sound.* Report prepared for the Puget Sound Partnership and NOAA/NIDIS. Climate Impacts Group, University of Washington, Seattle. doi:10.7915/CIG93777D

existing modeling and research of CIG and the Regional Planning Council's in-depth work in assessing vulnerability, risks, and defining adaptation actions.

The difficulty in making a dollars and cents case to spur adaptation implementation action is not unique to Thurston County. The work done here to quantify costs and benefits of water conservation measures will help inform jurisdictions across the country.

Work to be completed, methodology used, data sets, and approximate cost:

Study Area: Thurston County, including the cities of Olympia, Lacey, Tumwater, Yelm, Tenino, Rainier, the town of Bucoda, and unincorporated Thurston County in Washington State.

Work to be completed: Building from the Thurston Climate Adaptation Plan, the project team will perform cost benefit analyses on specific water scarcity actions from the adaptation plan. Then the team will convene two ratepayer focus groups and two utility and elected officials focus groups to assess how the presentation of cost benefit analysis results influences the willingness of ratepayers and decisions makers to invest in water conservation actions.

TRPC and CIG will start by identifying the drinking-water related actions from the Thurston Climate Adaptation Plan. Then using the vulnerability and risk assessments already completed and CIGs vast experience in analyzing climate actions, the project team will characterize the level of adaptation benefit associated with each action from the plan.

Working from the vulnerability assessment, the project team will quantify the costs of inaction through 2050, the costs of adaptation actions, and the benefits of conservation measures identified in the adaptation plan. This will consider identified risks such as increased utility operation costs to drill deeper wells, increased ratepayer costs with decreased supply and increased demand, and increased cost with needing to move water greater distances. In developing the cost benefit analysis, the team will use information from a Water Research Foundation project previously funded by NOAA under the SARP grant, *Drought Management in a Changing Climate: Using Cost-Benefit Analyses to Assist Drinking Water Utilities.*[3] That NOAA funded work provides excellent information on the methodology for conducting CBA in relation to long-term water utility costs, such as the importance of looking at costs and benefits from multiple perspectives: the ratepayers, utility and elected officials, and society as a whole. However, the Water Research Foundation work acknowledged that a critical next step is to take their findings and apply them to an actual CBA at the local scale, which was not done in their work. This proposed project would conduct that real-world analysis and fill that important knowledge gap.

Since the intent of CBA is to influence decision makers to act, the project team believes it is also important to test whether providing information on costs and benefits actually influences willingness of key actors to support climate adaptation in this area. There are two key societal perspectives on this issue – water ratepayers and local decision makers. The project team will convene two groups of ratepayers and two groups of local decision makers. One of the ratepayer and local decision makers groups will be presented the climate vulnerability, risk, and adaptation action information. The other two groups will be presented that same adaptation plan information and will also be presented with the CBA results. Then all four groups will discuss their motivation to act and the effectiveness of the information to communicate the need to act. We would expect both the ratepayer and local decision makers groups presented with the CBA results to be more motivated to take action.

The project team will draft a final report detailing the study's scope, methodology, findings, and conclusions.

Timeframe: October 2017 to September 2018.

Approximate cost: $160,000

Relevance to the Competition that is being Targeted: This project directly relates to drought-related climate response action. It builds from and expands on work previously funded by NOAA under this grant and the results will help to inform utilities and decision-makers across the country. It also helps deepen the partnerships among the Thurston Regional Planning Council, researchers at University of Washington, including CIG, and NOAA.

[3] Blue, J., R.A. Krop, N. Hiremath, C. Gillette, J. Rooke, C.L. Knutson, and K. Smith. 2015. *Drought Management in a Changing Climate: Using Cost-Benefit Analyses to Assist Drinking Water Utilities.* Water Research Foundation. Sponsored by NOAA Climate Program Office's Sectoral Applications Research Program (NOAA/CPO/SARP).