

Chad Lembke
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SPECIALIZATION

Design of mechanics of sensors, vehicles, and platforms, including but not limited to pressure housing design, static and dynamic seals, high and low pressure fluid transfer, vacuum systems, fixturing (optical, electrical, mechanical), cable splicing, power and data transmission, and overall system layout. Design process contributions from mechanical and system level design to full project management involving the operation and enhancement of autonomous platforms. This includes engineering support on multiple AUV, ROV, Buoy, and towed platform deployments and operations locally and abroad. Current research is focused on managing USF's underwater glider fleet and combining new towed video methods with acoustic biomass technology and mapping sonars for fisheries stock assessment. Prior to work at USF, designed luxury yachts and specialty water craft for theme parks such as Disney World and Universal Studios.

EDUCATION

1995 B.S.M.E., University of South Florida
2007 M.M.E., University of South Florida

PROFESSIONAL EXPERIENCE

August 2017 – Present *Research Faculty*, University of South Florida Center for Ocean Technology, St. Petersburg, Florida
January 1998 – August 2017 *Assistant in Research, Project Engineer*, University of South Florida Center for Ocean Technology, St. Petersburg, Florida
May 1995 - December 1997 *Mechanical Design Engineer, Specialty and Luxury Watercraft*, David Jones and Associates, Pinellas Park, Florida
September 1994 – May 1995 *Mechanical Properties Testing*, Sigma Laboratories, Pinellas Park, Florida

AWARDS

David K. Costello Award for Interdisciplinary Engineering (2013)

COMMITTEE APPOINTMENTS

IOOS National Underwater Glider Plan Steering Committee (2012 - 2014)
GCOOS Gulf Glider Task Team (Chair) (2014 - 2020)

PUBLICATIONS

- Yang, R., M. Hou, C. Lembke, C. Edwards and F. Zhang, "Real-time Autonomous Glider Navigation Software," *OCEANS 2023 - Limerick*, DOI: 10.1109/OCEANSLimerick52467.2023.10244627.
- Yang, R., C. Lembke, F. Zhang and C. Edwards, (2023) "General Anomaly Detection of Underwater Gliders Validated by Large-scale Deployment Datasets," *OCEANS MTS/IEEE U.S. Gulf Coast*, DOI: 10.23919/OCEANS52994.2023.10337100.
- Zhang, Y., C. Hu, B. Barnes, Y. Liu, V. Kourafalou, D. McGillicuddy, J. Cannizzaro, D. English, and C. Lembke (2023) "Bio-Optical, Physical, and Chemical Properties of a Loop Current Eddy in the Gulf of Mexico", *Journal of Geophysical Research: Oceans*, 128, DOI: 10.1029/2022JC018726
- Ilich, A. J. Brizzolara, S. Grasty, J. Gray, M. Hommeyer, C. Lembke, S. Locker, A. Silverman, T. Switzer, A. Vivlamore, S. Murawski, (2021) "Integrating Towed Underwater Video and Multibeam Acoustics for Marine Benthic Habitat Mapping and Fish Population Estimation", *Geosciences*, DOI: 10.3390/geosciences11040176
- Cook, A. B., A. Bernard, K. Boswell, H. Bracken-Grissom, M. D'Elia, S. deRada, C. Easson, D. English, R. Eytan, T. Frank, C. Hu, M. Johnston, H. Judkins, C. Lembke, J. Lopez, R. Milligan, J. Moore, B. Penta, N. Pruzinsky, J. Quinlan, T. Richards, I. Romero, M. Shivji, M. Vecchione, M. Weber, R. J. D. Wells, and T. Sutton, (2020) "A Multidisciplinary Approach to Investigate Deep-Pelagic Ecosystem Dynamics in the Gulf of Mexico Following Deepwater Horizon", *Frontiers in Marine Science*, DOI: 10.3389/fmars.2020.548880
- Broadbent, H., S. Grasty, R. Hardy, M. Lamont, K. Hart, C. Lembke, J. Brizzolara, S. Murawski, (2019) "West Florida Shelf Pipeline Serves as Sea Turtle Benthic Habitat based on In-Situ Towed Camera Observations", *Aquatic Biology*, DOI: 10.3354/ab00722
- Xie, S., J. Law, R. Russell, T. Dixon, C. Lembke, R. Malservisi, M. Rodgers, G. Iannaccone, S. Guardatao, D. Naar, D. Calore, N. Fraticelli, J. Brizzolara, J. Gray, M. Hommeyer, J. Chen (2019) "Seafloor Geodesy in Shallow Water with GPS on an Anchored Spar Buoy", *Journal of Geophysical Research: Solid Earth*, 124 DOI: 10.1029/2019JB018242
- Weisberg, R. Y. Liu, C. Lembke, C. Hu, K. Hubbard, M. Garrett, (2019), "The Coastal Ocean Circulation Influence on the 2018 West Florida Shelf *K. brevis* Red Tide Bloom", *Journal of Geophysical Research: Oceans*, 124, 2501-2512, DOI: 10.1029/2018JC014887
- Milligan, R., A. Bernard, K. Boswell, H. Bracken-Grissom, M. D'Elia, S. deRada, C. Easson, D. English, R. Eytan, K. Finnegan, C. Hu, C. Lembke, J. Lopez, B. Penta, T. Richards, I. Romero, M. Shivji, L. Timm, J. Warren, M. Weber, R. Wells, T. Sutton, "The Application of Novel Research Technologies by the Deep Pelagic Nekton Dynamics of the Gulf of Mexico (DEEPEND) Consortium", *Marine Technology Society Journal*, Volume 52, Number 6, November/December 2018, pp. 81-86(6), DOI: <https://doi.org/10.4031/MTSJ.52.6.10>

- Lembke, C, S. Lowerre-Barbierri, D. Mann, C. Taylor (2018) "Using Three Acoustic Technologies on Underwater Gliders to Survey Fish", *Marine Technology Society Journal*, V52/N6, pp 39-52, DOI: 10.4031.
- Milligan, R., A. Bernard, K. Boswell, H. Bracken-Grissom, M. D'Elia, S. deRada, C. Easson, D. English, R. Eytan, K. Finnegan, C. Hu, C. Lembke, J. Lopez, B. Penta, T. Richards, I Romero, M. Shivji, L. Timm, J. Warren, M. Webber, D. Wells, T. Sutton, (2018) "The Application of Novel Research Technologies by the Deep Pelagic Nekton Dynamics of the Gulf of Mexico (DEEPEND) Consortium", *Marine Technology Society Journal*, V52/N6, pp 81-90.
- Lembke, C., D. Mann, C. Taylor, J. Gray, E Hughes, A. Silverman (2018) "Utilizing Gliders and Acoustics to Identify Fish Habitat Hotspots" *Oceans 2018 MTS/IEEE*, DOI: 10.1109
- Silverman, A., C. Lembke, S. Butcher, M. Lindemuth, S. Murawski (2018) "Enabling a Platform for Habitat and Marine Assessment with Real Time Monitoring and Synchronous Databasing" *Oceans 2018 MTS/IEEE*, DOI: 10.1109
- Cheve, R., J. Buermans, D. Lemon, C. Taylor, C. Lembke, C. DeCollibus, G. Saba, C. Reiss, (2018) "Adapting Multi-Frequency Echo-Sounders for Operation on Autonomous Vehicles" *Oceans 2018 MTS/IEEE*, DOI: 10.1109
- Todd A., He, R., C. Lembke, T. Kellison, C. Taylor, D. Mann, (2018) "Cross-shelf exchange associated with the Gulf Stream in the South Atlantic Bight: Direct observations using an autonomous underwater glider", *Marine Technology Society Journal*, V52, N3, pp 19-27, DOI: 10.4031/MTSJ.52.3.5
- Lembke, C., Grasty, S., Silverman, A., Broadbent, H., Butcher, S., Murawski, S., (2017) "The Camera-Based Assessment Survey System (CBASS): A Towed Camera Platform for Reef Fish Abundance Surveys and Benthic Habitat Characterization in the Gulf of Mexico", *Continental Shelf Research*, DOI: 10.1016
- Taylor, J. C., Lembke, C., (2017) "Echosounder for Biological Surveys Using Ocean Gliders", *Sea Technology*, July 2017, pp 35-38.
- Wall, C. C., D. Mann, C. Lembke, C. Taylor, R. He, and T. Kellison (2017) "Mapping the Soundscape Off the Southeastern USA by Using Passive Acoustic Glider Technology", *Marine and Coastal Fisheries*, DOI: 10.1080.
- Churnside, J. H., R. Marchbanks, C. Lembke, and J. Beckler (2017) "Optical Backscattering Measured by Airborne Lidar and Underwater Glider", *Remote Sensing*, DOI:10.3390/rs9040379.
- Hu, C., B.B. Barnes, Q. Li, C. Lembke, and D. English (2016) "Vertical migration of *Karenia brevis* in the northeastern Gulf of Mexico observed from glider measurements." *Harmful Algae*, V58, September 2016, pp 59–65.
- Weisberg, R., L. Zheng, Y. Liu, A. Corcoran, C. Lembke, C. Hu, J. Lenes, and J. Walsh (2016) "*Karenia brevis* blooms on the West Florida Shelf: A comparative study of the robust 2012 bloom and the nearly null 2013 event." *Continental Shelf Research*, 120, 106-121, <http://dx.doi.org/10.1016/j.csr.2016.03.011>.
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- Voytenko, D., TH. Dixon, M. Luther, C. Lembke, I.Howat, S. la Peñac, "Observations of inertial currents in a lagoon in southeastern Iceland using terrestrial radar

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- Wall, C., C. Lembke, C. Hu, and D. Mann (2014) “Fish Sound Production in the Presence of Harmful Algal Blooms in the Eastern Gulf of Mexico”, *PLoS ONE* 9(12): e114893. DOI:10.1371/journal.pone.0114893.
- Wall, C., P. Simard, M. Lindemuth, C. Lembke, D. Naar, C. Hu, B. Barnes, F. Muller-Karger, and D. Mann (2014) “Temporal and Spatial Mapping of Red Grouper *Epinephelus Morio* Sound Production”, *Journal of Fish Biology*, DOI: 10.1111/jfb.12500.
- Weisberg, R., L. Zheng, Y. Liu, C. Lembke, J. Lenes, and J. Walsh (2014) “Why a Red Tide was not Observed on the West Florida Continental Shelf in 2010”, *Harmful Algae*, DOI: 10.1016/j.hal.2014.04.010.
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- Lembke, C., X. Shi, A. Silverman, S. Butcher, S. Murawski, and S. Grasty (2013) “Development and Sea Trials of a New Camera-Based Assessment Survey System for Reef Fish Stocks Assessment”, *Oceans 2013 MTS/IEEE*, DOI: 10.23919/OCEANS.2013.6741218.
- Lindemuth, M., and C. Lembke (2013) “Sparse glider datasets: A case study for NoSQL databases”, *Oceans 2013 MTS/IEEE*, DOI: 10.23919/OCEANS.2013.6741198.
- Zhao, J., C. Hu, J. M. Lenes, R. H. Weisberg, C. Lembke, D. English, J. Wolny, L. Zheng, J. J. Walsh, and G. Kirkpatrick (2013) Three-dimensional structure of a *Karenia brevis* bloom: observations from gliders, satellites, and field measurements. *Harmful Algae*, DOI: 10.1016/j.hal.2013.07.004.
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- Fefilatyevev, S., D. Goldgof, M. Shreve, and C. Lembke (2012) “Detection and Tracking of Ships in Open Sea with Rapidly Moving Buoy-Mounted Camera System”, *Ocean Engineering*, OE-D-11-00395R1.

- Wall, C., C. Lembke, and D. Mann (2012) "Shelf-scale mapping of sound production by fishes in the eastern Gulf of Mexico, using autonomous glider technology", *Marine Ecology Progress Series*, Vol. 449: 55-64.
- Fefilyat'ev, S., D. Goldgof, C. Lembke (2010) "Tracking Ships from Fast Moving Camera through Image Registration", *2010 20th International Conference on Pattern Recognition*, DOI: 10.1109/ICPR.2010.854
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- Fefilyat'ev, S., S., Dmitry, B. Goldgof, and C. Lembke (2009) "Autonomous Buoy Platform for Low-Cost Visual Maritime Surveillance: Design and Initial Deployment", *Proc. SPIE Defense, Security, and Sensing*, V7317-0A.
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US COLLABORATORS (last 5 years)

Barbieri, S., Florida Marine Research Institute
 Beckler, J., Mote Marine Laboratory
 Boswell, K., Florida International University
 Bracken-Grissom, H., Florida International University
 Breitbart, M., University of South Florida
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 Edwards, C., Skidaway Institute of Oceanography
 Garrett, M., Florida Wildlife Research Institute
 Graham, A., University of South Florida
 Grasty, S., University of South Florida

He, R., North Carolina St. University
Hommeyer, M., University of South Florida
Horne, J., University of Washington
Howden, S., University of Southern Mississippi
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STUDENT ADVISEES

Surui Xie, Department of Geology
Edmund Hughes, College of Marine Science
Sean Beckwith, College of Marine Science