



Union of Concerned Scientists
Citizens and Scientists for Environmental Solutions



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Scientific Paper: Human Land-Use Drives Climate Change at Local, Regional and Global Scales

Authors Say Reducing Emissions, Improving Land-Use Practices Are Both Essential to Slowing Climate Change

WASHINGTON, July 9 – A study by 19 scientists from government, universities and other institutions finds that deforestation, urban sprawl, agriculture and other human influences on landscapes contribute to climate change on the local, regional and global scale. The paper, which was recently published in the journal *Climate Policy*, acknowledges that more work needs to be done to understand how land use changes affect the Earth's climate, but strongly urges that the complexity of the interaction of heat-trapping gases and land use in altering our local and global climates does not diminish the urgency with which scientists and policymakers must address these problems.

“We must more fully integrate land surface change into our understanding of human influences on the Earth's climate,” said Dr. Gregg Marland, from the Environmental Sciences Division of the Oak Ridge National Laboratory and lead author of the paper. “But the need for further research should not be used as an excuse to avoid actions that will minimize our disturbance of the Earth's climate system.”

These actions, the authors say, include reducing greenhouse gas emissions and minimizing the loss of forests and other ecosystems. Current efforts to combat climate change focus on reducing the emission of heat-trapping gases, but do not fully address the substantial contribution of land use to climate change. The paper suggests that science and public policy must evolve to factor in all the components of human-induced climate change.

The Earth's surface plays a significant role in the climate system. Humans have substantially altered and fragmented our landscape through farms, roads and cities. This disturbance can change the global atmospheric concentration of carbon dioxide, the principal heat-trapping gas, as well as affect local, regional and global climate by changing the energy balance on the Earth's surface.

“Even small changes of 100 square kilometers in urban development or deforestation can change local rainfall patterns and trigger other climate disruptions,” said report coauthor Dr. Peter C. Frumhoff, Senior Scientist and Director of the Global Environment Program at the Union of Concerned Scientists. “Actions we take today to understand and minimize land use change will reduce climate change far into the future.”

The new peer-reviewed paper, “The climatic impacts of land surface change and carbon management, and the implications for climate-change mitigation policy,” arose from a workshop that was sponsored by the Aspen Global Change Institute. It includes the contribution of Dr. Roger A. Pielke, Sr. of the Department of Atmospheric Science at Colorado State University, a preeminent expert in the role of land use in climate change. For the full version of the report, see www.sciencedirect.com

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