

# Spencer Bruce

113 Hill St. Troy, NY 12180 / spencerbruce.org  
Phone: 518.225.0787 / E-Mail: sbruce@albany.edu

## Appointments

### Current

Postdoctoral Research Scientist, State University of New York at Albany 2018 – present  
Instructor, State University of New York at Albany 2013 – present

### Previous

Research Fellow, New York State Museum 2014 – 2018  
Instructor, Siena College 2017 – 2018

## Education

**Doctor of Philosophy** State University of New York at Albany  
Biology; Ecology and Evolutionary Biology May 2018

**Graduate Certificate** State University of New York at Albany  
Geographic Information Systems and Spatial Analysis May 2014

**Master of Science** State University of New York at Albany  
Biology; Biodiversity, Conservation and Policy May 2014

**Bachelor of Arts** Brooklyn College  
Biology July 2012

**Bachelor of Arts** Buffalo State College  
Art History December 2004

## Research Experience

### Current

**University at Albany, Andam Bioinformatics Lab** 2020 – present

- Currently working as a Postdoctoral Researcher directing all computational analyses related to genomic variation in myriad bacterial pathogens effecting both humans and wildlife.
- Mentoring multiple graduate students in bioinformatic analyses, genome assembly and annotation, cellular genomics, data visualization, and manuscript writing.

### Previous

**University at Albany, Turner Wildlife Disease Ecology Lab** 2018 – 2020

- Worked as a Postdoctoral Researcher under a 2.5-million-dollar National Science Foundation grant studying the genomics of *Bacillus anthracis*, the causative agent of anthrax disease in Africa.
- Directed all lab work associated with DNA extraction, bioinformatics, genome assembly and annotation, population genomics, molecular ecology, and data visualization.

**New York State Museum, Department of Ichthyology** 2014 – 2018

- Developed and executed large scale fisheries genetic research, incorporating models to identify relationships based on ecology and habitat degradation, the identification of native populations for conservation purposes, while also assessing the influence of hatchery fish on wild populations at the molecular level.

- Directed lab work associated with the project at the New York State Museum's molecular facility focused on DNA extraction, multiplex PCR amplification, microsatellite genotyping and analysis for conservation, ecology and landscape genetics.

**University at Albany, BCP Program / Gonder Wildlife Genetics Lab** 2012 – 2014

- Trained in Dr. Mary Gonder's Genetics lab doing DNA extractions, dye-labeled PCR amplification, gel electrophoresis and microsatellite analysis for projects relating to primate landscape genetics and niche ecology.
- Analyzed brook trout genotype data in conjunction with Dr. Matthew Hare's lab at Cornell University for my Master's thesis.

**American Museum of Natural History, Department of Ichthyology** 2011 – 2012

- Worked with the Ichthyology Collection Associate on the sorting and distribution of incoming and outgoing fish specimens related to the Congo Project.
- Monitored alcohol levels and corrected/updated records associated with individual specimens from the collection.

**Brooklyn College, Laboratory for Invertebrate Ecology and Behavior** 2011 – 2012

- Worked on various experiments related to the endangered *Nautilus pompilius*. Designed and implemented a set of experiments to examine scavenging behavior for independent research credit.
- Aided in reworking statistical methods related to past foraging experiments. Worked closely with the lab director to ensure proper husbandry and nautilus care over the course of a year.

**American Museum of Natural History, NCSLET** 2010 – 2011

- Worked with the National Center for Science Literacy, Education and Technology on link research, photo research, caption creation and placement for online essays related to upcoming graduate seminars on subjects such as Ecology, Genetics and Climate Change.

## Peer-Reviewed Publications

**Bruce, S.A.\***, N.J. Schiraldi, P.L. Kamath, R.W. Easterday, W.C. Turner (2020) A classification framework for *Bacillus anthracis* based on global genomic structure. *Evolutionary Applications*. doi: <https://doi.org/10.1111/eva.12911>

**Bruce, S.A.**, Y. Kutsumi, C. Van Maaren, M.P. Hare\* (2020) Stocked fish introgression into wild Brook Trout (*Salvelinus fontinalis*) populations depends on habitat. *Transactions of the American Fisheries Society*. doi: <https://doi.org/10.1002/tafs.10239>

**Bruce, S.A.\***, S.D. George, B.P. Baldigo, J.J. Wright (2019) Elucidating the impact of anthropogenic supplementation, isolation and ecological heterogeneity on Brook Trout (*Salvelinus fontinalis*) genetic structure. *Landscape Ecology*. 35, 403–420. doi: <https://doi.org/10.1007/s10980-019-00955-z>

**Bruce, S.A.\***, P.C. Daniel, M.K. Krause, F.G. Henson, C.E. Pershyn, J.J. Wright (2019) A methodological approach to the genetic identification of native Brook Trout (*Salvelinus fontinalis*) populations for conservation purposes. *Global Ecology and Conservation*. 19(7), E00682. doi: <https://doi.org/10.1016/j.gecco.2019.e00682>

**Bruce, S.A.\***, J.J. Wright (2018) Gene flow and dispersal in wild Brook Trout (*Salvelinus fontinalis*) populations reveal ongoing migration and introgression from stocked fish. *Ecology and Evolution*. 8(23), 11410–11422. doi: <https://doi.org/10.1002/ece3.4556>

**Bruce, S.A.\***, M.W. Mitchell, M.P. Hare, J.J. Wright (2018) Confirmation of a unique and genetically diverse 'heritage' strain of Brook Trout (*Salvelinus fontinalis*) in a remote Adirondack watershed. *Conservation Genetics*. 19(1), 71–83. doi: <https://doi.org/10.1007/s10592-017-1019-6>

## Submitted Manuscripts

**Bruce, S.A.\***, Y-H. Huang, P.L. Kamath, H. van Heerden, W.C. Turner (submitted) The role of phage diversity, antimicrobial resistance, isolation source and selection in shaping the genomic architecture of *Bacillus anthracis*.

Turner, W.C.\*, P.L. Kamath, H. van Heerden, Y-H. Huang, Z.R. Barandongo, **S.A. Bruce**, K. Kausrud (submitted) The elusive role of the environment in virulence-transmission relationships.

Barord, G.\*, **S.A. Bruce**, J. Basil, V. Li, M. Beydoun, P. Ward (submitted) Foraging and scavenging behavior of Nautilus (*Cl. Cephalopoda*): a synthetic approach. *The Biological Bulletin*.

## Funding and Awards

### Current

Brook Trout Genome Project \$5,000	Trout Power Inc. 2020 – 2021
Sagamore Watershed Genotyping-By-Sequencing Project \$4,236	Trout Power Inc. 2020 – 2021
TU Citizen Science Wild Trout Projects \$6,000	Trout Unlimited 2020 – 2021

### Previous

Lake Colden Heritage Project \$2,000	Adirondack Lake Survey Corporation 2020
Tug Hill Wild Trout Project \$3,500	Trout Unlimited 2020
Brook Trout Genome/Microsatellite Project \$7,000	Trout Power Inc. 2019
Ashokan Watershed 'Heritage' Brook Trout Project \$1,000	Trout Unlimited 2019
Four-Year Ichthyology Fellowship \$175,000	New York State Museum 2014 – 2018

Silver Lake Wilderness/Brook Trout Microsatellite Project \$2,200	Trout Power Inc. 2017
Tibor T. Polgar Fellowship \$4,800	Hudson River Foundation 2017
Sagamore Preserve Brook Trout Microsatellite Project \$2,200	Trout Power Inc. 2017
Huyck Research Grant \$2,650	Huyck Preserve & Biological Research Station 2015
Biodiversity Master's Research Grant \$4,000	UAlbany Foundation 2014

## Teaching Experience

- University at Albany: Human Genetics 2019 – 2021
- Currently teaching a lecture section with over 70 students emphasizing the principles and mechanisms of inheritance including the analysis of genetic material; cellular processes, the behavior of genes in individuals, families, and populations; and the implications for behavior and evolution, disease, and society.
  - Meeting with students three times a week to convey processes and concepts utilizing current issues in the literature, presenting on-going research, and facilitating discussions.
- University at Albany: Introductory Genetics 2020
- Taught a lecture section for biology majors with over 200 students emphasizing the principles and mechanisms of inheritance. Topics include: DNA structure and replication; Mendelian genetics and recombination; population, fungal, somatic cell, and bacterial genetics; gene organization; the genetic code; mechanisms of gene expression and regulation; and applications of genetic technology.
  - Met with students two times a week to convey processes and concepts utilizing current technology including interactive PPT presentations, animations and iClickers. Developed homework materials and supervised Teaching Assistants for six discussion sections.
- University at Albany: Ecology & Evolutionary Biology Seminar 2019
- Co-led the graduate seminar for the Ecology & Evolutionary Biology program, met with students once a week to discuss current issues in the literature, present on-going research, and participate in discussions with professionals in the field.
- University at Albany: Biodiversity, Conservation & Policy Seminar 2018
- Led the graduate seminar for the Biodiversity, Conservation & Policy M.S. program, met with students once a week to discuss current issues in the literature, present on-going research, and participate in discussions with professionals in the field.
  - Directed a workshop for the application of the R programming language in scientific data analysis and visualization.

Siena College: Vertebrate Biology Lab 2017-2018

- Co-developed and taught one vertebrate biology lab section, meeting with students once a week to go over homework questions, review material from the lecture section, reinforce concepts, participate in laboratory exercises, and administer quizzes/exams.
- Directed a number of field laboratories where students learned techniques for sampling organisms in the wild, as well as field-based data collection and the application of ecological principles.

Siena College: Biological Diversity, Field Techniques and Biology Lab I 2017

- Co-taught Biological Diversity and Field Techniques in the Environmental Studies Dept. as well as two undergraduate Bio labs, met with students once a week to participate in lecture and laboratory sections.
- Developed curriculum and lab activities for courses that met university guidelines for a diverse array of students with various educational backgrounds.

The Huyck Preserve & Biological Research Station: Fisheries Ecology Seminar 2015

- Gave two seminars to visiting high school student groups about the use of conservation genetics and ecology in fisheries biology.
- Developed and directed a number of field demonstrations where students learned techniques for sampling fish in the wild, as well as field-based data collection.

University at Albany: General Biology Labs I & II 2013 – 2014

- Taught two general biology labs, met with students once a week to go over homework questions, review material from the lecture section, reinforce concepts, participate in laboratory exercises, and administer quizzes/exams.
- Coordinated with Lab Director to ensure curriculum and course material meet university guidelines.

University at Albany: Undergraduate Genetics Discussion 2013

- Taught a discussion course in conjunction with lecture section, meeting with students once a week to go over homework questions, administer quizzes, review material from the lecture section, and reinforce concepts.

## Research Mentoring

University at Albany 2018 – 2021

Sirazum Chowdhury (undergraduate), J.R. Mathews (graduate), Madison Turcotte (graduate), Nicole Traver (graduate), Zoe Barandongo (graduate)

New York State Museum 2014 – 2018

Noel Deyette (undergraduate), Luis Rodriguez (undergraduate), Carrienne Pershyn (graduate)

## Invited Presentations

University of Connecticut ~ Storrs, Connecticut 2019

- Utilizing the Genomic Architecture of *Bacillus anthracis* to Understand Anthrax Outbreak Origins and Genetic Diversity

- Siena College ~ Loudonville, New York 2019
- Unraveling Native Brook Trout Genetic Structure in New York State
- Trout Unlimited: Ashokan Pepacton Chapter Meeting ~ Boiceville, NY 2018
- The Biogeography of Native Brook Trout populations in New York State
- Carey Institute of Ecosystem Studies ~ Millbrook, NY 2017
- Genetic Differentiation and Hybridization Between Stocked and Native Brook Trout in The Upper Hudson

### Conference/Professional Presentations

- Wildlife Conservation Society Meeting ~ Kingston, New York 2019
- A Biogeographical Approach to the Identification of Native Brook Trout Populations for Conservation Purposes
- Adirondack Research Forum ~ Old Forge, New York 2019
- Utilizing Citizen Science to Identify, Map and Monitor Wild Brook Trout Genetic Structure in the Adirondack Park
- Adirondack Research Forum ~ Old Forge, New York 2017
- Trout Power Citizen Science: Sagamore Watershed Brook Trout Genetics
- Adirondack Research Forum ~ Old Forge, New York 2015
- Genetic Diversity and Population Structure of Brook Trout in the Adirondacks
- University at Albany EEB Seminar ~ Albany, NY 2015
- Population Structure and Distribution of Brook Trout in the Adirondack Park
- New York State Museum Bio-lunch ~ Albany, NY 2014
- The Persistence of Admixture Signals in Wild Brook Trout Populations

### Affiliations/Memberships

- American Society for Microbiology ~ Member 2020 – present
- American Fisheries Society ~ Member 2015 – present
- Society for Conservation Biology ~ Member 2010 – present

### Manuscript Reviewer

- Transactions of the American Fisheries Society
- Pathogens
- Evolutionary Applications
- Ecology and Evolution
- PLOS One
- Proceedings of the National Academy of Sciences
- Conservation Genetics

## Previous Professional Experience

**Big Duck Studios, Project Coordinator ~ New York, NY** 2009 – 2010

- Maintained detail relating to the scheduling and coordination of up to 15 projects for various non-profit organizations such as the Dutchess County Land Conservancy and the NY–NJ Harbor Estuary Program.
- Dealt with all aspects of seeing design and marketing pieces through production to delivery including bids from printers/ mailing houses, web development, vendor relations, printing, packaging and delivery/ mailing.

**Professional Association for Design, Project Manager ~ New York, NY** 2005 – 2008

- Managed the installation of a green roof through inception to completion, oversaw all construction in the first-floor exhibition space, managed the design of environmental office signage for the AIGA Design Center, as well as the conversion of the fourth floor from a storage area to a working office space.
- Acted as the point person for AIGA's Design Business partners, handled the printing and publication of collateral, the promotion and execution of an annual conference in conjunction with the Yale School of Management, AIGA sustainability initiatives, as well as seeing a new website through from conception to launch.

## Technical Skills

Fluent in the R programming language, shell scripting, cluster computing, and Python. Trained in a wide range of qualitative data analysis, including the Structured Query Language (SQL). Extensive experience in collecting, cleaning, and organizing large-scale datasets. Expert level at Adobe Illustrator with extensive data visualization experience. Trained in DNA extraction (feces, soil, tissue), DNA quantification, fragment analysis, whole genome library preparation, multiplex PCR calibration and sequencing, gel electrophoresis, landscape genomics, molecular ecology and genomic data visualization.