

## Pamela Bishop, PhD

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### EDUCATION

- 2012      **Ph.D., Evaluation, Statistics, and Measurement**  
University of Tennessee  
Dissertation: *"Impacts of an Interdisciplinary Research Center on Participant Publication and Collaboration Activities"*
- 2005      **M.S., Entomology & Plant Pathology**  
University of Tennessee  
Thesis: *"Determining dollar spot fungicide resistance in Tennessee and Northern Mississippi"*
- 2002      **B.S., Plant Sciences**  
University of Tennessee

### PROFESSIONAL APPOINTMENTS

- 2016-Present    **Director**  
**The National Institute for STEM Evaluation and Research**  
The University of Tennessee, Knoxville, TN
- 2015-Present    **Associate Director for STEM Evaluation**  
**The National Institute for Mathematical and Biological Synthesis**  
The University of Tennessee, Knoxville, TN
- 2009-2015      **Evaluation Manager**  
**The National Institute for Mathematical and Biological Synthesis**  
The University of Tennessee, Knoxville, TN
- 2007- 2009      **Evaluation Research Assistant**  
**Oak Ridge Institute for Science and Education**  
Oak Ridge, TN
- 2006- 2007      **State Evaluation Coordinator**  
**Mathematics and Science Partnership Program**  
University of Tennessee, Knoxville, TN
- 2005-2006      **Research Associate**  
**Department of Plant Sciences**  
The University of Tennessee, Knoxville, TN

### PUBLICATIONS

- Sturner, K., **Bishop, P.**, and S. Lenhart. Developing Collaboration Skills in Team Undergraduate Research Experiences. Problems, Resources, and Issues in Mathematics Undergraduate Studies, 2016 (in press).
- Bishop, P.**, Huck, S.W., Ownley, B.O., Richards, J.K., and Skolits, G.J. (2014). Impacts of an interdisciplinary research center on participant publication and collaboration patterns. Research Evaluation 23 (4): 327-340.

- Duncan, S., **Bishop, P.**, and Lenhart, S. (2010). Preparing the “New” Biologist of the Future: student research at the interface of mathematics and biology. *CBE Life Sciences Education* 9(3): 311-315.
- Bishop, P.** (2012). Impacts of an Interdisciplinary Research Center on Participant Publication and Collaboration Activities. (Doctoral Dissertation, The University of Tennessee), [http://trace.tennessee.edu/utk\\_graddiss/1511](http://trace.tennessee.edu/utk_graddiss/1511).
- Crawley, C.E., and **P. Bishop.** (2012). Communicating Science Through Music: A Case Study from Mathematics and Biology. 12th International Public Communication of Science and Technology Conference Abstracts. Florence, Italy.
- Bishop, P.**, Sorochan, J.C., Ownley, B.H., Samples, T.J., Windham, A.S., Windham, M.T., and Trigiano, R.N. (2008). Resistance of *Sclerotinia homoeocarpa* to thiophanate-methyl, iprodione, and propiconazole in Tennessee and northern Mississippi. *Crop Sci.* 48: 1615-1620.
- Baird (Bishop), P.** (2005). Determining Dollar Spot Resistance in Tennessee and Northern Mississippi. (Master’s Thesis, The University of Tennessee), [http://trace.tennessee.edu/utk\\_gradthes/1634](http://trace.tennessee.edu/utk_gradthes/1634)

#### EXTERNAL SUPPORT

**2016-2021** NSF (award in process) **ASPIRE: Appalachian Students Promoting the Integration of Research in Education.** \$5,000,000

**(Evaluator)** This project will support high achieving, low-income Appalachian students who attend the University of Tennessee in Knoxville or Chattanooga to complete degrees in science because economic growth in Appalachia is projected to rely heavily on science. However, these Appalachian students come from households where post-secondary education is rare and poverty rates are high, thus creating barriers to degree completion. ASPIRE will address financial, academic, and other barriers to graduating with a scientific degree by providing scholarships and targeted academic and social support. Eighty students will receive four-year scholarships, live in research-focused living/learning communities, engage in mentored research, and participate in academic transition seminars, career-building fellowships and family activities. Scholarship students on the larger Knoxville campus will also engage with the new Appalachian Mentoring Program, which will provide support across social, academic, and career-related domains. Outcomes for students from low-income, low-minority rural schools (those receiving S-STEM scholarships and not receiving this support) and students from low-income, high-minority, urban schools (who are and are not receiving existing support services) will be compared to advance knowledge about practices that facilitate success for diverse students.

**2016-2018** NSF (award in process) **INCLUDES Conference on Multi-Scale Evaluation in STEM Education.** \$249,721

**(Co-PI)** This project will develop, organize and host a Conference to assist in the planning of the NSF INCLUDES Alliances and National Network. The focus of this project is the design and implementation of program evaluations necessary for the INCLUDES Alliances and National Network. The proposed Conference will be the first ever held that emphasizes the multiple scales at which evaluations occur for programs that include components based at single institutions, at interdisciplinary centers/institutes within larger institutions, at alliances/partnerships between several institutions and at entities with a national scope. As the INCLUDES Alliances and National Network will operate across multiple scales, the proposed Conference will provide guidance on the technical aspects of designing and planning multi-scale evaluations. The target audience for the activities are those individuals involved in current INCLUDES projects, those considering collaborating in such projects and STEM

educators considering inclusion of formal evaluation in their projects. The overall goals are to (i) enhance the knowledge of the participants about evaluation methods; (ii) present the experiences of individuals who have successfully developed alliances and carried out evaluation efforts for these; and (iii) provide advice regarding evaluation methods for those planning to participate in future requests for INCLUDES Alliances and/or the National Network.

**2016-2019 NSF (award in process) Biology undergraduate Mathematics Attitudes and Anxiety Program \$300,000**

**(Evaluator)** This project will: 1) develop experiential learning materials that guide students towards greater comfort with math, and pilot those materials with Radford University undergraduates who self-identify as needing help in math/stat courses; 2) conduct a controlled study in which some sections of courses are assigned our materials as a supplement to their content instruction; 3) disseminate these materials to instructors nationwide, by leveraging the QUBES (Quantitative Undergraduate Biology Education and Synthesis) project, with its faculty development networks, online instructor hub, and consortium of partners (e.g., HHMI, AAAS, Society for Mathematical Biology, MAA). Through QUBES, we will reach key “change-makers” - instructors interested in quantitative biology reform who can act as conduits for implementing the materials at their home institutions.

**2015-2017 NSF #1544375 Math: EAGER: Assessing Impacts on Student Learning in Mathematics from Inclusion of Biological, Real-World Examples. \$299,900**

**(PI)** This project is to develop a new instrument to investigate and compare learning comprehension and skill development in college-level mathematics courses that use real-world examples from the life sciences versus courses that use more abstract learning. The instrument—the Quantitative Biology Concept Inventory (QBCI)—could serve as a model for measuring the effect of using real-world interdisciplinary examples on enhancing mathematical comprehension in undergraduates.

**2016-2021 USDA-MSP # 2016-38413-25270 Building Capacity for the Recruitment and Retention of Students in Forestry: Multicultural Scholars Program. \$232,971**

**(Co-PI, Evaluator)** This project targets historically underrepresented students in agriculture and natural resource sciences and seeks to recruit, educate and graduate minority undergraduate scholars. We will utilize newly passed state legislation (Tennessee Promise) that provides two-years of free community college tuition to Tennessee residents to recruit underrepresented students into Forestry through articulation agreements with local community colleges. MSP scholars will complete a rigorous curriculum designed to promote experiential learning opportunities through undergraduate research and professional internship experiences. At the completion of this project, we anticipate placing 9 underrepresented scholars directly into the workforce in the fields of Resource Management or Urban Forestry.

**2015-2016 Alfred P Sloan Foundation # G-2015-14145 Blackwell-Tapia Conference \$26,364**

**(Co-PI, Evaluator)** This conference seeks to address the underrepresentation of minorities in the mathematical sciences. The goals are to recognize and showcase mathematical excellence by minority researchers; recognize and disseminate successful efforts to address under-representation; educate participants about career opportunities in mathematics, especially outside academia; and provide networking opportunities for mathematical researchers at all career stages.

**2015-2016 HHS-NIH-NIAID-National Institute of Allergy and Infectious Diseases # 1 R13 AI124621-01 X International Conference on HFRS, HPS and Hantaviruses \$5,000**

**(Co-PI, Evaluator)** Travel and evaluation support for the X International Conference on Hemorrhagic Fever With Renal Syndrome (HFRS), Hantavirus Pulmonary Syndrome (HPS) and Hantaviruses to be held at Fort Collins, Colorado, May 31-June 3, 2016. The International Society of Hantaviruses (ISH) organizes this international conference every three years, which rotates in location to include all areas of the world with hantavirus diseases. The ISH is a chartered organization with an international Governing Committee, and an elected President, Vice President and Secretary. These conferences have provided a forum for a synergistic group of clinicians, basic researchers, mammalogists, epidemiologists and ecologists to share their expertise and interests in all aspects of hantavirus research.

**2016-2019 NSF # 1560033 REU Site: Advanced Materials for Energy and Sensing Applications at the University of Tennessee \$330,000**

**(Evaluator)** This award from the Division of Chemistry (CHE) supports a Research Experience for Undergraduates (REU) Site at the University of Tennessee-Knoxville entitled "Advanced Materials for Energy and Sensing Applications at the University of Tennessee" that is led by Professors Michael D. Best and Shawn R. Campagna. The site offers an intensive introductory research experience for undergraduate students which is designed to introduce and train participants in modern research techniques and also mentor them in the development of complementary professional skills that are critical for successful scientific careers. In this way, the program strengthens the scientific enterprise in the United States by recruiting students and developing them into skilled researchers at an early point in their education. Further, the program emphasizes the inclusion of a diverse group of participants to address the underrepresentation of various demographic groups in the sciences.

**SPEAKING ENGAGEMENTS/TEACHING**

**Keynote Speaker**, "How Program Evaluation Can Enhance your Project," National Science Foundation Research Coordination Networks in Undergraduate Biology Education Summit, Washington, DC, 2016

**Guest lecturer**, "Grant Writing," ENGL 360, Technical/Professional Writing, 2015-2016

**Guest lecturer**, "Introduction to Quantitative Research Methods," COUN 650, Foundations of Counselor Education, University of Tennessee Knoxville, September 2012-2016

**Instructor**, EDPY 577, Statistics in Applied Fields II, University of Tennessee Knoxville, 2011

**Workshop Organizer**, NSF Biology Research and Education Center Evaluation Meeting, 2010

Teaching Assistant, PLSC 441, Advanced Turfgrass Physiology, University of Tennessee Knoxville, 2005

**Lab Instructor**, PLSC 441, Advanced Turfgrass Physiology, University of Tennessee Knoxville, 2005

**PROGRAM EVALUATION EXPERIENCE**

**4/16-Present**

NIMBioS Evaluation Services

Evaluate multiple projects involving interdisciplinary scientific research groups, K-16 and graduate-level interdisciplinary educational programs, and outreach events aimed at promoting teaching, learning, and research at the intersection of mathematics and biology.

**2/09-Present**

National Science Foundation

*Evaluation of the Research and Education and Outreach Programs at the National Institute for Mathematical and Biological Synthesis (NIMBioS)*

Management and establishment of research protocols for all NIMBioS program evaluation activities, including the working group and workshop research activities, research-level tutorials, and the variety of outreach activities including general public, K-12 programs at schools, mentoring networks for high school teachers, and mentoring networks for undergraduates.

**9/07-2/09**

Joint Genome Institute

*Evaluation of the JGI Bioinformatics Education Consortium course*

Analysis of pre- and post-survey data from student responses for a project utilizing undergraduate research in a bioinformatics course at multiple universities across the country.

**9/07-2/09**

U.S. Department of Energy

*Evaluation of the DOE National Science Bowl*

Analysis of responses to a questionnaire collected by DOE WDTS at their National Science Bowl.

Analysis of data from the Cray XT Quad-core workshop, the Cray Quad XT5 workshop, and NCCS user meeting surveys.

**9/07-2/09**

U.S. Department of Energy

*Science Teacher as Researcher*

Analysis of pre- and post-survey data from participant responses for a project providing pre-service and early-career science teachers with eight-week-long, paid and mentored research internships at a national research center.

**3/06-8/07**

Tennessee Department of Education

*Evaluation of the Mathematics and Science Partnership Program*

Coordination and establishment of evaluation reporting protocols and data collection instruments for 21 MSP projects across the state of Tennessee. Analysis of site visit, interview, and observation data.

**3/06-8/07**

Tennessee Department of Education

*Evaluation of School-Wide Positive Behavior Support Program*

Development of evaluation data collection tools and analysis methods for School-Wide Positive Behavior Support Program across the state of Tennessee. Analysis of interview data.

**PRESENTATIONS**

*Evaluation of Center-Scale Initiatives.* (2016, September). Presentation at the Presentation at the Joint International Synthesis Center Consortium Meeting in Fort Collins, CO.

*How Program Evaluation Can Help You.* (2016, January). Keynote presentation at the National Science Foundation Research Coordination Networks for Undergraduate Biology Education Summit in Washington, DC.

*Factors influencing productivity in interdisciplinary synthetic team science groups.* (2015, June). Paper presentation at the American Evaluation Association Annual Conference. Chicago, IL.

*NIMBioS Evaluation Strategies.* (2015, January). Presentation at the Joint International Synthesis Center Consortium Meeting in Leipzig, Germany.

*Applying Social Network Analysis to Evaluate the Evolution of Interdisciplinary Research Teams.* (2014, August). Paper presentation at the Science of Team Science Annual Conference. Austin, TX.

*Impacts of an interdisciplinary research center on participant publication and collaboration patterns.* (2013, September). Paper presentation at the Global Tech Mining Conference in Atlanta, GA.

- Impacts of an Interdisciplinary Research Center on Participant Publication and Collaboration Activities.* (2012, October). Poster presentation at the American Evaluation Association Annual Conference. Minneapolis, MN.
- A Student-Generated Collaborative Approach to Developing New Evaluator Competencies.* (2010, November). Roundtable presentation at the American Evaluation Association Annual Conference. San Antonio, TX.
- My First Year as an Internal Evaluator: What I Didn't Know That I Didn't Know.* (2010, November). Roundtable presentation at the American Evaluation Association Annual Conference. San Antonio, TX.
- Using Program Theory to Communicate Evaluation Plans with Stakeholders.* (2010, February). Paper presented at the Southeastern Evaluation Association Annual Conference. Tallahassee, FL.
- Development of a Visual Program Theory Framework for Multilevel Evaluation of the National Institute for Mathematical and Biological Synthesis.* (2009, November). Paper presented at the American Evaluation Association Annual Conference. Orlando, FL.
- To PhD or not to PhD? That is the Question.* (2009, November). Roundtable presentation at the American Evaluation Association Annual Conference. Orlando, FL.
- Internal and External Evaluation Issues: Where Do You Draw the Line?* (2008, November). Roundtable presentation at the American Evaluation Association Annual Conference. Denver, CO.
- Issues in Multisite, Multilevel Evaluations of Science, Technology, Engineering, and Mathematics (STEM) Education Programs.* (2008, November). Paper presented at the American Evaluation Association Annual Conference. Denver, CO.
- A Logic Model Framework for Evaluation of a National Workforce Development Endeavor.* (2008, November). Poster presentation at the American Evaluation Association Annual Conference. Denver, CO.
- Developing a National Evaluation System for Science Education Programs.* (2008, May). Paper presented at the Canadian Evaluation Society Annual Conference. Quebec, Canada.
- A Logic Model Framework for Evaluation of a National Workforce Development Endeavor.* (2008, May). Poster presented at the Canadian Evaluation Society Annual Conference. Quebec, Canada.
- Inheriting a National Evaluation System: Lessons Learned and Advice Given.* (2008, February). Paper presented at the Southeastern Evaluation Association Annual Conference. Tallahassee, FL.
- A Logic Model Framework for Evaluation of a National Workforce Development Endeavor.* (2008, February). Poster presented at the Southeastern Evaluation Association Annual Conference. Tallahassee, FL.
- Mathematics and Science Partnership Programs Evaluation Design.* (2006, December). Paper presented at the Tennessee Department of Education Meeting for MSP Principle Investigators. Nashville, TN.
- Determining Dollar Spot Fungicide Resistance in Tennessee and Northern Mississippi.* (2004, November). Paper presented at the American Society of Agronomy Annual Conference. Seattle, WA.
- University of Tennessee Golf Turf Research Update.* (2004, August). Paper presented at the East Tennessee Golf Course Superintendents Association Meeting. Greenville, TN.
- Dollar Spot Fungicide Resistance and Managing for it.* (2004, April). Paper presented at the Middle Tennessee Golf Course Superintendents Association Meeting. Nashville, TN.
- University of Tennessee Turfgrass Research Update.* (2004, January) Paper presented at the Tennessee Turfgrass Association Annual Conference. Nashville, TN.

**PROFESSIONAL SERVICE**

- 2016-present Member, University of Tennessee Commission for Women
- 2016-present Member, University of Tennessee Women in STEM Committee
- 2016-present Member, University of Tennessee Institutional Review Board
- 2015-2016 Reviewer, *Journal of Applied Ecology*, *Research Evaluation*, and *CBE Life Sciences Edition*
- 2012 Volunteer Activity Coordinator, Gadget Girls: Adventures in STEM, Knoxville, TN
- 2010 Member of iPlant Collaborative External Evaluation Advisory Panel, Durham, NC
- 2008-present Invited Member, American Evaluation Association Annual Conference Proposal Review Committee, 2008-present
- 2005 Reviewer, Tennessee Mathematics and Science Partnership Programs grants; Tennessee Department of Education, Nashville, TN.

**PROFESSIONAL MEMBERSHIPS**

- 2014-Present Joint International Synthesis Center Consortium
- 2009-Present American Psychological Association  
Division 5 (Evaluation, Measurement, and Statistics)
- 2008-Present Southeastern Evaluation Association
- 2008-2011 American Association for Public Opinion Research
- 2006-Present American Evaluation Association