Lucas Michael Goodman

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EDUCATION

Virginia Polytechnic Institute and State University, Blacksburg, VA	Aug 2022 - present
PhD Student, Planning, Governance, and Globalization	GPA: 3.59
Virginia Polytechnic Institute and State University, Blacksburg, VA	Aug 2020 - present
MS Student, Biological Systems Engineering	GPA: 3.44
Iowa State University, Ames, IA	Jan 2017 - Dec 2019
Bachelor of Science in Animal Ecology and Environmental Studies	GPA: 3.58
Des Moines Area Community College , Ankeny, IA	<i>Aug 2015 - Dec 2016</i>
General Education Pre-Requisites	GPA: 3.49

RESEARCH EXPERIENCE

NSF Research Trainee Fellow, Science-Policy Interface Lab Virginia Tech, School of Public and International Affairs PI: Dr. Todd Schenk Aug 2022 - present

Grant Title: Convergence at the Interfaces of Policy, Data Science, Environmental Science and Engineering to Combat the Spread of Antibiotic Resistance (CIP-CAR)

- Studying mechanisms for effective science-based policy interventions and governance strategies for combating antimicrobial resistance (AMR)
- Collaborating across disciplines with environmental engineers and scientists, data scientists, and bioinformaticists to develop convergent solutions for AMR policy drivers, ethics concerns, and conflicting needs and perspectives of stakeholders

Graduate Research Assistant, Hydroecology & Watershed Engineering Lab Aug 2020 - present Virginia Tech, Biological Systems Engineering Department Aug 2020 - present

PIs: Dr. Durelle Scott, Dr. Erich Hester (Civil and Environmental Engineering Dept) Grant Title: Watershed effects on success of stream restoration for excess nitrogen mitigation

- Developed a hydraulic model for a 4th-order watershed that simulates stream restoration scenarios (floodplain reconnection, Stage 0 restoration, and unrestored) at varying locations throughout the stream network using HEC-RAS (v6.2)
- Calibrated model by creating synthetic hydrographs for monthly, semi-annual, 1-yr, and 2-yr storm recurrence intervals derived from regional curves based on stream discharge data from gages in the Virginia Piedmont physiographic region
- Parameterized model geophysical factors by researching what is commonly found in Virginia Piedmont (Manning's n, hydraulic conductivity, channel dimensions, drainage area, slope)
- Generated a comprehensive nitrate removal rate database containing rates for different stream restoration scenarios by gathering data through a systematic literature review process
- Created a random forest machine learning model to show the influence of different watershedscale, restoration, and temporal variables in predicting N removal rates
- Developed an artificial neural network that incorporated the previously developed random forest approach to predict nitrate removal rates based on specific watershed, restoration, and temporal conditions

- Wrote random forest machine learning code in R (v4.1.0)
- Produced a dataframe of predicted nitrate removal rates for restoration scenarios that will be incorporated into hydraulic 4th-order watershed model to calculate total nitrate load reductions at watershed outlet based on duration and area of floodplain inundation during storm events
- Assisted in organizing meetings with stakeholders from academia, non-profit, private sector, and federal, state, and local government agencies to gain input on project direction, outcomes, and goals
- Orchestrated correspondence with US Army Corps of Engineers HEC-RAS developers
- Generated an annual status report for grant agency (Chesapeake Bay Trust) summarizing nitrate removal rate database, major findings, and current state of the literature (Goodman, et al. 2021)

Independent Undergraduate Researcher, Applied Geomorphology Lab Iowa State University, Natural Resource Ecology Management Department

Aug - Dec 2019

Pls: Dr. Peter Moore, Dr. Kristie Franz, Dr. Laura Merrick

- Investigated the role of stream restoration efforts in altering hydrodynamics within the system
- Orchestrated and managed stream measurement efforts while mentoring an undergraduate field technician
- Developed a HEC-RAS model to assess changes in flood-carrying capacity after stream • restoration efforts using pre-restoration LiDAR data and design DEM data
- Incorporated cross-sections into model, merged field measurements with design DEM to improve cross-section accuracy, and interpolated data when necessary
- Presented at local conference (Iowa State University Science with Practice Symposium Fall 2019)

Independent Undergraduate Researcher, Healthy Streams Healthy Coasts NSF REU June - July 2019 University of Louisiana at Lafayette, Civil Engineering Department PI: Dr. Robert Miller

- Developed a computational geospatial water budget model for Vermilion River, Louisiana using HEC-RAS, QGIS, R, and MATLAB to simulate flow dynamics to better understand the relationship between flooding and poor water quality
- Partitioned model into compartments to understand flow interactions within the system using • data from a catastrophic flooding event in 2016
- Predicted the effects of future river modification projects and climate change on water quality dynamics and flooding events
- Gathered input data (precipitation and evapotranspiration) from publicly available sources (i.e., • U.S. Geological Survey, Lafayette, LA Regional airport, Louisiana State University AgCenter)
- Incorporated net flow rate data and digital elevation model into HEC-RAS model
- Presented at international conference (*Coastal and Estuarine Research Federation Conference 2019) and regional conference (SUS-RURI: Developing a Convergence SUS Agenda for Redesigning the Urban-Rural Interface along the Mississippi River Watershed)

Independent Undergraduate Researcher, Watershed Conservation Lab Iowa State University, Natural Resource Ecology and Management Department PIs: Dr. Thomas Isenhart, Dr. Emily Zimmerman

Aug 2018 - May 2019

- Used ArcGIS to model best management practices for mitigating nitrate and phosphorus runoff from agricultural landscapes in Iowa
- Incorporated hydrology with crop productivity and land rental value to determine most • environmentally and economically viable conservation planning strategies
- Presented at national conference (21st Annual Texas National McNair Scholars Research Conference)

Research Team Member

Iowa State University, Ronald E. McNair Postbaccalaureate Achievement Program Supervisors: Dr. Ashley Garrin, Thelma Harding

- Investigated how cultural empathy, or lack thereof, affects relationships between graduate students and academic mentors at a predominantly white institution (Iowa State University)
- Surveyed graduate students and faculty by crafting and conducting personal interviews
- Collaborated with peers to synthesize qualitative data from interviews, find commonalities, and
 assess reoccurring themes

Independent Undergraduate Researcher, Sustainable RIVER NSF REU University of South Dakota, Biology Department

PI: Dr. Jacob Kerby, Supervisor: Anna Kase (Ph.D. Candidate)

- Investigated influence of habitat alteration on false map turtle (*Graptemys pseudogeographica*) assemblages in anthropogenically disturbed riverine systems
- Surveyed Missouri River, SD for multiple turtle species using traps, visual surveys, and environmental DNA samples
- Assisted graduate students with turtle, amphibian, fish, and benthic invertebrate sampling in riverine and wetland systems as well as freshwater mesocosms
- Presented at national conference (AAAS and NSF Emerging Researchers National Conference in STEM) and two regional conferences (**LSAMP IINSPIRE Program Annual Conference, Missouri River Institute Symposium)

Independent Undergraduate Researcher, Grassland Conservation Lab Iowa State University, Ecology, Evolution, and Organismal Biology Department PI: Dr. Diane Debinski, Supervisor: Nicholas Lyon (MS Graduate)

- Analyzed relationships between plant and arthropod communities in Iowa prairie systems
- Identified prairie plants and arthropods, gathered field samples, and compiled data over the course of a summer internship
- Presented at national conference (National Conference on Undergraduate Research)

Field Technician Intern, Grassland Conservation Lab

Iowa State University, Ecology, Evolution, and Organismal Biology Department PI: Dr. Diane Debinski

- Identified and collected data on Midwestern butterfly, bee, and floral prairie plant species in situ
- Entered data into Microsoft Access
- Managed and cleaned datasets from previous nine years

TECHNICAL REPORTS

Goodman, L.M., Federman, C.E., Scott, D.T., and Hester, E.T. 2021. Literature Review of Nitrate Removal Rates by Stream Restoration Practices and Summary of Removal Rate Database. Chesapeake Bay Trust.

ORAL PRESENTATIONS

Goodman, L.M., Shanmukh Panji, N., Kang, J., Risteca, P., Sterling, C. *An interactive website on environmental justice within the New River Valley*. Virginia Tech Interfaces of Global Change Graduate Research Symposium. Virginia Polytechnic Institute and State University, Blacksburg, VA. 04/2023.

Aug 2018 - May 2019

May - Aug 2018

Aug - Dec 2017

May - Aug 2017

- **Goodman, L.M.**, Federman, C., Scott., D.T., Kruse Daniels, N., Hester, E.T. *Cumulative Effects of Stream Restoration and Watershed Characteristics on Watershed-Scale Nitrate Removal*. American Society of Civil Engineering Environmental & Water Resources Institute: World Environmental and Water Resources Congress 2022. Atlanta, GA. 06/2022.
- Goodman, L.M., Miller, R.L. Modeling a Catastrophic Flooding Event to Improve Water Quality and Environmental Health in Southern Louisiana. Coastal and Estuarine Research Federation 25th Biennial Conference. Mobile, AL. 11/2019.

*Awarded best undergraduate student oral presentation

- Goodman, L.M., Santos-Rivera, C., Steen, A., González-Díaz, L., Elmore, K., Vargas, A., Alvarez-Valdivia, A., Whitehead, D., Diaz, E., Argueta, E., Castillo, I., Villa, J., Landeros, J., Carranza, J., Figueroa, N., Bonner, T., Garrin, A., Harding, T. *The Importance of Cultural Empathy within Mentor-Mentee Relationships at a Predominantly White Institution*. Iowa State University Annual Ronald E. McNair Postbaccalaureate Achievement Program Research Symposium. Iowa State University, Ames, IA. 04/2019.
- **Goodman, L.M.**, Zimmerman, E., Isenhart, T.M. *Balancing Conservation and Economics to Improve Water Quality in Iowa and Beyond*. Iowa State University 13th Symposium on Undergraduate Research & Creative Expression. Iowa State University, Ames, IA. 04/2019.
- **Goodman, L.M.**, Kase, A., Kerby, J. *Effects of Habitat Alteration on False Map Turtles (Graptemys psuedogeographica) in the Missouri River, South Dakota*. AAAS and NSF Emerging Researchers National Conference in STEM. Washington, D.C. 02/2019.
- **Goodman, L.M.**, Zimmerman, E., Isenhart, T.M. *Balancing Conservation and Economics to Improve Water Quality in an Agricultural Landscape*. 21st Annual Texas National McNair Scholars Research Conference. University of North Texas, Denton, TX. 02/2019.
- Goodman, L.M., Kase, A., Kerby, J. Damming of the Missouri River and Its Effects on the Threatened False Map Turtle (Graptemys psuedogeographica). LSAMP IINSPIRE Program Annual Conference. Iowa State University, Ames, IA. 02/2019.
 *Awarded 3rd place overall for oral presentations
- **Goodman, L.M.**, Kase, A., Kerby, J. *Effects of Habitat Alteration on False Map Turtles (Graptemys psuedogeographica) in the Missouri River, South Dakota*. Iowa One Health Symposium. Iowa State University, Ames, IA. 11/2018.

POSTER PRESENTATIONS

- **Goodman, L.M.,** Federman, C., Scott., D.T., Hester, E.T. *Watershed-Scale Effects of Floodplain and Stage O Restoration on Flood Attenuation and Floodplain Exchange*. River Restoration Northwest 2023 Symposium. Skamania, Washington. 02/2023.
- **Goodman, L.M.,** Federman, C., Scott., D.T., Kruse Daniels, N., Hester, E.T. *Watershed-Scale Restoration Strategies for Maximizing Water Quality Benefits Through Machine Learning and Hydraulic Modeling*. Virginia Tech Interfaces of Global Change Graduate Research Symposium. Virginia Polytechnic Institute and State University, Blacksburg, VA. 04/2022.
- **Goodman, L.M.**, Moore, P., Franz, K., Merrick, L., Milach-Teixeira, A. *Changes in Flood-Carrying Capacity* of a Recently Restored Stream System. Iowa State University Science with Practice Symposium Fall 2019. Iowa State University, Ames, IA. 12/2019.

- **Goodman, L.M.**, Miller, R.L. *Modeling a Catastrophic Flooding Event to Improve Water Quality and Environmental Health in Southern Louisiana*. SUS-RURI: Developing a Convergence SUS Agenda for Redesigning the Urban-Rural Interface along the Mississippi River Watershed. Iowa State University, Ames, IA. 08/2019.
- **Goodman, L.M.**, Miller, R.L. *Modeling a Catastrophic Flooding Event to Improve Water Quality and Environmental Health in Southern Louisiana*. University of Louisiana Lafayette REU & Summer Undergraduate Research Symposium. University of Louisiana at Lafayette, Lafayette, LA. 07/2019.
- **Goodman, L.M.**, Zimmerman, E., Isenhart, T.M. *Balancing Conservation and Economics to Improve Water Quality in Iowa and Beyond*. Iowa State University Annual Ronald E. McNair Postbaccalaureate Achievement Program Research Symposium. Iowa State University, Ames, IA. 04/2019.
- **Goodman, L.M.**, Zimmerman, E., Isenhart, T.M. *Balancing Conservation and Economics to Improve Water Quality in Iowa and Beyond*. 14th Annual Research in the Capitol. Iowa State House, Des Moines, IA. 04/2019.
- **Goodman, L.M.**, Kase, A., Kerby, J. *Effects of Habitat Alteration on False Map Turtles (Graptemys psuedogeographica) in the Missouri River, South Dakota*. Missouri River Institute Symposium. University of South Dakota, Vermilion, SD. 11/2018.
- **Goodman, L.M.**, Kase, A., Kerby, J. *Effects of Habitat Alteration on False Map Turtles (Graptemys psuedogeographica) in the Missouri River, South Dakota*. South Dakota Established Program to Stimulate Competitive Research Undergraduate Research Symposium. Pierre, SD. 07/2018.
- **Goodman, L.M.**, Lyon, N., Debinski, D.M. *Flowers Increase Ecosystem Biodiversity in Midwestern Prairies*. It's All About Science Festival. Sanford Research Center, Sioux Falls, SD. 06/2018.
- **Goodman, L.M.**, Lyon, N., Debinski, D.M. *Flowers Increase Ecosystem Biodiversity in Midwestern Prairies*. Iowa State University 12th Symposium on Undergraduate Research & Creative Expression. Iowa State University, Ames, IA. 04/2018.
- **Goodman, L.M.**, Lyon, N., Debinski, D.M. *Flowers Increase Ecosystem Biodiversity in Midwestern Prairies*. National Conference on Undergraduate Research. University of Central Oklahoma, Edmond, OK. 04/2018.
- **Goodman, L.M.**, Lyon, N., Debinski, D.M. *Effects of Flowering Plant Species Richness on Arthropod Order Richness in a Grassland Ecosystem*. Iowa State University Ecology and Evolutionary Biology Graduate Department Research Symposium. Iowa State University, Ames, IA. 02/2018.

TEACHING EXPERIENCE

Seminar Instructor and Coordinator, Interfaces of Global Change 1st Seminar (GRAD 5134) Jan 2023

- Led Peer Assist Seminar for newly admitted Interfaces of Global Change Fellows (PhD students)
- Provided insight and guidance for newly admitted Fellows by sharing opportunities and expectations of the Interfaces of Global Change Program, including fellow commitments, social events, research opportunities, capstone project expectations, and fellowships

Volunteer Booth Instructor, Montgomery County Stormwater Days

- Taught middle school students about the effects of topography on landscape-level hydrology using an interactive augmented reality sandbox
- Led hands-on activities with students to engage them in topics surrounding hydrology, water • resource management, land use planning, and water quality

Teaching Assistant, Introduction to Green Engineering (ENGR 3124) Virginia Tech, Instructors: Dr. Durelle Scott, Dr. Sean McGinnis

Served as the single TA for 303 students over 2 semesters

- 0 183 students in Fall; 120 students in Spring
- Assisted in transitioning lecture-hall-style course to a virtual format and curriculum due to COVID-19 pandemic
- Facilitated in-class discussions on renewable and non-renewable energy sources and systems, energy storage systems, water resource management, sustainable agriculture, transportation systems, sustainable urban planning, green infrastructure, and energy efficient buildings
- Assisted students with assignments and general questions during office hours and started biweekly homework review sessions
- Graded assignments, guizzes, and exams •
- Led lectures occasionally

Teaching Assistant, Integrative Undergraduate Research Course (U ST 275X) Iowa State University, Instructor: Dr. Svitlana Zbarska

- Provided advice and individually assisted undergraduate students with finding research opportunities by becoming involved in research on campus and through national research programs
- Managed the course's online interface program (Canvas) for two sections consisting of 76 • students by generating and grading assignments and quizzes, posting lectures and supplemental material, and responding to students' questions and concerns
- Presented a 50-minute lecture on proper methods for data collection, analysis, storage, • management, organization, manipulation, and presentation

Peer Tutor, STEM Scholars Program

Iowa State University, Supervisor: Dr. Corey Welch

Assisted fellow STEM Scholars in academic preparation for Principles of Biology I and II (BIOL • 211/212)

Event Coordinator and Instructor, Science Bound Program **Iowa State University**

- Engaged middle and underrepresented high school students of color with the field of ecology, and exposed them to degrees and careers in the field
- Designed and instructed interactive problem-solving activities focused on basic ecological • concepts
- Shared potential degree and career opportunities in ecology and natural resource management • fields

Aug 2018 - May 2019

Apr 2022

Aug - Dec 2019

Nov 2018

Aug 2020 - May 2021

LEADERSHIP AND VOLUNTEER EXPERIENCE

Interfaces of Global Change Curriculum Committee (IG3C) Graduate Student Representative Interfaces of Global Change (IGC) Graduate Student Organization May 2022 - present

Virginia Tech, Supervisor: Dr. Erin Hotchkiss

- Facilitate ongoing dialogue and feedback from fellow IGC Fellows on the quality of the IGC curriculum, which consists of three seminars taken in succession that focus broadly on the science-policy interface
- Provide input and perspectives from IGC Fellows during meetings held with IG3C and Global Change Center leadership
- Assist in organizing and leading IGC seminars throughout the academic year

Biological Systems Engineering Senator, Graduate and Professional Student Senate Virginia Tech

- Represent graduate student voice for my department during GPSS meetings •
- Consult with fellow graduate students in my department about issues relevant to them or timely bills going through GPSS
- Distribute senate briefings to graduate students in my department
- Facilitate student feedback, questions, and concerns through surveys and conversations with fellow departmental graduate students

Graduate Student Representative, Energy and Sustainability Committee Aug 2021 - Aug 2022 Virginia Tech, Program Coordinator: Kristina Cook

Vote on key issues pertaining to Virginia Tech's Climate Action Commitment and efforts to increase sustainability on campus

Volunteer Liaison, Biological Systems Engineering Graduate Student Senate Aug 2021 - Aug 2022 Virginia Tech, Supervisor: Dr. Cully Hession

- Organize departmental volunteer events including a tree planting event at Stroubles Creek and for the American Society for Agricultural and Biological Systems Engineering (ASABE) Rally
- Coordinate departmental social events including social hours, lunches, events focused around diversity, equity, and inclusion, and outdoor activities
- Created a universal resource guide for students to refer to for a variety of questions throughout • their graduate career at Virginia Tech

Lead Undergraduate Research Ambassador, Undergraduate Research Program Aug - Dec 2019 Undergraduate Research Ambassador Aug 2018 - May 2019

Iowa State University, Supervisor: Dr. Svitlana Zbarska

- Organized meetings, assisted in agenda planning, and scheduled events for the Undergraduate Research Ambassadors team
- Presented at campus events to promote the Undergraduate Research Program and shared other • programs that encourage students to pursue research and graduate education
- Interacted and taught incoming and current students, parents, faculty, and academic advisors • about undergraduate research opportunities during classes, seminars, and fairs
- Facilitated communications between fellow Ambassadors and program supervisor

Aug 2021 - Aug 2022

Student Organization Member, Climate Reality Campus Corps 100% Committed Campaign Coordinator President

Iowa State University, Advisor: Dr. J. Gordon Arbuckle

- Achieved official commitment from Iowa State University President Wendy Wintersteen that the university will begin moving towards carbon neutrality
- Organized the creation of the ISU 100% Renewable Electricity Commitment Campaign and led the campaign for its 16-month duration
- Met with ISU President personally to achieve university commitment to carbon neutrality
- Facilitated collaborations with directors of ISU Department of Sustainability and Facilities Planning and Management, Faculty Senate, Student Government, and other student organization leaders
- Arranged educational, engagement, volunteer, and activist events related to climate change and sustainability
- Organized and moderated faculty and mayoral candidate panel event (100+ attendees)

Subcommittee Chair, Student Government Sustainability Committee Iowa State University

• Partnered with other members of Student Government and student organizations to advance 100% Renewable Electricity Commitment Campaign and other campus sustainability initiatives

Invited Panelist and Moderator, STEM Scholars Iowa State University, Supervisor: Dr. Corey Welch

- Assisted in organizing event titled "Advice for a Successful Transition to College Life"
- Led discussions with a group of 25 Latinx and Native American high school students from the Iowa State University 4-H Maize Program

HONORS AND AWARDS

Convergence at the Interface of Policy, Data Science, Environmental Science and Engineering Apr 2022 to Combat the Spread of Antibiotic Resistance National Science Foundation Research Traineeship Fellowship Interfaces of Global Change Program Fellow (Virginia Tech) Dec 2020 John Lee Pratt Fellowship (Virginia Tech) Dec 2020 Southeast Climate Adaptation Science Center Global Change Fellowship (North Carolina State) Feb 2020 Davenport Fellowship (Virginia Tech) Feb 2020 Iowa State University Dean's List Fall 2017, Spring 2018, Fall 2018, Spring 2019, Fall 2019 Ronald E. McNair Postbaccalaureate Achievement Program Apr 2018 - Dec 2019 Iowa State University STEM Scholars Program Jan 2018 - Dec 2019 Beta Beta National Biological Honors Society Sept 2017 - Dec 2019 ISU Dept of Natural Resource Ecology and Management Senior Contribution Award Dec 2019 ISU College of Agriculture and Life Science Featured Internship Spotlight Aug 2019 David and Candice Arp Animal Ecology Scholarship Apr 2019 Iowa State University Live Green! Excellence in Sustainability Award Feb 2019 J.N. "Ding" Darling, Iowa National Heritage Scholarship Apr 2018 Iowa City Sportsman's Club Loren R. Forbes Memorial Scholarship Apr 2018 Phi Theta Kappa International Honors Society Jan - Dec 2016 Des Moines Area Community College Foundation Scholarship Dec 2016 Des Moines Area Community College Dean's List Fall 2015, Spring 2016

Curriculum Vitae

Jan 2017 – Dec 2019 May 2018 - May 2019 May 2017 - May 2018

Aug 2018 – May 2019

Apr 2018

Aug 2018

PROFESSIONAL DEVELOPMENT

Climate Reality International Leadership Training Conference, Los Angeles, CA

- Received full scholarship for travel, lodging, and conference fee due to climate action leadership and achievements at Iowa State University
- Trained for three days by political representatives, scientists, professional communicators, environmental activists, community organizers, among others to become a leader in my community by shaping public opinion, influencing public policy, and inspiring others to act and fight for solutions to mitigate and adapt to climate change

PROFESSIONAL SOCIETIES

Association for Public Policy Analysis & Management	Feb 2023 - present
American Society of Civil Engineers	Jan 2022 - present
American Geophysical Union	Oct 2020 - Dec 2022
Coastal and Estuarine Research Federation	Oct 2019 - Dec 2020
Society for Advancement of Chicanos/Hispanics & Native America	ans in Science Mar 2018 - Dec 2020
Ecological Society of America	Jan - Dec 2019
American Society of Civil Engineers American Geophysical Union Coastal and Estuarine Research Federation Society for Advancement of Chicanos/Hispanics & Native America Ecological Society of America	Jan 2022 - presen Oct 2020 - Dec 202 Oct 2019 - Dec 202 ans in Science Mar 2018 - Dec 2020 Jan - Dec 2019

TECHNICAL SKILLS

- Software programs (Advanced): <u>RStudio</u>, <u>HEC-RAS</u>
- Software programs (Intermediate): ArcGIS, QGIS, Google Earth Pro
- Software programs (Novice): Python, MATLAB, MARK, Vortex, GNSS, MultiSpec
- Non-native language (Elementary): Spanish
- Substantial experience towing trailers, driving boats (inboard and outboard engines), trucks, and four-wheel drive, all-terrain, and utility vehicles
- Considerable experience using power tools
- Mechanical experience (minor) working on boat engines and other vehicle parts

REFERENCES

Dr. Todd Schenk

Associate Professor School of Public and International Affairs Virginia Polytechnic Institute and State University 263A Steger Hall 1015 Life Science Circle, Blacksburg, Virginia 24061 540-231-1803 tschenk@vt.edu

Dr. Durelle Scott

Associate Professor Biological Systems Engineering Department Virginia Polytechnic Institute and State University 554 Human and Agricultural Biosciences Building I Blacksburg, Virginia 24061 540-449-8346 dscott@vt.edu

Dr. Erich Hester

Associate Professor Civil and Environmental Engineering Department Virginia Polytechnic Institute and State University 220-D Patton Hall 750 Drillfield Drive, Blacksburg, Virginia 24061 540-231-9758 ehester@vt.edu