Pacific Northwest forests could store more carbon, help address greenhouse issues

July 2 2009

The forests of the Pacific Northwest hold significant potential to increase carbon storage and help mitigate greenhouse gas emissions in coming years, a recent study concludes, if they are managed primarily for that purpose through timber harvest reductions and increased rotation ages.

In the complete absence of stand-replacing disturbances - via fire or timber harvest - forests of Oregon and Northern California could theoretically almost double their carbon storage.

Although it isn't realistic to expect an absence of disturbance, the estimates were based on average conditions up until now that include variation in forest biomass, age, climate, disturbances and soil fertility. If all forest stands in this region were just allowed to increase in age by 50 years, their potential to store atmospheric carbon would still increase by 15 percent, the study concluded.

That would be a modest, but not insignificant offset to the nation's carbon budget, scientists say, since this region accounts for 14 percent of the live biomass in the entire United States.

The findings were made by scientists in the College of Forestry at Oregon State University, as the result of almost two decades of analysis of 15,000 inventory plots in a large region, through several different projects, as part of the North American Carbon Program. The scientists, who said they have often been asked what the theoretical potential was

for storing carbon in these forests, conducted the analysis using inventory data that captured current variation in biomass due to many factors.

"We have known that forests in this region have high productivity, and in recent years we have learned they have a high potential to store large amounts of carbon even at very old ages," said Beverly Law, a professor of forest science at OSU. "The forests west of the Cascade Range are also wetter and less likely to be lost to fire. We suspected these forests might provide more opportunity for carbon storage than has been recognized, and these data support that."

Many economic, ecological and land management issues come into play, the researchers said, and the recent study does not consider what effect increases in temperature or changes in precipitation might have on these lands, or the implications that might have for catastrophic forest fire. But looked at from nothing more than a carbon offset perspective, the optimal approach would be to leave the forests alone, the scientists said.

"Increasing carbon storage in this region might be one contribution to what clearly is a much larger global issue, something that policy makers could consider," Law said. "A lot of land management approaches are now being seen as a short-term bridge to a period where we will be using fewer fossil fuels and addressing carbon issues in other ways."

Largely because of its many forests, researchers say the various "carbon sinks" in Oregon already sequester from 30-50 percent of the emissions caused by use of fossil fuels in the state. That's much better than many other states or the national totals, Law said.

Among the findings of the report:

- About 65 percent of the live and dead biomass in this region is on public lands, while private lands often have younger age classes of vegetation and less total biomass;

- Contrary to accepted views on biomass stabilization and decline, biomass is still increasing in stands more than 300 years old in the Coast Range, Sierra Nevada and the West Cascade Range, and in stands more than 600 years old in the Klamath Mountains;

- The entire study region of Oregon and Northern California, as far south as San Francisco, holds a total live biomass of about two billion tons of carbon - about 14 percent of the biomass in the whole nation;

- If forests in this region were managed over hundreds of years to maximize carbon sequestration, the carbon in live and dead biomass could theoretically double in the Coast Range, west and east Cascade Range and Sierra Nevada; and triple in the Klamath Mountains.

Source: Oregon State University (news : web)