


Morgan E. Gorris

Los Alamos National Laboratory

Information Systems and Modeling Group ◻ Center for Nonlinear Studies

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EDUCATION

- Ph.D. Earth System Science, University of California, Irvine** Aug 2019
Dissertation: *Environmental infectious disease dynamics in relation to climate and climate change*
Thesis co-advisors: Dr. James Randerson, Dr. Charles Zender
Committee members: Dr. Kathleen Treseder
- M.S. Earth System Science, University of California, Irvine** Dec 2016
- B.S.E. Earth System Science and Engineering, University of Michigan** May 2014
Concentration in Meteorology, Minor in Mathematics

THESIS PROJECTS

- Oct 2014 - **The Effects of Climate and Climate Change on Infectious Diseases in the United States**
Aug 2019
Examine the relationships between climate and infectious disease dynamics in the U.S., including Valley fever and West Nile virus. I compiled the first Valley fever incidence database, created a climate threshold model of Valley fever endemicity, and modeled future projections of Valley fever in response to climate change. I am now exploring the relationships between climate and West Nile virus. I am building a statistical model to describe the current spatial extent and magnitude of the disease. My collaborators include the Washington State Department of Health, University of Utah, and Los Alamos National Laboratory.
- Feb 2016 - **Particulate Matter Air Quality Study** Borrego Springs, CA
Aug 2019
Assess the historical and present trends in particulate matter air quality in Borrego Springs, CA using satellite products, in-situ measurements, and dust transport modeling with the Weather Research and Forecasting model. The goal of this project is to identify dust source regions to mitigate local air quality concerns.

PROFESSIONAL EXPERIENCE

- Feb 2020 - **Los Alamos National Laboratory – Director’s Postdoc Fellow**
Current
Information Systems and Modeling Group and Center for Nonlinear Studies
Advisors: Dr. Carrie Manore and Dr. Sara Del Valle
- Sep 2019 - **University of California, Irvine – Research Specialist**
Nov 2019
Advisors: Dr. Charles Zender and Dr. James Randerson
Continuation of my thesis work on modeling the effects of climate on West Nile virus and the particulate matter air quality study in Borrego Springs, CA.
- Apr 2019 - **Subcontractor to Industrial Economics, Incorporated**
Sep 2019
Environmental Protection Agency Contract EP-D-14-031
Projections of Valley fever impacts in response to climate change under the EPA Climate Change Impacts and Risk Analysis (CIRA) framework, in collaboration with James Neumann (IEc), Patrick Kinney (Boston University), and Marcus Sarofim (EPA).
- Jun 2018 - **Los Alamos National Laboratory – Visiting Scientist**
Aug 2018
Theoretical Biology and Biophysics

Advisors: Dr. Carrie Manore and Dr. Chonggang Xu

Explored the spatial relationships between climate and West Nile virus incidence in collaboration with LANL as part of my dissertation.

The University of California, Irvine – Teaching Assistant

Mar 2016 - Jun 2016
Class: Earth System Science Laboratory and Field Methods, Department of Earth System Science
Professor: Dr. Alex Guenther

Earth System Science and Environmental Science upper division course (ESS 114) with 45 students. This course was an introduction to field methods that covered isotopic and chromatographic analysis, measuring microclimate, hydrology, trace-gas exchange, and plant growth.

Jan 2016 - Mar 2016
Class: Advanced Data Modeling, Department of Earth System Science
Professor: Dr. James Randerson

Earth System Science and Environmental Science upper division course (ESS 118) with 25 students. This course was an introduction to data analysis in Python. We covered general programming techniques, analyzing and plotting data, and worked with text files and netCDF files. I conducted the class recitation and substituted for lectures.

Sept 2015 - Dec 2015
Class: Introduction to Earth System Science, Department of Earth System Science
Lecturer: Dr. Julie Ferguson

General education course (ESS 1) with 400 students, targeted towards non-Earth System Science majors. We reviewed the geosphere, atmosphere, biosphere, hydrosphere, and connections between these components. I conducted three recitations with 130 students, held office hours, and led review sessions prior to exams.

Jun 2014 - Aug 2014
Naval Research Laboratory – Research Intern
Marine Meteorology Division

Created a series of statistical analysis scripts in Python to calculate the efficiency of a navigational forecasting and ship routing algorithm developed by the Navy. The main parameter analyzed was the fuel burn of the ship, while ensuring the ship stayed within its safety and time limitations.

Oct 2013 - May 2014
The University of Michigan – Undergraduate Research
Advisor: Dr. Gretchen Keppel-Aleks

Investigated global land-carbon dioxide dynamics, with a focus on boreal forests and other northern ecosystems. I created the boundaries of ecoregions to input in pulse-response functions of CO₂.

Jun 2013 - Aug 2013
Massachusetts Institute of Technology Lincoln Laboratory – Research Intern
Air Traffic Management Group

Analyzed the forecast accuracy for an algorithm that depicts arrival aircraft jet route availability based on convective weather. An emphasis was placed on forecast statistics and accuracy visuals in MATLAB.

May 2013
Texas Tech University – Undergraduate Field Study
Tornado Radar Research

Collected radar data on the formation, development, and dissipation of tornadoes. Field work included videography, photography, and tracking the storm's progress.

Jun 2012 - Aug 2012
NASA Ames Research Center – Research Intern
Aviation Weather Systems Division

Parsed the National Transportation Safety Board database of weather-related aircraft accidents to assess the greatest weather hazards to aviation in Alaska. Then I compiled appropriate weather products to implement in the development of a smart tablet application to address these weather hazards.

Sept 2011 - Apr 2012
Geophysical Flows in the Atmosphere and Ocean
Undergraduate Research Opportunities Program

Advisor: Dr. John Boyd

Created MATLAB animations of geophysical flows in the atmosphere and ocean such as baroclinic instabilities, vortices, Kelvin Helmholtz interactions, Rossby waves, and the Fujiwara effect.

PEER REVIEWED PUBLICATIONS

PUBLISHED

Gorris, M. E., Cat, L. A., Matlock, M., Ogunseitan, O. A., Treseder, K. K., Randerson, J. T., & Zender, C. S. (2020), Coccidioidomycosis (Valley fever) case data for the southwestern United States, *Open Health Data*, 7(1). <https://doi.org/10.5334/ohd.31>

Gorris, M. E., Treseder, K. K., Zender, C. S., & Randerson, J. T. (2019), Expansion of coccidioidomycosis endemic regions in response to climate change in the United States, *GeoHealth*, 3, <https://doi.org/10.1029/2019GH000209>.

Cat, L. A., **Gorris, M. E.**, Randerson, J. T., Riquelme, M., & Treseder, K. K. (2019), Crossing the Line: Human Disease and Climate Change Across Borders, *Journal of Environmental Health*, 81(8), 14-22.

Aburto-Oropeza, O., Johnson, A. F., Agha, M., Allen, E. B., Allen, M. F., **et al.** (2018), Harnessing cross-border resources to confront climate change, *Environmental Science and Policy*, 87, 128-132, <https://doi.org/10.1016/j.envsci.2018.01.001>

Gorris, M. E., Cat, L. A., Zender, C. S., Treseder, K. K., & Randerson, J. T. (2018), Coccidioidomycosis dynamics in relation to climate in the southwestern United States, *GeoHealth*, 2, 6-24, <https://doi.org/10.1002/2017GH000095>.

IN REVIEW

Gorris, M. E., Neumann, J. E., Kinney, P. L., Sheahan, M., Sarofim, M. C. (In Review, 2020), Economic valuation of coccidioidomycosis (Valley fever) projections in the United States in response to climate change. *Weather, Climate, and Society*.

Cat, L. A., **Gorris, M. E.**, J. Randerson, J. T., & Treseder, K. K. (In Review, 2019), Dispersal of pathogenic fungi in soil and air across the US Southwestern region, *Fungal Ecology*.

PRESENTATIONS (FIRST AUTHOR)

* INVITED

***Gorris, M. E.**, Manore, C. A., Xu, C., Treseder, K. K., Zender, C. S., & Randerson, J. T. (2019), *A migration of West Nile virus in the United States in response to climate change*, Invited eLightning talk at the American Geophysical Union Fall Meeting. San Francisco, CA. Dec 9.

***Gorris, M. E.**, Treseder, K. K., Zender, C. S., & Randerson, J. T. (2019), *The expansion of Valley fever endemic regions in response to climate change*, Invited webinar for the Collaborative on Health and the Environment. Dec 5. <https://www.healthandenvironment.org/webinars/96503>

***Gorris, M. E.**, Treseder, K. K., Zender, C. S., & Randerson, J. T. (2019), *How climate conditions impact Valley fever disease dynamics*, Invited talk at the Anivive annual corporate retreat. Los Angeles, CA. Nov 11.

***Gorris, M. E.**, Treseder, K. K., Zender, C. S., & Randerson, J. T. (2019), *The future of Valley fever in response to our changing climate*, Invited talk at the 2019 UC Valley Fever Summit at University of California, Merced. Merced, CA. Oct 25.

***Gorris, M. E.**, Zender, C. S., Randerson, J. T., Cat, L. A., & Treseder, K. K. (2019), *Using climate and environmental data to understand Valley fever disease dynamics*, Invited department seminar in Environmental Sciences at University of California, Riverside. Riverside, CA. May 17.

- Gorris, M. E.,** Salamone, A., Clifford, W., Zender, C. S., Treseder, K. K., & Randerson, J. T. (2019), *Environmental niche modeling of Coccidioides ssp. in Washington State*, oral presentation at the 63rd Coccidioidomycosis Study Group Meeting, Sacramento, CA. Apr 5.
- Gorris, M. E.,** Treseder, K. K., Zender, C. S., Clifford, W., Salamone, A., Oltean, H. N., & Randerson, J. T. (2019), *Coccidioidomycosis Climate Niche Model for Predicting Current and Future Endemic Regions in the United States through the 21st Century and Applications to Environmental Soil Sampling*, oral presentation at the American Meteorological Society 99th Annual Meeting. Phoenix, AZ. Jan 9.
- Gorris, M. E.,** Zender, C. S., Randerson, J. T., Goodsman, D. W., Xu, C., & Manore, C. A. (2018), *Expanding a seasonal forecast of US West Nile virus for 21st century disease projections*, oral presentation at the American Geophysical Union Fall Meeting. Washington, DC. Dec 10.
- Gorris, M. E.,** Zender, C. S., Randerson, J. T., Goodsman, D. W., Xu, C., & Manore, C. A. (2018), *Expanding a seasonal forecast of US West Nile virus for 21st century disease projections*, poster presentation at the 75th Los Alamos National Laboratory Student Symposium. Los Alamos, NM. Aug 1.
- Gorris, M. E.,** Treseder, K. K., Zender, C. S., & Randerson, J. T. (2018), *The effects of climate change on coccidioidomycosis endemic regions in the United States*, oral presentation at the 62nd Annual Coccidioidomycosis Study Group Meeting, Northern Arizona University. Flagstaff, AZ. Apr 14.
- Gorris, M. E. & Zender, C. S.** (2018), *Evaluating Particulate Matter Air Quality in Borrego Springs. Year 2: An overview and cases studies of particulate matter air quality in Borrego Springs*, Borrego Springs, CA. Feb 18.
- Gorris, M. E.,** Hoffman, F. M., Treseder, K. K., Zender, C. S., & Randerson, J. T. (2017), *The Influence of Current and Future Climate on the Spatial Distribution of Coccidioidomycosis in the Southwestern United States*, oral presentation at the American Geophysical Union Fall Meeting, New Orleans, LA. Dec 12.
- Gorris, M. E.,** Cat, L. A., Zender, C. S., Treseder, K. K., & Randerson, J. T. (2017), *The Effects of Climate on Valley Fever Incidence in the Southwestern United States*, poster presentation at the 7th International Coccidioidomycosis Symposium, Stanford University, Stanford, CA. Aug 11.
- Gorris, M. E.** (2017), *Valley Fever: More than just Dust in the Wind*, oral presentation at Associated Graduate Student Symposium, UC Irvine, Irvine, CA. Apr 21.
- Gorris, M. E.,** Parajuli S. P., & Zender, C. S. (2017), *Evaluating Particulate Matter Air Quality in Borrego Springs. Year 1: Characterization and evaluation of historical air quality*, Borrego Springs, CA. Feb 26.
- Gorris, M. E.,** Cat, L. A., Treseder, K. K., Zender, C. S., & Randerson, J. T. (2017), *The Spatiotemporal Relationship between Climate and Valley Fever in the Southwestern United States*, oral presentation at the American Meteorological Society 97th Annual Meeting, Seattle, WA. Jan 23.
- Gorris, M. E. & Cat, L. A.** (2016), *Disease in the Desert: Ecology, Epidemiology and Environmental Modeling of Valley Fever*, invited talk at the 2016 Colorado Desert Natural History Research Symposium, Nov 4.
- Gorris, M. E.,** Cat, L. A., Randerson, J. T., Zender, C. S., & Treseder, K. K. (2016), *Climate Drivers and Coccidioidomycosis Incidence at the Regional Scale*, poster presentation at the 60th Annual Coccidioidomycosis Study Group Meeting, UCSF Fresno. Fresno, CA. Apr 9.
- Gorris, M. E. & Cat, L. A.** (2015), *Out of the Valley: A multi-disciplinary approach to forecasting valley fever dispersal in the U.S. Southwest*, invited talk and poster presentation at University of California, Irvine's 1st Annual Data Science Initiative Summer Symposium. Irvine, CA. Sept 17.

Gorris, M. E. (2014), *Analysis of Convective Weather Impact Prediction on Arrival Routes in the New York Airspace*, Abstract S30, poster presentation at the American Meteorological Society 13th Annual Student Conference, Atlanta, GA, Feb 2–6.

Gorris, M. E. & Boyd J. P. (2012), *Geophysical Flows in the Atmosphere and Ocean*, poster presentation at the University of Michigan Undergraduate Research Opportunities Program Spring Symposium. Ann Arbor, MI. Apr 18.

AWARDS AND HONORS

Los Alamos National Laboratory Director’s Postdoc Fellowship Jan 2020

Los Alamos National Laboratory Center for Nonlinear Studies Postdoctoral Fellowship Jun 2019

UC Irvine Earth System Science Faculty Endowed Fellowship Jun 2019

Outstanding Student Presentation Award: American Geophysical Union Jan 2019
GeoHealth Conference

Best Student Oral Presentation: American Meteorological Society Feb 2017
7th Conference on Environment and Health

National Defense Science and Engineering Graduate Fellowship Sept 2016 – Sept 2019
American Society of Engineering Education

Borrego Valley Endowment Fund Support Feb 2016 – Feb 2019

UC Irvine Physical Sciences Travel Grant (\$250; \$300) Dec 2016; Mar 2019

Honorable Mention, National Science Foundation Graduate Research Fellowship Program Apr 2016

Coccidioidomycosis Study Group Travel Grant (\$500) Apr 2016

Data Science Initiative Fellowship Jun 2015 – Sept 2015

Jenkins Family Graduate Fellowship Oct 2014 – Dec 2014

Outstanding Poster Award Apr 2012
University of Michigan Undergraduate Research Opportunities Program Spring Symposium

Naval Weather Service Association Scholarship Sept 2010

POPULAR PRESS

Science Friday (Apr 24, 2020), *A Fever in the dust*. Author: L. Young and K. Klein.
<https://methods.sciencefriday.com/valley-fever>

ASBMB Today (Apr 7, 2020), *Stopping the devil in the dust*. Author: J. Arnst. <https://www.asbmb.org/asbmb-today/science/040720/stopping-the-devil-in-the-dust>

California Healthline (Dec 16, 2019), *Valley fever cases climb in California’s Central Valley — and beyond*. Author: B. Ostrov and H. Rowan. <https://californiahealthline.org/multimedia/valley-fever-cases-climb-in-californias-central-valley-and-beyond/>

Cronkite News Arizona PBS (Nov 5, 2019), *As valley fever education increases, so does the infection's reach*. Author: G. Schmidt. <https://cronkitenews.azpbs.org/2019/11/05/valley-fever-education/>

High Country News (Oct 16, 2019), *Diseases are spreading with climate change. Panic doesn't have to*. Author: H. Santoro. <https://www.hcn.org/articles/public-health-diseases-are-spreading-with-climate-change-panic-doesnt-have-to>

Valley Public Radio, NPR for Central California (Oct 1, 2019), *Valley fever could spread with climate change, Study Warns*. Author: K. Klein. <https://www.kvpr.org/post/valley-fever-could-spread-climate-change-study-warns>

Insider (Sep 25, 2019), *A deadly fungal infection that spreads through dust is on the rise in the southwestern US, and scientists warn the north may be next*. Author: G. Landsverk. <https://www.insider.com/valley-fever-deadly-fungal-infection-spreading-north-climate-change-2019-9>

Yahoo News Video (Sep 25, 2019), *A deadly fungal infection that spreads through dust is on the rise in the Southwestern U.S.* <https://news.yahoo.com/deadly-fungal-infection-spreads-dust-195130345.html>

Great Falls Tribune (Sep 23, 2019), *Potentially fatal desert lung disease could reach Montana by century's end*. Author: David Murray. <https://www.greatfallstribune.com/story/news/2019/09/23/climate-change-could-bring-valley-fever-montana-centurys-end/2422190001/>

Futurity (Sep 20, 2019), *Climate change could push fungus infection from dirt north*. Author: B. Bell. <https://www.futurity.org/valley-fever-climate-change-2165882/>

Edgy Labs (Sep 19, 2019), *Valley fever range to double in size due to climate change*. Author: Z. Guedim. <https://edgy.app/valley-fever-range-to-double-in-size-due-to-climate-change?pfrom=science&fp=a7>

National Science Foundation (Sep 19, 2019), *Scientists project northward expansion of Valley fever by end of 21st century*. https://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=299221

Truthout (Sep 18, 2019), *Climate change expected to accelerate spread of something-fatal fungal infection*. Author: B. Bell. <https://truthout.org/articles/climate-change-expected-to-accelerate-spread-of-sometimes-fatal-fungal-infection/>

Mountain West News Bureau, KUNC (Sep 18, 2019), *Climate change may bring Valley fever to more of the Mountain West*. <https://www.kunc.org/post/climate-change-may-bring-valley-fever-more-mountain-west#stream/0>. Also a 1-minute radio segment broadcast on NPR stations across the Mountain West.

News Medical Life Science (Sep 17, 2019), *Range of Valley fever expected to increase substantially, say UCI scientists*. <https://www.news-medical.net/news/20190917/Range-of-Valley-fever-expected-to-increase-substantially-say-UCI-scientists.aspx>

Popular Science (Sep 17, 2019), *This deadly fungal disease could use climate change to mobilize*. Author: N. Wetsman. <https://www.popsci.com/climate-change-valley-fever-fungus-weather/>

OC Weekly (Sep 17, 2019), *Valley fever still coming soon because climate change*. Author: A. Pignataro. <https://ocweekly.com/valley-fever-still-coming-soon-because-climate-change/>

YubeNet.com (Sep 17, 2019), *Climate change expected to accelerate spread of sometimes-fatal fungal infection: valley fever*. <https://yubanet.com/scitech/climate-change-expected-to-accelerate-spread-of-sometimes-fatal-fungal-infection-valley-fever/>

AGU100 American Geophysical Union (Sep 16, 2019), *Climate change expected to accelerate spread of sometimes-fatal fungal infection*. <https://news.agu.org/press-release/climate-change-expected-to-accelerate-spread-of-sometimes-fatal-fungal-infection/>

Environmental News Network (Sep 16, 2019), *Climate change expected to accelerate spread of sometimes-fatal fungal infection*. <https://www.enn.com/articles/59737-climate-change-expected-to-accelerate-spread-of-sometimes-fatal-fungal-infection>

Science Daily (Sep 16, 2019), *Climate change expected to accelerate spread of sometimes-fatal fungal infection*. <https://www.sciencedaily.com/releases/2019/09/190916114034.htm>

Medical Xpress (Sep 16, 2019), *Scientists project northward expansion of Valley fever by end of 21st century*. <https://medicalxpress.com/news/2019-09-scientists-northward-expansion-valley-fever.html>

UCI News (Sep 16, 2019), *UCI Scientists project northward expansion of Valley fever by end of 21st century*. <https://news.uci.edu/2019/09/16/uci-scientists-project-northward-expansion-of-valley-fever-by-end-of-21st-century/>

BuzzFeed News (Oct 18, 2018), *An incurable disease is on the rise in California, and scientists say climate change could cause it to spread to much of the western US*. Author: S. K. Baer. <https://www.buzzfeednews.com/article/skbaer/valley-fever-fungal-infection-spreading-climate-change>

PROFESSIONAL AFFILIATIONS

American Meteorological Society Dec 2011 – Current
President and Co-founder of zotCAMS: Student Chapter of AMS at UC Irvine (Apr 2017 – Jun 2019)
Aviation, Range, and Aerospace Meteorology Student Committee Member (Jan 2015 – Jan 2019)
University of Michigan Student Chapter Executive Board (Sept 2013 – May 2014)

American Geophysical Union Jul 2017 – Current
Early Career Scientist Co-chair for GeoHealth Meetings Committee (Jan 2019 – Current)
Session chair: “Climate Influences on Infectious Disease Dynamics and the Potential for Transnational Outbreaks Posters” (Dec 2018)

American Institute of Aeronautics and Astronautics Sept 2012 – May 2014

EXTRA CURRICULAR ACTIVITIES

Journal Referee: *Ecohealth*

Undergraduate Students

Patrick Mara, UC Irvine, BS Earth System Science, Graduated June 2019 Feb 2018 – Jun 2019

zotCAMS: Student Chapter of the American Meteorological Society at UC Irvine Apr 2017 – Aug 2019

President and Co-founder

UC Irvine Anteater Awards Best New Student Organization (2017 – 2018)

AMS Student Chapter of the Year Honor Roll (2017 – 2018)

AMS Annual Meeting Best Local Student Chapter Poster (Jan 2019)

UC Irvine Student Organization of the Month (Apr 2018)

CLEAN (Climate, Literacy Empowerment And iNquiry) Oct 2014 – Aug 2019
Elementary School Outreach – Student Member

UC Irvine Physical Sciences Student Mentor Oct 2016 – Aug 2019

