GREGORY R. RUTHIG
CURRICULUM VITAE

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FACULTY STATUS

2022- Present **Professor of Biology**, North Central College
2017- 2022 **Associate Professor of Biology**, North Central College
2011- 2017 **Assistant Professor of Biology**, North Central College

ACADEMIC POSITIONS

2008-2011 **Visiting Assistant Professor of Biology**, Grinnell College
2006-2008 **Postdoctoral Research Associate**, Arizona State University, Project: *Reservoirs hosts of the amphibian pathogen,* Batrachochytrium dendrobatidis, *advisors*: James Collins and Elizabeth Davidson

EDUCATION

2000-2006 Ph.D. in Biology, University of Virginia, Thesis: *The Influence of the Environment and Infectious Disease on Amphibian Egg Laying Behavior, advisor*: Henry Wilbur
2004 Advanced Training in Amphibian Population Decline Research, La Selva and la Universidad de Costa Rica: Ten day course on monitoring, global change, disease, contaminants, statistics, and experimental design sponsored by the Research and Analysis Network for Neotropical Amphibians (RANA) and the National Science Foundation
1996 American Institute for Foreign Study, Universidad de Salamanca, Spain
1994-1998 B.S. in Biology, Washington and Lee University

RESEARCH INTERESTS

Ecology, Herpetology, Disease ecology, Conservation biology, Life history evolution, Tropical ecology

TEACHING EXPERIENCE

North Central College:

First Year Experience, FYE 100
Biology 1, Biology 101
Human Biology, Biology 104
Environmental Science, Environmental Studies/Biology 106
Special Topic Biology of Infectious Disease Biology 120
B**iological Investigations I**, Biology 151
B**iological Investigations II**, Biology 152

Investigating Biology, Biology 195
Special Topics in Environmental Science: Introduced Species (co-taught), Science 201
Biostatistics, Biology 240
Field Biology- Natural History of Bioko Island, Biology 250 (Taught in Equatorial Guinea)
Field Biology- Darwin and the Galapagos, Biology 250 (May Term portion taught in the Galapagos Islands)
Field Biology- Tropical Ecology, Biology 250 (May Term portion taught in Ecuador)
Ecology and the Environment Biology 253
Vertebrate Biology, Biology 305
Biology of Animals, Biology 310
Epidemiology for the Health Sciences, Kinesiology 310
Natural History of Costa Rica, Global Studies 363 (Taught in Costa Rica)
Careers in the Biological Sciences, Biology 390
Evolution, Biology 400/330
Infectious Disease, Biology 340
Capstone Lab, Biology 400

Grinnell College:
Introduction to Biological Inquiry, Biology 150
Ecology, Biology 368
Mechanisms of Evolution, Biology 373
Biology of Infectious Diseases, Biology 395
Organisms, Evolution, and Ecology, Biology 252

University of Virginia:
Emerging Infectious Disease in Humans and Wildlife (co-taught), Biology 330

Coe College – Wilderness Field Station:
Boreal Ecology, Biology 203 (Taught in the Boundary Waters of Minnesota)

Teaching Assistantships

Grinnell College:
Tropical Biological Diversity: Amazonia, Biology 395, Assisted a seminar course that included a week long expedition to central Brazil, Professor: David Campbell: Fall 2009

University of Virginia:
Introductory Laboratory, Biology 204, Professor: Dr. Kristen Curran
Introductory Laboratory, Biology 203, Professor: Dr. Elizabeth Machunis-Masuoka
Microbiology Laboratory, Biology 315, Professor: Dr. Ronald Bauerle
Biology of Infectious Diseases, Biology 309, Professor: Dr. Janis Antonovics

UNDERGRADUATE MENTORING

North Central College

Student	Years	Accomplishments
Hannah Galletti	2024	NCC Summer Undergraduate Research Colloquium
Evelyn Kandler	2023-2024	NCC Summer Undergraduate Research Colloquium; Rall Symposium 2024
Nelly Carbonell Nieves	2023	The Promotion of Underrepresented Minorities in Academic STEM (PUMA-STEM)
Dallas Gillson	2023-2024	The Promotion of Underrepresented Minorities in Academic STEM (PUMA-STEM)
Maisha Marzan	2022-2024	NCC Summer Undergraduate Research Colloquium; National Conference on Undergraduate Research (NCUR) 2023; Rall Symposium 2023
Courtney Mayeda	2022-2023	NCC Summer Undergraduate Research Colloquium; National Conference on Undergraduate Research (NCUR) 2023; Rall Symposium 2023
Justyn Salas	2021-2023	NCC Summer Undergraduate Research Colloquium, National Conference on Undergraduate Research (NCUR) 2022 and 2023; Rall Symposium 2022 and 2023
Dakshya Karki	2021	NCC Summer Undergraduate Research Colloquium, Presented at the Rall Symposium 2022
Ana Cvetkovic	2018-2019	NCC Summer Undergraduate Research Colloquium, Presented at the 2019 National Conference on Undergraduate Research (NCUR) meetings, Rall Symposium 2019 and 2020, Amphibian Disease Meetings 2019
Lauren Bode	2018-2019	NCC Summer Undergraduate Research Colloquium, Presented at the 2019 National Conference on Undergraduate Research (NCUR) meetings, Rall Symposium 2019 and 2020, Amphibian Disease Meetings 2019
Prerana Shrestha	2018-2019	NCC Summer Undergraduate Research Colloquium, Presented at the 2019 National Conference on Undergraduate Research (NCUR) meetings, Rall Symposium 2019 and 2020, Amphibian Disease Meetings 2019
Jinsung Bae	2017	NCC Summer Undergraduate Research Colloquium 2017; Presented at the 2017 National Conference on Undergraduate Research (NCUR) meetings, Rall Symposium 2018
Anna Halverson	2017	NCC Summer Undergraduate Research Colloquium -2017; Presented at the 2017 National Conference on Undergraduate Research (NCUR) meetings, Rall Symposium 2018
Ashley Wojciechoski	2017	NCC Summer Undergraduate Research Colloquium -2017; Presented at the 2017 National Conference on Undergraduate Research (NCUR) meetings, Rall Symposium 2018

Elsa Zuniga	2016-2018	NCC Summer Undergraduate Research Colloquium -2016; Submitted an abstract to present at the 2017 National Conference on Undergraduate Research (NCUR) meetings, Honor's Thesis Director
Taryn McKenna	2016-2018	NCC Summer Undergraduate Research Colloquium -2016; Submitted an abstract to present at the 2017 National Conference on Undergraduate Research (NCUR) meetings, Honor's Thesis Director
Lisette Hererra	2015-2016	Presented at the Center for Undergraduate Research in Mathematics in Los Angeles, CA, April 2016, Title, "Modeling Multihost Infectious Diseases"
Taylor Spino	2015-2016	Presented at the Center for Undergraduate Research in Mathematics in Los Angeles, CA, April 2016, Title, "Modeling Multihost Infectious Diseases"
Rebecca Rachan	2015-2016	Presented at the Center for Undergraduate Research (CURM) in Mathematics in Los Angeles, CA, April 2016, Title, "Modeling Multihost Infectious Diseases"
Dana Lacey	2015-2016	Presented at the Center for Undergraduate Research in Mathematics in Los Angeles, CA, April 2016, Title, "Modeling Multihost Infectious Diseases"
Jessica Krempp	2014-2016	NCC Summer Undergraduate Research Colloquium; National Conference on Undergraduate Research (NCUR) 2016; National Conference on Undergraduate Research (NCUR) 2015; Rall Symposium 2016; Rall Symposium 2014
Jacqueline Pfaff	2014-2016	NCC Summer Undergraduate Research Colloquium; National Conference on Undergraduate Research (NCUR) 2016; Rall Symposium 2015
Olivia King	2015-2016	Honor's Thesis (Director); Rall Symposium 2015
William Noland	2016	Honor's Thesis (I served as first reader)
Kylie Wolf	2015	NCC Summer Undergraduate Research Colloquium
Taelor Randa	2015	NCC Summer Undergraduate Research Colloquium
Joshua Sager	2015	NCC Summer Undergraduate Research Colloquium
Alexis Gramera	2014-2016	NCC Summer Undergraduate Research Colloquium, Honor's Thesis (Director); National Conference on Undergraduate Research (NCUR); Rall Symposium 2015; I assisted in conducting field work on nesting; Manuscript is published in Herpetological Notes
Samantha Czernik	2014-2015	Honor's Thesis (Director)
Andrew Muñoz	2014-2015	Independent Research; Rall Symposium 2015; National Conference on Undergraduate Research (NCUR) 2015
Daniela Martinez	2014-2015	Honor's Thesis (I served as first reader)
Lauren Gamperl	2014	Rall Symposium 2014

Tiara Sondergoth	2015-2016	Independent Research; Rall Symposium 2016; Research is being prepared for professional publication (co-authored with NCC students Jordan Kremer and Brent Gaither)
Rachel DiPietro	2014	National Conference on Undergraduate Research (NCUR) 2015
Brent Gaither	2014-2015	Independent Research
Allyn Kent	2013-2014	Independent Research; Rall Symposium 2014 (poster)
Austin Nye	2013	Independent Research
Kelsey Sedgwick	2013	Independent Research
Jon Bitner	2013-2014	Honor's Thesis (Director); Rall Symposium 2014 (Poster)
Kathryn Reese	2012-2014	NCC Summer Undergraduate Research Colloquium; National Conference on Undergraduate Research (NCUR) 2014; Rall Symposium 2015 (oral presentation)
Joel DiBernardo	2012-2014	NCC Summer Undergraduate Research Colloquium; National Conference on Undergraduate Research (NCUR) 2014; Rall Symposium 2014 (oral presentation)
Jordan Kremer	2012-2013	National Conference on Undergraduate Research (NCUR) 2013; Rall Symposium 2013
Andrew DuBois	2012-2013	NCC Summer Undergraduate Research Colloquium, Honor's Thesis (Director); Rall Symposium 2013
Kate Leuders	2012	Independent Research

Student Mentoring at Other Institutions

Student	**Years**	**Accomplishments**
Allyse Hellmich	2009-2011	Mentor Advanced Project, Grinnell College
Stephanie Watanabe	2011	Mentor Advanced Project, Grinnell College
Xiani Liu	2009	Mentor Advanced Project, Grinnell College
Ann Murray	2009	Mentor Advanced Project, Grinnell College
Sunny Mah	2010	Mentor Advanced Project, Grinnell College
Lauren Kiraly	2008	Undergraduate Research, Arizona State University
Katie Provost	2003-2004	Research Experience for Undergraduates (REU), Mountain Lake Biological Station; Published a manuscript in Diseases of Aquatic Organisms. Earned her Ph.D. from John Hopkins University
Stesha Pesachnik	2002	Research Experience for Undergraduates (REU), Mountain Lake Biological Station; Published manuscript in the Journal of Herpetology. Earned her Ph.D. from the University of Tennessee

RESEARCH EXPERIENCE

2023-Present	**Carbon Sequestration on Shade Coffee Plantations**, North Central College, Work with the North Central Coffee Lab and the growers of the Juan Ana Collectivo in San Lucas Tolimán, Guatemala to measure the Carbon sequestered by trees on shade coffee plantations.
2006-2008	**Postdoctoral Research**, Arizona State University, Tempe, AZ, Examined the role of host amphibian communities on the dynamics of the amphibian pathogen, *Batrachochytrium dendrobatidis*
2003-2005	**Ph.D. Research**, Savannah River Ecology Laboratory, Aiken, SC, Surveyed breeding populations of the southern leopard frog; mapped location of several egg masses using a Trimble GPS unit, digital photographs and Arcview GIS; collected and isolated strains of water molds from infected frog eggs in the field
2001-2004	**Ph.D. Research**, Mountain Lake Biological Station, Giles County, VA, Performed lab and field experiments on the impact of predators and pathogens on amphibian eggs
2001	**Rotation Research,** University of Virginia, Charlottesville, VA, *advisor*: Dr. Douglas Taylor: Tested microsatellite primers on several species of the plant genus *Silene* to examine phylogenetic relationships
2000	**Rotation Research**, University of Virginia, Charlottesville, VA, *advisor*: Dr. Henry Wilbur: Used skeletal chronology to determine the age of red-spotted newts captured in the field
2000	**Research Assistant**, Smithsonian Tropical Research Institute, Panama, *director*: Stefan Schnitzer, University of Pittsburgh: Surveyed seedlings in a study of the effects of lianas on plant biodiversity
1999-2000	**Research Assistant**, Smithsonian Tropical Research Institute, Panama, *director*: Dr. Gregory Adler, University of Wisconsin-Oshkosh: Trapped and collected demographic data on island mammal populations; conducted censuses of flowering and fruiting plants on the islands
1999	**Research Assistant**, Caribbean Conservation Corporation, Tortuguero Costa Rica, *director*: Sebastian Tröeng: Tagged, collected morphological data, and marked locations of nesting green and leatherback turtles; excavated hatched nests; performed necroscopies on hatchlings and eggs; worked with a multilingual group of researchers from seven countries
1997	**R.E. Lee Research Assistant**, Washington and Lee University, Lexington, VA, *advisor*: Dr. Lawrence Hurd: Studied the effects of population density and intraspecific competition on larval amphibians

SERVICE

Coffee Lab Advisory Board, 2024-Present, North Central College

Faculty Mentor, Cardinal First – Biology, 2023-2024, North Central College

Faculty Handbook Subcomittee, 2020-2022 Chair, North Central College

Faculty Welfare Committee, Winter Term 2014, Chair, 2017-2021, North Central College

Faculty Search Committees, One-year Plant Biologist, 2012; Tenure-Track Plant Biologist, 2013; One-year Plant Biologist, 2013; Tenure-Track Plant Biologist, 2014; Tenure-Track Organismal Biologist, 2015; Tenure-Track Media Studies, 2015; Tenure-Track Plant Biologist, 2016, Tenure-Track Exercise Science 2018, 2019

Science Immersion Cardinal Camp Director, 2016, 2017, 2018, North Central College

Faculty Professional Development Committee, 2015- 2017, North Central College

Academic Assessment Committee, 2012-2014, North Central College

Rall Symposium Moderator, 2012, 2013, North Central College

Faculty Mentor, Men's Track and Field Team, 2012-2014, North Central College

Faculty Mentor, Beta Beta Beta Society, 2012-2017, North Central College

Manuscript Referee for the following scholarly journals: The American Naturalist, Journal of Herpetology, Oecologia, Ecology Letters, Southeastern Naturalist, Journal of Parasitology, Herpetological Conservation and Biology, Revista Iberoamericana de Micologia, Freshwater Biology, Herpetological Review, Environmental Pollution, Journal of Wildlife Diseases, Ecosystems, Biology Letters, Functional Ecology, Oikos, Northwestern Naturalist, Marine Ecology, Fems Microbiology

National Science Foundation, Reviewed five grant proposals

Grinnell Science Project Volunteer, Organized and taught laboratory exercises for a student orientation program designed to introduce students from underrepresented groups to the sciences at Grinnell College

Co-President, University of Virginia Biology Department Graduate Student and Post-Doc Association, *2003-2004 Academic Year*

Judge, Ward Traditional Academy Science Fair, Tempe, AZ, *February 28, 2007*

Judge, Graduates in Earth, Life, and Social Sciences Symposium, Arizona State University, *February 1, 2008*

Advisory Board, Save the Frogs 2006-2013

GRANTS AND FELLOWSHIPS

Faculty Development Grant, 2024, North Central College, Ecological Traits of Pathogenic Water Molds

Faculty Development Grant, 2023, North Central College, Estimating the Population Size of Aquatic Pathogens

Faculty Development Grant, 2022, North Central College, Modeling the Impacts of Aquatic Pathogens

Faculty Development Grant, 2021, North Central College, Ecology of Aquatic Pathogens

Faculty Development Grant, 2019, North Central College, Extracting Pathogen DNA from Environmental Samples

Faculty Development Grant, 2018, North Central College, Testing a Newly Developed Method for Detecting Pathogens

Faculty Development Grant, 2017, North Central College, Environmental Detection of Amphibian Pathogens

Feed a Bee Grant, 2016, Bayer, $5,000, Established a native prairie on North Central College's campus.

Faculty Development Grant, 2016, North Central College, Pathogens Create Ecological Links Between their Host Species

Faculty Development Grant, 2015, North Central College, The Ecology of Pathogens that Infect Multiple Host Species

Faculty Development Grant, 2014, North Central College, Studying Amphibian Pathogens in Nature

Faculty Development Grant, 2013, North Central College, Community Ecology of Amphibian Pathogens

Faculty Development Grant, 2012, North Central College, Identifying Multi-Host Pathogens of Amphibians in the Naperville Region

National Science Foundation Doctoral Dissertation Improvement Grant 2003-2005. $6,408. The Influence of Disease on Seasonal Variation in Amphibian Life History Traits. Co-participant: Henry Wilbur

Sigma Xi Grant in Aid of Research 2003-2005. $1,000. The Influence of Disease on Seasonal Variation in Amphibian Life History Traits

University of Virginia First Year Fellowship 2000-2001. Tuition at the University of Virginia and an $18,000 living stipend

Mountain Lake Biological Station Research Fellowship 2001-2004. Summer living expenses and access to the facilities at the Mountain Lake Biological Station

PRESENTATIONS

Invited Seminars

Monarch Landing, Naperville, IL: "Multihost Pathogens Connect Amphibian Hosts to Their Communities" *December 17, 2014*

Wilderness Field Station, Ely, MN, Title: "Multihost Pathogens Connect Amphibian Hosts to Their Communities" *July 6, 2011*

Iowa Association of County Conservation Board Employees, Winterfest 2011, Waterloo, IA, Title: "Environmental Impacts on Amphibians" *January 24, 2011*

Millikin University, Decatur, IL, Title: "Multihost Pathogens Connect Hosts to Their Communities" *January 21, 2011*

Grinnell in the Twin Cities, Como Park Zoo St. Paul, MN, Title: "Emerging Infectious Disease and the Plight of Amphibians" *November 9, 2008*

Washington and Lee University, Lexington, VA, Title: "Disease, the Environment, and Amphibian Egg Laying Behavior" *March 11, 2004*

Seminars

Grinnell College Departmental Seminar, Grinnell, IA, Title: "The Role of Multihost Pathogens in Community Ecology" *November 19, 2010*

BESTNet – DIVERSITAS - AgTrans Workshop: Analyzing the Role of Agricultural Transformation and Invasive Species in Disease Emergence, Global Institute of Sustainability, Arizona State University, Tempe AZ, Title: "Globalization and Invasive Pathogens" *May 30, 2008*

Host Pathogen Biology and the Global Decline of Amphibians, Arizona State University, Tempe, AZ, Title: "*Batrachochytrium dendrobatidis* at Amphibian Breeding Sites in Central Arizona" *November 2, 2007*

Ecological Society of America, San Jose, CA, Title: "Temperature and Host Density Influence Susceptibility of Frog Eggs to Disease" *August 9, 2007*

Host Pathogen Biology and the Global Decline of Amphibians, Arizona State University, Tempe, AZ, Title: "The Effect of Temperature on the Persistence of *Batrachochytrium dendrobatidis* Zoospores in Pond Water" *November 10, 2006*

Posters

What Limits Host Range? CIEE Winter Workshop, University of Edinburgh, Edinburgh, UK, Title: "Dead or Alive? Multihost Saprobes Are Facultative Pathogens of Amphibians" *December 8, 2009*

Host Pathogen Biology and the Global Decline of Amphibians, Arizona State University, Tempe, AZ, Title: "The Role of the Environment and Egg Laying Behavior on *Saprolegnia* Transmission" *November 11, 2004*

Southeastern Ecology and Population Genetics Group, Camp Sequoia, VA, Title: "The Roles of Infectious Disease and the Environment in Bullfrog Oviposition Site Choice" *September 20, 2003*

Southeastern Ecology and Population Genetics Group, Hanging Rock, NC, Title: "Ecological Implications of Amphibian Egg Laying Behavior" *September 22, 2001*

PUBLICATIONS

*Ahmed, A.K., V.C. Sijercic, M.S. Akhtar, Ahmed Elbayomy, M.A. Marouf, M.S. Zeleke, R. Sayad, A. Abdelshafi, N.J. Laird, M. A. El-Mokhtar, **G.R. Ruthig**, and H. F. Hetta. 2024. Cholera rages in Africa and the Middle East: a narrative review on challenges and solutions. Health Sci Rep 7:e2013. doi:10.1002/hsr2.2013

*Ahmed, A. K., V.C. Sijercic, R. Sayad, **G.R. Ruthig,** S.F. Abdelwahab, M.A. El-Mokhtar, and I.M. Sayed, I. M. 2023. Risks and preventions for pregnant women and their preterm infants in a world with COVID-19: A narrative review. Vaccines 11(3): 640.

Ruthig, G.R. 2020. Population Genetics. in The Routledge Companion to Race and Ethnicity. eds. S. M Caliendo and D. McIlwain.

*__Ruthig, G.R.,__ L.J. Bode, A. Cvetkovic, and P. Shrestha. 2020. Dead mink frogs (*Lithobates septentionalis*) found in Northern Minnesota were infected with both *Batrachochytrium dendrobatidis* and Ranavirus. Herpetological Review 51:744-746.

***Ruthig, G. R.** and A. E. Gramera. 2018. Spatial distribution of olive ridley sea turtle (*Lepidochelys olivacea*) nests impacts animal and human predation. Herpetological Notes 12:1-7.

Ruthig, G. R. 2013**.** Temperature affects disease susceptibility of frog eggs to infection by water molds. Herpetological Biology and Conservation 8: 707-714.

***Ruthig, G. R.** and K. N. Provost-Javier. 2012. Multihost saprobes are facultative pathogens of the bullfrog, *Lithobates catesbeianus* eggs. Diseases of Aquatic Organisms 101: 13-21.

Ruthig, G. R. and B. P. DeRidder. 2012. Fast quantitative PCR, locked nucleic acid probes, and reduced volume reactions are effective tools for detecting *Batrachochytrium dendrobatidis* DNA. Diseases of Aquatic Organisms 97: 249-253.

Davidson, E. D., J. Snyder, D. Lightner, **G. R. Ruthig**, and J. Gilley. 2010. Exploration of potential microbial control agents for the invasive crayfish, *Orconectes virilis*, in

Arizona, USA. Biocontrol Science & Technology 20: 297-310.

Schock, D. M., G. R. Ruthig, J. P. Collins, S. J. Kutz, S. Carrière, R. J. Gau, A. Veitch, N. C. Larter, D. P. Tate, G. Guthrie, D. G. Allaire, and R. Popko. 2009. Amphibian chytrid fungus and ranaviruses in the Northwest Territories, Canada. Diseases of Aquatic Organisms. doi: 10.3354/dao02134

Ruthig, G. R. 2009. Water molds of the genera *Saprolegnia* and *Leptolegnia* are pathogenic to the North American frogs, *Rana catesbeiana* and *Pseudacris crucifer*, respectively. Diseases of Aquatic Organisms 84: 173-178.

Karraker, N. E. and **G. R. Ruthig**. 2009. The interaction between road salt and water molds on amphibian egg mortality. Environmental Research 109: 40-45.

Ruthig, G. R. 2008. The influence of temperature and spatial distribution on the susceptibility of southern leopard frog eggs to disease. Oecologia 156: 895-903.

*Pasachnik, S. and **G. R. Ruthig**. 2004. Versatility of habitat use in three sympatric species of Plethodontid salamanders. Journal of Herpetology 38: 434-437.

* Denotes a publication that was co-authored with an undergraduate researcher

SKILLS

Proficiency in Spanish, Gel Electrophoresis, Polymerase Chain Reaction (PCR), Quantitative (realtime) PCR, Freshwater aquarium setup and maintenance, Small mammal trapping, Amphibian skeletal chronology, Small boat operation, PADI open water certified SCUBA diver

Computer Programs: SAS, Arc View GIS, Minitab, Microsoft Excel, Microsoft Word, Microsoft PowerPoint, MEGA, SPSS, Populus, R