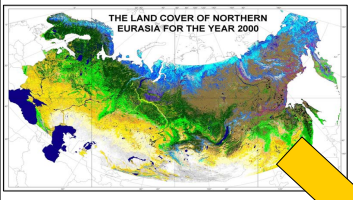
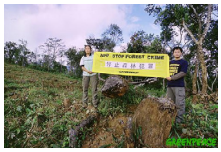
Land Use and Land Cover Dynamics of China in Support of GOFC/GOLD and NEESPI Sciences

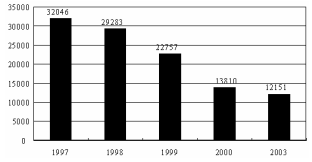
A project funded by NASA at Michigan State University with participations from many institutions in US and China

Jiaguo Qi (qi@msu.edu)
Center for Global Change and Earth Observations, Department of Geography, Michigan State University, East Lansing, MI 48823

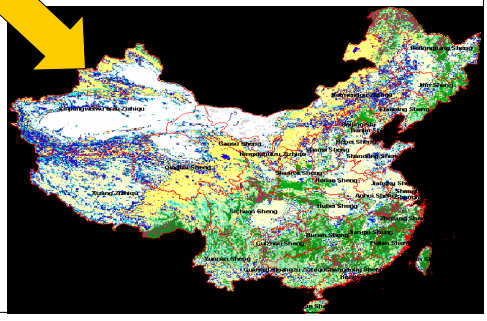




Fires and logging are two most common forms of deforestation. Photo by Greenpeace org.



Timber output from natural forests under China's National Forest Conservation Program. According to FAO's report, in 1997, the timber output from all the natural forests included in the NFCP was 32.1 million m^3. It decreased to 29.3 million m^3 in 1998, and to 22.8 million m^3 in 1999. It is expected that timber output will be further reduced to 12.1 million m m^3 by 2003.



I Introduction

Land use and land cover in China has gone through dramatic changes in the past fifty years. Its consequences in global change, particularly in carbon sequestration and hydrological processes, are unknown. Although substantial effort has been made over the past decade, there is little integrative effort across different disciplines. This NASA funded research project is dedicated to bring scientists together to assess the land use and land cover dynamics of China and their consequences in carbon sequestration.

II Research Objectives

1)Develop maps of rapid land use and land-cover changes for all of China to support the GOFC-GOLD science missions and

2) Quantify carbon stocks and the uncertainty about the carbon cycle due to land use and land cover changes in northern China within the NEESPI region

III Tasks Undertaking

1.Capacity Building – Establish an interdisciplinary research team and develop a geospatial database focusing on land cover dynamics of the entire country and its impacts on carbon cycling in the northern part of China, by leveraging the existing funded projects by the Chinese collaborators to support the GOFC/GOLD and NEESPI sciences.

2. Quantifying Land Cover Dynamics - To develop wall-to-wall coverage of land cover products of the country for 1982-2005 from remotely sensed images and field observations, capitalizing the previous and on going studies of the country, in support of the GOFC/GOLD program by expanding the existing regional network to cover China.

3. Estimating Regional Carbon Fluxes: To use existing and well validated biogeochemical models (GEMS, DNDC) to quantify carbon stocks under various land cover change scenarios and investigate the coupled impacts of land cover changes on carbon cycles in support of NEESPI science, in the northern part of China.

IV Participating Institutions

1) US Institutions: Jiaguo Qi (PI – MSU), David Skole (MSU), Mark Cochrane (MSU), Joseph Messina (MSU), Runsheng Yin (MSU), Peng Gong (UC-Berkeley), Xiangming Xiao (UNH), Changsheng Li (UNH), William Salas (AG), Guoqing Sun (UMd), Wei Gao (CSU), Yongyun Yin (U. British Columbia), Shuming Bao (UM), Shuguang Liu (EDC), Cuizhen Wang (UM–Columbia)

2) Chinese Institutions: NJU (Wanchang Zhang), NNU(Genian Lv, Shan Yang), LU(Zhongdong Feng), CAREEI(Jiemin Wang), FU(Ya-Qiu Jin), NEAU(Guoping Lei), IGSNRR(Jintao Xu, Zhiqiang Gao, Jiyuan Liu), CRSHAAS(De Liu, Shubin Liu), XU(Xiaoling Pan), and JNU(Zheng Lin), NEAU (Guoping Lei).

V Implementation Plan:

Activities	Year 1				Year 2				Year 3			
1. Capacity building	x	x	x	x	x	x	x	x	x	x	x	x
1.1 Establish a regional LUCC network	x	x	x	x	x	x	x	x	x	x	x	x
1.2. Develop geospatial database				x	x	x	x	x	x	x	x	
2. LUCC Dynamics of China		x	x	x	x	x	x	x	x	x	x	x
2.1. Land Cover Dynamics		x	x	x	x	x	x	x	x	x	x	x
2.1.1. Land use and land cover mapping		x	x	x	x	x	x	x				
2.1.2.Land cover biophysical attributes					x	x	x	x	x	x	x	
2.2. Fires and their consequences			x	x	x	x	x	x	x	x		
2.3. Modeling LUCC change				x	x	x	x	x	x	x	x	x
3. Carbon Stocks Estimates			x	x	x	x	x	x	x	x	x	x
3.1. Carbon stocks modeling in northern China			x	x	x	x	x	x	x			
3.2. Spatial and temporal dynamics					x	x	x	x	x	x	x	
3.3. Uncertainty analysis in carbon dynamics								x	x	x	x	x
3.4. Coupled climate and LUCC impacts on C sequestration									x	x	x	x

Center for Global Change & Earth Observations, Michigan State University

MICHIGAN STATE UNIVERSITY

NASA

LCLUC