UF WATER INSTITUTE 5 YEAR ACCOMPLISHMENT REPORT
June 2006-April 2011

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1. EXECUTIVE SUMMARY

Over the last five years, the University of Florida Water Institute has emerged on campus, and in the state, as a leader in coordinating interdisciplinary research, education and outreach programs designed to develop and share new knowledge, and to develop and encourage the implementation of new technology and policy solutions for water issues. Dedicated efforts have forged linkages among diverse groups of faculty and graduate students representing a breadth of water specialties from geophysical to biological to social sciences, engineering, law and humanities. Through research coordination and collaboration; synthetic cross-disciplinary studies and projects; dataset compilation and sharing; joint proposal development; seminars and symposia, the Water Institute is adding value to the University of Florida. Illustrative examples of innovative research, education and outreach programs that resulted from the creation of the UF Water Institute are described below.

Research: The Water Institute has brought together interdisciplinary faculty and graduate student teams to develop proposals to external agencies worth over $55 Million. These proposals included a $4.5 million proposal for a National Science Foundation (NSF) Critical Zone Observatory submitted in 2007, a $25 million proposal for a NSF Science and Technology Center submitted in 2008, a $1.2 million proposal for a NSF Innovative Technology Experiences for Students and Teachers project submitted in 2009, and a $4 million proposal for a NSF Water, Sustainability and Climate Project submitted in 2010. These efforts have created new collaborative linkages among UF faculty, as well as agencies and institutions across the country, and have resulted in external awards totaling approximately $9 million. In addition to these Water Institute projects, Water Institute faculty members individually manage over $100 million in other externally funded projects.

Education: The Water Institute Graduate Fellows program (WIGF), initiated in 2010, is changing the culture of graduate education at UF. The WIGF program supports interdisciplinary faculty-graduate fellow teams to conduct integrative research in emerging areas of water science, including the social, natural, and engineering sciences. The Deans of the UF College of Agricultural and Life Sciences, College of Liberal Arts and Sciences, School of Natural Resources and Environment, and the Chair of the Department of Environmental Engineering have committed Graduate School Fellowships for biennial cohorts of 6-8 Ph.D. students to participate in this program. Using gifts provided by the Swisher Foundation and the Sherwood-Stokes Foundation, the Water Institute leverages this UF investment by providing a competitive graduate fellow research grants program to support field, laboratory and computer analyses by the faculty/student cohort as well as integrative activities to support their development into a cohesive interdisciplinary cadre of professional researchers.

Outreach: A biennial Water Institute Symposium, sponsored by the Progress Energy endowment with significant additional contributions from organizations throughout the state, has been established. These symposia bring together researchers, engineers, policy makers, water managers, industry representatives, lawyers, students and citizens to consider the challenges to water resources sustainability; explore solutions for pressing issues; and provide broad-based recommendations for research, education, technology and policies to ensure water resources sustainability for Florida and beyond. More than 400 people (>60% external to UF) have

attended each symposium. Evaluation surveys indicate that 99% of participants agree or strongly agree that the themes of the symposia and the content of the sessions are timely and informative, and 98% of participants plan to attend a UF Water Institute Symposium again.

The next five years will be an exciting time for the Water Institute. The Water Institute has built internal and external partnerships needed to address relevant and urgent research challenges, implement innovative interdisciplinary training programs for promising students, and provide state-of-the-art expert assistance and knowledge transfer programs for external stakeholders. With continued base funding from the University of Florida; sustained external funding for innovative interdisciplinary research, education and knowledge transfer projects; and on-going revenue from new and existing endowments, the UF Water Institute is well-positioned to build on the programs and reputation established within the Southeastern US and to create broad new national and international impacts.

2. INTRODUCTION

Florida's burgeoning human population and vulnerability to both climatological and anthropogenic changes in the water cycle make the state a unique living laboratory to develop new knowledge and test solutions to global water problems. In recognition of the importance of water issues, and the need to address them in a new interdisciplinary manner, the University of Florida (UF) established a campus-wide interdisciplinary Water Institute in May 2006.

Over the last five years, the Water Institute has emerged on campus, and in the state, as a leader in coordinating interdisciplinary research, education and outreach programs designed to develop and share new knowledge, and to develop and encourage the implementation of new technology and policy solutions for water issues. Dedicated efforts have brought together diverse groups representing a breadth of water specialties from geophysical to biological to social sciences, engineering, law and humanities. Through research coordination and collaboration; synthetic cross-disciplinary studies and projects; dataset compilation and sharing; joint proposal development; seminars and symposia, the Water Institute is forging links between researchers across disciplinary fields and developing a new generation of students. This report describes the Water Institute's progress in accomplishing the goals set out in the 2004 Water Institute Task Force Report (Appendix 1) and the Water Institute 2007-2010 Strategic Plan (Appendix 2) and provides a look toward the future.

2.1 Mission

The UF Water Institute brings together talent from throughout the University to address complex water issues through innovative interdisciplinary research, education, and public outreach programs.

2.2 Vision

Interdisciplinary UF Water Institute Teams, comprised of leading water researchers, educators and students, develop new scientific breakthroughs; creative engineering, policy and legal solutions; and pioneering educational programs that are renowned for addressing state, national, and global water problems.

2.3 Values

Partnerships**:** The Water Institute recognizes the importance of developing strong inclusive partnerships among Water Institute affiliate faculty, and with external stakeholders, to identify and prioritize critical water issues requiring interdisciplinary expertise.
Expertise**:** The Water Institute is committed to developing the basic knowledge, practical experience, and infrastructure required to respond to stakeholders' emerging water issues.
Excellence**:** The Water Institute is committed to provide excellent interdisciplinary water-related research, education and outreach programs that are recognized within the state of Florida, the nation and the world.
Respect**:** The Water Institute provides services that acknowledge and respect the expertise of all Water Institute affiliate faculty; it also recognizes the personal values, cultures, and socioeconomic context of its diverse external stakeholders.

2.4 Goals

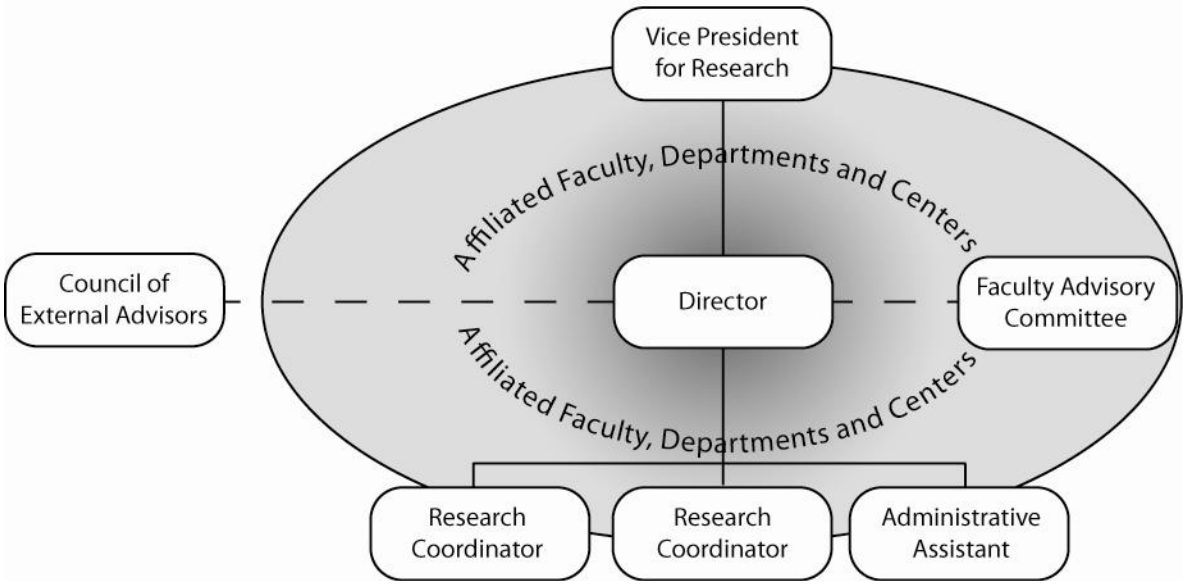
The overarching goals of Water Institute programs are to:

- Improve basic knowledge of the physical, chemical, and biological processes in aquatic systems (rivers, lakes, springs, estuaries, wetlands, soil and ground waters).
- Enhance understanding of the interactions and interrelationships between human attitudes and activities, and aquatic systems.
- Develop and promote the adoption of improved methodologies for water management and policy (including quantity, quality and ecosystem services) based on a foundation of science, engineering, management and law.

3.0 ORGANIZATION

The Water Institute is led by a full-time director, who reports to the Vice President for Research (Figure 1). Two research coordinators with advanced degrees assist the director in the development, execution and evaluation of Water Institute programs. An administrative assistant serves as office accountant, office manager, and website/database developer.

Figure 1: Organizational Chart for University of Florida Water Institute



Individual faculty affiliation with the Water Institute is through voluntary registration in an on-line faculty expertise database. All registered faculty are considered Water Institute Affiliate Faculty members and eligible to vote on Water Institute governance issues. All Affiliate Faculty members retain their positions in their tenure department homes where all administrative and performance review functions are carried out. Currently there are over 200 University of Florida

faculty members from more than 65 departments and centers affiliated with the Water Institute. Levels of faculty engagement vary from periodic attendance at Water Institute seminars and symposia to dedicated engagement in interdisciplinary proposal development and project execution, reflecting variations in shared interests, time and other resources. See http://waterinstitute.ufl.edu/FacultyExpertise/Expertise.aspx for the searchable on-line database of Water Institute faculty members.

An internal Faculty Advisory Committee (FAC) for the Water Institute consists of 15 members of the Water Institute Affiliate Faculty. Ten members of the FAC are elected by members of the Water Institute Affiliate Faculty on staggered 3 year terms. Five members are appointed by the Water Institute director to ensure balance among disciplines. See Table 1 for a list of current FAC members. Over the past 5 years, a total of 20 faculty members, representing 15 departments and 6 colleges, have participated on the FAC, ensuring Water Institute programs reflect departmental programs and faculty strengths.

An ad-hoc External Council of Advisors consists of speakers who have participated in the Water Institute Distinguished Scholar Seminar Series. These individuals are representatives of leading academic institutions in a wide range of water-related fields, many of whom are National Academy members and two of whom are Stockholm Water Prize winners. For a list of Distinguished Scholar Seminar Series speakers see http://waterinstitute.ufl.edu/seminars/seminars.asp.

Table 1: 2010-2011 Water Institute Faculty Advisory Committee

Name	Department	College
Mary Jane Angelo	Environmental Law	Law
Michael Annable	Environmental Engineering Sciences	Engineering
Tatiana Borisova	Food and Resource Economics	Agricultural and Life Sciences
Mark Brenner	Geological Sciences	Liberal Arts and Sciences
Thomas Frazer	Fisheries and Aquatic Sciences	Agricultural and Life Sciences
Dorota Haman	Agricultural and Biological Engineering	Agricultural and Life Sciences/Engineering
Karl Havens	SeaGrant	Agricultural and Life Sciences
Jonathan Martin	Geological Sciences	Liberal Arts and Sciences
Christopher McCarty	Bureau of Economic and Business Research	Business
Martha Monroe	Forest Resources and Conservation	Agricultural and Life Sciences
Rafael Munoz-Carpena	Agricultural and Biological Engineering	Agricultural and Life Sciences/Engineering
Christine Overdevest	Sociology and Criminology & Law	Liberal Arts and Sciences
Ramesh Reddy	Soil and Water Sciences	Agricultural and Life Sciences
Peter Sheng	Civil and Coastal Engineering	Engineering
Jane Southworth	Geography	Liberal Arts and Sciences

4.0 ACCOMPLISHMENTS

The following summarizes highlighted accomplishments toward the goals set out in the Water Institute 2007-2010 Strategic Plan (Appendix 2). Excellent progress has been made toward all of our strategic objectives. Although accomplishments for specific projects, programs and initiatives are reported under particular strategies, each accomplishment contributes to multiple strategies and objectives to achieve the overall Water Institute mission and vision.

4.1 Strategy 1: **Develop partnerships with external stakeholders to identify and prioritize critical water issues requiring interdisciplinary expertise, as well as to provide expertise and support for addressing these issues.**

4.1.1 Objectives

- Provide a portal for external stakeholders seeking water-related expertise.
- Provide a focal point for water-related research and education at UF.
- Engage external state, national and international partners in prioritizing and executing Water Institute programs.

4.1.2 Accomplishments

UF Water Institute programs have facilitated networking both on campus and externally. Activities listed below have enhanced coordination and cooperation among water resources stakeholders including academic, industry, governmental and non-governmental organizations. Through these programs the Water Institute has established itself as the "go-to" location for linking to a wide range of water expertise focused on complex water issues.

- A comprehensive website was developed to provide UF faculty, students and external stakeholders with information regarding UF Water Institute faculty, programs and activities (waterinstitute.ufl.edu). The website contains a searchable faculty expertise database and a searchable database of externally funded Water Institute projects. This website has been used as a model for other interdisciplinary institutes and centers on campus.

- A Water Institute Distinguished Scholar Seminar Series was established that invites high-profile scholars to UF on a monthly basis to present a general Water Institute seminar of interest to a broad audience, meet with the Water Institute Faculty Advisory Committee to discuss strategic planning and partnering opportunities, and meet with interested Water Institute faculty and graduate students to discuss specific research/education issues. These seminars provide a magnet to bring Water Institute faculty together to brainstorm new proposal ideas, a forum to meet and discuss ideas with leading scholars, and an opportunity for new faculty and students to participate in and learn about Water Institute activities. Attendance at these seminars varies from about 40-100 participants. For a listing of the Distinguished Scholar Speakers, see http://waterinstitute.ufl.edu/seminars/seminars.asp.

- A biennial Water Institute Symposium was developed to bring together scientists, engineers, academics, policy makers, water managers, industry representatives, lawyers, students and citizens to consider the challenges to water resources sustainability; explore solutions for pressing issues; and provide broad-based recommendations for research, education,

technology and policies to ensure water resources sustainability for Florida and beyond. The symposium includes a graduate student poster competition with awards totaling $3000 to support graduate student travel to a national/international meeting to present their work. More than 400 people (~40% UF, ~60% external) have attended each Symposium.

The inaugural Water Institute Symposium was held in Gainesville, February 27-28, 2008. Over 180 contributed oral and poster presentations were presented by faculty, graduate students, consultants and state and federal agency scientists. A group of nationally and internationally recognized invited speakers from academia, federal agencies, and policy "think-tanks" participated in the opening plenary session of the symposium. The symposium concluded with a panel, comprised of the Executive Directors of each of the Water Management Districts and the Secretary of the Florida Department of Environmental Protection, which focused on current Florida policies and programs and future research and education needs. A complete summary of the inaugural symposium, including the program, presentations, and participant lists is available at http://waterinstitute.ufl.edu/symposium/index.html

The 2nd biennial Water Institute Symposium was held in Gainesville, February 24-25, 2010. Over 200 contributed oral, poster and panel presentations were presented by faculty, graduate students, consultants and state and federal agency scientists. A group of nationally and internationally recognized invited speakers from academia, non-governmental organizations, and industry participated in the opening plenary sessions of the symposium. The symposium included a report from Senator Lee Constantine, Chair of the Senate Select Committee on Inland Waters and concluded with a diverse panel of academic, industry, agency and non-governmental representatives who discussed recent progress, new challenges, and future trends regarding water resource sustainability. For a complete summary of the 2nd symposium see http://waterinstitute.ufl.edu/postsymposium2010index.asp.

- A series of interdisciplinary workshops and expert panels were organized, with and for various stakeholders, to identify and prioritize critical water issues requiring interdisciplinary expertise. In addition to providing expertise and support for addressing interdisciplinary issues, these activities engendered strong partnerships between and among UF Water Institute Faculty, external academics and external stakeholders. The following 17 workshops and expert panels were conducted (for details see http://waterinstitute.ufl.edu/events/workshops_panels.html):

    - July 16-20 2007: Agricultural Knowledge Initiative Research Planning Workshop, sponsored by US Department of Agriculture
    - August 21, 2007: Springs Nutrient Workshop, sponsored by Florida Department of Environmental Protection
    - September 12 2007: Hydrologic Information Systems Workshop, sponsored by UF Water Institute
    - November 15-16 2007: ArcHydro Workshop, sponsored by UF Water Institute
    - November 29, 2007: Open Modeling Interface Working Group Meeting, sponsored by UF Water Institute
    - November 30, 2007: Water Conservation Research Planning Workshop, sponsored by Conserve Florida Water

- September 4, 2008: Water and Social Equity Panel Discussion, sponsored by UF Harn Museum of Art
- September 17-18, 2008: Workshop on Environmental Effects of Withdrawals from the St. Johns River, sponsored by St. Johns River Water Management District
- June –September 2008: Peer review of the Florida Section of the American Water Works Association Florida 2030 Water Supply Infrastructure Vision Documents, sponsored by the Century Commission
- August 2008 –April 2009: Peer review of the Watershed Assessment Model, sponsored by the Florida Department of Agriculture and Consumer Services
- May 2009: Peer review of the St. Johns River Water Management District's Water Conservation Program, sponsored by St. Johns River Water Management District
- May 4-5, 2009: Cultivating Communities of Practice for Interdisciplinary Research Workshop, sponsored by UF Water Institute
- September 23-24, 2009: Workshop on Environmental Effects of Withdrawals from the St. Johns River, sponsored by St. Johns River Water Management District
- June 2009-March 2010: Peer review of the groundwater modeling effort in support of the 2010 Northeast Florida Water Supply Planning Effort, sponsored by St. Johns River Water Management District
- September 22, 2010: Public Water Utilities Climate Impacts Working Group Meeting, sponsored by UF Water Institute in partnership with the Florida Climate Institute and the UF IFAS Center for Public Issues Education
- January 20, 2011: Public Water Utilities Climate Impacts Working Group" – Workshop 2, sponsored by UF Water Institute in partnership with the Florida Climate Institute and the UF IFAS Center for Public Issues Education
- February 10, 2011: Ichetucknee Preservation Research Workshop, sponsored by Three Rivers Trust

- The Water Institute Director serves on a wide range of Stakeholder Advisory Committees and Panels. These activities help build relationships with external partners, afford opportunities to highlight UF water expertise, and provide opportunities to stay abreast of cutting edge approaches. A list of committees and panels for the 2006-2011 time period is included below:
  - National Science Foundation: Collaborative Large-Scale Engineering Analysis Network for Environmental Research Advisory Committee, 2005-2007
  - National Research Council Water Science and Technology Board: Water Implications of Biofuels Panel, July 12, 2007
  - Florida Legislature Energy and Environment & Natural Resource Committees: Water Management Implications of Climate Change Panel, November 6th, 2007
  - National Science Foundation: Member of WATer and Environmental Research Systems Network (WATERS Network) Design Team, 2006-2008
  - Army Corps of Engineers: Waterways Experiment Station Environmental Lab Peer Review Panel, May 2008
  - Century Commission: Florida Water Congress Delegate, September 2008
  - Consortium of Universities for the Advancement of Hydrologic Sciences: Member of the Board of Directors 2003-2008; Chair 2005-2006, Past-Chair 2007

- US Congressional Water Caucus Panel on Water Allocation Issues in the Apalachicola-Chattahoochee-Flint River Basin, May 2010
- National Science Foundation: Biofuel Technologies and their Implications for Water and Land Use Panel, August 2009
- National Science Foundation: Peer Review Panel for Cyber-enabled Discovery and Innovation Program, February 2009
- National Research Council's Committee on Independent Scientific Review of Everglades Restoration Progress (CISRERP), 2009-present
- State of Georgia: Scientific and Engineering Advisory Panel for Comprehensive State-wide Water Management Plan 2009-present

- As a result of these and other strategic efforts, the UF Water Institute has received the following recognition from external stakeholders:
  - March 2010: The Florida Senate Select Committee Report on Florida's Inland Waters recommended that the Florida Legislature utilize the University of Florida Water Institute "to provide recommendations to the Legislature based on the best available science."
  - February 2011: The UF Water Institute was invited by the US Environmental Protection Agency and the Florida Department of Environmental Protection to be a Center of Excellence for Watershed Management. A Memorandum of Understanding has been developed and is awaiting signatures.

4.2 Strategy 2: Build interdisciplinary teams to provide the knowledge base for, and to develop and encourage the implementation of, new technology and policy solutions for state, national and international water issues.

4.2.1 Objectives
- Focus faculty energy and intellect on important interdisciplinary water-related science, engineering, policy and law problems of the state of Florida, the nation and the world.
- Establish and maintain strong extramural funding for interdisciplinary programs.
- Decrease the transaction costs associated with interdisciplinary research.

4.2.2 Accomplishments
Interdisciplinary collaboration is widely perceived as having a high potential for making significant research contributions to understanding and solving complex water issues; however it also requires large investment in intellectual, logistical and temporal resources. The Water Institute has invested significantly in exploring new avenues for collaboration and has made good progress in building interdisciplinary teams of faculty and graduate students. Specific accomplishments are summarized below:

Research, Education and Outreach Thrust Areas were developed. Current thrust areas, defined through the 2006-2007 strategic planning process, include:
- Water Resources Sustainability
- Water, Land Use and Ecosystems
- Water and Climate
- Water and Society

These thrust areas are thematic cross-cutting initiatives around which the Water Institute Affiliate Faculty agreed to join forces to achieve Water Institute goals. The thrust areas provide a dynamic framework of emphasis areas and represent areas in which the Water Institute faculty believes interdisciplinary collaborations are likely to produce significant progress. See http://waterinstitute.ufl.edu/about/areas.html for a more complete description of the Water Institute thrust areas.

- Faculty/Graduate Student working groups were organized to develop the following White Papers and Synthesis Documents on emerging water issues:
  - Peer Review of Florida Section of the American Water Works Association Florida 2030 Task Force Issue Papers, Water Institute, 2008
  - Summary and Synthesis of the Available Literature on the Effects of Nutrients on Spring Organisms and Systems, Brown et al. 2008
  - The Water Resource Implications of Large-Scale Bioethanol Production, Cohen and Evans, 2008
  - Weathering the Storm(water): Implementing Low-Impact Development Stormwater Management for New Residential Development in Florida, Ruppert and Ankersen, 2008
  - Conservation and Drought Water Rates: State-of-the-art practices and their application, Rawls and Borisova, 2009
  - Peer Review of the Watershed Assessment Model, Graham et al. 2009
  - Residential Benchmarks for Minimal Landscape Water Use, Romero and Dukes, 2010

- UF Water Institute Affiliate faculty and graduate students conduct externally funded research projects on wide-ranging aspects of water-related sciences, engineering, design, policy and law. The goals of individual research projects include such diverse interests as advancing the understanding of fundamental physical, chemical and biological processes in various aquatic systems, understanding how people organize themselves to use and manage water, and developing solutions to practical problems through engineering, design and legal applications of new scientific understanding.

  There are four categories of externally funded Water Institute projects, depending on the level of involvement of Water Institute staff in the project development (for details see WI Project Classification Policy, note that this classification system has been adopted as a model by centers and institutes on campus). To explore all externally funded Water Institute projects by research thrust area, ecosystem of study, or classification level, see the on-line searchable awards database. A brief summary of projects funded over the last five years, by classification level, is included below and shown in Table 2:
  - Water Institute Directed Research Projects: For Water Institute directed projects, the Water Institute Director/Staff provide overall proposal coordination and/or project management. ***20 projects totaling approximately $4.0 Million have been funded under this category.*** For details regarding these projects, including title, goals and objectives, participating faculty and funding agency see http://waterinstitute.ufl.edu/research/researchProjects.asp?WIClassLevel=3
  - Water Institute Assisted Research Projects: For Water Institute assisted projects, a Water Institute faculty member provides overall proposal leadership, but the Water Institute

provides support services such as initial organization of the project team, liaison with a sponsoring agency, matching funds, technical support, data management, and/or project management. ***12 projects totaling approximately $5.0 Million have been funded under this category.*** For details regarding these projects including title, goals and objectives, participating faculty and funding agency see http://waterinstitute.ufl.edu/research/researchProjects.asp?WIClassLevel=2

- Water Institute Faculty Research Projects: In addition to the research projects described above, ***faculty affiliated with the Water Institute currently manage over $100 Million in active externally funded projects***. These projects are catalogued in an on-line database that can be searched by investigator, department, keyword, title, and date and/or funding agency (see http://waterinstitute.ufl.edu/research/WIClassLevel1.asp)
- An additional 23 proposals valued at over $46 Million have been coordinated by Water Institute staff and submitted to external funding agencies. Although not yet funded, these efforts have been valuable for laying the groundwork for successful resubmissions and for creating new linkages of collaboration among multiple departments, agencies and institutions across the country. These proposals included a $4.5 million proposal for a NSF Critical Zone Observatory submitted in 2007, $25 million proposal for a NSF Science and Technology Center submitted in 2008, a $1.2 million proposal for a NSF Innovative Technology Experiences for Students and Teachers project submitted in 2009, and a $4 million proposal for a NSF Water, Sustainability and Climate Project submitted in 2010. These are examples of large interdisciplinary proposals that would likely not be submitted in the absence of the Water Institute coordinating the proposal efforts.

Table 2: Summary of Externally Funded Proposals

Category	Number of Proposals	Value
Water Institute Directed (funded)	20	$4 Million
Water Institute Assisted (funded)	12	$5 Million
Water Institute Faculty (funded)	>550	>$100 Million
Proposals Submitted (not funded)	23	$46 Million

4.3 Strategy 3: Integrate and strengthen UF water faculty expertise within existing Departments and Centers.

4.3.1 Objectives

- Develop and promote individual Water Institute Affiliate Faculty programs.
- Promote department and center water-related research and education programs.
- Enhance departments and centers by building water faculty expertise in underrepresented disciplines.
- Enhance faculty recruitment and retention within departments and centers.

4.3.2 Accomplishments

While building new interdisciplinary research and education programs among UF faculty is central to the success of the Water Institute, it is also important to help develop, support and promote the water-related research and education programs that occur within existing Departments and Centers at the University of Florida. Several accomplishments reported under other specific strategies also contribute significantly to this goal including the comprehensive

Water Institute website that provides easy searchable access to descriptions of individual faculty expertise and research projects; the Distinguished Scholar seminar series that links internationally renowned experts to specific UF faculty, departments and centers; and the Water Institute Symposia, which provide the opportunity for promoting UF departments and centers. In addition, other accomplishments include:

- A Water Institute Program Initiation Fund (PIF) was established to encourage interdisciplinary working groups consisting of UF faculty, graduate students, and key external experts to identify problems, engage stakeholders, write proposals, develop knowledge and propose solutions for complex water issues that have state, national and global importance. In 2007, six PIF projects involving 16 faculty members from 4 colleges were selected for seed funding. In 2009, three projects involving 14 faculty members from 3 colleges were selected. Awards to date under this program total $414,000. Deliverables from these projects include one seminar series, 9 published journal articles, 4 white papers and 18 proposals totaling over $12.0 Million for externally funded research projects. To date, six external projects totaling $398,000 have been funded and additional proposals continue to be submitted. For a complete description of all PIF projects see http://waterinstitute.ufl.edu/research/researchProjects.asp?WIClassLevel=4

- The UF Water Institute has proposed the development of a suite of distributed, common-use, interdisciplinary labs, field facilities, and computer facilities that will allow integrated efforts of diverse researchers addressing common water problems across disciplines and locations. In 2007-08 the Water Institute received $500,000 from the Florida legislature to initiate development of this concept. With this first phase of funding, the following facilities were developed by UF Departments in the Colleges of Agricultural and Life Sciences, Engineering, and Liberal Arts and Sciences. These facilities are available for use by all UF Water Institute Affiliate Faculty.
  - Organic Contaminants Analytical Research Laboratory (hosted by Soil and Water Science)
  - Aquifer Characterization and Geomaterials Analysis Laboratory (hosted by Geological Sciences Department)
  - Dynamic Environmental Control Test Bed-DECTB (hosted by Environmental Engineering Sciences)
  - Florida Geographic Water Observations Data Server (hosted by Water Institute)

For complete details see http://waterinstitute.ufl.edu/shared-facilities/index.html

- In 2007 the Water Institute provided campus-wide planning to define 12 water-related faculty positions required to fill gaps in existing expertise and coursework, and submitted a Budget Request to the Florida legislature to provide funding to fill those positions in departments and centers.

4.4 Strategy 4: Recruit and train excellent students to pursue careers in water-related science, engineering, policy, planning, and management, bringing with them an interdisciplinary focus.

4.4.1 Objectives

- Increase the number and quality of graduate students studying water-related science, engineering, social science, humanities, policy and law.
- Train graduate students to work on interdisciplinary teams.
- Increase the number of post-doctoral associates working on interdisciplinary water projects.
- Provide access to state-of-the-art tools and technologies for use in graduate and post-doctoral programs.

4.4.2 Accomplishments

An important component of the Water Institute's Strategic Plan is to help train excellent students to pursue careers in water-related science, engineering, policy, planning, management and outreach. Approximately 18 graduate students and 5 post-doctoral associates have been funded under Water Institute Directed projects developed within the past 5 years. Hundreds more are funded under Water Institute Assisted and Water Institute Faculty projects. Approximately 125 students have participated in Water Institute Symposia, and 20 to 30 students regularly attend in the Water Institute Distinguished Scholar Seminar Series. In addition to these activities, the following programs have been developed or enhanced by the Water Institute in support of this strategic objective:

- A gift from the Smallwood Foundation helped establish a Water Institute Internship Program. This program supports undergraduate and graduate student interns to work on interdisciplinary Water Institute projects. As team members, these students conduct an individual project that contributes to the overall effort, while learning about the process of interdisciplinary scientific research, collaboration and scholarship. To date, seven interns have participated in this program. See http://www.waterinstitute.ufl.edu/people/interns.html for details.

- The Water Institute administers the UF Hydrologic Sciences Graduate Academic Cluster (HSAC) which was established in 1993 as a unique interdisciplinary program designed to broaden the skills of science and engineering students who are interested in all aspects of water; i.e., occurrence and quantity, distribution, circulation, quality, and management/policy. Currently 52 faculty members and 28 graduate students from 10 departments and 3 colleges participate in the HSAC. Since 1993, 140 M.S. and Ph.D. students have graduated from the program. The Water Institute revamped and now maintains the HSAC website, and developed and maintains an on-line database for the HSAC student, faculty and meeting records. In addition, the UF Water Institute Director serves as a permanent voting member on the HSAC Faculty Coordinating Committee.

- The Water Institute Graduate Fellows (WIGF) Program was created in 2010 to support interdisciplinary faculty-graduate fellow teams to conduct integrative research in emerging areas of water science, including the social, natural, and engineering sciences. The Deans of the UF College of Agricultural and Life Sciences, College of Liberal Arts and Sciences, School of Natural Resources and Environment, and the Chair of the Department of Environmental Engineering committed funding for UF Graduate Research Fellowships in support of this program. This funding will provide a $25,000 per year stipend plus tuition waiver for 4 years to biennial cohorts of 6-8 Ph.D. students.

The Water Institute leverages the UF investment using gifts provided by the Swisher Foundation and the Sherwood-Stokes Foundation. These funds are used to create a competitive graduate fellow research grants program to support field, laboratory and computer analyses by the faculty/student cohort as well as to fund integrative activities to support their development into a cohesive interdisciplinary cadre of professional researchers. The Water Institute also provides: a Research Coordinator for group facilitation; assistance with design, execution and evaluation of integrative activities; and proposal-writing assistance for development of external funding for the project.

The 2011 Water Institute Graduate Fellows Program focuses on *Watershed Management in the face of EPA's New Numeric Nutrient Criteria for Florida Waters*. This topic was proposed by the winning faculty team from an internal competitive RFP process. An excellent cohort of seven Ph.D. students will begin this program in Fall 2010 working with eight Water Institute affiliate faculty from four colleges and the Water Institute Director. The admitted students' grade point averages ranged from 3.8 to 4.0 (mean 3.91) and their GRE scores ranged from 1100 to 1400 (mean 1270). See http://waterinstitute.ufl.edu/WIGF/index.html for more details on the Water Institute Graduate Fellows program.

5.0 FUTURE ACTIONS

Over the last five years, we have seen growing scientific, public and political awareness of water issues emphasizing the need for locally relevant and nationally pertinent research, education and outreach. Understanding complex water issues in a new holistic manner and exploring integrated solutions to managing these issues requires a sustained high level effort. It calls for bold action to facilitate means to obtain, integrate and share new data; to design innovative, comprehensive large-scale experiments; and to develop new simulation tools to allow scientists, managers, citizens, and policy makers to explore alternative scenarios of the impacts of climate change, population growth, land use change, and water management and policy alternatives on the availability and quality of water resources.

The next five years will be an exciting time for the Water Institute. The Water Institute is poised to address relevant and urgent research challenges, implement an innovative program of interdisciplinary training for promising young researchers, and build its growing partnerships both on campus and with external stakeholders. High priority will be placed on ensuring a sustainable Water Institute through externally funded research, education, knowledge transfer projects; obtaining private donations to build both intellectual capacity and facilities; and producing broad state, national and international impacts.

Specific Actions will include:

- Continue to coordinate and further develop all research, education and outreach program activities described above.
- Update Strategic Plan to refine Thrust Areas, Strategies, Objectives, Actions and Performance Measures for the 2011-2016 time period.
- Form an External Advisory Committee.

- Pursue external funding for a Water Institute Building (e.g. NIST proposal submitted with Florida Climate Institute for April 2011 competition as well as proposals to foundations, corporate and individual donors).
- Develop funding to support new stakeholder engagement programs under the new UF Water Institute Center for Excellence in Watershed Management. (e.g. EPA 319 Proposal for May 2011 competition)
- Increase outreach and marketing activities by Water Institute staff to increase opportunities for private funding and donations.
- Continue to form and coordinate interdisciplinary faculty teams to submit proposals for large federal grants, e.g.
    - Submit a NSF Proposal for a Science and Technology Center focused on the role of wetland ecosystem dynamics in global macroelemental cycling to the May 2011 STC competition ($25Million).
    - Submit a NSF to the May 2011 Innovative Technology Experiences for Students and Teachers (ITEST) RFP (~$1.2Million).
    - Submit a NSF Water, Sustainability and Climate Proposal to the 2012 WSC competition (~$5Million).
    - Submit a NSF Proposal to the next Critical Zone Observatory RFP (~$5Million).
- Pursue State Legislative Budget Requests and Congressional Budget Requests to build Water Institute faculty, staff, facilities and programmatic capacity.
- Develop a UF Water Institute Visiting Scholars Program.

6.0 BUSINESS PLAN

The following summarizes the proposed business plan for funding Water Institute programs for the 2011-2016 period:

- Base funds from UF for Water Institute director and staff salaries
- Endowment funds for operating expenses
- Grant funding for research, education and outreach programs
- Industrial Membership Program to fund specific working groups, review panels etc.
- Indirect cost returns for re-investment in internal Program Initiation Fund Awards
- Fee-based short-courses and symposia
- Gifts and Endowments to fund
    - Endowed chairs and named professorships
    - Named Water Institute Graduate Fellowship Program
    - Named undergraduate internships
    - Named post-doctoral and visiting faculty fellowships
    - Named conferences
    - Named buildings, labs, computational centers

APPENDIX 1: 2004 UF WATER INSTITUTE TASK FORCE REPORT

Creation of a University of Florida Water Institute:

A Report from the UF Water Institute Task Force

(Originally Submitted April 2002; Revised September 2004)

Wendy D. Graham, Agricultural & Biological Engineering, Co-Chair

Jonathan B. Martin, Geological Sciences, Co-Chair

Michael Annable, Environmental Engineering Sciences

Sanford Berg, Public Utility Research Center, Economics

Mark Brenner, Land Use and Environmental Change Institute, Geological Sciences

Tom Crisman, Center for Wetlands, Environmental Engineering Sciences

Joseph J. Delfino, Environmental Engineering Sciences

James Heaney, Environmental Engineering Sciences

Richard Hamann, Center for Governmental Responsibility, Law School

Kirk Hatfield, Civil and Coastal Engineering

Louis H. Motz, Water Resources Research Center, Civil and Coastal Engineering

Ramesh Reddy, Soil and Water Science

Randall Stocker, Center for Aquatic and Invasive Plants and Center for Natural Resources, Agronomy

Vision:

The University of Florida Water Institute will strengthen and enhance the state, national, and international reputation of the University of Florida's water-related academic, research, and public outreach programs by coordinating existing programs to optimize the use of internal resources; establishing and maintaining new externally funded research programs required to solve water-related problems of importance to the state, the nation and the world; recruiting and funding increased numbers of graduate students; educating local, state and federal decision makers; and capturing the interest and support of the general public.

Justification:

Water resources research and education has historically been driven by the need to provide water supply, flood control, and power supply for human use on a sub-regional scale. However, the physical, chemical, biological, engineering and legal aspects of water-related studies that support solutions to these relatively small-scale problems do not consistently merge into the coherent whole needed to understand the broad implications of larger scale problems. Examples of such large scale issues include the possible geographic redistribution of water resources due to climate change, the ecological and sociological consequences of large-scale water transfers, the effects of land use changes on the regional water cycle, the effects of non-point sources of pollution on the quality of surface and ground water, the ecological and social impacts of freshwater withdrawal from rivers, the ecological impact of large desalination plants, and the effect of water projects and climatic changes on coastal and inland flooding. Changes in population and land use require large-scale water projects that may not consider ecological and social issues and consequently can adversely affect the quality of water and the well being of living resources in lakes, rivers, coastal zones, estuaries, and wetlands. To address complex water problems, the university would benefit from a focused organization that could facilitate interactions among multiple disciplines. The Water Institute would coordinate research programs, stimulate the development of new outreach initiatives.

Water-related studies are clearly multi-disciplinary, as water is important to and affected by the physical, chemical, and biological processes within all the compartments of the earth system: the atmosphere, glaciers and ice sheets, solid earth, lakes, rivers, estuaries and oceans. Due to the geophysical ubiquity of water, water-related studies are distributed among various disciplines: atmospheric science, coastal and ocean sciences, ecology, engineering, fisheries, geology, geography, hydrology, limnology, soil science, and wetland science. Social sciences and law also deal with water, given that water problems, although rooted in natural phenomena, are ultimately a consequence of human behavior. Recently, the issue of terrorist activities has led to reevaluations of how water systems need to be designed and operated to protect against these possibilities. There is now a consensus, supported by sound scientific and engineering principles, that water resource management strategies and policies require an integrated interdisciplinary approach to ensure the integrity and sustainability of large-scale aquatic ecosystems.

An interdisciplinary and integrated approach to water-related studies is needed at the University of Florida. Faculty in many departments at UF are involved in research and education activities in various aspects of water-related sciences, engineering, policy and law. The goals of individual research projects include such diverse interests as advancing the understanding of fundamental physical, chemical and biological processes in various aquatic systems, understanding how people organize themselves to use and manage water, and developing solutions to practical problems through engineering and legal applications of new scientific understanding. The spatial scales at which projects are conducted vary from the laboratory scale to the continental scale, while the temporal scales of interest range from seconds to millennia. The diversity in backgrounds, disciplinary foci, and research interests of these faculty bring a richness to the water-related sciences, engineering, policy and law programs at UF, and many individual faculty members at UF have strong state, national and international reputations. However to build a synergistic, nationally-recognized, comprehensive water program at UF, a stronger linkage among these faculty is required. Table 1 lists UF faculty and associates who as of the original submission date of this report expressed an interest in participating in the Water Institute, were given an opportunity to review this document prior to its submission, and in many instances helped craft the document. Table 1 represents an early attempt to inventory faculty with water related interests, and the number of faculty may grow as the Water Institute develops.

Similar Internationally Recognized Institutions:

Numerous water-related institutions are located at universities around the US including the Water Resources Research Institute at Colorado State University, the Texas Water Resource Institute at Texas A&M University, the Hydrologic Sciences Graduate Group at the University of California, Davis, the Department of Hydrology and Water Resource at the University of Arizona, the Desert Research Institute at the University of Nevada, and the Water Research Center at University of Minnesota. There is a notable lack of water institutes that focus on tropical and subtropical water issues. This lack of focus on tropical and subtropical areas stems from the historical misconception that water problems do not exist in humid environments. With the recent explosion of human populations in the tropics and subtropics, including Florida, problems with water quantity, as well as quality, have become critical. These problems have exposed a need for a thorough scientific understanding of the natural geophysical systems that govern the tropical and subtropical water cycle, their impact on biological and ecological systems, and the societal impact on those natural systems. The University of Florida, through various centers on campus, has a long history of state, national, and international research into water-related issues, generally at the individual PI level or through collaboration among a few PI's. The creation of the Water Institute with formal linkages among the various campus programs dedicated to water-related studies will allow UF to move into leadership role in this and other areas of developing national and international need.

Mission:

The mission of the proposed campus-wide Water Institute is to foster interdisciplinary research, education and outreach programs designed to i) obtain a thorough understanding of the physical, chemical, and biological processes in various aquatic systems (rivers, lakes, oceans, estuaries, wetlands, and groundwaters) occurring at a broad range of spatial and temporal scales; and ii) develop and promote the adoption of improved methodologies for water management and policy development based on a strong background in water-related sciences and engineering, economics, sociology and law.

The proposed Water Institute will provide a focal point for water-related research and education on campus and provide an entry point for outside stakeholders seeking water-related expertise. The Institute will coordinate and integrate the water-related programs in existing on-campus University of Florida disciplinary academic departments (such as Agricultural and Biological Engineering, Botany, Civil & Coastal Engineering, Environmental Engineering Sciences, Economics, Fisheries and Aquatic Sciences, Food and Resource Economics, Geologic Sciences, Geography, Political Science, Soil and Water Science, Zoology, and College of Law), interdisciplinary clusters and certificates (such as the Hydrologic Sciences Academic Cluster (HSAC) and the Wetlands Certificates) and centers (such as the Center for Aquatic and Invasive Plants, Center for Natural Resources (CNR), Center for Wetlands (CFW), the Water Resources Research Center (WRRC), the Center for Governmental Responsibility (CGR), the Land Use and Environmental Change Institute (LUECI), the Public Utility Research Center (PURC) and off-campus Research and Education Centers. Thus, the Institute will create the cross-campus linkages necessary to promote the University of Florida as a state, national, and international leader in the scientific, engineering, management and policy aspects of aquatic systems.

The Water Institute will benefit the State of Florida by enhancing graduate student and faculty recruitment; increasing the pool of well-trained water-related scientists and engineers; planners and policy-makers; and enhancing UF's ability to respond to and solve emerging large-scale water resource problems.

Principal program activities:

The principal program activities of the Water Institute will be to:

- Identify opportunities to utilize the collective expertise of Institute faculty to solve water-related science, engineering, policy and law problems which are of special importance to the state of Florida, the nation, and the world;
- Facilitate, establish and maintain extramural sources of funding for large multi-investigator, interdisciplinary research projects and graduate fellowships in the water-related sciences and engineering;
- Coordinate a monthly colloquium and periodic national symposia which highlight recent research advances in water-related sciences, engineering, policy and law made by both on-campus and off-campus researchers;
- Develop state, national and international contacts required to strengthen, enhance the visibility and increase the extramural funding of University of Florida’s water programs;

- Build and maintain an extensive inventory of faculty expertise and graduate coursework associated with water at the University of Florida to allow for more efficient utilization of resources (minimize duplication of expertise and effort) while maximizing the educational experience for graduate students at UF;
- Provide campus-wide planning and insight regarding water-related faculty positions and graduate courses required to fill gaps in existing expertise and coursework;
- Administer interdisciplinary water-related graduate programs such as the Hydrologic Sciences Academic Cluster and the Wetlands Certificate;
- Foster the development of new interdisciplinary water-related graduate cluster and degree programs;
- Conduct an outreach program to transfer new water science (research and policy) results and technology to the professional community (consultants; local, state, and national resource management agencies; local, state and national decision makers, and international organizations).

Organization:

The Water Institute will be led by a full-time Director, who will report to the Vice President for Research and Graduate Education. The proposed mission and program activities for the Water Institute overlap with the mission of several existing centers on campus. The Director will be responsible for coordinating these and other existing programs to optimize the use of internal resources, facilitate grant acquisition and fund raising efforts for these program areas, and for public relations with external stakeholders.

An internal Faculty Advisory Committee for the Water Institute will consist of affiliate Water Institute faculty from the Colleges of Agricultural and Life Sciences, Business, Engineering, Liberal Arts and Sciences and Law. . An external academic advisory committee will be formed of leading academicians in the field of water science, engineering, policy and law. An external stakeholder advisory committee will also be formed consisting of representatives from state and federal governmental agencies, industry, non-governmental organizations and other private entities with an interest in water related issues.

The Water Institute will be created in two phases. Upon creation of the Institute, Phase I will begin. Phase I ends when its deliverables are completed, specifically with the hiring of a permanent Director.

Phase I – Actions

The establishment of a five to seven member Faculty Launch team will initiate the Water Institute. The Faculty Launch team will be nominated by UF faculty at large, and appointed by the Vice President for Research and Graduate Education, ensuring representation from the Colleges of Agricultural and Life Sciences, Business, Engineering, Liberal Arts and Science, and Law. Once established the Faculty Launch team will elect a Chair who will lead the group during Phase I.

The Faculty Launch team will be responsible for implementing all deliverables of Phase I, and will report directly to the UF Vice President for Research and Graduate Education. This core team will create and lead task-oriented clusters of interested faculty from various departments across campus, who will constitute the heart of the Water Institute and will produce the deliverables. All faculty included in the working groups will be considered Affiliate Faculty of the Water Institute. Additional personnel required to initiate the Water Institute include support staff, in particular, a full time program coordinator and part time office help (i.e. webmaster, clerical staff). During Phase I the Water Institute will require dedicated office space for administration and support staff, as well as space for the working groups to meet and produce deliverables.

Phase I – Deliverables

The Faculty Launch Team, with support of working groups of Affiliate Faculty, will accomplish the following deliverables by the end of the Phase I:

- Recruit Affiliate Faculty from faculty with water-related expertise from all colleges and units at the University of Florida
- Conduct a comprehensive inventory of faculty expertise, research projects, course offerings, and laboratory space and field facilities relevant to the Water Institute mission and program activities. Organize this information into a comprehensive web-site, brochures and CDs.
- Distribute information to stakeholders, including current faculty and students, potential faculty and students, funding agencies, and resource management agencies.
- Solicit input from Affiliate Faculty on research, education and outreach opportunities relevant to the Water Institute mission.
- Solicit input from outside stakeholders on research, education and outreach opportunities of importance to the state and to the nation.
- Coordinate and prepare a multi-investigator research proposals targeted at large research opportunities that require extensive infrastructure in areas of interest identified by Affiliate Faculty and stakeholders (e.g. NSF Hydrologic Observatory).
- Assume a leadership role and actively participate in national and international water-related organizations such as the Consortium of Universities for the Advancement of Hydrologic Sciences, Inc (CUAHSI).
- Develop a proposal for a structured relationship between the Water Institute and existing water-related centers (e.g. CNR, WRRC, CFW, LUECI, Center for Aquatic and Invasive Plants, Eastern Water Law Center, Center for Governmental Responsibility, Public Utility Research Center,).
- Administer the Hydrologic Sciences Academic Cluster and Wetland Science Concentration and foster the development of new interdisciplinary graduate degree programs in water-related sciences.
- Initiate a search to hire a permanent Director. The Water Institute Launch Team will serve as the search and screen committee. The search for a permanent director will be carried out at the highest national and international level.

Phase I – Annual Funding Needs (~$400K/yr)

- Twenty five percent release time for each membersof the Faculty Launch Team elected from the participating colleges. Fifty percent release time for the Chair of the Faculty Launch Team. (~2.0FTE, ~$200K/yr)
- One FTE for a Program Coordinator. (~$70K)
- OPS funding for office support (i.e.,webmaster, clerical help, fiscal staff etc) (~$70K)
- Opportunity fund for travel support and operating expenses (~$60K)

Phase II – Actions

Phase II will begin with the arrival on campus of the permanent Director. The Affiliate Faculty will retain their position in their home departments, and will continue to work with the Director on all the Principal Program Activities outlined above. Three Faculty Fellows will be appointed for two year terms to lead specific large-scale initiatives. Each of the Faculty Fellows will be primarily affiliated with the Water Institute but will also represent the research, education, and outreach missions of colleges of Agriculture and Life Sciences, Business, Engineering, and Liberal Arts and Sciences, College of Law, and the School of Natural Resources and Environment. These Faculty Fellows will be recruited to fill gaps and create linkages among existing programs, and assist with the preliminary research needed to develop successful large interdisciplinary proposals.

During Phase II the Director will initiate a plan and search for funding for new construction, or renovation of existing space, needed to house new externally-funded inter-disciplinary Water Institute programs. It is anticipated that new facilities will house communal state-of-the-art analytical equipment and laboratories, office space for the Director and staff, office space for graduate students and Faculty Fellows, and meeting rooms for proposal preparation and colloquiums. Also during Phase II the relationship of the existing water-related centers to the Water Institute will be formalized.

Phase II Funding needs ($750K/yr)

- One FTE for the Director (75% administration including research management, 25% personal research).
- Three FTE for Faculty Fellows. These appointments will typically be for a two-year term
- One FTE for Program Coordinator
- OPS office support
- Travel support
- Operating expenses

Table 1. UF faculty and staff expressing interest in the Water Institute (as of April 2002).

	College/Affiliation	Department	Who
1	**CLAS**	Botany	George Bowes
2		Botany	Joseph S. Davis
3		Geography	Joann Mossa
4		Geography	Michael Binford
5		Geography	Nigel Smith
6		Geography	Peter Waylen
7		Geological Sciences	Dan Spangler
8		Geological Sciences	Dave Hodell
9		Geological Sciences	Elizabeth Screaton
10		Geological Sciences	Guerry McClellan
11		Geological Sciences	Jason Curtis
12		Geological Sciences	John Jaeger
13		Geological Sciences	Jon Martin
14		Geological Sciences	Mark Brenner
15		Geological Sciences	Phil Neuhoff
16		Geological Sciences	Tony Randazzo
17		Geological Sciences	William Kenney
18		Zoology	Bjorndal
19		Zoology	Bolton
20		Zoology	Brockmann
21		Zoology	Chapman, C.
22		Zoology	Chapman, L.
23		Zoology	Evans
24		Zoology	Guillette
25		Zoology	Julian
26		Zoology	Lanciana
27		Zoology	Lillywhite
28		Zoology	Maturo
29		Zoology	Osenberg
30		Zoology	St. Mary
31		Zoology	Vliet
32	**Engineering**	Civil and Coastal Engineering	Clayton J. Clark II
33		Civil and Coastal Engineering	Kirk Hatfield
34		Civil and Coastal Engineering	Daniel M. Hanes
35		Civil and Coastal Engineering	Jennifer M. Jacobs
36		Civil and Coastal Engineering	Lou Motz
37		Environmental Engineering Science	James Heaney
38		Environmental Engineering Science	Angela Lindner
39		Environmental Engineering Science	Bill Wise
40		Environmental Engineering Science	Doug Shaw
41		Environmental Engineering Science	Gabriel Bitton

42		Environmental Engineering Science	Jean Claude Bonzongo
43		Environmental Engineering Science	Joe Delfino
44		Environmental Engineering Science	John Warwick
	College/Affiliation	**Department**	**Who**
45	**Engineering**	Environmental Engineering Science	Mark Brown
46		Environmental Engineering Science	Mike Annable
47		Environmental Engineering Science	Tom Crisman
48		Environmental Engineering Science	Warren Viessman, Jr.
49		Mechanical Engineering	D. Yogi Goswami
50		Mechanical Engineering	James F. Klausner
51		The GEM Center/Civil & Coastal Engineering	Ramesh L. Shrestha
52	**Engineering/IFAS**	AG and Bio engineering	Allen Overman
53		AG and Bio engineering	Brian Boman
54		AG and Bio engineering	Dorota Haman
55		AG and Bio engineering	Fedro Zazueta
56		AG and Bio engineering	Jasmeet Judge
57		AG and Bio engineering	Jonathan Earle
58		AG and Bio engineering	Jonathan Jordan
59		AG and Bio engineering	Ken Campbell
60		AG and Bio engineering	Michael Dukes
61		AG and Bio engineering	Rafael Munoz-Carpena
62		AG and Bio engineering	Roger Nordstedt
63		AG and Bio engineering	Sanjay Shukla
64		AG and Bio engineering	Wendy Graham
65	**IFAS**	Agronomy	Alison Fox
66		Agronomy	Bill Haller
67		Agronomy	Jerry Bennett
68		Agronomy	Ken Boote
69		Agronomy	L. Hartwell Allen
70		Agronomy	Randall Stocker
71		Agronomy	Raymond Gallaher
72		Agronomy	Vernon Vandiver
73		Central District of Extension (IFAS)	Andy Rose
74		Central District of Extension (IFAS)	Austin Tilton
75		Central District of Extension (IFAS)	Barry Morton
76		Central District of Extension (IFAS)	Bill Price
77		Central District of Extension (IFAS)	Dana Venrick
78		Central District of Extension (IFAS)	David Griffis
79		Central District of Extension (IFAS)	David Holmes
80		Central District of Extension (IFAS)	Dennis Mudge
81		Central District of Extension (IFAS)	Eleanor Foerste
82		Central District of Extension (IFAS)	Joe Walters
83		Central District of Extension (IFAS)	John Jackson
84		Central District of Extension (IFAS)	Richard Tyson

85		Central District of Extension (IFAS)	Todd Hurt
86		Fisheries and Aquatic Sciences	Charles E. Cichra
87		Fisheries and Aquatic Sciences	Charles Jacoby
88		Fisheries and Aquatic Sciences	Claire Schelske
89		Fisheries and Aquatic Sciences	Craig Watson
90		Fisheries and Aquatic Sciences	Daryl Parkyn
	College/Affiliation	**Department**	**Who**
91	**IFAS**	Fisheries and Aquatic Sciences	Debra J. Murie
92		Fisheries and Aquatic Sciences	Edward J. Phlips
93		Fisheries and Aquatic Sciences	Frank A. Chapman
94		Fisheries and Aquatic Sciences	Jerome Shireman
95		Fisheries and Aquatic Sciences	Mike Allen
96		Fisheries and Aquatic Sciences	Patrick Baker
97		Fisheries and Aquatic Sciences	Roger Bachmann
98		Fisheries and Aquatic Sciences	Roy Yanong
99		Fisheries and Aquatic Sciences	Ruth Francis-Floyd
100		Fisheries and Aquatic Sciences	Shirley Baker
101		Fisheries and Aquatic Sciences	Thomas K. Frazer
102		Fisheries and Aquatic Sciences	William J. Lindberg
103		Fisheries and Aquatic Sciences	William Seaman
104		Food and Resource Economics	Alan Hodges
105		Food and Resource Economics	Charles Adams
106		Food and Resource Economics	Clyde Kiker
107		Food and Resource Economics	David Zimet
108		Food and Resource Economics	Donna Lee
109		Food and Resource Economics	Ferd Wirth
110		Food and Resource Economics	Michael Olexa
111		Food and Resource Economics	Roy Carriker
112		Food and Resource Economics	Shery Larkin
113		Food Science and Human Nutrition	Hordur Kristinsson, Ph.D.
114		Food Science and Human Nutrition	Susan W.Williams MA APR
115		IFAS	Charles (Charlie) Vavrina
116		IFAS	Mitch Flinchum
117		Palm Beach	Clayton E. Hutcheson
118		Soil & Water Science	John Duval
119		Soil and Water Science	Prenger, J.
120		Soil and Water Science	Brown, R.B.
121		Soil and Water Science	Calvert, D.V.
122		Soil and Water Science	Clark, M.W.
123		Soil and Water Science	Comerford, N.B.
124		Soil and Water Science	Daroub, S.
125		Soil and Water Science	DeBusk, W.F.
126		Soil and Water Science	Graetz, D.A.
127		Soil and Water Science	Grunwald, S.

128		Soil and Water Science	Hanlon, E.A.
129		Soil and Water Science	Harris, W.G.
130		Soil and Water Science	Hornsby, A.G.
131		Soil and Water Science	Jawitz, J.W.
132		Soil and Water Science	Kidder, G.
133		Soil and Water Science	Li, Y.C.
134		Soil and Water Science	Ma, L.
135		Soil and Water Science	Mansell, R.S.
136		Soil and Water Science	Mylavarapu, R.S.
	College/Affiliation	**Department**	**Who**
137	**IFAS**	Soil and Water Science	Nair, V.D.
138		Soil and Water Science	Nkedi-Kizza, P.
139		Soil and Water Science	Obreza, T.A.
140		Soil and Water Science	O'Connor, G.A.
141		Soil and Water Science	Ogram, A.V.
142		Soil and Water Science	Ou, L-T.
143		Soil and Water Science	Rechcigl, J.E.
144		Soil and Water Science	Reddy, K.R.
145		Soil and Water Science	Rhue, R.D.
146		Soil and Water Science	Sartain, J.B.
147		Soil and Water Science	Schumann, A.
148		Soil and Water Science	Snyder, G.H.
149		Soil and Water Science	Stanley, C.D.
150		Soil and Water Science	Sylvia, D.M.
151		Soil and Water Science	White, J.R.
152		Soil and Water Science	Wilkie, A.C.
153		Soil and Water Science	Wilson, P.C.
154		Turfgrass Science	Grady Miller
155		University of Florida Extension	Lamar T. Christenberry
156		University of Florida Extension	Scott Jackson
157		Wildlife Ecology and Conservation	Franklin Percival
158		Wildlife Ecology and Conservation	Peter Frederick
159		Wildlife Ecology and Conservation	WIley Kitchens
160	**Design, Construction,**	Rinker School of Building Construction	Charles Kibert
161		Rinker School of Building Construction	K.R. Grosskopf
162	**Law**	Center for Governmental Responsibility	Jeff Wade
163		Center for Governmental Responsibility	Richard Hamann
164	**Library**	Digital Library Center	Stephanie C. Haas
165		Marston	Vernon Kisling
166		Smathers Libraries	Joe Aufmuth
167	**Medicine**	Director, Clinical Research Center	Peter W. Stcapoole
168		Department of Medicine	George N. Henderson
169		Medicinal Chemistry	Margaret James
170		Medicinal Chemistry	Steve Schulman

171	**Other**	Engineering Res. Center - Particle Science & Tech.	Ben Koopman
172		Engineering Res. Center - Particle Science & Tech.	Brij Moudgil
173		Engineering Res. Center - Particle Science & Tech.	Chang Park
174		Engineering Res. Center - Particle Science & Tech.	Dinesh Shah
175		Engineering Res. Center - Particle Science & Tech.	Hassan El-Shall
176		Engineering Res. Center - Particle Science & Tech.	Rich Dickinson
177		Engineering Res. Center - Particle Science & Tech.	Sam Farrah
178		Engineering Res. Center - Particle Science & Tech.	Spyros Svoronos
179		Exercise and Sport Sciences	Cheryl Thacker
180		Florida Earth Project	Stan Bronson
181		Florida Sea Grant	Bill Seaman
	College/Affiliation	**Department**	**Who**
182	**Other**	Florida Sea Grant	Jim Cato
183		Florida Sea Grant	Mike Spranger
184		Florida Sea Grant Extension faculty	Andrew Diller
185		Florida Sea Grant Extension faculty	Bob Wasno
186		Florida Sea Grant Extension faculty	Charles Adams
187		Florida Sea Grant Extension faculty	Charles Jacoby
188		Florida Sea Grant Extension faculty	Chris Combs
189		Florida Sea Grant Extension faculty	Christina Verlinde
190		Florida Sea Grant Extension faculty	Donald Sweat
191		Florida Sea Grant Extension faculty	Douglas Gregory
192		Florida Sea Grant Extension faculty	John Stevely
193		Florida Sea Grant Extension faculty	L. Scott Jackson
194		Florida Sea Grant Extension faculty	LeRoy Creswell
195		Florida Sea Grant Extension faculty	Leslie Sturmer
196		Florida Sea Grant Extension faculty	Maia McGuire
197		Florida Sea Grant Extension faculty	Marella Crane
198		Florida Sea Grant Extension faculty	Rich Novak
199		Florida Sea Grant Extension faculty	Robert Swett
200		Florida Sea Grant Extension faculty	Sacheen Tavares
201		Florida Sea Grant Extension faculty	Steve Otwell
202		Florida Sea Grant Extension faculty	William Mahan
203		Office of Public Relations	Anderson Crooks
204		Physical Plant	Chuck Fender
205		Physical Plant	Clark Collins
206		Physical Plant	Donna Bloomfield
207		Physical Plant	Erick Smith
208		Physical Plant	Jeff Bair
209		Physical Plant	Steve Middleton
210		Physical Plant	Tom Morgan
211		Precollegiate Education and Training	Mary Jo Koroly
212		The Seminole Tribe of Florida	Berl Olswanger
213		Transportation and Parking Services	Danny Rigby

214		TREEO Center	Bill Engel
215		Whitney Marine Lab	Dr. Dimitri Boudko
216		Whitney Marine Lab	Dr. Paul Linser
217		Whitney Marine Lab	Dr. Richard Gleeson
218		Whitney Marine Lab	Dr. William Harvey
219		Whitney Marine Lab	Peter Anderson

APPENDIX 2: UNIVERSITY OF FLORIDA WATER INSTITUTE
2007-2010 STRATEGIC PLAN

1. Introduction

Florida's burgeoning human population and vulnerability to both climatological and anthropogenic changes in the water cycle make the State a unique living laboratory to develop new knowledge and test solutions to global water problems. In recognition of the importance of water issues, and the need to address them in a new interdisciplinary manner, the University of Florida (UF) established a campus-wide interdisciplinary Water Institute in May 2006.

2. Mission

The UF Water Institute brings together talent from throughout the University to address complex water issues through innovative interdisciplinary research, education, and public outreach programs.

3. Vision

Interdisciplinary UF Water Institute Teams, comprised of leading water researchers, educators and students, develop new scientific breakthroughs; creative engineering; policy and legal solutions; and pioneering educational programs that are renowned for addressing state, national, and global water problems.

4. Values

Partnerships**:** The Water Institute recognizes the importance of developing strong inclusive partnerships among Water Institute Affiliate Faculty, and with external stakeholders, to identify and prioritize critical water issues requiring interdisciplinary expertise.
Expertise**:** The Water Institute is committed to developing the basic knowledge, practical experience, and infrastructure required to respond to stakeholders' emerging water issues.
Excellence**:** The Water Institute is committed to provide excellent interdisciplinary water-related research, education and outreach programs that are recognized within the state of Florida, the nation and the world.
Respect**:** The Water Institute provides services that acknowledge and respect the expertise of all Water Institute Affiliate Faculty; it also recognizes the personal values, cultures, and socioeconomic context of its diverse external stakeholders.

5. Goals

The overarching goals of Water Institute research, education and outreach programs are to:

- Improve basic knowledge of the physical, chemical, and biological processes in aquatic systems (rivers, lakes, oceans, estuaries, wetlands, soil and ground waters).
- Enhance understanding of the interactions and interrelationships between human attitudes and activities, and aquatic systems.
- Develop and promote the adoption of improved methodologies for water management and policy (including quantity, quality and ecosystem services) based on a foundation of science, engineering, management and LAW

6. Thrust Areas

Research, Education and Outreach thrust areas are thematic cross-cutting initiatives around which the Water Institute Affiliate Faculty joins forces to achieve Water Institute goals. Thrust Areas provide broad outlines of emphasis areas rather than narrow definitions of the Institute, and represent areas in which interdisciplinary collaborations are likely to produce significant progress. Thrust areas are determined through an on-going process which reflects current interests of Water Institute Affiliate Faculty and Stakeholders. Initial Thrust Areas for 2007-2010 are summarized in Table 1, with representative examples.

Table 1: Water Institute Thrust Areas (2007-2010)

▪ **Water Resources Sustainability** ○ Development of alternative water supplies and storage ○ Water treatment, wastewater treatment, groundwater remediation ○ Water quality protection, management of groundwater recharge areas ○ Water conservation, reuse, demand management ○ Impacts of alternative energy on water resources
▪ **Water, Land Use and Ecosystems** ○ Terrestrial and aquatic system linkages (springsheds, watersheds, wetlands, estuaries and coastal zones) ○ Land use change impacts ○ Sustainable ecosystem thresholds (Total Maximum Daily Loads, Minimum Flows and Levels) ○ Ecosystem restoration
▪ **Water and Climate** ○ Extreme events (floods, flood control, droughts, hurricanes) ○ Climate variability (El Nino Southern Oscillation, Multidecal Oscillations) ○ Climate forecasts ○ Climate change (global warming, sea level rise, rainfall redistribution)
▪ **Water and Society** ○ Water policy and law ○ Water marketing and pricing ○ Social impacts and implications ○ Public health

This strategic plan will be reviewed tri-annually and changed as needed to respond to new challenges and opportunities, and to achieve excellence.

7. Strategies, Objectives, Actions and Performance Measures

The Water Institute mission, vision and goals will be achieved through the following strategies, objectives and actions:

Strategy 1: Develop partnerships with external stakeholders to identify and prioritize critical water issues requiring interdisciplinary expertise; as well as to provide expertise and support for addressing these issues.

Objectives:

- Provide a portal for external stakeholders seeking water-related expertise
- Provide a focal point for water-related research and education at UF
- Engage external state, national and international partners in prioritizing and executing Water Institute programs

Actions:

- Establish and maintain a web-accessible Water Institute Affiliate Faculty expertise and awards database with appropriate links to departmental and center programs
- Invite external stakeholders to participate in monthly Distinguished Scholar Seminar Series
- Invite external stakeholders to participate in Water Institute Symposia
- Host stakeholder scientists for sabbaticals at the Water Institute
- Provide short-term assistance (i.e., peer review services, white/synthesis paper preparation, short courses etc.) to external stakeholders
- Serve on stakeholder advisory committees
- Coordinate undergraduate and graduate internship programs for external stakeholders
- Increase the pool of well-trained water-related scientists, engineers, planners for employment with stakeholders
- Establish and maintain external financial resources to support basic and applied research programs, and testing of new technologies, management strategies, regulatory strategies and water policies that address stakeholders' interests

Performance Measures:

- Number of web visits by external stakeholders
- External stakeholder attendance at seminar series
- External stakeholder attendance at Water Institute Symposium
- Number of sabbatical visitors
- Numbers of short-term assistance projects completed
- Numbers of undergraduate and graduate interns placed
- Grants and contracts funded by external stakeholders
- Gifts and endowments to the Water Institute

Strategy 2: Build interdisciplinary teams to provide the knowledge base for, and to develop and encourage the implementation of new technology and policy solutions for state, national and international water issues.

Objectives:

- Focus faculty energy and intellect on important interdisciplinary water-related science, engineering, policy and law problems of the state of Florida, the nation and the world
- Establish and maintain strong extramural funding for interdisciplinary programs
- Decrease the transaction costs associated with interdisciplinary research

Activities:

- Define Water Institute Thrust Areas through an on-going process which reflects current interests of internal and external Water Institute stakeholders.
- Form and coordinate Faculty Working Groups along Water Institute Thrust Areas
- Coordinate Faculty Working Groups to develop peer-reviewed white papers and synthesis documents along Water Institute Thrust Areas
- Establish an annual Program Initiation Fund to provide funding for new, faculty-initiated research, extension and outreach programs
- Provide proposal writing support for large interdisciplinary proposals
- Provide matching funds for extramural interdisciplinary proposals
- Provide project management support for large interdisciplinary projects

Performance Measures:

- Faculty participation in Program Initiation Fund
- Faculty participation in thrust area working groups
- Faculty participation on proposal writing teams
- Faculty participation on research project teams
- Faculty participation in short-term assistance projects
- Interdisciplinary grants and contracts funded
- Number of journal articles published by interdisciplinary teams in the Water Institute

Strategy 3: Integrate and strengthen UF water faculty expertise within existing Departments and Centers.

Objectives:

- Develop and promote individual Water Institute Affiliate Faculty programs
- Promote department and center water-related research and education programs
- Enhance departments and centers by building water faculty expertise in underrepresented disciplines
- Enhance faculty recruitment and retention within departments and centers

Actions:

- Establish and maintain a web-accessible Water Institute Affiliate Faculty expertise and awards database with appropriate links to departmental and center programs
- Provide campus-wide planning regarding water-related faculty positions required to fill gaps in existing expertise and coursework, and seek funding to fill those positions in departments and centers
- Create and co-host a Visiting Scholar program with departments and centers
- Create and co-host, with departments and centers, a network of interdisciplinary laboratories and field facilities to support water-related research conducted by Water Institute Affiliate faculty
- Host a monthly Distinguished Scholar Seminar Series to provide a venue for interdisciplinary faculty interaction

- Host regular Water Institute Symposia to provide a venue to highlight faculty and departmental programs, and a venue for interdisciplinary interaction with external stakeholders
- Distribute indirect costs in an equitable manner that encourages participation of faculty, Department Chairs, Center Directors and Deans

Performance Measures:
- Use of expertise database by External & Internal Stakeholders
- Number of new water- related faculty positions requested/filled
- New interdisciplinary laboratories and field facilities supported
- Number of Visiting Scholars co-hosted
- Number of Water Institute Affiliate Faculty
- Faculty Attendance at Seminar Series
- Faculty Attendance at Water Institute Symposium
- Number of workshops for strengthening interdisciplinary understanding and cooperation
- Faculty publications in high quality journals
- Faculty publications of widely cited books and journal articles

Strategy 4: Recruit and train excellent students to pursue careers in water-related science, engineering, policy, planning, and management, bringing with them an interdisciplinary focus

Objectives:
- Increase number and quality of graduate students studying water-related science, engineering, humanities, policy and law
- Train graduate students to work on interdisciplinary teams
- Increase the number of post-doctoral associates working on interdisciplinary water projects
- Provide access to state of the art tools and technologies for use in graduate and post-doctoral programs

Activities:
- Establish externally funded graduate assistantship/fellowship programs
- Establish externally funded post-doctoral fellowship programs
- Establish externally funded internship programs to provide real-world experience with Water Institute external stakeholders
- Create a network of interdisciplinary laboratories (both existing and new facilities) for use in graduate student and post-doctoral programs
- Encourage and support the development of new courses to expose students to state-of-the art tools and technology
- Involve graduate students and post-doctoral associates in interdisciplinary faculty working groups working on synthesis papers, proposals, and projects

Performance Measures:
- Number graduate students funded by Water Institute Projects
- Number of post-doctoral associates funded by Water Institute Projects

- Number of funded internships
- New interdisciplinary laboratories and field facilities available to students and post-docs
- New courses developed as a result of Water Institute initiatives
- Student/post-doctoral associates participation on proposal writing teams
- Student/post-doctoral associates participation in short-term assistance projects
- Student/post-doctoral associates attendance at Seminar Series and Water Institute Symposium
- Student/post-doctoral publications acknowledging Water Institute support

8. Organization

The Water Institute is led by a full-time director, who reports to the Vice President for Research. A team of research coordinators with advanced degrees assist the director in the development, execution and evaluation of Water Institute Programs. An internal Faculty Advisory Committee for the Water Institute consists of 12 members of the Water Institute Affiliate Faculty, 8 elected and 4 appointed on staggered 3 year terms. Individual faculty association with the Water Institute is through voluntary registration in the on-line faculty expertise database. All registered faculty are considered Water Institute Affiliate Faculty members and eligible to vote for the Faculty Advisory Committee members, and other governance issues. All Affiliate Faculty members retain their positions in their tenure department homes where all administrative and performance review functions are carried out.

For the first 3 years following the establishment of the Water Institute, participants in the monthly Water Institute Distinguished Scholar Seminar Series will constitute an ad-hoc External Council of Advisors for a 12 month period following their seminar. A Formal External Science Advisory Board will be formed at the conclusion of the third year (May 2009). This board will consist of representatives leading academic institutions in the field of water science, engineering, policy and law; state and federal governmental agencies; industry; non-governmental organizations and other private entities with an interest in water related issues.

9. Business Plan

The following summarizes the business plan for funding Water Institute programs:

- Base funds from UF for Water Institute director and staff salaries
- Endowment funds for operating expenses
- Grant funding for research, education and outreach programs
- Indirect cost (IDC) returns for re-investment in internal Program Initiation Fund Awards
- Industrial Membership Program to fund specific working groups, review panels etc.
- Fee-based short-courses and symposia
- Naming opportunities for donors, e.g.
    - Endowed chairs and named professorships
    - Named graduate fellowships
    - Named undergraduate research fellows
    - Named lectureships or visiting fellowships
    - Named conferences
    - Named buildings, labs, computational centers