

# NICHOLAS D. PRESTON

DIGITAL DISEASE ECOLOGIST

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## 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.

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## 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.

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## Recent experience

### Boston Children's Hospital Informatics Program (CHIP)

Research Fellow - HealthMap

2014-present

Research on digital disease detection and the drivers of disease emergence. Developing data services and analytics for disease biosurveillance.

### 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 diagnostic web platforms, I oversaw 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 combined 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.

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## 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)

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## 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/l0.2007.52.5.2177.
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## 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).
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<b>Grants, Awards, and Contracts</b>	Defense Threat Reduction Agency (PI) Rapid Disease Identification Tool	<b>2013</b>
	Defense Threat Reduction Agency (Co-I) Biosurveillance Ecosystem	<b>2013</b>
	Skoll Global Threats Fund (PI) Global Vulnerability Maps	<b>2012</b>
	Vilas Travel Grant	<b>2009</b>
	ASLO Student Grant	<b>2007</b>
	Anna Grant Birge Award	<b>2006</b>
	John Jefferson Davis Travel Award	<b>2006</b>
	Ontario-Rhone-Alps Bursary	<b>1999</b>

<b>Recent Service</b>	EcoHealth Journal (Review Editor)	<b>2013-2014</b>
	NYU Capstone (Mentor)	<b>2013-2014</b>

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

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