Piloting Utility Modeling Applications:

Planning for Climate Change at the Portland Water Bureau

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Director, Resource Protection and Planning

PUMA Workshop, Boulder, CO

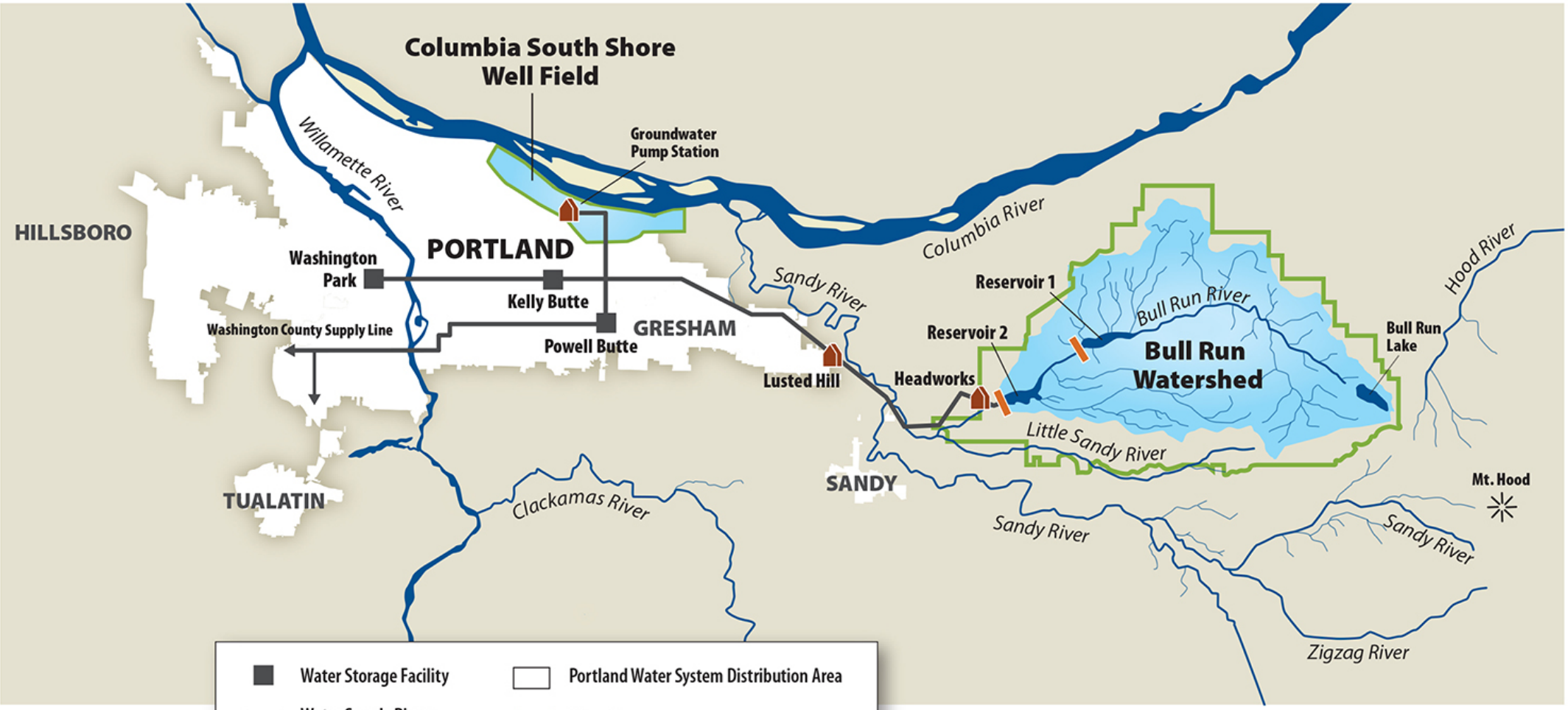
May 2, 2016

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

OVERVIEW

1. Background on Portland System and Climate Work
2. Hydrologic Model and GCM Downscaling
3. What We Learned from PUMA

Portland's Water System



Portland's Water System


Portland Groundwater Pump Station

Climate Impacts

The Impacts of Climate Change on Portland's Water Supply:

An Investigation of Potential Hydrologic and Management Impacts on the Bull Run System

Dr. Richard N. Palmer and Margaret Hahn
Department of Civil and Environmental Engineering
University of Washington
Box 352700
Seattle WA 98195-2700

For

Portland Water Bureau
January 2002

2002 Study by Richard Palmer and Margaret Hahn, University of Washington

Climate Impacts: Drawdown, Turbidity, Fire

Climate Impacts:
Water Quality & Temperature

Climate Impacts:
Extreme Events Affecting Assets & Infrastructure

PUMA project at PWB

PWB Needs:
Build Internal Expertise & Capacity

PWB Needs:
Strong Climate Science Partnerships

CIRC
Climate Impacts Research Consortium
A NOAA RISA TEAM

OSU
Oregon State
UNIVERSITY

OCCRI

University of Idaho

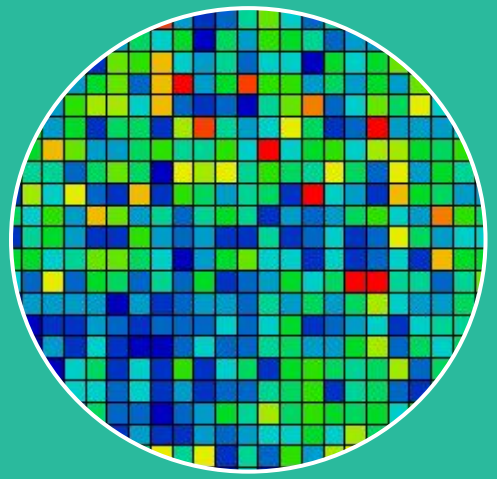
NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

RISA
Regional Integrated Sciences and Assessments

UNIVERSITY of WASHINGTON

PUMA:
Customized tools for climate impacts analysis

Develop a hydrologic model for BR

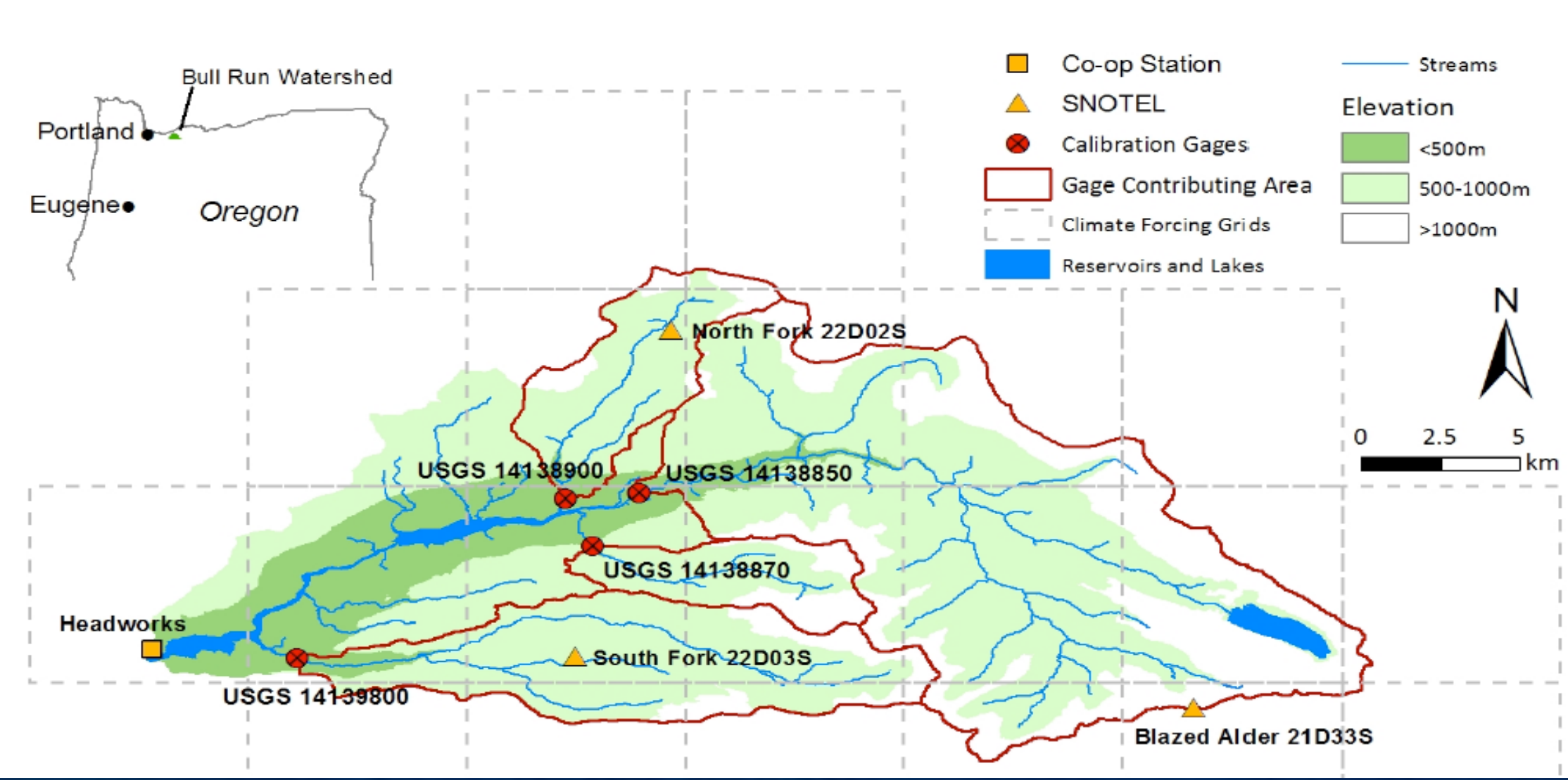


Downscale climate data to BR

Build institutional expertise

Co-production & actionable science

PUMA:
Customized tools for climate impacts analysis



Transition to UW Hydrologic Modeling
&
CIRC Model Evaluation and Downscaling

PUMA:
PWB Lessons Learned

1. Recognize & share water system expertise with science partners

2. Learn from science partners about process of developing tools, and what tools and data can and cannot do

3. Existing historical datasets don't always capture local observed conditions and may need to be customized for local water system dynamics

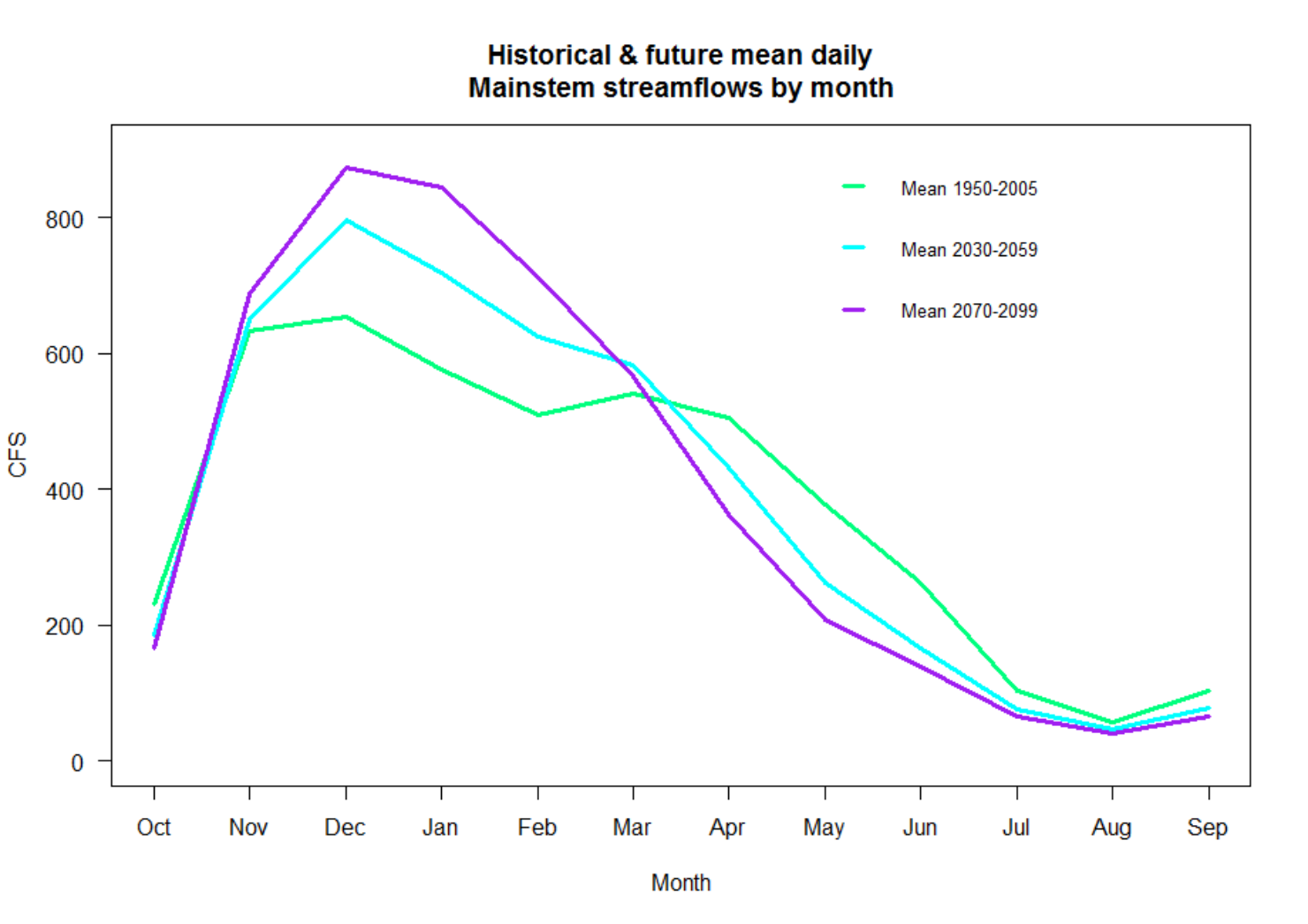
PUMA:
PWB Lessons Learned

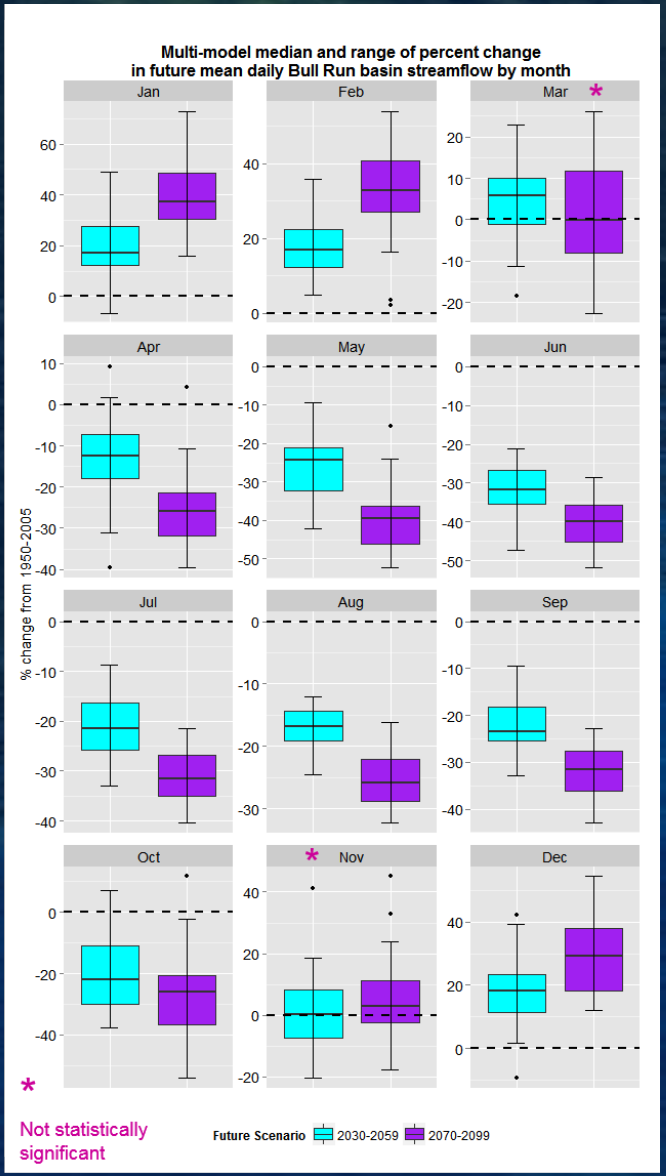
4. Important to generate internal support and trust in using modeling tools

5. Don’t need overly complex or costly model, but need it to be user-friendly and tested in previous climate change studies

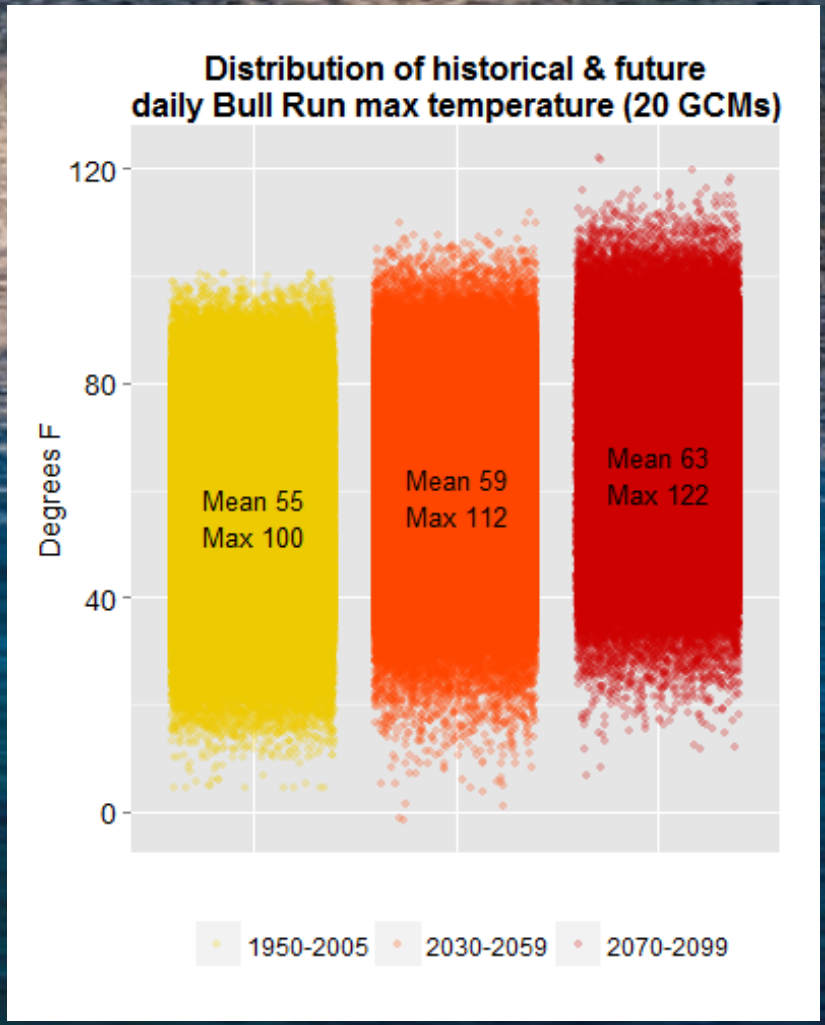
6. Ongoing advice and support from science partners (CIRC) is *invaluable* to users like PWB

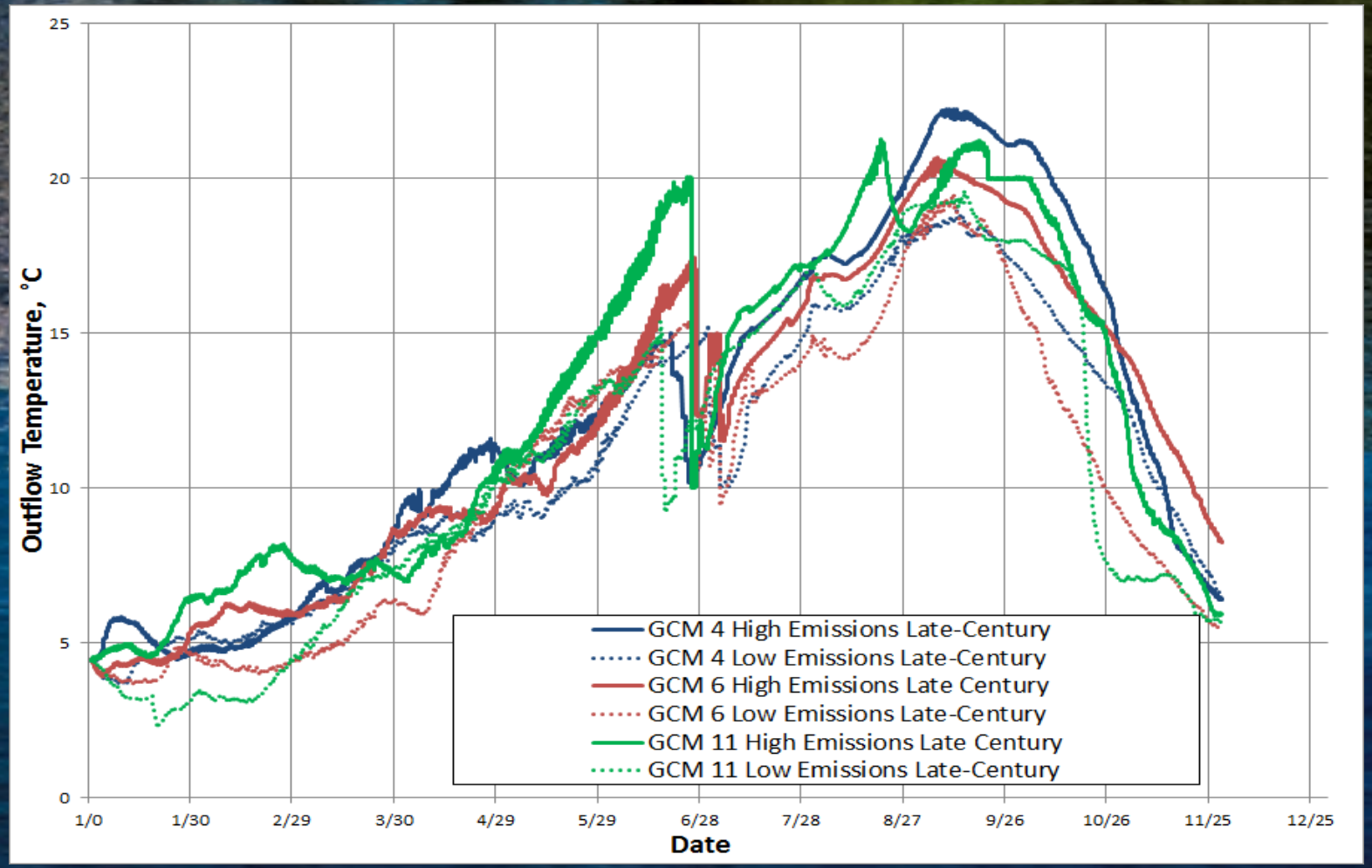
Applications:
Long-term Supply Planning





Applications:
Water Quality & Stream Temperature





Final Thoughts

- PWB is much better positioned to provide meaningful analysis of climate-related impacts to Portland's water system
- Using these tools requires somewhat of a cultural change at PWB, and we are only in the earliest stages of educating our peers and colleagues about the benefits and the need to acknowledge future uncertainties
- Working with WUCA and climate scientists is moving us from traditional (linear) planning approaches to a new frontier in planning – both interesting and challenging

Questions?

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https://www.portlandoregon.gov/water/climatechange

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