

Tiffany A. Stephens

Postdoctoral Fellow – University of Alaska, Fairbanks

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Education

- **Doctorate of Philosophy** **University of Otago, New Zealand**
○ *Marine Science* 2011 – 2016
Thesis title: Insights into the nitrogen ecophysiology of *Macrocystis pyrifera*.
- **Bachelor of Science, honors** **University of Washington, United States**
○ *Aquatic and Fishery Sciences* 2005 – 2009
Thesis title: The feeding preference of *Strongylocentrotus franciscanus* on fresh versus aged kelp.

Research interests

Ecology, physiology, and biochemistry of algae and seagrasses | nutrient subsidies | ecosystem services | multiple environmental stressors | mariculture enhancement | trophic ecology

I aspire to draw upon multiple disciplines. Fields compatible with my specialties include genomics and phylogenetics, spatial ecology, disease ecology, biomechanics, fisheries, etc.

Selected publications

- **Stephens TA** and Hepburn CH (2018) Biomass through space and tide: architecture of a kelp bed and implications for the abiotic environment. *Hydrobiologia*. DOI: 10.1007/s10750-018-3788-4.
- Krueger-Hadfield SA, **Stephens TA**, Wilbur RH, Heiser S (2018) Everywhere you look, everywhere you go, there's an...estuary invaded by the red seaweed *Gracilaria vermiculophylla*. *BioInvasions Records*. DOI: 10.3391/bir.2018.7.4.01.
- **Stephens TA** (2017) Terminal blades in *Macrocystis* and unexplored links to functional biology. *Ecology*. DOI: 10.1002/ecy.1913.
- **Stephens TA** and Hepburn CH (2016) A kelp with integrity: *Macrocystis pyrifera* prioritizes tissue maintenance in response to nitrogen fertilization. *Oecologia*. DOI 10.1007/s00442-016-3641-2.
- **Stephens TA** and Hepburn CH (2014). Mass-transfer gradients across kelp beds influence *Macrocystis pyrifera* growth over small spatial scales. *Marine Ecology Progress Series*. DOI: 10.3354/meps10974

See website for other manuscripts in preparation.

Selected professional employment

- **June 2017 - Present:** *Postdoctoral fellow.* I am currently working on an NSF-funded project: Apex Predators, Ecosystems, and Community Sustainability (APECS). This multidisciplinary research aims to better characterize the role of sea otters in coastal systems, including both ecological and social research. Specifically, I lead work that covers seagrass ecosystem services, bioturbation effects by sea otters in seagrass beds, and mapping of historical and current kelp presence. I am assisting with project coordination, report writing, and manuscript preparation. *PI: Dr. Ginny Eckert; University of Alaska Fairbanks.*
- **Apr 2016 - May 2017:** *Postdoctoral fellow.* I worked in the Centre for Seaweed Ecophysiology and Biology, where my research focused on carbon metabolism in a subtidal macroalgal community (35 species). This work also included investigating carbon flux (CO₂ and HCO₃⁻) in CCM and non-CCM red seaweeds treated with saturating and low light. *PI: Dr. Patrick Martone; University of British Columbia.*
- **Aug 2010 - Apr 2011:** *Field and lab technician.* Labwork included extracting novel compounds from invertebrates and algae extract, contributing to the International Cooperative Biodiversity Group's natural product drug discovery project. Fieldwork investigated algal-coral chemical interactions in tropical reefs. *Supervisor: Dr. Mark Hay; Georgia Institute of Technology.*
- **Jun 2009 - Aug 2010:** *Field and lab technician.* The project addressed the effects of shoreline armoring on both beach characteristics and their composition of intertidal species at various Puget Sound locations; data on infauna, sediment grain size and wrack composition were collected and processed. *Supervisors: Dr. Megan Dethier and Helen Berry; University of Washington and WA Department of Natural Resources, respectively.*

Selected teaching and mentoring

- **Sept - Oct 2017:** *2 weeks Full-time.* I co-developed a course within Northeastern University's Three Seas Program, where we engaged the students in using physiological and molecular tools to address ecological questions. Seagrass was used a model organism to investigate host-pathogen interactions with a slime mold. *Co-instructor: Dr. Rebecca Certner.*
- **Jul - Aug 2015:** *5 weeks Full-time.* I co-developed a summer course at Friday Harbor Labs, designed for advanced undergraduate and graduate students. The course highlighted intertidal and subtidal theory and field methods. Students conducted independent research, which culminated in public, oral presentations. *Co-instructors: Dr. Aaron Galloway, Dr. Megan Dethier, Dr. David Duggins.*
- **Mar 2012 - Jun 2015:** *3/4-time.* I demonstrated for introductory ecology courses at the University of Otago for five semesters, the last of which I was lead demonstrator. Undergraduate students utilized a cockle population to learn ecological theory and sampling methods. *Supervisor: Dr. Haseeb Randhawa.*
- **May 2012 - Sep 2014:** *Part-time.* I was a teaching fellow for two programs at the New Zealand Marine Studies Center: GK-12 and Gifted and Talented. School groups (ages 11-17) visited the center to obtain hands-on experience with scientific design and critical thinking in both laboratory and field settings. *Supervisor: Steve Cutler.*

Professional activities

- **Contributions to peer-review:** I am a Review Editor for *Frontiers in Marine Science*, for the Global Change and the Future Ocean section. Some of the journals for which I have reviewed manuscripts include *Aquatic Invasions*, *Ecological Research*, *Functional Ecology*, *Journal of Experimental Marine Biology and Ecology*, *Journal of Phycology*, *Limnology and Oceanography*, *Limnology and Oceanography Letters*, *Marine Ecology Progress Series*, and *Phycological Research*.
- **Guest lectures:** 2018, FHL seminar series (University of Washington); 2017, BLISS seminar series (University of British Columbia); 2013, University of the Third Age (U3A, community education in New Zealand); 2009, ZooBots guest lecture (FHL, University of Washington).

Skills and qualifications

- **Type of data:** seawater macronutrients, algal pigmentation, carbonic anhydrase activity, specific amino acids, stable isotopes, water mass-transfer, photosynthetic efficiency, trace elements (and clean methods), use of flume tanks, DNA extraction and PCR.
- **Getting data:** extensive experimentation in the field and lab, small craft operation, SCUBA – scientific diver via AAUS (USA) and OSH (New Zealand), drysuit and nitrox certifications.
- **Quantifying data:** nutrient auto analyzer, spectrophotometry, high-performance liquid chromatography (HPLC), PAM fluorometry, flow cytometry, membrane inlet mass spectrometry (MIMS), transects and quadrats.
- **Analyzing data:** R analytical package, Primer 6+ PERMANOVA, SPSS, ImageJ, basic understanding of Bayesian mixing models (using MixSIAR).

Honors and awards

- 2017 – Runner-up, Hilda Canter-Lund photography award (British Phycological Society)
- 2016 – Best student talk (International Seaweed Symposium, Denmark)
- 2016 – Winner of the Hilda Canter-Lund photography award (British Phycological Society)
- 2015 – Travel award; New Zealand Federation of Graduate Women (\$2,500).
- 2015 – Writing bursary; 3 months, University of Otago (\$6,000).
- 2014 – Runner-up best talk; Asian Pacific Phycological Forum.
- 2014 – Travel award; New Zealand Marine Sciences Society (\$1,000).
- 2014 – Travel award; Division of Sciences, University of Otago (\$2,000).
- 2011-2014 – International PhD scholarship; University of Otago (\$75,000).
- 2010 – NSF Graduate Research Fellowship Program, *award recipient* (\$120,000). Declined because I found a PhD program that best fit my professional interests outside of the USA.
- 2009 – NSF Graduate Research Fellowship Program, *honorable mention*.
- 2008 – Scholarship for Pelagic Ecosystems apprenticeship; Mary Gates Endowment (\$3,000).
- 2008 – Scholarship for ZooBot apprenticeship; Mary Gates Endowment (\$3,000).

Conference presentations

- 2018: *Talk* – Western Society of Naturalists (WSN); Tacoma, WA, USA.
- 2016: *Talk* – Western Society of Naturalists (WSN); Monterey, CA, USA.
- 2016: *Talk* – International Temperate Reef Symposium (ITRS); Pisa, Italy.
- 2016: *Talk* – International Seaweed Symposium (ISS); Copenhagen, Denmark.
- 2016: *Talk* – Northwest Algae and Seagrass Symposium (NWASS); Camp Casey, WA, USA.
- 2014: *Talk* – Western Society of Naturalists (WSN); Tacoma, WA, USA.
- 2014: *Talk* – Asian Pacific Phycological Forum (APPF); Wuhan, China.
- 2014: *Talk* – New Zealand Marine Science Society (NZMSS); Nelson, New Zealand.
- 2011: *Poster* – New Zealand Marine Science Society (NZMSS); Oban, New Zealand.
- 2009: *Poster* – Puget Sound Georgia Basin (PSGB); Seattle, WA, USA.
- 2009: *Poster* – Integrative and Comparative Biology (SICB); Boston, MA, USA.

Referees

- **Steve Cutler**
K-12 teaching mentor
steve.cutler@otago.ac.nz
New Zealand Marine Studies Center
- **Dr. Megan Dethier**
Mentor; community dynamics and intertidal ecology
mdethier@uw.edu
University of Washington
- **Dr. David Duggins**
Co-instructor; kelp bed ecology
dduggins@uw.edu
University of Washington
- **Dr. Ginny Eckert**
Research mentor; Coastal management and ecosystem services
gleckert@alaska.edu
University of Alaska, Fairbanks
- **Dr. Aaron Galloway**
Co-instructed a course at FHL; food-web ecology
agallow3@uoregon.edu
University of Oregon
- **Dr. Drew Harvell**
Collaborator; marine disease ecology
cdh5@cornell.edu
Cornell University
- **Dr. Chris Hepburn**
PhD supervisor; aquaculture and algal ecophysiology
chris.hepburn@otago.ac.nz
University of Otago
- **Dr. Patrick Martone**
Postdoctoral supervisor; algal biomechanics and biochemistry
patrick.martone@botany.ubc.ca
University of British Columbia
- **Dr. Haseeb Randhawa**
Supervisor for undergraduate teaching
hrandhawa@fisheries.gov.fk
Falkland Islands Fisheries