

Weekly Highlight for December 7-11, 2015

Papers Published or In Press:

Morton DC (618), Rubio J (Toulouse/618), Cook BD (618), Gastellu-Etchegorry J.-P. (Toulouse), Longo M (Embrapa), Choi H (SSAI/618), Hunter MO (UNH), Keller M (USFS). Amazon forest structure generates diurnal and seasonal variability in light utilization. *Biogeosciences Discussion*, 12, 19043-19072, doi:10.5194/bgd-12-19043-2015, 2015.

This study illustrates the importance of realistic, 3-D representations of the forest canopy for accurate simulations of light availability in tropical forests. DART model results have important implications for both modeling and remote sensing of tropical forest ecosystems, including how the vertical and horizontal distributions of light saturation effects influence remote sensing measurements and model estimates of forest productivity. Radiative transfer models provide an important link between top-down estimates from remote sensing platforms and bottom-up estimates of forest structure and carbon fluxes from field and tower-based instruments.

Wolf J (JGCRI), West TO (JGCRI), Le Page Y (JGCRI), Kyle GP (JGCRI), Zhang X (JGCRI), **Collatz GJ** (618), Imhoff ML (JGCRI). Biogenic carbon fluxes from global agricultural production and consumption. *Global Biogeochemical Cycles*, in press.

Quantification of biogenic carbon fluxes from agricultural lands is needed to generate comprehensive bottom-up estimates of net carbon exchange for global and regional carbon monitoring. We estimated global agricultural carbon fluxes associated with annual crop net primary production (NPP), harvested biomass, and consumption of biomass by humans and livestock. Global crop NPP in 2011 was estimated at 5.25 ± 0.46 Pg C yr⁻¹, of which 2.05 ± 0.05 Pg C yr⁻¹ was harvested and 0.54 Pg C yr⁻¹ was collected from crop residues for livestock fodder. The spatial distribution of these fluxes may be used for global carbon monitoring, estimation of regional uncertainty, and for use as input to Earth system models.

Neigh, C.S.R. (618), Masek, J.G. (618), Bourget, P. (USM), Rishmawi, K. (UMD), Zhao, F. (UMD), Huang, C. (UMD), Cook, B. (618), & Nelson, R.F. (618). Regional rates of US forest growth measured from annual Landsat disturbance history and IKONOS stereo imagery. *Remote Sensing of Environment, 2014 ForestSAT special issue*, in press. doi:10.1016/j.rse.2015.09.007 <<http://dx.doi.org/10.1016/j.rse.2015.09.007>>.

Forests of the Contiguous United States (CONUS) have been found to be a large contributor to the global atmospheric carbon sink. We combine annual Landsat forest disturbance history from 1985 to 2011 with single date IKONOS stereo imagery to estimate the change in young forest canopy height and above ground live dry biomass accumulation for selected sites in the CONUS. For 20 study sites distributed across five regions of the CONUS, 19 showed statistically significant recovery trends ($p < 0.001$) with canopy growth from 0.26 m yr⁻¹ to 0.73 m yr⁻¹. Growth estimates found with this approach are consistent with site index curves and total biomass estimates fall within the range of field estimates.

Presentations:

David Lagomasino (618/USRA) gave a talk and presented a poster at the Coastal and Estuarine

Research Federation 2015 Meeting in Portland, Oregon (Nov 9-12). The presentation, “Moving from Blue to REDD: MRV and carbon accounting in mangroves [Lagomasino, D (618/USRA), Fatoyinbo, T (618) and Lee, S.K (618/ORAU)” highlighting the use of 3D remote sensing for measure canopy height and carbon in mangrove forests. A second poster titled “Variability of water levels in the Florida Coastal Everglades using two time-series analyses [Anderson, G (USGS)., Lagomasino, D (618/USRA)., Price, R (FIU)., Wdowinski, S (UMiami)., Smith, T (USGS)” examined the interaction of long-term water levels in the freshwater and saltwater of Everglades National Park and showed drastic changes in freshwater levels over the past 16 years.

External Interactions:

Assaf Anyamba (618/USRA) attended the Global Health Security Agenda (GHSA) Meeting organized by EcoHealth Alliance on November 4th, 2010 in Washington DC. GHSA presentation was given by Dr. Elizabeth E. Cameron, Director, Countering Biological Threats, National Security Council. He also participated in the Pandemic Prediction and Forecasting S&T Working Group Teleconference on November 10, 2015 to deliberate on various USG options to address disease outbreak threats during this El Niño period. Anyamba, Kenneth Linthicum (USDA) and Jean-Paul Chretien (DoD-AFHSC) contributed an El Niño and Rift Valley fever risk, East Africa: Prediction, Preparedness, Prevention brief for consideration. The Pandemic Prediction and Forecasting S&T Working Group is organized under the Subcommittee on Biological Defense Research and Development (BDRD) Committee on Homeland and National Security, National Science and Technology Council.

Jeff Masek (618) took part in a Reddit “Ask Me Anything” chat on the global carbon cycle on Thursday November 12, as part of the Earth Right Now focus on carbon and climate. Other participants included David Schimel (JPL) and Anastasia Romanou (Columbia University).