

UNIT REPORT

Water Resources Center - Final
Annual Report

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Center for the Management, Utilization and Protection of Water Resources

Start: 07/01/2017

End: 06/30/2018

Providing Department: Water Resources Center

Department/Unit Contact: Bharat Soni, Amy Hill

Mission/Vision/Goal Statement:

Mission:

The mission of the Center for the Management, Utilization, and Protection of Water Resources is to support state and federal agencies, communities, and industry in solving water quality, biodiversity, and water security problems and advancing scientific understanding of all aspects of water science and engineering through basic and applied research. Center researchers study aquatic biodiversity and ecology from genes to ecosystems; address water quality challenges and develop better treatment technologies; and implement state-of-the-art technologies and tools for watershed sciences, modeling & simulation, data acquisition and geospatial analysis. The Center provides a strong water resources research infrastructure at Tennessee Tech by supporting faculty research, training and mentoring of future water professionals, and serving the citizens of the state of Tennessee.

Vision:

To enhance water quality, water security and aquatic biodiversity in Tennessee, and provide pioneering scientific information to better protect, manage, and utilize water resources from local to global scales.

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Start: 07/01/2016

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Mission/Vision/Goal Statement:

Mission:

- Research and develop innovative solutions to current knowledge and technology barriers associated with safe and sufficient water resources and biological diversity and sustainability.
- Develop transformational technologies and tools that encompass water-energy-food interactions.
- Through global outreach, support industry and state/federal agencies and communities in water security, biological diversity and associated sustainability programs.
- Support academic programs through student and faculty development and laboratory infrastructure access.
- Promote economic and rural community development regionally and in the State of TN.

Vision:

To enhance water security and biodiversity and explore the water-energy-food nexus to provide knowledge that will ensure a sustainable future.

Goal 1

Progress: Ongoing

Define Goal:

Increase recognition of the Center and its faculty through invited presentations, refereed publications, and other promotion initiatives. Produce a minimum of two refereed publications per year and present a minimum of four professional regional, national or international meetings per year.

Intended Outcomes / Objectives:

Objective 1.1. Make one invited speaking engagement per year.

Relationship to University Flight Plan Focus Area

Create Distinctive Programs and Invigorate Faculty

Action Plan: Through refereed publications, continued external funding, focused research, and participation in professional organizations, faculty obtain state, regional and national recognition.

Goal 1

Progress: Ongoing

Define Goal:

Increase recognition of the Center and its faculty through invited presentations, refereed publications, and other promotion initiatives. Produce a minimum of eight refereed publications per year and present at a minimum of 10 professional, regional, national or international meetings per year.

Intended Outcomes / Objectives:

Objective 1.1. Produce a minimum of eight refereed publications per year.

Objective 1.2. Produce a minimum of 10 professional regional, national or international meetings per year.

Objective 1.3. Make one invited speaking engagement per year.

Relationship to University Flight Plan Focus Area Create Distinctive Programs and Invigorate Faculty

Action Plan: Through refereed publications, continued external funding, focused research, and participation in professional organizations, faculty obtain state, regional and national recognition.

Goal 2

Define Goal:

Increase externally funded research.

Intended Outcomes / Objectives:

Objective 2. Increase externally funded research, which addresses the diverse water-related problems in Tennessee, the nation and the world. Toward this goal, the Center strives to increase external funding to 75% of state appropriation.

Relationship to University Flight Plan Focus Areas

Create Distinctive Programs and Invigorate Faculty

Action Plan: Strategic focus areas have been established by Center faculty and faculty associates. A portion of Center funds are being invested in selected high-return, research focus areas. Priority for the remaining research funds will be given to projects with potential to secure additional related external funds. The Center annually supports faculty who seek external research funds by: reviewing proposals prior to their being sent off campus; providing travel funds to support PIs meeting with agency program directors to discuss research opportunities; keeping faculty informed about research opportunities; bringing faculty together to develop interdisciplinary research proposals; and providing essential matching funds and student research support. The Center is working with the university administration to keep Tennessee's Congressional delegation informed about research findings and new emerging areas of research.

Goal 2

Progress: Ongoing

Define Goal:

Increase externally funded research.

Intended Outcomes / Objectives:

Objective 2.1. Increase externally funded research, which addresses the diverse water-related problems in Tennessee, the nation and the world. Toward this goal, the Center strives to increase external funding to \$3 (including indirect costs) per dollar of state appropriation.

Relationship to University Flight Plan Focus Areas

Create Distinctive Programs and Invigorate Faculty

Action Plan: Strategic focus areas have been established by Center faculty and faculty associates. Center funds are being invested in selected high-return, research focus areas. The Center annually supports faculty who seek external research funds by: reviewing proposals prior to their being sent off campus; providing travel funds to support PIs meeting with agency program directors to discuss research opportunities; keeping faculty informed about research opportunities; acting as a catalyst to bring faculty together to develop interdisciplinary research proposals; and providing essential matching funds. The Center is working with the university administration to keep Tennessee's Congressional delegation informed about research findings and new emerging areas of research.

Objective 2.2. Enhance the recognition of faculty members' contribution to science and engineering. In addition to a minimum of two refereed publications per year, faculty will present their research at a minimum of four professional regional, national or international meetings per year.

Relationship to University Flight Plan Focus Areas

Create Distinctive Programs and Invigorate Faculty

Action Plan: The Center maintains an editorial staff that prepares articles and information regarding researchers' activities and findings for targeted audiences such as the general public, decision makers, funding sources, colleagues, etc. The editor also assists faculty in manuscript preparation, and professional poster and oral presentations. Graduate student theses and dissertations are prepared as a compilation of professional articles to expedite the submittal of manuscripts to peer-reviewed journals.

Goal 3

Progress: Ongoing

Define Goal:

Increase the number of graduate students supported by the Center.

Goal 3

Progress: Ongoing

Define Goal:

Increase the graduate student stipend levels.

Intended Outcomes / Objectives:

Relationship to University Flight Plan Focus Areas

Create Distinctive Programs and Invigorate Faculty

Action Plan: Currently, the Center combines its resources with external funding to support graduate students at the level of \$1,200 per month for master's students. Doctoral students receive \$1,500 per month. The Center will continue to work with academic units and faculty to increase stipends to competitive levels within the Southeast.

Assessment: Tracking Number of Graduate Students Supported

Goal/ Outcome/ Objective: Goal 3

Type of Tool: Tracking Spreadsheet

Frequency of Assessment: Annually

Rationale:

The Center will continue to increase its initiative to support graduate students in their environmental science/engineering related research. Annually, the Center will assess how many students have been supported.

Assessment: Tracking Number of Graduate Students Supported

Goal/ Outcome/ Objective: Goal 3

Type of Tool: Tracking Spreadsheet

Frequency of Assessment: Annually

Rationale:

The Center will continue to increase its initiative to support graduate students in their environmentally related research. Annually, the Center will assess how many students have been supported.

Assessment: Collaborating with External Partners

Goal/ Outcome/ Objective: Goal 2

Type of Tool: Other

Frequency of Assessment: Every Five Years

Rationale:

The Center will assess its goal of increasing external funding through the expansion of external collaborations. These collaborations will extend into all aspects of improving water quality including expanding initiatives in water-energy-food nexus projects and sensors and other information technology tools to help society and the community. Collaborative relationships and intellectual capital will also be developed to support the Tennessee Department of Environment and Conservation and the Tennessee Department of Transportation in their environmental efforts throughout the state.

Assessment: Collaborating with External Partners

Goal/ Outcome/ Objective: Goal 2

Type of Tool: Other

Frequency of Assessment: Every Five Years

Rationale:

The Center will assess its goal of increasing external funding through the expansion of its external collaborations. These collaborations will extend into all aspects of improving water quality through expanding initiatives in water-energy-food nexus projects and sensors and other information technology tools to help society and the community, and through building the collaborative relationship and intellectual capital to support the Tennessee Department of Environment and Conservation and the Tennessee Department of Transportation in their environmental efforts throughout the state.

Assessment: External Funds

Goal/ Outcome/ Objective: Goal 2, Objective 2.1

Type of Tool: Other

Frequency of Assessment: Annually

Rationale:

The Center annually assesses the external funds received during the state's fiscal year. The Center conducts trend analyses to determine progress toward achieving goals and asserts correction action when needed.

Assessment: External Funds

Goal/ Outcome/ Objective: Goal 2, Objective 2.1

Type of Tool: Other

Frequency of Assessment: Annually

Rationale:

The Center annually assesses the external funds received during the state's fiscal year. The Center conducts trend analyses to determine progress toward achieving goals and asserts correction action when needed.

Assessment: Faculty Evaluations and Annual Reports

Goal/ Outcome/ Objective: Goal 1, Objective 1.1

Type of Tool:

Other

Frequency of Assessment: Annually

Rationale:

Annual faculty achievement reports contain information on scholarly works. This information is compiled and analyzed annually.

Assessment: Faculty Evaluations and Annual Reports

Goal/ Outcome/ Objective: Goal 1, Objective 1.1

Type of Tool: Other

Frequency of Assessment: Annually

Rationale:

Annual faculty achievement reports contain information on scholarly works. This information is compiled and analyzed annually.

Results Goal 1

Goal/Objective/Outcome Number: Goal 1

Results:

Center faculty published 20 refereed journal articles this fiscal year and and made 57 professional presentations, seven of which were invited presentations.

Results Goal 1

Goal/Objective/Outcome Number: Goal 1

Results:

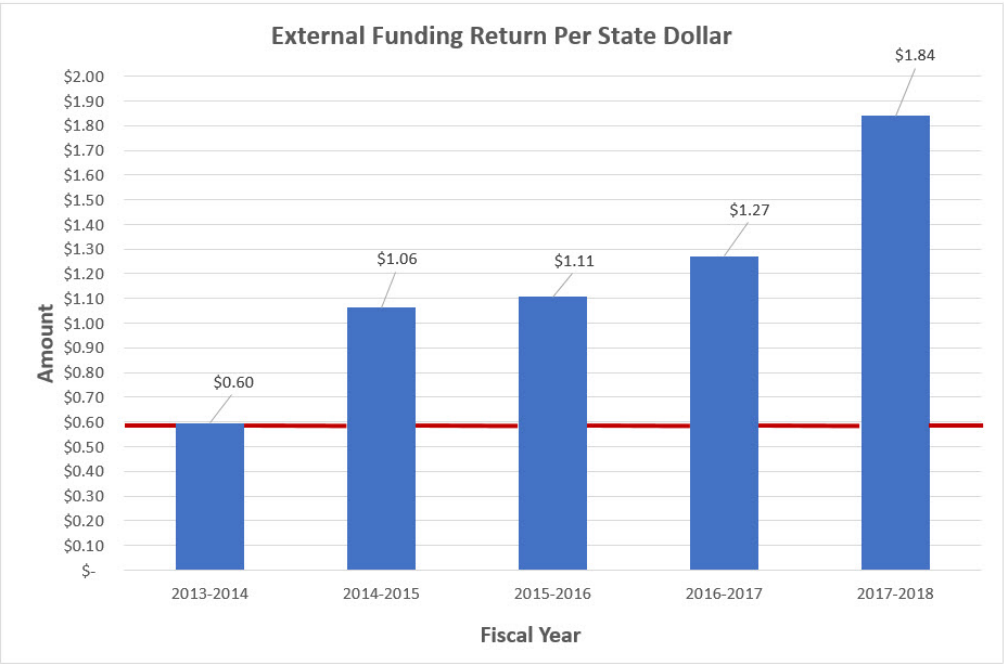
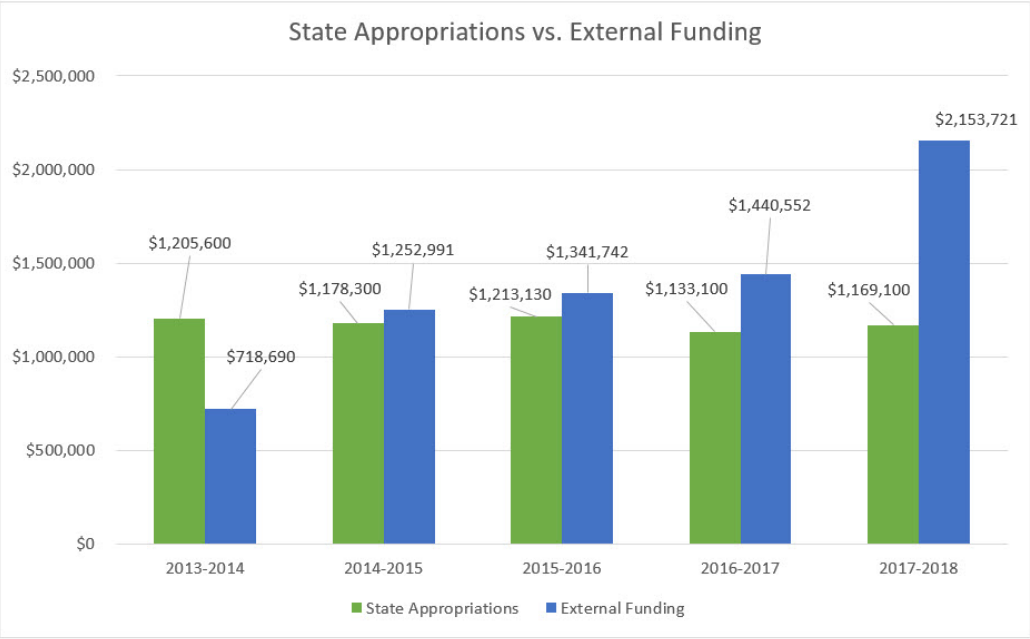
This fiscal year, Center researchers produced 13 refereed publications and made 47 professional presentations, four of which were invited.

Results Goal 2

Goal/Objective/Outcome Number: Goal 2

Results:

To meet the Center's goal of increasing external funding to 75% of the state appropriation of \$1,169,100, the Center would had to have earned \$876,825. This year, Center researchers earned \$2.2 million in external funding, which is a 49.5% increase over last-year's external funding of \$1.4 million and is 184% (or a \$1.84 return per state dollar) of the state appropriation.



The Center also partnered with the following agencies through externally funded research projects:

- 1. U.S. Department of Agriculture
- 2. U.S. Geological Survey
- 3. National Park Service
- 4. Tennessee Wildlife Resources Agency
- 5. Missouri Department of Conservation
- 6. U.S. Fish and Wildlife Service
- 7. North Carolina Community Foundation
- 8. Tennessee Department of Agriculture
- 9. National Geographic Society
- 10. National Science Foundation
- 11. Burroughs Wellcome Fund
- 12. Ensafe Inc.
- 13. IREX

Results Goal 2

Goal/Objective/Outcome Number: Goal 2

Results:

This fiscal year, the Center earned \$1,406,981 in external funding, which is 125% of its State-funded appropriation of \$1,128,005. The Center also initiated two collaborative research collaborations. Assistant Professor of Civil and Environmental Engineering Tania Datta hosted visiting scholar Ken Omori, from Chiba University in Japan. This is part of a long-term research collaboration between Amano and Datta on surface water quality assessment and nutrient pollution. Datta also initiated a collaborative proposal between TTU and the Technical University of the Philippines through the USAID-STRIDE program to investigate biogas production from sugar industry waste.

Results Goal 3

Goal/Objective/Outcome Number: Goal 3

Results:

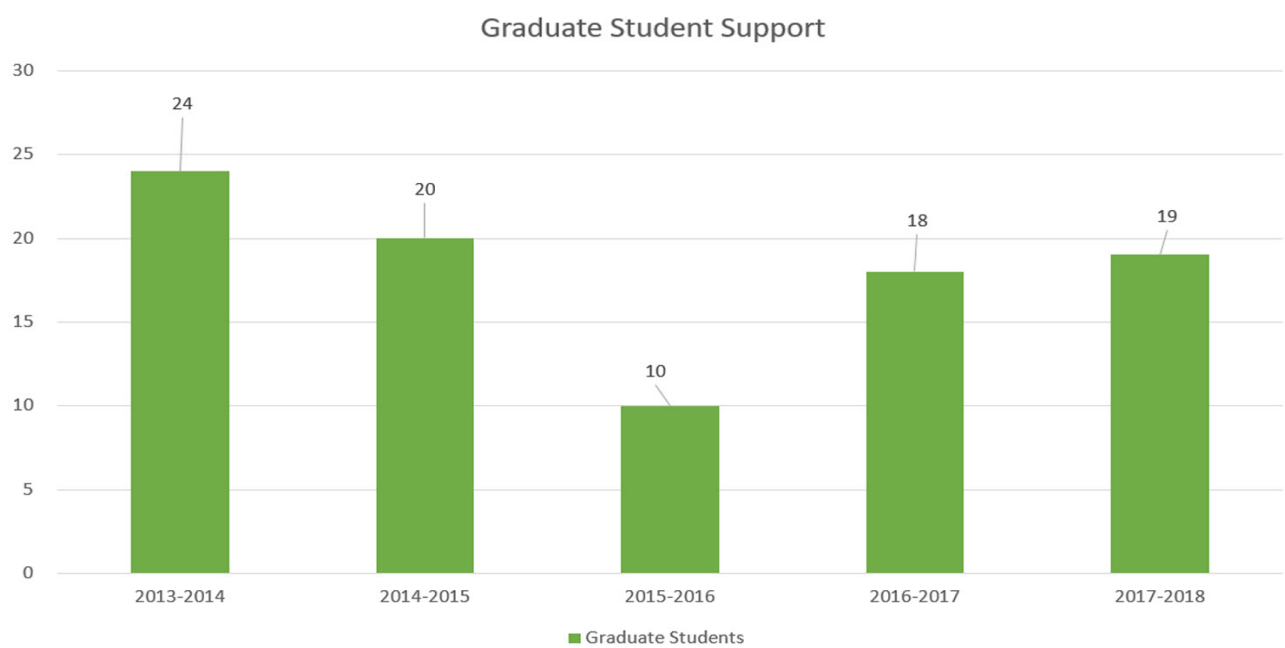
This fiscal year, the Center supported 18 graduate students.

Results Goal 3

Goal/Objective/Outcome Number: Goal 3

Results:

This year, the Center supported 19 graduate research assistants from six different academic majors. This is a 0.05% increase over last year.



Modifications and Continuing Improvement to Goals/Objectives/Outcomes

Program Changes and Actions due to Results:

The Center will shift its focus for Goal 3 from increasing the graduate student stipend levels to increasing the number of graduate students supported to reflect the Center's emphasis on increasing the number of students who receive first-hand research experiences with highly qualified faculty.

New Modifications and Continuing Improvement to Goals/Objectives/Outcomes

Goal/Objective/Outcome Number: Goal 1 Modification

Program Changes and Actions due to Results:

After reviewing Goal 1, the Center's Interim Director decided to remove Objective 1.3, Make one invited speaking engagement per year, for the 2018-2019 Fiscal Year. The final objectives will include Objective 1.1, Produce a minimum of eight refereed publications per year, and Objective 1.2, Produce a minimum of 10 professional regional, national or international meetings per year. Objective 2 of Goal 2 will also be changed to read "Increase externally funded research, which addresses the diverse water-related problems in Tennessee, the nation and the world. Toward this goal, the Center strives to maintain a minimum of external funding of 75% of state appropriations." The original read that the Center would strive to "increase external funding to 75% of state appropriation."

Improvement to Assessment Plan

Improvements to Assessment Plan:

The Center for the Management, Utilization and Protection of Water Resources has updated its mission statement and will coordinate its future activities toward that aim, which will be stated in the 2017-2018 report.

New Improvement to Assessment Plan Item

Improvements to Assessment Plan:

The rationale section of the Center's assessment tool of collaborating with external partners will be changed to read:

The Center will assess its goal of increasing external funding through the expansion of external collaborations. These collaborations will extend into all aspects of improving water quality including expanding initiatives in projects specifically identified as regional priorities, and sensors and other information technology tools to help society and the community. Collaborative relationships and intellectual capital will also be developed to support the Tennessee Department of Environment and Conservation and the Tennessee Department of Transportation in their environmental efforts throughout the state.

The word "correction" in the Center's external funds assessment tool rationale will change to read "corrective":

The Center annually assesses the external funds received during the state's fiscal year. The Center conducts trend analyses to determine progress toward achieving goals and asserts corrective action when needed.