

Mountain Pine Beetle Science Symposium: Impacts on the Hydrologic Cycle and Water Quality: What have we learned?



NOAA Dave Skaggs Research Center

Boulder, CO – April 25, 2011



About Western Water Assessment (WWA)



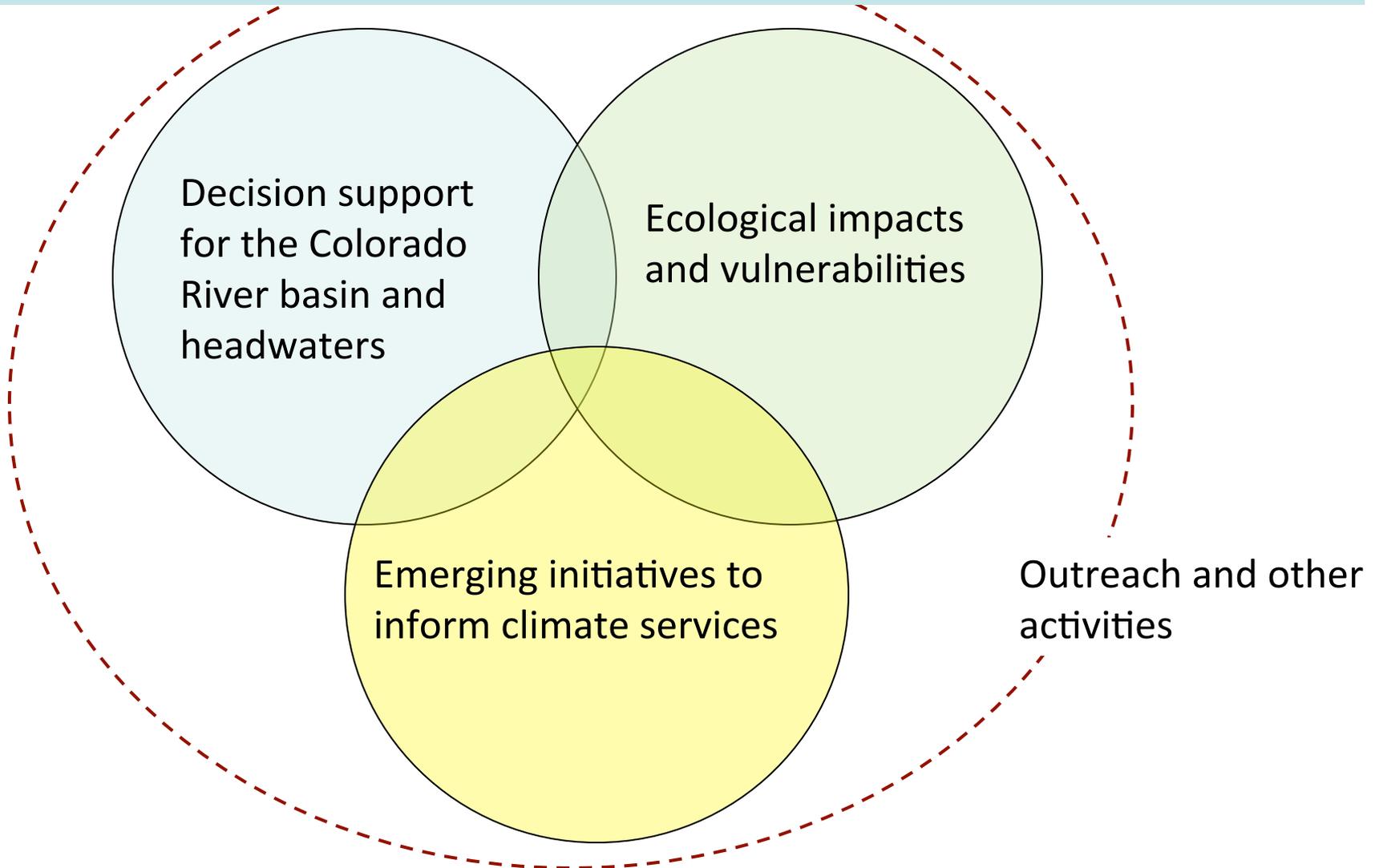
Colorado
University of Colorado at Boulder

We provide decision-support information to stakeholders who manage climate-sensitive resources in Colorado, Utah, Wyoming

- Joint CU-NOAA program, sponsored researchers from multiple disciplines assisted by 6 full-time staff
- We work directly with stakeholders to frame research questions and develop climate planning strategies
- Stakeholders/partners: Bureau of Reclamation, Denver Water, Colorado Water Conservation Board, US Forest Service, Bureau of Land Management, and many others

Western Water Assessment (WWA)

Three **research themes** for 2011 and beyond:



WWA Project: “Bark Beetles and Forest Change”

Goals and accomplishments:

- Outreach to connect WWA and water managers to other MPB stakeholders
- Hold meetings and symposia to bring together researchers and resource managers (Dec. 2009, Apr. 2010, today)
- Develop *Beetles, Water, Climate* web pages at WWA that serve as info clearinghouse on MPB-water-climate issues
- Write review paper on beetle impacts on hydrologic processes
- Identify opportunities for WWA researchers to pursue beetle/water/climate research

Apr. 2010 MPB-Water Science Symposium

50 participants, 13 presentations

Impact

Watershed and Regional Hydrologic Processes

Conclusions and Gaps

- Water managers are concerned about changes to snowmelt timing and peak flow levels
- Research has shown beetle attacks may advance snowmelt timing but magnitude is uncertain
- **No conclusive evidence of changes in peak flow or total water yield**
- Need ongoing monitoring to detect change and understand long-term impacts
- Further process modeling needed to better understand system sensitivities

Water Chemistry and Water Quality

- Evidence points to changes in water chemistry
- Possibility of increased nutrient levels
- **Nitrogen inputs do not seem to be elevated enough to concern water managers**
- Groundwater storage may delay evidence of impacts

Synthesis Report on MPB-Water Symposium



“No compelling evidence yet for runoff changes caused by the current MPB infestation”

“Initial results...do not indicate nutrient loading or other water chemistry changes of the magnitude that would present problems for either human water use or aquatic ecosystems”

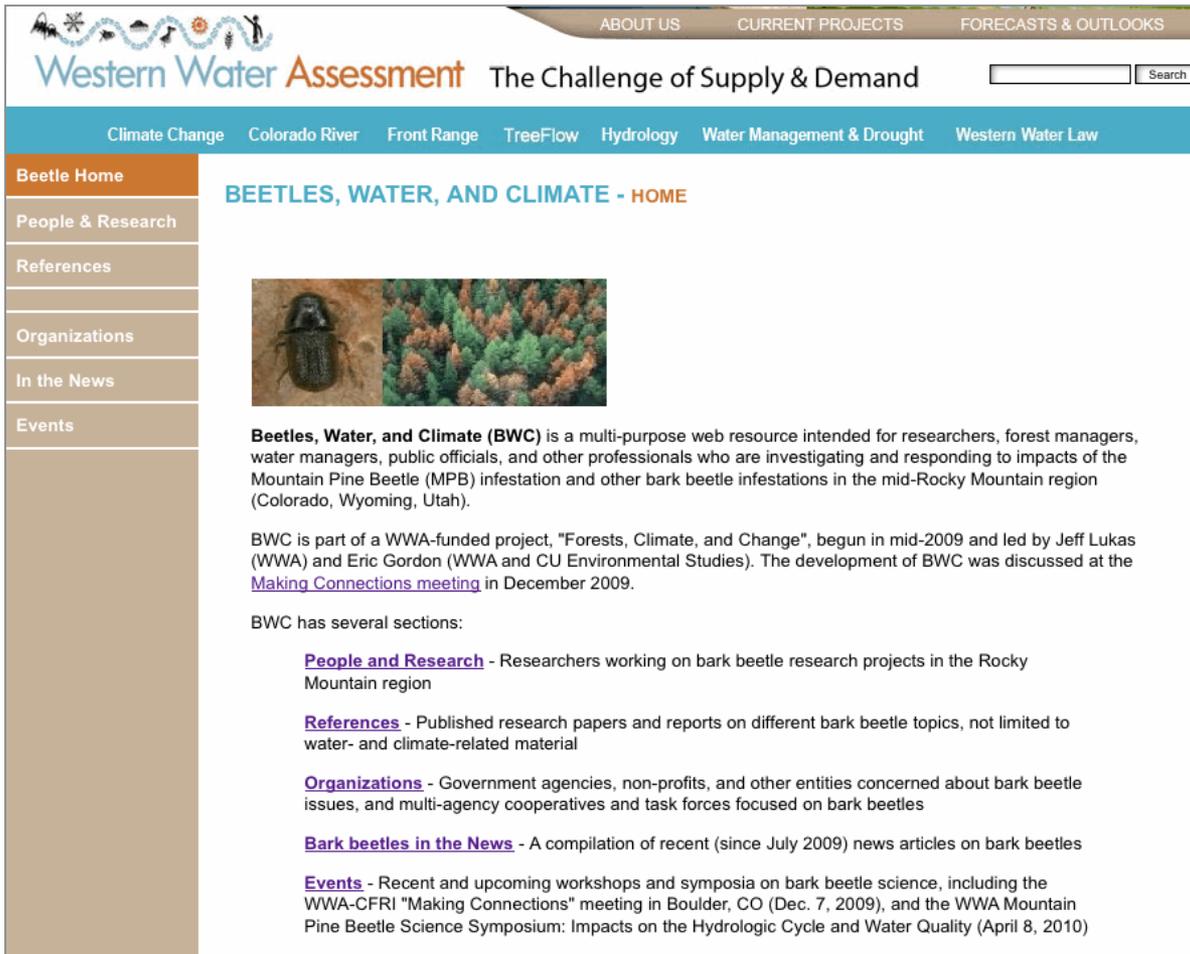
“Lurking in the background...is the prospect of dramatic changes in water quality...that would occur if a large and intense wildfire were to occur in an MPB-affected forest”

“Management practices...such as harvesting for fuels reduction, have the potential for greater effects on water yield and water quality than those caused by MPB alone, at least at the stand level”

Feature Article,
May 2010 IWCS
(Lukas and Gordon)

Beetles, Water, and Climate web pages

<http://wwa.colorado.edu/ecology/beetle/>



The screenshot shows the Western Water Assessment website. The header includes navigation links for 'ABOUT US', 'CURRENT PROJECTS', and 'FORECASTS & OUTLOOKS'. Below the header is a search bar and a secondary navigation bar with links for 'Climate Change', 'Colorado River', 'Front Range', 'TreeFlow', 'Hydrology', 'Water Management & Drought', and 'Western Water Law'. The main content area is titled 'BEETLES, WATER, AND CLIMATE - HOME' and features a sidebar on the left with links to 'Beetle Home', 'People & Research', 'References', 'Organizations', 'In the News', and 'Events'. The main text describes the 'Beetles, Water, and Climate (BWC)' resource, its purpose, and its sections: 'People and Research', 'References', 'Organizations', 'Bark beetles in the News', and 'Events'. An image of a beetle and a forest is also visible.

Beetles, Water, and Climate (BWC) is a multi-purpose web resource intended for researchers, forest managers, water managers, public officials, and other professionals who are investigating and responding to impacts of the Mountain Pine Beetle (MPB) infestation and other bark beetle infestations in the mid-Rocky Mountain region (Colorado, Wyoming, Utah).

BWC is part of a WWA-funded project, "Forests, Climate, and Change", begun in mid-2009 and led by Jeff Lukas (WWA) and Eric Gordon (WWA and CU Environmental Studies). The development of BWC was discussed at the [Making Connections meeting](#) in December 2009.

BWC has several sections:

- People and Research** - Researchers working on bark beetle research projects in the Rocky Mountain region
- References** - Published research papers and reports on different bark beetle topics, not limited to water- and climate-related material
- Organizations** - Government agencies, non-profits, and other entities concerned about bark beetle issues, and multi-agency cooperatives and task forces focused on bark beetles
- Bark beetles in the News** - A compilation of recent (since July 2009) news articles on bark beetles
- Events** - Recent and upcoming workshops and symposia on bark beetle science, including the WWA-CFRI "Making Connections" meeting in Boulder, CO (Dec. 7, 2009), and the WWA Mountain Pine Beetle Science Symposium: Impacts on the Hydrologic Cycle and Water Quality (April 8, 2010)

Sections:

- People & Research
- References
- Organizations
- Events
- *Today's program and abstracts*

Goals for the day...

- Share the latest research findings on MPB-water impacts—what *have* we learned in the past year?
- Identify gaps in the research and inconsistencies in the results
- Discuss how the science could be made more responsive and applicable to stakeholder needs, in particular, streamflow forecasting
- Provide opportunities for networking and research coordination

Agenda

What is the status of the MPB infestation in CO?

2010 CSFS flight survey

Red = 2008-10 MPB activity

Yellow/Orange = pre-2008 MPB activity

