The Terrestrial Carbon (TerraC) Information System Vers. 1.0

Brandon Hoover[1], Gustavo M. Vasques[2], Biao Zhong[1], Sabine Grunwald[1], Timothy A. Martin[3], David L. JR. Depatie[1]

[1]Department of Soil & Water Science
University of Florida
Gainesville, FL, 32611

[2] Federal Rural University of Rio de Janeiro, in Seropédica, RJ, Brazil (former affiliation: Department of Soil and Water Science, University of Florida)

[3]School of Forest Resources & Conservation
University of Florida
Gainesville, FL, 32611

Abstract

There are urgent needs to better synthesize knowledge and data across large regions and time periods to address global climate change, conduct terrestrial carbon accounting, model carbon dynamics, assess carbon sequestration, and develop strategies for mitigation and adaptation. To address these needs we created a database infrastructure for the carbon science community, focused on ecosystems in Florida and the southeastern United States. The Terrestrial Carbon (TerraC) Information System is dedicated to advance terrestrial carbon science through fusing of carbon and environmental data to accurately assess the potential to capture carbon in biomass and below-ground. Florida's natural and agro-forest ecosystems have much potential to sequester carbon in biomass and soils due to unique climatic and landscape conditions. TerraC offers tools to upload, store, manage, query, analyze, and download data characterizing terrestrial carbon dynamics from various sources, including soils, plants/biomass, atmosphere, water, and whole ecosystems. The purpose of TerraC is three-fold: (i) advance terrestrial carbon science through sharing of carbon and environmental data; (ii) facilitate environmental synthesis; and (iii) enhance collaboration among students, faculty, scientists, and extension specialists through shared resources. Data stored in TerraC conform to quality standards and can be shared privately among selected users or publicly with any user. Here we present TerraC Vers. 1.0 that will be used to spin off various carbon synthesis research projects focused on bioenergy and carbon accounting. Detailed information about TerraC and data sharing options are available at: http://TerraC.ifas.ufl.edu.

Preferable presentation type: Poster / computer demo

Mash-ups Embedded in Online Learning Material to Stimulate Learning

D.L. DePatie JR., B. Hoover, and S. Grunwald

Abstract. The Soil and Water Science (SWS) department has made great progress on the road to encourage development of new and interactive materials. We are engaging in proactive change in the methods of online material delivery. Several online courses and Reusable Learning Objects (RLOs) in the department have been enriched by videos, recordings, tutorials, and other media facilitated by a new Web/Distance Education Studio. The EcoLearnIT RLO system facilitates the creation of new learning materials, serves learners around the globe, and supports open learning activities. It provides access to RLOs, which are small learning units focused on environmental sciences (soil, water, climate, policy and ecosystem services), ecology, natural resources and agricultural management. The learning material is peer-reviewed and shared among the users. Audio and video embedded units are being created to enhance learning experiences and engagement of students. The internet presence is being expanded to connect with the global scholar. In this presentation we will showcase various online tutorials, mash-ups and implementation styles for RLOs, and key pedagogical principles to build effective learning material. Currently the EcoLearnIT system contains 100+ published RLOs of users (~ 380) around the globe including students and instructors from the SWS department.

Type of presentation: Computer demo

Bioenergy for Small Farm Syrup Production

Camilo Cornejo[1] and Ann C. Wilkie[2]
[1]Postdoctoral Research Associate, Soil and Water Science Department
[2]Soil and Water Science Department

Small farmers in Florida are returning to traditional activities as a source of income to increase the profitability and sustainability of their farms. The production of homemade cane syrup is one of these activities. Canes used for this purpose are known as syrup or ribbon canes. The process to concentrate the sugars into syrup is energy intensive and is a significant part of the costs. One alternative for small farmers may be to use part of their cane production for energy generation. Anaerobic digestion could be used to produce biogas (methane) from the cane. Biogas can be burned directly or mixed with propane. Preliminary lab analyses have been conducted to estimate the potential for biogas production. Chemical Oxygen Demand (COD) is a measure of the digestibility of organic materials under anaerobic conditions. Syrup samples have a COD of 2,086,000 mg/L (±51,401). This is equivalent to a theoretical methane production potential of 823.97 liters of methane per liter of syrup. The syrup cane juice COD is 298,000 mg/L, with a methane potential of 117.7 L CH_4/L juice. These results show the potential to produce biogas from cane syrup and juice, which could be an option for small farmers to displace or reduce the use of fossil fuels for juice concentration to syrup. Additionally, the anaerobic digestion process mineralizes the nutrients present in the juice. The effluent could be returned to the field recovering part of the nutrients applied to the crop, reducing the need for synthetic fertilizers and adding organic matter.