

Adam T. Greer, PhD

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Appointments

Postdoctoral Research Associate, **University of Southern Mississippi** (July 2015 – Present) – CONCORDE: understanding the fate of oil through physics and food web processes using multibeam acoustics and *in situ* imaging technologies in the Gulf of Mexico.

Postdoctoral Research Associate, **University of Georgia** (November 2013 – July 2015) – incorporating image data into ecosystem models with emphasis on model parameterization of biological processes.

Education

PhD, **University of Miami** – Rosenstiel School of Marine and Atmospheric Science 2013
Dissertation: “Fine-scale distributions of plankton and larval fishes: Implications for predator-prey interactions near coastal oceanographic features”

Advised by Dr. Robert K. Cowen

Committee members: Dr. Su Sponaugle, Dr. Peter Ortner, Dr. Jonathan Hare, and Dr. Mei-Ling Shyu

BA, **Vanderbilt University** – Department of Biological Sciences 2007
Ecology, Evolution, and Organismal Biology, *Cum Laude*

Research Interests:

Fish early life history, biological oceanography, marine ecosystems, plankton ecology, trophic interactions, biophysical coupling, ichthyology, behavioral ecology, optics and imaging, ecological database design and management, sampling technology, citizen science

Research Skills:

Image analysis, phytoplankton and zooplankton taxonomy, statistics, oceanographic instrumentation (plankton nets, imaging, CTD, FlowCam), acoustics, agent-based modeling, AAUS Scientific Diver, PADI Advanced Open Water Certified, immunohistochemistry, paraffin and frozen sectioning, PCR

Software:

R (advanced), ImageJ (advanced), MATLAB (intermediate), Java (intermediate), WinBugs (intermediate), FMMidwater (intermediate), SQL (beginner), Python (beginner)

Teaching and Mentoring

Currently work closely with two students at the University of Southern Mississippi (Graham lab), Katrina Aleksa and Adam Boyette, helping advise in data analysis and writing for publications and PhD dissertations.

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ASLO mentor for Erin McCarthy (UNC-Wilmington) and Kristin Gloeckler (UH-Mānoa) at the Aquatic Science Meeting, Honolulu, HI, March 2017

ASLO mentor for Joy Shapiro (University of San Diego) at the Ocean Sciences Meeting, New Orleans, LA, February 2016

Co-designed and taught the course “Biophysical Interactions in the Ocean” at the University of Georgia (ENGR 8890 Spring 2015) – a graduate level course examining the interaction of physics and biology across a range of spatial scales and trophic levels throughout marine ecosystems. We also discussed how these interactions may change in the future.

Guest lecture “Exploring the Ocean” highlighting various sampling techniques used in ocean science – October 21, 2014

Advised two undergraduate researchers at the University of Georgia: Conner Smith and Taylor McKenzie

Assisted in the undergraduate senior thesis projects of Benjamin Grassian and Jenna Binstein at the University of Miami (primary mentor was labmate Jessica Luo)

Teaching assistant for Biology of Fishes (undergraduate) at the University of Miami in 2011. Organized the lab sessions and gave three class lectures.

Outreach

Volunteer for the *RV Point Sur* “open ship” day at the Port of Gulfport on July 17, 2017. We talked to the public about the various kinds of research being done in the Gulf of Mexico.

Served as science judge for talks and posters at the Graduate Student Symposium held on March 5, 2016 at USM’s Gulf Coast Research Laboratory in Ocean Springs, MS

Ongoing work with local fishing community talking about the science being performed by the CONCORDE team and what we can learn from the data collected in the Gulf of Mexico – lead is Dr. Jessica Kastler (2015 – present)

Assisted in introducing local high school teachers to plankton ecology and field techniques in marine science aboard the *RV Point Sur*. We collected and processed plankton net samples and physical oceanographic data. July 15, 2015

Part of the science team and blog writer for www.planktonportal.org: a citizen science project to engage the public in scientific research and teach about ocean biodiversity. Blogs are written about various aspects of plankton ecology and oceanographic research for a general audience.

Volunteer tutor/mentor for 8th graders for the University of Miami Kulula Project from 2011-2012

Vanderbilt Student Volunteers for Science (VSVS) – science demonstrations and teaching for 6th graders from 2006-2007

Awards

RSMAS Student Travel Award 2012

Capt. Harry D. Vernon Scholarship 2012

NSF Graduate Research Fellowship honorable mention 2010

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NOAA LMRCSC Fellowship 2009-2010
RSMAS Alumni Fellowship 2008

Pending Funding

(Proposal submitted) co-PI (lead-PI is Mark Benfield – Louisiana State University, collaboration with the U.S. Naval Research Lab) Development of a novel turbulence mapping technique exploiting GoMRI particle imagery. Gulf of Mexico Research Initiative.

\$800,000 (2 yr)

(Proposal submitted) co-PI (lead-PI is Jeff Krause – Dauphin Island Sea Lab) Plankton Thin Layers in the Northern Gulf of Mexico. Gulf of Mexico Research Initiative.

\$1,500,000 (3 yr)

(Proposal submitted) postdoc (lead-PI is Jerry Wiggert – University of Southern Mississippi) CONCORDE II - Consortium for Oil Spill Exposure Pathways in Coastal River-Dominated Ecosystems. Gulf of Mexico Research Initiative.

\$6,000,000 (2 yr)

Oceanographic Cruises and Field Work

July 21 – 30, 2016 – *RV Point Sur* – member of the CONCORDE plankton sub-group using ISIIS to map plankton distribution on the inner shelf of the northern Gulf of Mexico

March 30 – April 12, 2016 – *RV Point Sur* – member of the CONCORDE plankton sub-group using ISIIS to map plankton distribution on the inner shelf of the northern Gulf of Mexico. Served as Chief Scientist for the second half of this cruise (April 6 – April 12)

October 27 – November 5, 2015 – *RV Point Sur* – member of the CONCORDE plankton sub-group using ISIIS to study the drivers of plankton distributions on the inner shelf of the northern Gulf of Mexico.

September 3 – 19, 2014 – assisted in field research at several sites in Baja California, Mexico. Collaborators were Brock Woodson, Fiorenza Micheli, Charles Boch, and Justin Rogers.

June, July and August (three 2 week cruises) 2011 – NOAA *McArthur II* – studied vertical distribution patterns of larval fish and zooplankton as part of the Natural Resource Damage Assessment (NRDA) for the Gulf of Mexico oil spill.

October 15 – 17, 2010 – NOAA *Bell M. Shimada* – “shakedown” cruise sampling a front with the *In Situ* Ichthyoplankton Imaging System (ISIIS) off the coast of San Diego, CA.

August – September 2010 – NOAA *Delaware II* – Ecosystem monitoring cruise investigating ichthyoplankton assemblages near Georges Bank and the Gulf of Maine.

June – July 2010 – *RV Shana Rae* – investigation of thin layer formation and zooplankton composition in Monterey Bay.

July 2008 – *RV Walton Smith* – Study of larval fish population dynamics in the Florida Straits.

Prior Research Experience

Lab Technician for Dr. David Bader at Vanderbilt University Department of Cardiology:
June 2007 – June 2008

Studied developmental biology of the mesothelium using a variety of laboratory techniques, including immunohistochemistry, paraffin/frozen sectioning, and PCR.

Lab Assistant for Dr. Daniel Funk at Vanderbilt University Department of Biological Sciences: June 2005 – August 2005

Performed feeding experiments and assisted with data collection and experimental set up. Research was aimed at studying varieties of leaf beetles (*Neochlamisus bebbianae*) and the potential for sympatric speciation based on survival and reproduction differences among host plants.

Publications

Greer, A.T., L.M. Chiaverano, J.Y. Luo, R.K. Cowen, W.M. Graham (in press) Ecology and behaviour of holoplanktonic scyphomedusae and their interactions with larval and juvenile fishes in the northern Gulf of Mexico. *ICES Journal of Marine Science*

Greer, A.T., C. Briseño-Avena, A.L. Deary, F.J. Hernandez, R.K. Cowen, W.M. Graham (2017) Associations between lobster phyllosoma and gelatinous zooplankton in relation to oceanographic properties in the northern Gulf of Mexico. *Fisheries Oceanography* 26(6), doi: 10.1111/fog.12228

Dzwonkowski, B., **A.T. Greer**, C. Briseño-Avena, J.W. Krause, I.M. Soto, F.J. Hernandez, A.L. Deary, J.D. Wiggert, D. Joung, P.J. Fitzpatrick, S.J. O'Brien, S.L. Dykstra, Y. Lau, M.K. Cambazoglu, G. Lockridge, S.D. Howden, A.M. Shiller, W.M. Graham (2017) Estuarine influence on biogeochemical properties of the Alabama shelf during the fall season. *Continental Shelf Research* 140: 96-109, doi: 10.1016/j.csr.2017.05.001

Greer, A.T., C.B. Woodson, C.E. Smith, C.M. Guigand, R.K. Cowen (2016) Examining mesozooplankton patch structure and its implications for trophic interactions in the northern Gulf of Mexico. *Journal of Plankton Research*, 38(4): 1115-1134, doi: 10.1093/plankt/fbw033

Greer, A.T., C.B. Woodson, C.M. Guigand, R.K. Cowen (2016) Larval fishes utilize Batesian mimicry as a survival strategy in the plankton. *Marine Ecology Progress Series*, 551 (Feature Article): 1-12, doi: 10.3354/meps11751

Greer, A.T. and C.B. Woodson (2016) Application of a predator-prey overlap metric to determine the impact of sub-grid scale feeding dynamics on ecosystem productivity. *ICES Journal of Marine Science*, 73(4): 1051-1061, doi: 10.1093/icesjms/fsw001

Greer, A.T., R.K. Cowen, C.M. Guigand, J.A. Hare (2015) Fine-scale planktonic habitat partitioning at a shelf-slope front revealed by a high-resolution imaging system. *Journal of Marine Systems*, 142: 111-125, doi: 10.1016/j.jmarsys.2014.10.008

Luo, J.Y., B. Grassian, D. Tang, J.O. Irisson, **A.T. Greer**, C.M. Guigand, S. McClatchie, R.K. Cowen (2014) Environmental drivers of the fine-scale distribution of a gelatinous zooplankton community across a mesoscale front. *Marine Ecology Progress Series*, 510: 129-149, doi: 10.3354/meps10908

- Greer, A.T.**, R.K. Cowen, C.M. Guigand, J.A. Hare, D. Tang (2014) The role of internal waves in larval fish interactions with predators and prey. *Progress in Oceanography*, 127: 47-61, doi: 10.1016/j.pocean.2014.05.010
- Sevadjian, J.C., M.A. McManus, J.P. Ryan, **A.T. Greer**, R.K. Cowen, C.B. Woodson (2014) Across-shore variability in plankton layering and abundance associated with physical forcing in Monterey Bay, California. *Continental Shelf Research*, 72: 138-151, doi: 10.1016/j.csr.2013.09.018
- Timmerman, A.H.V, M.A. McManus, O.M. Cheriton, R.K. Cowen, **A.T. Greer**, R.M. Kudela, K.C. Ruttenberg, J.C. Sevadjian (2014) Hidden thin layers of toxic diatoms in a coastal bay. *Deep Sea Research II*, 101: 129-140, doi: 10.1016/j.dsr2.2013.05.030
- Greer, A.T.**, R.K. Cowen, C.M. Guigand, M.A. McManus, J.C. Sevadjian, A.H.V. Timmerman (2013) Relationships between phytoplankton thin layers and the fine-scale vertical distribution of two trophic levels of zooplankton. *Journal of Plankton Research*, 35(5): 939-956, doi: 10.1093/plankt/fbt056 (featured article and cover image)
- Cowen, R.K., **A.T. Greer**, C.M. Guigand, J.A. Hare, D.E. Richardson, H.J. Walsh (2013) Evaluation of the *In Situ* Ichthyoplankton Imaging System (ISIIS): comparison with the traditional (bongo net) sampler. *Fishery Bulletin*, 38: 1-12, doi: 10.7755/FB.111.1.1
- McClatchie, S., R.K. Cowen, K. Nieto, **A.T. Greer**, J.Y. Luo, C. Guigand, D. Demer, D. Griffith, D. Rudnick (2012) Resolution of fine biological structure including small narcomedusae across a front in the Southern California Bight. *Journal of Geophysical Research*, 117, C04020, doi: 10.1029/2011JC007565

Manuscripts submitted or in prep

- Greer, A.T.**, A.M. Shiller, J.D. Wiggert, E.E. Hofmann, S.J. Warner, S.M. Parra, D. Joung, A.L. Deary, C. Briseño-Avena, A.D. Boyette, I.M. Soto, M.K. Cambazoglu, J.W. Krause, B. Dzwonkowski, S. Dykstra, J.A. Kastler, T.N. Miles, L. Hode, U. Nwankwo, L. Quas, S. O'Brien, P.J. Fitzpatrick, Y. Lau, K.M. Martin, S.D. Howden, J.N. Moum, F.J. Hernandez, I. Church, J.W. Book, R.A. Arnone, S. Sponaugle, R.K. Cowen, W.M. Graham. CONCORDE: An interdisciplinary approach toward improved understanding of river influenced coastal oceans (in prep)
- Parra, S.M., **A.T. Greer**, A.L. Deary, J.W. Book, C. Briseño-Avena, A.D. Boyette, T.N. Miles, F.J. Hernandez. Highly-resolved temporal in situ variability of zooplankton diel vertical migrations in the Mississippi Bight (in prep)
- Boyette, A.D., **A.T. Greer**, A.D. Weidemann, G.A. Jacobs, W.M. Graham. Physical mechanisms for formation and resulting lower trophic level interactions within a plankton thin layer in the northern Gulf of Mexico (in prep)

Invited Talks

- U.S. Coast Guard Sector Mobile, Mississippi Area Committee Meeting. Moss Point, MS. Coastal river-dominated ecosystems and implications for oil extraction: From observations to mechanisms and models (July 2017)

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University of Southern Mississippi Division of Marine Science. Stennis Space Center, MS. A matter of scale: What can fine-scale measurements reveal about plankton communities and biophysical mechanisms of ecosystem productivity? (April 2017)

IGB Leibniz-Institute of Freshwater Ecology and Inland Fisheries. Neuglobsow, Germany. Biophysical drivers of plankton patch structure and consequences for ecosystem productivity (August 2016)

University of Southern Mississippi Gulf Coast Research Laboratory Seminar. Ocean Springs, MS. Biophysical drivers of plankton patch structure and consequences for ecosystem productivity (February 2016)

University of Georgia - Enthusiasts of Diversity, Genetics, and Evolution (EDGE) seminar. Athens, GA. Blending in with the crowd: Larval fish mimicry in the plankton (August 2014)

University of Georgia - Department of Marine Science Seminar. Athens, GA. Describing fine-scale biophysical interactions among plankton and larval fishes using *in situ* imaging technology (January 2014)

University of Georgia. Skidaway Institute of Oceanography Seminar. Savannah, GA. Describing fine-scale biophysical interactions among plankton and larval fishes using *in situ* imaging technology (January 2014)

Conference Presentations

Church, I., **A.T. Greer**, L. Quas, M.H. Williamson. Multibeam water column filtering methods to improve data management and bio-acoustic interpretation (poster). GeoHab Conference. Nova Scotia, Canada. May 2017.

Greer, A.T., C. Briseño-Avena, A.L. Deary, M.K. Cambazoglu, I.M. Soto, G.A. Jacobs, F.J. Hernandez, R.K. Cowen, W.M. Graham. Partners or prey? Exploring the drivers of associations between lobster phyllosoma and gelatinous zooplankton in the northern Gulf of Mexico (oral presentation). ASLO Aquatic Sciences Meeting. Honolulu, HI. March 2017.

Boyette, A.D., **A.T. Greer**, A.D. Weidemann, G.A. Jacobs, W.M. Graham. Physical mechanisms for formation and resulting lower trophic level interactions within a plankton thin layer in the northern Gulf of Mexico (oral presentation given by Boyette). ASLO Aquatic Sciences Meeting. Honolulu, HI. March 2017.

Chiaverano, L.M., **A.T. Greer**, A. Pliru, F.J. Hernandez, W.M. Graham. High resolution sampling of early stage *Aurelia* medusae and associated water column properties in the northern Gulf of Mexico (poster). ASLO Aquatic Sciences Meeting. Honolulu, HI. March 2017.

Greer, A.T., I. Church, L.M. Chiaverano, M.H. Williamson, C. Briseño-Avena, R.K. Cowen, W.M. Graham. Combining multibeam acoustics and *in situ* imaging to resolve patch structure of shrimp aggregations and gelatinous zooplankton in relation to hypoxia (oral presentation). Gulf of Mexico Oil Spill and Ecosystem Science Conference. New Orleans, LA. February 2017.

Briseño-Avena, C., S.J. Warner, **A.T. Greer**, I.M. Soto, S.M. Parra, A.L. Deary, F.J. Hernandez, W.M. Graham, J.N. Moum, R.K. Cowen. Turbulence microstructure in coastal river plumes: Measuring the *in situ* effects on plankton. Gulf of Mexico Oil Spill and Ecosystem Science Conference. New Orleans, LA. February 2017.

Parra, S.M., A.L. Deary, J.W. Book, **A.T. Greer**, C. Briseño-Avena, A.D. Boyette, T.N. Miles, F.J. Hernandez. Highly-resolved temporal in situ variability of zooplankton diel vertical migrations in the Mississippi Bight. Gulf of Mexico Oil Spill and Ecosystem Science Conference. New Orleans, LA. February 2017.

Church, I., **A.T. Greer**, M.H. Williamson, L. Quas. Multibeam water column data processing techniques to facilitate bio-acoustic interpretation. Gulf of Mexico Oil Spill and Ecosystem Science Conference. New Orleans, LA. February 2017.

Greer, A.T., L.M. Chiaverano, J.Y. Luo, R.K. Cowen, W.M. Graham. Salinity-driven patches of *Pelagia noctiluca* and their top-down impact on the northern Gulf of Mexico plankton community described with an *in situ* imaging system. (poster) 5th International Jellyfish Bloom Symposium. Barcelona, Spain. May 2016.

Greer, A.T. and C.B. Woodson. Application of a predator-prey overlap metric to determine the impact of sub-grid scale feeding dynamics on ecosystem productivity. (oral presentation) AGU/ASLO Ocean Sciences Meeting. New Orleans, LA. February 2016. Session co-chair and moderator for “Impacts of Ecological Interactions on Marine Ecosystem Dynamics: New Insights from Models, Theory, and Field Measurements” (I and II)

Cambazoglu, M.K., G.A. Jacobs, S.D. Howden, J.W. Book, R. Arnone, I.M. Soto-Ramos, R.A. Vandermeulen, **A.T. Greer**, T.N. Miles. Spatio-temporal variability of internal waves in the northern Gulf of Mexico studied with the Navy Coastal Ocean Model, NCOM (poster). AGU/ASLO Ocean Sciences Meeting. New Orleans, LA. February 2016.

Greer, A.T., I. Church, M.H. Williamson, C. Briseño-Avena, A.D. Boyette, R.K. Cowen, W.M. Graham. Acoustical and optical characterization of marine snow layers in the northern Gulf of Mexico: Layer types and mechanisms of formation. (poster) Gulf of Mexico Oil Spill and Ecosystem Science Conference. Tampa, FL. February 2016.

Cowen, R.K., W.M. Graham, F.J. Hernandez, J.W. Krause, S.D. Howden, I. Church, C. Briseño-Avena, **A.T. Greer**, A.L. Deary. CONCORDE: Measurement of fine- to sub-mesoscale processes driving autumn plankton distributions and transport in the highly dynamic coastal shelf system of the northern Gulf of Mexico. (poster) Gulf of Mexico Oil Spill and Ecosystem Science Conference. Tampa, FL. February 2016.

Williamson, M., I. Church, L. Quas, **A.T. Greer**. High frequency multibeam sonar water column backscatter: A 3D view of water column acoustic anomalies to facilitate ecosystem science. (poster) Gulf of Mexico Oil Spill and Ecosystem Science Conference. Tampa, FL. February 2016.

Greer, A.T., R.K. Cowen, C.M. Guigand, J.A. Hare. Fine-scale planktonic habitat partitioning at a shelf-slope front revealed by a high-resolution imaging system. (oral presentation) ASLO Ocean Sciences Meeting. Honolulu, HI. February 2014.

Cowen, R.K., C.M. Guigand, J.Y. Luo, **A.T. Greer**, B. Grassian. Plankton Portal: An online Citizen Science project for plankton classification and education (poster) ASLO Ocean Sciences Meeting. Honolulu, HI. February 2014.

Luo, J.Y., B. Grassian, **A.T. Greer**, C.M. Guigand, R.K. Cowen. Environmental drivers of the fine-scale distribution of a gelatinous zooplankton community across a small-scale front. (poster) ASLO Ocean Sciences Meeting. Honolulu, HI. February 2014.

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Greer, A.T., R.K. Cowen, C.M. Guigand, J.A. Hare. Fine-scale spatial relationships of larval fishes, predators, and prey: the impact of internal waves. (oral presentation) 37th Annual Larval Fish Conference, Miami, FL. June 2013.

Luo, J.Y., B. Grassian, **A.T. Greer**, C.M. Guigand, J.O. Irisson, S. McClatchie, R.K. Cowen. Fine scale distribution of gelatinous zooplankton across a front in the Southern California Bight. (oral presentation given by J.Y. Luo) 4th International Jellyfish Bloom Symposium, June 2013.

Greer, A.T., R.K. Cowen, C.M. Guigand, J.Y. Luo. Using plankton imaging technology and computer science for biological oceanographic advancement and education. (poster) SEEDs Interdisciplinary Careers Workshop, Miami, FL. February 2013.

Greer, A.T., R.K. Cowen, C.M. Guigand, M.A. McManus, J.C. Sevadjan, A.H.V. Timmerman. Small scale change in zooplankton community in relation to stratification and phytoplankton thin layers. (poster) ASLO Ocean Sciences Meeting, Salt Lake City, UT. February 2012.

Cowen, R.K., **A.T. Greer**, C.M. Guigand, M.A. McManus, J.C. Sevadjan, A.H.V. Timmerman, C.B. Woodson, S.G. Monismith, D.A. Fong. Physical processes driving fine scale biological patchiness in an inner shelf, high productivity environment: acoustic and optical measurements. (poster) ASLO Ocean Science Meeting, Salt Lake City, UT. February 2012.

Cowen, R.K., C.M. Guigand, G. Tsechpenakis, C. Cousins, **A.T. Greer**, S. Chatzis, J.A. Hare. Update on the In Situ Ichthyoplankton Imaging System (ISIIS). (oral presentation given by R.K. Cowen) 34th Annual Larval Fish Conference, June 2010.

Cowen, R.K., C.M. Guigand, C. Cousin, G. Tsechpenakis, S. Chatzis, **A.T. Greer**. An operational *In Situ* Ichthyoplankton Imaging System (ISIIS). (oral presentation given by R.K. Cowen) OceanObs, Venice, Italy, September 2009.

Book Review

Greer, A.T. (2015) Review of: Impacts of Oil Spill Disasters on Marine Habitats and Fisheries in North America. *Copeia* 103(4): 1102-1116.

Professional Activities

Association for the Sciences of Limnology and Oceanography (ASLO)
American Fisheries Society – Early Life History Section. Southern Division.
Ecological Society of America
American Society of Naturalists

Peer Reviewer: Bulletin of Marine Science, Environmental Biology of Fishes, Journal of Plankton Research (3), Marine Ecology Progress Series (3), PLOS ONE, IEEE Journal of Ocean Engineering, NSF OCE – Biological Oceanography (2)

Other Languages

Spanish (advanced)