

“Toward a Well Adapted Future in Puget Sound:
A Symposium on Climate Change Adaptation and the Law”

January 21, 2011
Seattle, WA

Climate Adaptation at Seattle Public Utilities

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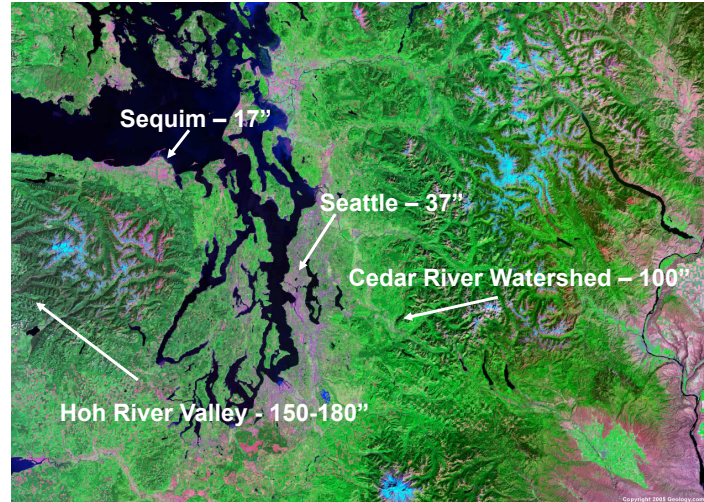
The logo for Seattle Public Utilities, featuring a stylized blue wave graphic above the text "Seattle Public Utilities".

Outline

- Seattle context
- SPU's Climate Program
- US Water Sector adaptation Initiatives
- Federal adaptation initiatives
- Conclusion

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Hydrologic and Physical Context



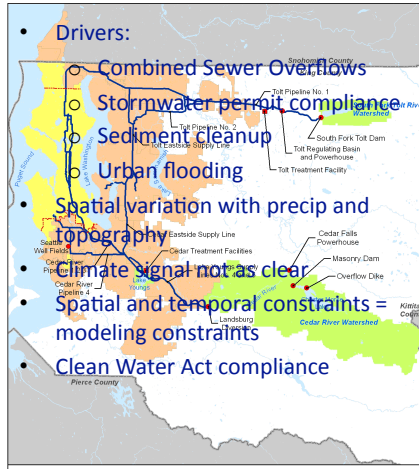
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Operating Context

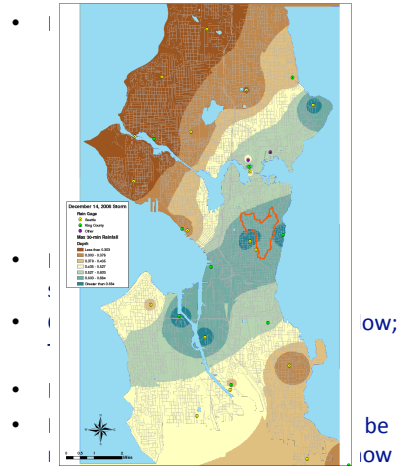
- Seattle Public Utilities
 - Department of City of Seattle
 - Part of Executive Branch
 - Budget/rates approved by City Council
 - Federal statutory requirements
- Four key services
 - water supply
 - drainage/wastewater
 - solid waste
 - environmental services
- Rate-based, enterprise funds

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Seattle's Water Supply and Drainage/ Wastewater Systems



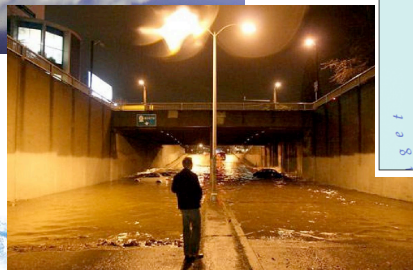
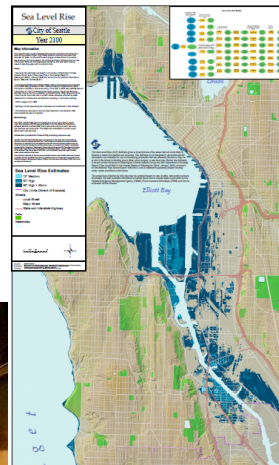
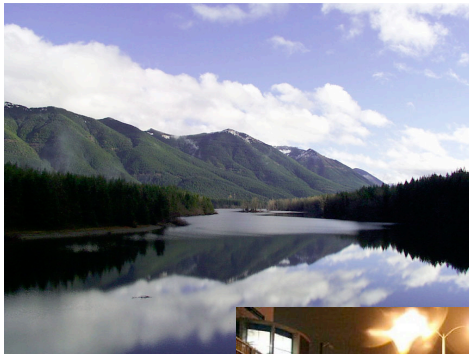
- Drivers:
 - Combined Sewer Overflows
 - Stormwater permit compliance
 - Sediment cleanup
 - Urban flooding
- Spatial variation with precip and topography
- Climate signal not as clear
- Spatial and temporal constraints = modeling constraints
- Clean Water Act compliance

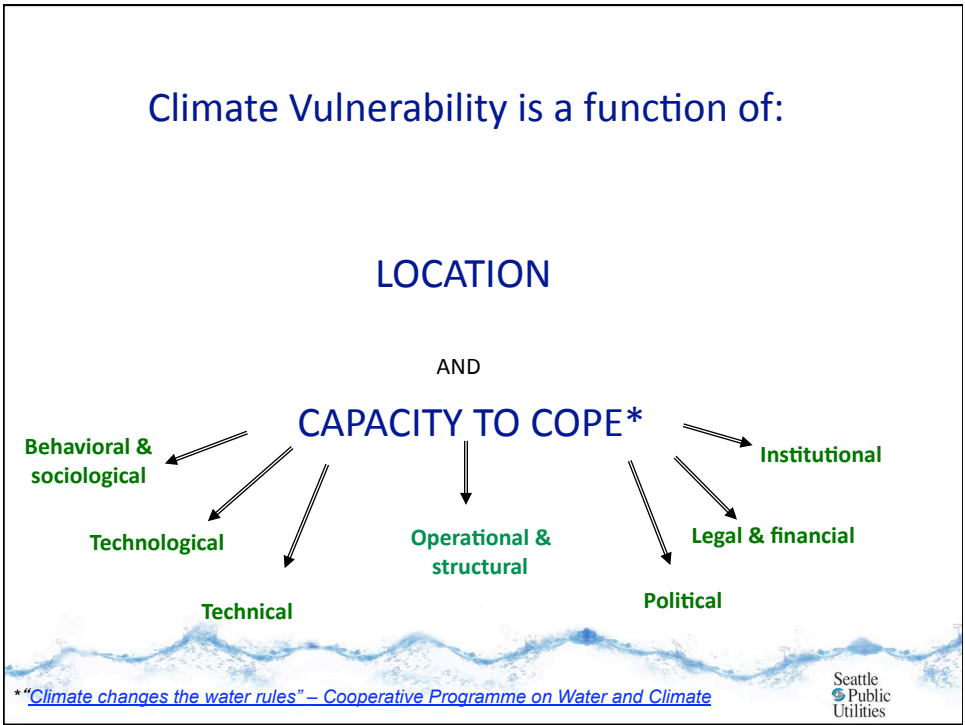


SPU's Approach to Adaptation

- Assess impacts
- Pursue “no regrets” options in multiple realms
- Enhance knowledge
- Build internal capacity
- Collaborate
- Establish strategic partnerships

Areas of Interest





Adaptation in Multiple Realms

- *Used cost-benefit analysis "to evaluate a selection of feasible and applicable measures to adapt to the expected risk - spanning infrastructural, technological, behavioral and financial solutions."**

*The Economics of Climate Adaptation Working Group

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Seattle's Water Supply Outlook

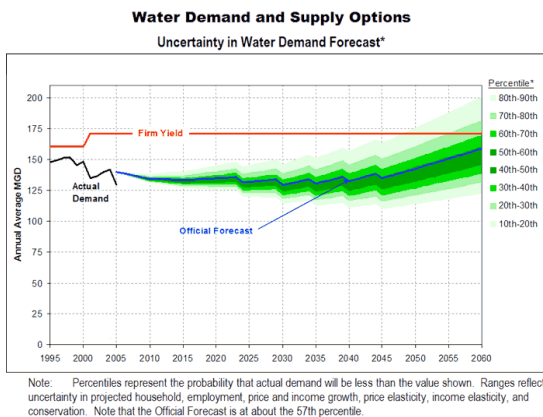
Average Daily Demand:

2009: 130 mgd

2060: 159 mgd

Available Supply:

171 mgd can be diverted
after meeting instream
flows



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Assessing Impacts

Statistical Downscaling – Water Supply

- 2002-2006: SPU-funded project with UW Climate Impacts Group (UW CIG)
- 2006-2008: Regional study with UW CIG
- 2010-2011: Piloting Utility Modeling Applications (NYC, Portland, SF, Seattle and Tampa)

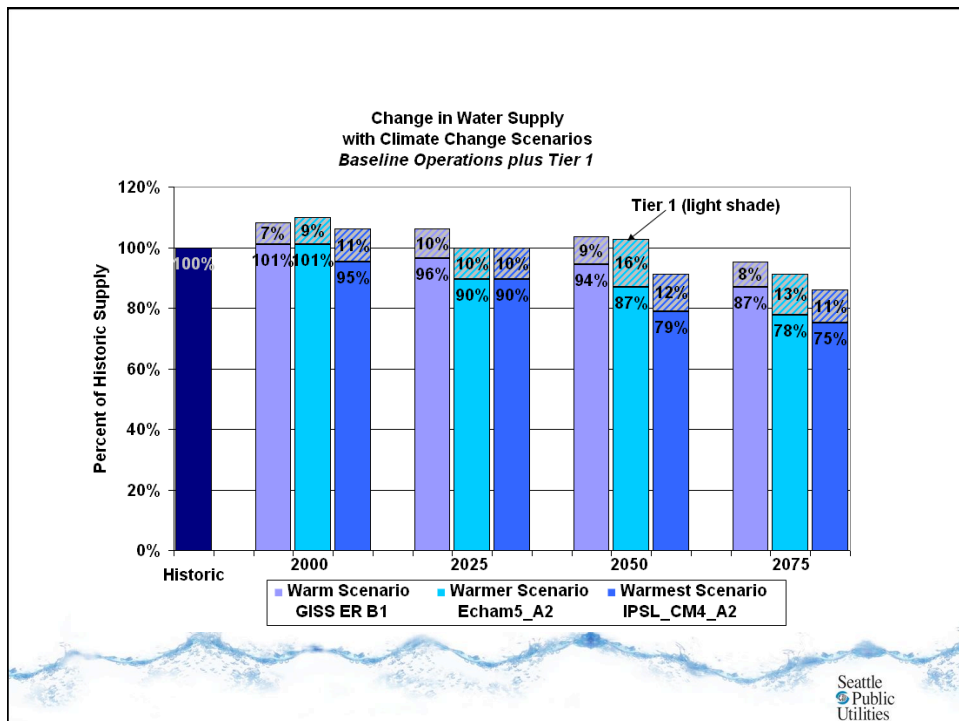
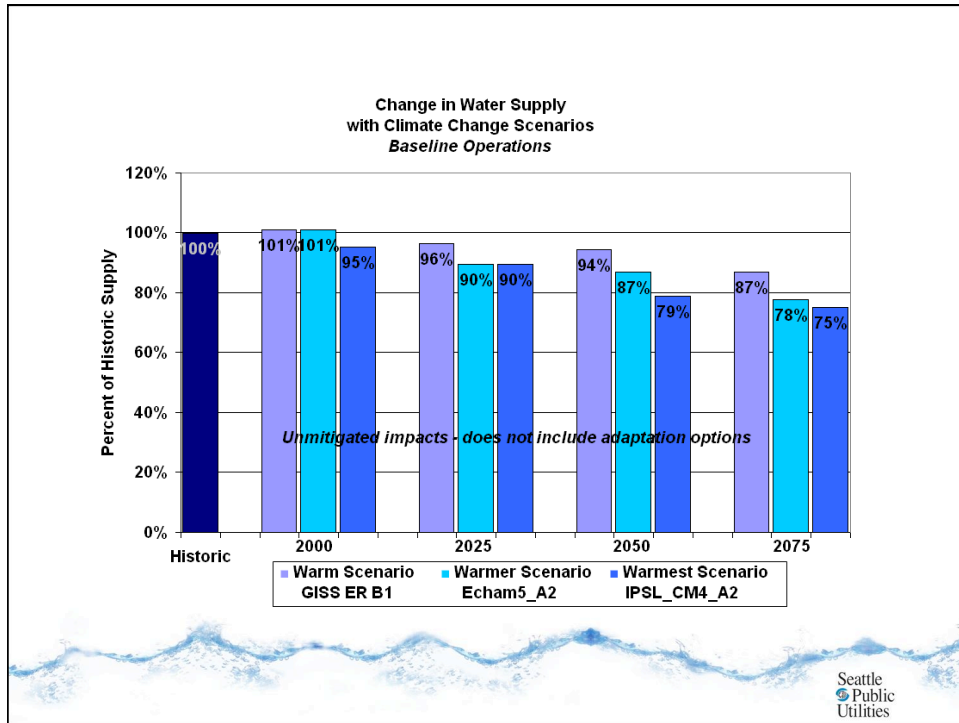
Dynamical Downscaling – Urban Drainage

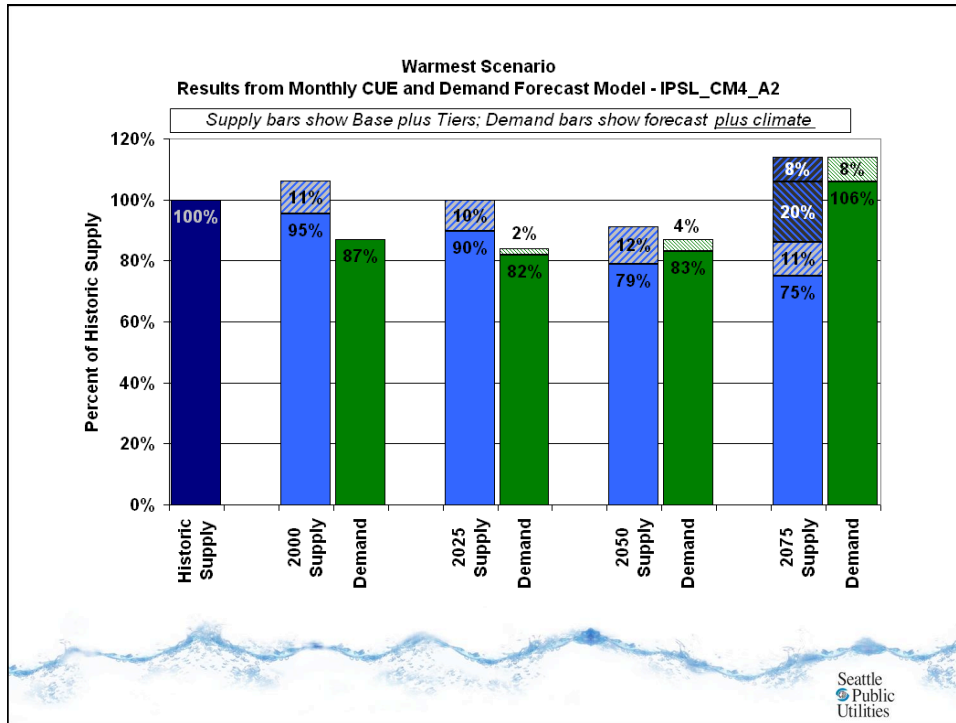
- 2008: UW CIG study for State of Washington

Sea Level Rise Mapping

- Created layers in GIS
- Map inundation, hydraulic grade line

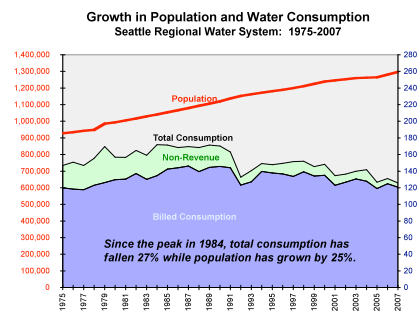
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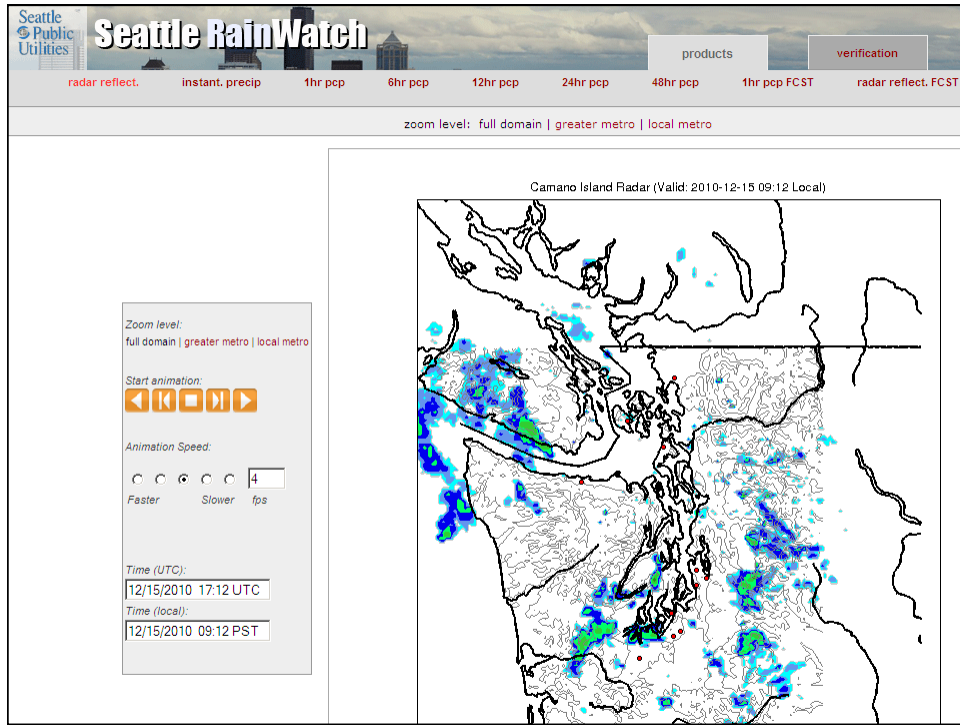




Water Conservation

- Since mid 80's population and consumption decoupled
- Historic savings of 44 mgd
- Committed to 15 mgd through 2030
- Delayed impacts of climate change



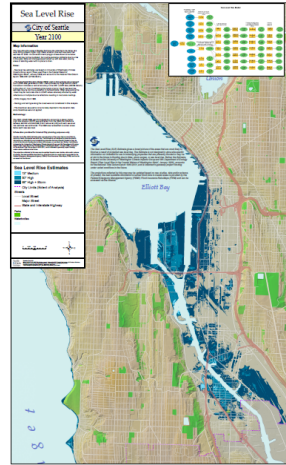


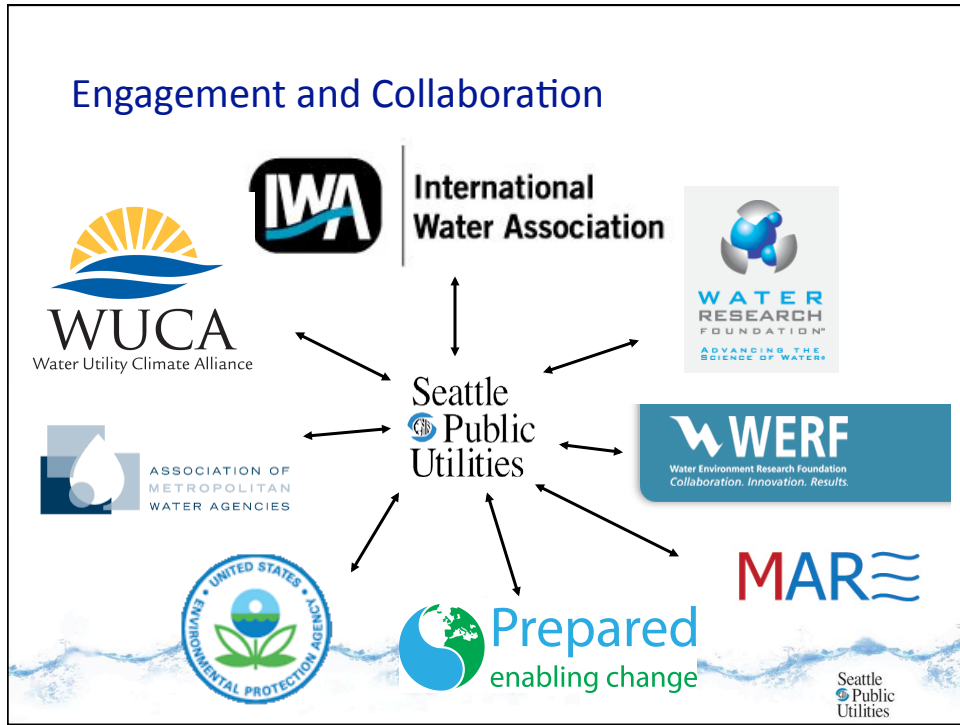
Urban Drainage and Sea Level Rise

**Seattle Public Utilities
Urban Drainage and Adaptation Workshop**

Agenda:

- Participants
- Agenda
- Speaker Bios
- 2010 Climate Change Adaptation Urban Watershed Framework
- City Proceedings
- City 1 Breakout Sessions
- City 2 Proceedings
- City 2 Breakout Sessions
- Presentations





Water Utility Climate Alliance (WUCA)

- federal climate research
 - user and shaper
- federal legislation
- federal agency initiatives
- climate modeling
- decision support
- learning alliance

Southern NV Water Authority
Tampa Bay Water

*Wucaonline.org/html/actions.html

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Piloting Utility Modeling Applications (PUMA)

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 Seattle Public Utilities
 Portland Water Bureau
 Climate Decision Support Consortium

PORTLAND WATER BUREAU
 FROM FOREST TO FAUCET

SFPUC
 WATER WASTEWATER POWER

SF Public Utilities Commission
 CA-NV Applications Program

NYC
 Environmental Protection

NYC Dept Env Protection Consortium on Climate Risk in the Urban NE

TAMPA BAY WATER

Tampa Bay Water SE Climate Consortium

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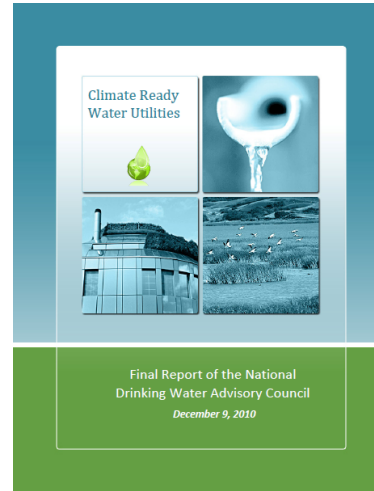
Water Sector Research

- 4239 - **Climate Change Impacts on the Regulatory Landscape: Evaluating Opportunities for Regulatory Change**
- 4262 - Vulnerability Assessment and Risk Management Tools for Climate Change: Assessing Potential Impacts and Identifying Adaptation Options
- 4263 - Analysis of Changes in Water Use Under Regional Climate Change Scenarios
- 4264 - Changing Mindsets to Promote Design of Sustainable Infrastructure
- 4306 - Analysis of Reservoir Operations under Climate Change



EPA's Climate Ready Water Utilities Working Group

- Varying capacity in water sector
- Adaptive learning and management framework
- Expanded concept of infrastructure
- Water specific research
- Sector interdependencies
- Implications of “stationarity is dead” on regulatory community



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National Climate Assessment

- Synthesizes relevant science and information
- Increases understanding of what is known and not known
- Identifies information needs related to preparing for climate variability and change, and reducing climate impacts and vulnerability
- Evaluates progress of adaptation and mitigation activities
- Informs science priorities
- Builds assessment capacity in regions and sectors



<http://www.globalchange.gov/what-we-do/assessment>

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Wrap Up and Conclusions

- Adaptation is a core utility responsibility
- Requires engagement in multiple spheres, adaptation in multiple realms
- Knowledge enhancement, capacity building
- “Co-production of knowledge”
- Collaborative networks
- The importance of “T”



Thank You