



from tree mortality and fires outbreak in California coast

**Project 1. Effects of land use change and urbanization on soil nutrient cycling and storage in the Charlotte Metropolitan Area.**

This project intends to quantitatively assess the effects of land use change and urbanization on soil carbon, nitrogen and organic matter in the Charlotte Metropolitan Area. The objective is to quantify soil nitrogen and carbon storage across different land uses, map the regional storage through statistical and geostatistical up-scaling, and contrast nutrient storage across different intensity of land use change gradients.

Accomplishment – Ongoing.

**Project 2. Soil and biomass carbon losses from forest ecosystem resulting from Sudden Oak Death mortality and wildfire outbreak in California coast**

This project intends to assess the effects of Sudden Oak Death (SOD) mortality on soil and biomass carbon release following wildfire outbreak in the California coast. The objective is to assess regional scale losses of soil and vegetation carbon to the atmosphere following SOD death through field plot monitoring, remote sensing and spatial modeling.

Accomplishment – Ongoing.

Manuscript close to submission. Target journal – Forest Ecology and Management.

**Post Doctoral Researcher**

Jan. 2007 – Aug 2008

Forest Water Resources Laboratory  
School of Forest Resources and Conservation  
University of Florida, Gainesville, FL

Duty: Leadership role in multiple projects focused on quantitative aspects of spatial nutrient loadings from a watershed, surface water quality, and spatial variability of soil properties, and soil-landscape modeling

**Project 1 - Hierarchical Soil Nutrient Mapping for Improved Ecosystem Change Detection in the Greater Everglades**

This project enhances and builds upon previous work on mapping of soil nutrients (Everglades Soil Mapping Project – ESM) throughout the Greater Everglades ecosystem in South Florida. In contrast to regional scale mapping of soil properties in the ESM project, this work is concerned with evaluating the short and medium scale spatial variability in soil properties. The objective is to assess short range variability, spatial patterns of local ecosystem-driven variability and signal detection of soil properties in the Greater Everglades.

**Project 2 - Spatial Nutrient Loading Dynamics in the Newnans Lake Watershed**

The goal of this project is to assess the spatial nutrient loadings into the Newnans Lake, which is a hyper-eutrophic lake designated as impaired by the Florida Department of Environmental Protection. The objective is to identify the sources of nitrogen and phosphorus loading into the lake, and assist in ascribing load reduction responsibility which is necessary to achieve the pollution load reduction goal

### **Project 3 – Assessment of water quality in Florida springs**

The goal of this project is to assess nitrogen and phosphorus in Florida springs, their trends, and relationships with land use and landscape developments in the springsheds

#### **Graduate Research Assistant**

Jan. 2003 – Dec. 2006

Soil and Water Science Department  
University of Florida, Gainesville, FL

### **TEACHING EXPERIENCE**

#### **Co-Instructor**

Spring semester 2008

Graduate course - **GIS Analysis**

University of Florida, Gainesville, FL

This was a web-based course with lectures delivered using Interactive Broadcasting internet technology - software Elluminate, and course materials are distributed using Blackboard

#### **Co-Instructor**

July 28-30, 2004

Short course - **GIS Applications in Soil and Water Science**

University of Florida, Gainesville, FL

This course was offered as a GIS training course for environmental professionals from across Florida

#### **Teaching Assistant**

Fall semesters of '03, '04, '05

Graduate Course - **GIS in Land Resource Management**

University of Florida, Gainesville, FL

### **PUBLICATIONS**

#### **Peer reviewed**

Cohen, M. J., S. Lamsal, T. Z. Osborne, K. R. Reddy, and S. Newman. XXXX. Soil organic matter quality across the Greater Everglades. Soil Science Society of America Journal (*In review*)

Lamsal, S., C. M. Bliss, and D. A. Graetz. 2009. Geospatial mapping of soil nitrate-nitrogen distribution under a mixed land use system. *Pedosphere* 19(4): 434-445.

M. J. Cohen, S. Lamsal, T. Z. Osborne, J. C. J. Bonzongo, S. Newman and K. R. Reddy. 2009. Soil Total Mercury Concentrations across the Greater Everglades. *Soil Science Society of America Journal* 73:675-685.

Lamsal, S. 2009. Visible near-infrared reflectance spectroscopy for geospatial mapping of soil organic matter. *Soil Science* 174 (1): 35-44.

Grunwald, S., P. Goovaerts, C. M. Bliss, N. B. Comerford and S. Lamsal. 2006. Incorporation of auxiliary information in the geostatistical simulation of the spatial

distribution of soil nitrate-nitrogen in a mixed-use watershed. *Vadoze Zone Journal* 5: 391-404.

Lamsal, S., S. Grunwald, G. L. Bruland, C. M. Bliss, and N. B. Comerford. 2006. Regional hybrid geospatial modeling of soil nitrate-nitrogen in the Santa Fe River watershed. *Geoderma* 135: 233-247.

Meers, E., S. Lamsal, P. Vervaeke, M. Hopgood, N. Lust and F. Tack. 2005. Availability of heavy metals for uptake by *Salix viminalis* on a moderately contaminated dredged sediment disposal site. *Environmental Pollution* 137: 354-364.

Meers, E., E. Lesage, S. Lamsal, M. Hopgood, P. Vervaeke, F. Tack and M. Verloo. 2005. Enhanced phytoextraction: I. effect of EDTA and citric acid on heavy metal mobility in a calcareous soil. *International Journal of Phytoremediation*, Vol. 7 (2), pp 129-142.

Lease, E., E. Meers, P. Vervaeke, S. Lamsal, and M. Hopgood, T. M. G. Tack, and M. G. Verloo. 2005. Enhanced phytoextraction II effect of EDTA and citric acid on heavy metal uptake by *helianthus annuus* from a calcareous soil. *International Journal of Phytoremediation* 7: 143-152.

### **Book Chapter**

Grunwald, S. and S. Lamsal. 2006. The Impact of Emerging Geographic Information Technology on Soil-Landscape Modeling. *In* S. Grunwald (ed.) *Environmental Soil Landscape Modeling*. CRC Press, Boca Raton, FL

### **Manuscripts in preparation**

Lamsal, S. and U. Mishra. Mapping soil textural fractions across a large watershed in north-east Florida. Target journal - *Journal of Environmental Management*

Lamsal, S., and M. J. Cohen. Land Use and Geologic Variables to Predict Water Quality in Florida's Artesian Springs. Target journal – *Ecological Indicators*

Lamsal, S., Q. Meng, and R. Meentemeyer. Spatial variation of above-ground forest biomass in heterogeneous landscapes. Target journal – *Forest Ecology and Management*

Lamsal, S., J. Vogel, and M. J. Cohen, T. Z. Osborne. Spatial distribution, changes and risk to entrainment of total phosphorus in sediments of Lake Okeechobee, Florida. Target journal – *Journal of Environmental Quality*

### **Proceedings and Reports**

Cohen, M. J., T. Z. Osborne, S. Lamsal, and Mark W. Clark. 2009. Regional Distribution of Soil Nutrients - Hierarchical Soil Nutrient Mapping for Improved Ecosystem Change Detection. South Florida Water Management District, West Palm Beach, FL.

Cohen, M., S. Lamsal, L. Kohnak, and L. Long. 2007. Spatial nutrient loading and sources of phosphorus in the Newnans Lake watershed. Submitted to St. Johns River Water Management District, Palatka, FL

Lamsal, S., S. Grunwald, C. M. Bliss, I. Lopez-Zamora, N. B. Comerford, and M. W. Clark. 2004. Upscaling of site-specific nitrate-nitrogen measurements to the watershed scale in the Santa Fe River watershed. Suwannee River Basin and Estuary Intergrated Science Workshop Proceedings: September 22-24, 2004, Cedar Key, Florida.

Lamsal, S., E. Meers, F. Tack and M. Verloo. 2004. Modeling the bioavailable fraction of heavy metals in contaminated dredged sediments and its implications for phytoremediation. Soil and Crop Science Society of Florida Proceedings 63: 117.

### **Posters**

Lamsal, S., A. Davis, M. Dorning, D. Shoemaker, R. Meentemeyer. 2008. Assment of the effects of land use change on soil carbon and nitrogen in the Charlotte Metropolitan Area. Annual meeting - South East Division of the American Association of Geographers. Nov 23-25, Greensboro, NC.

Lamsal, S., M. J. Cohen, L. Korhnak, and L. Long. 2008. Land use intensity and water quality in the Newnans Lake watershed. Sustainable Water Resources; Florida Challenger, Global Solutions. University of Florida Water Institute. February 27-28, Gainesville, FL

Lamsal, S., M. J. Cohen, D. Watts, T. Osborne, and M. Clark. 2007. Hierarchical soil nutrient mapping for improved ecosystem change detection in the Greater Everglades. United States Geological Survey and Florida Fish and Wildlife Co-operative Research Unit Symposium – April 17, 2007, Gainesville, FL

Lamsal, S., S. Grunwald, G. L. Bruland, C. M. Bliss, and N. B. Comerford. 2005. Regional scale spatial distribution of soil nitrate-nitrogen in the Santa Fe River watershed in North-east Florida. Pedometrics Conference, Sept. 12-14, 2005, Naples, FL

Lamsal, S., G. L. Bruland, S. Grunwald, C. M. Bliss, and N. B. Comerford. 2005. Modeling of regional soil nitrate-nitrogen patterns using a mixed geospatial modeling approach. Fifth Annual Departmental Forum, Soil and Water Science Department, University of Florida, Gainesville, FL. September 2005

Lamsal, S., S. Grunwald, C. M. Bliss, I. Zamore-Lopez, G. L. Bruland, M. W. Clark and N. B. Comerford. 2004. Comparison of multivariate methods for predictive modeling of

soil properties in a mixed-use watershed in Florida. Annual Meeting of the Soil Science Society of America, Oct 31 – Nov. 2004, Seattle, WA

Lamsal, S., S. Grunwald, C. M. Bliss, I. Zamora-Lopez, N. B. Comerford and K. M. Portier. 2004. Spatial upscaling of site-specific nitrate-nitrogen measurements to the watershed scale in the Santa Fe River watershed. Fourth Annual Departmental Forum, Soil and Water Science Department, University of Florida, Gainesville, FL

**PROFESSIONAL MEMBERSHIP**

Soil Science Society of America

Ecological Society of America

South Eastern Division of the Association of American Geographers