Helen Carter Esch

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Research Interests

- Behavioral context and acoustic function of cetacean calls
- Passive acoustic detection of baleen whales and coincident physical and biological oceanographic contexts
- Detection probability of baleen whale calls

Education

2006-present: Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program
Ph.D. Biological Oceanography (expected graduation date 8/12)
Dissertation: Acoustic ecology of balaenid whales in the Bering Sea

2003-2006: University of North Carolina Wilmington (UNCW)
M.S. Marine Biology
Thesis: Whistles as potential indicators of stress in bottlenose dolphins

2000-2003: University of North Carolina Wilmington (UNCW)
B.S. Marine Biology cum laude with honors in Biology, Minor in Chemistry

1995-1996: University of South Carolina
(Marine Science)

Distinctions and Awards

North Pacific Research Board Graduate Research Award (2009)
Arctic Research Initiative Graduate Research Assistantship (2008-2010)
Ocean Life Institute Fellow (2006-2008)
UNCW, Department of Biology and Marine Biology Excellence in Teaching Award (2005)
SEAMAMMS- 1st place poster presentation, Master's level (2005)
UNCW, Chancellor's Achievement Award for Academic Performance (2000-2003)

UNCW, William S. Deloach Award for Excellence in Organic Chemistry (2002)

Research Cruises

2010 **Russian-American Long-term Census of the Arctic (RUSALCA),** Bering Strait region*, R/V Professor Kromov (Spirit of Enderby)*, July 31-August 11

2009 **North Atlantic Right Whale Foraging Ecology Cruise,** Great South Channel, *R/V Tioga*, May 1-May 31

Pacific Right Whale Evaluation Study (PRIEST), southeast Bering Sea, *F/V Aquila*, July 15-August 6

2009 **Bowhead Whale Foraging Ecology Study (BOWFEST)**, western Beaufort Sea, Barrow Arctic Science Consortium, August 25-September 23

2008 **Bowhead Whale Foraging Ecology Study (BOWFEST)**, western Beaufort Sea, Barrow Arctic Science Consortium, August 27-September 23

Pacific Right Whale Evaluation Study (PRIEST), southeast Bering Sea, *F/V Ocean Olympic*, August 2-15

2007 **Bowhead Whale Foraging Ecology Study (BOWFEST)**, western Beaufort Sea, Barrow Arctic Science Consortium, August 23-September 21

Humpback Whale Tagging & Bioacoustics Cruise, Stellwagen Bank National Marine Sanctuary*, R/V Tioga*, July 18-20

North Atlantic Right Whale Foraging Ecology Cruise IV, Great South Channel, *NOAA Ship Albatross IV*, May 28-June 10

2006 **Humpback Whale Foraging Ecology Cruise**, Stellwagen Bank National Marine Sanctuary*, R/V Tioga*, August 6-14

2004 **More of the North Atlantic Humpback (MONAH)**, Outer Banks, NC, *F/V Outer Limit*s, February 2-March 4

Relevant work experience

Right Whale Aerial Survey Coordinator: UNCW/NOAA (10/2005-5/2006)

- Coordinated the schedule and logistics for mid-Atlantic right whale aerial surveys, managed observers and pilots schedules and logistics, collected

sighting data and photographs for identification, constructed and maintained sighting databases, and communicated those data to multiple government agencies

Research Assistant: UNCW (Spring 2004, Spring 2005-Spring 2006)

- Performed self-directed analyses of marine mammal vocalizations

Field Biologist: Duke University (Winter 2004)

- Participated in multi-team offshore bottlenose dolphin photo-identification surveys

Stranding Technician: Virginia Aquarium Stranding Response Program, Va. Beach, Va. (Summer 2004, 2005)

- Provided response to stranded marine mammals and sea turtles
- Collected marine mammal and sea turtle Level A Data, photographs, and tissue samples
- Performed marine mammal and sea turtle necropsies, live animal care and medical procedures
- Cooperated with local government agencies and fisheries to coordinate the retrieval of both live and dead marine mammals and sea turtles
- Operated a small boat and performed surveys to locate, photograph and document stranded sea turtles on the Eastern Shore of Virginia
- Conducted boat-based surveys to photo-identify and estimate seasonal abundance of bottlenose dolphins in Va. Beach, Va.
- Received Level 2 large whale disentanglement training

Dolphin Watch Interpreter: Virginia Aquarium, Va. Beach, Va. (Summer 2004)

- Served as an interpretive guide aboard a dolphin watching vessel
- Provided guests with the life history, seasonal abundance trends, and evolutionary and phylogenetic relationships of bottlenose dolphins
- Photo-identified bottlenose dolphins

Field Biologist: Virginia Aquarium Stranding Response Program (February-March 2004)

- Acted as primary data manager for boat-based large whale surveys
- Constructed and maintained photo-identification and sighting databases
- Performed biopsy sampling, retrieved and processed genetic samples, performed photo-identification and primary data collection (e.g., latitude/longitude, group size, water temperature, etc.)

Field Assistant: Mote Marine Laboratory, Sarasota, FL (2003-2005)

- Participated in annual bottlenose dolphin health assessment capture-release events
- Collected acoustic recordings of bottlenose dolphins

Field Biologist: UNCW (2001-2004)

- Conducted weekly small-boat bottlenose dolphin surveys, photo-identification, acoustic recordings, and mark-recapture population estimates
- Performed sighting data entry and database management

Teaching Experience

Teaching Certification Program: Massachusetts Institute of Technology (2008-2010)

Guest Instructor: Mullen-Hall Elementary School, Falmouth, MA (Spring 2008)

Teaching Assistant: UNCW (Fall 2003, Fall 2004, Spring 2005)

- Instructed General Biology and Marine Biology undergraduate students in laboratory and field techniques
- Provided guidance in data analyses and scientific writing

Presentations

H.C.Esch, J.Lynch, Y.T.Lin, A. Newhall, P.Tyack, and M.F.Baumgartner**.** 2011. Modeling the probability of detecting north Pacific right whale gunshots: implications for abundance estimation. 19th Biennial Conference on the Biology of Marine Mammals, Tampa, FL, November 28-December 2, 2011.

H.C.Esch. 2011. Do you speak whale? Decoding marine mammal bioacoustics. Oundle School, Oundle, England, February 1, 2011.

H.C.Esch. 2011. Fine-scale patterns in North Pacific right whale call production. U.K. Student Chapter of the Marine Mammal Society Meeting, University of St. Andrews, St. Andrews, Scotland, January 29, 2011.

H.C. Esch, M.F. Baumgartner, Catherine Berchok, and Alexandre Zerbini**.** 2010. Fine-scale temporal patterns in North Pacific right whale call production. Alaska Marine Science Symposium, Anchorage, Alaska, January 20-25, 2010.

H.C. Esch, M.F. Baumgartner, Catherine Berchok, and Alexandre Zerbini**.** 2009. Fine-scale temporal patterns in North Pacific right whale call production. 18th Biennial Conference on the Biology of Marine Mammals, Quebec City, Canada, October 12-16, 2009.

H.C. Esch. 2009. Ecotourism: Impacts on marine mammals. Wellesley College, Wellesley, MA, April 22, 2009.

H.C. Esch. 2008. Marine mammal bioacoustics. Monmouth School, Monmouth, Wales, March 20, 2008.

H.C. Esch, M.F. Baumgartner, F.W. Wenzel, and S.V. Parijs. 2007. Automated detection of stereotyped baleen whale vocalizations: advantages over traditional methods. 17th Biennial Conference on the Biology of Marine Mammals, Cape Town, South Africa, November 29 to December 3, 2007.

Sayigh, L.S, **H.C. Esch**, R.S. Wells, and J.E. Blum. 2007. Whistles as potential indicators of stress in bottlenose dolphins (*Tursiops truncatus*). 21st Conference of the European Cetacean Society, Donostia-San Sebastian, Spain, April 23-25, 2007.

H.C. Esch, L.S. Sayigh, J.E. Blum, and R.S. Wells. 2005. Whistles as potential indicators of stress in bottlenose dolphins. 16th Biennial Conference on the Biology of Marine Mammals, San Diego, CA, December 11-15, 2005.

H.C. Esch, L.S. Sayigh, and R.S. Wells. 2005. Quantifying stereotypy of bottlenose dolphin signature whistles. Southeast and Mid-Atlantic Marine Mammal Symposium, Wilmington, North Carolina, March 2005.

H.C. Esch, L.S. Sayigh, and R.S. Wells. 2003. Signature whistles of bottlenose dolphins: fact or fallacy? 15th Biennial Conference on the Biology of Marine Mammals, Greensboro, NC, December 15-19, 2003.

Publications

Esch, H.C., J. Lynch, P.Tyack, and M. Baumgartner (in prep). Modeling the probability of detecting North Pacific right whale calls in the summertime southeast Bering Sea: implications for abundance estimation using passive acoustics.

Esch, H.C., C. M. Baumgartner, C. Berchok, and A. Zerbini (in prep). Fine-scale patterns in North Pacific right whale call production.

Esch, H.C. (2011). The latest fashion in bowhead whale songs: why do cetacean crooners change their tune? Oceanus 49, 6-9.

Esch, H. C., L.S. Sayigh, R.S.Wells. (2009). Quantifying parameters of bottlenose dolphin signature whistles. Marine Mammal Science 25:976-986.

Esch , H.C., L.S. Sayigh, J.E. Blum, and R.S. Wells (2009). Whistles as potential indicators of stress in bottlenose dolphins (*Tursiops truncatus*). Journal of Mammalogy 90:638-650.

Patrician, M.R., I.S. Biedron, **H. C. Esch**, F.W. Wenzel, L.A. Cooper, P.L. Hamilton, A.H. Glass, and M.F. Baumgartner (2009). Evidence of a North Atlantic right whale calf (*Eubalaena glacialis*) born in northeastern U.S. waters. Marine Mammal Science 25:462-477.

Baumgartner, M.F., S.V. Parijs, F.W. Wenzel, C. Trembley, **H.C. Esch**, and A. Warde (2008). Low frequency vocalizations produced by sei whales (*Balaenoptera borealis*). Journal of the Acoustical Society of America 124:1339-1349.

Sayigh, L.S., **H.C. Esch**, V.M. Janik, and R.S. Wells (2007). Facts about signature whistles of bottlenose dolphins (*Tursiops truncatus*). Animal Behavior 74:1631-1642.

McLellan, W., C. Duggan, **H.C. Esch**, J. Yonas, and D.A. Pabst (2006). Final Report: Mid-Atlantic Marine Mammal Aerial Survey. NOAA Technical Memo NMFS-SEFSC-201, 118 pp.

Barco, S.G., W.M. Swingle, and **H.C. Esch** (2004). Final Report MONAH: Mid-Atlantic Survey Effort Feb-Mar 2004. Virginia Aquarium Foundation Scientific Report 2004-02.

Academic and Community Service

Arnold B. Arons Award for Excellence in Teaching, Advising, and Mentoring selection committee (2010)
Woods Hole Oceanographic Institution

Joint Program Student Representative (2008-2009)
Woods Hole Oceanographic Institution, Biology Department

Marine Mammal Stranding Response Volunteer (2006-present)
International Fund for Animal Welfare Marine Mammal Rescue, Yarmouth, MA

- Respond to marine mammal stranding events
- Participate in necropsies

Professional Service

Reviewer for *Animal Behavior*