NICHOLAS D. PRESTON

DIGITAL DISEASE ECOLOGIST

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(608) 698-6425

Interests

Disease Ecology

Ecosystem and network approaches to the ecological determinants of disease.

Data Science

Analyzing digital media and instrumented systems for threats to ecosystems and health.

Global Health

Health reporting networks, diagnostics, biosurveillance, and the drivers of disease.

Profile

I am interested in the intersection of global ecology, computing, and health. My research leverages data science, web development, and virtual laboratories to understand infectious disease dynamics in the context of global ecosystems.

Recent experience

EcoHealth Alliance (EHA)
Director of Data Science and Research Technology   2013-2014

I founded the Data Science and Research Technology (DART) lab at EHA. As Principal Investigator for our diagnostic web platforms, I oversee a team of software developers, data scientists, epidemiologists, and disease ecologists designing intelligent applications for diagnosing diseases from emergent media, with an emphasis on identifying novel outbreaks, emerging infectious disease events, and diseases of unknown etiology. The systems combine automated data collection, machine learning, natural language processing, web visualizations, disease situation dashboards, data processing tools for analysts, and adaptive diagnostic models.

EcoHealth Alliance (EHA)
Senior Research Scientist   2011-2013

Surveillance and analysis of diseases dynamics in humans and wildlife, mapping hotspots of emerging infectious diseases and global threats, building capacity in data science, researching the history of emerging infectious diseases, and developing virtual laboratories for collaborative epidemiology and biosurveillance.

Education

UW-Madison Center for Sustainability and the Global Environment, Wisconsin, USA
Postdoctoral Scientist   2011

The dotSkapes Project: An open source virtual laboratory for collaborative global health research

UW-Madison Center for Limnology, Wisconsin, USA
Ph.D.   2009

Dissertation: External drivers of lakes in forested watersheds: Aeolian organic carbon inputs and ice phenology.

UW-Madison Global Health Institute, Wisconsin, USA
Certificate, Global Health   2009

Coursework in epidemiology, health systems, and EcoHealth field experience.

University of Guelph, Ontario, Canada
B.Sc.   2002

Major: Biological Sciences (Dean's list) Minor: Mathematical Sciences (Statistics, Mathematics, and Computer Science)

Universite de Joseph Fourier, Grenoble, France
International Studies   2000

Biology of Organisms and Populations (Ontario-Rhone-Alps Bursary)

Papers

Preston N.D., Daszak P., and Colwell R.R. **2013**
The human environment interface: Applying ecosystem concepts to health. Curr Top Microbiol Immunol. PMID: 23633105.

Hanson P.C., Hamilton D.P., Stanley E.H., Preston N.D., Langman O.C., and Kara E.L. **2011**
Fate of allochthonous dissolved organic carbon in lakes: A quantitative approach. PLoS ONE, 6(7), e21884. PMCID: PMC3136486.

Preston N.D., Rusak J.A. **2010**
Homage to Hutchinson: Does inter-annual climate variability affect zooplankton density and diversity? Hydrobiologia, 653, 165–177. doi: 10.1007/s10750-010-0352-2.

Biggs, R., Diebel M.W., Gilroy D., Kamarainen A.M., Kornis M.S., Preston N.D., Schmitz J.E., Uejio C.K., Van De Bogert M.C., Weidel B.C., West P.C., Zaks D.P.M., Carpenter S.R. **2010**
Preparing for the future: Teaching scenario planning at the graduate level. Frontiers in Ecology and the Environment, 8(5), 267–273.

Solomon C.T., Cole J.J., Doucett R.R., Pace M.L., Preston N.D., Smith L.E., Weidel B.C. **2009**
The influence of environmental water on the hydrogen stable isotope ratio in aquatic consumers. Oecologia, 161(2), 313–324. PMID: 19471971.

Preston N.D., Carpenter S.R., Cole J.J., Pace M.L. **2008**
Airborne carbon deposition on a remote forested lake. Aquatic Sciences, 70(3), 213–224. doi: 10.1007/s00027-008-8074-5.

Pace M.L., Carpenter S.L., Cole J.J., Coloso J.J., Kitchell J.F., Hodgson J.R., Middelburg J.J., Preston N.D., Solomon C.T., Weidel B.C. **2007**
Does terrestrial organic carbon subsidize the planktonic food web in a clear-water lake. Limnology and Oceanography, 52(5), 2177–2189. doi: 10.4319/lo.2007.52.5.2177.

Talks

Healthscapes: A new web platform for global environmental health research. **2011**
American Society for Photogrammetry and Remote Sensing. Milwaukee, Wisconsin (USA).

Healthscapes: A web platform for integrating and analyzing health and environmental data across scales. **2011**
One Health Congress, Melbourne (Australia).

HealthScapes: A new web framework for studying the environmental determinants of global public health. **2010**
International Association for Ecology and Health (EcoHealth), London, London (UK).

EcoHealth service learning in Autlan, Mexico. **2009**
Global Health Symposium (GHS), Madison, WI (USA).

Healthscapes: A new tool for exploring the environmental determinants of infectious disease. **2009**
National Environmental Public Health Conference (NEPHC), Atlanta, GA (USA).

Terrestrial support of lakes across the landscape. **2008**
Ecological Society of America (ESA), Milwaukee, WI (USA).

Driving allochthony: The rain of carbon and airborne deposition on lakes. **2007**
Advancing the Science of Limnology and Oceanography (ASLO), Santa Fe, NM (USA).

Climate-driven changes in spring conditions: The influence of ice cover on spring zooplankton abundance. **2006**
Advancing the Science of Limnology and Oceanography (ASLO), Victoria, BC (Canada).

Grants,

Awards, and Contracts

Defense Threat Reduction Agency (PI) Rapid Disease Identification Tool	2013
Defense Threat Reduction Agency (Co-I) Biosurveillance Ecosystem	2013
Skoll Global Threats Fund (PI) Global Vulnerability Maps	2012
Vilas Travel Grant	2009
ASLO Student Grant	2007
Anna Grant Birge Award	2006
John Jefferson Davis Travel Award	2006
Ontario-Rhone-Alps Bursary	1999

Recent Service

EcoHealth Journal (Review Editor)	2013-2014
NYU Capstone (Mentor)	2013-2014

Guest Lectures

Rutgers School of Environmental and Biological Sciences	2014
EcoHealthNet Epidemiology and Outbreak Investigation Workshop	2012
NCAR/CDC Workshop on Climate and Health	2012
UW-Madison Population Health 803 - Monitoring Population Health	2011
EcoHealthNet Disease Mapping and Modeling Workshop	2011
UW-Madison Population Health 740 - Health Impact Assessment of Global Environmental Change	2010

Technical

Python	R	Javascript
Agile Project Management	Databases (NoSQL & SQL)	Geospatial Analysis
Network Analysis	Natural Language Processing	Machine Learning

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