

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed for Form Page 2.
Follow the sample format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME	POSITION TITLE
Gross, Louis J.	Professor of Ecology & Evolutionary Biology and Mathematics

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Drexel University, Philadelphia, PA.	B.S.	1974	Mathematics
Cornell University, Ithaca, NY.	Ph.D.	1979	Applied Mathematics

NOTE: The Biographical Sketch may not exceed four pages. Items A and B (together) may not exceed two of the four-page limit. Follow the formats and instructions on the attached sample.

A. Positions and Honors. List in chronological order previous positions, concluding with your present position. List any honors. Include present membership on any Federal Government public advisory committee.

Positions and Employment

1979-1985	Assistant Professor, Department of Mathematics and Graduate Program in Ecology, University of Tennessee, Knoxville, TN
1982 (Fall)	Visiting Biomathematics Researcher, Grassland Research Institute, Berkshire, UK
1982-1984	Faculty Research Participant (Summers), Atmospheric Turbulence and Diffusion Lab, NOAA
1986	Visiting Biomathematician
1987	Distinguished Visitor (Summer), Mathematics and Botany Departments, University of California, Davis, California
1985-1992	Associate Professor, Department of Mathematics and Graduate Program in Ecology, University of Tennessee, Knoxville, Tennessee
1992- 1997	Professor, Department of Mathematics and Graduate Program in Ecology, University of Tennessee, Knoxville, Tennessee
1997-	Professor, Departments of Ecology and Evolutionary Biology and Mathematics, University of Tennessee, Knoxville, TN
1998 -	Director, The Institute for Environmental Modeling, University of Tennessee
2008 -	James R. Cox Distinguished Professor of Ecology and Evolutionary Biology and Mathematics
2008-	Director, National Institute for mathematical and Biological Synthesis
2010-	Alvin and Sally Beaman Distinguished Professor of Ecology and Evolutionary Biology and Mathematics

Honors and Memberships

1992-2001	Science Alliance Center of Excellence Award, University of Tennessee
1999	Chancellor's Research Scholar, University of Tennessee
2000-2001	Vice Chair, Ecological Society of America, Theoretical Ecology Section
2000-2002	National Research Council: Mathematics and Computer Science Panel Member, Bio2010 Committee on Undergraduate Preparation for Future Biology Researchers
2001-2002	Chair, Ecological Society of America, Theoretical Ecology Section
2002-2003	President-Elect, Society for Mathematical Biology
2002-2003	National Research Council: Chair, Committee on Education in Biocomplexity Research
2003-2005	President, Society for Mathematical Biology
2004-2005	National Research Council, Committee on Environmental Decision Making: Principles and Criteria for Models
2004	Top 10 Tennessee Scientists, Tennessee Business Magazine

2004-2005	Chair, Board of Governors, Mathematical Biosciences Institute (NSF – Ohio State University)
2006	Distinguished Scientist Award, American Institute of Biological Sciences
2008	Annual Meeting Program Chair and Meetings Committee co-Chair, Ecological Society of America
2008-2014	Board on Life Sciences Member, National Academies and National Research Council
2009	Elected Fellow, Biological Sciences Section, American Association for the Advancement of Science
2009-2012	Treasurer, American Institute of Biological Sciences

B. Selected peer-reviewed publications (in chronological order). Do not include publications submitted or in preparation.

1. Clark, M. E. and L.J.Gross. "Periodic solutions to nonautonomous difference equations". *Mathematical Biosciences* 102, 105-119. (1990).
2. Gross, L. J., M. U. F. Kirschbaum, and R. W. Pearcy. "A dynamic model of photosynthesis in varying light taking account of stomatal conductance, C3-cycle intermediates, photorespiration, and Rubisco activation". *Plant, Cell and Environment* 14, 881-893. (1991).
3. Kindlmann, P., A. F. G. Dixon, and L.J. Gross. "The relationship between individual and population growth rates in multicellular organisms". *Journal of Theoretical Biology* 157, 535-542. (1992).
4. Gross, L. J. "Limitations of reductionist approaches in ecological modeling: model evaluation, model complexity and environmental policy". Pages 509-518 in: *Wildlife Toxicology and Population Modeling: Integrated Studies of Agroecosystems*, R. J. Kendall and T. E. Lacher, (editors). Lewis Publishers and CRC Press, Boca Raton, FL (1994).
5. Gross, L. J.. "Quantitative training for life-science students". *BioScience* 44, 59. (1994).
6. Gross, L. J. "Individual-based ecological models for spatially-explicit investigation and computational ecology. *Life Sciences Educational Computing* 7(2):10-12 (1997).
7. Pearcy, R. W., L.J. Gross and D. He. "An improved dynamic model of photosynthesis for estimation of carbon gain in sunfleck light regimes". *Plant, Cell and Environment* 20: 411-424 (1997).
8. Luh, H.-K., C. Abbott, M. Berry, E. J. Comiskey, J. Dempsey, and L.J. Gross. "Parallelization in a spatially-explicit individual-based model (I) - Spatial data Interpolation". *Computers and Geosciences* 23: 293-304 (1997).
9. Abbott, C. A., M. W. Berry, E. J. Comiskey, L.J. Gross and H.-K. Luh "Computational models of white-tailed deer in the Florida Everglades". *IEEE Computational Science and Engineering* 4:60-72 (1997).
10. DeAngelis, D. L., L.J. Gross, M. A. Huston, W. F. Wolff, D. M. Fleming, E. J. Comiskey, and S. M. Sylvester. "Landscape modeling for Everglades ecosystem restoration". *Ecosystems* 1:64-75 (1998).
11. Mellott, L. E., M. W. Berry, E. J. Comiskey and L.J. Gross. "The design and implementation of an individual-based predator-prey model for a distributed computing environment". *Simulation Practice and Theory* 7:47-70 (1999).
12. Gaff, H., D. L. DeAngelis, L.J. Gross, R. Salinas and M. Shorosh. "A dynamic landscape model for fish in the Everglades and its application to restoration". *Ecological Modelling* 127:33-52 (2000).
13. DeAngelis, D. L., L.J. Gross, W. F. Wolff, D. M. Fleming, M. P. Nott and E. J. Comiskey. "Individual-based models on the landscape: applications to the Everglades". P. 199-211 in J. Sanderson and L. D. Harris (eds.), *Landscape Ecology: A Top-Down Approach*. Lewis Publishers, Boca Raton, FL (2000).
14. Curnutt, J. L., E.J. Comiskey, M. P. Nott and L.J. Gross. "Landscape-based spatially explicit species index models for Everglades restoration". *Ecological Applications* 10:1849-1860 (2000).
15. Gross, L. J. "Education for a biocomplex future". *Science* 288:807 (2000).
16. DeAngelis, D. L., S. Bellmund, W. M. Mooij, M.P. Nott, E.J. Comiskey, L.J. Gross, M. A. Huston and W.F. Wolff Modeling Ecosystem and Population Dynamics on the South Florida Hydroscape. In: *The Everglades, Florida Bay, and Coral Reefs of the Florida Keys: An Ecosystem Sourcebook*, J. W. Porter and K. G. Porter (eds.). CRC Press, FL.. (2001).
17. Louis J. Gross and D. L. DeAngelis. "Multimodeling: new approaches for linking ecological models". In *Predicting Species Occurrences: Issues of Scale and Accuracy*, (Scott, J. M., P. J. Heglund, M. Morrison, M. Raphael, J. Hafler, B. Wall, editors). Island Press, Covello, CA.(2002).
18. Duke-Sylvester, S. and Gross, L.J. "Integrating spatial data into an agent-based modeling system: ideas and lessons from the development of the Across Trophic Level System Simulation (ATLSS)". Chapter 11 in: *Integrating Geographic Information Systems and Agent-Based Modeling Techniques for Stimulating Social and Ecological Processes*, (R. Gimblett, ed.), Oxford University Press. (2002).
19. Gustafson, E., J. Nestler, L.J. Gross, K. Reynolds, D. Yaussy, T. Maxwell, V. Dale. *Evolving Approaches and Technologies to Enhance the Role of Ecological Modeling in Decision-Making*. In: *Ecological Modeling for Resource Management*, V. Dale (ed.). Springer-Verlag, NY. (2002).
20. DeAngelis, D. L., L. J. Gross, E. J. Comiskey, W. M. Mooij, M. P. Nott and S. Bellmund. The Use of Models for a Multiscaled Ecological Monitoring System. Chapter 6 (P. 167-188) in: D. Busch and J. Trexler, eds. *Ecological Monitoring of Ecoregional Initiatives: Interdisciplinary Approaches for Determining Status and Trends of Ecosystems*. Island Press, Washington, DC. (2003).

21. Okubo, A. and L. J. Gross. Animal movements in home range. Chapter 8 in: Diffusion and Ecological Problems (A. Okubo and S. A. Levin, editors). Springer-Verlag, NY. (2002)
22. Comiskey, E. J., O. L. Bass, Jr., L. J. Gross, R. T. McBride, and R. Salinas. Panthers and forests in South Florida: an ecological perspective. *Conservation Ecology* 6(1): 18. [online] URL: <http://www.consecol.org/vol6/iss1/art18> (2002)
23. Brewer, C. A. and L. J. Gross. Training ecologists to think with uncertainty in mind. *Ecology* 84:1412-1414. (2003).
24. Rock, J. H., B. Beckage and L. J. Gross. 2004. Population recovery following differential harvesting of *Allium triococum* Ait. in the southern Appalachians. *Biological Conservation* 116: 227-234
25. Gross, L. J. 2004. Interdisciplinarity and the undergraduate biology curriculum: finding a balance. *Cell Biology Education* 3:85-87.
26. Wang, D., E. Carr, L. J. Gross, and M. W. Berry. "Toward ecosystem modeling on computing grids". *Computing in Science and Engineering* 7:44-52 (2005).
27. Salinas, R. A., S. Lenhart and L. J. Gross. "Control of a metapopulation harvesting model for black bears". *Natural Resource Modeling* 18:307-321 (2005).
28. Beckage, B. and L. J. Gross. "Overyielding and species diversity: what should we expect?" *New Phytologist* 172(1): 140-148 (2006).
29. Wang, D., M. W. Berry and L. J. Gross. "On parallelization of a spatially-explicit structured ecological model for integrated ecosystem simulation". *International Journal of High Performance Computing Applications* 20:571-581 (2006).
30. Whittle, A. J., S. Lenhart and L. J. Gross. "Optimal control for management of an invasive plant species". *Mathematical Biosciences and Engineering* 4(1):101-112 (2007).
31. Gaff, H. D. and L. J. Gross. "Modeling tick-borne disease: a metapopulation model". *Bulletin of Mathematical Biology* 69:265-288 (2007).
32. Fuller, M. M., D. Wang, L. J. Gross and M. W. Berry. "Current problems and future directions in computational science for natural resource management". *Computing in Science and Engineering* 9:40-48 (2007).
33. Ding, W., L. J. Gross, K. Langston, S. Lenhart and L. A. Real. "Rabies in raccoons: optimal control for a discrete time model on a spatial grid". *Journal of Biological Dynamics* 1:379-393 (2007).
34. Fuller, M. M., L. J. Gross, S. M. Duke-Sylvester and M. Palmer. "Testing the robustness of management decisions to uncertainty: Everglades restoration scenarios". *Ecological Applications*. 18:711-723 (2008).
35. Asano, E. L. J. Gross, S. Lenhart and L. A. Real. "Optimal control of vaccine distribution in a rabies metapopulation model". *Mathematical Biosciences and Engineering* 5:219-238 (2008).
36. Bodine, E. N, L. J. Gross and S. Lenhart. "Optimal control applied to a model for species augmentation". *Mathematical Biosciences and Engineering* 5:669-680 (2008).
37. Travis, C. B., L. J. Gross, and B. A. Johnson. "Tracking the gender pay gap: a case study". *Psychology of Women Quarterly* 33: 410-418 (2009).
38. Beckage, B., W. J. Platt and L. J. Gross. "Vegetation, fire, and feedbacks: a disturbance-mediated model of savannas". *American Naturalist* 174(6): 805-818 (2009).
39. Clayton, T., S. Duke-Sylvester, L. J. Gross, S. Lenhart and L. A. Real. "Optimal control of a rabies epidemic model with a birth pulse". *Journal of Biological Dynamics* 4(1):43-58 (2010).
40. Beckage, B., L. J. Gross and W. J. Platt. "Grass feedbacks on fire stabilize savannas". *Ecological Modelling* 222: 2227-223 (2011).

C. Research Support. List selected ongoing or completed (during the last three years) research projects (federal and non-federal support). Begin with the projects that are most relevant to the research proposed in this application. Briefly indicate the overall goals of the projects and your role (e.g. PI, Co-Investigator, Consultant) in the research project. Do not list award amounts or percent effort in projects.

ONGOING

Cooperative Agreement 04IIQAG0125, Subagreement #04125IIS001 9/1/05-12/31/11

U.S. Geological Survey

Development of an Across Trophic-level Systems Simulation (ATLSS) for the wetland ecosystems of South Florida

Role: PI

The major goal of this project is to develop and apply a set of mathematical and computer models to aid the planning of long-term water management in South Florida associated with the restoration of the Everglades.

Cooperative Agreement EF-0832858 9/1/08-8/31/13

National Science Foundation

National Institute for Mathematical and Biological Synthesis

Role: PI

This is a Synthesis Center at the interface of mathematics and biology sponsored by NSF, Department of Homeland Security and the Department of Agriculture.

COMPLETED

IIS-0427471 8/1/04-9/1/07
National Science Foundation
ITR: Grid Computing for Ecological Modeling and Spatial Control
Role: PI

This project developed a collection of high-performance computing methods for a variety of ecological modeling and resource management problems.

CESU 99155HS001 Gross (PI) 9/01/02-8/31/05
U.S. Geological Survey
Development of an Across Trophic-level Systems Simulation (ATLSS) for the wetland ecosystems of South Florida
Role: PI

The major goal of this project is to develop and apply a set of mathematical and computer models to aid the planning of long-term water management in South Florida associated with the restoration of the Everglades.

DMS-0010920 Gross (PI) 9/1/01-8/31/05
National Science Foundation
QEIB: Spatially-distributed population models with external forcing and spatial control
Role: PI

The major goal of this project is to develop new mathematical and computational approaches for spatial control in an ecological context, with particular applications to individual-based models. A supplement has been funded through the Undergraduate Mathematics and Biology Initiative, providing support for 6 undergraduates from biology and math to collaborate on interdisciplinary projects.

NRC-04-02-057 Stewart (PI) 9/01/02-1/31/05
Nuclear Regulatory Commission
Bayesian subsurface radiological surveying and analysis
Role: Co-PI

The goal is to add the capability for Bayesian updating for the placement and analysis of radiological samples to the Spatial Analysis and Decision Assistance software.

DEB-02-19269 Gross (PI) 9/1/02-8/31/05
National Science Foundation
ITR: Parallel and Grid Computing for Ecological Multimodeling
Role: PI

This focuses on the development of parallelization methods on a variety of platforms for ecological models that include a variety of mathematical forms and spatial and temporal scales.

IIS-0427471 Gross (PI) 9/1/04-8/31/07
National Science Foundation
ITR: Grid Computing for Ecological Modeling and Spatial Control
Role: PI

This focuses on the development of grid computing methods to assist natural resource managers in spatial aspects of natural system management and the development of a curriculum in computational science for natural resource management.

1 R25 GM59924-01 Gross (PI) 7/1/99-7/31/02

National Institutes of Health
Short Courses on Mathematics of Biological Complexity
Role: PI

This funded three 4-day short courses, a one day short course in conjunction with a Conference on Mathematical Biology, and a one-day workshop for high school biology teachers. These were held from June 2000-July 2002.

2 R25 GM59924-02 Gross (PI) 7/01/02-6/30/04

National Institutes of Health
Short Courses on Mathematics of Biological Complexity

This was a continuation of previous short courses to offer three additional short courses during 2003: An Introduction to Modeling of Complex Biological Systems, Optimal Control in Biology, and Modeling the Genetic Basis of Complex Phenotypes.

DMS-02-11991 Gross (PI) 8/1/02-7/31/03

National Science Foundation
International Conference on Mathematics in Biology

Role: PI

This provided support for student and young researchers to attend a Conference held July 2002.

23900-BA-YT001U WR #0029 Dolislager (PI) 10/01/02-9/30/03

Bechtel-Jacobs
Risk Integration Support for Risk Analysis Information System

Role: Co-PI

This provided support and maintenance for continuation of this on-line database of support tools for toxicant risk assessment.

23900-BA-YT001U WR #0030 Dolislager (PI) 10/01/02-9/30/03

Bechtel-Jacobs
PORTS (Portsmouth Gaseous Diffusion Plant) Risk Assessment Support

Role: Co-PI

This provided support and maintenance for use and application of the Risk Analysis Information System to the Portsmouth Gaseous Diffusion Plant.

CESU 99HQAG0155 Gross (PI) 10/1/01-9/31/03

U.S. Geological Survey
Critical Model Development for the Restudy - Additional DOI Restudy Needs and ATLSS Production-Runs for Various Hydrologic Evaluations

Role: PI

The major goal of this project was to apply a set of mathematical and computer models to aid the planning of long-term water management in South Florida associated with the restoration of the Everglades.

CESU 99155HS003 Gross (PI) 9/01/02-8/31/04

U.S. Geological Survey
Project title: Vegetative community succession models for the Across Trophic Level System Simulation Program

Role: PI

This involved the development of a dynamic spatially-explicit model for vegetation dynamics to link with the other ATLSS models for hydrology and various biotic components.