

# CURRICULUM VITAE



## **Charles H. Greene**

**Director  
Ocean Resources and Ecosystems Program  
Department of Earth & Atmospheric Sciences  
4120 Snee Hall  
Cornell University  
Ithaca, NY 14853  
(607) 275-1662**

### **EDUCATION**

Ph.D.                      Biological Oceanography, 1985, University of Washington, Seattle  
B.A.                      Biological Oceanography, 1978, University of Colorado, Boulder

### **PROFESSIONAL APPOINTMENTS**

2006 -                      Affiliate Professor, University of Hawaii Hilo  
2006                      Senior Scientist, Pacific Ocean Shelf Tracking Project  
2003 -                      Professor, Department of Earth and Atmospheric Sciences,  
                                 Cornell University  
2001 -                      Senior Scientist, The Kohala Center  
2000 - 2001                Sabbatical Fellow, National Center for Ecological Analysis and Synthesis, University of  
                                 California Santa Barbara  
1995 - 2002                Associate Professor, Department of Earth and Atmospheric Sciences,  
                                 Cornell University  
1995                      Adjunct Associate Professor, Section of Ecology and Systematics,  
                                 Cornell University  
1992 -                      Director, Ocean Resources and Ecosystems Program, Cornell University  
1991 - 1994                Adjunct Assistant Professor, Section of Ecology and Systematics,  
                                 Cornell University  
1988 - 1992                Director, Biological Resources Program, Cornell University  
1986 - 1990                Visiting Assistant Professor, Section of Ecology and Systematics,  
                                 Cornell University  
1986 - 1989                Visiting Scientist, Ecosystems Research Center, Cornell University  
1986 -                      Visiting Investigator, Biology Department, Woods Hole Oceanographic Institution  
1985 - 1986                Postdoctoral Scholar, Biology Department, Woods Hole Oceanographic Institution

### **RESEARCH INTERESTS AND SYNERGISTIC ACTIVITIES**

Dr. Greene's research interests range from the ecological dynamics of marine animal populations to the impacts of climate variability and change on ocean ecosystems and the Earth system. During recent years, his interests have evolved towards seeking solutions to the grand challenges society faces in achieving a sustainable biosphere.

In 1991, Dr. Greene chaired a panel discussion on training and human resources development at a National Science Foundation-sponsored workshop on *GLOBEC Acoustic Instrumentation*. Recommendations from this panel discussion led the Office of Naval Research to fund several series of marine bioacoustics courses that he first organized in 1993 and will continue to coordinate through 2017. By bringing together many of the top researchers in marine bioacoustics, biological oceanography, and marine biology, these courses have provided students with a unique opportunity to work side by side with world experts using state-of-the-art tools and technologies. The courses also have provided a setting for developing and testing new technologies. In this manner, they have served as a research magnet, attracting leading scientists to conduct their own research in a creative teaching and learning environment that has catalyzed interactions across the various disciplines associated with marine bioacoustics. During the past 25 years, the courses have trained over 325 students from 32 countries.

In 2000, Dr. Greene organized a special symposium and workshop at the summer ASLO Meeting in Copenhagen, Denmark on *The Response of North Atlantic Shelf Ecosystems to Climate Variability and Change*. These activities led to the formation of a working group dedicated to investigating Marine Ecosystem Responses to Climate In the North Atlantic (MERCINA). The synthesis research conducted by MERCINA revealed that decadal-scale regime shifts in Northwest Atlantic shelf ecosystems are often remotely forced by atmosphere-cryosphere-ocean interactions in the Arctic's climate system.

Dr. Greene and his students have used the oceanographic insights from this research to advance the management of commercially exploited and protected animal populations in the Gulf of Maine, including cod and the highly endangered North Atlantic right whale. In the case of the right whales, they were able to demonstrate that variability in the population's recovery rate is strongly coupled to food availability, which in turn is linked to climate-driven changes in the ecosystem.

Since 2010, Dr. Greene has served on the leadership team of a consortium of universities and other organizations that are conducting marine microalgae research to develop an integrated approach for society to achieve climate, energy, food, and water security in the 21<sup>st</sup> century.

In recognition of his contributions to the oceanographic community in research, teaching, and service, Dr. Greene was elected a Fellow in The Oceanography Society in 2008 and a Sustaining Fellow in the Association for the Sciences of Limnology and Oceanography in 2016.

## **PROFESSIONAL COMMUNITY LEADERSHIP AND SERVICE**

2018	Member, Award Committee for Jerlov Medal in Ocean Optics, The Oceanography Society
2018 -	Council Member, Biological Oceanography, The Oceanography Society
2017	Chair, Award Committee on Fellows, The Oceanography Society
2010 -	Member, Advancement Board, Friday Harbor Laboratories, University of Washington
2009 - 2012	Member, Award Committee on Fellows, The Oceanography Society
2008 - 2011	Member, External Advisory Committee, Ocean Observing Initiative
2008 - 2013	Education Coordinator, Ocean Tracking Network
2001 -	Associate Editor, <i>Oceanography</i> , The Oceanography Society
2000 - 2013	Coordinator, MERCINA Working Group
1989 - 1992	United States Representative, Krill Working Group, Commission for the Conservation of Antarctic Marine Living Resources
1988 - 1991	Executive Committee Representative for Water-Column Biology, Office of Naval Research Flow Over Abrupt Topography Accelerated Research Initiative

## **UNIVERSITY COMMUNITY LEADERSHIP AND SERVICE**

2014 - 2017	Departmental Representative, University Faculty Senate
2010 - 2013	At-Large Member, College of Agriculture and Life Sciences Faculty Senate
2009 -	Director, Cornell - Woods Hole Oceanographic Institution Master of Engineering Ocean Science and Technology Program
2009 - 2012	Coordinator, Sustainable Earth, Energy and Environmental Systems

	Seminar Series, Cornell Center for a Sustainable Future
2006 - 2010	Chairman, Science of Earth Systems Curriculum Committee
2005 - 2007	At-Large Member, University Faculty Senate
1997	Chairman, Marine Sciences Program Committee, College of Agriculture and Life Sciences
1992 -	Director, Ocean Resources and Ecosystems Program, Cornell University
1988 - 1992	Director, Biological Resources Program, Cornell University

## **HONORS AND AWARDS**

2016	Sustaining Fellow, Association for the Sciences of Limnology and Oceanography
2010 - 2012	Sustainable Tompkins County Awards (a separate award for each year)
2008	Fellow, The Oceanography Society
2001	Faculty Innovation in Teaching Fellow, Cornell University
1999	Merrill Presidential Scholar Outstanding Educator, Cornell University
1998	J.P. and Mary Barger Excellence in Teaching Award, College of Engineering, Cornell University
1993	Rolex Awards for Enterprise Selected Project: Acoustic Visualization of Predator-Prey Interactions in the Southern Ocean Food Web
1985 - 1986	Woods Hole Oceanographic Institution Postdoctoral Fellowship
1983 - 1984	Seaspace Academic Scholarship
1982 - 1983	Havana Bradner Academic Scholarship
1979	Award for Excellence in Teaching Undergraduate Oceanography, School of Oceanography, University of Washington
1978	Chancellor's Medal, Recognition of Outstanding Academic Achievement, College of Arts and Sciences, University of Colorado
1978	Member, Phi Beta Kappa

## **SEAGOING RESEARCH EXPERIENCE**

Chief Scientist; Research Vessel Endeavor; Gulf of Maine; 12-day cruise; December 1999  
 Chief Scientist; Research Vessel Endeavor; Gulf of Maine; 12-day cruise; October 1999  
 Chief Scientist; Research Vessel Oceanus; Gulf of Maine; 12-day cruise; December 1998  
 Chief Scientist; Research Vessel Oceanus; Gulf of Maine; 12-day cruise; October 1998  
 Chief Scientist; Research Vessel Endeavor; Gulf of Maine; 10-day cruise; October 1997  
 Chief Scientist; Research Vessel Roger Revelle; Monterey Bay; 7-day cruise; August 1997  
 Chief Scientist; Research Vessel Seward Johnson and Research Submersible Johnson Sea Link; Gulf of Maine; 6-day cruise; September 1993  
 Chief Scientist; Research Vessel Seward Johnson and Research Submersible Johnson Sea Link; Gulf of Maine; 8-day cruise; August 1992  
 Chief Scientist; Research Vessel Endeavor; Gulf of Maine; Chief Scientist; 10-day cruise; August 1992  
 Chief Scientist; Research Vessel Seward Johnson and Research Submersible Johnson Sea Link; Gulf of Maine and submarine canyons south of Georges Bank; 8-day cruise; September 1989  
 Bioacoustics Team Leader; Coordinated Eastern Arctic Research Experiment, Ice Camp A; Arctic Ocean; 11-day deployment; April 1989

## **TEACHING EXPERIENCE**

### **Undergraduate Summer Internship Programs**

1996	Coordinator, Center for the Environment - Akumal Ecological Center Summer Internship Program, Akumal, Mexico; June 9 - August 4, 1996
1995	Coordinator, Center for the Environment - Akumal Ecological Center Summer Internship Program, Akumal, Mexico; June 15 - August 15, 1995
1994	Coordinator, Center for the Environment - Akumal Ecological Center Summer Internship Program, Akumal, Mexico; June 1 - August 15, 1994

## Advanced Summer Workshops

- 2013 Coordinator, Marine Bioacoustics, Friday Harbor Laboratories, Friday Harbor, WA; July 22 - August 16, 2013
- 2011 Coordinator, Marine Bioacoustics, Friday Harbor Laboratories, Friday Harbor, WA; June 20 - July 22, 2011
- 2009 Coordinator, Marine Bioacoustics, Friday Harbor Laboratories, Friday Harbor, WA; July 20 - August 21, 2009
- 2007 Coordinator, Marine Bioacoustics, Friday Harbor Laboratories, Friday Harbor, WA; July 16 - August 17, 2007
- 2005 Coordinator, Marine Bioacoustics, Friday Harbor Laboratories, Friday Harbor, WA; August 1 - 15, 2005
- 2004 Coordinator, Marine Bioacoustics, Hawaii Preparatory Academy, Waimea, HI; February 23 - March 12, 2004
- 2003 Coordinator, Marine Bioacoustics, Friday Harbor Laboratories, Friday Harbor, WA; July 14 - August 15, 2003
- 1998 Coordinator, Bioacoustical Oceanography Advanced Workshop: Top Predators and their Prey in the Marine Environment, Shoals Marine Laboratory, Appledore Island, ME/University of New Hampshire, Durham, NH; July 15 - August 8, 1998
- 1997 Coordinator, Bioacoustical Oceanography Workshop III: Top Predators and their Prey in the Marine Environment, University of California Santa Cruz, Santa Cruz, CA; July 21 - August 14, 1997
- 1996 Coordinator, Bioacoustical Oceanography Advanced Workshop: Top Predators and their Prey in the Marine Environment, University of California Santa Cruz, Santa Cruz, CA; August 5 - 30, 1996
- 1995 Coordinator, Bioacoustical Oceanography Workshop II: Top Predators and their Prey in the Marine Environment, University of California, Santa Cruz, Santa Cruz, CA; August 1 - 25, 1995
- 1993 Coordinator, Bioacoustical Oceanography Workshop, Friday Harbor Laboratories, Friday Harbor, WA; July 19 - August 21, 1993

## SIGNIFICANT RECENT PUBLICATIONS

- 2018 Beal, C.M., et al. Marine microalgae commercial production improves sustainability of global fisheries and aquaculture. *Scientific Reports* 8: 15064. DOI:10.1038/s41598-018-33504.
- 2018 Beal, C.M., et al. Integrating algae with bioenergy carbon capture and storage (ABECCS) increases sustainability. *Earth's Future* 6: 524-542. DOI: 10.1002/2017EF000704.
- 2018 Brosnan, I., et al. A description of a non-invasive surgical training pathway using translational tools to teach intracoelomic implantation of acoustic transmitters in fish. *J. Aquat. Anim. Health* 30: 226-232. DOI: 10.1002/AAH.10031.
- 2018 Meyer-Gutbrod, E., and C.H. Greene. Uncertain recovery of the North Atlantic right whale in a changing ocean. *Glob. Chang. Biol.* 24: 455-464.
- 2018 Meyer-Gutbrod, E.L. C.H. Greene, and K.T.A. Davies. Marine species range shifts necessitate advanced policy planning: the case of the North Atlantic right whale. *Oceanography* 31(2): 16-20.
- 2017 Greene, C.H., et al. Geoengineering, marine microalgae, and climate stabilization in the 21<sup>st</sup> century. *Earth's Future*. DOI: 10.1002/2016EF000486.
- 2017 Greene, C.H. Arctic sea ice loss, mid-latitude extreme weather, and Superstorm Sandy. Pages 437-438 in K.A. Sverdrup and R.M. Kudela, authors. *Investigating Oceanography*, 2<sup>nd</sup> Edition. McGraw Hill Education, New York.
- 2016 Walsh, M.J., et al. Algal food and fuel coproduction can mitigate greenhouse gas emissions while improving land and water-use efficiency. *Environ. Res. Lett.* 11 (2016) 114006. DOI: 10.1088/1748-9326/11/11/114006.
- 2016 Greene, C.H., et al. Marine microalgae: climate, energy, and food security from the sea. *Oceanography* 29(4): 10-15.
- 2016 Greene, C.H. North America's iconic marine species at risk due to unprecedented ocean warming. *Oceanography* 29(3): 14-17.
- 2016 Greene, C.H. Wading in the footsteps of an ecological giant. *Oceanography* 29 (2): 5-6.

- 2015 Rau, G.H., and C.H. Greene. Emissions reduction is not enough. *Science* 349: 1459.
- 2015 Meyer-Gutbrod, E., C.H. Greene, A.J. Pershing, and P. Sullivan. Climate-associated changes in prey availability drive reproductive dynamics of the North Atlantic right whale population. *Mar. Ecol. Progr. Ser.* 535: 243–258.
- 2015 Meyer-Gutbrod, E., C.H. Greene, L. McGarry. Wave Glider technology: Expanding the fisheries acoustics toolbox. *Sea Technol.* 56(12): 16-19.
- 2015 Huntley, M.E., et al. Demonstrated large-scale production of marine microalgae for fuels and feed. *Algal Res.* 10: 249-265.
- 2015 Conversi, A., V. Dakos, A. Gårdmark, S. Ling, C. Folke, P. Mumby, C. Greene, M. Edwards, T. Blenckner, M. Casini, A. Pershing, and C. Möllmann. A holistic view of marine regime shifts. *Phil. Trans. R. Soc. B.* 370: 20130279.
- 2015 Beaugrand, G., A. Conversi, S. Chiba, M. Edwards, S. Fonda-Umani, C. Greene, N. Mantua, S. A. Otto, P. C. Reid, M. M. Stachura, L. Stemann and H. Sugisaki. Synchronous marine pelagic regime shifts in the Northern Hemisphere. *Phil. Trans. R. Soc. B.* 370: 20130272.
- 2015 Beal, C.M., et al. Algal biofuel production for fuels and feed in a 100-ha facility: a comprehensive techno-economic analysis and life cycle assessment. *Algal Res.* 10: 266-279.
- 2014 Greene, C.H., et al. A Wave Glider approach to fisheries acoustics: transforming how we monitor the nation's commercial fisheries in the 21<sup>st</sup> century. *Oceanography*: 27(4): 168–174.
- 2014 Meyer-Gutbrod, E., and C.H. Greene. Climate-driven regime shifts drive decadal-scale variability in recovery of North Atlantic right whale population. *Oceanography* 27(3): 132-137.
- 2013 Sills, D.L., V. Paramita, M.J. Franke, M.C. Johnson, T.M. Akabas, C.H. Greene, and J.W. Tester. Quantitative uncertainty analysis of life cycle assessment for algal biofuel production. *Environ. Sci. Technol.* 47: 687–694.
- 2013 Greene, C.H., et al. Remote climate forcing of decadal-scale regime shifts in Northwest Atlantic shelf ecosystems. *Limnol. Oceanogr.* 58: 803-816.
- 2013 Greene, C.H., J.A. Francis, and B.C. Monger. Superstorm Sandy: A series of unfortunate events? *Oceanography* 26(1): 8–9.
- 2013 Greene, C.H. Towards a more balanced view of marine ecosystems. *Fish. Oceanogr.* 22: 140-142.
- 2012 MERCINA (Greene, C.H., et al.). Recent Arctic climate change and its remote forcing of Northwest Atlantic shelf ecosystems. *Oceanography* 25(3): 208-213.
- 2012 Greene, C.H., and B.C. Monger. An Arctic wildcard in the weather. *Oceanography* 25(2): 7-9.
- 2012 Greene, C.H. The winters of our discontent. *Scientific American* 307: 50-55.
- 2010 Greene, C. Monger, B. Huntley, M. Geoengineering: the inescapable truth of getting to 350. *Solutions* 1(5): 57-66.
- 2010 Greene, C.H., D.J. Baker, and D.H. Miller. A very inconvenient truth. *Oceanography* 23 (1): 214-218.
- 2009 Greene, C.H., B.C. Monger, and L.P. McGarry. Some like it cold. *Science* 324: 733-734.
- 2009 Greene, C.H., B.A. Block, D. Welch, G. Jackson, and G.L. Lawson. Advances in conservation oceanography: new tagging and tracking technologies and their potential for transforming the science underlying fisheries management. *Oceanography* 22 (1): 210-223.
- 2008 Greene, C.H., A.J. Pershing, T.M. Cronin, and N. Cecci. Arctic climate change and its impacts on the ecology of the North Atlantic. *Ecology* 89(11) Supplement 2008: S24-S38.
- 2007 Greene, C.H., and A.J. Pershing. Climate drives sea change. *Science* 315: 1084-1085.
- 2005 Pershing, A.J., C.H. Greene, J.W. Jossi, L. O'Brien, J.K.T. Brodziak, and B.A. Bailey. Interdecadal variability in the Gulf of Maine zooplankton community with potential impacts on fish recruitment. *ICES J. Mar. Sci.* 62: 511-523.
- 2004 MERCINA (Greene, C.H., et al.). Supply-side ecology and the response of zooplankton to climate-driven changes in North Atlantic Ocean circulation. *Oceanography* 17(3): 10-21.

- 2004 Greene, C.H., and A.J. Pershing. Climate and the conservation biology of North Atlantic right whales: the right whale at the wrong time? *Frontiers Ecol. Environ.* 2: 29-34.
- 2003 MERCINA (Greene, C.H., et al.). Trans-Atlantic responses of *Calanus finmarchicus* populations to basin-scale forcing associated with the North Atlantic Oscillation. *Progr. Oceanogr.* 58: 301-312.
- 2003 Greene, C.H., A.J. Pershing, R.D. Kenney, and J.W. Jossi. Impact of climate variability on the recovery of endangered North Atlantic right whales. *Oceanography* 16(4): 96-101.
- 2001 MERCINA (Pershing, A.J., et al.). Oceanographic responses to climate in the Northwest Atlantic. *Oceanography* 14(3): 77-83.

## ADVISING

### POSTDORAL ASSOCIATES

- Dr. Sam McClatchie. 1990. Cornell University (Current position: Supervisory Fisheries Oceanographer, NOAA Southwest Fisheries Science Center)
- Dr. Bruce Monger. 1993-1994. Cornell University (Current position: Senior Lecturer, Cornell University)
- Dr. Andrew Pershing. 2001-2003. Cornell University (Current position: Chief Scientist, Gulf of Maine Research Institute)
- Dr. Deborah Sills. 2011-2013. Cornell University (Current position: Assistant Professor, Bucknell University)
- Dr. Leda Gerber. 2013- 2016. Cornell University (Current position: Assistant Professor, University of North Carolina)
- Dr. Louise McGarry. 2014-2016. (Current position: Research Associate, University of Maine)
- Dr. Erin Meyer-Gutbrod. 2016-2017. (Current position: Postdoctoral Associate, University of California Santa Barbara)

### DOCTORAL STUDENTS

- Dr. Shonali Chandy. 1997. Estimating the predatory impact of gelatinous zooplankton. Ecology and Evolutionary Biology, Cornell University
- Dr. Gideon Gal. 1999. The biological and physical interactions of *Mysis relicta* in Lake Ontario. Ecology and Evolutionary Biology, Cornell University (Current position: Head/Senior Scientist/ Kinneret Limnological Laboratory, Israel)
- Dr. Andrew Pershing. 2001. Response of large marine ecosystems to climate variability: patterns, processes, concepts, and methods. Ecology and Evolutionary Biology, Cornell University (Current position: Chief Scientist, Gulf of Maine Research Institute)
- Dr. Karen Fisher Favret. 2002. Intermittency of spatial and temporal plankton patterns. Ecology and Evolutionary Biology, Cornell University (Current position: Chief Scientist, Spatial Temporal Earth, LLC, Montreal, Canada)
- Dr. Yianna Samuel-Rhoads. 2008. Climatic impacts on ocean ecosystems: a study of climate variability and conservation oceanography. Geological Sciences, Cornell University (Current position: Research Associate, University of Cyprus, Cyprus)
- Dr. Andrew Fischer. 2008. An estuarine plume and coastal ocean variability: discerning a land-sea linkage in Monterey Bay, California. Geological Sciences, Cornell University (Current position: Lecturer, University of Tasmania, Australia)
- Dr. Louise McGarry. 2014. An examination of blue whale foraging and its krill prey field in the Monterey Bay submarine canyon. Geological Sciences, Cornell University (Current position: Research Associate, University of Maine)
- Dr. Ian Brosnan. 2014. Death of a salmon: An investigation of the processes affecting survival and migration of juvenile yearling Chinook salmon (*Oncorhynchus tshawytscha*) in the lower Columbia River and ocean plume with acoustic telemetry, mark-recapture statistics, and individual-based modeling. Ecology and Evolutionary Biology, Cornell University (Current position: Associate Chief for Strategic Planning, NASA Ames Research Center)

Dr. Erin Meyer-Gutbrod. 2016. Impacts of climate-associated changes in prey availability on population dynamics of the North Atlantic right whale. Atmospheric Science, Cornell University (Current position: Postdoctoral Associate, University of California Santa Barbara)

## **ORGANIZED WORKSHOPS AND SYMPOSIA**

- Workshop (organizer) on "Conservation Oceanography of Right Whales." Lenfest Ocean Program Workshop, Friday Harbor, WA; August 2019.
- Workshop (co-organizer) on "Forecasting Ecosystem Indicators with Process-Based Models." GLOBEC/PICES/ICES Workshop, Friday Harbor, WA; September 2012.
- Special Symposium (organizer) on "The Challenges of Getting to 350." American Association for the Advancement of Science Annual Meeting, Vancouver, British Columbia; February 2012.
- Workshop (organizer) on "Remote Climate Forcing of NW Atlantic Shelf Ecosystems," Ecological Studies of Subarctic Seas Meeting, Seattle, Washington; June 2011.
- Research Symposium (organizer) on "Global Ocean Ecosystems and Climate." US Global Ocean Ecosystems Pan Regional Synthesis Symposium, Friday Harbor, Washington; August 2010.
- Special Symposium (organizer) on "Marine Ecosystem Regime Shifts: Observations and Predictions." American Geophysical Union/American Society of Limnology and Oceanography/The Oceanography Society Ocean Sciences Meeting, Portland, Oregon; February 2010.
- Workshop (organizer) on "Remote Climate Forcing of NW Atlantic Shelf Ecosystems," American Geophysical Union/American Society of Limnology and Oceanography/The Oceanography Society Ocean Sciences Meeting, Portland, Oregon; February 2010.
- Workshop (organizer) on "Responses of NW Atlantic Shelf Ecosystems to Climate Forcing," Shoals Marine Laboratory's Creek Farm Campus, Portsmouth, New Hampshire; October 2008.
- Special Symposium (organizer) on "Influences of Recent Changes in the Arctic on Subarctic and Mid-Latitude Marine Ecosystems." American Geophysical Union/American Society of Limnology and Oceanography/The Oceanography Society Ocean Sciences Meeting, Orlando, Florida; March 2008.
- Special Symposium (organizer) on "Emergence of Conservation Oceanography." American Association for the Advancement of Science Annual Meeting, San Francisco, California; February 2007.
- Workshop (organizer) on "Responses of NW Atlantic Shelf Ecosystems to Arctic Climate Change," Gulf of Maine Research Institute, Portland, Maine; November 2006.
- Workshop (organizer) on "Climate-Based Assessment and Forecasting of Ecosystems (CAFÉ) in the Gulf of Maine," Boston, Massachusetts; December 2004.
- Special Symposium (organizer) on "Ocean Observing Systems: Novel Approaches to Studying and Monitoring Large Marine Ecosystems and their Living Resources." American Society of Limnology and Oceanography/The Oceanography Society Ocean Research Conference, Honolulu, Hawaii; February 2004.
- Workshop (organizer) on "Hawaiian Ocean Resources and Ecosystems Observatory," Keauhou Beach Resort, Keauhou, Hawaii; February 2003.
- Special Symposium and Workshop (organizer) on "Marine Ecosystem Responses to Climate: The Responses of Large Marine Ecosystems to Interdecadal-Scale Climate Variability." American Geophysical Union/American Society of Limnology and Oceanography Ocean Sciences Meeting, Honolulu, Hawaii; February 2002.
- Workshop (organizer) on "Response of NW Atlantic Marine Ecosystems to Climate Variability," National Center for Ecological Analysis and Synthesis, Santa Barbara, California; Spring 2001.
- Special Symposium and Workshop (organizer) on "The Response of Northeast and Northwest Atlantic Shelf Ecosystems to Climate Variability and Change." American Society of Limnology and Oceanography Summer Meeting, Copenhagen, Denmark; June 2000.
- Workshop (organizer) on "Spatio-Temporal Dynamics: New Statistical and Modeling Approaches for Analyzing Spatially and Temporally Indexed Data from Pelagic Ecosystems," Cornell University, Ithaca, New York; Autumn 1996.

## HISTORY OF GRANT SUPPORT

Funding Agency: Office of Naval Research  
Title: Marine Bioacoustics: Applications in Mobile Ocean Observing Network  
Principal Investigator: Charles H. Greene (The Kohala Center)  
Project Duration: June 1, 2018 – May 31, 2021  
Award Amount: \$74,307

Funding Agency: Lenfest Ocean Program, Pew Charitable Trusts  
Title: Climate Change and the Conservation Oceanography of the North Atlantic Right Whale Population  
Principal Investigators: Charles H. Greene (Cornell University)  
Project Duration: May 24, 2018 - May 31, 2020  
Award Amount: \$285,200

Funding Agency: Atkinson Center for a Sustainable Future, Cornell University  
Title: Transforming Fisheries Science and Management  
Principal Investigators: Charles H. Greene (Cornell University), Helen Takade-Heumacher, and  
Jake Kritzer (Environmental Defense Fund)  
Project Duration: April 1, 2016 - March 31, 2017  
Award Amount: \$87,570

Funding Agency: Department of Energy  
Title: Marine Algae Industrialization Consortium  
Principal Investigator: Zackary Johnson (Duke)  
Project Duration: October 1, 2015 – September 30, 2019  
Award Amount: \$5,240,313

Funding Agency: Atkinson Center for a Sustainable Future, Cornell University  
Title: Developing Surrogates for Advanced Liquid Transportation Fuels  
Principal Investigators: C. Thomas Avedisian et al. (Cornell University)  
Project Duration: July 15, 2014 - July 14, 2015  
Award Amount: \$103,084

Funding Agency: National Science Foundation  
Title: Development of a Large-Area, High-Resolution Marine Acoustic Tracking System  
Principal Investigator: Charles H. Greene (Cornell University)  
Project Duration: July 1, 2013 - June 30, 2016  
Award Amount: \$500,036

Funding Agency: Office of Naval Research  
Title: Marine Bioacoustics: Soundtracks for the Future  
Principal Investigator: Charles H. Greene (The Kohala Center)  
Project Duration: April 1, 2013 – March 31, 2018  
Award Amount: \$250,007

Funding Agency: Department of Defense  
Title: National Defense Science and Engineering Predoctoral Fellowship: Erin L. Meyer-Gutbrod  
Principal Investigators: Charles H. Greene and Erin L. Meyer-Gutbrod (Cornell University)  
Project Duration: August 1, 2012 - July 31, 2015  
Award Amount: \$92,500

Funding Agency: National Oceanic and Atmospheric Administration  
Title: Pilot study utilizing a Wave Glider towed echo-sounder system for fisheries acoustic surveys:  
Application to acoustic surveys of Pacific hake (*Merluccius productus*)  
Principal Investigators: Larry Hufnagle (NMFS), Dezhang Chu (NMFS), Charles Greene (Cornell),  
Janusz Burczynski (BioSonics), Alan Declerk (Liquid Robotics)  
Project Duration: August 1, 2012 – July 31, 2014  
Award Amount: \$205,776



Funding Agency: Atkinson Center for a Sustainable Future, Cornell University  
Title: Sustainable Hawaii  
Principal Investigators: Charles H. Greene et al. (Cornell University)  
Project Duration: July 1, 2012 – December 31, 2014  
Award Amount: \$20,000

Funding Agency: Department of Energy  
Title: Algal Biofuels Consortium: Large-Scale Production of Fuels and Feeds from Marine Microalgae  
Principal Investigators: Charles H. Greene and Mark E. Huntley (Cornell)  
Project Duration: July 29, 2011 – September 30, 2015  
Award Amount: \$8,713,416

Funding Agency: Atkinson Center for a Sustainable Future, Cornell University  
Title: Sustainable Energy Pathways: The Qatar Connection  
Principal Investigators: Charles H. Greene et al. (Cornell University)  
Project Duration: July 1, 2011 – December 31, 2013  
Award Amount: \$16,000

Funding Agency: Department of Agriculture (subcontract from Cellana)  
Title: Developing a New Generation of Animal Feed Protein Supplements: Co-Products from Marine Algae Biofuel Production  
Principal Investigators: Charles H. Greene and Xingen Lei (Cornell)  
Project Duration: March 1, 2011 – February 28, 2015  
Award Amount: \$499,972

Funding Agency: Cellana  
Title: Algal Biofuels Life Cycle Analysis  
Principal Investigator: Charles H. Greene (Cornell)  
Project Duration: December 1, 2010 – June 1, 2011  
Award Amount: \$51,041

Funding Agency: National Science Foundation  
Title: Wave Gliders in the Development of a Continental-Scale Integrated Ocean-Observing System  
Principal Investigator: Charles H. Greene (Cornell University)  
Project Duration: October 1, 2010 - September 30, 2013  
Award Amount: \$452,190

Funding Agency: Department of Defense  
Title: National Defense Science and Engineering Predoctoral Fellowship: Ian G. Brosnan  
Principal Investigators: Charles H. Greene and Ian G. Brosnan (Cornell University)  
Project Duration: August 1, 2010 - July 31, 2013  
Award Amount: \$92,500

Funding Agency: National Science Foundation (subcontract from Rutgers)  
Title: U.S. GLOBEC: Global Ocean Ecosystems and Climate: A Pan-Regional Synthesis  
Principal Investigators: Charles H. Greene (Cornell University)  
Project Duration: January 1, 2009 – February 28, 2013  
Award Amount: \$150,070

Funding Agency: Office of Naval Research  
Title: Marine Bioacoustics: Back to the Future  
Principal Investigator: Charles H. Greene (The Kohala Center)  
Project Duration: January 1, 2008 – December 31, 2012  
Award Amount: \$530,235

Funding Agency: College of Engineering, Cornell University  
Title: Plug in the Big Island – Clearing the Gridlock for a Sustainable Energy Future  
Principal Investigators: Max Zhang, Robert Thomas, and Charles H. Greene (Cornell University)  
Project Duration: July 1, 2007 – June 30, 2008  
Award Amount: \$30,000

Funding Agency: National Science Foundation  
Title: U.S. GLOBEC: NWA/Georges Bank – Marine Ecosystem Responses to Climate-Associated Remote Forcing from the Labrador Sea  
Principal Investigators: Charles H. Greene and Andrew J. Pershing (Cornell University)  
Project Duration: January 1, 2006 – June 30, 2009  
Award Amount: \$256,920

Funding Agency: National Oceanic and Atmospheric Administration (Subcontract from GOMOOS)  
Title: A Regional Association Project to Observe Ocean Climate in the Gulf of Maine in Support of Marine Resource Management: A Sentinel Buoy in the Northeast Channel with Predictive Tools for Shrimp Stocks and Marine Mammals  
Principal Investigators: Gulf of Maine Ocean Observing System (GOMOOS)  
Project Duration: October 1, 2003-September 30, 2004  
Award Amount: \$35,972

Funding Agency: Office of Naval Research  
Title: Bioacoustical Oceanography Workshops: The Next Generation  
Principal Investigator: Charles H. Greene (The Kohala Center, Cornell University)  
Project Duration: January 1, 2003 – December 31, 2007  
Award Amount: \$510,087

Funding Agency: National Oceanic and Atmospheric Administration  
Title: Synthesis: Climate-Based Forecasts for the Gulf of Maine Ecosystem  
Principal Investigators: Andrew J. Pershing and Charles H. Greene, (Cornell University), Barbara A. Bailey (University of Illinois), Jon K.T. Brodziak, Loretta O'Brien, and Jack W. Jossi (National Marine Fisheries Service)  
Project Duration: September 1, 2002 – August 31, 2004  
Award Amount: \$350,546

Funding Agency: National Oceanic and Atmospheric Administration  
Title: Right whales, *Calanus*, and climate: understanding the distribution and abundance of right whales relative to their prey  
Principal Investigators: Andrew J. Pershing, Charles H. Greene, and Bruce C. Monger (Cornell University)  
Project Duration: July 1, 2001 – June 30, 2003  
Award Amount: \$210,756

Funding Agency: National Aeronautics and Space Administration  
Title: Undergraduate Course on Satellite Remote Sensing in Biological Oceanography  
Principal Investigators: Bruce C. Monger and Charles H. Greene (Cornell University), Heidi Sosik (Woods Hole Oceanographic Institution),  
Project Duration: July 1, 2001 – June 30, 2002  
Award Amount: \$89,482

Funding Agency: National Aeronautics and Space Administration  
Title: Undergraduate Course on Satellite Remote Sensing in Biological Oceanography  
Principal Investigators: Bruce C. Monger and Charles H. Greene (Cornell University), Heidi Sosik (Woods Hole Oceanographic Institution), and James J. Bisagni (University of Massachusetts)  
Project Duration: July 1, 1999 – March 31, 2001  
Award Amount: \$152,501

Funding Agency: National Oceanic and Atmospheric Administration  
Title: Estimating the *in situ* Acoustic Target Strength, Distribution and Abundance of Diapausing *Calanus finmarchicus* and its Invertebrate Predators in the Deep Basins of the Gulf of Maine  
Principal Investigators: Mark C. Benfield (Louisiana State University), Charles H. Greene (Cornell University), Peter H. Wiebe, Timothy K. Stanton (Woods Hole Oceanographic Institution), and Richard F. Shaw (Louisiana State University)  
Project Duration: May 1, 1998 – December 31, 1999  
Award Amount: \$102,156

Funding Agency: National Science Foundation  
Title: U.S. GLOBEC: Broad-Scale Patterns of the Distribution of Zooplankton and Nekton in Relation to Micro-, and Coarse-scale Physical Structure in the Georges Bank Region  
Principal Investigators: Peter H. Wiebe, Timothy K. Stanton, and Charles H. Greene (Woods Hole Oceanographic Institution)  
Project Duration: February 15, 1998 – January 31, 1999  
Award Amount: \$90,000

Funding Agency: National Aeronautics and Space Administration  
Title: Biological and Physical Controls of Primary Production and its Subsequent Fate in the Georges Bank Region: an Integration of Satellite Imagery and US-GLOBEC Survey Cruises  
Principal Investigators: Charles H. Greene and Bruce C. Monger (Cornell University)  
Project Duration: September 1, 1997 – October 31, 2000  
Award Amount: \$218,223

Funding Agency: National Aeronautics and Space Administration  
Title: Volumetric Assessment of Factors Governing Seasonal and Interannual Fluxes of Phytoplankton from Georges Bank 1994-1999 and Applications to SeaWiFS Data for Large-Scale New Production Estimates  
Principal Investigators: Charles H. Greene and Karen Fisher (Cornell University)  
Project Duration: September 1, 1998 – August 31, 2001  
Award Amount: \$66,000

Funding Agency: National Oceanic and Atmospheric Administration  
Title: U.S. GLOBEC: Processes Controlling the Recruitment of *Calanus finmarchicus* Populations from the Gulf of Maine to Georges Bank  
Principal Investigators: Charles H. Greene (Cornell University), Mark C. Benfield (Louisiana State University), and Peter H. Wiebe (Woods Hole Oceanographic Institution)  
Project Duration: January 1, 1997 – June 30, 2001  
Award Amount: \$645,846

Funding Agency: Department of Defense  
Title: National Defense Science and Engineering Predoctoral Fellowship: Andrew J. Pershing  
Principal Investigators: Charles H. Greene and Andrew J. Pershing (Cornell University)  
Project Duration: August 1, 1996 – July 31, 1999  
Award Amount: \$86,352

Funding Agency: Office of Naval Research  
Title: Bioacoustical Oceanography Workshops: Top Predators and their Prey in the Marine Environment  
Principal Investigator: Charles H. Greene (Cornell University)  
Project Duration: January 1, 1996 – September 30, 1998  
Award Amount: \$225,000

Funding Agency: Department of Defense  
Title: A High-Performance Towed Platform for Bio-Optical, Acoustical, and Physical Data Acquisition  
Principal Investigators: Peter H. Wiebe, Timothy K. Stanton, and Charles H. Greene (Woods Hole Oceanographic Institution)  
Project Duration: July 1, 1995 – June 30, 1996  
Award Amount: \$458,100

Funding Agency: National Science Foundation  
Title: U.S. GLOBEC: Broad-Scale and Time Series Acoustic Measurements of Zooplankton and Nekton  
in the Georges Bank Region  
Principal Investigators: Peter H. Wiebe, Timothy K. Stanton, and Charles H. Greene  
(Woods Hole Oceanographic Institution)  
Project Duration: March 1, 1995 – February 28, 1997  
Award Amount: \$399,477

Funding Agency: National Science Foundation  
Title: Bioacoustical Oceanography Workshop II  
Principal Investigators: Timothy K. Stanton, Peter H. Wiebe, and Charles H. Greene  
(Woods Hole Oceanographic Institution)  
Project Duration: March 1, 1995 – December 31, 1995  
Award Amount: \$25,000

Funding Agency: New York State Sea Grant  
Title: Dynamics of the Mysid Population in Lake Ontario  
Principal Investigators: Lars G. Rudstam, Edward L. Mills, Charles H. Greene (Cornell University)  
and Ora Johansson (Great Lakes Laboratory)  
Project Duration: February 1, 1995 – January 31, 1997  
Award Amount: \$150,000

Funding Agency: Office of Naval Research  
Title: Bioacoustical Oceanography Workshop II  
Principal Investigator: Charles H. Greene (Cornell University)  
Project Duration: January 1, 1995 – December 31, 1995  
Award Amount: \$52,636

Funding Agency: Office of Naval Research  
Title: Marine Mammals and Acoustic Remote-Sensing Initiative  
Principal Investigator: Charles H. Greene (Cornell University)  
Project Duration: May 1, 1994 – April 30, 1996  
Award Amount: \$44,693

Funding Agency: Office of Naval Research  
Title: Bioacoustical Oceanography Workshop  
Principal Investigator: Charles H. Greene (Cornell University)  
Project Duration: Apr. 15, 1993 – Dec. 31, 1994  
Award Amount: \$50,357

Funding Agency: National Oceanic and Atmospheric Administration  
Title: GLOBEC Field Studies in the NW Atlantic: Predatory Impact of Euphausiids on Overwintering  
*Calanus finmarchicus* Populations in the Gulf of Maine  
Principal Investigator: Charles H. Greene (Cornell University)  
Project Duration: Feb. 1, 1992 – Jan. 1, 1994  
Award Amount: \$11,187 and 2 weeks of Johnson Sea Link submersible time

Funding Agency: Department of Defense (subcontract from WHOI)  
Title: Modeling Biological-Physical Interactions: A Population Biological Approach  
Principal Investigator: Charles H. Greene (Cornell)  
Project Duration: April 1, 1992 – March 31, 1997  
Award Amount: \$662,735

Funding Agency: National Science Foundation  
Title: Bioacoustical Oceanography: Dual-Beam Acoustics Deployed on a Multiple Opening/Closing Net  
and Environmental Sensing System (D-BAD MOCNESS)  
Principal Investigators: Charles H. Greene (Cornell University) and Peter H. Wiebe  
(Woods Hole Oceanographic Institution)  
Project Duration: June 1, 1991 – May 30, 1993  
Award Amount: \$133,027 (to Cornell University); \$250,013 (to Woods Hole Oceanographic Institution)

Funding Agency: Office of Naval Research  
Title: Bioacoustical Signatures of Seamounts  
Principal Investigator: Charles H. Greene (Cornell University)  
Project Duration: Oct. 1, 1988 – Sept. 30, 1993  
Award Amount: \$440,051

Funding Agency: New York Sea Grant  
Title: Cornell's Year of Ocean Awareness Open House and Distinguished  
Ocean Scholar Seminar Series  
Principal Investigator: Charles H. Greene (Cornell University)  
Project Duration: Sept. 1, 1989 – May 30, 1990  
Award Amount: \$9,000

Funding Agency: National Oceanic and Atmospheric Administration  
Title: The Distributional Patterns of Antarctic Krill: Collection and Analysis of Hydroacoustic Survey Data  
off Elephant Island  
Principal Investigators: Charles H. Greene and Simon A. Levin (Cornell University)  
Project Duration: Dec. 1, 1989 – Sept. 30, 1990  
Award Amount: \$75,126

Funding Agency: Office of Naval Research  
Title: Arctic Zooplankton Ecology  
Principal Investigators: Charles H. Greene (Cornell University) and Peter H. Wiebe  
(Woods Hole Oceanographic Institution)  
Project Duration: Jan. 1, 1988 – Sept. 30, 1990  
Award Amount: \$362,503

Funding Agency: Office of Naval Research  
Title: Variability in Zooplankton Vertical Migration Behavior  
Principal Investigators: Charles H. Greene and Peter H. Wiebe (Woods Hole Oceanographic Institution)  
Project Duration: Feb. 1, 1987 – Sept. 30, 1988  
Award Amount: \$168,333