EERD Quarterly Report

Project Title: Observing carbon fluxes and potential climate change impacts from forest land management

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Period: October 1,2011-December 31,2011 (2011 Q4)

Project Period: June 1,2010 – May 31, 2013

Overview:
The carbon sequestration capacity of Wisconin's forests is a major natural asset in the state and how property owners manage these forests can impact this capacity. Our study is intensively measuring and modeling carbon sequestration in a north temperature hardwood forest as it undergoes a forest harvest to better predict how future management actions will influence forest carbon cycling.

Activities for Q4:
We have continued to operate and maintain the Willow Creek Ameriflux tower and produced the first year data product, which is now available online. Collaborators at Lawrence Livermore National Laboratory have continued to operate automated soil respiration and radiocarbon devices at the site. We recently acquired an automated phenology web camera that we are testing in the lab and plan to install next spring. In December, our site suffered a generator failure, which we are currently repairing. We are in discussion with a focused workshop on those who are modeling carbon cycling and forest management in this region to occur in June 2012.

Major activities include:

- Continued operation of automated cellular system and QC/QA. First preliminary computed carbon fluxes are at: http://flux.aos.wisc.edu/data/wcreek-raw/prelim/

- Continued development of a new modeling approach for carbon fluxes with the cosystem Demography ED2 model with collaborator Mike Dietze, U. Illinois.

- Recruitment of a new post-doctoral scholar to be partially supported by this project.

- Contribution to new synthesis manuscripts on photosynthesis and phenology.

- Submission of a follow-up proposal to Dept of Energy that dramatically expands scope of this research.

- Relevant presentations:
  - *Seasonal controls on regional methane and carbon dioxide exchange observed from a very tall eddy covariance tower in a wetland-rich landscape*, Ankur Desai, American Geophysical Union Fall 2011 meeting, San Francisco, CA, Dec. 5, 2011

- Relevant publications:
  - Hicke, J.A., Allen, C.D., **Desai, A.R.**, Dietze, M., Hall, R., Hogg, E.T., Kashian, D., Moore, D., Raffa, K., Sturrock, R., and Vogelmann, J., 2012. Effects of biotic disturbances on forest carbon cycling in the United States and Canada. Global Change Biology, 18, 7-34,doi:10.1111/j.1365-2486.2011.02543.x.
  - Richardson, A.R., Anderson, R.S., Altaf Arain, M., Barr, A.G., Bohrer, G., Chen, G., Chen, J.M., Ciais, P., Davis, K.J., **Desai, A.R.**, Dietze, M.C., Dragoni, D., Garrity, S., Gough, C.M., Grant, R., Hollinger, D.Y., Margolis, H.A., McCaughey , H., Migliavacca, M., Monson, R.K., Munger, J.W., Poulter, B., Raczka, B.M., Ricciuto, D.M., Sahoo, A., Schaefer, K., Tian, H., Vargas, R., Verbeeck, H., Xiao, J., and Xue, Y., 2012. Terrestrial biosphere models need better representation of vegetation phenology: results from the North American Carbon Program Site Synthesis. Global Change Biology, 18(2), 566-584, doi:10.1111/j.1365-2486.2011.02562.x.
  - Sprintsin, M., Chen, J.M., **Desai, A.R.**, and Gough, C.M., 2012. Evaluation of leaf-to-canopy upscaling methodologies against carbon flux data in North America. Journal of Geophysical Research-Biogeosciences, doi:10.1029/2010JG001407, in press.