



March 2009 • U.S. Department of Agriculture • **Forest Service** • Office of Communication Contact: Robert Westover 202-205-1777

## Briefing Paper

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*“Climate change makes droughts worse, causing worse insect outbreaks and worse fires, which in turn means more smoke and carbon in the atmosphere—and more climate change. This cycle threatens the capacity of our forests to provide all kinds of environmental services that people have come to expect, including clean air and water, habitat for fish and wildlife, and opportunities for hunting, fishing, skiing, and other kinds of outdoor recreation.”*

—**Forest Service Chief Gail Kimbell**

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### **We are already seeing the effects of climate change on our forests:**

- Fires are a natural part of forested landscapes, but each year the fire season is coming earlier and ending later. In addition, the fires themselves are burning hotter. Fires have become more damaging and dangerous.
- Insects are also a natural part of forested landscapes, but now the insects—both the native ones and the invaders—are spreading more rapidly. The winter cold isn't knocking some populations back. Epidemics are larger and last longer, killing more trees and increasing fire risk.
- The warmer winters are also affecting our water supplies. The snowpacks are thinner and they melt earlier in spring, so the water runs out from the forest earlier in summer. Extended droughts make trees more vulnerable to fire and insects.

### **If warming continues as anticipated over the next 30 years:**

- The number and severity of large wildfires are likely to increase.
- The range and frequency of large insect outbreaks are likely to increase.
- Hurricanes and ice storms are likely to increase. Storm damage can reduce forest productivity and carbon storage.

### **What is the Forest Service doing about climate change?**

- The Forest Service has developed the *Strategic Framework for Responding to Climate Change* to help us set priorities and to make informed decisions for sustaining forest and grassland resources in a changing environment.
- The framework envisions a future where ecosystem services are sustained; forests and grasslands are adapting successfully to changing climate; and management actions contribute to mitigating impacts of climate change.



**America's researchers and land managers are working to help America's ecosystems adapt to climate change by:**

- Actively managing the national forests and grasslands to improve ecosystem health; sequester more carbon; and be more resilient to stresses such as drought, air pollution, and invasive insects and diseases.
- Improving our ability to detect and model the impacts of climate change on plants and animals and on water quality and availability.
- Better understanding ecosystem vulnerability and finding ways to increase ecosystem resilience.
- Preventing and reducing such barriers to species migration as forest fragmentation.
- Restoring ecosystems where necessary after large-scale disturbances.
- Considering realignments of seed zones and planting methods.

**America's forests could potentially offset a portion of America's annual carbon emissions through partnerships and management measures, including:**

- Encouraging and assisting private landowners to preserve forests and other ecosystems that store carbon.
- Encouraging private landowners to actively manage their forest lands to improve ecosystem health, creating forests more resilient to stresses such as drought and more efficient at storing carbon.
- Supporting the development of markets for carbon offsets created by sound forest management.
- Finding new ways to use small-diameter woody biomass in wood products that can store carbon.
- Finding ways to use woody biomass to heat homes, generate electricity, and power cars through cellulosic ethanol.
- Promoting tree growth in urban areas to take up carbon and to provide shade and greenery.

For specific facts and references, see *Climate Change Quick Facts*.

***Forest Service Mission***  
*Sustain the health, diversity, and productivity*  
*of the Nation's forests and grasslands*  
*to met the needs of present and future generations.*

