Soil Carbon Sequestration Update

Spring 2018

- Critical Reports & Studies -

International Policy Objectives for Agriculture Transitions in Pursuit of the 1.5° C Goal.
Policy dialogue brief from the Stanley Foundation.

Natural climate solutions.
Publication in Proceedings of the National Academy of Sciences.

Ecosystem management that maintains high levels of plant diversity can enhance SOC storage and other ecosystem services that depend on plant diversity.
Publication in PNAS.

Global Sequestration Potential of Increased Organic Carbon in Cropland Soil.
Publication in Nature
Press Release from the Nature Conservancy.

A study published by the EU Joint Research Centre (JRC) in Nature Climate Change shows that soils can be a net sink of greenhouse gases through increased storage of organic carbon, but unless the use of fertilizers is adjusted to balance additional nitrogen inputs, any climate change mitigation benefit may be offset through higher nitrous oxide (N2O) emissions from soil.

4 per 1000 Soils for Food Security and Climate Initiative
Publication in Soil & Tillage Research

In light of the recent adopted decision by the Parties at the Bonn Climate Change Conference in November 2017 known as the **Koronivia joint work on agriculture,** the Food and Agriculture Organization of the United Nations and the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) organized a global webinar to provide participants with a better understanding of the key opportunities and challenges involved in advancing Koronivia joint work on agriculture and an opportunity for dialogue on the topics identified in the Koronivia decision ahead of the Subsidiary Bodies for Scientific and Technological Advice (SBSTA) and Implementation (SBI) meetings that took place from 30 April - 10 May 2018 in Bonn, Germany. Click here to see a summary blog and to hear audio from a webinar convened on the big issues.

Outlook for SBSTA/SBI 48 (April/May 2018)
SBSTA/SBI 48 will continue to consider issues related to agriculture, including through workshops and expert meetings, working with constituted bodies under the Convention and taking into consideration the vulnerabilities of agriculture to climate change and approaches to addressing food security. Parties and observer organizations are invited to submit their views on elements to be included in the work by 31 March 2018. Submitted views are publicly available via the submission portal. Recent UNFCCC meetings in Bonn resulted in a roadmap for ongoing meetings to clarify details on including agriculture in climate negotiations.

Organic soil carbon sequestration rates may be higher than conventional agriculture.
This paper looks at the potential impacts on consumer preferences.

Recent studies found soils help mitigate carbon emissions in the atmosphere and release carbon during times of disturbances.
Publication in Science: Long term pattern and magnitude of soil carbon feedback to climate system in a warming world.
Study by Stanford University: The Ecology of Soil Carbon: Pools, Vulnerabilities, and Biotic and Abiotic Controls.

A 5-year research project in China worked to summarize how biological systems in the country help mitigate carbon emissions.
Publication in PNAS

Article in Science News claims reforesting degraded U.S. soils could significantly boost soil carbon sequestration and climate mitigation.

Reducing deforestation and increasing soil carbon sequestration can address climate while simultaneously maintaining food security.
Publication in Environmental Research Letters: Win-win Strategies for Climate and Food Security.
Press Release from the INRA

Anaerobic microsites are important regulators of soil carbon persistence.
Publication in Nature: Anaerobic Microsites have an unaccounted role in soil carbon stabilization.
Press Release from Stanford University.

Adaptive grazing can potentially offset greenhouse gas emissions so the finishing phase of beef production could be a net carbon sink.
Publication in Journal of Agricultural Systems: Impacts of soil carbon sequestration on life cycle greenhouse gas emissions in Midwestern USA beef finishing systems.

The effect of grazing of grass-fed animals on sequestration of carbon time-limited, reversible, and at the global level, substantially outweighed by the GHG missions they generate.
Report by the Food Climate Research Network: Grazed and Confused.

Long-term studies of grazing methods in Texas tallgrass prairie show that cattle can actually help mitigate climate change.
Publication in Journal of Soil, Conservation and Water: Ruminants can contribute to the reduction of agriculture's carbon footprint in North America.
Article in Forbes: **Get Paid Watching the Grass Grow: Carbon Sequestration, Texas-Style.**

Report by the International Institute for Sustainable Development quantified the direct monetary and non-monetary values of these landscapes, including their role in carbon sequestration, soil conservation and support for biodiversity. The Association of Manitoba Community Pastures (AMCP) is a producer-led not-for-profit organization that operates 20 community pastures (350,000 acres of native prairie) in the Manitoba Province of Canada. AMCP pastures are worth $4.7 million as large undisturbed tracts of land based on carbon sequestration.

- Conferences -

The Hoffmann Centre for Sustainable Resource Recovery, Nature Conservancy, 4 per 1000, and Cornell University hosted a February 2018 workshop in London to explore knowledge gaps and priorities to accelerate investment and action on soil organic carbon storage and sequestration. The summary report is here.

The Food Lab assembled a Learning Journey on healthy soils. Most specialized commodity systems lack diversity, so growing small grains, legumes, and cover crops would build soil organic matter, and increased soil organic matter would create more resilient productivity, improve water quality, and sequester carbon. But how do we actually achieve these system changes?

The Ecological Farming Association holds an annual Eco Farm gathering of thousands each year dedicated to sustainable and healthy farming. This year's conference had numerous sessions on soil carbon and healthy soils. The conference videos can be found here.

The FAO held the second **International Symposium on Agroecology** in April 2018. For details, click here.

Africa Climate Smart Agriculture Summit
The Africa Climate Smart Agriculture Summit is underway in Nairobi. A broad group of stakeholders attends this gathering.
dates: 15-16 May 2018 **location:** Nairobi, Kenya **www:** http://www.csa-africa.aidforum.org/

Global Climate Action Summit
Convened by Governor Jerry Brown and the State of California, US, the Global Climate Action Summit will bring leaders from government, business and the global community to inspire greater global ambition to act on climate change. Executive Secretary of the UN Framework Convention on Climate Change (UNFCCC), Patricia Espinosa, the UN Secretary-General's Special Envoy for Cities and Climate Change, Michael Bloomberg, and Mahindra Group Chairman, Anand Mahindra, will co-chair the Global Climate Action Summit. There will be some focus on healthy soils and land based mitigation and adaption both internally and in side-events in California.
dates: 12-14 September 2018 **location:** San Francisco, CA,
US **www:** https://globalclimateactionsummit.org/

Global Land Forum 2018
The Global Land Forum (GLF) will convene International Land Coalition (ILC) members, government representatives, and other stakeholders from around the world to advance understanding of the complex and dynamic political, economic, environmental and social linkages between land governance, food security, poverty and democracy. Following a series of in-depth field visits, the main conference will open on the Indonesian National Peasants' Day, 24th September, with a day focusing on Indonesia and Asia. **Dates:** 22-27 September 2018 **location:** Bandung, Jawa Barat,
Indonesia **www:** https://landportal.org/event/2018/01/global-land-forum-glf?u...

- News Coverage -

Article in Forbes: Soils around the world both have the ability to capture and release carbon enough to significantly dampen the effects of climate change.

Article in Food Business News about General Mills offering new products that feature regenerative agriculture practices.

Blog by CGIAR on the gathering momentum for soil carbon sequestration.

Article in Grist: California is turning soils into carbon sucking factories.

Article in The Guardian: Carbon emissions from warming soils could trigger disastrous feedback loop.

Article in the New York Times Magazine: Can Dirt Save the Earth?

Article exploring history of regenerative agriculture and its growing impact on the Natural Products industry.

Australia is testing a new carbon farming program with payments to ranchers and farmers.

India has set a goal to increase its tree cover from 24% to 33% over its total land area primarily by promoting agroforestry in croplands. Agroforestry boosts production and biodiversity in India. Article in Mongabay.

Article in Stanford University News points to several studies supporting the potential of soils to slow climate change.

- Emerging Efforts -

Several major corporations are taking steps to provide incentives and mandates for healthy soils practices. One of the recent leaders to promote soil health is Wrangler, launching its Seeding Soils Potential Initiative. Others include Annie's Soil Matters campaign.

The Ecological Restoration Alliance of Botanic Gardens is a new alliance on ecological restoration being led by botanical gardens around the world.

The Land Institute is breeding new perennial grain and seed crops adapted to ecologically intensified polycultures that mimic natural systems in order to produce ample food and reduce or eliminate impacts from the disruptions and dependencies of industrial agriculture.

The Noble Research Institute has embarked on an ambitious national effort in the U.S. to advance voluntary ecosystem service markets that incentivize farmers and ranchers to improve soil health systems benefits for multiple co-benefits.

Green America in partnership with several stakeholders has launched the Carbon Farming Innovation Network.

The Rodale Institute announced a new organic regenerative certification program designed to incentivize a range of healthy soils and soil carbon sequestration practices.

- Resources -

The Quivera Coalition and a public radio station in New Mexico has launched a podcast series focused on in-depth interviews with soil carbon experts and farmers. Click here to listen.

The FAO has launched its Global Soil Organic Carbon Map. Nearly 100 countries have prepared national maps according to clear technical specifications. FAO is now working to ensure that all countrie are included. Soil carbon baselines and maps continue to be vital to building the field of soil carbon sequestration and healthy soils. This soil mapping effort is part of the Global Soil Information S ystem (GLOSIS)

The World Bank Group offers a self-paced course on estimating GHG emissions and carbon sequestration in agriculture, forestry and other land use.

Prepared by Taylor Herren and Betsy Taylor, Breakthrough Strategies and Solutions, Takoma Park, Maryland. To submit suggested resources for the next update, please contact Taylor Herren.