

# Science

## BRIEFING

January 7, 2014

# WATERSHED VULNERABILITY ASSESSMENT

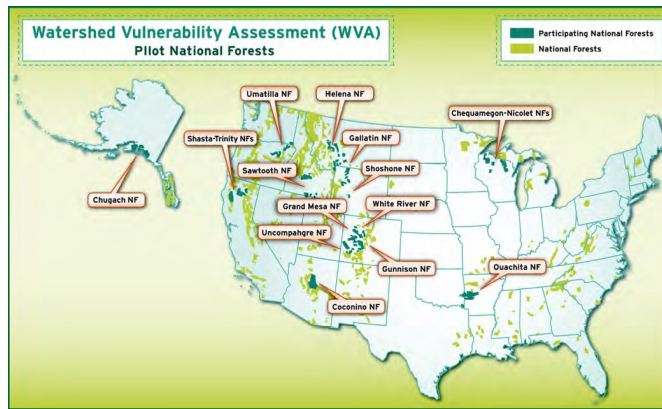
## BACKGROUND

Existing models and predictions project serious changes to worldwide hydrologic processes as a result of global climate change. Projections indicate that significant change may threaten National Forest System watersheds that are an important source of water used to support people, economies, and ecosystems.

## RESEARCH

**Research Activity:** A pilot Watershed Vulnerability Assessment (WVA) approach was developed and implemented to evaluate the relative vulnerability of watersheds to potential changes associated with a warming climate. Each of the eleven participating national forests identified water resources important in that area, determined local exposure to climate change, and assessed watershed sensitivity. The assessments provided management recommendations to anticipate and respond to projected climate-hydrologic changes. Completed assessments differed in level of detail, but each identified priority areas and management actions to maintain watershed resilience in response to a changing climate.

**Benefits to Resource Managers:** Wildland managers are expected to anticipate and respond to these threats, adjusting management priorities and actions. Because watersheds differ greatly in: (1) the values they support, (2) their exposure to climatic changes, and (3) their sensitivity to climatic changes, understanding these differences will help inform the setting of priorities and selection of management approaches. Drawing distinctions in climate change vulnerability among watersheds on a national forest or grassland allows more efficient and effective allocation of resources and better land and watershed stewardship.



Eleven national forests throughout the U.S., representing each of the nine Forest Service regions, conducted assessments of potential hydrologic change resulting from ongoing and expected climate warming.



The primary objective for Sawtooth N.F. was to determine what influence climate change will have on threatened bull trout populations. The vulnerability rating resulting from this process (i.e. the extinction risk for bull trout) predicted bull trout persistence in subwatersheds by 2040.

## KEY FINDINGS

- Climate models predict substantial changes to worldwide temperatures and hydrologic processes throughout the 21st century. These effects pose significant challenges to the Forest Service and other land managers.
- Many managers may have limited experience applying large-scale climate change information at the local-scale. This has led to uncertainties about likely impacts and appropriate responses.
- The pilot WVA project provides a useful, locally based assessment of water resource vulnerability to the impacts of climate change.
- Assessing vulnerability is the essential first step in adapting to climate change, and this information provides a basis for managers to target investment of limited resources.

## MORE INFORMATION

[www.fs.usda.gov/pnw/pubs/pnw\\_gtr884.pdf](http://www.fs.usda.gov/pnw/pubs/pnw_gtr884.pdf)  
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