

Districts Engaging in

Global climate change, living a carbon-neutral life and reducing your carbon footprint have become everyday phrases. Whether it is national politics, a trip to the local store or a daily weather report, we constantly hear about the impacts of greenhouse gases on the environment in which we live.

Greenhouse gases (GHG) include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. Greenhouse gases are primarily associated with the use of coal, oil and natural gas, but they can come from many different sources and all sectors of society—indeed, even respiration. Most U.S. emissions come from electricity generation and transportation, with additional emissions from commercial activity, agriculture and industrial buildings.

Due to the dynamics of our ecosystem, it is difficult to know the exact impact these greenhouse gases will have on agricultural production, sea

levels, the water supply and climate patterns in your specific area.

Recently, USDA released a report on the expected impact on agriculture due to climate change (see box). Other federal agencies have produced similar reports such as the Environmental Protection Agency's National Water Program Strategy: Response to Climate Change. EPA's report focuses on increased water pollution problems, extreme water related events, changes in the availability of drinking water supplies and impacts to coastal areas.

The work that conservation districts have been undertaking for years addresses green house gas emissions, but may not have been presented in these terms.

USDA is highlighting the GHG benefits of conservation programs including carbon sequestration in the Conservation Reserve Program and creating new or refining exiting standards for the Grasslands Reserve Program, Wetlands Reserve Program, Environmental Quality Incentives Program, Conservation Stewardship Program and Wildlife Habitat Incentives Program. The Department is also developing incentives that focus on carbon sequestration and reducing emissions.

NRCS has developed and is continually refining their online tool, Carbon Management Evaluation Tool – Voluntary Reporting (COMET-VR), which allows producers to estimate changes in carbon sequestration, fertilizer and energy use to estimate their greenhouse gas footprint.

Sources: Okanagan University College, Canada, Department of Geography, University of Oxford, School of Geography, United States Environmental Protection Agency (EPA), Washington; Climate Change 1995, The Science of Climate Change, Contribution of Working Group I to the Second Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), UNEP and WMO (World Meteorological Organization, Cambridge University Press, 1996, <http://www.grida.no/climate/vitalafrica/english/09.htm>.
Cartographer: Philippe Rekacewicz, UNEP/GRID-Arendal.

Addressing Climate Change through Forest Management

Through all the climate change rhetoric, there has developed an increased realization that trees and forests have an important function in regulating the cycle of atmospheric carbon. As trees die, forests burn and wood decays carbon is given up or liberated to the atmosphere. Conversely, as trees and other plants grow, carbon is removed from the atmosphere via photosynthesis and stored, or sequestered, as a major component of wood.

Recent publications state that forests will mitigate the release of atmospheric carbon if forests remain as forests and that forests will increasingly sequester atmospheric carbon if burning effects of the forests are lost. Managed forests remove and sequester more atmospheric carbon over time than unmanaged forests by delaying the decomposition or burning of wood in the unmanaged forest. As policymakers address the issue of climate change, NACD has joined the discussion as members of the Forest-Climate Working Group. Nearly 60 members representing 33 diverse organizations interested in the role of forests and climate are meeting to raise the awareness of role of forests and climate and explore areas of mutual agreement regarding carbon release, sequestration and climate. Ultimately, the group will try to reach consensus regarding more specific aspects of the forest and climate discussion.



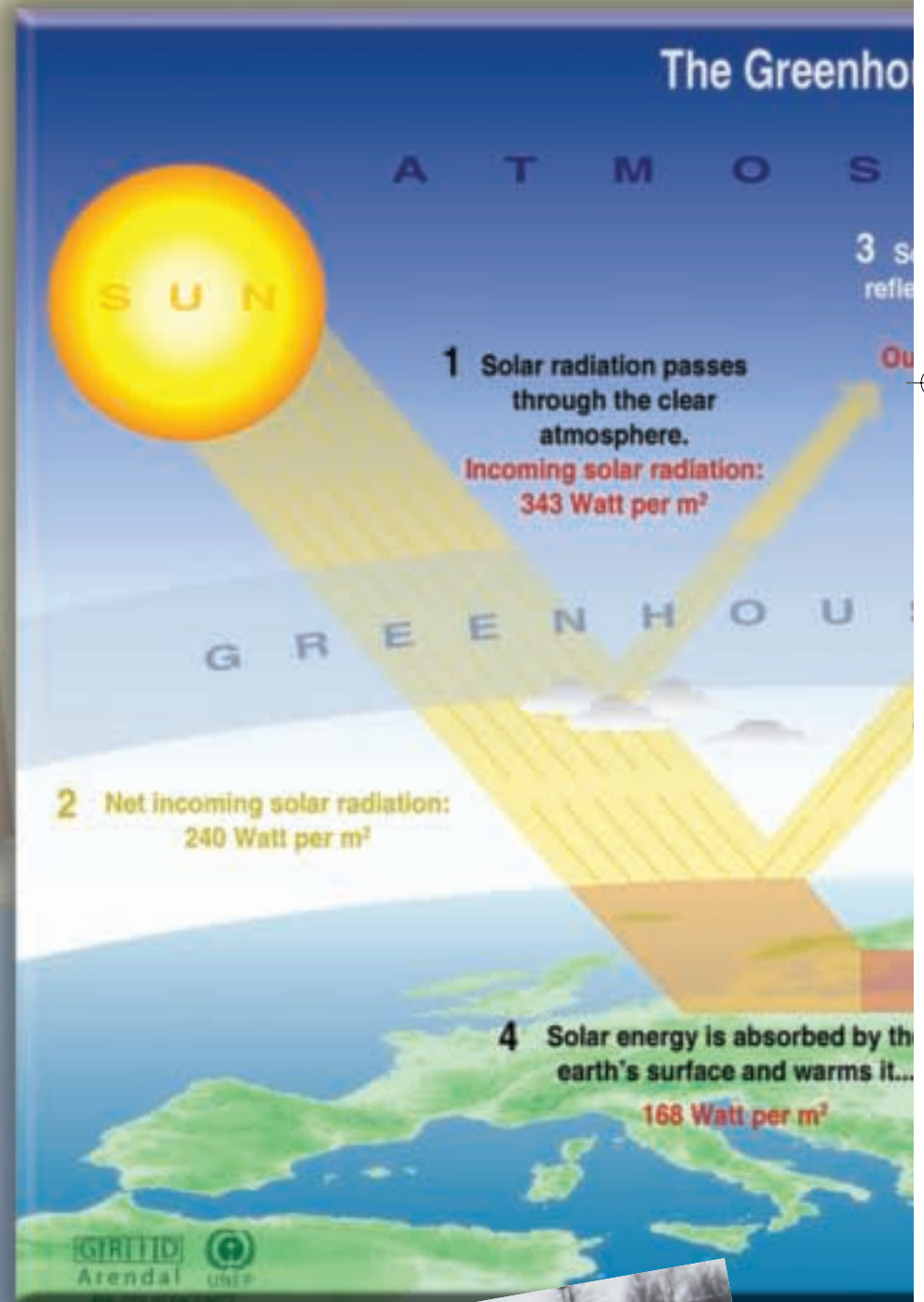
Properly managed forests can play an important role in regulating the cycle of atmospheric carbon.

Districts Building Greener Futures

Green building design and construction incorporates energy conservation and alternative energy technologies to reduce the use of non-renewable energy sources and building materials. Some conservation districts are utilizing green technology in their buildings, and also creating opportunities to demonstrate to the public the resource conservation benefits of green buildings.

The Westmoreland Conservation District has used green technologies throughout their campus in Greensburg, Pa. The district office features many green building elements, as does their newly renovated GreenForge business incubator building. Features include a geothermal system to draw on the earth's natural thermal qualities for heating and cooling and a 3,600-watt solar array capable of producing an average of about 7,000 watts of power a day. A 9,000-square-foot flat "green roof" on the GreenForge building is planted with live plants as a natural way to moderate building temperature, reduce stormwater runoff, enhance air quality, insulate sound and improve aesthetics while using resources efficiently and minimizing impact on the environment. More information on Westmoreland CD's buildings can be found at <http://www.wcdpa.com/>.

The East Maricopa Natural Resource Conservation District in Chandler, Arizona is in the process of planning a green building. In partnership with a local group, Everlasting Marks, an Earthship will be built in Mesa, Ariz. at Superstition Farm. Construction of the building will utilize old tires, cans, bottles and similar materials, and repurposing them to create a sound, off-grid building powered by solar and wind technology. When completed, the building will be a classroom for the District's Education Center, and open to the public for educational green building tours. Construction of the Earthship is expected to be complete by late 2008. Follow the progress of East Maricopa NRCDC's Earthship at <http://www.emnrcd.org/>.



Climate Change

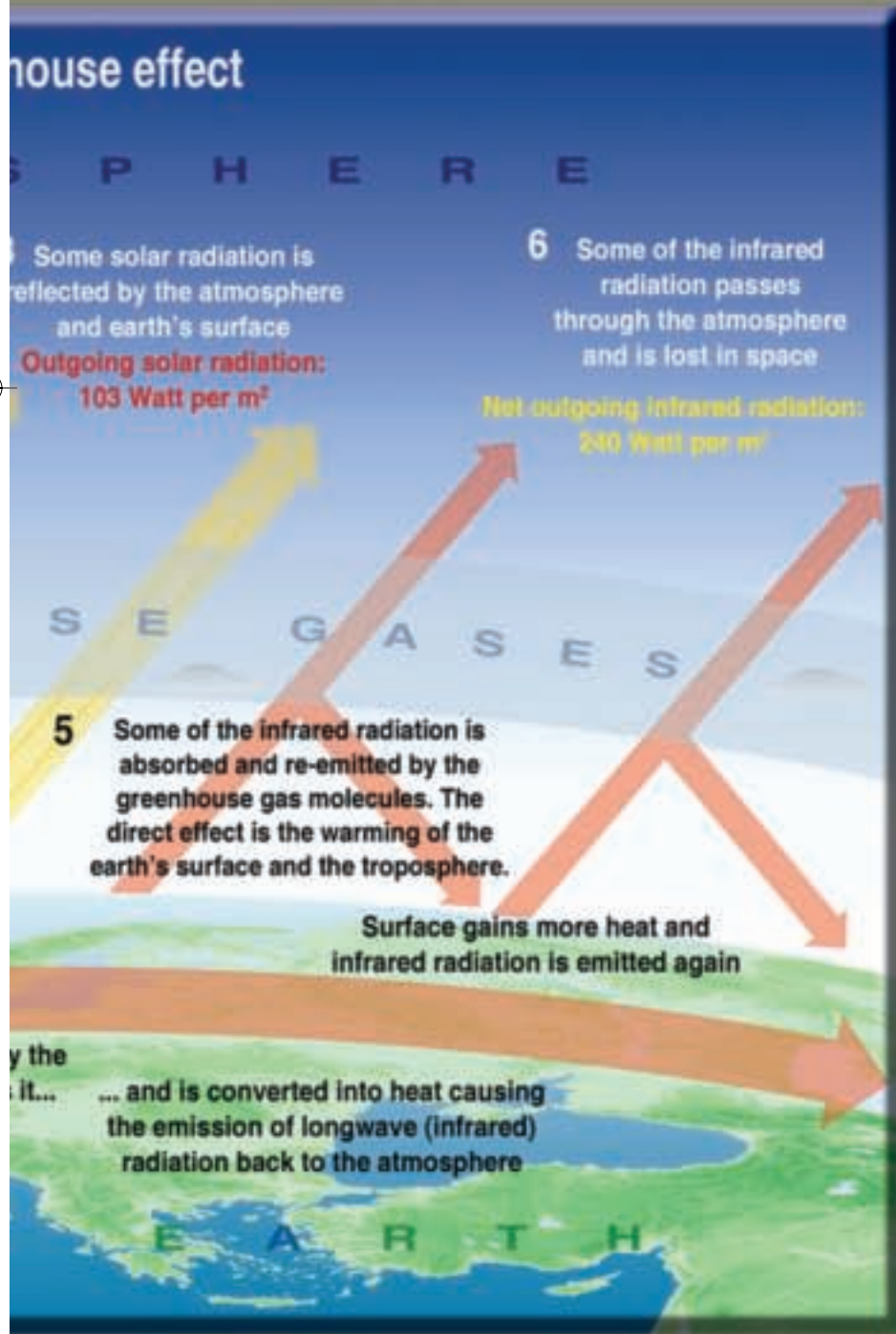
The U.S. Congress entered the climate change debate in full swing with several proposals pending in both the U.S. Senate and the House of Representatives. Recently, the Senate became locked in procedural debates on the Lieberman-Warner Climate Change bill. The action in the Senate included debates on increasing fuel and energy costs, potential treatment of agriculture in the bill and uncertainty about last minute changes to the legislation.

This Lieberman-Warner bill, the most widely known of the climate proposals, would establish emission caps for certain operations such as power plants and industrial sites. Allowances—the specific amount of emissions allowed to that specific operation—would either be distributed by the government, or auctioned to the highest bidder, creating incentive for that operation to reduce their emissions. A regulated entity could also be allowed to purchase a certain amount of credits to allow them to emit more than their specified allowance, if those additional emissions are offset elsewhere.

While agriculture emits less than seven percent of the national greenhouse gases, the ability to offset emissions through conservation practices and land management is a potential opportunity for agriculture and forestry operations. Through carbon sequestration or methane capture, agricultural and forestry operations can contribute to reducing GHG emissions, and potentially off-set other emissions.

Methods for sequestering carbon include no-till farming, use of cover crops, mulching of crop residue, and crop rotations. Carbon can also be sequestered through sustainable forestry practices, in which carbon is stored by a combination of sustainable harvesting yields, reforestation and natural processes. Once carbon is sequestered, credits can be generated that have market value and can be sold or traded to industries needing to offset carbon emissions.

NACD is working in various Washington, D.C. based coalitions to ensure that agriculture and forestry have the opportunity to participate in these offset markets. Many individual producers and conservation districts are already participating in voluntary carbon trading market, but under a regulated cap-and-trade system, both the value of the credits and participation is expected to increase.



USDA Addresses Climate Change Impacts on Agriculture

USDA recently released "The Effects of Climate Change on Agriculture, Land Resources, Water Resources, and Biodiversity in the U.S.," a report outlining the effects of climate change on agricultural systems and an expectation that the impacts will become more pronounced over the next several decades.

The report predicts that farms may experience short-term productivity increases due to warming temperatures associated with global warming.

However, many areas are likely to experience setbacks, including diminished water resources, changes in the seasonality of crops and environmental disruptions.

Grain and oilseed crops may experience a lower yield potential due to shorter life cycles and increased carbon dioxide levels.

Horticultural crops will be more sensitive to increased temperatures and poor water availability. Increased levels of pathogens and parasites may be associated with the warm weather.

Livestock producers may benefit from longer forage production seasons and shifts in range and pastureland plant species, meaning a reduced need in winter forage reserves.

USDA is using these findings in the development of a new Strategic Plan for Climate Change Research. Programs are being implemented in the US Forest Service, National Resources Conservation Service and Farm Services Agency. USDA is also providing guidance to landowners to help them estimate their greenhouse emissions footprint.

The full report is available at http://www.usda.gov/oc/global_change/sap_2007.htm.



A recent USDA report outlines the effects of climate change on agriculture. Weather extremes such as drought and flooding heavily impact crop and livestock production.



Carbon Credit Trading: Conserving Resources and Climate

Conservation districts are positioned to be at the forefront of carbon trading, and some states are already participating in this growing market.

The Association of Illinois Soil and Water Conservation Districts (AISWCD) partnered with numerous state agencies and interested organizations to initiate the Illinois Conservation and Climate Initiative (ICCI) in 2005. The AISWCD serves as a verifier of soil offsets in the partnership for the Chicago Climate Exchange (CCX), with individual conservation district staff performing the field work of verifying offsets. Sign ups are offered twice per year and verified contracts are filed with the CCX and an aggregator for approval. To date, more than \$1,000,000 has been paid to ICCI contract holders.

The Oklahoma Association of Conservation Districts (OACD) is also participating in an emerging trading

mechanism. Western Farmers Electric, one of the generation cooperatives for Renewable Energy Credits in Oklahoma voted to purchase a little over \$100,000 worth of the carbon credits generated by a 319 Nonpoint Source Grant-funded project on the North Canadian River. OACD will serve as aggregator of the credits and the Oklahoma Conservation Commission (OCC) will verify the credits. Under Oklahoma statute, the OCC has the ability to certify and verify carbon credits. This also creates a weights and measures standard to ensure that when a carbon credit is purchased in Oklahoma, an accurate unit of measurement is used for the purchase price.

Conservation districts have opportunities to fill critical roles in the growing carbon trading market, while also maintaining support for landowners to adopt conservation practices to control erosion and improve water quality.



Conservation districts are increasingly involved in the carbon credit trade system, encouraging landowners to implement practices such as no-till and be rewarded for their efforts.