

The U.S. Global Change Research Program (USGCRP) released the Second State of the Carbon Cycle Report (SOCCR2) on November 23, 2018, which assesses the last decade of carbon cycle advances across the U.S., Canada, and Mexico. USDA served as the Federal Administrative Lead for this USGCRP Sustained Assessment Report.

Information given in this scientific assessment relates to carbon research as well as to management practices in North America and around the world. The balance of carbon emissions (sources), uptake (sinks), and transformations is relevant to society, food and fiber production, many livelihoods, and to climate change and other environmental factors. The report synthesizes the latest understanding of carbon sources and sinks since the last state of the carbon cycle report a decade ago, as well as the causes, interactions, and exchanges of carbon across North America. With over 200 contributing authors, SOCCR2 contains many scientifically significant and societally relevant key findings. These findings include:

- The energy and transportation sectors continue to be the largest source of carbon emissions in North America, but significant reductions in this source are possible with current technologies. Emissions due to energy use (fossil fuels) have decreased in North America and the increase in these emissions globally has slowed down. This has occurred as net economic growth has been reported over the same period.
- At the same time, land and coastal waters are sinks of atmospheric carbon in North America, taking up from one third to one half of the total emissions. However, some of these sinks are diminishing in strength and many are at risk in the future due to increasing disturbance in forests (e.g. fire, pests, invasive species), projected increased emissions in high latitudes (arctic regions), and increasing land use pressure on all ecosystems.
- Soils in croplands, rangelands, grasslands, and forests have strong potential for carbon sequestration. The conversion of peatland soils accounts for the largest emissions from soils, but accelerated warming in Arctic regions creates vulnerability of large stores of carbon in permafrost soils.
- Aquatic systems are both sources and sinks of carbon in North America and the report describes new understanding that breaks down the balance of emissions and uptake of carbon as well as the effect increasing atmospheric carbon has on ecosystems.
- The report also discusses future projections and potential carbon management strategies along with trade-offs and co-benefits of certain actions.

SOCCR2 can be downloaded at: <https://carbon2018.globalchange.gov>.