BENJAMIN A. LEVY, PhD

ASSOCIATE PROFESSOR OF MATHEMATICS Fitchburg State University

QUANTITATIVE RESEARCH SCIENTIST
National Oceanic and Atmospheric Administration

PHONE: (860) 459-4293

EMAIL: blevy1@fitchburgstate.edu benjamin.levy@noaa.gov

WEBSITE: www.benjaminlevymath.com

PROFESSIONAL EXPERIENCE

2021-present | QUANTITATIVE RESEARCH SCIENTIST

National Oceanic and Atmospheric Administration (NOAA) Northeast Fisheries Science Center, Woods Hole, MA

2020-present | Associate Professor of Mathematics

2016-2020 ASSISTANT PROFESSOR OF MATHEMATICS Fitchburg State University, Fitchburg, MA

2014-2016 | GRADUATE RESEARCH ASSOCIATE

National Institute for Mathematical and Biological Synthesis (NIMBioS)

University of Tennessee, Knoxville, TN

2010-2014 | GRADUATE TEACHING ASSOCIATE

Department of Mathematics

University of Tennessee, Knoxville, TN

2008-2010 | MATH & SCIENCE FACULTY

Departments of Mathematics and Science

Rumsey Hall Junior Boarding School, Washington Depot, CT

EDUCATION

2016 | Ph.D in Mathematics, University of Tennessee

Thesis: "Modeling Feral Hogs in Great Smoky Mountains National Park"

Concentration: Mathematical Ecology

Supporting Areas: Numerical Analysis and Differential Equations

Advisors: Dr. Suzanne Lenhart and Dr. Charles Collins

2013 M.S. in Mathematics, University of Tennessee

2008 | B.A. in Mathematics, Franklin and Marshall College

Minor: Philosophy

RESEARCH INTERESTS

Applied Mathematics Mathematical Biology Statistical Modeling Infectious Disease Modeling Population Modeling Distribution Modeling Parameter Estimation Fisheries Modeling Undergraduate Research

IN PROGRESS

- **Levy, B.**, Legault, C., Brooks, E., and Miller, T. *Modeling Spatial Preferences and Stock Trends of Atlantic Fish Under the Pressures of Climate Change.* In Progress.
- Saucedo, O., Prosper, O., Levy, B., Tang, T., Laubmeier, A., and Asik, L. *Impact of Data Structure, Availability and Noise Distribution on Practical and Structural Identifiability of an SEIR Model*. In Progress.
- Welsh, D., Ludlam, P., Downs, E., Gordon, E., Clark, E., Levy, B., Huang, J., and O'Connor, A. Stream Fish Community Structure Across an Urban Gradient. Submitted August 2022.

JOURNAL ARTICLES

- Edholm, C., Levy, B., Spence, L., Agusto, F., Chirove, F., Chukwu, W., Goldsman, D., Kgosimore, M., and Maposa, M. *A vaccination model for COVID-19 in Gauteng, South Africa*. Infectious Disease Modelling. 7.3: 333-345, (2022).
- **Levy, B.**, Windoloski, K., and Ludlam, J. *Matrix and Agent-Based Modeling of Threats to a Diamond-backed Terrapin Population*. Mathematical Biosciences. p.108672, (2021)
- Burton, D., Lenhart, S., Levy, B., Edholm, C., Washington, M., Greening, B., White, J., Lungu, E., Chimbola, O., Kgosimore, M., Chirove, F., and Machingauta, H. *A Mathematical Model of Contact Tracing During the 2014-2016 West African Ebola Outbreak*. Mathematics. 9.6: 608-629, (2021)
- **Levy, B.,** Lenhart, S., Collins, C., and Stiver, W. *Evidence for Multiple Transmission Routes for Pseudorabies in Wild Hogs.* Springer Series: Mathematics of Planet Earth, Infectious Diseases and our Planet. 37-56 (2021)
- Levy, B., Correia, H., Ronoh, M., Chimbola, O., Kgosimore, M., Chirove, F., Abebe, A., Machingauta, H., Lenhart, S., and White, J. *Modeling the Effect of HIV/AIDS Stigma on HIV Infection Dynamics in Kenya*. Bulletin of Mathematical Biology. 83.5: 1-25, (2021)
- Edholm, C., Levy, B., Le Fevre, S., Lenhart S., Marijani, T., Yakubu, A., and Nyabadza, F. *A Risk Structured Mathematical Model of Buruli Ulcer Disease in Ghana*. Mathematics of Planet Earth, Springer, Cham: 109-128, (2019).
- **Levy**, **B.**, and A. Odoi. *Exploratory Investigation of Region Level Risk Factors of Ebola Virus Disease in West Africa*. PeerJ 6: e5888, (2018).
- Levy, B., Edholm, C., Lenhart, S., Gaoue, O., Kgosimore, M., Lungu, E., Nyabadza, F. and Marijani, T. 2017. *Modeling the Role of Public Health Education in Ebola Virus Disease Outbreaks in Sudan*. Infectious Disease Modelling 2.3: 323-340, (2017).
- **Levy, B.**, Collins, C., Lenhart, S. and Stiver, W. *Evaluating Wild Hog Preferences to Guide Control Strategies in the Great Smoky Mountains National Park*. Natural Resource Modeling 30.3: e12132, (2017).
- Hujoel, M., Dantzler, A., Parkman, V., Wild, A., Levy, B., Lenhart, S. and Wilkes, R. *Canine Distemper Outbreak Modeled in an Animal Shelter*. Letters in Biomathematics 3.1: 13-28, (2016).
- **Levy, B.**, Collins, C., Lenhart, S., Madden, M., Corn, J., Salinas, R. and Stiver, W. *A Metapopulation Model for Feral Hogs in Great Smoky Mountains National Park*. Natural Resource Modeling 29.1: 71-97, (2016).

JOURNALS REFEREED

| Mathematics
| Journal of Theoretical Biology
| PLOS One
| SIAM Undergraduate Research Online (SIURO)
| Problems, Resources, and Issues in Mathematics Undergraduate Studies (PRIMUS)

| Frontiers in Ecology and Evolution

GRANTS

2022	XSEDE COMPUTING STARTUP REQUEST
	Requested 50,000 core-hours and 500 GB of storage for computational work • Awarded
2020	NSF U.SAfrica Collaborative Research Network
	Senior personnel on the grant ◆ Requested \$250,000 over 3 years ◆ Awarded
	FITCHBURG STATE UNIVERSITY SPECIAL PROJECTS GRANT
2020	Requested research-related course release • Awarded
2019	Requested research-related course release • Awarded
2017	Requested \$1760 for student support • Awarded
	FITCHBURG STATE UNIVERSITY TRAVEL GRANT
2019	Awarded \$500 towards travel to Malawi in November 2019
2017	Awarded \$300 towards travel to Tanzania in November 2017
	American Mathematical Society and Simon's Foundation Early Career Travel Grant
2019	Requested \$4000 for research travel • Denied
2017	Requested \$4000 for research travel • Denied
	Marion and Jasper Whiting Foundation Travel Grant
2019	Requested \$2350 for research travel • Denied
2017	Requested \$1650 for research travel • Denied
2018	PIF GRANT TO DEVELOP A QUANTITATIVE REASONING COURSE (MATH 1100) AND ITS CO-REQ
	Awarded \$3167 from March-August 2018
2016-2017	PROJECT NEXT FELLOWSHIP
	Mathematical Association of America
	NATIONAL INSTITUTE FOR MATHEMATICAL & BIOLOGICAL SYNTHESIS
2014-2016	Graduate Research Assistantship
	NIMBioS at the University of Tennessee

PRESS

2020	Featured in Lowell Sun newspaper article titled "Social separation called our best de-
	fense at present"
2020	Fitchburg State Library's Faculty Spotlight for the Month of February
2020	Research trip to Malawi was featured in Worcester Telegram& Gazette newspaper article "Fitchburg State student attends forum in Africa"

TEACHING EXPERIENCE

2019	Mathematical Modeling (Fitchburg State)
2018-2022	Methods of Applied Mathematics (Fitchburg State)
2017 & 2021	Operations Research (Fitchburg State)
2018-2020	Linear Algebra (Fitchburg State)
2014-2022	Calculus I (Tennessee & Fitchburg State)
2019 & 2021	Seminar in Mathematics (Fitchburg State)
2014-2022	Precalculus (Tennessee & Fitchburg State)
2016	ACT Preparation (Tennessee)
2011-2012	Mathematical Reasoning (Tennessee)
2010-2011	Algebra I & II (Rumsey Hall)
2008-2010	8 th Physical Science (Rumsey Hall)
2008-2010	6 th Grade Earth Science (Rumsey Hall)

Undergraduate Mentoring Experience

2022 Davis, C.

A Zoonotic Compartmental Model for Visceral Leishmaniasis Disease I am the faculty mentor for this senior honors project.

2022 | Mathews, K.

A Mathematical View of the Supply and Demand of Product Industries During Covid-19 I am the faculty mentor for this senior honors project.

2019 | Foster, M.

Modeling the Role of Stigma on HIV/AIDS Dynamics in Kenya Matt and I traveled to the Masamu Advanced Study Institute in Blantyre, Malawi.

2019 | Melus, E. & Titus, O.

Modeling Contaminants in the Nashua River Watershed

Distribution modeling project started during summer and continued into school year. Work was presented to community and will be included in future publication.

2018 | Windoloski, K.

Matrix and Agent Based Modeling of Diamondback Terrapins
Project funded by internal grant and results were published in Mathematical Biosciences.

2017 | Windoloski, K. & Cochran, A.

Comparing Optimal College Student Budgets

Project started in Operations Research class, completed following semester & presented at undergraduate conference.

2017 | Taylor, C. & Ryan, S.

An Optimization Problem to Determine the Flattest 5k at Fitchburg State University
Project started in Operations Research class, completed over the summer & presented at undergraduate conference.

Hujoel, M., Dantzler, A., Parkman, V., & Wild, A.

Canine Distemper Outbreak Modeled in an Animal Shelter

NIMBioS Summer Research Experience for Undergraduates. Resulted in publication.

INVITED PRESENTATIONS

2022	Modeling Spatial Preferences and Stock Trends of Atlantic Fish Under the Pressures of Climate Change, THE CHRISTIE LECTURE AT THE MAA NORTHEASTERN SECTION FALL 2022 MEETING, Keene, NH
2022	A Vaccination Model for COVID-19 in South Africa, SIAM CONFERENCE ON THE LIFE SCIENCES SESSION ON ADVANCES IN EPIDEMIOLOGY, Pittsburgh, PA
2022	A Vaccination Model for COVID-19 in South Africa, JOINT MATHEMATICS MEETINGS SPECIAL SESSION ON DYNAMICS OF INFECTIOUS DISEASES: ECOLOGICAL MODELS ACROSS MULTIPLE SCALES, Held Remotely
2021	Modeling the Effect of HIV/AIDS Stigma on HIV Infection Dynamics in Kenya, SAMSA-MASAMU VIRTUAL COLLOQUIA SERIES, Held Remotely
2021	Modeling the Effect of HIV/AIDS Stigma on HIV Infection Dynamics in Kenya, JOINT MATHEMATICS MEETINGS SPECIAL SESSION ON ADVANCES IN MODELING THE ECOLOGY OF INFECTIOUS DISEASES, Held Remotely
2020	An Introduction to Disease Modeling with an Application to the HIV/AIDS in Kenya, ITHACA COLLEGE MATHEMATICS SEMINAR, Ithaca, NY and Remotely
2020	An Introduction to Disease Modeling with an Application to the Ebola Virus Disease, Connecticut College Senior Mathematics Seminar, New London, CT
2018	A Discrete Data-Driven Pseudorabies Model for Feral Hogs, SIAM Conference on Mathematics of Planet Earth Session on One Health: Con- necting Humans, Animals, and the Environment, Philadelphia, PA
2018	Using Mathematics to Locate Wild Boar in Great Smoky Mountains National Park, PI MU EPSILON INDUCTION CEREMONY, Fitchburg, MA
2018	Modeling Behavior Change to Limit an Ebola Outbreak in Sudan, JOINT MATHEMATICS MEETINGS AMS SPECIAL SESSION ON MATHEMATICS IN NATURAL RE- SOURCE MODELING, San Diego, CA
2017	Modeling Feral Hogs in Great Smoky Mountains National Park to Evaluate Control Efforts and Analyze the Population's Niche, FRANKLIN AND MARSHALL COLLEGE PI MU EPSILON INDUCTION CEREMONY, Lancaster, PA
2016	A Canine Distemper Outbreak Modeled in an Animal Shelter, SIAM Conference on Mathematics of Planet Earth Special Session on Data Driven Infectious Disease Models and Applications, Philadelphia, PA
2016	Modeling Feral Hogs in Great Smoky Mountains National Park to Evaluate Control Efforts and Analyze the Population's Niche, JOINT MATHEMATICS MEETINGS AMS SPECIAL SESSION ON MATHEMATICS IN NATURAL RESOURCE MODELING, Seattle, WA
2016	Modeling Feral Hogs in Great Smoky Mountains National Park to Assess the Importance of a Control Program, SOCIETY FOR MATHEMATICAL BIOLOGY ANNUAL CONFERENCE SESSION ON DISCRETE POPULATION MODELS WITH MANAGEMENT FEATURES, Atlanta, GA
2014	Modeling as a Means of Informing Management Strategies, MATHEMATICS SEMINAR AT MARYVILLE COLLEGE, Maryville, TN

2014 | Modeling Feral Hogs in Great Smoky Mountains National Park,
SIAM ANNUAL MEETING SPECIAL SESSION FOR STUDENT RESEARCH, Chicago, IL

CONTRIBUTED PRESENTATIONS

- 2021 Modeling the Effect of HIV/AIDS Stigma on HIV Infection Dynamics in Kenya, FITCHBURG STATE UNIVERSITY SPEAKER SERIES
- 2020 Modeling the Effect of HIV/AIDS Stigma on HIV Infection Dynamics in Kenya, SOUTHERN AFRICA MATHEMATICAL SCIENCES ASSOCIATION ANNUAL CONFERENCE, Held Remotely
- Evaluating Threats to Diamondback Terrapins in a Coastal Carolina Salt Marsh,
 SOUTHERN AFRICA MATHEMATICAL SCIENCES ASSOCIATION ANNUAL CONFERENCE,
 Blantyre, Malawi
- 2019 *Matrix and Agent-Based Modeling of Diamondback Terrapins*,
 SPRING DEVELOPMENT DAY, Fitchburg State University, Fitchburg, MA
- Constructing a Habitat Suitability Model for Wild Boar in Great Smoky Mountains National Park Using Environmental Predictors and Presence Only Data,

 Spring Development Day, Fitchburg State University, Fitchburg, MA
- Modeling the Role of Education in Limiting a Future Outbreak of Ebola,
 SOUTHERN AFRICA MATHEMATICAL SCIENCES ASSOCIATION ANNUAL CONFERENCE, Pretoria,
 South Africa
- 2015 Modeling Canine Distemper Virus in an Animal Shelter,
 SOUTHERN AFRICA MATHEMATICAL SCIENCES ASSOCIATION ANNUAL CONFERENCE. Windhoek, Namibia,
- Modeling Feral Hogs in Great Smoky Mountains National Park,
 SOUTHERN AFRICA MATHEMATICAL SCIENCES ASSOCIATION ANNUAL CONFERENCE, Victoria
 Falls, Zimbabwe
- Modeling Feral Hogs in Great Smoky Mountains National Park,
 INTERNATIONAL SYMPOSIUM ON BIOMATHEMATICS & ECOLOGY: EDUCATION & RESEARCH,
 Harvey Mudd College, Claremont, CA

POSTER PRESENTATIONS

- Modeling Feral Hogs in Great Smoky Mountains National Park,
 5TH ANNUAL SCIENCE SYMPOSIUM., Fitchburg State University Fitchburg, MA
- Modeling Feral Hogs in Great Smoky Mountains National Park,
 4RD ANNUAL SCIENCE SYMPOSIUM., Fitchburg State University Fitchburg, MA
- Modeling Feral Hogs in Great Smoky Mountains National Park,
 46TH ANNUAL JOHN H. BARRETT MEMORIAL LECTURES, University of Tennessee, Knoxville,
 TN
- Evaluating Multi-Sensory Learning and Relationship Building through STEMpunk: a Reverse Science Fair,

 WOMEN IN STEM RESEARCH SYMPOSIUM., University of Tennessee Knoxville, TN
- 2015 Modeling Feral Hogs in Great Smoky Mountains National Park,
 MATHEMATICS OF PLANET EARTH WORKSHOP ON EDUCATION FOR THE PLANET EARTH OF
 TOMORROW, NIMBioS, Knoxville, TN
- Modeling Feral Hogs in Great Smoky Mountains National Park,
 MATHEMATICS OF PLANET EARTH WORKSHOP ON MANAGEMENT OF NATURAL RESOURCES,
 Howard University, Washington D.C.

Additional Conferences Attended

2020-21 Society for Mathematical Biology Annual Meeting. Held remotely
2017 SOUTHERN AFRICA MATHEMATICAL SCIENCES ANNUAL MEETING, Arusha, Tanzania
2017 MATHEMATICAL ASSOCIATION OF AMERICA'S MATHFEST, Chicago, IL
2017 MASSACHUSETTS PROJECT KALEIDOSCOPE REGIONAL SUMMER MEETING, Fitchburg MA
2017 JOINT MATHEMATICS MEETING, Atlanta, Georgia
2016 MATHEMATICAL ASSOCIATION OF AMERICA'S MATHFEST, Columbus, OH
2015 MAA Southeastern Section Meeting. University of North Carolina, Wilmington, NC
2014 AMS SECTIONAL MEETING, University of Tennessee, Knoxville, TN
2013 SOUTHEAST-ATLANTIC REGIONAL CONFERENCE ON DIFFERENTIAL EQUATIONS, Knoxville, TN
2013 RESOURCE MODELING ASSOCIATION ANNUAL MEETING, Cornell University, Ithaca, NY

SERVICE TO THE DISCIPLINE

2020	Judge for <i>Undergraduate Challenge Using Differential Equations Modeling Challenge</i> SIMIODE, Held remotely
2019	Co-Organizer of STEM Workshop for high school teachers SAMSA ANNUAL CONFERENCE, Blantyre, Malawi
2019	Local Organizing Committee for MAA Northeast Section Meeting MATHEMATICAL ASSOCIATION OF AMERICA, Fitchburg, MA
2017	Presenter in STEM Workshop for high school teachers SAMSA ANNUAL CONFERENCE, Arusha, Tanzania
2017	Co-organizer of a panel session titled Where are the math majors? Broadening scope by increasing mathematics enrollment MATHEMATICAL ASSOCIATION OF AMERICA'S MATHFEST, Chicago, IL

AWARDS

2016	GRADUATE STUDENT ACHIEVEMENT AWARD Department of Mathematics, University of Tennessee
2015	SIAM AWARD FOR EFFORT AND ACHIEVEMENT Society for Industrial & Applied Mathematics
2013	DOROTHEA & EDGAR D. EAVES TEACHING AWARD Department of Mathematics, University of Tennessee

Workshops and Certificate Programs

2020- Present	The Faculty Academy- Training to reach students at-risk, FITCHBURG STATE UNIVERSITY, Facilitated by Dr. Paul Hernandez
2020- Present	Dynamics of Infectious Diseases: Ecological Models Across Multiple Scales, AMS MATHEMATICS RESEARCH COMMUNITY, Held remotely
2021 2020	Masamu Advanced Study Institute Workshop in Mathematical Sciences, Held remotely Held remotely
2019 2017	Blantyre, Malawi Arusha, Tanzania
2016	Pretoria, South Africa Windhoek, Namibia
2015 2014	Victoria Falls, Zimbabwe
2020	Workshop on Mathematical Models in Understanding COVID-19, Institute for Pure and Applied Mathematics at UCLA, Held Remotely
2018	Applications of Spatial Ecology: Ecological Niche Modeling, NIMBIOS AT THE UNIVERSITY OF TENNESSEE, Knoxville, TN
2016- 2017	Project NExT Fellowship, MATHEMATICAL ASSOCIATION OF AMERICA, Various Locations
2017	Course Redesign Workshop, CENTER FOR TEACHING AND LEARNING AT FITCHBURG STATE UNIVERSITY, Fitchburg, MA
2011- 2016	Teaching Certificate Program, DEPARTMENT OF MATHEMATICS, UNIVERSITY OF TENNESSEE, Knoxville, TN
2015	Mathematics of Planet Earth Workshop on Education for the Planet Earth of Tomorrow, NATIONAL INSTITUTE FOR MATHEMATICAL & BIOLOGICAL SYNTHESIS, Knoxville, TN
2015	Mathematics of Planet Earth Workshop on Management of Natural Resources, Howard University, Washington, D.C.
2017	Modeling the Spread & Control of Ebola in West Africa - A Rapid Response Workshop, Georgia Institute of Technology, Atlanta, GA
2014	Best Practices in Teaching Certificate Program, THE GRADUATE SCHOOL, UNIVERSITY OF TENNESSEE, Knoxville, TN
2014	Industrial Mathematical / Statistical Modeling Workshop, STATISTICAL & APPLIED MATHEMATICAL SCIENCES INSTITUTE, NCSU, Raleigh, NC
2014	Parameter Estimation for Dynamic Biological Models Workshop, NATIONAL INSTITUTE FOR MATHEMATICAL & BIOLOGICAL SYNTHESIS, Knoxville, TN

UNIVERSITY SERVICE AND OUTREACH

FSU = Fitchburg State University
2021-present Center for Teaching and Learning New Faculty Mentor (FSU)
2017-present Center for Faculty Scholarship Advisory Board (FSU)
2017-present Faculty advisor for Fitchburg State University Chess Club (FSU)
2017-present Crocker Center for Community Scholarship group member (FSU)
2016-present Mathematics Department Seminar Committee (FSU)
2016-present Elizabeth Haskins Mathematics Competition Committee (FSU)
2020-2021 First Year Experience (FYE) Committee (FSU)
2020 Falcons Supporting Falcons Initiative Spring and Fall 2020 (FSU)
2019-2020 Co-Organizer for <i>Undergraduate Conference on Research and Creative Practices</i> (FSU)
2018-2019 Search committee for Tenure-Track Position in Mathematics (FSU)
2018-2019 Created textbook and course material for QR course Math in Society (FSU)
2017-2019 Living and Learning Community Facilitator (FSU)
2016-2017 Interdisciplinary STEM Major Formation Committee (FSU)
2016-2017 Pi Mu Epsilon and Math Club Advisor (FSU)
2016-2017 All University Policies Committee (FSU)
2013-2016 Student chapter for the Society for Industrial and Applied Mathematics (UT) President (2014-2016) and Treasurer (2013-2014)
2015 Coordinator for STEMPunk Reverse Science Fair (UT)
2010-2015 High school math contest official (UT)
2014 & 2015 Math assistant for Adventures in STEM Day Camp (UT)
2014 Middle School Mathematics Ambassador (UT)
2013-2014 Graduate student peer teaching mentor (UT)

PROFESSIONAL SOCIETIES

American Mathematical Society (AMS)

| Society for Mathematical Biology (SMB)

| Mathematical Association of America (MAA)

| Society for Industrial and Applied Mathematics (SIAM)

| Southern Africa Mathematical Sciences Association (SAMSA)