BIOGRAPHICAL SKETCH - LOUIS J. GROSS

Professional Preparation

Drexel University, Philadelphia PA	Mathematics with honors	BS 1974
Cornell University, Ithaca, NY	Applied Mathematics	Ph.D. 1979

Professional Appointments:

2022 - present, Chancellor's Professor Emeritus and Emeritus Distinguished Professor of Ecology and Evolutionary Biology and Mathematics, University of Tennessee

2021 - present, Director Emeritus, National Institute for Mathematical and Biological Synthesis

2018 - 2022, Chancellor's Professor, University of Tennessee

2017 - 2021, Director, National Institute for Mathematical and Biological Synthesis

2010 - 2022, Alvin and Sally Beaman Distinguished Professor, University of Tennessee

2015 - 2017, Director Emeritus, National Institute for Mathematical and Biological Synthesis

2009 - 2012, James R. Cox Distinguished Professor, University of Tennessee

2008 - 2015, Director, National Institute for Mathematical and Biological Synthesis

1997 - 2022, Professor, Departments of Ecology and Evolutionary Biology and Mathematics, University of Tennessee, Knoxville, TN

1998 - 2022, Director, The Institute for Environmental Modeling, University of Tennessee

1992- 1997, Professor, Department of Mathematics and Graduate Program in Ecology, University of Tennessee, Knoxville, Tennessee

1985-1992, Associate Professor, Department of Mathematics and Graduate Program in Ecology, University of Tennessee, Knoxville, Tennessee

1987, Distinguished Visitor (Summer), Mathematics and Botany Departments, University of California, Davis, California

Books:

1. Gross, L. J. and R. M. Miura (editors). ***Some Mathematical Questions in Biology - Plant Biology.*** Vol. 18 of Lectures on Mathematics in the Life Sciences. American Mathematical Society, Providence, RI. (1986)
2. Hallam, T. G., L. J. Gross and S. A. Levin (editors). ***Mathematical Ecology: Proceedings, Trieste 1986.*** World Scientific Publishing Co., Singapore. (1988).
3. Levin, S. A., T. G. Hallam and L. J. Gross. (editors). ***Applied Mathematical Ecology.*** Springer-Verlag, Berlin. (1989).
4. DeAngelis, D. L. and L. J. Gross (editors). ***Individual-Based Models and Approaches in Ecology***. Routledge, Chapman and Hall, New York (1992).
5. Whipple, C. G., M. B. Beck, C. J. Clark III, R. T. Clemen, J. A. Graham, L. J. Gross, W. Harrington, P. Howard, K. L. Jones, T. E. McKone, N. Oreskes, S. N. Pandis, L. M. Ryan, M. L. Stein and W. E. Wagner. ***Models in Environmental Regulatory Decision Making***. National Academies Press, Washington, DC. (2007).
6. Hastings, A. and L. J Gross (editors). ***Encyclopedia of Theoretical Ecology.*** University of California Press (2012).
7. Bodine, E., S. Lenhart and L. J. Gross. ***Mathematics for the Life Sciences.*** Princeton University Press (2014).
8. Haas, L., A. O. Hero III, A. Adhikari, D. Culler, D. Donoho, E. T. Ewing, L. J. Gross, N. Horton, J.

Lane, A. McCallum, R. McCullough, R. Nugent, L. Rainie, R. Rutenbar, K. Tolle, T. Wiliams, A. Zieffler. ***Envisioning the Data Science Discipline: The Undergraduate Perspective: Interim Report***. National Academies Press, Washington, DC. (2017).

9. Haas, L., A. O. Hero III, A. Adhikari, D. Culler, D. Donoho, E. T. Ewing, L. J. Gross, N. Horton, J. Lane, A. McCallum, R. McCullough, R. Nugent, L. Rainie, R. Rutenbar, K. Tolle, T. Wiliams, A. Zieffler. ***Data Science for Undergraduates: Opportunities and Options***. National Academies Press, Washington, DC. (2018).

Selected Recent Publications:

Travis, C. B., L. J. Gross, and B. A. Johnson. 2009. Tracking the gender pay gap: a case study. *Psychology of Women Quarterly* **33**: 410-418.

Beckage, B., W. J. Platt and L. J. Gross. 2009. Vegetation, fire, and feedbacks: a disturbance-mediated model of savannas. *American Naturalist* **174**: 805-818.

Clayton, T., S. Duke-Sylvester, L. J. Gross, S. Lenhart and L. A. Real. 2010. Optimal control of a rabies epidemic model with a birth pulse. *Journal of Biological Dynamics* **4**:43-58.

Beckage, B., L. J Gross and W. J. Platt. 2011. Grass feedbacks on fire stabilize savannas. *Ecological Modelling* **222**: 2227-2233.

Beckage, B., L. J. Gross, and S. Kauffman. 2011. The limits to prediction in ecological systems. *Ecosphere* **2**(11):125. doi:10.1890/ES11-00211.1

Yin, L., S-L. Shaw, D. Wang, E. A. Carr, M. W. Berry, L. J. Gross and E. J. Comiskey. 2012. A framework of integrating GIS and parallel computing for spatial control problems – a case study of wildfire control. *Int. J. Geographical Information Sci.* **26**:621-641.

Bodine E.N., L. J. Gross and S. Lenhart. 2012. Order of events matter: comparing discrete models for optimal control of species augmentation. *Journal of Biological Dynamics* **6**:31-49.

Beckage, B., L. J. Gross, W. J. Platt, W. Godsoe and D. Simberloff. 2012. Individual variation and weak neutrality as determinants of forest diversity. *Frontiers of Biogeography* **3**:145-154.

Gross, L. J. and B. Beckage. 2012. Toward a metabolic scaling theory of crop systems. *Proceedings of the National Academy of Sciences* **109**:15535-15536.

Federico, P., L. J. Gross, S. Lenhart, and D. Ryan. 2013. Optimal control in individual-based models: implications from aggregated methods. *American Naturalist* **181**: 64-77.

Gross, L. J. 2013. Selective ignorance and multiple scales in biology: deciding on criteria for model utility. *Biological Theory* **8**:74-79.

Stevenson, R. D., K. M. Klemow and L.J. Gross. 2014. Harnessing bits and bytes to transform ecology education. *Frontiers in Ecology and the Environment* **12**: 306-307.

Hilker, F. M., L. J. S. Allen, V. A. Bokil, C. J. Briggs, Z. Feng, K. A. Garrett, L. J. Gross, F. M. Hamelin, M. J. Jeger, C. A. Manore, A. G. Power, M. G. Redinbaugh, M. A. Rúa and N. J. Cunniffe. 2017. Modelling virus coinfection to inform management of maize lethal necrosis in Kenya. *Phytopathology* **107**: 1-14.

Bucini, G., B. Beckage, and L. J. Gross. 2017. Climate seasonality, fire and global patterns of tree cover. *Frontiers of Biogeography* **9**(2): 1-15.

Beckage, B., L. J. Gross, K. Lacasse, E. Carr, S. S. Metcalf, J. M. Winter, P. D. Howe, N. Fefferman, T. Franck, A. Zia, A. Kinzig and F. M. Hoffman. 2018. Linking models of human behavior and climate alters projected climate change. *Nature Climate Change* **8**, 79–85..

Hamelin, F. M., L. J.S. Allen, V. A. Bokil, L. J. Gross, F. M. Hilker, M. J. Jeger, C. A. Manore, A. G. Power, M. A. Rúa, N. J. Cunniffe. 2019. Co-infections by non-interacting pathogens are not independent and require new tests of interaction. *PLoS Biol 17(12): e3000551. doi.org/10.1371/journal.pbio.3000551*

Taylor, R. T., P. R. Bishop, S. Lenhart, L. J. Gross, and K. Sturner. 2020. Development of the BioCalculus Assessment (BCA). CBE—Life Sciences Education 19 (1): doi.org/10.1187/cbe.18-10-0216

Robeva, R. S., J. R. Jungck and L. J. Gross. 2020. Changing the nature of quantitative biology education: data science as a driver. *Bulletin of Mathematical Biology* 82:127

Beckage, B., K. Lacasse, J. M. Winter, L. J. Gross, N. Fefferman, F. M. Hoffman, S. S. Metcalf, T.

Franck, E. Carr, A. Zia and A. Kinzig. 2020. The Earth has humans, so why don't our climate models? *Climatic Change* https://doi.org/10.1007/s10584-020-02897-x
Scott, S.M. and L. J. Gross. 2021. COVID-19 and crime: Analysis of crime dynamics amidst social distancing protocols. PLoS ONE 16(4): e0249414. https://doi.org/10.1371/journal.pone.0249414
Srivastava, D. S., M. Winter, L. J. Gross, J. P. Metzger, J. S. Baron, N. Mouquet, T. R. Meagher, B. S. Halpern and V. D. Pillar. 2021. Maintaining momentum for collaborative working groups in a post-pandemic world. *Nature Ecology & Evolution* **5**:1188–1189.
Moore, F.C., K. Lacasse, K. J. Mach, Y. A. Shin, L. J. Gross and B. Beckage. 2022. Determinants of emissions pathways in the coupled climate–social system. *Nature* **603**: 103–111. https://doi.org/10.1038/s41586-022-04423-8
Shin, Y., K. Lacasse, L. J. Gross and B. Beckage. 2022. How coupled is coupled human-natural systems research? *Ecology and Society* **27** (3):4. https://www.ecologyandsociety.org/vol27/iss3/art4/

Selected Recent External Support as Lead Principal Investigator:

National Science Foundation Cooperative Agreement EF-0832858. National Institute for Mathematical and Biological Synthesis. 2008-2013. $16,000,000. Supplements: $186,298 and $199,986.

National Science Foundation Cooperative Agreement DBI-1300426. National Institute for Mathematical and Biological Synthesis. 2013-2018. $18,600,000. (PI from 2013-2014, 2016-2021)

US Department of Energy, UT-Battelle, ORNL Contract 4000141793 Mod 1-24, EPA Risk - Environment Assessment and Decision Analysis. 2015-2021. $3,025,261

National Science Foundation Award HRD-165039. P. Bishop, E. Brothers, S. Lenhart (co-PIs). DCL: NSF INCLUDES Conference on Multi-Scale Evaluation in STEM Education. 2016-2017. $248,397

Burroughs-Wellcome Fund. Grant ID#1018963. Enhancing Quantitative and Data Science Education for Graduate Students in Biomedical Science. 2018-2020. $150,000.

Total External Support as Lead Principal Investigator since 1990: $50,365,421
Additional External Support as Co-Principal Investigator since 1990: $4,390,916
Total of External Support since 1990: $54,656,337

Selected Recent Invited Talks:

Gordon Research Conference on Undergraduate Biology Education Research, Bates College, ME. July 2015.

Meeting on Transforming Post-Secondary Education in Mathematics, National Academies, Washington, DC. March 2016.

10th Anniversary of SeMovi, University of Lyon, Lyon, France. September 2016.

Annual Meeting of the Ecological Society of America Organized Oral Session on "Bringing Research Data to the Ecology Classroom: Opportunities, Barriers, and Next Steps". Portland OR. August 2017.

Burroughs Welcome Fund Workshop "Models: At the intersection of data and discovery". Ann Arbor, MI. August 2017.

Invited Speaker, DIMACS Workshop on "Mathematics of Planet Earth 2013+: The Future". New Brunswick, NJ. July 2018.

Invited Speaker, David Bradford Seminar Series, Center for Policy Research on Energy and the Environment, Woodrow Wilson School, Princeton University. Princeton, NJ. March 2019.

Workshop Session Leader and Invited Speaker, Bioquest/QUBES Workshop "Evolution of Data in the Classroom: from Data to Data Science". Williamsburg, VA. July 2019.

Invited Speaker and Showcase Poster presenter, Ecological Society of America Annual Meeting (virtual). August 2020

Selected Professional Activities:

Society for Mathematical Biology. President (2003-2005). Scientific Committee member for Annual Meetings (1999, 2000), Annual Meeting Chair (2002). Education Committee member (1999-2008). President-Elect (2002), Nominating Committee Chair (2010), Okubo Prize Chair (2011), Annual Meeting Chair (2012)

American Institute for Biological Sciences. 2006 Distinguished Scientist Awardee. Elected at-Large Member of Board of Directors, 2008-2010; Elected Treasurer, 2010-2013.

Ecological Society of America. Annual Meeting Program Chair, 2008; Meetings Committee co-Chair, 2008-2009; Theoretical Ecology Section: Vice Chair, 2000-2001; Chair, 2001-2002.

National Research Council and National Academies. Chair, Committee on Integrating Education with Biocomplexity Research. 2001-2003. Member, Committee on the Selection and Use of Models in Regulatory Decision Making, 2004-2005. Member, Board on Life Sciences, 2008-2014; BLS Liaison to Standing Committee on Emerging Science for Environmental Health Decisions, 2010-2013. Member, Committee on Envisioning the Data Science Discipline: the Undergraduate Perspective, 2016-2019.

University of Tennessee. *Faculty Senate*: 1989-1992, 2001-2004, 2015-2018. Budget Committee, 1989 1994, 2001-2006, 2015-2020, Chair 2002-2004, Chair 2015-2018. President-Elect, 2005-2006. President, 2006-2007. Past-President, 2007-2008. President, 2021-2022. UTK Chancellor's Advisory Board 2018-2020

Advisory Boards. Board of Governors, Mathematical Biosciences Institute Ohio State University, 2002-2006. Chair, 2003-2005. Vision and Change in Undergraduate Biology Education, AAAS and NSF 2008-2009. AAAS Panel for Science Prize for On-line Resources (SPORE) 2010-2012**.** Vision and Change in Undergraduate Biology Education II, AAAS, HHMI, NIH and NSF 2012-2013. Advisory Board, NSF QUBES (Quantitative Undergraduate Biology Education and Synthesis) 2016-present. AAAS INCLUDES Conference 2017. AAAS Sea Change Data Advisory Board 2017-present.

Recent Postdoctoral and Graduate Student Mentoring (Current position):

Nathan Louis Pollesch, Ph.D. in Mathematics, August 2016. (Mathematician, EPA Duluth)

Emily Moran. NIMBioS Postdoctoral Fellow 2010-2012. (Asst. Professor, Univ. Calif.- Merced)

Orou Gaoue. NIMBioS Postdoctoral Fellow 2011-2013. (Assoc. Professor, Univ. Tennessee, Knoxville)

Calistus Ngonghala. NIMBioS Postdoctoral Fellow 2011-2013. (Asst. Professor, Univ. of Florida)

Arik Kershenbaum. NIMBioS Postdoctoral Fellow 2012-2014. (Research Fellow, University of Cambridge, UK)

Chris Remien. NIMBioS Postdoctoral Fellow 2012-2014. (Asst. Professor, Univ. of Idaho)

Caroline Farrior. NIMBioS Postdoctoral Fellow 2014-2016 (Asst. Professor, Univ of Texas, Austin)

Megan Rúa. NIMBioS Postdoctoral Fellow 2015-2016 (Asst. Professor, Wright State Univ.)

Tyler Poppenwimer. Ph.D. in Ecology and Evolutionary Biology, Dec. 2020 (Postdoc, Tel Aviv U.)

Shelby Scott, Ph.D. in Ecology and Evolutionary Biology, April 2021 (Health Data Scientist, Guidehouse)