Joshua P. Kilborn, Ph.D.

Research Assistant Professor
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PROFESSIONAL SUMMARY

Academic researcher with a track record of success in the development and application of computational mathematical/statistical methods directed at challenges in marine fisheries, socio-ecological systems' dynamics, and holistic resource management. A progressive leader and educator committed to promoting growth, equity, and understanding among all stakeholders through the pursuit of knowledge and providing access to the best possible scientific evidence for fact-based decision making.

As a full-time **Research Assistant Professor** (April 2019-Present), my current responsibilities include the development and administration of novel scientific research and quality graduate student training that both rise to the high standards of a preeminent research university. Under the auspices of research, I fully support my work via externally funded grant opportunities (see "Secured Funding – Refereed Research Grants") while undertaking proposal creation, budgeting, purchasing and acquisitions, hiring, task management, and project performance. Under the mission of graduate education, I develop all course curriculum, lectures, and evaluation tools for all sections I teach; I have delivered courses in both the in-person and synchronous-online formats.

EDUCATIONAL BACKGROUND

- **Ph.D. Marine Science** – Concentration in *Marine Resource Assessment*, University of South Florida, College of Marine Science; 2017
  - Dissertation: **Kilborn, J. P.** 2017. *Investigating the Marine Resources in the Gulf of Mexico at Multiple Spatial and Temporal Scales of Inquiry*. Graduate Theses and Dissertations, University of South Florida, College of Marine Science. http.scholarcommons.usf.edu/etd/7046.
- **B.S. Mathematics**. Jacksonville University; 2002
  - Undergraduate Research: Differential equation models of HIV dynamics via CD4+ T cells; 2001
  - Thesis Project: Minimizing airline expenses for relocation of assets faced with natural disaster – A modeling projecting using the SIMPLEX method; 2002

PEER-REVIEWED MANUSCRIPTS

- Murawski, S. A., **J. P. Kilborn**, A. Bergarano, D. Chagaris, D. Donaldson, F. Hernandez, T. MacDonald, C. Newton, E. B. Peebles, K. L. Robinson. 2020 (*Under review*). A Synthesis of Deepwater Horizon Impacts on Coastal and Nearshore Living Marine Resources. *Frontiers in Marine Science.*
- Schwing, P. T., P. A. Montagna, S. B. Joye, C. B. Paris, E. E. Cordes, C. R. McClain, **J. P. Kilborn**, S. A. Murawski. 2020 (*Revision under review*). A synthesis of deep benthic faunal impacts and resilience following the Deepwater Horizon oil spill. *Frontiers in Marine Science.*
- Dell'Apa, A., **J. P. Kilborn**, W. J. Harford. 2020. Advancing ecosystem management strategies for the Gulf of Mexico's fisheries resources: implications for the development of a fishery ecosystem plan. *Bulletin of Marine Science.* 96(0):000-000. https://doi.org/10.5343/bms.2019.0081
- **Kilborn, J. P.**, M. Drexler, and D. L. Jones†. 2018. Fluctuating fishing intensities and climate dynamics reorganize the Gulf of Mexico's fisheries resources. *Ecosphere* 9(11):e02487.10.1002/ecs2.2487
- **Kilborn, J. P.**, D. L. Jones, E. B. Peebles, and D. F. Naar. 2017. Resemblance profiles as clustering decision criteria: Estimating statistical power, error, and correspondence for a hypothesis test for multivariate structure. *Ecology and Evolution*; 7:2039-2057. https://doi:10.1002/ece3.2760.
- Tzadik, O. E., **J. P. Kilborn**, and R. S. Appeldoorn. 2017. Differential habitat use of reef fishes on a shelf-edge off La Parguera, Puerto Rico. *Bulletin of Marine Science*; 93(3):893-914

SECURED FUNDING – REFERREED RESEARCH GRANTS

- Gulf of Mexico Fishery Management Council (GMFMC). Exploring Unexplained Variability in Stock-Recruitment Relationship Estimates for the Gulf of Mexico's Greater Amberjack (*Seriola dumerili*) Stock with Long-Term, Ecological Time Series. 2020. **Kilborn, J. P.** (PI, USF). **$85,000**
  - Develop mathematical/statistical models and computer code to analyze the relationship between the stock recruitment of Greater Amberjack (GAJ) and natural environmental variability, particularly with respect to the macroalgae *Sargassum*
  - Assess whether a monitoring system can be developed to support near real-time decision making with respect to GAJ and environmental predictions/observations
- National Oceanographic and Atmospheric Administration, Marine Fisheries Initiative (NOAA, MARFIN). Investigating multivariate ecological time-series models to improve our understanding and assessment of the Gulf of Mexico Large Marine Ecosystem. 2017-2021. **Kilborn, J. P.** (PI, USF), M. Drexler (Co-PI, Ocean Conservancy). **$524,106**
  - Develop, code, and evaluate the Ecosystem-Level, Management-Indicator Selection Tool (EL-MIST); detailed description of EL-MIST can be found in **Kilborn et al. (2018)** above
  - Apply EL-MIST to the Gulf of Mexico large marine ecosystem (Gulf LME) to understand the temporal dynamics and system-wide organization of aquatic resources (e.g., fishes, marine mammals, sea turtles, and birds)
  - Use EL-MIST to determine which natural (e.g., Atlantic Multidecadal Oscillation, dissolved nutrients) and anthropogenic (e.g., fishing effort, oil industry development) factors best account for changes in aquatic resource organization states over time
  - Use explicit temporal models within EL-MIST to determine management-relevant time scales and their associated biotic resources within the Gulf LME
  - Apply EL-MIST to assess the long-term temporal dynamics of the King Mackerel (*Scomberomorus cavalla*) population in the Gulf LME using recent stock assessment outputs
  - Contribute to the scientific work in Dell'Apa et al. (2020) listed above that advocates a framework for the development of a fishery ecosystem plan for multispecies management of all fisheries resources throughout the Gulf LME

INDEPENDENT CONTRACTING & CONSULTATIONS

- University of South Florida – College of Marine Science. Population and Ecosystem Dynamics Lab (PI: Steven A. Murawski, Ph.D.); **Statistical Consultant**, 2019-2020
  - Gulf of Mexico Research Initiative/C-IMAGE III (No. SA 18-16): Core Area III Synthesis
  - Organize, analyze, and synthesize regional time series data collected over the 9 years post-Deep Water Horizon oil spill; Contribute to all relevant products and publications (see above)
- Ocean Conservancy, **Statistical Contractor**, 2016
  - Develop and document a multivariate statistical model for the Gulf of Mexico fisheries ecosystem
- Hawaii International Environmental Services (HIES), **Statistical Consultant**, 2015
  - Evaluate HIES's statistical power analysis of a long-term ecological monitoring (LTEM) program's ability to detect changes as defined in the LTEM program's goals
  - Evaluate HIES's critical analysis of a LTEM program's sampling design and statistical methods with particular emphasis on the non-parametric and multivariate nature of the LTEM dataset collected
- University of South Florida – College of Marine Science. Physical Oceanography Lab (PI: Gary Mitchum, Ph.D.); **Research Assistant**, 2014
  - Project using sea surface height data from tide-gauges to estimate satellite altimeter drift and error
  - Theoretical statistical model verification and MATLAB implementation with algorithm optimization

TEACHING EXPERIENCE

- USF – College of Marine Science. *Biometry*, **Instructor**, August 2018-Present; **Teaching Assistant** (Fall 2014; Instructor: David L. Jones, Ph.D.)
  - Graduate level course covering core concepts of univariate statistical analysis and general coding practices with an emphasis on ecological and biological datasets and implemented in MATLAB and R

- Particular focus on experimental design, methods application, and interpretation of results

❖ USF – College of Marine Science. *Applied Multivariate Statistics*, **Instructor**, January 2018-Present; **Teaching Assistant** (Fall 2013, Spring 2015; Instructor: David L. Jones, Ph.D.)
- Graduate level course emphasizing hands-on analysis of large, high-dimensional marine ecological and environmental datasets using distribution-free methodologies
- Focus on non-normal, highly skewed, and zero-inflated data and relevant analyses
- Exploratory analysis, hypothesis testing (canonical analysis), detection of species-environmental relationships (direct gradient analysis), and spatial analysis are emphasized throughout the course
- Extensive MATLAB software use throughout the course

SHIP-BASED RESEARCH CRUISES

❖ Florida Fish and Wildlife Conservation Commission. June 5-16, 2013. **R/V Tommy Munro**: Fishery Independent Monitoring – Southeast Area Monitoring and Assessment Program (SEAMAP) Summer Groundfish Trawl Survey
- Conduct semi-balloon-trawl sampling across entire West Florida Shelf
- Deploy oceanographic sensor packages to measure *in situ* water parameters

❖ USF – College of Marine Science. August 20-25, 2012. **R/V Weatherbird II**: Northern Gulf of Mexico, USA
- Conducted benthic long-line survey for predatory fishes including

❖ University of South Florida – College of Marine Science. June 2-9, 2012. **R/V Bellows**: Marquesas Islands & Hawk Channel, Florida Keys, USA
- Side scan sonar habitat survey and seafloor mapping

SCUBA DIVING FIELD WORK

❖ University of South Florida – College of Marine Science, Reef Indicators Lab. **Keys Marine Lab**: Tennessee Reef, FL Keys. December 5-7, 2012; July 10-13, 2012; April 21-23, 2013
- Conducted pulse-amplitude modulation fluorometry on selected coral colonies
- Collected benthic foraminifera samples

❖ SCUBAnauts International, LLC – Saint Petersburg, FL Chapter.
- **Mote Marine Lab**: Looe Key, FL, USA; **U.S. Army Special Forces Underwater Operations School**: Key West, FL, USA. July 28-August 3, 2012; July 27-29, 2013
  - Benthic habitat and fish abundance surveys using point count and belt transect protocols from Atlantic and Gulf Rapid Reef Assessment (AGRRA), Reef Environmental Education Foundation (REEF) methods, respectively
  - Coral nursery maintenance and fragmentation placement for *Acropora spp.* intended for transfer to natural out-plant site.
  - Monitor and survey out-plant corals for ongoing coral restoration project at Mote
  - Participate in navigation training with U.S. Army Special Forces Diving Team
- **Glover's Reef Research Station**: Glover's Reef Atoll, Belize. June 23-30, 2012
  - AGRRA point count and belt transect habitat surveys with REEF fish surveys
  - Deployed HOBO data-loggers for continuous, long-term data collection

SPECIAL SKILLS

❖ Extensive knowledge of MATLAB (including the Fathom Toolbox for Ecological Statistics)
❖ Working knowledge of the R-language, R-studio, and Git-Hub
❖ Unix-based, high-performance cluster computing utilization
❖ Data simulation and testing (e.g., statistical methods development and optimization)
❖ Working knowledge ArcGIS, C++, Ecopath with Ecosim, Fortran
❖ Extensive knowledge of Adobe Illustrator, Microsoft Windows, and Microsoft Office products
❖ Former certified Instructor for the National Association of Underwater Instructors (NAUI)
❖ Former certified Instructor for the Diver's Alert Network (DAN)

- Schwing, P. T. (presenter), **J. P. Kilborn**, P. Montagna, C. Paris, R. Faillettaz., I. C. Romero, S. B. Joye, W. A. Overholt, G. Brooks, R. Larson, D. J. Hollander, S. A. Murawski, T. Sutton, W. Patterson III. 2020. Assembling the benthic record of species and community change for the Gulf of Mexico following the Deepwater Horizon Event. *Gulf of Mexico Oil Spill & Ecosystem Science Conference*, Tampa, FL.
- Murawski, S. A. (presenter), **J. P. Kilborn**, L. DiPinto, D. Chagaris, D. Donaldson, J. Litz, T. MacDonald, C. Newton, E. B. Peebles, K. Robinson, L. Schwacke, R. Takeshita. 2020. On the Resilience of Coastal/Nearshore Living Resources to Deepwater Horizon: A Harbinger of Future Coastal Restoration Efforts? *Gulf of Mexico Oil Spill & Ecosystem Science Conference*, Tampa, FL.
- Murawski, S. A. (presenter), W. Patterson III, P. T. Schwing, P. Montagna, R. Milligan, T. Sutton, **J. P. Kilborn**, S. Gilbert. 2019. Poster presentation: Vulnerability and Resilience of Species and Ecosystems to Large-Scale Contamination Events: Lessons Learned from the Deepwater Horizon. *American Geophysical Union Fall Meeting*, San Francisco, CA.
- **Kilborn, J. P.** 2019. Ecosystem Impacts of the Deepwater Horizon Event: Detecting Trends and Evaluating Changes in Ecosystems and Populations. *C-IMAGE II; Core Area III Synthesis Workshop #2*, Washington D.C.
- **Kilborn, J. P.** 2019. Explicitly Accounting for Temporal Variability in the Context of EBFM for the Gulf of Mexico's Living Marine Resources 1986-2013. *American Fisheries Society & American Wildlife Society Joint Meeting*, Reno, NV.
- Ellis R. (chair), J. Carroll, **J. P. Kilborn**. 2019. (Symposium) Variation in Life History of Fishes: Accounting for and Incorporating Spatiotemporal Variability in Demographic Rates. *American Fisheries Society & American Wildlife Society Joint Meeting*, Reno, NV
- **Kilborn, J. P.** 2019. Ecosystem Impacts of the Deepwater Horizon Event: Overview – Statistical Methods to Detect Trends & Evaluate Change. *C-IMAGE II; Core Area III Synthesis Workshop #1*, St. Petersburg, FL.
- **Kilborn, J. P.**, M. Drexler, and D. L. Jones. 2018. Using the Ecosystem-Level Management-Indicator Selection Tool to Explicitly Model Temporal Trends and Partition the Variability for Fisheries Resources in a Large Marine Ecosystem. *American Fisheries Society – Annual Meeting*, Atlantic City, NJ.
- **Kilborn, J. P.**, M. Drexler, and D. L. Jones. 2017. An Ecosystem-Level Management-Indicator Selection Tool for the Distillation of Complex Multivariate Datasets: Gulf of Mexico Case Study. *NOAA Southeast Regional Office – Brown Bag Lunch Seminar Series*, St. Petersburg, FL.
- **Kilborn, J. P.**, M. Drexler, and D. L. Jones. 2017. Describing Three Decades of Fisheries Regime States in the Gulf of Mexico Using an Ecosystem-Level Redundancy Analysis Approach. *International Council for the Exploration of the Sea – Annual Science Conference*, Ft. Lauderdale, FL.
- **Kilborn, J. P.**, M. Drexler, and D. L. Jones. 2017. Describing Three Decades of Fisheries Regime States in the Gulf of Mexico Using an Ecosystem-Level Redundancy Analysis Approach. *American Fisheries Society – Annual Meeting*, Tampa, FL.
- **Kilborn, J. P.**, M. Drexler, and C. Ridings. 2016. An ecosystem-level redundancy analysis decision tool to inform the integrated ecosystem assessment indicator selection process. *International Council for the Exploration of the Sea – Annual Science Conference*, Riga, Latvia.
- **Kilborn, J. P.**, O. E. Tzadik, and R. S. Appeldoorn. 2015. Differential habitat use and reef-fish community organization among the reef-top and slope morphology within a single shelf-edge ecotone in La Parguera, Puerto Rico. *Gulf and Caribbean Fisheries Institute 68th Conference*, Panama City, Panama.
- **Kilborn, J. P.**, D. L. Jones, and E. B. Peebles. 2014. Detection of unique bentho-demersal fish communities in the high diversity West Florida Shelf ecosystem and the impact of environmental drivers. *International Council for the Exploration of the Sea – Annual Science Conference*, A Coruña, Spain.
- **Kilborn, J. P.**, E. B. Peebles, and D.L. Jones. 2013. Poster presentation: Clustering methods for assigning community types, spatial distributions, and habitat associations to multispecies benthic fish communities on the West Florida Shelf, eastern Gulf of Mexico. *International Council for the Exploration of the Sea – Annual Science Conference*, Reykjavik, Iceland.
- **Kilborn J. P.**, E. B. Peebles, D. L. Jones, and D. F. Naar. 2012. Poster presentation: Using one fish community to predict another: Dynamic models of predator distribution based on lower-trophic-level community structure and other habitat features. *International Council for the Exploration of the Sea – Annual Science Conference*, Bergen, Norway.

- **Kilborn, J. P.** 2012. An exposition on essential fish habitat. *University of South Florida – College of Marine Science, Graduate Student Symposium*, St. Petersburg, FL.
- **Kilborn, J. P.**, S. Rai. 2001. A differential equation model of HIV dynamics via CD4+ T cells. *National Council of Undergraduate Research*, Lexington, KY.
- **Kilborn, J. P.**, S. Rai. 2000. A differential equation model of HIV dynamics via CD4+ T cells. *Mathematical Association of America – Sectional Meeting*, Ft. Meyers, FL

HONORS & AWARDS

- **Kilborn, J. P.**, *Graduate Student Commencement Ceremony Speech*, University of South Florida Graduate Students' Spring Commencement Ceremony, USF Sun Dome, Tampa, FL, 2017
- **Outstanding Mathematics Student of the Year**. Jacksonville University, 2000
- Awarded by Mathematics dept. faculty to most promising student for the academic year
- **Eagle Scout Award**. Troop 12, Baden Powell Council, Boy Scouts of America, 1995

COMMUNITY OUTREACH/SERVICE ACTIVITIES

- St. Pete Science Festival, **Planning and Logistics Committee**, Event Dates: October 17-18, 2014
  - Coordinated sign-up and logistical needs of 100+ exhibitors in months leading to event
  - Organized and planned site map for the day of the event
- SCUBAnauts International, LLC, Saint Petersburg, FL Chapter, 2011-2014
  - **Chapter Vice President**, 2012-2014
  - **Dive Safety Officer** responsible for all SCUBA diving activities and safety, 2011-2012
  - **Organizer** of marine debris coastal cleanups
    - Deer Key, FL Keys, USA, May 2012; July 2012
    - Clam Bayou Education Center in St. Petersburg, FL, November 2011
- USF – College of Marine Science, Oceanography Camp Especially for Girls, Summer 2011
  - **Science Mentor** in charge of wax model demonstration of plate tectonics theory
  - Assisted in beach profile field study demonstration and active learning for campers
- Reef Monitoring Inc., Clearwater Beach, FL, September 2011
  - **Artificial Reef Cleanup**, Underwater marine debris collection on SCUBA

BUSINESS EXPERIENCE

- The Garden Produce Company, Jacksonville, FL
  - **Vice President of Administration**, January 2007-July 2010
    - Oversee Accounts Receivables, Accounts Payables, Personnel Management, and Reception
  - **Information Systems Manager**, January 2006-July 2010
    - Maintenance and development of company-wide databases for 2000+ customers, 10,000+ inventoried items, and associated point-of-sale software implementations (remote online and in-person)
- Pitman Produce Company, Jacksonville, FL
  - **Territory Sales Manager**, September 2004-December 2006
    - Manager responsible for all facets of territory operations including: solicitation, development, long-term partnerships, and new product introductions
- Southend Brewery & Smokehouse, Jacksonville, FL
  - **General Manager**, September 2000-July 2004
    - General Manager responsible for all facets of unit operations including: purchasing, receiving, inventory, profit-loss analyses, profitability growth solutions, and building maintenance
    - Hiring, training, scheduling, and day-to-day management for 40+ employees in fast-paced casual dining experience with on-site craft brewing operations