

# CHRISTOPHER J. DUGAW

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CONTACT INFORMATION	Department of Mathematics Humboldt State University 1 Harpst St. Arcata, CA 95521-8299	<i>Voice:</i> (707) 826-4251 <i>Fax:</i> (707) 826-3140 <i>E-mail:</i> <a href="mailto:dugaw@humboldt.edu">dugaw@humboldt.edu</a> <a href="http://users.humboldt.edu/dugaw/">http://users.humboldt.edu/dugaw/</a>
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RESEARCH  
INTERESTS      Mathematical and statistical modeling in ecology and fire science.

EDUCATION      Doctor of Philosophy, **University of California, Davis**, Applied Mathematics  
September 2003.  
Dissertation Title: *Dynamics of a Soil-Dwelling Parasite and its Insect Host*  
Advisor: Alan Hastings

Master of Science, **University of Washington**, Applied Mathematics  
August 1999.

Bachelor of Science, **Western Washington University**, Biology/Mathematics  
December, 1997 (Magna Cum Laude).

ACADEMIC  
POSITIONS      Full Professor      August 2015 - present  
**Humboldt State University. Mathematics Department.**

Associate Professor      August 2010 - August 2015  
**Humboldt State University. Mathematics Department.**

Assistant Professor      August 2005 - August 2010  
**Humboldt State University. Mathematics Department.**

Faculty Fellow      July 2003 - July 2005  
**University of California, Davis. Mathematics Department.**  
Taught upper and lower division mathematics courses and conducted research.

Teaching Assistant      September 2001 - April 2002  
**University of California, Davis. Mathematics Department.**  
Led small discussion sections and graded exams for calculus, linear algebra, and upper-division courses.

Associate Instructor      July - August 2001  
**University of California, Davis. Mathematics Department.**  
Taught a small calculus course.

Research Assistant September 1999 - June 2001  
**University of California, Davis. Institute of Theoretical Dynamics.**  
Participated in a multi-disciplinary research group focusing on the role of non-linear dynamics in various areas of biology.

Math Tutor July - August 1999  
**Garfield High School. Seattle, Washington.**  
Tutored an ethnically diverse group of students in basic algebra.

Teaching Assistant September 1998 - June 1999  
**University of Washington. Mathematics Department.**  
Led small discussion sections, and graded exams for calculus courses.

COURSES  
TAUGHT

- Model Fitting
- Data Collection & Analysis
- Graduate Mathematical Modeling Practicum
- Probability and Mathematical Statistics
- Graduate Stochastic Processes
- Mathematical Computing
- Graduate Dynamical Systems
- Probability Theory
- Mathematical Modeling
- Partial Differential Equations
- Ordinary Differential Equations
- Special Topic Course in Mathematical Ecology
- Math Modeling Graduate Seminar
- Elements of Linear Algebra
- Calculus I & II
- Short Calculus II
- Calculus for the Life Sciences I & II

PUBLICATIONS Kreye, J. K., J. M. Varner, and C. J. Dugaw. 2014 *Spatial and temporal variability of forest floor duff characteristics in long-unburned Pinus palustris forests*. **Canadian Journal of Forest Research**, 44(12), 1477-1486.

\*Kreye J. K., J. M. Varner, C. J. Dugaw, J. Cao, J. Szecsei, and E. Engber. 2013 *Pine cones facilitate ignition of forest floor duff*. **Canadian Journal of Forest Research**, 43(5), 512-516.

Engber, E. A., J. M. Varner, **C. J. Dugaw**, L. Quinn-Davidson, and J. K. Hiers. 2013 *Utility of an instantaneous moisture meter for duff moisture prediction in long-unburned longleaf pine forests*, **Southern Journal of Applied Forestry**, 37(1), 13-17.

\*Perryman, H. A., **C. J. Dugaw**, J. M. Varner, and D. L. Johnson. 2012 *A cellular automata model to link surface fires to firebrand lift-off and dispersal*. **International Journal of Wildland Fire**, 22(4), 428-439.

\*Watts, C. M. J. Cao, C. Panza, **C. J. Dugaw**, et al. 2012 *Modeling the effects of predator exclosures on a Western Snowy Plover population*. **Natural Resource Modeling**, 25(3), 529-547.

**Dugaw, C. J.** 2012 *Birth-death Models in Encyclopedia of Theoretical Ecology* (A. Hastings and L. Gross, eds.) University of California Press: Berkeley.

**Dugaw, C. J.**, K. Ram. 2011 *Individual Heterogeneity in Mortality Mediates Long-term Persistence of a Seasonal Microparasite*, **Oecologia**, 166(2), 317-325.

**Dugaw, C. J.**, R. Honeyfield, C. M. Taylor, and D. W. Verzi. 2009 *Modeling activity rhythms in fiddler crabs*. **Chronobiology International**, 26(7), 1355-1368.

Melbourne, B. A., H. V. Cornell, K. F. Davies, **C. J. Dugaw**, et. al. 2007 *Invasion in a heterogeneous world: resistance, coexistence or hostile takeover?* **Ecology Letters**, 10(1), 77-94.

Priesser, E. L., **C. J. Dugaw**, D. R. Strong, and B. Dennis. 2006. *Plant facilitation of a below ground predator*, **Ecology**, 87(5), 1116-1123.

**Dugaw, C. J.**, A. Hastings, E. L. Priesser, and D. R. Strong. 2005. *Windows of persistence in seasonal microparasite-host systems*. **Theoretical Population Biology**, 68, 267-276.

Priesser E. L., **C. J. Dugaw**, B. Dennis, and D. R. Strong. 2005. *Long-term survival of the entomopathogenic nematode *Heterorhabditis marelatus**. **Environmental Entomology**, 34(6), 1501-1506.

Hastings A., K. Cuddington, K. Davies, **C. J. Dugaw**, et. al. 2005. *The spatial spread of invasions: new developments in theory and evidence*. **Ecology Letters**, 8, 91-101.

**Dugaw, C. J.**, A. Hastings, E. L. Priesser, and D. R. Strong. 2003. *Seasonally limited host supply generates microparasite population cycles*. **Bulletin of Mathematical Biology**, 66, 583-594.

Haefner, J. W., and **C. J. Dugaw**. 2000. *Individual based models solved using fast Fourier transforms*. **Ecological Modelling**, 125, 159 - 172.

**Note:** A \* indicates research done jointly with a student.

CONFERENCE PRESENTATIONS **C. J. Dugaw**, *Smoldering Combustion of Forest Duff*, 4<sup>th</sup> **Fire Behavior and Fuels Conference**, 2013.

\*Watts, C. M., J. Cao, and **C. J. Dugaw**. Student Poster, *Modeling the Effects of Predator Exclosure on the Western Snowy Plover*, **Joint Mathematics Meetings**, 2011.

\*Perryman, H. A., **C. J. Dugaw**, J. M. Varner, and D. L. Johnson. Poster, *A mathematical model of a surface fire incorporating spot fire ignition and propagation*, 4<sup>th</sup> **International Fire Ecology & Management Congress: Fire as a Global Process**, 2009.

**Dugaw, C. J.** *Radioactive  $\pi$ ?*, Contributed Talk, **Mathematical Association of America, Mathfest**, 2009.

\***Dugaw, C. J.** and E. A. Hobelmann. *Models of road-facilitated biological invasions*, Contributed Talk, **Annual Meeting of the Society for Mathematical Biology Joint with Japan Association of Mathematical Biology**, 2007.

Brown, S. L. and **C. J. Dugaw**. *An approach to population and biological modeling for pre- and post-calculus students*, Minicourse, **Annual Meeting of the Pacific Northwest Section of the MAA**, 2007.

\*Marvit, S. and **C. J. Dugaw**. *Stabilizing the population dynamics of a host-parasite system by host immigration*, Student Talk, **Allegheny Mountain Section of MAA**, 2007.

\*Walker, S. M., G. B. Crawford, **C. J. Dugaw**, C. Fenton, and F. J. Shaughnessy. *Factors Affecting Turbidity in Humboldt Bay*, Poster, **California Estuarine Research Society Annual Meeting**, 2007.

**Dugaw, C. J.** *What epidemic models tell us about vaccination policies*. Invited Talk, **State of Jefferson Mathematics Congress**, 2006.

**Dugaw, C. J.**, E. L. Priesser, and D. R. Strong. *Consequences of heterogeneous survival rates of an entomopathogenic nematode*. Contributed Talk, **World Conference on Natural Resource Modeling**, 2005.

**Dugaw, C. J.**, A. Hastings, and D. R. Strong. *A mechanistic model of entomopathogenic nematodes and their hosts*. Poster, **Annual Meeting of the Society for Mathematical Biology Joint with Japan Association of Mathematical Biology**, 2001.

**Note:** A \* indicates research done jointly with a student.

MASTERS  
STUDENT  
THESES

Benjamin Miltz, 2015, *Analysis and extension of the coalescing colony model of invasive species spread*, **Humboldt State University**, Environmental Systems: Mathematical Modeling Program.

Kathleen Harar, 2014, *A mathematical model of the spread of Batrachochytrium dendrobatidis in the Cascades frog (Rana cascadae)*, **Humboldt State University**, Environmental Systems: Mathematical Modeling Program.

Sydney Chandler, 2014, *Assessing African wild dog (Lycaon pictus) survival and impact on private lands: a non-spatial individual based simulation model*, **Humboldt State University**, Environmental Systems: Mathematical Modeling Program.

Drew O'Kane, 2014, *Measuring the effects of road mediated long-range transport on infection risk for Port Orford cedar*. **Humboldt State University**, Environmental Systems: Mathematical Modeling Program.

Holland Heese, 2014, *Modeling fire-induced tree mortality in longleaf pine using spatial data*, Environmental Systems: Mathematical Modeling Program.

William Gill, 2012, *Analysis of field data and spatial methods for the parametrization of a spatial duff consumption model*, **Humboldt State University**, Environmental Systems: Mathematical Modeling Program.

Anna Morgante, 2011, *Incorporating spotting into a simple fire perimeter model*.,**Humboldt State University**, Environmental Systems: Mathematical Modeling Program.

Kyle Falbo, 2011, *An individual based larval dispersion model for the Hawaiian hawksbill sea turtle in the Hawaiian archipelago.*, **Humboldt State University**, Environmental Systems: Mathematical Modeling Program.

Amber Buntin, 2010, *A tritrophic model of the bush lupine, the ghost moth caterpillar and its nematode parasite*, **Humboldt State University**, Environmental Systems: Mathematical Modeling Program.

Holly Perryman, 2009, *A mathematical model of spot fires and their management implications*, **Humboldt State University**, Environmental Systems: Mathematical Modeling Program.

Steven Walker, 2009, *Using transfer functions to explain turbidity in Humboldt Bay, California*, **Humboldt State University**, Environmental Systems: Mathematical Modeling Program.

Thé Thé Kyaw, 2008, *Modeling the effect of marine snow fragmentation by Euphausia pacifica on carbon flux*, **Humboldt State University**, Environmental Systems: Mathematical Modeling Program.

Daniele Rosa, 2008, *Implementing a dynamic allocation scheme for the Lund-Potsdam-Jena dynamic global vegetation model*, **Humboldt State University**, Environmental Systems: Mathematical Modeling Program.

Emily Hobelmann, 2007, *Plant invasion models - road effects*, **Humboldt State University**, Environmental Systems: Mathematical Modeling Program.

Chris Panza, 2007, *A model to assess the use of nest exclosures for local population recovery of the western snowy plover (*Charadrius alexandrinus nivosus*)*, **Humboldt State University**, Environmental Systems: Mathematical Modeling Program.

#### GRANTS

- Joint Fire Science Program: Development and Validation of a Moisture-Dependent Forest Floor Fire Behavior Model, PI, 2010-2013 (\$292,000)
- NSF REU Site: Role Models in Science, PI, 2010 (\$100,000)

#### FELLOWSHIPS & AWARDS

- University of California Davis Dissertation Year Fellowship, 2002-2003.
- NSF Training Grant in Non-linear Dynamics and Biology Trainee, 1999-2002.
- Achievement Awards for College Scientists Fellowship, 1998-1999.
- Dr. Milton Smith Teaching Scholarship, 1995.

#### ACADEMIC SERVICE

- Humboldt State University Sponsored Programs Board of Directors, 2014-present.
- Graduate Program Committee, HSU Math Dept., 2005-present.
- Mathematics Department Personnel Committee, (chair 2013-14) 2010-present.
- Mathematics Department Curriculum Committee, 2007-2011, 2013-present.
- Lamberson Lecture Series Committee, 2009-present.
- Environmental Systems graduate program coordinator, 2008-present.
- Environmental Systems graduate program, Mathematical Modeling option coordinator, 2007-2008, 2014-present.
- Humboldt State University Statistics Committee, 2011-2014.
- Mathematics and Computer Science Administrative Support Coordinator Hiring Committee, 2011.
- Dean of Research and Sponsored Programs Foundation Hiring Committee, 2011.
- Mathematics Department Scholarship Committee, 2010-2011.
- Moodle Support Specialist Hiring Committee, 2010.
- Technology Committee, HSU Math Dept., 2005-2011.
- Co-organizer of the North Coast Student Research Conference, 2008-2009.
- University Classroom Priority Scheduling Committee, HSU, 2007 - 2009.
- Judge for North Coast Regional Graduate conference, 2007.
- Ad hoc committee to assess students' ability communicate about mathematics, HSU Math Dept., 2006.
- Faculty Mentor for Research Experience for Undergraduates at HSU, 2006, 2009.
- Referee for *Ecological Modelling*, *Ecology*, *Mathematical Biosciences*, *Theoretical*

*Population Biology, Journal of Biological Dynamics, Environmetrics* and *Journal of Mathematical Biology*.

- Member of the MAA and the Society for Mathematical Biology.

COMMUNITY  
SERVICE

- Big Brothers Big Sisters of the North Coast, 2010-2011.
- Humboldt County Science Fair Judge, 2006, 2007, and 2009.
- Volunteer for Make-a-Wish Foundation, 2005-2006.
- Volunteer for Yolo County SPCA, 1999-2004.

COMPUTER  
SKILLS

C/C++, Matlab, Mathematica, SAS, **R**, Linux,  $\text{\LaTeX}$ , HTML, and TI graphing calculators.

PERSONAL  
INTERESTS

Soccer, mountain biking, trail running, rock climbing, hiking, cross-country skiing, snowshoeing, animal welfare, fair trade, and environmental conservation.