



# Myakka

A Soil and Water Science Department Publication



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Florida State Soil

"MYAKKA"



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<http://soils.ifas.ufl.edu>



## FROM THE CHAIR...

Welcome to "Myakka", a publication of the Soil and Water Science Department. This publication is issued by our department to inform

our clientele, alumni, and friends about our teaching, research and extension activities and other associated events.

Myakka (pronounced 'My-yak-ah' – Seminole word for "big waters") gives a special identity to our department, as it is also the name of Florida's State Soil, Myakka fine sand. The State of Florida has the largest total acreage of Myakka fine sand (sandy, siliceous, hyperthermic Aeric Alaquod) on flatwood landscapes. On May 22, 1989, Governor Bob Martinez signed Senate Bill number 524 into law, making Myakka fine sand Florida's official state soil. These soils are poorly drained with high water-table and occupy more than 1.5 million acres.

Soil and water are among the most important of all natural resources. Maintaining soil and water quality is essential to sustainable agricultural productivity and the protection and conservation of natural resources. The Soil and Water Science Department (SWSD) has established itself as a leader in teaching, research, and extension/outreach programs in

the management and restoration of these resources.

The interdisciplinary nature of SWSD programs provides students and faculty with an opportunity to conduct basic and applied research on multiple scales (molecular to landscape) to solve environmental problems and protect and manage land and water resources.

The SWSD programs are designed to meet the changing needs of our clientele at state, national, and international levels. To meet new challenges and explore new opportunities, the SWSD's research, teaching, and extension programs are focused in five "thrust areas":

- **Management of Nutrients, Pesticides, and Wastes**
- **Remediation of Contaminated Soils, Waters and Aquifers**
- **Soil Quality and Ecological Indicators**
- **Soil-Landscape Analysis**
- **Wetlands and Aquatic Systems**

These areas reflect our current efforts to meet the changing needs our clientele in the State of Florida and provide an holistic approach to the protection of our land and water resources.

### PUTTING FLORIDA FIRST

Florida FIRST includes analyses of major trends and determinations of change including technological, human, natural resources, and institutional forces. Florida FIRST is a strategic planning process to enhance the UF/IFAS mandate for serving Florida's food, agricultural and natural and human resource sectors.

Our department is heavily involved in addressing the following Florida FIRST imperatives: Land and Water Management; Quality and Quantity Allocation; Managing Urban, Rural, and Human Impacts on Natural Ecosystems and Resources; Global Competitiveness of Current and Emerging Agricultural and Natural Resource Products; and Public Policy Issues. (<http://floridafirst.ufl.edu>)

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## TEACHING

### FALL 2000 GRADUATES

#### GRADUATE STUDENTS

Mark W. Clark, Ph.D., "Biophysical Characterization of Floating Wetlands (Flotant) and its Influence on Vegetative Succession of a Warm-Temperate Aquatic Ecosystem", Advisor: K. Ramesh Reddy.

Dirceu De Mattos, Jr., Ph.D., "Citrus Response Functions to N, P, and K Fertilization and N Uptake Dynamics", Advisor: Donald A. Graetz.

Travis A. Hanselman, M.S., "In Situ Methods for Measuring Net Nitrogen Mineralization Rates of Organic Soils Amendments", Advisor: Donald A. Graetz.

Juan G. Perez-Bolivar, Ph.D., "The Genesis of Carbon Sequestration in Subtropical Spodosols", Advisor: Mary E. Collins.

#### UNDERGRADUATE STUDENTS

Valerie K. Walen, BS, Environmental Management in Agriculture-Land & Water Management.

Our department is committed to providing a high-quality education to undergraduate and graduate students. Historically, graduate programs have been a major driving force of the teaching program in the department. We are actively evaluating various approaches to improve teaching programs and student recruitments at both graduate and undergraduate levels. These approaches will be discussed in detail at the upcoming teaching retreat planned for March 5, 2001.

Eight graduate students began their programs this Fall. They are: Katie Barch (M.S., J. R. White); Todd Osborne (Ph.D, K.R. Reddy); Travis Hanselman (Ph.D., D.A. Graetz); Lakeisha Hill (M.S., D.A. Graetz); Ioannis Ipsilantis (Ph.D., D. M. Sylvia); Arthi Krishnakumar (M.S., A.V. Ogram); Rebecca Vanderspiegel, (Ph.D., G.A. O'Connor); Jaime Sanchez, (Ph.D., S.R. Mylavarapu); Mayumi Seo (M.S., K.R. Reddy). Travis Hanselman has been awarded an Alumni Fellowship, while Todd Osborne is the recipient of the USDA National Needs Fellowship

Undergraduate programs of the Soil and Water Science Department (SWSD) include degree programs: SWS and Environmental

Management in Agriculture.

We are also going to revisit the specializations within the SWS major with an eye toward having only two specializations, one dealing with soil and one with water. In this light, we are also considering the development of a new undergraduate course dealing specifically with water, as this is a shortcoming of our present course offerings.

The Department has also set up a "distance education committee" to actively develop courses offered through Internet and media sources. Dr. David Sylvia is the SWSD distance education coordinator. We plan to develop several courses that can be used as a part of certification programs, such as bioremediation, nutrient management, and wetlands. At present we offer "Soil Microbial Ecology" through the Internet. "Wetlands and Water Quality", a web-based course currently under development, is funded through USDA Higher Education challenge grants. Our long-term goal is to offer a non-thesis graduate program through distance education.

### Graduate Research Forum

The 1<sup>st</sup> Annual Graduate Research Forum was held on September 28-29, 2000. The purpose of this forum was to: (1) present graduate student research in various departmental thrust areas, (2) promote graduate programs to recruit new students, and (3) enhance the interaction among graduate students and faculty, representatives from state and federal agencies, and private consulting firms and industry. The forum was coordinated by graduate students under the leadership of Mark Clark, a Ph.D. student, who functioned as the Coordinator of this program. A faculty committee including Bill DeBusk, Willie Harris, Rao Mylavarapu, George O'Connor, and Dean Rhue advised the students. The forum was attended by over 100 people, including students, staff and faculty, and representatives from state and federal agencies and private industry.



*Students at the Forum*

A total of 10 oral papers and 20 poster papers were presented at the forum.

Best oral paper presenters: **Patrick Inglett** (first place) and **Beth Kennelly** (second place). Best poster paper presenters: **Debbie Irons** (first place) and **John Leader** (second place).

Mark your calendars for the 2<sup>nd</sup> Annual Graduate Student Forum, scheduled for **September 5-6, 2001**, Reitz Union. Student Coordinator: Kanika Sharma 392-8927

## RESEARCH

The SWSD faculty have been very active in conducting basic and applied research in various ecosystems within and outside the State of Florida. The research focus has been within the five thrust areas, with emphasis on protecting agricultural and natural resources.

Our faculty have been very active in attracting extramural grant and contract funds from state and federal agencies, as well as private industry. The following are a few examples of projects funded by various sources.

The Soil and Water Science Department is the recipient of a \$671,125 award made under the **USDA- Initiative for Future Agriculture and Food Systems (IFAFS)**. The 4-year project is on Manure Phosphorus Management for the Suwannee River Basin: A Model for Highly Leachable Soils. Investigators include **Willie Harris, Vimala Nair, Dean Rhue, Don Graetz, Jerry Kidder, and Rao Mylavarapu** of the Soil and Water Science Department, and **Clint Truman**, soil scientist at the USDA-ARS Southeast Watershed Research Laboratory in Tifton, Georgia. This project will develop guidance in the form of a P index that will assess the risk of P loss from agricultural lands. It also includes extension and education components to assure that results are made known to those making critical nutrient management decisions.

**Andy Ogram, Ramesh Reddy, and Elisa D'Angelo** (former student in our department and now faculty at the University of Kentucky) were recently awarded \$847,000 from the **National Science Foundation** for ecological research in the Everglades. This project, which combines the expertise of microbiologists, biogeochemists, and statisticians, will attempt to link the composition of bacterial communities to biogeochemical cycling along nutrient gradients in the Everglades

Agricultural Area. This work will provide information on the effects of nutrient inputs into wetlands, assist in developing indicators of nutrient impact in Florida wetlands, and provide important information on the microbial ecology of these sensitive systems.

**Lena Ma, A. Green, G. Erdos and Y. Cai** are funded by the **National Science Foundation** to study Phytoremediation of arsenic contaminated soils and wastes: feasibility and optimization. \$185,000. Two Years. This study investigates the feasibility of using a hyperaccumulating plant at phytoremediate arsenic-contaminated sites. This will be accomplished by understanding and optimization of arsenic accumulation by the plant, investigation of arsenic speciation and distribution in the plant biomass, exploration of plant biomass disposal by gasification, and pilot demonstration of this new green technology on an arsenic-contaminated site.

**George O'Connor** was funded by **Water Environment Research Foundation** to study "the forms, solubilities, bioavailability, and mineralization of P in biosolids, manures, and commercial fertilizer". \$195,430. Two years.

Turfgrass program (**Jerry Sartain**) received a total of eight grants (total = \$130,000). Funding sources include – **FLDACS, Baker Chemical Co., Florida Turfgrass Associations, Sybron Chemical Corporation, NuGro Corp., Biotech Inc., Donlar Corp.**

**Ramesh Reddy, Bill DeBusk, Andy Ogram, Wendy Graham** are funded by the **U.S. Environmental Protection Agency** to study biogeochemical indicators of watershed integrity and wetland eutrophication. \$639,410 for 3 years. Co-investigators of this project include **Ed Lowe, Lawrence Keenan, and Matt Fisher** from the St. John's River Water Management District.

**Bill DeBusk, Ramesh Reddy, Andy Ogram, Debbie Miller, Jennifer Jacobs,**

**George Tanner, and Suresh Rao** (Purdue Univ.) are funded by the **U.S. Department of Defense** to determine indicators of ecological change at Ft. Benning, Ga. \$2,000,000 for 5 years.

### The Phosphorus Index UF/IFAS Role in its Development

The Phosphorus Index (P-Index) is a site specific, qualitative vulnerability assessment tool that allows a conservation planner to determine, from among a series of proposed P application sites, which sites are potentially most vulnerable to the off-site movement of P. The concept was originally introduced by a national group of scientists in the early 1990s. The work in Florida was initiated in August 1998 at a subcommittee meeting of the Florida USDA State Technical Committee on phosphorus concerns.

The Florida P-index Committee is co-chaired by **Don Graetz** of the SWSD and **Winston Tooke** of the state NRCS Office Florida. The major participants in developing the Florida P-index include **Willie Harris, Gerald Kidder, Rao Mylavarapu and Vimala Nair**, of the SWSD; **Ken Campbell** of the Agricultural and Biological Engineering Department; **Wade Hurt** and other personnel from the NRCS, the Florida Department of Agriculture and Community Services, the USDA Agricultural Research Service, as well as other agencies, organizations, and private individuals.

The Florida P-index has been field-tested at several sites by the above Committee, and as a result of this testing, several adjustments have been made in the original P-index to accommodate Florida conditions. Although the numerical result of the P index has no absolute value, the value is translated into a qualitative rating of low, medium, high or very high potential for P movement from the site. The Florida Phosphorus (P) Index was concurred in on November 13, 2000, by the USDA State Technical Committee and adopted by T. Niles Glasgow, NRCS State Conservationist. An index draft is available at: <http://seweb.ga.nrcs.usda.gov/fl/techttools.html>

Summaries of our key research findings are now published as "SWS-Research Briefs". Check out our website for details <http://soils.ifas.ufl.edu>

## EXTENSION

The SWSD extension faculty translate current, relevant soil and water science knowledge into user-friendly formats for Florida residents, visitors, industry, business, governmental agencies and county agents. Formats include publications, presentations, in-service training, videos, and computer software. These emphasize the SWSD's five thrust areas and 10 of the Florida Cooperative Extension Service State Major Programs (SMPs). SMPs cover precision agriculture, crop production and management, sustainable development and environmental regulations and water quality. The SWSD faculty's basic and applied research support extension efforts by addressing current and anticipated land, soil, and water resource uses and potential environmental problems. Extension publications produced by our faculty are located at: <http://edis.ufl.edu>

### Nutrient Management Education Core Group

**Rao Mylavarapu** was instrumental in creating a Nutrient Management Education Core Group which currently involves 30 faculty members from various departments and research and education centers. Successful functioning of this group will enhance the credibility of UF/IFAS faculty and educational resources and create a model point for liaison with agencies and the public. Rao also functions as the editor of the group's newsletter. For additional information contact [raum@ufl.edu](mailto:raum@ufl.edu)

### Alumni and Friends

Donor gifts from alumni and friends are a boost to our teaching, research, extension programs and without their support we would not be able to maintain a high level of academic excellence. We sincerely thank our alumni and friends for their generous support of SWSD programs. Gifts can be mailed to SWSD or to UF-Foundation Inc., SHARE, University of Florida, PO Box 110170, Gainesville, Florida 32611-0170.

## FACULTY, STAFF, and STUDENTS



**Donald A. Graetz**, Professor of Environmental Chemistry was elected to the Fellow of Soil Science Society of America.



**Ed Hanlon**, Center Director, South Florida REC and professor was elected as Fellow of the American Society of Agronomy.

**Hugh Popenoe** was appointed to a panel on African food security by the National Research Council.

**Rao Mylavarapu** has been appointed to the International CEU Committee of the Certified Crop Advisor Program, American Society of Agronomy. This membership deals with certifying courses/programs for CCA/CEU credits.



**David M. Sylvia**, Professor of Soil Microbiology was elected as a Fellow of Soil Science Society of America.

**Mr. Pete Straub**, Biological Scientist, at the ARL/ESTL received the UF/IFAS Superior Accomplishment award for the year 2000 in the Department.

**Kelly Lewis** and **Toyuna Grant** received SWSD Superior Accomplishment Award for excellence in overall job performance. Toyuna accepted a position with the Animal Science Department.

We would like to congratulate the students for winning the following scholarships: **Gerald Green**, the Frederick Buren Smith Scholarship; **Brian Murphy**, the SWS Outstanding Undergraduate Scholarship; **Christopher Appel** and **Melina Farve**, the Sam Polston Memorial Scholarship.

**Mark Clark** received the SWS Award for Excellence in Graduate Studies.