

# David Michael Baker

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## EDUCATION

- 2010 Ph.D. Ecology & Evolutionary Biology: Cornell University, Ithaca, NY  
Co-advisors: Dr. Drew Harvell, Dr. Jed Sparks
- 2004 M.S. Biology: American University, Washington, D.C.  
Advisor: Dr. Kiho Kim
- 2001 B.A. Biology: St. Mary's College of Maryland, St. Mary's City, MD

## POSITIONS HELD

- 2013 Assistant Professor, School of Biological Sciences, Department of Earth Science, & Swire Institute of Marine Science, University of Hong Kong
- 2011-2013 MarineGEO (Marine Science Network) Post-doctoral Fellow, Smithsonian Institution  
Advisor: Dr. Nancy Knowlton
- 2011-2013 Visiting Investigator: Carnegie Institution of Washington, Geophysical Lab
- 2010-2013 Faculty Fellow: Department of Environmental Sciences, American University, Washington, DC
- 2010-2011 Post-doctoral Associate: Carnegie Institution of Washington, Geophysical Lab  
Advisor: Dr. Marilyn Fogel

## PEER-REVIEWED PUBLICATIONS

13. CJ Freeman, RW Thacker, **DM Baker**, ML Fogel (in press) Quality or quantity: Is nutrient transfer driven more by symbiont identity and productivity than by symbiont abundance? *The International Society for Microbial Ecology (ISME) Journal*
12. **DM Baker**, JP Andras, AG Jordán-Garza, ML Fogel (in press) Nitrate competition varies with temperature among *Symbiodinium* clades. *ISME J*
11. **DM Baker**, L Weigt, M Fogel, N Knowlton (in press) Ancient DNA from *Symbiodinium* hosted by Caribbean octocorals illustrate a static mutualism in the midst of global change. *PLOS ONE*
10. M Moynihan\*, **DM Baker**, AJ Mmochi (2012) Isotopic and microbial indicators of sewage pollution from Stone Town, Zanzibar. *Marine Pollution Bulletin* 64, 1348-1355.
9. RE Rodríguez-Martínez, GA Jordán-Garza, **DM Baker**, E Jordán-Dahlgren (2012) Prevalence of coral-*Trididemnum solidum* interactions on Mexican Caribbean reefs. *Coral Reefs* 31(2), 571-577.
8. **DM Baker**, K Kim, JP Andras, JP Sparks (2011) Light-mediated <sup>15</sup>N fractionation in Caribbean gorgonian corals: implications for pollution monitoring. *Coral Reefs* 30, 709-717.

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\* indicates undergraduate advisee

7. **DM Baker**, E Jordán-Dahlgren, MA Maldonado, CD Harvell (2010) Sea fan corals provide a stable isotope baseline for assessing sewage pollution in the Mexican Caribbean *Limnology & Oceanography* 55(5) 2139-2149.
6. **DM Baker**, K Webster, K Kim (2010) Caribbean octocorals record changing carbon and nitrogen sources from 1862-2005. *Global Change Biology*, 16(10), 2701-2710.
5. EB Rivest\*, **DM Baker**, KL Rypien, CD Harvell (2010) Nitrogen preference of *Aspergillus sydowii*, an infective agent associated with aspergillosis of sea fan corals. *Limnology & Oceanography*, 55(1), 386-392.
4. KL Rypien, **DM Baker** (2009) Isotopic labeling and antifungal-resistance as tracers of gut passage of the sea fan pathogen, *Aspergillus sydowii*. *Diseases of Aquatic Organisms*, 86, 1-7.
3. CA Page, **DM Baker**, CD Harvell, Y Golbuu, L Raymundo, SJ Neale, KB Rosell, KL Rypien, JPAndras, BL Willis (2009) Influence of marine reserves on coral disease prevalence. *Diseases of Aquatic Organisms*. 87, 135-150.
2. A Jordan-Garza, MA Maldonado, **DM Baker**, R. Rodriguez (2008) High abundance of *Diadema antillarum* on a Mexican reef. *Coral Reefs* 27(2), 295.
1. **DM Baker**, SA MacAvoy, K Kim (2007) Relationship between water quality,  $\delta^{15}\text{N}$ , and aspergillosis of Caribbean sea fan corals. *Marine Ecology Progress Series*. 343, 123-130.

#### SUBMITTED MANUSCRIPTS

1. **DM Baker**, RE Rodríguez-Martínez, ML Fogel (in review) Tourism's nitrogen footprint on Caribbean coral reefs. *Coral Reefs*

#### TECHNICAL REPORTS

1. LI Raymundo, K Kim, J Redding, R Miller, K Pinkerton, **DM Baker** (2011) Links between deteriorating coral health and sewage pollution on Guam reef flats. University of Guam Marine Laboratory, Technical Report #131

#### GRANTS

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|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2010 | Bermuda Zoological Society, "Investigating Bermuda's marine pollution history through stable isotope analyses of modern and museum-held gorgonians", \$1,750                                                                                                                                                                          |
| 2007 | NSF: IGERT Program Small Grant, "Stable isotope history of the Caribbean: Corals as sentinels for human perturbation" \$3,860                                                                                                                                                                                                         |
| 2006 | NSF: IGERT Program Small Grant, "Monitoring coral reefs: $^{15}\text{N}$ through space and time" \$3,000<br>Mario Einaudi Center for International Studies, "Nitrogen isotope analyses of reef corals: investigating the role of nutrients and coral disease", \$1,000                                                                |
| 2005 | NSF: IGERT Program Small Grant, " $\delta^{13}\text{C}$ as a measure of photosynthetic efficiency in modified symbioses: a test of the adaptive bleaching hypothesis" \$4,000<br>PADI Foundation Grant, "A century of nitrogen perturbations in the Caribbean revealed using isotopic analysis of gorgonian coral skeletons", \$4,000 |

- NSF: IGERT Program Small Grant, "*The effect of nitrate concentration on uptake in the Caribbean octocoral Gorgonia ventalina*", \$2,997  
NSF: IGERT Program Small Grant, "*Stable isotopes of coral reef invertebrates: developing assessment tools to monitor reef health*", \$1,000  
2002 Hemlinge Research Grant, \$3,000

## AWARDS & HONORS

- 2011 Smithsonian Marine Science Network Post-doctoral Fellowship, \$100,000  
2006 EPA STAR Fellowship Conference, "*Stable Isotope Analysis and the Future of Coral Reef Monitoring*" **Award:** "*People's Choice*"; voted best poster by attendees.  
2005 Environmental Protection Agency – Science To Achieve Results (EPA-STAR) Fellowship, \$111,000  
2004 National Science Foundation Integrative Graduate Education and Research Traineeship (NSF-IGERT) Fellowship, Biogeochemistry and Environmental Biocomplexity Program, Cornell University \$30,000  
College of Arts and Sciences, American University "*Stable Isotope Analysis of Gorgonia ventalina: Spatial Variability and Trophic Status as Indicated by <sup>15</sup>N*" **Award:** "*Outstanding Presentation by a Graduate Student*"  
2002 Graduate Fellowship, American University

## PROFESSIONAL EXPERIENCE

- 2012 Visiting Academic: Australian Institute of Marine Science  
2007 Invited Participant: 5<sup>th</sup> International Ecology & Evolution of Infectious Disease Meeting, Cornell University  
2006 Visiting Academic: Australian Institute of Marine Science  
Participant & Presenter: World Bank/GEF Coral Disease working group meeting, Heron Is., AUS (talk)  
2005 Participant & Presenter: World Bank/GEF Coral Disease working group meeting, Akumal, MX (talk)  
Participant: Stable Isotope Biogeochemistry Short Course, MSU  
2003 Intern: NOAA U.S. Coral Reef Task Force, Silver Spring, MD

## FIELD EXPERIENCE

- 09/04 – Present >350 logged open water dives  
01/10 – Present Smithsonian Institution Scientific Diver  
02/06 – Present PADI certified Rescue Diver, Advanced Open Water Diver  
09/04 – Present PADI certified Open Water Diver  
11/04 – Present American Association of Underwater Scientists (AAUS) Scientific Diver  
Red Cross certified in CPR, First Aid, and Oxygen Administration  
**Field Sites:** Australia (including cross-shelf cruise, R/V *Lady Basten*, Australian Institute of Marine Science, 2006), Bahamas, Belize, Bermuda, Florida, Hawaii, Palau, Panama, Guam

## PRESENTATIONS

- 2012 Australian Institute of Marine Science, Townsville, Australia;  
International Coral Reef Symposium, Cairns, Australia;  
School of Biological Sciences, Hong Kong University; *"The central role of nitrogen in the coral symbiosis: implications for global change"* (talk, invited)  
Institute of Oceanography, National Taiwan University, Taiwan; *"The role of nitrogen in the ecology and evolution of corals"* (talk, invited)  
2012 Benthic Ecology Meeting, Norfolk, VA; *"Warm water breeds greedy partners: zooxanthellae share fewer resources with their hosts at higher temperatures"* (talk)  
ASLO/AGU Ocean Sciences Meeting Salt Lake City, Utah; *"Compound-specific analyses of coral amino acids shed light on a threatened symbiosis"* (talk)
- 2011 Department of Biology, University of Alabama, Birmingham; *"From cells to ecosystems: how stable isotopes improve our understanding of coral physiology and global change"* (talk, invited)  
Carnegie Institution of Washington, Geophysical Laboratory; *"Stable isotopes in coastal seas; records of global change from coral-algal symbioses"* (talk)  
University of Guam Marine Lab; *"Stable isotope analysis: a new tool for coral reef monitoring"* (talk)  
Smithsonian Museum Support Center; Laboratory of Analytical Biology (talk)  
DC-IRMS User Group Meeting, Carnegie Institution of Washington, Geophysical Laboratory (talk)  
ASLO Aquatic Sciences Meeting, San Juan, Puerto Rico *"A biogeochemical basis for coral-algal associations"* (talk)  
11th National Conference on Science, Policy and the Environment: *Our Changing Oceans*, Washington, D.C.; *"Stable isotope monitoring in the oceans: examples from coral reefs"* (poster)
- 2010 ISOECOL VII, University of Alaska, Fairbanks: *"Stable isotopes and coral reef ecology: a two-part tale"*. (talk)  
Carnegie Institution of Washington, Department of Global Ecology, Palo Alto, CA: *"From cells to ecosystems: how stable isotopes improve our understanding of coral physiology and global change"* (talk)  
2010 Ecology & Evolution of Infectious Diseases, Ithaca, NY: *"Stable isotopes reveal the biogeochemistry of a coral disease"* (poster)  
2010 Benthic Ecology Meeting, Wilmington, NC: *"Tracing sewage inputs to coral reefs: an example from the Mesoamerican barrier reef"* (talk)
- 2009 15th CF-IRMS Workshop, Cornell University *"Using CF-IRMS applications for monitoring pollution on Mexican coral reefs"* (talk, invited)  
ASLO Aquatic Sciences Meeting 2009, Nice, France *"Tracing sewage inputs to coral reefs: an example from the Mesoamerican barrier reef"* (poster)
- 2008 11<sup>th</sup> International Coral Reef Symposium Ft. Lauderdale, FL *"Long-term Caribbean nitrogen perturbations recorded by gorgonian corals"* (talk)
- 2006 NCER / USEPA ORD, Washington, DC *"Nutrients, stable isotopes, and the ecology of coral reefs"* (talk, invited)
- 2003 32<sup>nd</sup> Benthic Ecology Meeting, Groton, CT: *"Assessing pollution in gorgonians using <sup>15</sup>N isotope analysis"* (poster)

## TEACHING & OUTREACH EXPERIENCE

10/12	Invited Speaker for “ <i>Nerd Nite</i> ”, Public Lecture, Washington, DC
04/12	Presenter at the 2 <sup>nd</sup> USA Science & Engineering Expo, Washington, DC
10/10 – Present	Supervisor for two undergraduates in the Geophysical Laboratory
10/10	Presenter at the 1 <sup>st</sup> USA Science & Engineering Expo, Washington, DC
05/09 – 06/09	Organizer & Presenter: <i>Science from the Slope</i> , Sigma Xi’s 1 <sup>st</sup> Community Science Outreach, Ithaca, NY
09/09 – 12/09	Teaching Assistant: Ecology & the Environment, Cornell University
05/09 – 06/09	Teaching Assistant: Biology & Biodiversity of Marine Invertebrates, Shoals Marine Laboratory, Cornell University
01/09 – 05/09	Teaching Assistant: Evolutionary Biology, Cornell University
09/08 – 12/08	Teaching Assistant: Marine Ecology, Cornell University
04/08	Workshop Leader, “ <i>Ocean Odyssey</i> ”, Expanding Your Horizons Program
08/07 – 12/09	Supervisor for six undergraduates and 2 Honor’s Program students
01/07 – 12/07	Independent Study Instructor with Dr. Mike Timmons (Cornell B&EE)
11/05 – 11/09	Guest Instructor: Oceanography, Cornell University
01/02 – 05/04	Teaching Assistant / Lab Instructor: American University Multiple Courses Including: General Biology II, Great Experiments in Biology, Vertebrate Anatomy, Vertebrate Physiology, Molecular World
06/99 – 08/01	Environmental Educator: Living Classrooms Foundation, Baltimore, MD.

## OTHER SKILLS

- Designed, built and maintained a 3,800 L mariculture/teaching lab for cultivating gorgonian corals and other marine invertebrates at Cornell University
- Proficient in basic Spanish, learning Mandarin Chinese

## SERVICE

09/08 – 11/09	Vice President: <i>Sigma Xi</i> , Cornell Chapter
03/07 – 11/09	Student Member: Diving Control Board, Cornell University
2010 – Present	Reviewer: National Science Foundation, USEPA, USAID, NOAA/NURP, Marine Ecology Progress Series, <i>Oecologia</i> , <i>Biogeosciences</i> , <i>Marine Pollution Bulletin</i> , <i>Marine Biology Research</i> , <i>Journal of Experimental Marine Biology &amp; Ecology</i>

## PROFESSIONAL MEMBERSHIPS

08/11 – Present	American Geophysical Union (AGU)
08/08 – Present	Advancing the Science of Limnology & Oceanography (ASLO)
01/05 – Present	American Association of Underwater Scientists (AAUS)
11/02 – Present	International Society for Reef Studies (ISRS)