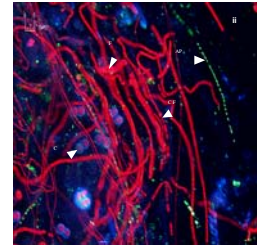
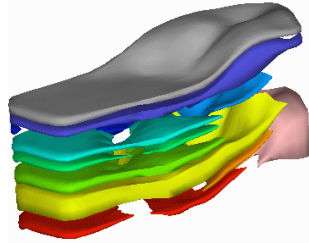


# Soil and Water Science



**ROAD MAP TO PREMINENCE**

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## SUMMARY

The Soil and Water Science Department (SWSD) at the University of Florida offers one of the strongest and most prestigious programs in soil, water, and environmental sciences in the nation. To build on the reputation of its faculty and programs, the Department must pay particular attention to future needs while maintaining current strength. The road map presented in this document functions as a guide to accomplish the Department's goals in the coming years. The plan includes 8 goals and 30 strategies aimed to achieve preeminence. The plan also includes a brief discussion on the Department's mission, vision, core values, program priorities, and constraints. For this plan to be successful, the faculty must be prepared to think outside the box and be open to creative and innovative, and be prepared to change the course to capture unexpected opportunities and address future challenges. Although the Department is committed to the strategic process, the plan will be reviewed on a regular basis and changed as needed to respond to future challenges and opportunities and provide vision and guidance for the growth and improvement of the Department.

### Goals

The goals supporting the department's mission and vision to achieve preeminence in soil, water, and environmental sciences are:

- Goal 1** ⇒ Attain preeminence in quality and effectiveness of academic programs.
- Goal 2** ⇒ Attain preeminence in research programs.
- Goal 3** ⇒ Attain preeminence in extension/outreach programs
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## PREAMBLE

**University of Florida's Soil and Water Science Department (SWSD) ranks among the largest and most prestigious departments in the nation.** With a distinguished record of accomplishments in teaching, research, and extension, the department has made a remarkable impact on the soil and water science discipline. The department has been the leader in graduate education with innovative programs that reach a wide range of students. The department has an outstanding record of meeting the needs of clientele through teaching, research, extension and outreach programs. **Overall, accomplishments of faculty, staff, and students in the past few years have continued to elevate the department's stature at national and international levels. We are not satisfied to reflect on the past, however, and strive for higher goals to reach preeminence in the field of soil, water, and environmental sciences.** To accomplish these goals, the department must take advantage of opportunities that enhance the effectiveness of its academic programs, while maintaining the relevance and impact of research, teaching, and extension/outreach programs. The department must have a vision to address the critical future needs of our clientele. The SWSD is organized as an academic unit within the University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS). Responsibilities of this unit include academic programs, research, extension education, and scientific/professional/community service. Soil and Water Science programs are located on the main campus in Gainesville as well as at 8 RECs located throughout the State. The department has developed an adaptive road map to preeminence as presented in the following pages. **The Department is committed to follow the strategies presented in this road map to achieve preeminence.** The plan is adaptive in nature, and will continuously change to ensure that the department's vision, core values, and goals remain relevant to meet the changing needs of our clientele.

## MISSION

The mission of the SWSD is to provide scientific leadership of the highest level in research, teaching, and extension for soil, water, and environmental sciences. By discovering new scientific knowledge and imparting that knowledge to fellow scientists, students, and citizens, the Department intends to assist in the resolution of soil and water issues related to agriculture and natural resources in Florida, the nation, and the world.

## VISION

Soil and water are vital resources in urban, agricultural, and natural ecosystems. The SWSD provides highly visible leadership in teaching, research, and extension/outreach programs to improve the productivity of agriculture with environmentally sound management practices, improve water quality, and protect and conserve natural resources. The department faces many new challenges in a rapidly changing environment at institute and professional levels, and the changing needs of clientele.

- The SWSD shall be a world-class center of excellence in the study of soil and water resources and in the application of knowledge to the solution of agricultural, natural resource, environmental, and land/water use problems.
- The SWSD shall be a premier learning center in soil and water science at the undergraduate and graduate levels and will adapt to the changing demographics and

educational needs of students. This includes meeting the professional needs of students on campus, and place-bound students (using a distance education program).

- The SWSD's research programs shall be cutting-edge and interdisciplinary and both basic and applied, with relevance to the needs of our clientele.
- The SWSD is committed to transferring research findings through its extension programs to appropriate audiences (e.g., farmers, regulatory decision makers, policy makers, legislators, classroom students, scientists, and other citizens) to ensure their application to critical problems.
- The SWSD shall engage in technology transfer by linkage with the private sector as appropriate through patents and licensing agreements that will maximize the beneficial effects of discoveries and inventions arising from departmental research.
- The SWSD is committed to maintain an active outreach program by offering relevant short courses to soil, water, and environmental professionals
- The SWSD shall work actively seek the input of clientele through formal and informal approaches, including deriving the expertise and insight of an external advisory panel or panels.

## CORE VALUES

- **Excellence:** The Department is committed to individual and collective excellence in every facet of its research, teaching, extension, and service functions.
- **Productivity:** The Department is committed to establishing and maintaining high productivity in all its programs, while maintaining high quality and relevance.
- **Creativity:** The Department is committed to be innovatively capturing new opportunities and developing new integrative programs, while maintaining strong foundations in current programs.
- **Accountability:** The Department places high value on accountability of its programs. This includes relevance of our programs to meet the needs of students, governmental agencies and industry.
- **Flexibility and Viability:** The Department shall be adaptive to the changing needs of our clientele. This includes optimization of departmental efforts and resources by engaging in collaborative, synergistic work and programs at every opportunity.
- **Partnerships:** The Department is committed to developing strong partnerships with our clientele through research and extension/outreach programs. The Department is committed to respond to the needs of the clientele.
- **Transparency:** The Department is committed to fostering and maintaining an open, honest, healthy, and fulfilling environment for its students, staff, faculty, and clientele.

## GOALS

The goals supporting the department's mission and vision are:

- Attain preeminence in quality and effectiveness of academic programs.
- Attain preeminence in research programs. Recognize advances and changes in the soil and water science disciplines and adapt programs accordingly to stay current and on the cutting-edge.
- Attain preeminence in extension/outreach programs
- Foster excellence in international programs
- Foster excellence in service and core laboratories
- Promote excellence in service to discipline(s), profession(s), institution, and community
- Foster excellence in administration
- Commit to continuous quality improvement in all programs

## STRATEGIES

The strategies that will be used to reach the SWSD's strategic goals are described below:

### **Academic Programs**

As an academic unit in a Land Grant University, the Department has fundamental responsibilities in the provision of high-quality education to undergraduate and graduate students. Those responsibilities include the development and delivery of a wide variety of courses targeted to students in our own and other majors; the maintenance of up-to-date curricula and specializations for students who select one of the majors or minors that we control; the recruitment of outstanding students from high schools, community colleges, and from UF and other universities/colleges into our major(s); and the placement of our graduates with appropriate employers to achieve satisfying, fulfilling careers for the graduates; and having positive, scientific impact on the employing organization and the profession/discipline.

#### ***Undergraduate Programs***

The SWSD is responsible for two undergraduate programs: (1) Soil and Water Science and (2) Interdisciplinary Environmental Management in Agriculture and Natural Resources (EMANR) with emphasis on Land and Water Management. The EMANR program is offered from two locations: Gainesville and Ft. Pierce. The Department is committed to improve current programs including additional courses, degree tracks, minors, and specializations, and to explore new opportunities to attract students to the Department.

#### ***Graduate Programs***

The Department offers an outstanding graduate education program and produces Masters and Doctoral graduates that are highly competitive in the scientific/professional community. Graduate programs have been a major driving force in the Department's overall effort. The Department is committed to be the center of excellence for graduate programs in soil, water, and environmental sciences.

## ***Distance Education Programs***

The Department offers an outstanding array of courses to place-bound students. These courses use innovative e-technologies, and are offered from Gainesville and from select RECs. In addition, the department also offers a graduate program for place-bound students. At present this program is offered at the Masters level. The Department is committed to reach an even broader group of students in the nation and the world in soil, water, and environmental sciences.

**Strategy 1** ⇒ Pursue excellence and innovation in learning

**Strategy 2** ⇒ Develop a new process for curriculum evaluation and improvement

**Strategy 3** ⇒ Improve the quality and diversity of students enrolled in our programs

**Strategy 4** ⇒ Maintain relevant course offerings

**Strategy 5** ⇒ Ensure that graduates are appropriately employed.

**Strategy 6** ⇒ Foster fundraising for scholarships and fellowships

## ***Pursue excellence and innovation in learning***

Currently the department provides a high quality learning experience to undergraduate and graduate students. The faculty need to explore innovative methods to improve learning, which may include the increased use of effective e-technologies, fostering critical thinking in the classroom, and challenging the students to function at their maximum potential. Learning methods used by to-day's students and students in the future will be different than today and are based on e-technologies. This requires the faculty to become familiar with, and to adopt, new learning techniques and instructional innovations. The role of hands-on experience in teaching should also be expanded.

- Encourage faculty to attend workshops and training programs on innovative teaching methods.
- Have each faculty write a reflective statement after each course is taught discussing new techniques and their effectiveness, and the techniques that worked well.
- Provide resources to increase student hands-on experience and out-of-class room projects
- Obtain resources through grants and contracts to support study-abroad programs.
- Explore opportunities to establish UF-SWSD hubs in select countries for DE programs
- Improve quality and delivery methods of distance education courses, including use of innovative e-technologies.
- Develop certificate programs in soil, water, and environmental sciences alone or in collaboration with other UF departments or centers.
- Increase student credit hours in undergraduate and graduate courses by offering additional relevant courses

## ***Develop a new process for curriculum evaluation and improvement***

Professional needs of students are constantly changing and will continue to change in the future. To meet these changing needs, the curricula must impart strong fundamentals, while transforming quickly to provide the highest quality of learning experience to students. This transformation may include: addition or deletion of optional and required courses, ensuring relevant course content, and reconsideration of the number of course required for graduation. The program must exhibit maximum flexibility to meet the current needs of students and potential employers.

- A departmental curriculum committee will research the current undergraduate SWS major and its specializations to determine its relevance and timeliness for current and future job markets, and contact potential employers for their input as well.
- The committee will examine Department curricula and course syllabi to determine if the material covered prepares students for the Council of Soil Science Examiners, Fundamentals and Professional Practice Examinations, for ARCPACS certification, and other certification/licensing programs as deemed relevant. The committee will then recommend changes in curricula and courses as appropriate.
- The committee will recommend ways and means by which the Department should continue to build and enhance the water-related content of SWSD courses and curricula.
- The committee will work with the faculty to modify existing curriculum and areas of emphasis and/or to create new curricula, specializations, and/or emphases based on committee findings.
- The Department is committed to actively participate in interdisciplinary graduate programs, including Hydrologic Sciences, Ecology, Wetland Sciences, and others.
- A standing or ad hoc committee will explore possibilities of cooperating with other relevant graduate programs. Examples include: Agro-ecology, Biogeochemistry, and others.

### ***Improve the quality and diversity of students***

Undergraduate programs: The Department will visibly, aggressively, and pro-actively recruit outstanding, qualified students from high schools, community colleges, UF, and other academic institutions, with emphasis in recruiting students from underrepresented groups.

- The Undergraduate Coordinator and undergraduate advisors will work with other faculty and with the office of the Dean for Academic Programs to create attractive, informative display(s) and handout materials explaining about our majors and minor(s) for use at recruitment functions and other occasions that present opportunities for information transfer.
- The Department will work with local schools and host science projects for select students interested in land, water, and environmental sciences.
- The Department will target potential majors by developing lists, with the help of the Office of Academic Programs, of outstanding prospects from among applicants, from pre-professional programs, from the engineering and natural resource colleges, and from among non-majors who have performed particularly well in our own course(s).
- The Department will seek ways to use our service courses and other courses to identify and attract majors, through the insertion of career-highlighting materials into course syllabi and through contacts with outstanding prospects while they are in our classes.

Graduate programs: The Department is committed to continue recruiting outstanding graduate students in soil, water, and environmental sciences.

- The Graduate Studies Committee will review current approaches used to recruit students and as necessary, develop new strategies to recruit high quality students.
- The Graduate Studies and Publicity Committees should maintain an up to date and user friendly web site describing individual faculty programs, range of graduate programs, career opportunities, and an alumni recruiting page.

- Develop new recruiting presentation packages to be given at professional conferences, on-campus recruiting venues, site visits to historically black colleges and universities, and other universities.
- The Department will work closely with minority universities in the State and develop joint graduate programs.

### ***Maintain relevant course offerings***

The suite of courses offered by the Department must meet the current and future needs of students and potential employers. The Department will continuously examine, and appropriately modify the assemblage of course offerings to ensure that the breadth of subject matter, the level of instruction, and rigor are appropriate to meet these needs. Additional mechanisms are needed to regularly revisit individual courses as to subject matter in relation to the target audience(s), relevance for our own and other majors, and support by proper FTE and expertise of instructor(s).

- The Department will investigate curricula around campus and contact departments as appropriate to learn what is needed in our courses to meet the needs of students in curricula outside our own majors.
- The Department Teaching Committee will work with faculty members to evaluate the list of course offerings and their contents/titles and make recommendations for revisions of existing courses, addition of new courses, and termination of existing courses to meet the needs of our own updated/revised curricula
- Individual faculty members, departmental peer evaluation teams, and the Department Chair will give particular attention to course syllabi and their “fit” within the departmental curricula and the suite of courses offered by the Department, with an eye for gaps and overlap.
- Faculty will design and implement undergraduate courses to be offered via distance learning, as part of formal degree programs, professional certification programs, and/or in fulfillment of other needs among off-campus students/citizens.

### ***Ensure that graduates are appropriately employed***

The Department is committed to ensure that employment of its graduates commensurate with student programs of study, academic performance, talents, skills, and potentials.

- Undergraduate advisors and the Department Chair will actively and continuously seek internship opportunities for our students with public agencies and private organizations, and will engage in ongoing communications with such agencies/organizations to learn of their needs, to gain feedback as to the performance of our interns, and to ensure that our graduates get a fair shot at permanent employment with these and similar organizations upon graduation.
- The Department will invite potential employers to events organized by the department and introduce them to prospective graduates.
- All faculty will be encouraged to discuss the employment question when dealing with collaborating agencies/organizations and clientele, with a view to ensuring that potential employers are made aware of the fact that we turn out educated, talented, skilled, thinking graduates.

### ***Foster fundraising for scholarships and fellowships***

The Department must aggressively pursue securing scholarships and fellowships. The department is committed to seek funding for graduate students from various sources including

state matching assistantships, alumni fellowships, national fellowships, and matching funds from state agencies and the industry.

- The Department needs to take maximum advantage of matching assistantships funded by the Dean for Academic Programs.
- The Department is committed to providing matching assistantships jointly to Gainesville faculty with graduate faculty status, including faculty at RECs and affiliate/courtesy faculty.
- The Department should pursue funding opportunities from partners and stakeholders (e.g., Water Management Districts, other state agencies, and industry).
- Faculty members should pursue extramural funding aggressively and continuously in support of graduate programs. Faculty will be encouraged, individually or collaboratively, to carry and/or pursue national-level teaching grants (e.g., EPA Training Grants, NSF, and other national needs fellowships).

## Research Programs

The Department is a unit in a Land Grant University with responsibilities under the Hatch and McIntire-Stennis Acts and other federal and state laws, and with the majority of its FTE assigned to the Florida Agricultural Experiment Station (i.e., in research). The SWSD faculty conducts targeted research in a wide range of ecosystems including: agricultural lands, forested lands, range lands, urban lands, and wetlands and aquatic systems. Research is conducted at multiple scales from molecular to landscape level. The SWSD research programs are interdisciplinary and faculty actively collaborate with researchers from other departments and universities and state and federal agencies.

Extramural funding including *grants*, *contracts*, and -- to a lesser extent -- *gifts* are the lifeblood of research in SWSD, although obtaining special newly appropriated funds to address pressing issues through, for example, the establishment of new faculty lines, are pursued. State and federal funds for research have been level for several years, which in effect amounts to a steady reduction of appropriated state and federal dollars for research. Furthermore, faculty should constantly examine their emerging discoveries and inventions and apply for patents and establishment of licenses as appropriate in a timely fashion. The Department and its faculty statewide need to be successful players in the extramural funding arena *and* in the conducting of relevant, timely research addressing the breadth of soil, water, and natural resource issues facing society. Success will depend heavily on our ability and willingness to engage in collaborative, interdisciplinary research with other scientists within the Department and across the campus, nation, and world.

**Strategy 7** ⇨ Focus on high quality, scholarly, high impact, and relevant research

**Strategy 8** ⇨ Facilitate and encourage interdisciplinary research

**Strategy 9** ⇨ Aggressively pursue extramural funding

**Strategy 10** ⇨ Engage in technology transfer

**Strategy 11** ⇨ Foster reporting and accountability

**Strategy 12** ⇨ Promote research forum, workshops, and symposia

***High quality, scholarly, high impact, and relevant research***

The Department must constantly strive to conduct high quality, scholarly, high impact, and relevant research.

- The Department should foster collaborative efforts across disciplines and sub-disciplines along the lines of the Thrust Areas that have been established at any given time.
- The Department should actively seek out highly qualified affiliate and courtesy faculty having relevant expertise to complement departmental programs. Such affiliate and courtesy faculty members should be encouraged to present seminars on campus.
- The Department should continue to ensure that the faculty located at RECs are fully integrated into Department Thrust Areas and other programmatic endeavors and made to feel they have a disciplinary/intellectual home in Soil and Water Science.
- Given the importance of water resources to the state and to the Department, the Department should seek to have at least one highly qualified courtesy faculty member from each of the five Water Management Districts in Florida, as well as other agencies/organizations.
- Increase refereed publication rate in high impact journals.
- Develop better communication of research results through research briefs and develop more coordinated linkages with extension programs

### ***Facilitate and encourage interdisciplinary research***

Most of the Soil and Water Science programs are interdisciplinary. The department has a long history of conducting interdisciplinary research with faculty from various departments, but the level of collaboration can be significantly increased.

- The department must actively pursue interdisciplinary projects with SWS faculty taking the lead role.
- Faculty should pro-actively seek out collaborators from other departments and agencies on research proposals, with a view to each faculty member having at least one collaborative sponsored project at any given time.
- Expand, coordinate, and integrate research with interdisciplinary programs conducted by UF-Water Institute and the School of Natural Resources and Environment.

### ***Extramural funding***

Faculty members will pursue extramural funding aggressively and continuously.

- The Department as a whole should strive to improve overall extramural funding from all sources.
- The Department Chair should continue to explore new funding sources and opportunities for faculty.
- The faculty are strongly encouraged to attend grant writing workshops and participate in grant review process including serving on review panels.
- The Department should maintain steady growth in extramural funding, with approximately a 10% increase per year
- Increase proposal submission rate to federal agencies including NSF, USDA, USEPA, DOD, and others
- The Department Chair and the senior faculty should strive to develop large interdisciplinary proposals that includes junior faculty members in the team and take the lead in select areas (examples: water quality, remediation, carbon sequestration, nutrient management, waste management, wetlands).
- The Department should work closely with the UF-Water Institute, the School of Natural Resources and Environment, and other interdisciplinary centers and programs and explore funding opportunities for interdisciplinary projects.

### ***Engage in technology transfer***

The Department needs to be aggressive in scientific/technological discovery and its proper, timely disclosure to the University whenever potential commercial applications are anticipated.

- Faculty members will be vigilant and decisive in the pursuit and identification of discoveries and inventions that may have commercial applications through patenting and licensing agreements. Proper and timely reporting to appropriate UF offices will be carried out.

### ***Foster reporting and accountability***

Researchers are accountable to extramural sponsors, to the University, and to the citizens of the state and nation. Mechanisms for reporting research results and their implications and impacts are in place, and other opportunities to “tell the world” about departmental contributions should be pursued.

- Each faculty member with 30% or more research assignment will be Principal Investigator on at least one active State Project at all times.
- All faculty members with research FTE will actively participate in their discipline(s)/subdiscipline(s) through regular attendance at conferences, timely and frequent presentation/publication of research findings, and at least triennial presentation of departmental seminars.
- Faculty, post doctoral fellows, and graduate students should actively publish grant funded project results in refereed nationally recognized journals.
- All faculty members with research FTE should participate in outreach to the public, including timely and thorough response to agency officials, and other citizens through phone and email requests for information, and participate in speaking opportunities to interest groups, government bodies, and the like.

### ***Promote research forum and workshops***

The Department should continue to show case its research programs through the annual department research forum and synthesis workshops.

- Conduct the annual Soil and Water Science Department Research Forum and showcase research conducted by graduate students, post-doctoral fellows, staff, and faculty. The Forum committee should invite representatives from funding agencies and the industry. Awards will be presented to the outstanding student, staff, and post-doctoral presenters.
- The Department in collaboration with others on and off-campus should continue to foster organizing thematic research conferences, symposia, and workshops

## **Extension/Outreach Programs**

As a unit in a Land Grant University, the department has the responsibility under the Smith-Lever Act to extend knowledge to off-campus audiences. The Department must be a major player in the extension education arena, across the breadth of its expertise, and employ the full complement of technologies (EDIS, compressed video, web pages, etc.) to reach audiences from extension faculty, to K-12 teachers/students, citizens, agency officials, policy makers, and others.

- Strategy 13** ⇒ Ensure that the breadth of our expertise is covered in our extension programs
- Strategy 14** ⇒ Foster extramural funding
- Strategy 15** ⇒ Foster reporting and accountability
- Strategy 16** ⇒ Increase the number of fee-based short courses on topics related to soil, water, and environmental sciences.

### ***Ensure that the breadth of our expertise is covered in our extension programs***

The Department must strive to ensure that its entire realm of expertise is covered with its extension programs. Each researcher should have an extension counterpart to turn to for (1) extending new knowledge, and (2) gaining feedback from client groups as to the priorities, relevance, and applicability of research to current real-world problems.

- The Department must maintain a lead role in select extension programs (examples: nutrient management, waste management, water quality, urban landuse, remediation of contaminated soils and waters, ecosystem restoration, and wetlands)
- An ad hoc extension/research faculty committee, including the SWSD Extension Coordinator will evaluate the breadth and depth of current extension programs and identify new strategies to make improvements.
- An ad hoc extension/research faculty committee, including the SWSD Extension Coordinator, will evaluate current extension expertise and identify the need for new faculty positions and resources
- Establish a stronger linkage between extension programs of Gainesville faculty and REC faculty.
- Extension faculty should strive to increase EDIS or related publication resources in all extension programs
- The Department should foster the development of e-extension programs for broader groups of clientele

### ***Foster extramural funding***

Faculty members will pursue extramural funding aggressively and continuously.

- The Department as a whole should continue to improve overall extramural funding from all sources.
- Each faculty member is expected to pursue extramural funding to support demonstration projects
- Each faculty member with majority or minority assignment in extension will be encouraged to lead or play a major role in at least one interdisciplinary grant and/or grant proposal each year.
- The Department should maintain steady growth in extramural funding, with approximately 10% increase per year.
- Foster stronger linkage between extension and research faculty. Many state and federal agencies now require extension/outreach component as a part of the proposals.

### ***Foster reporting and accountability***

Extension faculty are accountable to the state and federal Extension Services, to county faculty, to clientele, and others. Mechanisms for determining and reporting impacts of extension programs already developed and used.

- Each faculty member with 30% or more assignment in extension will be a member of at least one Extension State Major Program related to his or her program.

- Each faculty member with extension responsibilities will establish mechanisms for determining and quantifying impacts of his or her programs on targeted audiences and on the state.
- All faculty with extension appointment will produce products including EDIS publications, brochures, CDs and web sites, and other related electronic materials.

### ***Short courses on topics related to soil, water, and environmental sciences.***

The SWSD offers several short-course on various topics related to soil, water, and environmental sciences. These short courses are targeted mainly to practitioners, professionals, country agents, regulators, and others interested in water quality and environmental issues. The Department is committed to enhance the range of short courses to meet the needs of our clientele.

- The Extension Coordinator as a part of an ad hoc committee will review the current short-course offering, and identify gaps with inputs from clientele.
- Increase the frequency and number of short courses offered each year as appropriate.
- Review the quality of short courses with input from the participants who attended the course.
- Develop short courses in web-based format to reach a larger audience.
- Explore opportunities for funding to develop courses using innovative e-technologies.

## **International Programs**

The Department has been an active participant in international activities. Faculty development leaves and/or extended visits have taken faculty to such countries as Australia, Brazil, Cameroon, China, Malawi, New Zealand, Spain, Turkey, Uganda, and Venezuela in recent years. Scientists from several countries have spent sabbaticals or extended study visits here, not to mention the wide variety of nations represented at any given time, by our graduate students and post-doctoral research associates. Our international contacts have tended, however, to be rather “ad hoc”, relying on individual faculty relationships with counterparts in other countries and lacking formal, long-term arrangements, memoranda of understanding, or contracts. The Department needs to expand its involvement in international programs, with an awareness that (1) Florida cannot function in isolation from other countries and cultures, and (2) science is an international endeavor that has no borders. We must explore ways to formalize active, long-duration contacts and collaborations with other countries, and afford our faculty and students opportunities for international experiences.

**Strategy 17** ⇨ Formalize international contacts

**Strategy 18** ⇨ Expand international opportunities for students

### ***Formalize international contacts***

The Department should continue to explore possibilities for formal arrangements with institutions in other countries for the benefit of science and the mutual benefit of our scientists. Explorations of opportunities potentially involving the Department should take place at the administrative (Department Chair, Deans, Vice President, Director of UF/IFAS Office of International Programs, Director of UF International Programs), *and* at the scientist/faculty level, with leadership coming from the Department’s International Programs Liaison and others with strong and current international contacts.

- The Department should pursue opportunities to engage foreign institutions in formal and/or semi-formal arrangements and collaborations between/among our organizations. When promising prospects appear, the Chair will work with appropriate faculty and with the UF/IFAS Office of International Programs to determine whether there is merit in pursuing an agreement of some kind.
- The Department Chair and others will strive to pursue funding opportunities from agencies such as USAID, USDA, NSF, Foundations, to support collaborative programs.

### ***Expand international opportunities for students***

The Department needs to “internationalize” its undergraduate and graduate teaching programs for the benefit primarily of its domestic students who will be operating professionally/scientifically after they graduate in a world market of experiences, ideas, and science.

- With leadership to come from the Department’s Contact for Students Interested in International Study, the Department will examine its courses and curricula with a view to in the international dimension of what our undergraduate and graduate students are introduced to in the classroom.
- Department faculty will actively seek out opportunities and funding for our domestic students to experience foreign travel, study opportunities, research opportunities, and internships.
- Department will continue to explore new opportunities to expand current distance education programs to reach international audience.

## **Soil and Water Science Service and Core Laboratories**

The laboratories described below provide service to SWSD faculty and to collaborators from other UF-departments, agency, and industry personnel. The Department provides IFAS wide service through Extension Soil Testing Laboratory (ESTL), Analytical Research Laboratory (ARL), and Stable Isotope Mass Spectrometry (SIMS) Laboratory. For details see: <http://soils.ifas.ufl.edu/department/newsletters/summer06.pdf>

**Strategy 19** ⇔ The Department is committed to maintain laboratories of excellence to support soil, water, and environmental sciences programs

### ***SWS research core laboratories***

The SWSD faculty and students use a wide range of analytical and field instrumentation in their research programs. To maximize the use of these analytical instruments, groups of faculty established several core laboratories in the department with the objective of sharing instrumentation and avoiding duplication of facilities. The instrumentation in each core laboratory was purchased by select faculty through their grants and contracts with some matching support from state funds.

- The Department is committed to maintaining core laboratories for use by all faculty and students.
- A core laboratory committee should regularly review instrumentation and staff needs for each of the laboratory and seek funding from grants and contracts and matching funds from the department and IFAS Research Administration.
- Select core laboratories shall maintain appropriate certification to meet State of Florida’s QA/QC requirements

- Individual core laboratory committees will establish appropriate price structures to recover the cost of analysis.
- SWSD faculty in collaboration with other departments, should aggressively pursue extramural funding for major instrumentation.
- The Department will develop a plan to assign one dedicated TEAMS position to each core laboratory.

### ***Extension soil testing laboratory (ESTL)***

The Department is committed to providing soil testing services for growers, ranchers, homeowners, and extension agents -- assuming appropriate and sufficient infusion of resources from user fees and from the IFAS administration -- through its Extension Soil Testing Laboratory (ESTL).

- The Department will serve the citizens of Florida, including growers, homeowners, and other interested parties, by providing soil and water testing as an educational service through the Cooperative Extension Service.
- The Department will provide analytical services needed to assist with teaching and extension activities and to implement extension field demonstrations involving proper management techniques and improved agricultural/environmental testing procedures for efficient fertilizer use.
- The Department will work with the Soil Testing and Analytical Research Labs' Oversight Committee and the UF/IFAS administration to make these labs self supportive with a fee structure that allows the Lab to pay for its operating expenses and equipment replacement using cash flow and an appropriate carry-forward mechanism.

### ***Analytical research laboratory (ARL)***

The Department is committed to providing selected analytical services for IFAS researchers -- assuming appropriate infusion of resources from researchers and from the IFAS administration - through its Analytical Research Laboratory.

- The Department will offer high quality analytical services for a suite of standard tests.
- The Department will provide this analytical service in a timely manner, while addressing proper sample-handling, standardized sample custody procedures, and quality assurance reports.
- The Department will work with the Soil Testing and Analytical Research Labs' Oversight Committee and the UF/IFAS administration to make these labs self supportive with a fee structure that allows the Lab to pay for its operating expenses and equipment replacement using cash flow and an appropriate carry-forward mechanism.

### ***Stable isotope ratio mass spectrometry (SIMS) laboratory***

The Department established the SIMS laboratory for use by UF faculty. The instrumentation was purchased jointly in collaboration with Botany and Geology departments.

- The SIMS laboratory committee will review the use of the instrumentation and make modifications in the price structure and use of the instrumentation.
- The faculty associated with SIMS laboratory should aggressively seek extramural funding to support future improvement in the instrumentation.

## **Service to Discipline(s), Profession(s), Institution, and Community**

The Department and its faculty need to be highly visible in the discipline of soil, water, and environmental sciences in the professional ranks of soil and water scientists/practitioners, in the University of Florida community, and in the outside community through various forms of “service”. Service in these contexts encompasses a wide variety of activities and contributions that do not constitute our primary job assignments, but are an essential element of our professional responsibility. Faculty members can have significant impacts upon the intellectual vitality of their discipline(s), on the functioning of scientific/professional organizations, on the informed establishment of science-based policy, and on the knowledge and interest-level of citizens. The goal of the Department is to be involved visibly and effectively in service of several different types.

**Strategy 20** ⇨ Serve scientific disciplines and professions

**Strategy 21** ⇨ Provide information, insights, and assistance to citizens

### ***Serve scientific disciplines and professions***

Each faculty member should strive to be a contributing member of various professional and disciplinary bodies, be they editorial boards, committees, task forces, advisory boards, or the like. Faculty members are encouraged to serve on state or regional and/or national or international committees, task forces, boards, or other bodies conducting the affairs of a scientific/professional society, agency, or other appropriate body.

- Faculty should be members of one or two key national professional societies and actively participate in society activities.
- Senior faculty members (Associate Professor or equivalent and above) should strive to be in a leadership role (Chair, Convener, etc.) on at least one state or regional and at least one national or international committee, task force, board, or other body that is conducting the affairs of a scientific/professional society, agency, or other appropriate body.

### ***Provide information, insights, and assistance to citizens***

Department faculty should be involved in their communities. As scientists, we have an obligation to ensure that local debates and decisions are factually based. As public servants, we should be willing and available to give something back to the people who not only employ us but who, in the cases of many of us, helped to subsidize our educations.

- Each faculty member should make himself/herself available for local activities or programs, that affords visibility to soil and water resources and to soil and water science, and gives the discipline a voice in local affairs. Such activities/programs might include citizen’s advisory boards to local units of government, nature/environmental camp activities, science fair administration/judging, writing of popular and informative articles for local periodicals, and so on.

## **Departmental Administration**

One of the major limitations to the Department’s achievement of preeminence is its physical facilities, especially the quality of laboratory space which is very poor. IFAS administration has made a new building to house the department a high priority. In the mean time the Department is committed to use the existing facilities in an optimal manner for maximum efficiency.

**Strategy 22** ⇨ Evaluate the department’s management and decision-making process

**Strategy 23** ⇒ Formalize contacts and communications with stakeholders

**Strategy 24** ⇒ Improve alumni relations and development

**Strategy 25** ⇒ Increase involvement with practitioners of the discipline/profession

### ***Evaluate the department's management and decision-making processes***

The Department should regularly review the procedures and policies used in management and the ways in which decisions are made that affect programs, allocation of resources, faculty assignments, and efficiencies of operations.

- The Department Chair and Chairs of standing departmental committees, and other appropriate bodies, should evaluate and recommend to the faculty a revised listing of appropriate standing committees -- including charges to and responsibilities of those committees -- for the Department. Upon approval by the faculty, the new suite of committees should be established and given their charges and responsibilities.

### ***Formalize the department's contacts and communication with stakeholders***

The Department needs to formalize the manner in which stakeholders provide feed back to SWSD programs. The Department as a whole should establish an External Advisory Committee to gain advice, insights and recommendations regarding not only our extension programs, but also research and teaching programs as well. Questions to the Committee will include the relevance and quality of our extension programs, the relevance and quality of our research programs, and the relevance and quality of our undergraduate/graduate courses and curricula.

- An External Advisory Committee of up to ten stakeholders representing natural resources, agricultural, and environmental interests in the public and private sectors will be established to provide guidance to the Department's extension, research, and teaching programs. This Committee will meet with the Department at least annually.
- The Department will brainstorm internally on a continuing basis, with particular emphasis to be given to the subject at statewide faculty meetings, and in collaboration with other units and with stakeholders, to generate viable, timely ideas for legislative initiatives involving research, extension, and/or teaching, to be proposed to the Deans and Vice President for inclusion in the UF/IFAS legislative budget request for the upcoming year.

### ***Improve alumni relations and development***

The Department needs to improve communication with alumni, former employees, and other friends of the Department. Doing so provides an enjoyable and rewarding set of contacts that are good for the Department, the discipline, and the profession. Similarly, the Department needs to stay in touch with its former employees (faculty, staff, post-docs, etc.) to the extent possible, and also with practitioners of soil and water science in Florida who may never have been associated formally with the Department.

- The Department should maintain alumni contact information and seek their input on a regular basis. Selected alumni should be highlighted in the newsletter on a regular basis.
- The Department has few scholarship programs, and very little discretionary Foundation money with which it can enhance academic, research, extension, and alumni-targeted outreach programs. Without being overbearing or impinging on any giving that alumni and friends may already do with the UF Foundation, SHARE, the 4-H Foundation, etc., the Department should initiate a fund-raising campaign among alumni and friends with

the objective of increasing our endowed and discretionary resources for scholarships and for Department activities.

- The Department will establish an annual fund-raising drive targeted to alumni, current and former faculty members, friends, and other supporters. Funds raised will be directed as appropriate to existing scholarship endowments and/or to the Department's unrestricted SHARE account for non-endowed scholarships and appropriate activities/programs.

### ***Involvement with practitioners of the discipline/profession***

As the only academic unit in the entire state of Florida offering comprehensive teaching, research, and extension programs in soil and water science, the Department has a unique obligation for strong ties to practitioners of soil, water, and closely related sciences throughout the state. Such ties can help practitioners keep abreast of the latest research findings and help us kept abreast of issues practitioners encounter in their work. The Department needs to establish and maintain close contact with soil and water science practitioners who work in Florida, or whose organizations have interests in Florida.

A data base of practitioners of soil and water scientists needs to be created from our own alumni records, the membership roles of the Florida Association of Environmental Soil Scientists, the Soil and Crop Science of Florida, the National Society of Consulting Soil Scientists, the Soil Science Society of America, and the Soil and Water Conservation Society. This list should be added to our alumni, emeritus faculty, and friends of soil and water science listing for mailings of newsletters, invitations to open houses, solicitations of support for department scholarship accounts, and so on.

Soil and water science practitioners involved in particularly timely and interesting issues should be invited to present departmental seminars. Conversely, our own faculty and students should be encouraged to attend and participate in meetings of the various soil and water science organizations around the state as appropriate.

The Department and its faculty are encouraged to be involved in continuing education and such certification programs as the Certified Crop Advisor Program, ARCPACS, and Soil Science Fundamentals and Practice Examinations.

## **Continuous Quality Improvement**

To attain preeminence in teaching, research, and extension programs, the Department must strive for continuous quality improvement. The following are a few strategic goals to foster continuous quality improvement.

- Strategy 26** ⇒ Assess outcomes
- Strategy 27** ⇒ Promote professional development for faculty and staff
- Strategy 28** ⇒ Seek improvements in current physical facilities
- Strategy 29** ⇒ Develop a strategic plan for future staffing of the department
- Strategy 30** ⇒ Widely disseminate information on Department successes and accomplishments

### ***Assess outcomes***

The continued success of the Department depends on monitoring outcomes (number of graduates, research and professional impact, national and international recognition, and other

indicators). This monitoring involves collecting and reacting to feedback from clientele including alumni, state agencies, industry, and others. The Department must collect such input from all of its clientele and use this information to improve the quality of the deliverables.

- An “outcomes assessment committee” will develop a mechanism for outcomes assessment. This committee will conduct surveys on a regular basis.

### ***Promote professional development for faculty and staff***

Faculty professional development is usually marked by promotion through ranks of assistant, associate and full professor. Although these milestones mark one’s career progress, for some of the faculty there is a potential that they may become narrowly focused in certain areas that may limit their long-term professional development. It is important that faculty are made aware of all opportunities the University has to offer for their professional development in potentially new and exciting areas.

- During the faculty evaluation meeting, the Department Chair will review faculty career development and encourage faculty to think strategically about their program and future
- On an annual basis the faculty should be asked to develop one-page description of their career direction and objectives.
- Similarly, the staff will be asked to identify opportunities for professional development and growth.

### ***Seek improvement in current physical facilities***

At present physical facilities in Gainesville are not conducive for quality development of faculty and staff. This is a serious problem that limits research productivity and opportunities, recruiting and retention of high caliber faculty and students

- The Department Chair will continue to emphasize to the IFAS administration the need for quality space.
- The Department must obtain resources to improve current facilities.

### ***Develop strategic process for future staffing of the department***

To maintain national and international reputations, the Department must continuously identify areas of opportunity that address future needs of our clientele and aid in future faculty and staff hires. The programmatic need for faculty positions should be discussed by faculty on a regular basis.

- The Department will identify future needs of faculty positions with input from all faculty and external advisory council

### ***Widely disseminate information of the Department successes and accomplishments***

The Department must be highly visible not only within the system but more importantly at state, national, and international levels. In to-day’s information age, it is important that the Department’s successes and accomplishments are widely publicized using brochures, internet, and other marketing strategies.

- The Department must invest in a staff member who is dedicated to developing new ideas, promotional materials, newsletters, newspaper articles, and other marketing strategies.

## **Programmatic Priorities and Resources**

The SWSD has been successful in maintaining strong programs in teaching, research, and extension/outreach programs to meet the needs of our clientele in the State of Florida, with broader implications at regional, national, and global scales. The interdisciplinary nature of these programs provides an opportunity to conduct basic and applied research at multiple (molecular to landscape) scales to solve environmental problems and protect and manage land and water resources. At present major emphasis of our programs is focused soil and water quality issues in a wide range of ecosystems including: agricultural lands, forested lands, rangelands, urban lands, wetlands, and shallow lakes, springs, and estuaries. Global significance of our education, research, outreach/extension programs are: water quality, ecosystem productivity, carbon sequestration, greenhouse gases and climate change, and public health. The Department should review current thrust areas and identify our strengths and gaps.

Current resources available in the Department are not adequate to accomplish the goals set in this plan. The Department needs the following resources to strengthen current programs and be prepared to capture emerging opportunities and to address changing needs of clientele.

- Improved physical facilities. New building on UF main campus to house SWS programs
- Faculty positions to maintain core strength of the department.
- Faculty positions in new strategic areas to capture emerging opportunities
- Technical staff to support and maintain core laboratories
- Funds to purchase and maintain state-of-the-art instrumentation

Here are some examples of faculty positions needed in the department (these are just suggestions and will be discussed during state-wide faculty meeting).

#### Faculty Needs – Gainesville

Urban Landuse and Management (50E/25R/25T)  
Organic Biogeochemistry (70R/30T)  
Vadose Zone Hydrology (70R/30T)  
Soil Management (70R/30T)  
Environmental Informatics (70R/30T)  
Environmental Microbiology (70R/30T)  
Urban Lands Biogeochemistry (70R/30T)  
Watershed Biogeochemistry (70R/30T)  
Waste Management (70E/30R)

#### Faculty Needs – RECs

Soil and Water Quality – Milton  
Soil and Water Quality - Apopka

## Benchmark Measures

The Department uses the following benchmarks to assess progress toward preeminence.

### Input measures

- Graduate enrollment per FTE (full-time equivalent) faculty

- Undergraduate enrollment per FTE (full-time equivalent) faculty
- Faculty teaching load (courses per FTE)
- Student credit hours per FTE
- Graduate student assistantships and fellowships
- Graduate Record Exam (GRE) scores of graduate students
- Grants and contracts per faculty FTE
- Faculty salaries by rank
- Annual gifts and endowments to the department

## **Output measures**

- Number of masters and doctoral degrees granted per year
- Number of undergraduate degrees granted per year
- Number of scholarly publications per faculty FTE
- Quality of journals in which research is published
- Number of citations of faculty research work per faculty FTE
- Number of students involved in scholarly publications
- Number of post-doctoral fellows involved in scholarly publications
- Number of patents
- Awards for faculty, staff, and students
- Number of elected Fellows in professional societies
- Impact of programs in addressing the needs of clientele