# **Iliana B. Baums, Ph.D.**

*Helmholtz Center for Functional Marine Biodiversity* (HIFMB)

Ammerländer Heerstraße 231, 26129 Oldenburg, Germany

Email: iliana.baums@hifmb.de

#### Experience

9/22 *Group leader Marine Conservation*. Helmholtz Center for Functional Marine Biodiversity (HIFMB), Alfred Wegener Institute for Polar and Marine Research, Oldenburg, Germany.

9/22 *Professor* (with tenure). Marine Conservation. Institute for Chemistry and Biology of Marine Environments [ICBM], Carl-von-Ossietzky Universität, Oldenburg, Germany.

7/19-8/22 *Professor* (with tenure). Marine Molecular Ecology and Evolution. Department of Biology, The Pennsylvania State University, USA

7/13-6/19 *Associate Professor* (with tenure)*.* Marine Molecular Ecology and Evolution. Department of Biology, The Pennsylvania State University, USA.

8/07 – 6/13 *Assistant Professor.* Marine Molecular Ecology and Evolution. Department of Biology, The Pennsylvania State University, USA.

8/06 – 7/07 *Assistant Professor - Research.* Department of Biology, The Pennsylvania State University, USA.

#### Education

8/05 – 7/06 *Assistant Researcher*, Coral Reef Molecular Ecology, University of Hawaii, USA. I studied the gene flow and population structure of several coral reef organisms (hard corals, hermit crabs) across the Hawaiian using microsatellite markers and sequencing approaches.

6/04 – 8/05 *Postdoctoral Researcher* to Dr. John McManus, Coral Reef Ecology, University of Miami, USA. I studied the gene flow and population structure of several coral reef organisms (predatory gastropods and intracellular symbionts) closely associated with the Caribbean coral *Acropora palmata* using microsatellite markers.

6/04 – 8/05 *Postdoctoral Researcher* to Dr. Jack Fell, Marine Microbiology, University of Miami, USA. I developed a DNA-based, rapid identification technique for fecal bacterial contamination in recreational waters. Detection of multiplexed and hybridized bacterial DNA is accomplished with a LUMINEX 100 flow cytometer.

5/98 – 5/04 *Ph.D. Degree* at the Rosenstiel School of Marine and Atmospheric Sciences, University of Miami, USA. Title of Dissertation: Genetic Status of *Acropora palmata* populations in the Caribbean. Advisor: Dr. P. Glynn. I developed for the first time microsatellite markers for acroporid corals. I used these to distinguish clones, estimate population structure and describe reef connectivity for the highly threatened coral, *Acropora palmata* in the Caribbean.

10/97 - 5/00 *Diplom Degree*, University of Bremen, Germany. Title of Thesis: Population ecology and feeding physiology of *Coralliophila abbreviata*, Lamarck (Coralliophilidae), a corallivorous gastropod in the Florida Keys. Major: Marine Biology, 1. Minor: Ecology, 2. Minor: Cell-and Molecular Biology/Genetics. Graduated with 'sehr gut' equivalent to a GPA of 4.0. Advisors: Dr. A. Szmant, Dr. G. Hempel. I investigated the effects of the corallivorous snail *Coralliophila abbreviata* on the coral population in the Florida Keys. Next to extensive field observations, I applied physiological, molecular and chemical methods to quantify the feeding impact of the gastropod on corals.

8/96 - 9/97 *International exchange student* at University of Miami.

10/93 - 7/96 *Vordiplom*, University of Tuebingen, Germany. Major: Biology.

9/93 - 7/94 *Leibniz Kolleg*, Tuebingen, Germany. The Leibniz Kolleg is a unique institution. It offers a one-year program in which 50 selected applicants are given the opportunity to live on campus and study under some of Germany's top professors.

#### Awards

Faculty Scholars Medal for Outstanding Achievements, 2020, The Pennsylvania State University.

Coral Reef Hero, 2020. Recognized as one of the top fifteen coral reef research contributors. http://digital.ecomagazine.com/publication/?i=664239&ver=html5&p=10.

Fellow, Hanse-Wissenschaftskolleg, 2017 and 2018 (6 months).

Humboldt Fellowship for experienced researchers, Alexander von Humboldt Foundation, 2014-2015 (12 months).

Molecular Ecology’s Best Reviewers, 2014.

NOPP Excellence in partnering award 2012. Awards for Excellence in Partnering are presented annually to research teams that best demonstrate the partnerships objectives of NOPP, recognizing the project’s commitment to partnering, the success of the partnership effort, and the impact of the partnership on oceanography. Member of research team.

Recipient of the 2004 Smith Prize awarded for the most original piece of research in marine and atmospheric science at the Rosenstiel School of Marine & Atmospheric Science, University of Miami.

Academic Merit Award 2004 for academic excellence by the Graduate School of the University of Miami.

#### Publications

**(a = Principal Author; b = Co-Author; c = Supervising Author; d = Co-first Author)**

\* graduate student at PSU, ^ undergraduate student at PSU

|  |  |
| --- | --- |
|  | Researcher ID: http://www.researcherid.com/rid/G-6435-2010 |

ORCID ID: orcid.org/0000-0001-6463-7308

**1. Articles in refereed journals**

1. Rivera HE, Cohen AL, Thompson JR, Baums IBb, Fox M, Meyer-Kaiser K (2022) Palau’s warmest reefs harbor a thermally tolerant coral lineage that thrives across different habitats. *Communications Biology* **5**,1394, doi: 10.1038/s42003-022-04315-7.
2. Osman EO, Vohsen SA\*, Girard F\*, Cruz R^, Glickman O, Bullock LM, Anderson KE, Weinnig AM, Cordes EE, Fisher CR, Baums IBc (in 2022) Capacity of deep-sea corals to obtain nutrition from cold seeps aligned with microbiome reorganization. *Global Change Biology* **29**, 189-205, doi: 10.1111/gcb.16447.
3. Kuntz KLV\*, Kitchen SA, Conn TL\*, Vohsen SA\*, Chan AN\*, Vermeij MJA, Page C, Marhaver KL, Baums IBc (2022) Juvenile corals inherit mutations acquired during the parent’s lifespan. S*cience Advances* **8**, eabn0707, doi: 10.1126/sciadv.abn0707.

True J (2023) Faculty Opinions Recommendation of [Vasquez Kuntz KL et al., Sci Adv 2023 8(35:eabn0707)]. *Faculty Opinions*. doi: 10.3410/f.742303073.793597268. **“Very Good”**

1. Kitchen SA, Osborne CC, Fogarty ND, Baums IB (2022) Morphotype is not linked to mitochondrial haplogroups of Caribbean acroporid hybrids. Coral Reefs 41, 829-836. doi: 10.1007/s00338-021-02135-5.
2. Baker LJ, Reich HG, Kitchen SA, Grace Klinges J, Koch HR, Baums IBc, Muller EM, Thurber RV (2022) The coral symbiont Candidatus Aquarickettsia is variably abundant in threatened Caribbean acroporids and transmitted horizontally. *The ISME Journal* **16**, 400-411, doi: 10.1038/s41396-021-01077-8.
3. Stankiewicz KH\*, Vasquez Kuntz KL\*, Coral Microsatellite Group, Baums IBc (2022) The impact of estimator choice: Disagreement in clustering solutions across K estimators for Bayesian analysis of population genetic structure across a wide range of empirical datasets. *Molecular Ecology Resources* 22, 1125-1148, doi: 10.1111/1755-0998.13522.
4. Hagedorn M, Page AC, O'Neil K, Flores DM, Tichy L, Conn T\*, Chamberland VC, Lager C, Zuchowicz N, Lohr KE, Blackburn H, Vardi T, Moore J, Moore T, Baums IBb, Vermeij MJA, Marhaver KL (2021) Assisted gene flow using cryopreserved sperm in critically-endangered coral. *Proceedings of the National Academy of Sciences* **118**, e2110559118, doi: 10.1073/pnas.2110559118.
5. Reich HG\*, Kitchen SA, Stankiewicz KH\*, Devlin-Durante M, Fogarty ND, Baums IBc (2021) Genomic variation of an endosymbiotic dinoflagellate (*Symbiodinium 'fitti'*) among closely related coral hosts. *Molecular Ecology* **30**, 3500-3514, doi: 10.1111/mec.15952.
6. Reusch TBH, Baums IBb, Werner B (2021) Evolution via somatic genetic variation in modular species. *Trends Ecology & Evolution* **36**, 1083-1092, doi: 10.1016/j.tree.2021.08.011.
7. Cziesielski MJ, Duarte CM, Aalismail NA, Al-Hafedh Y, Anton A, Baalkhuyur F, Baker AC, Balke T, Baums IBb, Berumenm ML, Chalastani VI, Cornwell B, Daffonchio D, Diele K, Ehtsaam F, Gattuso J-P, He S, Lovelock C, Mcleod E, Macreadie PI, Marba N, Martin C, Muniz Barreto M, Krishnakumar PK, Prihartato P, Rabaoui L, Saderne V, Schmidt-Roach S, Suggett D, Sweet M, Statton J, Teicher S, Trevathan-Tackett SM, Joydas TV, Yahya RZ, Aranda M (2021) Investing in Blue Natural Capital to secure a future for the Red Sea ecosystems. *Frontiers in Marine Science* **7** doi: 10.3389/fmars.2020.603722*.*
8. Arias-Gonzalez JE, Baums IBb, Banaszak AT, Prada C, Rossi S, Hernandez-Delgado EA, Rinkevich B (2022) Editorial: Coral Reef Restoration in a Changing World: Science-Based Solutions. Frontiers in Marine Science 9. doi: 10.3389/fmars.2022.919603.
9. Vardi T, Hoot WC, Levy J, Shaver E, Winters RS, Banaszak AT, Baums IB, Chamberland VF, Cook N, Gulko D, Hein MY, Kaufman L, Loewe M, Lundgren P, Lustic C, MacGowan P, Matz MV, McGonigle M, McLeod I, Moore J, Moore T, Pivard S, Pollock FJ, Rinkevich B, Suggett DJ, Suleiman S, Viehman TS, Villalobos T, Weis VM, Wolke C, Montoya‐Maya PH (2021) Six priorities to advance the science and practice of coral reef restoration worldwide. Restoration Ecology 29, e13498. doi: 10.1111/rec.13498.

**Top-Cited Article Restoration Ecology, 2021-2022.**

1. Grottoli A, Toonen R, van Woesik R, Vega Thurber R, Warner M, McLachlan R, Price J, Bahr K, Baums IBb, Castillo K, Coffroth MA, Cunning R, Dobson K, Donahue M, Hench J, Iglesias-Prieto R, Kemp D, Kenkel C, Kline D, Kuffner I, Matthews J, Mayfield A, Padilla-Gamino J, Palumbi S, Voolstra C, Weis V, Wu H (2021) Best-practice recommendations for coral bleaching experiments. *Ecological Applications.* *e2262.* doi: *10.1002/eap.2262.*

**Top-Cited Article Ecological Applications, 2021/2022.**

1. Rodriguez-Casariego JA, Mercado-Molina AE, Garcia-Souto D, Ortiz I, Lopes C, Baums IBb, Sabat AM, Eirin-Lopez JM (2020) Genome-wide DNA methylation analysis reveals a conserved epigenetic response to seasonal environmental variation in the staghorn coral *Acropora cervicornis*. Frontiers in Marine Science 10.3389/fmars.2020.560424 doi:10.3389/fmars.2020.560424
2. Kitchen SA, Von Kuster G, Kuntz KLV, Reich HG, Miller W, Griffin S, Fogarty ND, Baums IBc (2020) STAGdb: a 30K SNP genotyping array and Science Gateway for *Acropora* corals and their dinoflagellate symbionts. *Scientific Reports* 10:12488. doi:10.1038/s41598-020-69101-z.
3. Vohsen SA\*, Anderson K, Gade A, Dannenberg R, Osman E, Gruber-Vodicka H, Dubilier N, Fisher CR, Baums IBc (2020) Deep-sea corals provide new insight into the ecology, evolution, and the role of plastids in widespread apicomplexan symbionts of anthozoans. *Microbiome* 8:34*. doi:10.1186/s40168-020-00798-w.*
4. Parkinson J, Baker A, Baums IBb, Davies S, Grottoli A, Kitchen S, LaJeunesse T, Matz M, Miller M, Shantz A, Kenkel C (2019) Molecular tools for coral reef restoration: beyond biomarker discovery. *Conservation Letters.* e12687. Doi: /10.1111/conl.12687. ***Cover article.***
5. Baums IBa, Baker AC, Davies S, Grottoli AG, Kenkel C, Kitchen SA, Kuffner IB, LaJeunesse T, Matz M, Miller M, Parkinson J, Shantz AA (2019) How to maximize the adaptive potential of restored coral populations. *Ecological Applications:* e01978.
6. Durante M, Baums IBd, Williams DW, Kemp D (2019) What drives phenotypic divergence among coral clonemates? *Molecular Ecology*28:3208-3224.
7. Chan AP\*, Lewis C, Neely KL, Baums IBc (2019) Fallen Pillars: The Past, Present, and Future Population Dynamics of a Rare, Specialist Coral-Algal Symbiosis. *Frontiers in Marine Science* 6 (218)10.3389/fmars.2019.00218*.*
8. Kitchen SA, Ratan A, Bedoya-Reina O, Burhans R, Fogarty ND, Miller W, Baums IBc (2019) Genomic variants among threatened *Acropora* corals. *G3 – Genes Genomes Genetics* 9:g3.400125.402019.
9. Drury C, Greer J, Baums IBb, Gintert B, Lirman D (2019) Clonal diversity impacts coral cover in *Acropora cervicornis* thickets: potential relationships between density, growth and polymorphisms. *Ecology and Evolution* 9:4518-4531.
10. Vohsen S\*, Fisher CR, Baums IBc (2019) Metabolomic richness and fingerprints of deep-sea coral species and populations. *Metabolomics*15:34.
11. Lopez JV, Hannah B, Medina M, Collins T, Baums IBb (2019) The many facets of marine invertebrate conservation genomics. *Annual Review of Animal Biosciences* 7, 22.21-22.25. **Invited Review.**
12. O'Donnell K, Lohr KE, Bartels E, Baums IBb , Patterson J (2018) Spatiotemporal dynamics in *Acropora cervicornis* genotype performance and symbiont identity throughout the restoration process. *Coral Reefs* 37, 1109-1118.
13. Neely KL, Lewis C, Chan AP\*, Baums IBc (2018) Hermaphroditic spawning by the gonochoric pillar coral *Dendrogyra cylindrus*. *Coral Reefs*. 10.1007/s00338-018-1730-x.
14. Muller EM, Bartels E, Baums, IBc (2018) Bleaching causes loss of disease resistance within the threatened coral species, *Acropora cervicornis*. *e-Life*, e3506610.7554/eLife.35066.001. **High Impact Journal.**
15. Glynn PW, Feingold JS, Baker AC, Banks S, Baums IBb, Cole J, Colgan M, Fong P, Glynn PJ, Keith I, Manzello D, Riegl B, Ruttenberg BI, Smith T, Vera-Zambrano M (2018) State of corals and coral reefs of the Galápagos Islands (Ecuador): past, present and future. *Marine Pollution Bulletin* 133, 717-733.
16. Parkinson JE, Bartels E, Devlin-Durante MK, Lustic C, Nedimyer K, Schopmeyer S, Lirman D, LaJeunesse TC, Baums IBc (2018) Extensive transcriptional variation poses a challenge to thermal stress biomarker development for endangered corals. *Molecular Ecology* 27, 1103-1119. 10.1111/mec.14517.
17. Miller MW, Baums IBb, Bright AJ, Cameron CM, Williams DE, Moffitt ZJ, Woodley CM (2018) Clonal structure and fertilization compatibility in Florida Keys broadcast spawning corals. *Coral Reefs* 37:239-249.
18. Devlin-Durante MK, Baums IBc (2017) Genome-wide survey of single-nucleotide polymorphisms reveals fine-scale population structure and signs of selection in the threatened Caribbean elkhorn coral, *Acropora palmata*. *PeerJ* 5, e4077.
19. Irwin A, Greer L, Humston R, Devlin-Durante M, Cabe P, Lescinsky H, Wirth K, Curran HA, Baums IBc (2017) Age and intraspecific diversity of resilient *Acropora* communities in Belize. *Coral Reefs* 36, 1111-1120.
20. Ruiz-Ramos D\*, Fisher C, Baums IBc (2017) Stress response of the black coral *Leiopathes glaberrima* when exposed to sub-lethal amounts of crude oil and dispersant. *Elementa: Science of the Anthropocene* 5, 77.
21. Voolstra CR, GIGA Community of Scientists (COS)b, Wörheide G, Lopez JV (2017) Advancing genomics through the Global Invertebrate Genomics Alliance (GIGA). *Invertebrate Systematics* 31:231-231. Group co-author.
22. Cordes EE, Auscavitch S, Baums IBb, Fisher CR, Girard F\*, Gomez C, McClain-Counts J, Mendlovitz HP, Miles, Smith S, Vohsen S\*, Weinheimer A (2016) ECOGIG: Oil Spill Effects on Deep-Sea Corals Through the Lenses of Natural Hydrocarbon Seeps and Long Time Series. *Oceanography* 29, 28-29.
23. Cardona Y, Ruiz-Ramos DV\*, Baums IBb, Bracco A (2016) Potential Connectivity of Coldwater Black Coral Communities in the Northern Gulf of Mexico. *PLoS ONE* 11, e0156257.
24. Carne L, Baums IBc (2016) Demonstrating effective Caribbean acroporid population enhancement: all three nursery-grown, out-planted taxa spawn August 2015 & 2016 in Belize. *Reef Encounter* 31, 42-43.
25. Serrano XM, Baums IB, Smith TB, Jones RJ, Shearer TL, Baker AC (2016) Long distance dispersal and vertical gene flow in the Caribbean brooding coral *Porites astreoides*. *Scientific Reports* 6, 21619.
26. Benestan LM, Ferchaud A-L, Hohenlohe PA, Garner BA, Naylor GJP, Baums IBb, Schwartz MK, Kelley JL, Luikart G (2016) Conservation genomics of natural and managed populations: building a conceptual and practical framework. *Molecular Ecology* 25, 2967-2977.
27. Selkoe KA, Gaggiotti OE, Treml EA, Wren JLK, Donovan MK, Toonen RJ (2016) The DNA of coral reef biodiversity: predicting and protecting genetic diversity of reef assemblages. *Proceedings of the Royal Society of London B: Biological Sciences* 283. Group co-author.
28. Hellberg ME, Prada C, Tan MH, Forsman ZH, Baums IBc (2016) Getting a grip at the edge: recolonization and introgression in eastern Pacific *Porites* corals. *Journal of Biogeography* 43, 2147-2159.
29. Devlin-Durante MK, Miller MW, Caribbean Acropora Research G, Precht WF, Baums IBc (2016) How old are you? Genet age estimates in a clonal animal. *Molecular Ecology* 25, 5628-5646.
30. Wood S, Baums IBb, Paris CB, Ridgwell A, Kessler WS, Hendy EJ (2016) El Niño and coral larval dispersal across the eastern Pacific marine barrier. *Nature Communications* 7, 12571.
31. Parkinson JE\*, Baumgarten S, Michell CT, Baums IBb, LaJeunesse TC, Voolstra CR (2016) Gene Expression Variation Resolves Species and Individual Strains among Coral-Associated Dinoflagellates within the Genus *Symbiodinium*. *Genome Biology and Evolution* 8, 665-680.
32. DeLeo DM, Ruiz-Ramos DV\*, Baums IBb, Cordes EE (2016) Response of deep-water corals to oil and chemical dispersant exposure. *Deep Sea Research Part II: Topical Studies in Oceanography* 129, 137-147.
33. Griffin JN, Schrack EC, Lewis K-A, Baums IBb, et al. (2015) Density-dependent effects on initial growth of a branching coral under restoration. *Restoration Ecology* 23, 197-200.
34. Parkinson JE\*, Banaszak AT, Altman NS, LaJeunesse TC, Baums IBc (2015) Intraspecific diversity among partners drives functional variation in coral symbioses. *Scientific Reports* 5, 15667.
35. Quattrini AM, Baums IBb, Shank TM, Morrison CL, Cordes EE (2015) Testing the depth-differentiation hypothesis in a deepwater octocoral. *Proceedings of the Royal Society B: Biological Sciences* 282, 20150008.
36. Ruiz-Ramos DV\*, Saunders M, Fisher CR, Baums IBc (2015) Home Bodies and Wanderers: Sympatric Lineages of the Deep-Sea Black Coral *Leiopathes glaberrima. PLoS ONE* 10, e0138989.
37. Baums IBa, Devlin-Durante M, LaJeunesse TC (2014) New insights into the dynamics between reef corals and their associated dinoflagellate endosymbionts from population genetic studies. *Molecular Ecology* 23:4203-4215. **Cover, featured in a “Perspective” article.**
38. Baums IBa, Durante MD, Laing AA^, Feingold J, Smith T, Bruckner A, Monteiro J (2014) Marginal coral populations: the densest known aggregation of *Pocillopora* in the Galápagos Archipelago is of asexual origin. *Frontiers in Marine Science* 1.
39. Serrano X, Baums IBb, O'Reilly K, Smith TB, Jones RJ, Shearer TL, Nunes FL, Baker AC (2014) Geographic differences in vertical connectivity in the Caribbean coral *Montastraea cavernosa* despite high levels of horizontal connectivity at shallow depths. *Molecular Ecology* 23:4226-4240.
40. Selkoe KA, Gaggiotti O, Bernal MA, Bird C, Bolick H, Baums IBb, Coleman R, Concepcion GT, Craig MT, DiBattista JD, Eble JA, Fernandez-Silva I, Gaither M, Iacchei M, Polato NR\*, Rivera MAJ, Rocha LA, Skillings D, Timmers M, Szabo Z, Bowen BW, Toonen RJ (2014) Emergent patterns of population genetic structure for a coral reef community. *Molecular Ecology* 23:3064-3079.
41. Fisher CR, Demopoulos AWJ, Cordes EE, Baums IBb, White HK, Bourque JR (2014) Coral Communities as Indicators of Ecosystem-Level Impacts of the Deepwater Horizon Spill. *BioScience* 64:796-807.
42. Williams DE, Miller MW, Baums IBc (2014) Cryptic changes in the genetic structure of a highly clonal coral population and the relationship with ecological performance*. Coral Reefs* 33:595-606.
43. Parkinson JE\*, Baums IBc (2014) The extended phenotypes of marine symbioses: ecological and evolutionary consequences of intraspecific genetic diversity in coral-algal associations. *Frontiers in Microbiology* 5.
44. Prada C, DeBiasse MB, Neigel JE, Yednock B, Stake JL, Forsman ZH, Baums IBb, Hellberg ME (2014) Genetic species delineation among branching Caribbean *Porites* corals. *Coral Reefs* 33:1019-1030
45. Ruiz-Ramos D\*, Baums Ic (2014) Microsatellite abundance across the Anthozoa and Hydrozoa in the phylum Cnidaria. *BMC Genomics* 15:939.
46. Lirman D, Schopmeyer S, Galvan V, Drury C, Baker AC, Baums IBb (2014) Growth Dynamics of the Threatened Caribbean Staghorn Coral *Acropora cervicornis*: Influence of Host Genotype, Symbiont Identity, Colony Size, and Environmental Setting. *PLoS ONE* 9:e107253.
47. Edmunds PJ, Adjeroud M, Baskett ML, Baums IBb, Budd AF, Carpenter RC, Fabina NS, Fan T-Y, Franklin EC, Gross K, Han X, Jacobson L, Klaus JS, McClanahan TR, O'Leary JK, van Oppen MJH, Pochon X, Putnam HM, Smith TB, Stat M, Sweatman H, van Woesik R, Gates RD (2014) Persistence and Change in Community Composition of Reef Corals through Present, Past, and Future Climates. *PLoS ONE* 9:e107525*.*
48. Concepcion GT, Baums IBb, Toonen RJ (2014) Regional population structure of *Montipora capitata* across the Hawaiian Archipelago. *Bulletin of Marine Science* 90:257-275*.*
49. Boulay JN\*, Hellberg ME, Cortés J, Baums IBc (2014) Unrecognized coral species diversity masks differences in functional ecology. *Proceedings Biological sciences / The Royal Society* 281:20131580.
50. Baums IBa, Scott Godwin L, Franklin EC, Carlon DB, Toonen RJ (2014) Discordant population expansions in four species of coral-associated Pacific hermit crabs (Anomura: Diogenidae) linked to habitat availability resulting from sea-level change. *Journal of Biogeography* 41:339-352.
51. Baums IBa, Devlin-Durante MK, Polato NR\*, Xu D^, Giri S^, Altman NS, Ruiz-Ramos D\*, Parkinson JE\*, Boulay JN\* (2013) Genotypic variation influences reproductive success and thermal stress tolerance in the reef building coral, *Acropora palmata*. *Coral Reefs,* 32:703 – 717.
52. Polato NR, Altman NS, Baums IBc (2013) Intra-population variation in the transcriptional response of threatened coral larvae to elevated temperatures. *Molecular Ecology*, 22:1366 – 1382.
53. Foster NL, Baums IBb, Sanchez JA, Paris CB, Chollett I, Agudelo CL, Vermeij MJA, Mumby PJ (2013) Hurricane-Driven Patterns of Clonality in an Ecosystem Engineer: The Caribbean Coral *Montastraea annularis*. *PLoS ONE* 8, e53283.
54. Johnston L, Miller MW, Baums IBc (2012) Assessment of host-associated genetic differentiation among phenotypically divergent populations of a coral-eating gastropod across the Caribbean. *PLoS ONE* 7**,** e47630.
55. Boulay JN, Cortés J, Nivia-Ruiz J, Baums IBc (2012) Genotypic diversity of the reef-building coral *Porites lobata* (Dana, 1846) (Scleractinia: Poritidae) at Cocos Island National Park, Costa Rica. *Revista Biologia Tropical* 3, 279 - 292.
56. Baums IBa, Boulay J\*, Polato NR\*, Hellberg ME (2012) No gene flow across the Eastern Pacific Barrier in the reef-building coral *Porites lobata*. *Molecular Ecology* 21**,** 5418-5433. **Featured in a “Perspective” article in *Molecular Ecology*.**
57. Griffin S, Spathias H, Moore DM, Baums IBb, Griffin BA (2012) Scaling up *Acropora* nurseries in the Caribbean and improving techniques. In: Proceedings of the 12th International Coral Reef Symposium (eds. Yellowlees D, Hughes TP). James Cook University, Townsville, Australia. Available online: http://www.icrs2012.com/Proceedings.htm
58. Glynn PW, Colley SB, Maté JL, Baums IBb, Feingold JS, Cortés J, Guzman HM, Afflerbach JC, Brandtneris VW, Ault JS (2012) Reef coral reproduction in the equatorial eastern Pacific: Costa Rica, Panamá, and the Galápagos Islands (Ecuador). VII. Siderastreidae, *Psammocora stellata* and *Psammocora profundacella*. *Marine Biology* 159, 1917 – 1932.
59. Hagedorn M, Carter V, Martorana K, Paresa MK, Acker J, Baums IBb, Borneman E, Brittsan M, Byers M, Henley M, Laterveer M, Leong J-A, McCarthy M, Meyers S, Nelson BD, Petersen D, Tiersch T, Uribe RC, Woods E, Wildt D (2012) Preserving and Using Germplasm and Dissociated Embryonic Cells for Conserving Caribbean and Pacific Coral. *PLoS ONE* 7, e33354.
60. Pinzón J\*, Reyes-Bonilla H, Baums Ib, LaJeunesse T (2012) Contrasting clonal structure among *Pocillopora* (Scleractinia) communities at two environmentally distinct sites in the Gulf of California. *Coral Reefs* 3, 765 – 777.
61. Foster NL, Paris CB, Kool JT, Baums IBb, Stevens JR, Sanchez JA, Bastidas C, Agudelo C, Bush P, Day O, Ferrari R, Gonzalez P, Gore S, Guppy R, McCartney M, McCoy C, Mendes JM, Srinivasan A, Steiner SCC, Vermeij MJA, Weil E, Mumby PJ (2012) Complementary insights into coral connectivity from empirical and modelled gene flow *Molecular Ecology* 12, 1143 – 1157.
62. Polato NR\*, Vera AC, Baums IBc (2011) Gene discovery in the threatened Elkhorn coral: 454 sequencing of the *Acropora palmata* transcriptome*. PLoS ONE* 6, e28634.
63. Pinzón J\*, Devlin-Durante M, Weber M, Baums Ib, LaJeunesse T (2011) Microsatellite loci for Symbiodinium A3; (*S. fitti*) a common algal symbiont among Caribbean *Acropora*; (stony corals) and Indo-Pacific giant clams (*Tridacna*). *Conservation Genetics Resources* 3, 45-47.
64. Toonen RJ, Andrews KR, Baums IBb, Bird CE, Concepcion GT, Daly-Engel TS, Eble JA, Faucci A, Gaither MR, Iacchei M, Puritz JB, Schultz JK, Skillings DJ, Timmers M, Bowen BW (2011) Defining boundaries for ecosystem-based management: A multispecies case study of marine connectivity across the Hawaiian Archipelago. *Journal of Molecular Biology 2011*, Article ID 460173.
65. Pinzón J\*, Devlin-Durante M, Weber M, Baums Ib, LaJeunesse T (2011) Microsatellite loci for *Symbiodinium A3*; (*S. fitti*) a common algal symbiont among Caribbean *Acropora*; (stony corals) and Indo-Pacific giant clams (*Tridacna*). *Conservation Genetics Resources* 3, 45-47.
66. Polato NR\*, Voolstra CR, Schnetzer J*,* DeSalvo MK, Randall CJ, Szmant AM, Medina M, Baums IBc, (2010) Location-Specific Responses to Thermal Stress in Larvae of the Reef-Building Coral *Montastraea faveolata*. *PLoS ONE* 5(6): e11221.
67. Polato NR\*, Concepcion GT, Toonen RJ, Baums IBc (2010) Isolation by distance across the Hawaiian Archipelago in the reef-building coral *Porites lobata*. *Molecular Ecology* 19, 4661-4677.
68. Baums IBa, Johnson ME, Devlin-Durante MK, Miller MW (2010) Host population genetic structure and zooxanthellae diversity of two reef-building coral species along the Florida Reef Tract and wider Caribbean. *Coral Reefs* 29, 835-842.
69. Concepcion GT, Polato NR\*, Baums IBb, Toonen RJ (2010) Development of microsatellite markers from four Hawaiian corals: *Acropora cytherea*, *Fungia scutaria*, *Montipora capitata* and *Porites lobata*. *Conservation Genetics Resources* 2, 11-15.
70. Glynn PW, Riegl B, Correa AMS, Baums IBb (2009) Rapid recovery of a coral reef at Darwin Island, Galapagos Islands. *Galapagos Research* 66, 6-13.
71. Baums IBa, Devlin-Durante MK, Brown L^, Pinzón JH\* (2009) Nine novel, polymorphic microsatellite markers for the study of threatened Caribbean acroporid corals. *Molecular Ecology Resources* 9, 1155-1158.
72. Baums IBa (2008) A restoration genetics guide for coral reef conservation. *Molecular Ecology* 17, 2796-2811.
73. Godwin S, Baums IBb (2008) The hermit crab *Calcinus isabellae* Poupin (Crustacea:Decapoda: Anomura: Diogenidae), a new record for the Hawaiian Archipelago, including a review of the genus *Calcinus* Dana in Hawai‘i. *Bishop Museum Occasional Papers* 100, 52-54.
74. Baums Ia, Goodwin K, Kiesling T, Wanless D, Fell J (2007) Luminex detection of fecal indicators in river samples, marine recreational water and beach sand. *Marine Pollution Bulletin* 54, 521-536.
75. Foster NL, Baums IB b, Mumby PJ (2007) Sexual vs. asexual reproduction in an ecosystem engineer: the massive coral *Montastraea annularis*. *Journal of Animal Ecology* 76, 384-391.
76. Miller MW, Baums IB b, Williams DE (2007) Visual discernment of sexual recruits is not feasible for *Acropora palmata*. *Marine Ecology-Progress Series* 335, 227-231.
77. Baums IBa, Miller MW, Hellberg ME (2006a) Geographic variation in clonal structure in a reef building Caribbean coral, *Acropora palmata*. *Ecological Monographs* 76, 503-519.
78. Baums IBa, Paris CB, Cherubin LM (2006b) A bio-oceanographic filter to larval dispersal in a reef-building coral. *Limnology and Oceanography* 51, 1969-1981.
79. Baums IBa, Hughes CR, Hellberg MH (2005a) Mendelian microsatellite loci for the Caribbean coral *Acropora palmata*. *Marine Ecology - Progress Series* 288, 115-127.
80. Baums IBa, Miller MW, Hellberg ME (2005b) Regionally isolated populations of an imperiled Caribbean coral, *Acropora palmata*. *Molecular Ecology* 14, 1377-1390. **Cover article. Highly Cited.**
81. Baums IBa, Miller MW, Szmant AM (2003a) Ecology of a corallivorous gastropod, *Coralliophila abbreviata*, on two scleractinian hosts. 1: Population structure of snails and corals. *Marine Biology* 142, 1083-1091.
82. Baums IBa, Miller MW, Szmant AM (2003b) Ecology of a corallivorous gastropod, *Coralliophila abbreviata*, on two scleractinian hosts. II. Feeding, respiration and growth. *Marine Biology* 142, 1093-1101.

#### 2. Parts of books

1. Baums IBa, Chamberland VF, Locatelli NS, Conn T (2022) Maximizing genetic diversity in coral restoration projects. In: *Coral reef conservation and restoration in the ‘omics’ age* (eds. Van Oppen MJH, Aranda M), pp. 35-53. Springer.
2. Lessios HA, Baums IBb (2017) Gene Flow in Coral Reef Organisms of the Tropical Eastern Pacific. In: *Coral Reefs of the Eastern Tropical Pacific: Persistence and Loss in a Dynamic Environment* (eds. Glynn WP, Manzello PD, Enochs CI), pp. 477-499. Springer Netherlands, Dordrecht.
3. Johnson ME, Lustic C, Bartels E, Baums IBb, Gilliam DS, Larson L, Lirman D, Miller MW, Nedimyer K, Schopmeyer S (2011) Caribbean *Acropora* Restoration Guide. Best Practices for Propagation and Population Enhancement The Nature Conservancy, Arlington, VA.
4. Baums IBa (2008) A synopsis of coral restoration genetics. In: Advances in Coral Husbandry in Public Aquariums. Public Aquarium Husbandry Series, Vol. 2. Editors: R.J. Leewis and M. Janse. Burgers’ Zoo, Arnhem, the Netherlands. p. 335-338.

#### 3. Articles published as preprints, in nonrefereed journals or in in-house publications

1. Gomez-Campo K, Sanchez R, Martinez-Rugerio M, Yang X, Maher T, Osborne CC, Enriquez S, Baums IBb, Mackenzie SA, Iglesias Prieto R (2023) Phenotypic plasticity in coral skeletal features: Molecular signatures from DNA methylation and transcriptional interaction networks. Authorea. doi: 10.22541/au.168423509.93827399/v1.
2. Rivera H, Cohen A, Thompson J, Baums Ic, Fox M, Meyer K (2022) Palau’s warmest reefs harbor a thermally tolerant coral lineage that thrives across different habitats. *Nature Portfolio* 10.21203/rs.3.rs-1190526/v1, doi: 10.21203/rs.3.rs-1190526/v1.
3. Chan AN\*, González-Guerrero LA\*, Iglesias-Prieto R, Burmester EM, Rotjan RD, Finnerty JR, Baums IBc (2021) An algal symbiont (*Breviolum psygmophilum*) responds more strongly to chronic high temperatures than its facultatively symbiotic coral host (*Astrangia poculata*). *bioRxiv*, 2021.2002.2008.430325. doi: 10.1101/2021.02.08.430325.
4. Kuntz KLV\*, Kitchen SA, Conn TL\*, Vohsen SA\*, Chan AN\*, Vermeij MJA, Page C, Marhaver KL, Baums IBc (2020) Juvenile corals inherit mutations acquired during the parent’s lifespan. *bioRxiv*, 2020.2010.2019.345538. doi: 10.1101/2020.10.19.345538.
5. Baker LJ, Reich HG\*, Kitchen SA, Klinges JG, Koch HR, Baums IBc, Muller E, Thurber RV (2021) The coral symbiont Candidatus *Aquarickettsia* is variably abundant in threatened Caribbean acroporids and transmitted horizontally. *bioRxiv*, 2021.2001.2028.428674. doi: 10.1101/2021.01.28.428674.
6. Reich HG,\* Kitchen SA, Stankiewicz KH, Devlin-Durante M, Fogarty ND, Baums IBc (2020) Genotypic similarity among algal symbionts corresponds to associations with closely related coral hosts. *bioRxiv*, 2020.2009.2026.314773. doi: 10.1101/2020.09.26.314773.
7. Vohsen SA, Gruber-Vodicka HR, Osman EO, Saxton MA, Joye SB, Dubilier N, Fisher CR, Baums IBc (2020) Deep-sea corals near cold seeps associate with chemoautotrophic bacteria that are related to the symbionts of cold seep and hydrothermal vent mussels. *bioRxiv* 10.1101/2020.02.27.968453.
8. Kitchen SA, Von Kuster G, Vasquez Kuntz KL, Reich HG, Miller W, Griffin S, Fogarty ND, Baums IBc (2020) STAGdb: a 30K SNP genotyping array and Science Gateway for *Acropora* corals and their dinoflagellate symbionts. *bioRxiv* 10.1101/2020.01.21.914424.
9. Devlin-Durante M, Baums Ia, Williams DW, Kemp D (2019) What drives phenotypic divergence among coral clonemates? *bioRxiv*, 10.1101/514430.
10. Kitchen SA, Ratan A, Bedoya-Reina O, Burhans R, Fogarty ND, Miller W, Baums IBc (2018) Genomic variants among threatened *Acropora* corals. *bioRxiv*, 10.1101/349910.
11. Durante M, Baums IBc (2017) Genome-wide survey of single-nucleotide polymorphisms indicates fine-scale population structure and signs of local selection in the threatened Caribbean elkhorn coral, *Acropora palmata*. *PeerJ Preprints* 5, e3043v1.
12. Parkinson JE, Bartels E, Devlin-Durante MK, Lustic C, Nedimyer K, Schopmeyer S, Lirman D, LaJeunesse TC, Baums IBc (2017) Extensive transcriptional variation poses a challenge to thermal stress biomarker development for endangered corals. *PeerJ Preprints* 5, e3158v3151.
13. Miller MW, Baums IB b, Williams DE, Szmant AM (2002) Status of Candidate coral, *Acropora palmata*, and its snail predator in the upper Florida Keys National Marine Sanctuary: 1998-2001. *NOAA Technical Memorandum* NMFS-SEFSC-479, 26pp.
14. Baums IBa: Coral restoration genetics. In: Final Report of the Smithsonian *Acropora* coral conservation/restoration workshop. November 2009, Washington DC.

#### Technology Transfer

Baums IB and Kitchen SA (2018) “*Acropora* Spp Single Nucleotide Axiom Genotyping Array”. PSU Invention Disclosure Number: 2018-4868. Technology transferred to ThermoFisher Scientific. Available for order as “AxiomTM Coral-Algae Genotyping Array” (SKU 550961 and 550962).

#### Offices Held

Director, Center for Marine Science and Technology. Pennsylvania State University. Since 2014-2022.

Associate editor “Frontiers in Microbiology”; “Frontiers in Marine Science”; “Proceedings of the Royal Society *Series B*”. Various Dates.

Member of the Editorial Board of the Springer journal Coral Reefs. Since 2011.

Member of the Scientific Program Committee for the “Reef Futures” Conference (400 participants), Key Largo, FL, Sep 2018 & 2022

Core-group member and workshop co-organizer: “Natural Adaptation and Assisted Evolution of Corals to Climate Change”. Funded by the Coral Research & Development Accelerator Platform (CORDAP). [www.cordap.org](http://www.cordap.org). Fall 2022 – present.

Chair, Restoration Genetics Working group of the Coral Restoration Consortium (CRC). The working group is developing guidelines for coral restoration based on evolutionary principles and has provided advice to NOAA, IUCN, and the State of Florida upon their request. Baums organized a workshop at PSU in May 2018 for the working group. Since 2017.

Organizing committee member of the “Global Invertebrate Genomics Alliance (GIGA) – III” conference, Oct 2018, Curacao.

Lead PI of a consortium of seven labs to sequence the genome of the temperate coral, *Astrangia poculata*. Since 2017.

Chief Scientist for the “Jewels of the Gulf” expedition: Ecosystem Impacts of Oil and Gas Inputs to the Gulf of Mexico (ECOGIG II) cruise to monitor corals around Macando, sample corals, water and sediments. Vessel: *Ocean Intervention II* and ROV *Global Explorer*. 09 June 2017 – 23 June 2017.

Scientific advisory board member of “SECORE (SExual Coral REproduction)”. To address coral reef conservation needs, SECORE was initiated by the Rotterdam Zoo in 2001 with the primary goals of studying sexual coral reproduction, developing *ex situ* breeding techniques, disseminating techniques among aquarium and research communities through workshops and publications, developing a cooperative international network of public aquariums and research institutions and establishing breeding programs to help sustain *ex situ* and field populations. Since 2009.

Advisor to the *Acropora* recovery team. This US government task force that is tasked with drafting rules and regulations as well as management plans for the only two reef-building corals listed under the US Endangered Species Act. 2006 - 2009.

Past Member of the Institute of Molecular Evolutionary Genetics (IMEG, Director Dr. Masatoshi Nei) at PSU (2007-2015).

#### Grants

**Current**

Reef Engineering to Enhance Future Structures (REEFS). **Defense Advanced Research Projects Agency (DARPA)**. HR0011-22-2-0041/OS00000984. 06/01/2022- 11/30/2023. AWI PI Baums, IB. $1,193,66.

Adaptive asexual evolution in cancer, corals and seagrasses – ADAPTASEX. **Human Frontiers Science Program**. Co- Principal Investigators: Baums IB, Reusch T, Werner B, 12/01/2020 - 11/31/2023 $1,050,000.

Search for Genetic Regulators of Coral Resilience to Thermal Stress. **NOAA**, Principal Investigator: Iliana Brigitta Baums, Co-PIs: Barshis DJ, Voolstra C, 10/01/2020 - 09/30/2023, $543,115.

**Completed**

Fieldable Microarray. **National Philanthropic Trust**. Principal Investigator: Baums, IB. Co-PI Miraglia, P. (Draper Laboratories). 2/1/2020 – 1/31/2021. $650,000

Detecting Reproductive Impairment from Senescence in ESA-listed Elkhorn Coral (*Acropora palmata*). **NOAA**, Principal Investigator: Iliana Brigitta Baums, 7/1/2019-6/30/2022, $83,239

Assisted Gene Flow II. **Paul Allen Foundation**, Principal Investigator: Iliana Brigitta Baums, 1/1/2020-12/31/2020, $200,00.

*Dendrogyra* Rescue Project. **Paul Allen Foundation**, Principal Investigator Iliana Brigitta Baums, 11/01/2019-10/31/2020, $20,000.

NSF INCLUDES Alliance: Collaborative Research: Islands Alliance. **National Science Foundation**, Co-Principal Investigator: Iliana Baums, 11/1/2019-10/31/2024, $736,199, On Campus, Academic: 0.19 Summer: 0.06

Collaborative Research: Hybridization: the key to threatened coral species survival or the harbinger of extinction?, **National Science Foundation**, Principal Investigator: Iliana Brigitta Baums, 10/1/2015-9/30/2020, $699,677, On Campus, Cal/Smr/Acad: 0.

GOMRI ECOGIG 2, **Georgia, University of**, Principal Investigator: Iliana Brigitta Baums, 1/1/2015-12/31/2018, $1,110,948, On Campus, Cal/Smr/Acad: 0.

Collaborative Research: NSF INCLUDES - Changing the Face of STEM in the U.S. Virgin Islands through Targeted Interventions to Expand Opportunities and Broaden Participation, **National Science Foundation**, Faculty: Iliana Brigitta Baums, 12/1/2016-11/30/2018, $31,800, On Campus, Academic: 0.09 Summer: 0.03.

Establishment of *Acropora* nurseries and restoration sites in reefs of the Gulf of Mexico and the Mexican Caribbean, **Oceanus, A.C**., Principal Investigator: Iliana Brigitta Baums, 10/1/2016-9/30/2018, $5,032, On Campus, Academic: 0.09 Summer: 0.03.

Repopulate reefs within replenishment zones of Turneffe Atoll Marine Reserve and South Water Caye Marine Reserve with temperatures resilient coral varieties, **Fragments of Hope, Ltd**., Principal Investigator: Iliana Brigitta Baums, 2/1/2017-1/31/2019, $12,000, On Campus, Academic: 0.02 Summer: 0.01.

Restoring protected coral species in Biscayne National Park, **Biscayne National Park**, Principal Investigator: Iliana Brigitta Baums, 6/8/2017-5/31/2019, $4,161, On Campus, Academic: 0.01.

Building a genetic and bioinformatic analysis pipeline for genotyping of Caribbean corals, **National Oceanic and Atmospheric Administration**, Principal Investigator: Iliana Brigitta Baums, 8/1/2017-1/31/2019, $70,392, On Campus, Academic: 1.50 Summer: 0.50.

RAPID: COLLABORATIVE RESEARCH: Interaction between genotype and acquired environmental modifications during coral responses to extreme climatic events Irma and Maria, **National Science Foundation**, Principal Investigator: Iliana Brigitta Baums, 1/15/2018-12/31/2018, $35,877, On Campus, Academic: 0.38 Summer: 0.13.

Genetic analysis of *Porites* colonies from Punta Adela, Golfo Dulce, Costa Rica, **University of Costa Rica**, Principal Investigator: Iliana Brigitta Baums, 6/9/2017-6/8/2022, $1,554, On Campus, Academic: 0.01.

*Dendrogyra* rescue project and *Acropora* GeneChip development, **Coral Restoration Foundation**, Principal Investigator: Iliana Brigitta Baums, 1/1/2017-12/31/2018, $22,000, On Campus, Academic: 0.01.

Ecosystem Impacts of Oil and Gas Inputs to the Gulf (ECOGIG 2), **Georgia, University of**, Principal Investigator: Iliana Brigitta Baums, 6/1/2018-5/31/2019, $29,312, On Campus, Cal/Smr/Acad: 0.

PSU request for additional sample analysis funds, **Georgia, University of**, Principal Investigator: Iliana Brigitta Baums, 8/1/2018-12/31/2019, $99,527, On Campus, Academic: 0.14 Summer: 0.04.

The population genetic structure of *Dendrogyra cylindrus* and associated *Symbiodinium*, **Florida Fish and Wildlife Conservation Commission**, Principal Investigator: BAUMS, 2/3/2014 - 9/30/2016, $65,000.

Improving the conservation value of staghorn nurseries, **National Oceanic and Atmospheric Administration**, Principal Investigator: BAUMS, 7/1/2014 - 6/30/2016, $68,999.

RAPID: Collaborative Research: surviving climate change - the role of acclimatization in reef-building corals, **National Science Foundation**, Principal Investigator: BAUMS, 11/15/2014 - 12/31/2016, $138,816.

Functional Genetic Diversity of ESA-listed *Acropora* Corals. 2013 - 2014. **National Oceanic and Atmospheric Administration**, $68,042. PI.

The population genetic structure of *Dendrogyra cylindrus* and associated *Symbiodinium*" 2013 - 2015. **Florida Fish and Wildlife Conservation Commission**, $65,000. PI.

Microsatellite analysis of coral larvae. 2013 – 2015. **Southeast Fisheries Science Center** (NOAA), $30,000. PI.

Ecosystem Impacts of Oil and Gas Inputs to the Gulf (ECOGIG). 2011 – 2014. PI of consortium Ray Highsmith, **Gulf of Mexico Research Initiative -** , $25,000,000 ($872,298 to PSU) and 3 oceanographic expeditions with Remotely Operated Vehicles ($2,000,000). Co-PI with C. Fisher.

Susceptibility of populations of *Acropora palmata* to global climate change: The role of temperature, acidification, ultraviolet radiation and diseases. 2013 - 2014. **La Universidad Nacional Autonoma de Mexico**, $33,384. PI.

Measuring the degree of connectivity between remnant staghorn patches at risk of anthropogenic impacts. 2013 – 2014. **University of Guam,** $41,455. PI.

MRI: Acquisition of an AB SCIEX Triple TOF5600 Spectrometer for Metabolomics Research. 2011 – 2014. Ferry JG, Assmann S, Guiltinan M, Marden J and Salis H. **National Science Foundation**, $407,667*.* Senior Personnel.

Analytical services for SEFSC Research. 2010 – 2013. **NOAA - National Marine Fisheries Service**. $37,000. PI.

Exploration and Research of Northern Gulf of Mexico Deepwater Natural and Artificial Hard Bottom Habitats with Emphasis on Coral Communities: Reefs, Rigs and Wrecks. **Mineral Management Service and NOAA OER**. $3,200,000 ($791,234 to PSU) and 4 oceanographic expeditions with Remotely Operated Vehicles ($3,000,000). 8/1/2008-7/31/2012. Co-PI with C. Fisher.

Investigating the fundamental units of natural selection among coral-algal symbioses: ecological, geographic, and physiological diversity of host-symbiont genotypes. 2009 – 2012. Extension until 2013. **NSF** Biological Oceanography, $612,780. Award OCE - Co-PI with T LaJeunesse.

Predicting the effects of ocean warming on larval dispersal by measuring adaptive potential of corals. 2008 – 2011. Extension until 2014. **NSF** Biological Oceanography, $467,833, Award OCE – 0825979. PI.

Collaborative research: ENSO-enhanced gene flow across the Eastern Pacific Barrier. **NSF** Biological Oceanography, 2006- 2009, $262,671 to PSU, Award OCE – 0550294. CoPI with ME Hellberg.

ARRA: Threatened Coral Recovery in Florida and US Virgin Islands. 2009-2012. **The Nature Conservancy**. $25,000. PI.

Genotyping of *Acropora* spp. using microsatellite genetic markers. 2009 - 2010. **NOAA** - National Marine Fisheries Service: $12,000. PI.

Determining the feasibility of genetic fingerprinting as a mechanism to track native and cultured corals. Mote Marine Laboratory, 2007 – 2009, $59,510. PI.

Restoration and *Ex-situ* Conservation of Federally Listed *Acropora* Corals, 2008 – 2009, $55,085, NOAA Coral Reef Restoration Grant – US Department of Commerce. PI.

Aquarius Coral Reef Restoration Experiment (ACCRE) project design and analysis. Year 2. 2009 - 2010. National Underwater Research Center, University of North Carolina at Wilmington: $15,000. PI.

Aquarius Coral Reef Restoration Experiment (ACCRE) project design and analysis, 2008, $15,088 National Underwater Research Center, University of North Carolina at Wilmington. PI.

Student Group Travel grant: “Biol 482: Coastal Biology”. International Student Services, Pennsylvania State University, 2009, $2000. PI.

Scaling up Staghorn Coral Restoration across the Florida Reef Tract using Resilience Principles, 2008, The Nature Conservancy, $10,000. PI.

Analytical services to determine multilocus genotypes of tissue samples. US Department of Commerce, 2006 – 2008, $37,965, WC133F06SE3815. PI.

MRI: Acquisition of an Illumina HiSeq2000 as a core sequencing instrument for genomics and gene expression research. 2012 - 2015. **National Science Foundation,** $798,876. Axtell MJ, Albert I, dePamphilis CW, Marden J and Roossinck MJ. Pennsylvania. Senior Personnel.

Genetic structure of *Acropora palmata* populations in the Caribbean. National Center for Caribbean Coral Reef Research (NCORE) and EPA, 2001-2004, $134,770. Co-PI with Miller MW, McManus J.

Genetic structure of *Acropora palmata* populations in the Caribbean. CMRC and NOAA, 2001-2004, $97,112. Cop-PI with Miller MW, McManus J, Hellberg ME.

Genetic status of *Acropora palmata* populations in the Caribbean. Perry Institute for Marine Science, 2002-2003, $16,440. Cop-PI with Miller MW, McManus J.

Equipment for microsatellite development.Founders Award, University of Miami, 2000, $4,500.Cop-PI with Purcell J.

Feeding Ecology of *Coralliophila abbreviata*. Reitmeister Award, University of Miami, 1999, $1,000.

Student Travel Fund, University of Miami, 1998-2000, $1,100.

#### Invited Talks

|  |  |
| --- | --- |
| 2023 | How corals adapt. Invited Keynote Speaker, Topical Meeting of the DFG Priority Program "Tropical Climate Variability & Coral Reefs" (SPP 2299). Bremen, Germany. 2 Jun 2023. |
|  | Managing expectations for breeding “super” corals. Restoration Genomics Workshop, Invited Speaker. NSF NRT Sustainable Ocean Training Grant and the Coastal and Marine Sciences Institute, University of California at Davis, Davis, USA. 17-18 May 2023. |
|  | Eco-evolutionary approaches to coral conservation. MEB Seminar Series, University of Southern California, Los Angeles, USA. 16 May 2023. |
|  | How do corals adapt to rising temperatures? OEB Seminar Series, Invited Speaker. Harvard University, Boston, USA. 23 Mar 2023. |
|  | Coral Life History. Invited Speaker and Co-Organizer, Coral Assisted Evolution workshop. CORDAD. King Abdullah University of Science and Technology (KAUST), Saudi Arabia. 24 Jan 2023. |
| 2022 | How diversity fuels coral survival. 14th International Coral Reef Symposium, Bremen, Germany, Invited Plenary Speaker. 3-8 July 2022. |
|  | How do corals adapt to rising temperatures? Evolution by the sea, Sep 2022. Kiel, Germany. Keynote. |
| 2021 | CRC Genetics Working Group Update. Keynotes/Plenary Addresses. December 2021. International Reef Futures, Coral Restoration Consortium, virtual, |
|  | Genomic signatures of biased introgression in F1 coral hybrids. Cold Spring Harbor, 13 May 2021. Virtual. |
| 2020 | How diversity fuels coral survival. 14th International Coral Reef Symposium, Bremen, Germany, Invited Plenary Speaker. (Postponed to summer 2022 due to COVID). |
|  | Communicating Climate in a Complex World. Panel Member. 28 Oct 2020 |
| 2019 | The role of asexual evolution and epigenetic changes in the climate change responses of corals. 24 July 2019, Society of Molecular Biology and Evolution, Manchester, UK. Invited keynote. |
|  | How to maximize the adaptive potential of restored coral populations. 11 Mar 2019, King Abdullah University of Science and Technology (KAUST), Tuwal, Saudi Arabia. |
| 2018 | Somatic mutations, epigenetic divergence and a shift towards asexual reproduction in ancient coral genets. 6 Jul 2018, GEOMAR, University of Kiel, Germany. |
|  | Microbial associates of deep water corals reveal new insights into the ecology and evolution of coral symbioses. PSU Microbiome Center Seminar Series. 14 Apr 2018, University Park, PA |
|  | Genomic basis for coral adaptability and resilience. Meeting of the National Academy of Science's Committee on Interventions to Increase the Resilience of Coral Reefs. 31 May 2018, University of Miami, Miami, FL. |
| 2017 | Coral reef restoration in a changing environment. Symposium: Assisted Evolution - a novel tool to overcome the conservation crisis? 7 Dec 2017, Zoological Museum, Kiel, Germany |
|  | Revive & Restore and CSIRO: “Engineering Resilience in Threatened Ecosystems.” 11 Sep 2017, Heron Island, Australia. *Invitation declined due to travel conflict*. |
|  | Gordon Research Conference on Marine Molecular Ecology - Impacts of Water Quality and Climate Change on Marine Life, Hong Kong University of Science and Technology, 22 - 28 July 2017. *Invitation declined due to travel conflict*. |
|  | Genomic data indicates that hybridization between Caribbean elkhorn and staghorn corals is a likely mechanism for rapid adaptation. Evolutionary Ecology Research Symposium. 20 April 2017, University Park, PA  Fellow Lecture: Ecology and Evolution of Deep-Sea Coral Associated Bacterial Communities. Fellow Lecture at the Hanse-Wissenschaftskollege 5 Jul 2017, Delmenhorst, Germany |
| 2016 | How long lived corals survive and adapt to rapid environmental change. University of Frankfurt. Nov 2016, Frankfurt, Germany |
|  | Assisted evolution, assisted migration. SECORE Board Meeting. 14 Sep 2016, Curacao |
|  | Ecology and Evolution of deep sea coral-associated bacterial communities. ECOGIG 2 PI meeting. 10 Oct 2016, Athens, GA |
|  | Assisted evolution, assisted migration. SECORE Board Meeting. 14 Sep 2016, Curacao |
|  | *Astrangia*: steps to make it the ultimate scleractinian model. *Astrangia* workshop. 4 Aug 2016, Roger Williams University, Bristol RI. |
|  | Can Corals Survive Climate Change. NOAA Acropora Restoration Workshop, NOAA. 18 Jun 2016, Honolulu, HI |
| 2015 | Effects of chemical stress on deep-sea corals. Oil Spill Science: Exploring Oil Spill Impacts in the Deep Gulf of Mexico, Sea Grant Programs of the Gulf of Mexico, Corpus Christi, Texas. December 8, 2015. |
|  | Can corals survive climate change? NOAA Coral Reef Task Force. 15 June 2015. |
|  | Effects of chemical stress on deep-sea corals and their symbionts. Max-Planck-Institute for Marine Microbiology, Bremen. 4 Jun 2015 |
|  | Coral-microbe interactions mediate response to environmental stress. Ludwig-Maximillian-University, Munich. 1 Jun 2015 |
|  | Should I stay or should I go? Dispersal and local adaptation of corals. University of Bristol. 2 Feb 2015. |
| 2014 | Coral-microbe interactions mediate response to environmental stress. 7 Nov 2014 University of Bremen, Zentrum für Marine Tropenökologie. |
| 2013 | The Role of host-symbiont genotype by genotype interactions in determining temperature tolerance of reef building corals. 4 Apr 2013 University of South Florida. |
| 2012 | Corals in a warming ocean. 14 Dec 2012, Institute of Molecular Evolutionary Genetics Seminar Series Seminar Series, PSU. |
|  | The Role of host-symbiont genotype by genotype interactions in determining temperature tolerance of reef building corals. 7 Dec 2012, Hopkins Marine Station, Stanford University. |
|  | The role of dispersal in the Ecology and Evolution of Corals. 11 Apr 2012, Woods Hole Oceanographic Institution. |
| 2011 | Genotype variation in response to thermal stress is basis for coral survival. 24 Oct 2011, Department of Biological Sciences, Louisiana State University. |
|  | Genotype variation in response to thermal stress is basis for coral survival. 18 Nov 2011, Department of Biological Science, Florida State University. |
|  | Should I stay or should I go? 14 Oct 2011, Department of Biology, Duke University. |
|  | The role of marginal environments in the ecology and evolution of reef building corals. 13 Oct 2011, Department of Biology, North Carolina State University, Raleigh. |
|  | Local adaptation in the face of large scale gene flow. 6 Oct 2011, SCRIPSS Institute of Oceanography. |
|  | The role of marginal environments in the ecology and evolution of reef building corals. 30 Sep 2011, Department of Geoscience, University of Iowa. |
|  | Should I stay or should I go? 14 Apr 2011, Section of Integrative Biology, University of Texas at Austin. |
| 2010 | Should I stay or should I go? The role of dispersal in the ecology and evolution of corals. Dec 2010, Zentrum für Marine Tropeneökologie, University of Bremen, Germany. |
|  | Does genotypic diversity of reef-building corals determine the biodiversity of the associated community? Nov 2010, University of Bochum, Germany. |
|  | Should I stay or should I go? The role of dispersal in the ecology and evolution of corals. Sep 2010, Ecology and Evolution, University of Pittsburgh. |
|  | Genetic differentiation in *Porites*: patterns of hybridization, population connectivity and clonal structure. Apr 2010, University of Costa Rica. |
|  | Predicting the effects of ocean warming on a threatened coral using next generation sequencing. Feb 2010, Institute of Molecular Evolutionary Genetics Seminar Series. PSU. |
| 2009 | Functional genomics in non-model organisms: the role of dispersal in the ecology and evolution of reef-building corals. Jun 2009, Leibniz-Institute for Marine Sciences, University of Kiel, Germany. |
|  | Living on the edge: effects of increasing sea surface temperature on coral reproduction and dispersal. Apr 2009, Biology Department, Kent University. |
| 2007 | Discovering the present and reconstructing the past: the ecology and evolution of a reef-building coral. Apr 2007, Geology Department, SUNY Buffalo, NY. |
|  | Discovering the present and reconstructing the past: the ecology and evolution of a reef-building coral. Jan 2007, Geosciences Department, PSU. |
|  | Message in a bottle: The role of dispersal in the ecology and evolution of corals. Feb 2007, Biology Department, PSU. |
| 2006 | Geographic variation in clonal structure in a reef-building Caribbean coral, *Acropora palmata.* Nov 2006, IGDP Ecology Seminar, PSU. |
|  | The snail *Coralliophila abbreviata* and its coral prey. Dec 2006, Center for Infectious Diseases Seminar, PSU. |

#### Popular press coverage (selected)

2023 Can hybrid super reefs defend the coasts? UM leading research for military project. By Nicolas Rivero. 9 Jan 2023. Miami Herald.

Coral species that withstand ocean warming identified. By Claudia Caruana. 9 Jan 2023. Scidev.net.

2022 Can hybrid super reefs defend the coasts? UMleading research for military project

2021 Somatic evolution in corals. Epsilon. Nouveau magazine d’actualité scientifique. p. 55, July 2021.

2020 NSF Research News “New tool for identifying endangered corals could help conservation efforts”. 3 Sep 2020.

New Scientist: “Corals are first animals seen to pass on mutations acquired as adults” Interviewed for article by Michael Marshall. Online Nov 2020.

Hakai Magazine: “Corals versus Climate” Interviewed for online video article by Mark Garrison. Online Dec 2020.

2019 Ecological Applications: “How to maximize the adaptive potential of restored coral populations.” Featured on The Hill, Science Daily, phys.org, among others.

2018 Elife: “Coral bleaching increases disease risk in threatened species” Featured on climatechange.ie, Science Daily, Infosurhoy, among others.

2016 Press release Eberly College of Science Public Information Office on “Corals much older than previously thought”. Featured on phys.org; National Ocean Service: Ocean Facts, National Science Foundation NSF360 Science News Top Story, Futurity, among others.

2015 Press release Eberly College of Science Public Information Office on “Response to environmental change depends on individual variation in partnership between corals and algae”. Featured on phys.org among others.

2014 Press release by the Eberly College of Science Public Information Office on “Until death do us part: Genetics reveal that threatened reef corals and they symbiotic algae live together but evolve independently”. Featured on Science Daily among others.

2012 Press release by the Eberly College of Science Public Information Office on “Darwin Discovered to Be Right: Eastern Pacific Barrier is Virtually Impassable by Coral Species”. Featured on MSNBC, Science Daily, SavePlant among others.

Radio interview with Radio Australia.

2010 Radio interview with the Canadian Broadcasting Corporation.

2010 Press release by the Eberly College of Science Public Information Office on “Discovery could aid restoration of coral reefs”. Featured in Spiegel, Aachener Nachrichten, National Geographic, Physorg.com, Wissenschaft.de among others.

2008 Earth Science Picture of the Day (EPOD) on 28 Oct 2008.

2008 Press release by the Eberly College of Science Public Information Office on “8-day undersea mission begins experiment to improve coral reef”, featured on the Penn State Newswire, the Penn State Live website, the homepage of the Eberly College of Science, Zee News ([www.zeenews.com](http://www.zeenews.com) , 6/19/08), the Innovations Report ([www.innovations-report.de](http://www.innovations-report.de), 6/19/08).

2008 Press release by the Eberly College of Science Public Information Office“Biologists Study Abilities of Corals to Withstand Global Warming”, featured on the Penn State Newswire, the Penn State Live website and the homepage of the Eberly College of Science.

2007 E. Pennisi: “Spawning for a better life” Vol 318, Dec 2007 in Science.

2006 Podcast of research activities while aboard the NOAA ship Hi'ialakai in the North Western Hawaiian Islands. Posted on http://www.hawaiianatolls.org/research/May2006/index.php.

2006 Several interviews to the Honolulu Advertiser while aboard the NOAA ship Hi'ialakai in the North Western Hawaiian Islands. Posted on <http://www.hawaiianatolls.org/research/May2006/index.php>.

2005 Interview with WLRN (Miami National Public Radio) and Radio Key West.

#### Reviews

| **Reviewer for referreed journals** | **Peer reviewer of grants** |
| --- | --- |
| American Naturalist | National Coral Reef Institute (NCRI) |
| Biological Conservation | National Geographic Society |
| Biology Letters  Comptes Rendus | National Oceanographic and Atmospheric Administration (NOAA) |
| Conservation Biology | NSF Biological Oceanography, and Ecosystems, |
| Conservation Genetics | NSF Antarctic Organisms |
| Coral Reefs | NSF Organisms – Environmental Interactions |
| Current Biology | National Underwater Research Center |
| Ecological Monographs | NOAA’s Undersea Research Program |
| Ecography | USAID – MERC Ecology Panel |
| Evolution | Deutsche Forschungsgemeinschaft |
| Global Change Biology |  |
| Heredity |  |
| Invertebrate Biology |  |
| Journal of Biogeography |  |
| Journal of Heredity |  |
| Limnology and Oceaongraphy |  |
| Marine Biology |  |
| Marine Ecology |  |
| Marine Ecology Progress Series |  |
| Molecular Biology and Evolution |  |
| Molecular Ecology |  |
| National Reseach Council  PNAS |  |
| PLoS One |  |
| Proceedings of the Royal Society  Proceedings of the National Academy of Sciences  Protist  Scientific Reports |  |
| The Veliger |  |

#### Memberships

Member of the Society for Molecular Biology and Evolution, since 2014

Member of the American Society for Limnology and Oceanography, since 2004

Member of the International Society for Reef Studies, since 2000

Member of the Society for the Study of Evolution, since 2002

Member of the Ecological Society of America, since 2002

Graduate and Postdoctoral advisors

*Postdoc Advisors*: Fell JW (Univ of Miami), Toonen R (Univ of Hawaii)

*Thesis Advisor*: Glynn PW (Univ of Miami), Szmant A (Univ of Miami)

#### Collaborators

Cohen A (WHOI), Dubilier N (MPI Bremen), Fisher C (PSU), Fogarty N (UNC), Iglesias-Prieto R (PSU), Joye M (UGA), LaJeunesse T (PSU), Medina M (PSU), Miller MW (NOAA), Muller E (Mote), Rotjan R (NEAQ), Smith T (Univ of Virgin Islands).

#### Postdoctoral sponsor

Dr. Rahel Salathe (2010 – 2011); Dr. Nicholas Polato (2012 – 2013); Dr. John Parkinson (2014 – 2016, currently Assistant Prof at University of Florida), Dr. Dustin Kemp (2015 – 2016, currently Assistant Prof at U of Alabama), Dr. Sheila Kitchen (2016 – 2018, currently Assistant Prof at University of Texas), Dr. Andy Shantz (2017-2019, currently Research Scientist, University of Florida). Dr. Eslam Osman (2019 – 2021, currently postdoc at KAUST).

#### Students supervised

**Supervision of graduate dissertations at PSU**

| Name |  | Degree | Semester graduated | Notes |
| --- | --- | --- | --- | --- |
| Polato, | Nicholas | PhD | Spring ‘12 | Advisor, since Fall 2006, received **NSF predoctoral fellowship** in 2008. |
| Ruiz, | Dannise | PhD | Fall ‘14 | Advisor, since Fall 2008, Bunton-Waller fellowship for URM students |
| Boulay | Jennifer | PhD | Fall ‘14 | Advisor, since Fall 2009, received University fellowship |
| Parkinson | John | PhD | Summer ‘14 | Advisor, since Fall 2009, received Biology department fellowship and **NSF predoctoral fellowship** in 2009 |
| Dannenberg | Richard | MSc | Spring ‘16 | Co- Advisor |
| Chan | Andrea | PhD | Spring ‘19 | Advisor, since Fall 2013, received University fellowship, received **NSF predoctoral fellowship** in 2014. |
| Vohsen | Samuel | PhD | Fall ‘19 | Co-Advisor, since Fall 2014 |
| Vasquez | Kate | MS | Fall ‘19 | Advisor, since Fall 2017, Bunton-Waller Fellowship for URM students. |
| Stankiewicz | Kate | PhD | Summer 2022 | Advisor, since Fall 2017, CBIOS pre-doctoral training program fellow |
| Osborne | Cornelia | PhD | Present | Advisor, since Fall 2018, **NSF graduate research fellow** |
| Conn | Trinity | PhD | Present | Advisor, since Fall 2019, Barbara McClintock fellow, PSU |
| Locatelli | Nicolas | PhD | Present | Advisor, since Fall 2020, University Graduate fellow |

**Courses taught**

| Course | Title | Credits | Enrollment | Level |
| --- | --- | --- | --- | --- |
| Biol220W\* | Ecology and Evolution | 3 | 275 | Introductory level undergraduate |
| Biol 482 | Coastal Biology | 3 lecture, 1 field trip | 20 | Upper level undergraduate |
| Biol 110\* Honors | Biology, Basic Concepts and Biodiversity | 3 | 24 | Introductory level undergraduate |
| Biol 110\* | Biology, Basic Concepts and Biodiversity | 3 | 700 | Introductory level undergraduate |
| ECLGY 597 B\* | Advances in Ecology | 3 | 17 | Graduate |
| ECLGY 597F\* | Evolutionary Ecology Seminar | 1 | 10 | Graduate |
| Biol 597\* | Topics in Population Genetics | 1 | 19 | Graduate |
| Biol 592\* | Evaluation of Biological Literature | 1 | 8 | Graduate |

\* team taught

#### Skills

*Laboratory*: genome sequencing, SNP analysis, cloning, fragment analysis, sequencing, PCR, hybridization, probe design, flow cytometry, histology, nutrient analysis, microscopy. *Field*: expedition organization, permit acquisition, SCUBA diving (AAUS research diver, NITROX certified), small boat handling (MOCC certified), American Red Cross CPR and First Aid. *Computer*: database management statistics and population genetics programs, image analysis. *Languages*: Fluent in German and English.

#### Referees

Dr. Nicole Dubilier, Max-Planck-Institute for Marine Microbiology, Celsiusstr. 1, D-28359 Bremen, Germany. Tel +49 421 2028-932, [ndubilie@mpi-bre­men.de](mailto:ndubilie@mpi-bre­men.de). Collaborator and Sabbatical Host.

Dr. Peter W. Glynn, RSMAS-MBF, University of Miami, 4600 Rickenbacker Causeway, Miami FL 33149. Tel +1.305.361.4134, [pglynn@rsmas.miami.edu](mailto:pglynn@rsmas.miami.edu). PhD Advisor.

Dr. Margaret W. Miller, NOAA-Fisheries, Southeast Science Center, 75 Virginia Beach Drive, Miami FL 33149. Tel +1.305.361.4561, [Margaret.W.Miller@noaa.gov](mailto:Margaret.W.Miller@noaa.gov). Collaborator.

Dr. Rob J. Toonen, University of Hawaii, 46-007 Lilipuna Rd, Kane’ohe HI 96744. Tel +1 (808) 236-7425, [toonen@hawaii.edu](mailto:toonen@hawaii.edu). Postdoctoral Sponsor.

#### Advisors

Dr. Gottfried Hempel, University of Bremen. Retired. Diplom Vater.

Dr. Alina Szmant, University of North Carolina, Wilmington, [szmanta@uncw.edu](mailto:szmanta@uncw.edu). Master’s Advisor.

Dr. Peter W. Glynn, RSMAS-MBF, University of Miami, [pglynn@rsmas.miami.edu](mailto:pglynn@rsmas.miami.edu). PhD Advisor.

Dr. Jack Fell, RSMAS – MBF, University of Miami, [jfell@rsmas.miami.edu](mailto:jfell@rsmas.miami.edu). Postdoctoral Sponsor.

Dr. Rob J. Toonen, University of Hawaii, [toonen@hawaii.edu](mailto:toonen@hawaii.edu). Postdoctoral Sponsor.