GABRIEL GELLNER

September 2018 – Curriculum Vitae

UNIVERSITY OF GUELPH
DEPT. OF INTEGRATIVE BIOLOGY
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RESEARCH INTERESTS

food webs, ecosystem function, population ecology, theoretical ecology, computational biology, biodiversity, conservation, disease ecology, fisheries and global change

EDUCATION & APPOINTMENTS

University of Guelph, *Integrative Biology*, September 2018 – present.
Postdoctoral Researcher

NWRC National Wildlife Disease Program, *USDA*, 2016 – 2018.
Affiliate Researcher (Pepin Lab)

Colorado State University, *Biology*, 2016 – 2018.
Postdoctoral Researcher (Webb Lab)

University of California Davis, *Environmental Science and Policy*, 2014 – 2016.
Postdoctoral Researcher (Hastings Lab)

University of Guelph, Ph.D. *Integrative Biology*, 2014.
Thesis: *The Nature of Ecological Stability: Integrating Theory from Modules to Whole Food Webs.* Advisor: Kevin McCann

University of Guelph, M.Sc. *Zoology*, 2010.
Thesis: *The Stability of Omnivory: A Geometrical Reconciliation*.
Advisor: Kevin McCann

McGill University, B.A. *Mathematics* and *Economics*, 2005.
Double Majors. Dean's Honor List (top 10% of graduating class).

FUNDING

Co-PI with Dr. Colleen Webb (PI), United States Department of Agriculture and the National Wildlife Research Center: 2017-2018, $50,000

Travel grants (university and departmental) to present research at national and international conferences: 2012-2018, $9,000

Grant to develop interactive teaching materials for undergraduate ecology course, University of Guelph, Department of Integrative Biology: 2012, $1,000

PUBLICATIONS

JOURNAL ARTICLES (PEER REVIEW)

Hastings, Abbott, Cuddington, Francis, **Gellner**, Lai, Morozov, Petrovskii, Scranton & Zeeman (2018). Transient phenomena in ecology. *Science*. 361

Kadoya, **Gellner** & Mccann (2018). Potential oscillators and keystone modules in food webs. *Ecology letters*, 21(9). **Recommended by Faculty of 1000**

McCauley*, **Gellner***, Martinez, Williams, Sandin, Micheli, Mumby & McCann (2018). On the prevalence and dynamics of inverted trophic pyramids and otherwise top-heavy communities. *Ecology Letters.* (*Authors did equal work)

Jarvis, McCann, Tunney, **Gellner** & Fryxell (2016). Early Warning Indicators Detect Catastrophic Effects of Experimental Warming. *Ecology and Evolution*.

Gellner, McCann & Hastings (2016). The Duality of Stability: Towards a Stochastic Theory of Species Interactions. *Theoretical Ecology*. 1-9.

Gellner & McCann (2016). On the Consistent Role of Weak and Strong Interactions in Consumptive Food Webs. *Nature Communications*. 7:1180.

McCann, **Gellner**, McMeans, Deenik, Holtgrieve, Rooney, Hannah, Cooperman & Nam (2015). Food Webs and the Sustainability of Indiscriminate Fisheries. *Canadian Journal of Fisheries and Aquatic Sciences.* 73(4):656-665.

MacDougal, McCann, **Gellner** & Turkington (2013). Diversity loss with persistent human disturbance increases vulnerability to ecosystem collapse. *Nature.* 494:86-89. **Recommended by Faculty of 1000**

Gellner & McCann (2012). Reconciling the Omnivory-Stability Debate. *The American Naturalist.* 179(1):22-37. **Recommended by Faculty of 1000**

Rooney, McCann, **Gellner** & Moore (2006). Structural asymmetry and the stability of diverse food webs. *Nature.* 442:265-269. **Recommended by Faculty of 1000**

BOOK CHAPTERS

McCann & **Gellner** (2012). "Food Chains and Food Web Modules" In *Encyclopedia of Theoretical Ecology*. Hastings & Gross (Eds.) University of California Press.

MANUSCRIPTS IN REVIEW

Gellner & McCann "Conditions for Quasi-Sign-Stability in Food Web Models" *Theoretical Ecology*

Donohue, Coscieme, **Gellner**, Yang, Costanza & McCann "Resource diversity, fossil fuels and the stability of economic networks" *Nature Communications*

PRESENTATIONS

Gellner*, Webb & Pepin. *Ecological Society of America* Annual Meeting: "The role of spatial coupling in the outbreak of avian influenza" Portland, OR (August 2017) Oral presentation.

Gellner*, Webb & Pepin. *United States Department of Agriculture:* "Predicting the spatial spread of AI among commercial farms" Fort Collins, CO (April 2017) Invited oral presentation.

Gellner* & Hastings. *Society for Mathematical Biology* Annual Meeting: "Decoupling the Stability of Food Web Modules using Implicit Lags and Energy Flux" Atlanta, GA (June 2015) Oral presentation.

Gellner*, McCann & Hastings. *Ecological Society of America* Annual Meeting: "Understanding the role of intermediate time scales on the stability of classical food web modules" Sacramento, CA (August 2014) Invited oral presentation for special session on time scales in ecology.

Gellner* & McCann. *Food Webs Symposium*, "Scaling theory from food web modules to whole food webs" Giessen, Germany (November 2013) Invited oral presentation (sole student paper selected for inclusion in the decadal conference).

Gellner* & McCann. *Ecological Society of America* Annual Meeting: "Deconstructing Complexity: Towards a Theory of Whole Food Webs" Minneapolis, MN (August 2013) Oral presentation.

Gellner* & McCann. *Canadian Society for Ecology and Evolution* Annual Meeting: "The Geometry of Ecological Stability" Vancouver, BC (May 2012) Oral presentation.

*presenting author

PROFESSIONAL EXPERIENCE

Modeling and Statistical Analysis, *Conservation International* project on indiscriminate fisheries in Cambodia's Tonlé Sap, with Dr. Kevin McCann (PI), University of Guelph. Built data pipelines to process fisheries and life history data from the Tonlé Sap. Tools continue to be used by large interdisciplinary research groups inside and outside of Cambodia. 2013.

Contract Research Consultant, Developed software solutions for automated processing of photographic movement data from an empirical lamprey migration study for Dr. Rob McLaughlin's research lab, University of Guelph. 2011.

Lead Field Researcher, Feral Pig Study with Dr. Kevin McCann (PI), University of Guelph, worked in conjunction with Florida State Parks to collect isotope data of pig populations which couple inland and costal ecosystems. 2010-2011.

Field Assistant, Dr. Colette Ward (now University of Zurich, Evolutionary Biology and Environmental Studies), Conducted summer-long coastal assessment in Florida gulf region affected by Deepwater Horizon oil spill. Core sediment, water, and fish samples collected and processed. 2010-2011.

Field Assistant, Dr. Alexander Tewfik (now Glover's Reef Research Station, Wildlife Conservation Society, Belize), Beach ecology data collection in Florida. Collected spatial and isotope data for ghost and mole crabs and their food sources. 2010-2011.

Contract Research Consultant, Developed custom tools for processing National Oceanic and Atmospheric Administration (NOAA) weather data for a research lab of Dr. Lauren Chapman, McGill University, as part of a study of African plains biodiversity. 2009.

Researcher, University of Guelph, *Decision Analysis and Adaptive Management* (DAAM) working group concerning fisheries management of the Great Lakes. Built and designed interactive tools for statistical analysis used by stakeholders, including the Chippewas of Nawash First Nation, and the Ontario Commercial Fisheries Association. 2005-2007.

Field Research Assistant, Dr. Kevin McCann and Dr. Neil Rooney, University of Guelph, Algonquin Park Lakes, Ontario, Canada. Summer field seasons netting lake trout in lakes of varying sizes and connectance for isotopic food web study. 2005-2006.

TEACHING EXPERIENCE

COURSE INSTRUCTOR

- Energetic Approach to Food Webs (graduate course, co-taught)
  International Center for Theoretical Physics (ICTP) *South American Institute for Fundamental Research* (SAIFR), Sao Paulo, Brazil. 2012.
  Student evaluations of course lectures were very strong. (9.2/10 rating: n=19)

STUDENT ADVISING

University of California, Davis (graduate advising w/ Professor Hastings)

- Kaela Vogel, Ph.D. student, *Environmental Science and Policy* (2016)
  Project collaboration in development of scientific software on the role of pseudospectral methods in food web stability.
- Yuzhao Li, Ph.D. student, *Environmental Science and Policy* (2015)
  Informal mentorship on the use of dynamical systems for analyzing empirical data.

University of Guelph (undergraduate advising w/ Professor McCann)

- Mike Yodzis, B.Sc. student, *Mathematics and Statistics* (2011)
  Mentored student development of lab software for analyzing large food web networks.
- Lauren Jarvis, B.Sc. student, *Integrative Biology* (2011)
  Co-advised on theoretical aspects of her undergraduate thesis; project supervision.

GUEST LECTURER

- Mathematical Methods in Population Biology "Turing instabilities" (graduate level) University of California Davis, *Environmental Science and Policy*. 2015.
- Population Ecology "Population genetic models" (undergraduate level) University of California Davis, *Environmental Science and Policy*. 2014.
- Mathematical Methods in Population Biology "Bifurcation theory" (graduate level) University of California Davis, *Environmental Science and Policy*. 2014.
- Community Ecology "Diversity Stability debate" (undergraduate level) University of Guelph, *Integrative Biology*. 2012.

WORKSHOP LEADER

- Scientific Modeling: graduate workshops in *Mathematica*. University of Guelph, *Integrative Biology*. 2012.

LEAD TEACHING ASSISTANT

Delivered undergraduate lectures (i.e. large class teaching), designed assignments and created innovative teaching materials (i.e. interactive notebooks) in addition to regular TA duties.

- Community Ecology. University of Guelph, *Integrative Biology*. 2012.

TEACHING ASSISTANT

Undergraduate level teaching activities include: teaching (lead tutorial lectures and labs, assist student learning) and assessment (grade coursework, mark exams).

- Ecology. University of Guelph, *Integrative Biology*. 2012.
- Introduction to Biodiversity. University of Guelph, *Integrative Biology*. 2011.
- Population Ecology. University of Guelph, *Integrative Biology*. 2010.
- Wildlife Conservation & Management. University of Guelph, *Integrative Biology*. 2007.
- Biology 1. University of Guelph, *Integrative Biology*. 2006.
- Community Ecology. University of Guelph, *Integrative Biology*. 2006.
- Humans in the Natural World. University of Guelph, *Integrative Biology*. 2005.

PROFESSIONAL SERVICE OUTREACH

Co-Editor, *Theoretical Ecology: Principles and Applications* (Invited book project approved. New edition in development for *Oxford University Press*)

Invited Member, NIMBioS Working Group, *Long Transients and Ecological Forecasting,* National Institute for Mathematical Biological Synthesis: Knoxville, TN, 2017-present.

Journal Reviewer: *Ecology Letters, Functional Ecology, Journal of Animal Ecology, Journal of Mathematical Biology, Natural Resource Modeling*, *Proceedings of the Royal Society B*, *Theoretical Ecology, Theoretical Population Biology.*

Mentor, Google Summer of Code, DifferentialEquations.jl project, 2017, 2018.

Member, Postdoctoral Researcher Hiring Committee, *Biology*, Colorado State University, 2017.

Judge, Graduate Student Poster Competition, *Biology*, Colorado State University, February 2017.

Member, Seminar Series Committee, *Integrative Biology*, University of Guelph, 2012-2013

Student Member, Hiring Committee, *Integrative Biology*, University of Guelph, 2012.

Sponsored Delegate, *SciPy: Conference of Scientific Computing with Python*, California Institute of Technology, Burbank, CA, 2008.

Professional Affiliations: *Canadian Society of Ecology and Evolution, Ecological Society of America, The Society for Mathematical Biology.*

REFERENCES: CONTACT INFORMATION

Colleen Webb, Professor

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Colorado State University
Biology Building 340
Fort Collins, Colorado, USA 80523

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Alan Hastings, Distinguished Professor

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University of California, Davis
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