

Hannes Baumann, Ph.D

Climate, Fisheries & Evolutionary Ecology

Assistant Professor

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Professional preparation

Kiel University	Kiel (Germany)	Pre-diploma (equiv. B.S.)	1997
Kiel University	Kiel (Germany)	Fisheries Biology, M.S.	2002
Hamburg University	Hamburg (Germany)	Fisheries Biology, Ph.D.	2006
Hamburg University	Hamburg (Germany)	Fisheries, Post-doctoral	2006-08
Stony Brook University	Stony Brook, NY	Ecology Evolution, Post-doctoral	2008-10

Appointments

- 2010-14: Adjunct Assistant Professor, Stony Brook University, NY
- August 2014: Assistant Professor, Department of Marine Sciences, University of Connecticut

Research Interests

I study how fish populations are adapted to environmental variability and how they may therefore cope with unfolding marine climate change, i.e., ocean warming, acidification and oxygen decline. It also includes changes to the marine food web and natural mortality patterns such as fisheries exploitation and selection. I pursue these questions by employing experimental, field, and modeling approaches with tools including otolith microstructure and microchemistry, fish physiology, population dynamics, and evolutionary genetics. At the University of Connecticut, I have established the **Fisheries Ecology Lab** as a leader in experimental research on coastal forage fish such as silversides or sand lances. My groups research has received continuous NSF funding since 2010, in addition to research grants by NOAA SeaGrant and the Bureau of Energy Management (BOEM).

Selected recent grants

- 2018 – Therkildsen, N. and **Baumann, H.** Collaborative research: The genomic underpinnings of local adaptation despite gene flow along a coastal environmental cline. NSF-OCE #1756316 (\$325,388 3 years)
- 2016 – **Baumann, H.**, Wiley, D. Kaufman, L., Valentine, P., and Gallagher, S. Sensitivity of larval and juvenile sand lance *Ammodytes dubius* on Stellwagen Bank to predicted ocean warming, acidification, and deoxygenation. Northeast Regional SeaGrant Consortium (\$198,393 2 years)

- 2016 – Dam, H., **Baumann, H.**, Finiguerra, M., and Pespeni, M. Collaborative Research: Transgenerational phenotypic and genomic responses of marine copepods to the interactive effects of temperature and CO₂. NSF-OCE #1550180 (\$609,684 3 years)
- 2016 – **Baumann, H.** and Nye, J. Collaborative research: Understanding the effects of acidification and hypoxia within and across generations in a coastal marine fish. NSF Project# 1536336 (\$829,035 3 years)

Graduate students and post-docs

- Elizabeth Brown (MS 2012), Alex Malvezzi (MS 2013), Christopher Murray (MS 2014, PhD 2019), Jacob Snyder (MS 2017), Julie Pringle (MS 2018), Callie Concannon (MS, present), Lucas (MS, present)
- Dr. Emma Cross (post-doc)

Selected publications

- Therkildsen, N.O., Wilder, A.P., Conover, D.O., Munch, S.B., **Baumann, H.**, and Palumbi, S.R. (2019) Contrasting genomic shifts underlie parallel phenotypic evolution in response to fishing. *Science* (in press)
- **Baumann, H.** (2019) Experimental assessments of marine species sensitivities to ocean acidification and co-stressors: how far have we come? *Canadian Journal of Zoology* 97:399-408
- Snyder, J.T., Whitney, M.M., Dam, H.G., Jacobs, M.W., and **Baumann, H.** (2019) Citizen science observations reveal rapid, multi-decadal ecosystem changes in eastern Long Island Sound. *Marine Environmental Research* 146: 80-88
- **Baumann, H.**, Cross, E.L., and Murray, C.S. (2018) Robust quantification of fish early life CO₂ sensitivities via serial experimentation *Biology Letters* 14:20180408
- **Baumann, H.** and Smith, E. (2018) Quantifying metabolically-driven pH and oxygen fluctuations in US nearshore habitats at diel to interannual time-scales. *Estuaries & Coasts* 41:1102-1117
- Murray, C.S., Fuiman, L., and **Baumann, H.** (2017) Consequences of elevated CO₂ exposure across multiple life stages in a coastal forage fish. *ICES Journal of Marine Science* 74:1051-1061
- Gobler, C.J. and **Baumann, H.** (2016) Hypoxia and acidification in ocean ecosystems: Coupled dynamics and effects on marine life. *Biology Letters* 12:20150976
- Malvezzi, A.J., Murray, C.M., Feldheim, K.A., Dibattista, J.D., Garant, D., Gobler, C.J., Chapman, D.D., and **Baumann, H.** (2015) A quantitative genetic approach to assess the evolutionary potential of a coastal marine fish to ocean acidification. *Evolutionary Applications* 8: 352-362
- Murray, C.M., Malvezzi, A., Gobler, C.J., and **Baumann, H.** (2014) Offspring sensitivity to ocean acidification changes seasonally in a coastal marine fish. *Marine Ecology Progress Series* 504: 1-11
- **Baumann, H.**, Talmage, S.C., and Gobler, C.J. (2012) Reduced early life growth and survival in a fish as a direct response to elevated CO₂ levels. *Nature Climate Change* 2: 38-41.
- **Baumann, H.** and Conover, D.O. (2011) Adaptation to climate change: contrasting patterns of thermal-reaction-norm evolution in Pacific vs. Atlantic silversides. *Proceedings of the Royal Society: B* 278: 2265-2273

Invited keynote talks

- **Baumann H.** 2018. Using experiments to assess the sensitivity of fish to marine climate change: progress and knowledge gaps. Ocean Global Change Biology Gordon Research Conference, Waterville Valley, NH, 15-20 July 2018
- **Baumann H.** 2018. Responses of marine fish to ocean acidification and co-stressors: An experimenters view. 57th Annual Meeting of the Canadian Society of Zoologists, 7-11 May 2018, Memorial University St. John's, NL Canada
- **Baumann H.** and Rivest E. 2018. Responses of marine organisms to ocean acidification and co-stressors. 4th OA PI workshop 17-19 February 2018, Portland, OR

Synergistic activities

- NSF-REU mentor 2017-current: H.B. has mentored three undergraduate female students (2017: Elle Parks, 2018: Sydney Stark, 2019: Deanna Elliott) for the NSF-REU Site Mystic Aquarium: Collaborative Research: Investigating the Consequences of Global Change on Marine Animals and their Ecosystem. Parks has been a co-author on a resultant publication (*Marine Biology* 2018, 165:75-83)
- H.B. produced the e-lecture "Combined effects of ocean acidification, warming, and hypoxia on marine organisms" *Limnology and Oceanography e-Lectures* 2016 6:1-43; H.B. developed the honors minicourse "Welcome to the Anthropocene" to teach anthropogenic changes beyond climate change, H.B. gave numerous public lectures, e.g., "Global weirding" Port Jefferson Rotary Club 2013; "Big Fish? Little Fish! How will the ocean's most productive vertebrates cope with marine climate change?" Ridgeway Research Seminar 2017.
- H.B. co-organized the 4th OA PI workshop in Portland, OR 17-19 February 2018 and gave a keynote "Responses of marine organisms to ocean acidification and co-stressors"
- H.B. is secretary of the Early Life History Chapter of the American Fisheries Society (2018-current), chair of the local organizing committee for the upcoming 44th Annual Larval Fish conference in Mystic, CT 21-26 June 2020 | lfc44.uconn.edu
- Verified reviewer of 65 manuscripts submitted 2012 - present to 25 international journals ([Publons](#)), reviewer of NSF, SeaGrant, NOAA proposals, panelist NOAA-CHRP program 2018