



Abstracts Booklet

GEO-Carbon Conference: Carbon in a changing world 24-26 October 2011, FAO, Rome

Aims

- To present the latest scientific developments in understanding the global carbon cycle
- To present an overview of the building and implementation of a Global Carbon Observing System for land, oceans and atmosphere
- To identify progress and gaps in obtaining policy relevant estimates of regional carbon budgets on land and ocean

Planned Sessions

- Progress in observing techniques and methodology for land, ocean and atmosphere, including network design, space borne techniques and in situ observations.
- Progress in data model fusion. Development of regional carbon budgets for land and ocean. Verification requirements in a post-Cancun world.
- Interfacing carbon cycle knowledge with society, needs, uncertainties and challenges.

Invited Speakers

J. Butler	A. Müller
J. Canadell	G. Ollier
F. Chevallier	Y. Pan
P. Ciais	P. Peylin
A. Freibauer	S. Plummer
E. Gloor	S. Quegan
M. Heimann	C. Schmullius
C. Heinze	E.D. Schulze
M. Herold	A. Shvidenko
R.A. Houghton	J.F. Soussana
M. Jung	T. Tanhua
	R. Valentini
	F. Vladu
	S. Wofsy

Organizing Committee

Han Dolman (COCOS)
Philippe Ciais (ICOS)
Annette Freibauer (COCOS)
Riccardo Valentini (GTOS)
Corinne le Quéré (GCP)
Pep Canadell (GCP)
John Latham (FAO)
Antonio Bombelli (GEOCARBON)
Seonkyun Baek (GEO)

Registration, contacts and more details on: <http://dwms.fao.org/geo-carbon/>





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FAO-Red Room

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Abstract

Climate change associated with greenhouse gas emissions has important effects on grassland ecosystems. This type of land-use covers approximately 20% of land area in Spain (Peninsule and Balearic Islands). An updated preliminary assessment of soil organic carbon (SOC) stock in grasslands showed a high total SOC stock of 0.96 Pg C (approximately one quarter of total SOC in Spain) though great differences among grassland types. Mediterranean-type lowland grasslands storages 66% of the total SOC stock, due to its large surface area. Perennial grassland of moist mild climate of northwest peninsular Spain contributed to a 26% of total SOC stock, despite its smaller surface area, due to its higher soil carbon content. Climate and land-use changes were potential drivers of SOC stock. Between 1989 and 2008, there was an experimental evidence of average SOC stock increase at a 2.2% annual rate in grasslands of central Spain. This rate did not significantly change after six year from abandonment. Projected scenarios of global change, that considered this SOC stock change rate and a small increase in grassland surface area, indicate that sequestration potential of grasslands would be of 0.11 Pg C in 2020. Grasslands must be considered as low-cost and effective option for climate change mitigation in Spain.

Keywords: Carbon sink, Carbon storage, Climate change mitigation, Grassland, Soil carbon

The role of contrasting agroforestry land-uses on organic carbon storage and woody biomass allocation in tropical forests of Bangladesh

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Abstract

Agroforestry – nowadays, increasingly considered as a future land-use strategy for their immense potentials for income generation, biodiversity conservation and ecosystem regulation. However, it is still critical to understand how different agroforestry land-use(s) within or nearby to forests could contribute to local carbon cycling, and their complementarity to forest. We performed an exploratory study in a tropical rainforest patch in north-eastern Bangladesh to measure the organic carbon in soil, as well as living woody biomass preserved in corresponding agroforestry land-use(s). Fifty 100m² rectangular plots were randomly established in four contrasting agroforestry land-uses; viz., betel-vine (*Piper betel*) based agroforestry, lemon (*Citrus limon*) based agroforestry, pineapple (*Ananas comosus*) based agroforestry, and in undisturbed forest (as control). Interestingly, both soil



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organic carbon (30.362 ± 8.9247 tones ha^{-1}) and total woody biomass (134.44 tones ha^{-1}) was measured higher for betel-vine based agroforestry system. A systematic understanding of carbon allocated in different human dominated land-use(s), and finding out a comprehensive way to reward poor tropical land-owner(s) for carbon benefits provided to nature for their land-use(s) could secure both livelihoods and environment sustainability.

Keywords: Carbon storage, Biomass, Agroforestry, Land-use, Bangladesh

Long-term measurements of carbon budget in forest ecosystems at AIST stations in Japan and Thailand

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Abstract

Impacts of climate change on the activity of terrestrial biosphere have been predicted in recent studies. In East Asia and Southeast Asia strongly influenced by Asian Monsoon, changes not only in temperature but also in amounts of precipitation and length of the rainy season associated with the climate change could have much influence on the carbon budget in the terrestrial biosphere. However, responses of the terrestrial biosphere to climate change are not yet fully understood. For the better understanding of the responses, further analyses using long-term measurement data of the carbon budget in terrestrial ecosystem are necessary. National Institute of Advanced Industrial Science and Technology (AIST) has made long-term systematic measurements of CO₂ flux between the atmosphere and forest ecosystem and the related parameters in collaboration with some research groups, in a cool-temperate deciduous forest at Takayama (36°08'N, 137°25'E, 1420 m a.s.l.), Japan since 1993, and in seasonal tropical forests at Mae Klong (mixed deciduous forest, 14°35'N, 98°51'E, 231 m a.s.l.) and at Sakaerat (dry evergreen forest, 14°30'N, 101°55'E, 543 m a.s.l.), Thailand since 2001. Takayama is the longest monitoring site in the AsiaFlux network, while Mae Klong and Sakaerat are the longest AsiaFlux monitoring sites in Thailand. The CO₂ concentration data at Takayama have also been submitted to the World Data Centre for Greenhouse Gases of WMO. In this presentation, our research activities and some of the results obtained from the long-term measurements will be introduced. And also, inter-annual variation of the carbon budget observed at our sites and environmental factors governing the variation will be discussed.

Keywords: Carbon budget, Forest ecosystem, AsiaFlux, Asian monsoon, Long-term measurement