

Brief Curriculum Vitae
NELSON G. HAIRSTON, Jr.

Frank H.T. Rhodes Professor of Environmental Science, Emeritus
last update July 2022

PERSONAL

Professional Address: Department of Ecology and Evolutionary Biology
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EDUCATION

B.S. in Zoology, with Honors, University of Michigan, Ann Arbor, Michigan, 1971

Ph.D. in Zoology, University of Washington, Seattle, Washington, 1977
(*PhD Advisor*: WT Edmondson. *Committee*: RT Paine, WM Griffiths, K Banse, PL Illg)

EMPLOYMENT

2020 - Retired: Frank H. T. Rhodes Professor of Environmental Science, *Emeritus*,
College of Arts and Sciences, Cornell University

2017-18, 2009-11
& 2001-05 Chair, Department of Ecology and Evolutionary Biology, Cornell University

2012 & 2006-09 Senior Associate Dean, College of Arts and Sciences, Cornell University

1996-2019 Frank H. T. Rhodes Professor of Environmental Science, College of Arts and
Sciences, Cornell University

1988-2019 Professor, Department of Ecology and Evolutionary Biology, Cornell University

1985-1987 Associate Professor, Section of Ecology and Systematics, Cornell University

1981-1985 Associate Professor, Dept. of Zoology, University of Rhode Island, Kingston, RI

1977-1981 Assistant Professor, Dept. of Zoology, University of Rhode Island, Kingston, RI

AWARDS & RECOGNITIONS (last decade)

Einar Naumann-August Thienemann Medal – International Society of Limnology, 2020 – life-time achievement award

Fellow – Ecological Society of America, Class of 2018

Sustaining Fellow – Association for the Sciences of Limnology & Oceanography, Class of 2017

Kendall S. Carpenter Memorial Advising Award – Cornell University-wide recognition for excellence in undergraduate advising and mentoring, 2013.

Trustee, Cornell University Board of Trustees (faculty elected position; 2010-2014)

Trustee, Paleontological Research Institution (member elected position – two terms; 2014-2020)

Honorary Lectureships (selected last decade)

Keynote Speaker, DynaTrait Conference, Hannover, Germany, October 2017

Keynote Speaker, Symposium on “Natural Selection is Ecology in Action” in honor of W. Lampert’s 75th birthday, Max-Planck-Institute for Evolutionary Biology, Plön, Germany, October 2016

Keynote Speaker, Cornell University Chinese Visiting Scholars Association, Annual Meeting, Aug. 2016

Plenary Speaker, Monte Verità Conference on “The Genomic Basis of Eco-Evolutionary Change,” Ascona, Switzerland, June 2016

Featured Speaker, Gordon Conference on Predator-Prey Interactions, Ventura, CA, Jan 2016

Visiting Eminent Ecologist, Kellogg Biological Station, Michigan State University, 5-day visit, July 2015

L. Floyd Clarke Lecturer, Department of Zoology and Physiology, University of Wyoming, October 2014

Keynote Speaker, *Daphnia* Genomics Consortium (Birmingham, England), January 2014

Keynote Speaker, First Joint Meeting of the Society for Ecology (Germany, Switzerland & Austria) and the German Limnological Society, Potsdam, Germany, September 2013

Dennis H. Chitty Lecturer (graduate student invited), Department of Zoology, University of British Columbia, Canada, March 2013

Plenary Speaker, Seventh International Symposium on "Eco-Evolutionary Dynamics," KU Leuven, Belgium, February 2013
 Plenary Speaker, Lorentz Center Workshop: "Eco-evolutionary Dynamics in a Changing World," Leiden, Netherlands, February 2013
 Plenary Speaker, Amer. Society of Limnology and Oceanography, Annual Mtg, Otsu, Japan, July 2012
 Connections Lecturer, 4-college distinguished lecturer at Cornell College, Mt. Vernon, IA, October 2011.
 Plenary Speaker, Symposium on "Animal Migration", The Wenner-Gren Foundation & Royal Swedish Acad. of Sciences; Eighth Kristineberg Symposium; Kristineberg/Fiskebäckskil, Sweden, June 2011

Sabbatical and Visiting Positions

Visiting Scientist, Eawag (Swiss Federal Institute of Aquatic Science and Technology), Dübendorf, Switzerland, Fall 2013, Fall 2018
 Project Professor, University of Tokyo, Japan, Spring 2013
 Velux Foundation Professor of Biodiversity, ETH (Swiss Federal Institute of Technology), Zürich *and* Visiting Scientist, Eawag (see above), Dübendorf, Switzerland, Fall 2007
 Visiting Scientist, Max-Planck Institute for Limnology, Plön, Germany, Fall 1998
 Visiting Scientist, Archbold Biological Station, Lake Placid Florida, Spring 1992

Journals and Funding Agencies

Board of Editors, ECOLOGY/ECOLOGICAL MONOGRAPHS, 1989-1992;
Concepts Section editor 1994-1996
 Editorial Board, LIMNOLOGY AND OCEANOGRAPHY, 1986-1989; 2003-2004
 Panel Member, Population Biology and Physiological Ecology Program, National Science Foundation, 1985-1987
 Member, Site Visit Committee, Environmental Protection Agency, 1983

Other Activities (selected from last decade)

Member, Scientific Advisory Board, Leibniz-Institute of Freshwater Ecology and Inland Fisheries (IGB), Berlin, Germany, 2020 – 2024
 Member, Faculty Opinions Prime (F1000), Marine and Freshwater Ecology, 2020-
 Member, External Review Committee, Ecology and Evolutionary Biology Program, University of Toronto, March 2018
 Member, Grant Proposal Review Committee, Deutsche Forschungsgemeinschaft (German Research Foundation) Priority Program: "DynaTrait." Potsdam, Germany 3/2014 and 10/2017
 Member Site Visit Committee: Strategic Partnership Grants for Networks, Natural Sciences and Engineering Research Council of Canada, Montreal, 4/2016
 Member and recorder, External Advisory Committee, KU Leuven Centre of Excellence on "Eco- and Socio-Evolutionary Dynamics," 6/2016 and 2/2013
 Member, External Review Committee, Graduate Program in Ecology, Duke University, 1/2014
 External Reviewer for faculty position in Limnology at Uppsala University, Sweden, 7/2012

PROFESSIONAL SOCIETIES

Association for the Sciences of Limnology and Oceanography
 American Society of Naturalists Ecological Society of America
 Freshwater Biological Association International Society of Limnology
 Society for the Study of Evolution Sigma Xi

TEACHING EXPERIENCE (selected)

Ecology and the Environment - 3 credit; freshmen; cotaught (250 students)
 Limnology: Ecology of Lakes - 5 credit lecture & laboratory; seniors (30 students)
 Tropical Field Ecology - 2 credit; grad students; cotaught (14 students)
 Various 2 credit seminars on limnological, ecological, and evolutionary topics (5-30 students)

GRADUATE STUDENTS ADVISED [current or final position]

MS students: **KT Li** [URI 1982; Principle - Cultural Brokerage Bus. Consult.]; **CJ Meise** [URI 1982; Scientist – NMFS]; **VS George** [URI 1983]; **JV Jackson** [URI 1986]; **SF Tjossem** [Cornell 1990; Sr. Lecturer, Columbia Univ.]; **AM Onion** [Cornell 2004; Scientist – USGS]; **LR Schaffner** [Cornell 2019; Exec. Admin. Asst – Cornell Inst. Biotech.]; **PhD students:** **DH Kesler** [1979 U Michigan; Prof. – Rhodes College]; **BT De Stasio** [1989 Cornell; Prof. – Lawrence Univ.]; **VS George** [1990 URI]; **KD Hambright** [1991 Cornell; Professor – Univ. Oklahoma]; **GT Epp** [1995 Cornell]; **CE Cáceres** [1997 Cornell; Prof. & Dir. – School Integ. Biol., Univ. Illinois]; **AJ Bohonak** [1998 Cornell; Prof. & Assoc. Dean – San Diego St. Univ.]; **CL Holtmeier** [2000 Cornell; Sci. Teacher – Hyla School, Bainbridge Isl., WA]; **DM Post** [2000 Cornell; Prof. – Yale Univ.]; **JA Fox** [2005 Cornell; Teaching Prof. – Georgetown Univ.]; **GA Gerrish** [2007 Cornell; Assoc. Prof. & Dir. – Trout Lake Station, Univ. Wisconsin]; **R Doyle-Morin** [2011 Cornell; Prof. – Univ. Wisconsin-Platteville]; **MT Booth** (2011 Cornell; Visiting Assist. Prof. – Univ. Cincinnati); **CC Carey** (2012 Cornell; Assoc. Prof. – Virginia Tech. Univ.); **JL Simonis** [2013 Cornell; Data Analyst – Univ. Florida: Founder, Dapper Stats, Portland, OR]; **SM Collins** [2014 Cornell; Assist. Prof. – Univ. Wyoming]; **CM Dalton** (2015 Cornell; Sci. Teacher – The Rivers School, Weston, MA); **CW Twining** [2018 Cornell; Marie Curie Postdoc, Eawag, Switzerland]; **KM Sirianni** [2018 Cornell; Assoc. – eCornell, Cornell Univ.]; **RL Wilkins** (Cornell current; Assoc. – eCornell, Cornell Univ.)

Selected PUBLICATIONS divided by areas of research [>130 peer-reviewed papers]*Eco-evolutionary dynamics - general*

Schaffner, L.R., L. Govaert, B.E. Miner, E. Fairchild, P. Spaak, L. De Meester, S.P. Ellner, **N.G. Hairston, Jr.** 2019. Consumer-resource dynamics is an eco-evolutionary process in a natural plankton community. *Nature Ecology & Evolution* 3:1351-1358

Rudman, SM, M Barbour, K Csillery, P Gienapp, F Guillaume, **NG Hairston Jr**, AP Hendry, et al. 2017. What genomic data can reveal about eco-evolutionary dynamics. *Nature Ecology & Evolution* 2:9-15

Messer, PW, SP Ellner, **NG Hairston Jr** 2016. Can population genetics adapt to rapid evolution? *Trends in Genetics* 32:408-418.

Hiltunen, T, **NG Hairston Jr**, G Hooker, LE Jones, SP Ellner. 2014. A newly discovered role of evolution in previously published consumer-resource dynamics. *Ecology Letters* 17:915-923.

Ellner, SP, MA Geber, **NG Hairston Jr**. 2011. Does rapid evolution matter? Measuring the rate of contemporary evolution and its impacts on ecological dynamics. *Ecology Letters* 14: 603–614.

Kinnison, MT, **NG Hairston Jr**. 2007. Eco-evolutionary conservation biology: contemporary evolution and the dynamics of persistence. *Functional Ecol.* 21:444-454.

Hairston, NG Jr, SP Ellner, MA Geber, T Yoshida, JA Fox. 2005. Rapid evolution and the convergence of ecological and evolutionary time. *Ecology Letters* 8:1114-1127.

Plankton-chemostat consumer-resource and eco-evolutionary dynamics

Hiltunen, T, SP Ellner, G Hooker, LE Jones, **NG Hairston Jr**. 2014. Eco-evolutionary dynamics in a three-species food web with intraguild predation: intriguingly complex. *Advances in Ecological Research* 50:41-72

Becks, L, SP Ellner, LE Jones, **NG Hairston Jr**. 2012. The functional genomics of an eco-evolutionary feedback loop: linking gene expression, trait evolution, and community dynamics. *Ecology Letters* 15: 492–501.

Yoshida, T, SP Ellner, LE Jones, BJM Bohannan, RE Lenski, **NG Hairston Jr**. 2007. Cryptic population dynamics: rapid evolution masks trophic interactions. *PLoS – Biology* 5:1868-1879.

Meyer, JR, SP Ellner, **NG Hairston Jr**, LE Jones, T Yoshida. 2006. Evolution on the time scale of predator-prey dynamics revealed by allele-specific quantitative PCR. *PNAS* 103:10690-10695.

Yoshida, T, LE Jones, SP Ellner, GF Fussmann, **NG Hairston Jr**. 2003. Rapid evolution drives ecological dynamics in a predator-prey system. *Nature* 424:303-306.

Fussmann, GF, SP Ellner, KW Shertzer, **NG Hairston Jr**. 2000. Crossing the Hopf Bifurcation in a live predator-prey system. *Science* 290: 1358-1360.

Rapid evolution & resurrection ecology

- Isanta Navaro, J, **Hairston, N.G., Jr.**, Beninde, J, Meyer, A., Straile, D., Möst, M. Martin-Creuzburg, D. 2021. Reversed evolution of grazer resistance to cyanobacteria. *Nature Communications* 12:1945
- Hairston, NG Jr**, CL Holtmeier, W Lampert, LJ Weider, DM Post, JM Fischer, CE Cáceres, JA Fox, U Gaedke. 2001. Natural selection for grazer resistance to toxic cyanobacteria: evolution of phenotypic plasticity? *Evolution* 55:2203-2214.
- Hairston, NG Jr**, W Lampert, CE Cáceres, CL Holtmeier, LJ Weider, U Gaedke, JM Fischer, JA Fox, DM Post. 1999. Rapid evolution revealed by dormant eggs. *Nature* 401:446
- Hairston, NG Jr**, TA Dillon. 1991. Fluctuating selection and response in a population of freshwater copepods. *Evolution* 44:1796-1805.
- Hairston, NG Jr**, BT De Stasio Jr. 1988. Rate of evolution slowed by a dormant propagule pool. *Nature* 336:239-242.
- Hairston, NG Jr**, WE Walton. 1986. Rapid evolution of a life-history trait. *PNAS* 83:4831-4833.

Diapause, egg banks and maintenance of genetic variation in temporally varying environments

- Yamamichi, M., **N.G. Hairston, Jr.**, M. Rees, S.P. Ellner. 2019. Rapid evolution with generation overlap: the double-edged effect of dormancy. *Theoretical Ecology* 12:179-195.
- Hairston, NG Jr**, LJ Perry, AJ Bohonak, MQ Fellows, CM Kearns, DR Engstrom. 1999. Population biology of a failed invasion: Paleolimnology of *Daphnia exilis* in upstate New York. *Limnology and Oceanography*. 44:477-486.
- Ellner, S, **NG Hairston Jr**, CM Kearns, D Babai. 1999. The roles of fluctuating selection and long-term diapause in microevolution of diapause timing in a freshwater copepod. *Evolution*. 53:111-122.
- Hairston, NG Jr**, CM Kearns, S Ellner. 1996. Phenotypic variation in a zooplankton egg bank. *Ecology* 77:2382-2392.
- Hairston, N. G., Jr.**, R. A. Van Brunt, C. M. Kearns, and D. R. Engstrom. 1995. Age and survivorship of diapausing eggs in a sediment egg bank. *Ecology* 76:1706-1711.
- Ellner, SP, **NG Hairston Jr**. 1994. Role of overlapping generations in maintaining genetic variation in a fluctuating environment. *American Naturalist* 143:403-417.
- Hairston, NG Jr**, WR Munns Jr. 1984. The timing of copepod diapause as an evolutionarily stable strategy. *American Naturalist* 123:733-751.

Fish vision, handling time, and ontogenetic changes in optimal diet

- Walton, WE, **NG Hairston Jr**, JK Wetterer. 1992. Growth-related constraints on diet selection by sunfish. *Ecology* 73:429-437.
- Li, KT, JK Wetterer, **NG Hairston Jr**. 1985. Fish size, visual resolution, and prey selectivity. *Ecology* 66:1729-1735.
- Hairston, NG Jr**, KT Li, SS Easter Jr. 1982. Fish vision and the detection of planktonic prey. *Science* 218:1240-1242.

Adaptations to damaging solar radiation and accompanying tradeoffs

- Hairston, NG Jr**. 1981. The interaction of salinity, predators, light and copepod color. In W. D. Williams, editor. Salt Lakes: Proceedings of an International Symposium on Athalassic Salt Lakes. *Hydrobiologia* 81:151-158.
- Hairston, NG Jr**. 1979. The adaptive significance of color polymorphism in two species of *Diaptomus* (Copepoda). *Limnology and Oceanography* 24:15-37.
- Hairston, NG, Jr**. 1976. Photoprotection by carotenoid pigments in the copepod *Diaptomus nevadensis*. *PNAS* 73:971-974.

Community and ecosystem processes

- Kazama, T. J. Urabe, K. Tokita, M. Yamamichi, X. Yin, I. Katano, H. Doi, **N.G. Hairston Jr**. 2021 A unified framework for herbivore-to-producer biomass ratio reveals the relative influence of four ecological factors. *Communications Biology* 4:49.

- Booth, M.T., **N.G. Hairston, Jr.**, A.S. Flecker. 2020. Consumer movement dynamics drive stream habitat structure: suckers as ecosystem engineers. *Oikos* 129:194–208.
- Twining, C.W., J.T. Brenna, P. Lawrence, D.W. Winkler, A.S. Flecker, **N.G. Hairston, Jr.** 2019. Aquatic and terrestrial resources are not nutritionally reciprocal for consumers. *Functional Ecology* 33:2042–2052.
- Yamamichi, M., T. Kazama, K. Tokita, I. Katano, H. Doi, T. Yoshida, **N.G. Hairston, Jr.**, J. Urabe. 2018. A shady phytoplankton paradox: phytoplankton increases under low light. *Proceedings of the Royal Society B* 285: 20181067.
- Dalton, C.M., K.E. Tracy, **N.G. Hairston, Jr.**, A.S. Flecker. 2018. Fasting or fear: The mechanisms of indirect predator effects on nutrient cycling by intermediate consumers. *Ecology* 99:681-689.
- Twining, C.W., J.T. Brenna, **N.G. Hairston, Jr.**, A.S. Flecker. 2016. The nutritional ecology of highly unsaturated fatty acids in natural ecosystems: what do we know and what do we still need to learn? *Oikos* 125:749–760. [DOI.org: 10.1111/oik.02910]
- Spaak, P., J.A. Fox, **N.G. Hairston Jr.** 2012. Modes and mechanisms of a *Daphnia* invasion. *Proceedings of the Royal Society B* 279: 2936-2944.
- Hiltunen, T, LE Jones, SP Ellner, **NG Hairston Jr.** 2013. Temporal dynamics of a simple community with intraguild predation: an experimental test. *Ecology* 94:773-779.
- Barreiro Felpeto, A, **NG Hairston Jr.** 2013. Indirect bottom-up control of consumer-resource dynamics: Resource-driven algal quality alters grazer numerical response. *Limnology and Oceanography* 58:827-838.
- Miner, BE, L De Meester, ME Pfrender, W Lampert, **NG Hairston Jr.** 2011. Linking genes to communities and ecosystems: *Daphnia* as an ecogenomic model. *Proceedings of the Royal Society of London B* 279: 1873–1882.
- Hambright, KD, **NG Hairston Jr**, WR Schaffner, RW Howarth. 2007. Grazer control of nitrogen fixation: synergisms in the feeding ecology of two freshwater crustaceans. *Fundamental and Applied Limnology* 170:89-101.
- Hairston, NG Jr**, CM Kearns, LJ Perry, SW Effler. 2005. Species-specific *Daphnia* phenotypes: a history of industrial pollution and pelagic ecosystem response. *Ecology* 86:1669-1678.
- Post, DM, ML Pace, **NG Hairston Jr.** 2000. Ecosystem size determines food-chain length in lakes. *Nature* 405:1047-1049.
- Hairston, NG Jr**, NG Hairston Sr. 1993. Cause-effect relationships in energy flow, trophic structure, and interspecific interactions. *American Naturalist* 142:379-411.
- Hawaii Island anchialine pool shrimp ecology
- Havird, J.C., P.M. Brannock, R.M. Yoshioka, R.C. Vaught, K. Carlson, C. Edwards, A. Tracy, C.W. Twining, Y. Zheng, A.E. Wilson, **N.G. Hairston Jr.**, S.R. Santos. 2022. Grazing by an endemic atyid shrimp controls microbial communities in the Hawaiian anchialine ecosystem. *Limnology and Oceanography* [in press]
- Dalton, CM, A Mokiao-Lee, TS Sakihara, MG Weber, CA Roco, ZZ Han, B Dudley, RA MacKenzie, **NG Hairston Jr.** 2013. Density- and trait-mediated top-down effects modify bottom-up control of a high endemic tropical aquatic food web. *Oikos* 122:790-800.
- Carey, C.C., M.P. Ching, S.M. Collins, A.M. Early, W.W. Fetzer, D. Chai, **N.G. Hairston, Jr.** 2011. Predator-dependent diel migration by *Halocardina rubra* shrimp (Malacostraca: Atyidae) in Hawaiian anchialine pools. *Aquatic Ecology* 45:35-41.
- Capps, K. A., C. B. Turner, M. T. Booth, D. L. Lombardozzi, S. H. McArt, D. Chai, and **N. G. Hairston, Jr.** 2009 The behavioral responses of the endemic shrimp *Halocardina rubra* Malacostraca:Atyidae) to an introduced fish, *Gambusia affinis* (Actinopterygii: Poeciliidae) and implications for the trophic structure of Hawaiian anchialine ponds. *Pacific Science* 63:27-37.