MEETING SUMMARY – Call #1
Water Resources and Quality (Freshwater) Preparation/Adaptation Work Group
Water PAWG
June 29, 2007, 10AM-12PM

ATTENDENCE

1. **Water PAWG Members:**
   a. Tom Laurie, WA Dept of Ecology (Lead)
   b. Mo McBroom, WA Env Council (for Rod Brown)
   c. Jon Culp, WA State Conservation Commission (for Mark Clark)
   d. Ginny Stern, WA Dept of Health (for Denise Clifford)
   e. Michael Garrity, American Rivers
   f. Dave Monthie, King County
   g. Tom Myrum, WA State Water Resources Assoc.
   h. Alan Hamlet, Climate Impacts Group, UW
   i. Lara Whitely Binder, CIG UW
   j. Carl Samuelson, WA Dept of Fish and Wildlife
   k. Jane Banyard, WA DFW
   l. James Schroeder, National Wildlife Federation
   m. John Stuhlmiller, WA Farm Bureau
   n. Mike Petersen, The Lands Council
   o. Tom Ring, Yakama Nation Water Program
   p. Denise Clifford, WA Dept of Health

2. **Agency and Staff Support:**
   a. Janice Adair, WA Ecology Liaison
   b. Hedia Adelsman, WA Ecology
   c. Kurt Unger, WA Ecology

3. **Other attendees:**
   a. Nancy Tosta, Ross & Associates Environmental Consulting, Ltd.
   b. Kristen Durance, Ross & Associates Environmental Consulting, Ltd.

BACKGROUND DOCUMENTS:

1. Agenda: http://www.ecy.wa.gov/climatechange/PAWGdocs/wr/062907WRagenda.pdf
2. PowerPoint presentation: http://www.ecy.wa.gov/climatechange/PAWGdocs/wr/062907WRpresentation.pdf
3. Summary of Call June 29th: http://www.ecy.wa.gov/climatechange/cat_pawg_wr.htm

DISCUSSION AND KEY ISSUES:

1. **Janice Adair and Tom Laurie welcomed the group and thanked members** for participating. Janice indicated the timeline for the PAWG's work:

a. Full report due to Governor by Feb 08 – need PAWG input by Dec 14, 2007
b. Legislative and budget needs should be identified generally by Oct 07

2. **Hedia Adelsman provided an overview of the context of the group** relative to other PAWGs, the Climate Advisory Team (CAT), and the Technical Working Groups (TWGs). She emphasized that the PAWG should focus on what is practical and feasible and build on work that has already been done. The PAWGs are responsible for generating specific recommendations, one of which could be that work of the PAWGs needs to continue.

3. **Tom Laurie emphasized the main components of the charge to the Water PAWG** as outlined below. Additionally, he noted that the scope of the PAWG includes: freshwater, in-stream flows, municipal water, industrial water, flooding/droughts, storm water, salmon recovery, stream temperatures, hydropower, and water supply.
   a. Identify key issues and vulnerabilities related to water resources.
   b. Identify 2-3 near-term priority adaptation strategies or next steps that can help the state integrate climate impacts in future decision-making. These strategies should identify barriers to implementation and the entities that need to be involved (e.g., state agencies and others).
   c. Identify critical information needs for further examination.

4. **The Water PAWG members provided their initial thoughts on priority issue areas**:
   a. In stream flow and competing demands
   b. Regional water supply issues
   c. Salmon recovery plans
   d. Funding for conservation and storage
   e. Changes in water code to aid transfers as necessary
   f. Obstacles to including climate change adaptation in formal state processes
   g. Need for flexibility and an adaptive institutional system to rebalance needs for water based on changing climate
   h. Response to infrastructure needs (e.g., hatcheries & recreational lands)
   i. Snow levels and timing
   j. Cross-boundary supply issues (e.g., Idaho as source water)
   k. Changes in timing of supply and effects on hydrograph
   l. Means to restore natural storage mechanisms – e.g., meadows, wetlands, floodplains, dikes.

5. **Alan Hamlet gave an overview of CIG knowledge on current changes in climate**. (see slide presentation listed above)
   a. Regional average temperature changes are largest in Jan, Feb, Mar, Aug, and Sept. The night time temp in the PNW in January has risen at a rate of 4 degrees centigrade from 1916-2003. Temperature increases affect the amount of snow pack and timing of melt and stream flow.
      i. Mountain snow pack at many individual snow course stations in the Cascades (WA, OR) have declined in excess of 50% (in some cases 80%) over the last 50 years. Over the Cascades as whole about 30% decrease, with about 2/3 due to temp alone. (Mid-winter temperature is large determinant of snow pack trends due to observed warming.)

   ii. Stream flows show increases in March and decreases in June.
b. Models are an essential tool for 21st century planning – because past records are not representative of expected future conditions
   i. Mean temperature predictions for 2040 are shown to be well outside range of normal variability over the last century.
   ii. Precipitation predictions are within the range of natural variability, but uncertainty is significant.
c. Timing of stream flow is dependent on type of watershed – and variations in mid winter temperature associated with elevation and proximity to the coast:
   i. Snow-based will have dominant spring/summer flows (e.g., Columbia at Dalles)
   ii. Rain-dominated (e.g., Chehalis) will have max flows Nov-Mar.
   iii. Transient-rain (e.g., Cedar) – max flows in spring (Mar-June)
d. The volume of stream flow is affected by variations in precipitation.
e. There are natural epochs of climate variation (e.g., associated with the Pacific Decadal Oscillation and the El Nino Southern Oscillation) – that can significantly affect stream flow in the PNW. It was wetter in the PNW from 1947-1976 and has been drier since then. Natural variability plays a strong role in how systems evolve despite fact that it may be warmer overall. The PNW is expected to be warmer and wetter and warmer and dryer at different times in the future, with wet and dry episodes lasting for several decades. Variability may also change in unexpected ways.
f. Models are useful for translating or interpreting hydrologic impacts from climate (e.g., warmest locations that accumulate snow are most sensitive to warming)
g. Changes in climate are difficult to predict – and the future may be warm/wet with increased flooding or warm/dry with increased drought at different times. The ability to respond to either (with uncertain sequencing and duration) is needed.
h. Various water resources vulnerabilities include:
   i. Water supply and demand
   ii. Energy supply and demand
   iii. In stream flow
   iv. Flood control and land use planning
   v. Transboundary relationships
   vi. Water law and policies

6. **Tom Laurie and Nancy Tosta reviewed the processes for the Water PAWG** including that individuals are representing themselves and not an agency or group, alternates are allowed and are expected to stay current on the work of the PAWG, meetings will be open to the public, summary notes will be circulated prior to posting, the PAWG will have input on agendas, and the final report of the Water PAWG will go to the Directors of Ecology and Community, Trade, and Economic Development (CTED) and then to the Governor.

7. **Nancy Tosta described a potential approach for the Water PAWG based on developing scenarios.** Scenarios would start by examining the vulnerabilities (some of which were outlined by Alan above) and analyzing the variables that affect the

vulnerability, including climate change. This approach moves away from having to predict specific climate changes, estimate secondary effects, and determine actions needed to respond to those effects. Rather, it focuses on the vulnerable systems, developing an understanding of how they respond or are responsive to changes and considering how uncertain climate effects might place additional stress on the systems. This "analysis of vulnerabilities" approach provides a means to examine how the uncertainty of climate change might lead to certain adaptive strategies. Water PAWG members agreed this may be a reasonable approach and will discuss further at the next meeting. One specific issue/vulnerability that was re-emphasized was whether current institutional structures that address water can handle the kinds of decisions that will need to be made in the future – both in terms of timing and tradeoffs.

NEXT STEPS AND AGREEMENTS:

1. Review calendars and schedule a face-to-face meeting
2. Submit questions about the Water PAWG and its activities to Tom Laurie
3. Develop background materials for scenario discussion at next meeting (based on Ecology, CTED, CIG, and other information)
4. Develop notes from this meeting and a draft agenda for next meeting and circulate to Water PAWG for review prior to Web posting
5. Post additional reference materials (e.g., background whitepapers from the CIG) on the Website.
6. Develop a schedule for calls for next several months.

NEXT MEETING:

The Water PAWG will meet face-to-face on Monday, July 30, 2007 10AM-3PM.