HILARY A. HAYFORD

SEATTLE, WA | hilaryhayford.com | hilary.hayford.biologist@gmail.com

EDUCATION

PhD, *Biology*, University of Washington, Seattle, 2016
Thesis: "Tidal migration patterns moderate thermal risk in the intertidal snail *Nucella ostrina*"
BS, *Marine Biology*, University of California, Santa Cruz, 2001
AS, AA, *Biology, Spanish,* Cabrillo College, Aptos, CA 1998

PROFESSIONAL POSITIONS

PROFESSIONAL POSITIONS

SENIOR PROGRAM MANAGER & BIOLOGIST, Puget Sound Restoration Fund — 2020 – present
Olympia oyster & bull kelp habitat restoration.

VISITING FACULTY, Bamfield Marine Sciences Centre/University of Victoria — 2019
Instruct marine behavioural ecology research course at remote field station.

POSTDOCTORAL RESEARCH ASSOCIATE, University of Washington — 2016 - 2019
Ecophysiology, climate change, aquaculture, ocean acidification.

GRADUATE STUDENT RESEARCHER
University of Washington: Thermal biology, tidal cycles, performance — 2009 – 2016
Moss Landing Marine Labs/San Jose State: Molecular ecology & invert. zool. — 2005 – 2009
Hopkins Marine Station, PISCO: Biomechanics, ecophysiology & genetics — 2007
Universidad Católico del Norte, Coquimbo, Chile: Kelp forest ecology — 2006

ASSISTANT RESEARCH SPECIALIST, University of California, Santa Cruz — 2001 – 2009
Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO).
Lab Manager 2001-2005; supervised > 50 people.
Experimental ecology, environmental monitoring; >700 field days.

STUDENT RESEARCH TECHNICIAN, University of California, Santa Cruz — 1999 – 2001

RESEARCH – COLLABORATION ON > 40 PROJECTS -

PEER-REVIEWED PUBLICATIONS

4. **HA Hayford**, MJ O'Donnell, E Carrington. (2018) Radio tracking detects behavioral thermoregulation at a snail's pace. *Journal of Experimental Marine Biology and Ecology*, 499:17-25
Citations: 4, * Recommended on Faculty of 1000 *

3. WB Stickle, E Carrington, **H Hayford** (2017) Seasonal changes in the thermal regime and gastropod tolerance to temperature and desiccation stress in the rocky intertidal zone at the southern end of the inside passage. *Journal of Experimental Marine Biology and Ecology*, 488:83-91
Citations: 12

2. SE Gilman, **H Hayford**, C Craig, E Carrington (2015) Body temperatures of an intertidal barnacle and two whelk predators in relation to shore height, solar aspect, and microhabitat. *Marine Ecology Progress Series,* 536:77-88
Citations: 10

1. **HA Hayford**, SE Gilman, E Carrington (2015) Foraging behavior minimizes heat exposure in a complex thermal landscape. *Marine Ecology Progress Series,* 518:165-175
Citations: 23

MANUSCRIPTS – *AVAILABLE UPON REQUEST*

HA Hayford, SE Gilman. Can behavior buffer climate change impacts in the rocky intertidal?

LA Newcomb, **HA Hayford**, EA Roberts, I Jefferds, CS Friedman, E Carrington. Attachment strength dynamics of cultured *Mytilus trossulus*: linkages to abiotic and biotic factors.

PRESENTED PAPERS - PRESENTING AUTHOR = 12, TOTAL = 21

*denotes undergraduate mentee

2020 Toft JE, Peabody B, **Hayford HA,** Allen B, McKenna G. Reimagining the kelp highway: A socio-ecological expedition to highlight Puget Sound's marine forests. Western Society of Naturalists (WSN), online

2019 *Toler-Scott C, *May CH, *Fields JA, Elahi R, **Hayford HA**. Stasis and change in the intertidal: a comparison of community structure over 45 years. Mary Gates Undergraduate Research Symposium, Seattle, WA

2018 **Hayford HA**, *Kreis M, *Le Baron N, Carrington E. Performance benefits of slow behavior in the thermally dynamic intertidal zone. WSN, Tacoma, WA

2018 *May CH, *Fields JA, *Toler-Scott C, **Hayford H**, Elahi R. Undergraduate research in historical ecology: A comparison of invertebrate body size over 45 years. WSN, Tacoma, WA

2018 Elahi R, Galloway AWE, **Hayford H**, King W. Synthesizing snail size shifts: evidence for body size decline over time despite considerable response heterogeneity. WSN, Tacoma, WA

2018 **Hayford HA**, George MN, Carrington E. Experimental ocean acidification inhibits snail growth. Society for Integrative & Comparative Biology (SICB) –San Francisco, CA

2017 **Hayford HA**, Carrington E. Small movements with big benefits: thermoregulation in an intertidal snail. Ecological Society of America, Portland, OR

2017 **Hayford HA**, Carrington E. Performance benefits of slow migratory behavior in a predictable dynamic habitat. SICB, New Orleans, LA

2017 Carrington E, George M, **Hayford H**, Newcomb L, Friedman C, Jefferds I. All washed up? Mussel survival in the face of ocean warming and acidification. SICB, New Orleans, LA

2015 **Hayford HA**. Slowly but surely: navigating thermal stress at a snail's pace. Biology Graduate Student Symposium (BGSS), Seattle, WA

2015 **Hayford HA**, Carrington E. The best of both worlds: Radio tracking and thermal mimics show thermoregulation in intertidal snails. SICB, West Palm Beach, FL

2014 **Hayford HA**, Carrington E. Catching waves: Radio tracked snails use tidal cycles to thermoregulate. WSN, Tacoma, WA

2014 **Hayford HA**. Behavior ameliorates thermal stress when tidal cycle shifts microclimate. Graduate Climate Conference, Eatonville, WA

2014 **Hayford HA**, Carrington E. Slowly but surely: Avoiding heat stress at a snail's pace. SICB, Austin, TX

2013 Carrington E, **Hayford H**, Gilman S, Kull K. Open air dining: Circatidal foraging patterns of the intertidal whelk *Nucella ostrina* in a complex thermal landscape. Congress of Malacology, Ponta Delgada, Portugal

2012 **Hayford HA**, O'Donnell MJ, Carrington E. Low speed, high tech: Radio tracking intertidal snails. WSN, Monterey, CA

2012 Gilman SE, **Hayford H**, Nishizaki M, Vaughn D, Carrington E. NSF-sponsored workshop 'Climate Change and Species Interactions: Ways Forward' - An (exhaustively) mechanistic study of temperature and species interactions. Cary Institute for Ecosystem Studies, NY

2012 Gilman SE, Helmuth B, Wethey D, Carrington E, **Hayford H**. Moving beyond measurement: Connecting sensor data to organismal performance. U.S. Regional Association of the International Association for Landscape Ecology, Newport, RI

2011 **Hayford HA**, Gilman SE, Carrington E. *Nucella ostrina* alters behavior when tidal cycle shifts microclimate. WSN, Vancouver, WA

2011 **Hayford HA**. Snail behavior changes when tidal cycling alters temperature. BGSS, Seattle, WA

2007 Geller JB, Mackie J, **Hayford HA**. Towards a molecular inventory of the plankton of Elkhorn Slough. Monterey Bay National Marine Sanctuary Currents Symposium, Monterey, CA

INVITED RESEARCH SEMINARS – 10 LECTURES, 7 INSTITUTIONS

Poetry Science Symposium	University of Washington	Nov 2019
ASKXXI: Arts + Science Knowledge	ASKXXI USA-Chile collaboration	May 2018
Oregon Institute of Marine Biology	University of Oregon	Aug 2018
Biology Department	Pacific Lutheran University (WA)	Nov 2017
Friday Harbor Labs	University of Washington	Jul 2017
Biology Department	Western Washington University	May 2016
Marine Ecology Research Group	University of California, Irvine	Aug 2015
Friday Harbor Labs	University of Washington	Nov 2014
Friday Harbor Labs	University of Washington	Nov 2012
Docent Program	Natural Bridges State Park (CA)	Jul 2008

GRANTS & FELLOWSHIPS - $78,000

Rafe Sagarin Fund for Innovative Ecology Honorable Mention (Co-PI)	$250	2017
Patricia L. Dudley Fellowship, Friday Harbor Labs	$1,500	2017
WA Sea Grant invited full proposal	*(Not funded)*	2017
Charlotte Magnum Student Support, Soc. Int. Comp. Biol	*Mtg housing*	2014, 2015
Alan & Marian Kohn Fellowship, Friday Harbor Labs	$2,500	2014
Achievement Rewards for College Scientists (ARCS), Seattle Chapter	$17,500	2009-2012
Edmondson Fellowship, Dept. of Biology, U. Washington	$1,500	2012
Richard & Megumi Strathmann Fellowship, Friday Harbor Labs	$1,600	2012
Neuro & Behavior Fellowship, Friday Harbor Labs	$400	2012
Ragen Family Fellowship, Friday Harbor Labs	$2,000	2011
Richard & Megumi Strathmann Fellowship, Friday Harbor Labs	$1,000	2011
Pacific Northwest Shell Club Research Scholarship	$750	2011
Top Scholar, Dept. of Biology, U. Washington	$11,400	2009
David & Lucille Packard Research & Travel Grant	$1,000	2009
Kim Peppard Memorial Scholarship, Moss Landing Marine Labs	$1,000	2009
San Jose State University Fellowships (Grad Equity, Burmahln)	$1,425	2007 - 2009
Harvey Fellowship, Moss Landing Marine Labs	$3,000	2008
Dr. Earl & Ethel Myers Oceanographic & Marine Biology Grant	$1,000	2006
Regents Scholar, U. California, Santa Cruz	$30,000	1998 - 2000
McHenry Scholar (4 university-wide), U. California, Santa Cruz	$420	1999

OTHER CONTRIBUTIONS

2020 *Cover photo.* Philosophical Transactions of The Royal Society B "The next horizons for lipids as 'trophic biomarkers': evidence and significance of consumer modification of dietary fatty acids" Theme issue compiled & edited by Aaron WE Galloway & Suzanne M Budge. 375(1804).

2015 *Contributed content & photos.* Symposium on "Climate change and Molluscan Ecophysiology" at the 79th Annual Meeting of the American Malacological Society. American Malacological Bulletin 33(1): 121-126.

2008 *Solicited report.* "Michael Graham: Discovery of New Kelp Environment" in The Scientist of San José State University, College of Science 12(1): 2,8.

2004 *Contributed photos.* PISCO Coastal Connections Vol 3.

TEACHING & MENTORING - 30 COURSES, >1300 STUDENTS –

† denotes courses with labs
***** denotes courses with field trips
> denotes courses with authentic research

INSTRUCTOR OF RECORD – 8 COURSES (2 INTERMEDIATE, 6 ADVANCED)

Marine Behavioural Ecology†*>	Bamfield Mar. Sci., Canada	2019
Biological Impacts of Climate Change	U. Washington, Seattle	2019
Marine Ecological Processes x 3	U. Washington, Seattle	2017, 2018, 2019
Historical Ecology Research Apprenticeship†*>	UW Friday Harbor Labs	2018
Foundations in Ecology†* x 2	U. Washington, Seattle	2017, 2018

TEACHING ASSISTANT – 22 COURSES (2 INTRODUCTORY, 5 INTERMEDIATE, 13 ADVANCED, 2 POSTBAC)

Introductory Cell & Molecular Biology†	U. Washington, Seattle	2016
Mycology†*	U. Washington, Seattle	2015
Invertebrate Zoology†*	U. Washington, Seattle	2015
Marine Ecology*>	U. Washington, Seattle	2015
Cell & Molecular Lab Techniques x 3†>	U. Washington, Seattle	2013 - 2015
Limnology & Limnology Lab x 4†*>	U. Washington, Seattle	2011 - 2014
Invert. Zoology & Research Apprenticeship x 2†*>	UW Friday Harbor Labs	2013 - 2014
Marine Algae & Research Apprenticeship x 3†*>	UW Friday Harbor Labs	2010 - 2012
Foundations in Physiology	U. Washington, Seattle	2012
Foundations in Ecology†*	U. Washington, Seattle	2011
Introductory Ecology & Evolution†*	U. Washington, Seattle	2010
Invertebrate Zoology†*	San Jose State University	2008
Teacher Enhancement Program: Lab & Field†*>	San Jose State University	2007
Teacher Enhancement Program: Biotechnology†*>	San Jose State University	2006

GUEST LECTURER – 11 LECTURES, 6 INSTITUTIONS

Ecology & Conservation	Unleash the Brilliance	2020
Salish Sea Sciences Summer Program	Salish Sea Sciences	2017, 2018, 2020
Spring Street Summer Institute	Spring Street International School	2013, 2014
Cell & Molecular Lab Techniques	U. Washington, Seattle	2014
Invertebrate Zoology	Seattle University	2013
Marine Botany	U. Washington, Seattle	2012

Marine Ecological Processes	U. Washington, Seattle	2012
Marine Ecology	U. California, Santa Cruz	2008

MENTOR – INDEPENDENT RESEARCH - 39 UNDERGRADUATES [NAMES REDACTED FOR STUDENT PRIVACY]

2019 - "Marine behavioural ecology of coastal invertebrates" [21 students] Bamfield Marine Sciences Centre
2019 - "The biological effects of increasing temperature on marine fishes" Ad-hoc honors written research project; [1 student] UW Biology
2018 - "Historical marine ecology of San Juan Island: using historical studies to assess long-term change" [9 students] UW Friday Harbor Labs
2016 - "Seasonal variation in mussel shell thickness" [1 student] UW Biology
2014 - "Measuring thermal performance of *Nucella ostrina*" [1 student] UW Biology
2013 - "Effect of heat stress & starvation on snail behavior and recovery rate" [1 student] UW Friday Harbor Labs
2013 - "Effect of heat stress & starvation on the respiration rate of *Nucella ostrina*" [2 students] UW Friday Harbor Labs
2012 - "Migration & feeding in intertidal whelks, *Nucella ostrina* & *N. lamellosa*" [2 students] UW Friday Harbor Labs
2010-2011 - "Metabolic response of *Nucella ostrina* & *Nucella lamellosa* to increased temperatures in aerial environments" Senior capstone; [1 student] UW School of Aquatic & Fisheries Sciences

SUPERVISOR – RESEARCH INTERNS

5 undergraduates, University of Washington
>50 undergraduates & technicians, University of California, Santa Cruz

TEACHING & MENTORING RECOGNITION

Postdoc Mentoring Award Nominee (university-wide), U. Washington		2018
Ingrith Deyrup Distinguished Teaching Award, Biology Dept., U. Washington	$750	2015

SERVICE & COMMUNITY

AD HOC MANUSCRIPT REVIEWER

American Naturalist x2
Comparative Biochemistry & Physiology
Ecography x2
Ecological Monographs
Invertebrate Biology
Journal of Coastal Research
Journal of Experimental Biology x2
Journal of Experimental Marine Biol. & Ecol. x2
Marine Biology
Marine Ecology
Marine Ecology Progress Series x6
Marine Environmental Research x3
Transactions on Biomedical Engineering x2

AD HOC GRANT REVIEWER

National Science Foundation – Biological Oceanography

PROFESSIONAL SERVICE

DEI Mentorship program	Western Society Naturalists	2020
Student paper judge	Western Society Naturalists	2018, 2020

Broadening Participation mentor	Society Integr & Comp Biol	2018
Student paper judge	Society Integr & Comp Biol	2017, 2018
Friday Harbor Labs Advisory Board	University of Washington	2013 - 2014
Undergraduate Curriculum Committee, Biology Dept.	University of Washington	2013 - 2014
Graduate Coordinating Committee, Biology Dept.	University of Washington	2012 - 2013
Graduate Program Committee, Biology Dept.	University of Washington	2010 - 2012
Biology Graduate Student Symposium Coordinator	University of Washington	2011
Judge, HHMI Undergraduate Research Symposium	University of Washington	2010
Dean's Student Advisory Board, College of Science	San José State University	2007 - 2009

FEATURES & POPULAR ARTICLES

"Hanging by a Thread - Mussels in a Changing Ocean" Animated video by Abby Lunstrum, Meg Chadsey, & Laura Newcomb, w/ WA Sea Grant; February 2018, https://tinyurl.com/y977soft

"Avoiding high temperatures at a snail's pace." Feature article in Friday Harbor Labs Tide Bites newsletter & San Juan Islander; May 2016, http://tinyurl.com/j4vg8mp

"The best of both worlds: A clever intertidal snail feeds on land and cools off in the sea." Feature article in Pacific Northwest Shell Club newsletter; Oct 2014, http://tinyurl.com/nwt7smh

"A snail can tell us a lot about global warming." Radio feature by Martha Baskin of Crosscut Radio; Apr 2012, http://tinyurl.com/pqtlgmj

COMMUNITY OUTREACH > 1,400 HOURS

Volunteer docent & training assistant, Seattle Aquarium, Seattle, WA	2016 - present
E-visiting scientist, Skype a Scientist	2018, 2019
Public speaker, Friday Harbor Labs Open House, Friday Harbor, WA	2018
Fundraiser volunteer, Puget Soundkeeper Alliance, Seattle, WA	2017, 2018
Visiting scientist, What is a Scientist? SICB School Outreach, New Orleans, LA	2017
Visiting scientist, Girls in Science, Burke Museum, Seattle, WA	2016
Science Positive blog contributor, Biology Dept., U. Washington, Seattle, WA	2015
Public speaker, Seattle Nerd Night, Seattle, WA	2015
Visiting lecturer, Advancement Board, Friday Harbor Labs, WA	2014
Volunteer naturalist, Lime Kiln Point State Park, Friday Harbor, WA	2013 – 2014
Visiting scientist, Friday Harbor Elementary School, Friday Harbor, WA	2010 – 2014
Volunteer writing mentor, Dream Project, U. of Washington, Seattle, WA	2010
Volunteer mentor, Student Oceanography Club, Monterey Bay Aquarium, CA	2007 – 2009
Science fair judge, secondary schools, Santa Cruz County, CA	2006 – 2009
Public outreach volunteer, Moss Landing Marine Labs, Moss Landing, CA	2005 – 2009
Fundraiser volunteer, Long Marine Lab, Santa Cruz, CA	2003, 2008, 2009
Career panelist, junior & senior high schools, Santa Cruz County, CA	2007, 2008
Volunteer mentor, Young Women in Science, Monterey Bay Aquarium, CA	2007
Volunteer, Shark Festival & Sanctuary Celebration, Santa Cruz, CA	2002
Co-leader, Ocean Explorers summer camp, Long Marine Lab, Santa Cruz, CA	1999 – 2000
Volunteer docent, school programs, Long Marine Lab, Santa Cruz, CA	1996 – 2000

SPECIALIZED SKILLS

Lab skills: Microscopy, spectrophotometry, gas exchange measurement, environmental chambers, cell culture, bacterial cloning, DNA, RNA, & protein extraction, PCR, Western Blot, gel electrophoresis
Construction skills: Hand & power tools, equipment installation into rock, plumbing, soldering, waterproofing, concrete
Statistical software: R, SPSS, Systat, Matlab, Sigma Plot
Taxonomy: Northeast Pacific marine algae, invertebrates, & planktonic forms
Certificates: WA State Boaters Card, WA State Driver's License
Languages: English (fluent), Spanish (proficient)
Diversity training: Engaging Oppression graduate course

PROFESSIONAL AFFILIATIONS

Ecological Society of America (ESA)
Society Integrative & Comparative Biol. (SICB)
Western Society of Naturalists (WSN)
500 Women Scientists

COMMUNITY AFFILIATIONS

American Civil Liberties Union (ACLU)
Nat'l Assoc. Advancement People of Color (NAACP)