CHRISTIAN E. GUNNING

(706) 224-7627 • http://www.x14n.org • icos.atropa@gmail.com

307 A Princeton SE • Albuquerque, NM 87106

BACKGROUND

Research employs a dynamical systems interpretation of population and community ecology, with an emphasis on probabilistic analysis of empirical datasets and discrete stochastic dynamical models.

Current focus on metapopulation dynamics of measles and whooping cough, including the effect of population size on stochastic extinction as a metapopulation measure of disease persistence.

Strong background in probability theory, machine learning methods, linear modeling, and bootstrapping. Fluent in the R programming language, with extensive experience in SQL, C++, and multidimensional data visualization.

Skilled mentor and teacher of probability, statistics, and scientific programming to students from diverse backgrounds.

EDUCATION

University of New Mexico, Albuquerque *Summer 2014*
Ph.D. with Distinction in Biology (Disease Ecology with concentration in Integrative Biology)
Advisor: Dr. Helen J. Wearing
Committee: Drs. Jim Brown, Melanie Moses, and Erik Erhardt
Title: Population and Metapopulation Ecology of Childhood Diseases in the pre-vaccine era United States

University of New Mexico, Albuquerque *Fall 2009*
Masters of Water Resources (Riparian Hydroecology)
Advisors: Drs. Bruce Thomson and Roy Jemison
Title: Estimating Phreatophyte Evapotranspiration from Diel Groundwater Fluctuations in the Middle Rio Grande Bosque

University of Georgia, Athens *Fall 2001*
Bachelor of Science, Biochemistry and Molecular Biology
Advisor: Dr. James Omichinski

GRANTS AND AWARDS

Apr 2013 ($500). UNM Biology Department Scholarship.

Apr 2013. Graduate oral presentation, 2nd place. UNM Biology Research Day.

Jun 2011 ($2,000). UNM PiBBS Student Enrichment Opportunities Grant to attend SFI Complex Systems Summer School.

May 2010 ($500). EEID Conference Workshop travel grant.

Apr 2010 ($500). UNM SRAC travel grant to attend useR2010.

Apr 2010. Graduate poster presentation, 1st place. UNM Biology Research Day.

Mar 2010 ($80,000). Center for Evolutionary & Theoretical Immunology (CETI) Seed Grant, Waning Immunity in Influenza and Whooping Cough, Contributing author.

Aug 2009 ($\approx$\$50,000). Program in Interdisciplinary Biological and Biomedical Sciences (PIBBS) 2 year fellowship.

May 2007 (\$4,400). UNM Graduate Research and Development grant, Hydrological research in the Middle Rio Grande Bosque.

PUBLICATIONS

C.E. Gunning, E. Erhardt, H.J. Wearing. Pre-vaccine era reporting rates of childhood diseases: a case study of observation process variability. (In Review, Proc. Roy. Soc. Lond. B.)

C. Andris, D. Lee, **C.E. Gunning**, M. Martino, M.J. Hamilton, J.A. Selden. The Rise of Partisanship in the U.S. House of Representatives. (In Review, PLoS ONE)

C.E. Gunning & H.J. Wearing. Probabilistic measures of persistence and extinction in measles (meta)populations. Ecology Letters 16(8), 985-994.

D.M. Smith, D.M. Finch, **C.E. Gunning**, R. Jemison, J.F. Kelly. 2009. Post-wildfire recovery of riparian vegetation during a period of water scarcity in the Southwestern USA. Fire ecology 5(1), 38-55.

CONTRIBUTED TALKS

C.E. Gunning, H.J Wearing. Reporting rate variation in U.S. cities. UNM Biology Research Day. Albuquerque, NM. Apr 2013.

C.E. Gunning. Measles dynamics in the pre-vaccine era United States: Linking models and data. UNM Biology Brownbag seminar series. Albuquerque, NM. Oct 2011.

C.E. Gunning, H.J Wearing. Measles epidemics in pre-vaccine era United States cities: Linking models and data. Ecological Society of America conference. Austin, TX. Aug 2011.

C.E. Gunning. Spatio-temporal ecology of measles. UNM Biology Research Day. Albuquerque, NM. Apr 2011.

C.E. Gunning. Rwave - Detecting synchrony of influenza between U.S. states. useR 2010 Conference. Gaithersburg, MD. Jul 2010.

CONTRIBUTED POSTERS

C.E. Gunning, E. Erhard, H.J. Wearing. Pre-vaccine era reporting rates of measles and whooping cough. Ecology and Evolution of Infectious Disease (EEID) Conference. Fort Collins, CO. Jun 2014.

C.E. Gunning. Reporting rate variation of acute, immunizing diseases in pre-vaccine U.S. cities. Ecology and Evolution of Infectious Disease (EEID) Conference. State College, PA. May 2013.

C.E. Gunning. Stochasticity, persistence, and extinction in measles (meta)populations. Models of Infectious Disease Agent Study (MIDAS) meeting. Atlanta, GA. Jun 2012.

C.E. Gunning, H.J Wearing. Stochasticity, persistence, and extinction in measles (meta)populations: Are we measuring what we think we're measuring? Ecology & Evolution of Infectious Disease (EEID) Conference. Ann Arbor, MI. May 2012.

C.E. Gunning. Using wavelets to detect synchrony of influenza between U.S. states. UNM Biology Research Day. Albuquerque, NM. Apr 2010.

C.E. Gunning. Linear Modeling of the Response of Groundwater Level to River Flow in the Middle Rio Grande Bosque, Water Year 2006. National Groundwater Association (NGWA) Conference. Albuquerque, NM. May 2007.

TEACHING EXPERIENCE

Probability for Scientists
Fall 2013, UNM Biology

· Course designer and lead instructor
· Mixed undergraduate/graduate course (primarily undergraduate)
· Hands-on course covering introductory probability, statistics, and data analysis

Statistical Programming
Spring 2013, UNM Statistics

· Teaching assistant
· Mixed undergraduate/graduate course (primarily graduate)
· Assisted Dr. Erik Erhardt with course lectures

UNM R Programming Group
Fall 2010 - Spring 2013, UNM

· Organizer and facilitator of weekly R programming group
· Participants included undergraduate and graduate students and professors

Ecology Workshop
May 2010, University of Michigan

· Assisted workshop participants with use of R programming language
· Workshop was part of the annual Ecology and Evolution of Infectious Disease conference

Undergraduate Biology Courses (various)
2008, 2009, 2014, UNM Biology

· Teaching assistant for Ecology & Evolution, Genetics, and Biology for Non-majors

RESEARCH EXPERIENCE

Research Assistant
Jan 2010 - Present

Wearing Lab, UNM Biology
Albuquerque, NM

· Conducted original research for publication
· Assisted with grant writing
· Systems administrator and data manager
· Mentor and manager of lab undergraduates

Hydrology Research Technician
Jan 2006 - Jan 2009

Rocky Mountain Research Station, U.S. Forest Service
Albuquerque, NM

· Conducted original research for U.S. Forest Service
· Prepared technical reports
· Collected and managed environmental monitoring data

Plant Genetics Lab Technician
Jun 2003 - Jun 2004

Malmberg Lab, UGA Plant Biology
Athens, GA

· Isolated DNA, Conducted PCR
· Designed data entry and management system

NMR Lab Technician
Jan 2001 - Jun 2002

Omichinski Lab, UGA Biochemistry and Molecular Biology
Athens, GA

· Administered mixed Unix workstation cluster
· Evaluated linux hardware/software for high-performance NMR data visualization

CONFERENCES AND PROFESSIONAL EVENTS

Jun 2014. Ecology and Evolution of Infectious Disease Conference. Colorado State University. Fort Collins, CO.

May 2013. Ecology and Evolution of Infectious Disease Conference. Pennsylvania State University. State College, PA.

May 2012. Ecology and Evolution of Infectious Disease Conference and Workshop. University of Michigan. Ann Arbor, MI.

Oct 2011. Rcpp R Programming Master Class. San Francisco, CA.

Aug 2011. Ecological Society of America Conference. Austin, TX.

Jun 2011. Santa Fe Institute Complex Systems Summer School. Santa Fe Institute. Santa Fe, NM.

Jul 2010. useR 2010 Conference. Gaithersburg, MD.

May 2010. Ecology and Evolution of Infectious Disease Conference and Workshop. Cornell University. Ithica, NY.

Aug 2009. Ecological Society of America Conference. Albuquerque, NM.

May 2007. National Groundwater Association Conference. Albuquerque, NM.

PROFESSIONAL SERVICE

Feb 2014. Reviewer, Theoretical Ecology.

May 2011 - May 2012. Mentored undergraduate Nathan Cournoyer. UNM Biology.

Mar 2009. Grant reader, Graduate Research Allocations Committee (GRAC). UNM Biology.

SOFTWARE DEVELOPMENT

Spring 2013. Wrote code, documentation, and unit tests for `discrimArts`, an R package for probability distribution estimation, according to the specifications of Drs. J. M. Rowland and C. Qualls.

Oct 2010 - Mar 2012. Contributor to `Rcpp`, an R package for C++ development.

2009-2012. Maintainer of `Rwave`, an R package for continuous wavelet transforms.

2010-2011. Submitted bug reports for `xts` and `zoo`, R packages for timeseries handling and analysis.