

**David Michael Baker****Present Academic Position**

Assistant Professor  
 School of Biological Sciences  
 The Swire Institute of Marine Science  
 The University of Hong Kong

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**Academic Qualifications**

2010	Ph.D. Ecology & Evolutionary Biology	Cornell University
2004	M.A. Biology	American University
2001	B.A. Biology	St. Mary's College of Maryland

**Academic Positions**

2013 — present	Assistant Professor	Biological Sciences	HKU
2011 — 2012	Postdoctoral Fellow	NMNH	Smithsonian
2010 — 2012	Postdoctoral Associate	Geophysical Lab	Carnegie Institution

**Research & Scholarship****1. Publications**

36 in total (w. additional 12 submitted or in review/revision),  
 citations = 461, h-index = 12, as of February 2018.

\* corresponding author, †postgraduate student, ‡undergraduate student

Top four papers in past six years indicated by shading with significance note included.

Manuscripts to be submitted (by March 2018)

48. SE McIlroy, JCY Wong<sup>†</sup>, **DM Baker**<sup>\*</sup> (submitted) FISH-Flow-SIA to link taxonomy and function in microbial communities. *Nature Methods*.  
 IF = 25.06      Ranking = 1/78 (biochem.res. meth.)      %Cont.= 25 Citations = N/A
47. SE McIlroy, PD Thompson<sup>†</sup>, FL Yuan, T Bonebrake, **DM Baker**<sup>\*</sup> (submitted) High thermal variation in coral climatic refugia limits reef proliferation. *Nature Climate Change*.  
 IF = 19.3      Ranking = 2/229 (environ. science)      %Cont.= 25 Citations = N/A
46. LY Chan<sup>‡</sup>, WY Chung<sup>‡</sup>, V Sheng<sup>†</sup>, J Richards, **DM Baker**<sup>\*</sup> (submitted) Endangered species for mass consumption: illegal eel in the frozen food aisle. *PNAS*.  
 IF = 9.661      Ranking = 4/64 (multidiscipl. sci.)      %Cont.= 25 Citations = N/A
45. JCY Wong<sup>†</sup>, **DM Baker**<sup>\*</sup> (submitted) A novel hollow-fiber membrane bioreactor for *Symbiodinium* culturing. *Algal Research*.  
 IF = 3.994      Ranking = 28/160 (biotech & microbiol.)      %Cont.= 50 Citations = N/A
44. A Archanat<sup>†</sup>, N Geeraert, MN Xu, SJ Kao, B Thibodeau, **DM Baker**<sup>\*</sup> (submitted) Variability of dual nitrate isotopes in an urbanized marine environment - an improved investigation on the differential impacts of mixing and transformation. *Water Research*.  
 IF = 6.942      Ranking = 2/49 (eng. environ. science)      %Cont.= 10 Citations = N/A

*Manuscripts in review*

43. A Ohdera , MJ Abrams, CL Ames, **DM Baker**, LP Suescun Bolivar, AG Collins, CJ Freeman, Edgar Gamero-Mora, TL Goulet, DK Hofmann, A Jaimes-Becerra, PF Long, AC Marques, LA Miller, L Mydlarz, AC Morandini, CR Newkirk, SP Putri, S Julia, N Stampar, B Steinworth, M Templeman, PE Thom  , M Vlok, C Woodley, JCY Wong<sup>†</sup>, MQ Martindale, WK Fitt and M Medina (in review) Upside-down but headed in the right direction: The highly versatile *Cassiopea xamachana* system. *Frontiers in Ecology and Evolution - Coevolution*.  
IF = N/A      Ranking = N/A      %Cont.= 5 Citations = N/A
42. MJ Perkins, YKY Mak, LSR Tao, ATL Wong, JKC Yau, **DM Baker**, KMY Leung (in review) Short-term tissue decomposition alters stable isotope values and C:N ratio but does not change relationships between lipid content, C:N ratio, and  $\Delta\delta^{13}\text{C}$  in marine animals. *PLOS ONE*  
IF = 2.806      Ranking = 15/64 (multidiscipl. science)      %Cont.= 10 Citations = N/A
41. K Kang, Y Ni, J Li, L Imamovic, C Sarkar, Y Heshiki, T Zheng, S Kumari, JCY Wong<sup>†</sup>, A Archana<sup>†</sup>, CWM Wong<sup>†</sup>, CE Dingle, S Denizen, **DM Baker**, MOA Sommer, CJ Webster, G Panagiotou (in review) The metro system may modulate the skin microbiome and resistome by its environmental exposures and the inner- and inter-city traffic flows. *Cell Reports*  
IF = 8.282      Ranking = 26/190 (cell biology)      %Cont.= 10 Citations = N/A

*Manuscripts in revision*

40. CP Shin<sup>‡</sup>, A Hoffman, W Lee, RC Kendrick, **DM Baker**, TC Bonebrake (in revision) Lichenivorous moths as a potential bioindicator: a stable isotope study of lichens and Lithosiini in Hong Kong. *Entomological Science*.  
IF = 1.262      Ranking = 40/93 (entomology)      %Cont. = 10 Citations=N/A
39. LG Gibson, A Andersson, D Dudgeon, Y Song, Y Chen, **DM Baker**, A Hofford. (in revision) Mismatch in Timing of Ivory Bans in China and Hong Kong Endangers African Elephants. *Frontiers in Ecology and the Environment*.  
IF = 8.039      Ranking = 7/153 (ecology)      %Cont.= 10 Citations=N/A
38. V Bacalan, T Poinatte, **DM Baker**, ML Fogel, K Kim (in revision) Stable isotope analyses of manatee bones measure historical nitrogen pollution in Florida waters, 1975-2010. *Marine Biology*  
IF = 2.136      Ranking = 31/105 (mar. freshwater biol.)      %Cont. 10 Citations = N/A
37. CWM Wong<sup>†</sup>, IE Conti-Jerpet<sup>†</sup>, LJ Raymundo, CE Dingle, A Ponzo, **DM Baker\*** (in revision) Whale shark ecotourism: impacts on coral reefs in the Philippines. *Environmental Management*  
IF = 1.878      Ranking = 111/229 (env. sciences)      %Cont.= 25 Citations = N/A

## Published

36. **DM Baker\***, CJ Freeman, JCY Wong<sup>†</sup>, ML Fogel, N Knowlton (in press) Climate change promotes parasitism in a coral symbiosis. *The ISME Journal*. DOI:10.1038/s41396-018-0046-8  
IF = 9.664      Ranking = 3/153 (ecology)      %Cont.= 80 Citations = 0
- Significance:** This paper is the first to report that algal symbionts in corals deemed “mutualists” become parasitic with ocean warming, casting doubt on the hope that symbionts have the potential to save corals from climate change. Since being published online it is the 2<sup>nd</sup> most referenced on social media amongst similarly aged papers in the journal and amongst the top 96% in the Nature Publishing Group.
35. N Duprey, SE McIlroy, TPT Ng, PD Thompson<sup>†</sup>, T Kim<sup>†</sup>, JCY Wong<sup>†</sup>, CWM Wong<sup>†</sup>, SM Husa, SMH Li, GA Williams, **DM Baker\*** (2017) Facing a wicked problem with optimism: issues and priorities for coral conservation in Hong Kong. *Biodiversity and Conservation* 26(11): 2521-2545.  
IF = 2.265      Ranking = 13/54 (biodiv. conservation)      %Cont.= 25 Citations = 0
34. CJ Freeman, EW Stoner, CG Easson, KO Matterson, **DM Baker** (2017) Variation in  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  suggests a coupling of host and symbiont metabolism in the *Symbiodinium* - *Cassiopea* mutualism. *Marine Ecology Progress Series* 571: 245-251.  
IF = 2.292      Ranking = 24/105 (mar. freshwater biol.)      %Cont.= 25 Citations = 0
33. N Duprey, XT Wang, PD Thompson<sup>†</sup>, J Pleadwell, LJ Raymundo, K Kim, DM Sigman, **DM Baker\*** (2017) Life and death of a sewage treatment plant recorded in a coral skeleton  $\delta^{15}\text{N}$  record. *Marine Pollution Bulletin* 120(1-2): 109-116.  
IF = 3.146      Ranking = 8/105 (mar. freshwater biol.)      %Cont.= 25 Citations = 1
32. Y Heshiki, T Dissanayake, T Zheng, K Kang, N Yueqiong, Z Xu, C Sarkar, PCY Woo, BKC Chow, **DM Baker**, A Yan, C Webster, G Panagiotou, and J Li. (2017) Towards a metagenomic understanding on the bacterial composition and resistome in Hong Kong banknotes. *Frontiers in Microbiology* 8:632.  
IF = 4.076      Ranking = 26/124 (microbiology)      %Cont.= 10 Citations = 0
31. CWM Wong<sup>†</sup>, N Duprey, **DM Baker\*** (2017) New insights on the nitrogen footprint of a coastal megalopolis from coral-hosted *Symbiodinium*  $\delta^{15}\text{N}$ . *Environmental Science and Technology* 51, 1981-1987.  
IF = 6.198      Ranking = 4/49 (eng. environ. sci.)      %Cont.= 50 Citations = 2
30. **DM Baker\***, T Murdoch, I Conti-Jerpe<sup>†</sup>, ML Fogel (2017) Investigating Bermuda's pollution history through stable isotope analyses of modern and museum held gorgonian corals. *Marine Pollution Bulletin* 114, 169-175.  
IF = 3.146      Ranking = 8/105 (mar. freshwater biol.)      %Cont.= 80 Citations = 3
29. AH Yeung, **DM Baker\*** (2016) A turnaround at Sanya National Coral Reef Nature Reserve? Proceedings of the 13<sup>th</sup> International Coral Reef Symposium, Honolulu: 570 - 589.  
IF = N/A      Ranking = N/A      %Cont.= 50 Citations = 0
28. A Anand<sup>†</sup>, L Li, SJ Kao, B Thibodeau, **DM Baker\*** (2016) Variations in nitrogen isotope composition of wastewater effluents by treatment type in Hong Kong. *Marine Pollution Bulletin* 111(1-2), 143-152.  
IF = 0.47      Ranking = 45/54 (biodiv. conservation)      %Cont.= 25 Citations = 4

27. F Stein, JCY Wong<sup>†</sup>, V Sheng<sup>†</sup>, SWC Law<sup>†</sup>, B Schröder, **DM Baker\*** (2016) First genetic evidence of illegal trade in endangered European eel (*Anguilla anguilla*) from Europe to Asia. *Conservation Genetics Resources* 8(4), 533-537.  
IF = 1.549      Ranking = 20/50 (fisheries)      %Cont.= 10 Citations = 1
26. N Duprey, M Yasuhara, **DM Baker\*** (2016) Reefs of tomorrow: eutrophication reduces coral biodiversity in an urbanized seascape. *Global Change Biology* 22(11), 3550-3568.  
IF = 8.502      Ranking = 1/54 (biodiv. conservation)      %Cont.= 50 Citations=16
- Significance:** This paper utilized two datasets from Hong Kong, comprising nearly 70,000 datapoints on water quality and coral biodiversity that are quite rare in temporal scale (since 1986) and scope (covering many parameters and sites). These data were used to support the hypothesis that degraded water quality is a driver of coral species loss; a subject that has been debated in the literature for many decades.
25. JCY Wong<sup>†</sup>, P Thompson<sup>†</sup>, JY Xie, JW Qiu, **DM Baker\*** (2016) *Symbiodinium* clade C generality among common scleractinian corals in subtropical Hong Kong. *Regional Studies in Marine Science* 8(3), 439-444.  
IF = N/A      Ranking = N/A      %Cont.= 25 Citations = 2
24. CJ Freeman, EW Stoner, CG Easson, KO Matterson, **DM Baker** (2016) Carbon and nitrogen metabolism by symbionts within *Cassiopea xamachana*. *Marine Ecology Progress Series* 544, 281-286.  
IF = 2.292      Ranking = 24/105 (mar. freshwater biol.)      %Cont.= 25 Citations = 3
23. CJ Freeman, CG Easson, **DM Baker** (2016) Niche structure of marine sponges from temperate hard-bottom habitats within Gray's Reef National Marine Sanctuary. *Journal of the Marine Biological Association of the United Kingdom*. 96(2), 559-565.  
IF = 1.038      Ranking = 69/105 (mar. freshwater biol.)      %Cont.= 10 Citations = 0
22. PK Cheung<sup>‡</sup>, KK Yuen<sup>‡</sup>, PF Li<sup>‡</sup>, WH Lau<sup>‡</sup>, CM Chiu<sup>‡</sup>, M Yuen<sup>‡</sup>, **DM Baker\*** (2015) To swim or not to swim? A disagreement between microbial indicators on beach water quality assessment in Hong Kong. *Marine Pollution Bulletin* 101, 53-60.  
IF = 3.146      Ranking = 8/105 (mar. freshwater biol.)      %Cont.= 25 Citations = 9
21. **DM Baker\***, CJ Freeman, N Knowlton, RW Thacker, K Kim, ML Fogel (2015) Productivity links morphology, symbiont specificity and bleaching in the evolution of Caribbean octocoral symbioses. *The ISME Journal* 9, 2620-2629.  
IF = 9.664      Ranking = 3/153 (ecology)      %Cont.= 80 Citations = 8
- Significance:** This paper is exemplar of the primary direction for my research. It is amongst the first studies to evaluate the relationship between morphological and molecular phylogenetics in conjunction with a coral's nutritional physiology. It provides the strongest evidence to date that there is a functional purpose for coral polyp size and that symbiont specificity and bleaching resistance is a characteristic of obligate autotrophic strategies in coral symbioses.
20. CJ Freeman, **DM Baker**, CG Easson, RW Thacker (2015) Shifts in sponge-microbe mutualisms across an experimental irradiance gradient. *Marine Ecology Progress Series* 526, 41-53.  
IF = 2.292      Ranking = 24/105 (mar. freshwater biol.)      %Cont.= 25 Citations = 5
19. K Pinkerton, **DM Baker**, MR Cuddy, LJ Raymundo, KA Meyer, K Kim. (2015) Nitrogen dynamics on Guam as revealed by the seagrass *Enhalus acoroides*. *Marine Ecology Progress Series* 528, 117-126.  
IF = 2.292      Ranking = 24/105 (mar. freshwater biol.)      %Cont.= 25 Citations = 0

18. CJ Freeman, CG Easson, **DM Baker\*** (2014) Metabolic diversity and niche structure in sponges from the Miskito Cays, Honduras. *Peer J* 2:e695.  
IF = 2.177      Ranking = 20/64 (multidiscipl. sciences)      %Cont.= 25 Citations=10
17. CG Easson, M Slattery, **DM Baker**, D Gochfeld (2014) Complex ecological associations: Evidence for competition and facilitation in a sponge-algal interaction. *Marine Ecology Progress Series* 507, 153-167.  
IF = 2.292      Ranking = 24/105 (mar. freshwater biol.)      %Cont.= 25 Citations = 9
16. C Fiore, **DM Baker**, M Lesser (2013) Nitrogen biogeochemistry in the Caribbean sponge *Xestospongia muta*: A source or sink of dissolved inorganic nitrogen? *PLOS ONE* 8(8): e72961.  
IF = 2.806      Ranking = 15/64 (multidiscipl. science)      %Cont.= 25% Citations = 29
15. JE Redding, RL Myers-Miller, **DM Baker**, ML Fogel, LJ Raymundo, K Kim (2013) Link between sewage-derived nitrogen pollution and coral disease severity. *Marine Pollution Bulletin* 73(1), 57-63.  
IF = 3.146      Ranking = 8/105 (mar. freshwater biol.)      %Cont.= 25 Citations = 25
14. **DM Baker\***, RE Rodríguez-Martínez, ML Fogel (2013) Tourism's nitrogen footprint on a Meso-american coral reef. *Coral Reefs* 32(3), 691-699.  
IF = 2.906      Ranking = 13/105 (mar. freshwater biol.)      %Cont.= 80 Citations = 25
13. CJ Freeman, RW Thacker, **DM Baker**, ML Fogel (2013) Quality or quantity: Is nutrient transfer driven more by symbiont identity and productivity than by symbiont abundance? *The ISME Journal* 7, 1116-1125.  
IF = 9.664      Ranking = 3/153 (ecology)      %Cont.= 25 Citations = 38
12. **DM Baker\***, JP Andras, AG Jordán-Garza, ML Fogel (2013) Nitrate competition in a coral symbiosis varies with temperature among *Symbiodinium* clades. *The ISME Journal* 7, 1248-1251.  
IF = 9.664      Ranking = 3/153 (ecology)      %Cont.= 80 Citations = 45
- Significance:** This paper was published soon after my start at HKU and has had a significant impact on my research vision. It's the first study to show that nitrogen metabolism in corals is affected by temperature in such a way that better describes the prevalence of major genetic types of coral symbionts in nature, and is the first demonstration that competition for nitrogen may dictate the dominant symbiont type corals associate with. This study was extended with a major grant received in 2014, with several publications in review/development.
11. **DM Baker\***, L Weigt, M Fogel, N Knowlton (2013) Ancient DNA from coral-hosted *Symbiodinium* reveal a static mutualism over the last 172 years. *PLoS ONE* 8(2): e55057.  
IF = 2.806      Ranking = 15/64 (multidiscipl. science)      %Cont.= 80 Citations = 9
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.  
IF = 3.146      Ranking = 8/105 (mar. freshwater biol.)      %Cont.= 50 Citations = 32
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.  
IF = 2.906      Ranking = 13/105 (mar. freshwater biol.)      %Cont.= 25 Citations = 5

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.  
IF = 2.906      Ranking = 13/105 (mar. freshwater biol.)      %Cont.= 80 Citations = 11
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.  
IF = 3.383      Ranking = 2/20 (limnology)      %Cont.= 80 Citations = 31
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.  
IF = 8.502      Ranking = 1/54 (biodiv. conservation)      %Cont.= 80 Citations = 26
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.  
IF = 3.383      Ranking = 2/20 (limnology)      %Cont. 50 Citations = 4
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.  
IF = 1.549      Ranking = 20/50 (fisheries)      %Cont.= 70 Citations = 12
3. CA Page, **DM Baker**, CD Harvell, Y Golbuu, L Raymundo, SJ Neale, KB Rosell, KL Rypien, JP Andras, BL Willis (2009) Influence of marine reserves on coral disease prevalence. *Diseases of Aquatic Organisms*. 87, 135-150.  
IF = 1.549      Ranking = 20/50 (fisheries)      %Cont.= 10 Citations = 27
2. A Jordán-Garza, MA Maldonado, **DM Baker**, R. Rodríguez (2008) High abundance of *Diadema antillarum* on a Mexican reef. *Coral Reefs* 27(2), 295.  
IF = 2.906      Ranking = 13/105 (mar. freshwater biol.)      %Cont.= 10 Citations = 17
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.  
IF = 2.292      Ranking = 24/105 (mar. freshwater biol.)      %Cont.= 75 Citations = 51

#### Prizes and awards

- 2016 Pew Charitable Trusts Fellows Program in Marine Conservation Fellowship Nominee (40 nominees annually, worldwide)
- 2013 Early Career Award, University Grants Committee, Research Grants Council of Hong Kong (9 awards in Biology in 2013)
- 2011 Smithsonian Marine Science Network Fellow
- 2005 US Environmental Protection Agency, Science to Achieve Results (EPA-STAR) Fellow

## 2. Peer review service

Ranked 9<sup>th</sup> at HKU on publons.com

**Editorship:** Associate Editor (since 2017), *Frontiers in Ecology & Evolution - Coevolution*; Frontiers Media, S.A.; Lausanne, Switzerland; 16 Associate Editors

**Journal reviewer:** Nature, Proceedings of the National Academy of Sciences, The ISME Journal, Analytical Chemistry, Molecular Ecology, Environmental Pollution, Proceedings of the Royal Society B: Biological Sciences, BioEssays, Earth and Planetary Science Letters, Scientific Reports, Evolution, Ecosystems, Microbial Ecology, Marine Pollution Bulletin, Coral Reefs, PLoS ONE, Marine Ecology Progress Series, PeerJ, Frontiers in Marine Science, Diversity, Science Advances, Biogeosciences, Environmental Microbiology, Geochemica et Cosmochemica Acta, Journal of Experimental Marine Biology and Ecology, Marine Biology Research, Marine Ecology Progress Series, Oecologia, Annual Reviews in Ecology Evolution and Systematics, Earth and Planetary Science Letters, eLife, Ecology

**Proposal reviewer:** United States Agency for International Development (USAID), United States Environmental Protection Agency Science to Achieve Results (EPA-STAR) Program, Netherlands Organization for Scientific Research (NWO), Natural Sciences and Engineering Research Council of Canada (NSERC), Canada Foundation for Innovation: John R. Evans Leadership Fund, Swiss National Science Foundation, Office of Competitive Research Funds -King Abdullah University of Science and Technology

## 3. Invited talks

- 2017 *Reefs of the future: 未来的珊瑚 complex, electric, and 3D printed?*, 1<sup>st</sup> International Forum on Coral Reefs (Hainan, China)  
(audience size ~100, support received: travel & accommodation)
- 2017 *Hong Kong corals through space and time: adventures in pollution and symbiosis*, SECORE International Workshop (Guam)  
(audience size ~30, support received: travel & accommodation)
- 2017 *Corals through space and time: adventures in symbiosis*, Duke-Kunshan University, Kunshan, China  
(audience size ~30, support received: travel & accommodation)
- 2017 *Climate change impacts on corals: from reef to cell*, Invited Seminar, National Sun Yat Sen University, Taiwan  
(audience size ~50, support received: travel & accommodation)
- 2017 *MarineGEO-Hong Kong: Assessing the Impacts of Urbanization on Marine Biodiversity and Ecosystem Functioning*, Gordon Research Conference: Marine Molecular Ecology, HKUST, Hong Kong  
(audience size ~100, support received: registration fees)
- 2016 *Reefs of future present: Hong Kong corals from the Qing Dynasty to the Information Age*, 13<sup>th</sup> International Coral Reef Symposium, Honolulu, Hawaii, USA  
(audience size ~75, support received: nil)
- 2016 *Climate change impacts on corals, from reef to cell*, Effects of the long-term climatic changes on marine environment and the marine invertebrate animals, Jeju National University, Korea  
(audience size ~50, support received: travel & accommodation)

- 2014 *The central role of nitrogen in the evolution and modern extinction of coral reefs*, Environmental Geology & Geochemistry Seminar Series, Princeton University, (audience size ~30, support received: travel & accommodation)
- 2014 *Biogeochemical patterns among invert-microbe symbioses*, 2014 Ocean Sciences Meeting (audience size ~70, support received: nil)
- 2013 *An American coral ecologist in China*, University Consortium on Aquatic Sciences, Xiamen University, China (audience size ~75, support received: travel & accommodation)

#### 4. Research grants over the past 5 years

8 major grants with over \$15.5M HKD (~\$2M USD) in research (incl. 4 GRFs and 1 TRS) and contract funding

#principal investigator, \*co-investigator

- 2017 Environment and Conservation Fund (Hong Kong), MarineGEO - Hong Kong: Towards an understanding of marine biodiversity and ecosystem function (67/2016; \$3,215,636 HKD)#
- 2017 The University of Hong Kong, Small Equipment Grant, *SIRMS expansion: A Gasbench - IRMS system for gas phase measurements for global change and conservation science*, (\$2,224,000 HKD)#
- 2017 US Department of State (USA), *Mapping pangolin trafficking from Africa to Asia*, (778,978 HKD)\*
- 2017 *Assessing the Marine Biodiversity and Ecology of Tolo Harbour and Channel, with Particular Reference to Coastal Marine Environments of Ting Kok and Shuen Wan Hoi – Phase II* (\$4,233,490 HKD)\*
- 2017 Ocean Park Conservation Foundation Hong Kong, *Forming a scientific foundation for coral reef restoration and resilience in Hong Kong* (\$466,000 HKD)#
- 2017 University Grants Council, The University of Hong Kong Seed Funding for Basic Research *Compound-specific stable isotope analysis of amino acids: a new application in SIRMS* (\$55,400 HKD)#
- 2016 Research Grants Council Hong Kong, TRS; *Diagnosis and Prognosis of Intensifying Eutrophication, Hypoxia and the Ecosystem Consequences around Hong Kong Waters: Coupled Physical-biogeochemical-pollution Studies*, (\$959,833 HKD)\*
- 2016 Research Grants Council Hong Kong, GRF; *Sedimentary records of historical coral diversity and distribution in the South China Sea*, (\$359,406 HKD)#
- 2016 University Grants Council, The University of Hong Kong Seed Funding for Basic Research; *3-D printed coral reefs: exploring the relationship between rugosity and biodiversity* (\$80,000 HKD)#
- 2015 Research Grants Council Hong Kong, GRF; *Determining the sources of nitrogen to the coral skeletal organic matrix*, (\$706,972 HKD)#



- 2015 University Grants Council, The University of Hong Kong Seed Funding for Basic Research; *A Pilot Survey of Marine Biodiversity using Autonomous Reef Monitoring Structures (ARMS): A First Step for MarineGEO Hong Kong* (\$47K)#
- 2015 Environment and Conservation Fund (Hong Kong) *Assessing the Marine Biodiversity and Ecology of Tolo Harbour and Channel, with Particular Reference to Coastal Marine Environments of Ting Kok and Shuen Wan Hoi – Phase I* (\$4,233,490 HKD)\*
- 2014 Research Grants Council Hong Kong, GRF; *Clash of the Dinoflagellates! Nitrogen competition among coral-hosted symbionts*, (\$1,014,100 HKD)#
- 2014 Environment and Conservation Fund (Hong Kong), *Two centuries of nitrogen pollution in Hong Kong's coastal waters reconstructed from hard-coral and octocoral  $\delta^{15}N$  records* (\$498,425 HKD)#
- 2013 US National Science Foundation: *RAPID Documenting bleaching susceptibility and resilience in Guam, Micronesia*. (\$93,000 USD)\*
- 2013 Research Grants Council Hong Kong, Early Career Scheme (RGC-ECS); *A stable isotope survey of Hong Kong's corals: Assessing the impact of nitrogen pollution on coral health and community biodiversity*, (\$1,234,706 HKD)#
- 2013 University Grants Council, The University of Hong Kong Seed Funding for Basic Research (\$120,000 HKD)#

5. External peer-reviewed competitive research grants (as principal investigator)  
Six total (4 GRFs and 2 ECFs)

- 2017 Environment and Conservation Fund (Hong Kong), *MarineGEO - Hong Kong: Towards an understanding of marine biodiversity and ecosystem function* (67/2016; \$3,215,636 HKD) progress = ongoing; RGC assessment available? = no
- 2016 Research Grants Council Hong Kong, GRF; *Sedimentary records of historical coral diversity and distribution in the South China Sea*, (#17304116; \$359,406 HKD) progress = ongoing; RGC assessment available? = no
- 2015 Research Grants Council Hong Kong, GRF; *Determining the sources of nitrogen to the coral skeletal organic matrix*, (#17303615; \$706,972 HKD) progress = ongoing; RGC assessment available? = no
- 2014 Research Grants Council Hong Kong, GRF; *Clash of the Dinoflagellates! Nitrogen competition among coral-hosted symbionts*, (#17100014; \$1,014,100 HKD) progress = completed; RGC assessment available? = no
- 2014 Environment and Conservation Fund (Hong Kong), *Two centuries of nitrogen pollution in Hong Kong's coastal waters reconstructed from hard-coral and octocoral  $\delta^{15}N$  records* (#2013-04; w. N. Duprey; \$498,425 HKD) progress = completed; RGC assessment available? = n/a
- 2013 Research Grants Council Hong Kong, Early Career Scheme (RGC-ECS); *A stable isotope survey of Hong Kong's corals: Assessing the impact of nitrogen pollution on coral health and community biodiversity*, (#789913; \$1,234,706 HKD) progress = completed; RGC assessment available? = no

## 6. Applied research

Refer to page 15, item 1c.

## 7. Internationalization

*China:* I am a co-investigator on a Theme-based research grant under the abbreviation "OCEAN\_HK". This project links several Hong Kong academic institutions with several others in Mainland China and Taiwan. Our field work takes place throughout the Pearl River Delta, and therefore involves cross-border cruises for sample collection. As such, this opportunity fosters collaborative ties with regional colleagues including the task leader, Prof. Minhan Dai (Xiamen). I maintain additional collaborations with Xiamen University through the State Key Laboratory in Marine Environmental Science and I am actively engaged with the development of a joint laboratory at SUSTech in Shenzhen, China.

*USA:* I spearheaded the development of a memorandum of understanding between HKU and the Smithsonian Institution. This is an open MOU (no terminal date) to illustrate the long-term links between SI and HKU surrounding the MarineGEO program of which we are the first partner site in Asia. I have also been awarded a Visiting Research Professorship for Profs. Nancy Knowlton and Jeremy Jackson (award value = \$750,000 HKD) which bought both internationally renowned scientists to Hong Kong for the past 3 years to provide advising and perspective on research initiatives at HKU/SWIMS.

*Postgraduate Training:* I recruit international students and staff to join my research group. Currently, we have 14 members (7 students, 3 postdocs, 4 research assistants) from 7 different countries. My lab has also hosted a diversity of students on training visits or on study exchange. Ms. Giulia Puntin (Italy), Mr. Stefan Husa (Finland), Ms. Molly Moynihan (Singapore), Ms. Nara Lina (Brazil) Ms. Maria Santos (Brazil) and Ms. Nicole Knight (Canada) have all spent considerable time embedded with my team to advance their own research.

## **Teaching and Learning**

### 1a. Undergraduate teaching

*Since 2013 I have been involved in teaching 6 courses. I designed, developed and coordinated 3 courses, including one common core course. Coordinated a further 1 course and co-taught 2 courses. Total enrollment for these courses has exceeded 450.*

2017 - present: *War, Peace, and the Natural World* (CCST9054) [common core course] course coordinator

2013 - present: *Methods in Environmental Science* (ENVS2001) [compulsory course for the Environmental Science major from 2013, elective for other majors] course coordinator

2014 - 2016: *Environmental Oceanography* (ENVS3313/2013) [elective course for Environmental Science and other majors, including Earth System Science and Ecology and Biodiversity] course coordinator in 2014, co-instructor in 2015, 2016

2015 - 2017: *Environmental Impact Assessment* (BIOL4302) [elective course for Ecology & Biodiversity and other majors] course coordinator in 2015 & 2016, co-instructor from 2017.

2014: I substituted for a Professor on emergency medical leave to teach 50% of *Pollution* (ENVS2008), and contributed 25% of the lectures in *Marine Biology* (BIOL2610).

***1b. Supervision and postgraduate education***

*Postgraduates: 14 students supervised in total, primary supervisor for 8 research postgraduates (7 Ph.D., 1 MPhil), including 1 HKPF recipient and 1 Outstanding Research Postgraduate Award winner. Students and research staff have represented 9 different nationalities.*

*\* co-supervisor, †HKPF recipient, ‡ other award winner*

**Graduated****Research Postgraduates**

Cheong Wai Martin WONG‡ (MPhil 2017) *Anthropogenic nitrogen inputs in marine environments: identifying sources, revealing variation, and assessing impacts.*

‡ HKU Outstanding Research Postgraduate Prize.

**Taught Postgraduates**

Symphonia LI (MSc 2015) *Impact of water quality on coral biodiversity in HK: insights from in situ transplantation experiment and public survey.*

Archana ANAND‡ (MSc 2014) *The nitrogen isotope fingerprint of wastewater effluents in Hong Kong, ‡ Ada and Arthur Hill Prize.*

**Ongoing**

Phillip THOMPSON (PhD 2018) *Physiological responses of symbiosis to seasonality in five species of coral in Hong Kong.*

Ching Yan WONG (PhD 2018) *Clash of the Dinoflagellates! Resource competition among coral-hosted symbionts.*

Archana ANAND (PhD 2019) *Direct and indirect impacts of sewage-derived nitrogen in Hong Kong waters.*

Inga CONTI-JERPE (PhD 2018) *The trophic dynamics of Hong Kong's coral communities.*

Taihun KIM (PhD 2019) *Coral – Symbiodinium lipid biomarkers: assessing the effects of eutrophication.*

Vicki SHENG (PhD 2020) *Sharks - forensic tools, trade networks, and impacts of predator removal.*

Jonathan CYBULSKI (PhD 2020) *Hong Kong coral assemblages through time - a paleoecological and geochemical look at human-driven change.*

*Undergraduates: 8 in total,*

*†summer research fellowship, \*final year project, ‡directed studies*

SUEN Hoi Ping (BSc 2017)‡, CHAN Cheuk Yee\*(BSc 2017), YAU Yu Yan† (BSc 2017), TSANG Hin Hung\* (BSc 2018), WANG Liuwei\*(BSc 2018), WONG Elvis\*(BSc 2018), CHUNG Arthur (BSc 2017)\*, SHIN Caren (BSc 2014)\*

*Additional research staff supervised: 5 in total, †postdoctoral fellow, \*research assistant*  
 Dr. Nicolas DUPREY† (2013-2015), Dr. Shelby MCILROY† (2016-present), Dr. Naomi GEERAERT† (2015-present), Dr. Till ROETHIG† (2017-present), Vriko YU\* (2016-2017), Cheung Wai WONG\* (2013-2014), Yvonne YAU\* (2017- present), Rinaldi GOETAMA\* (2017 - present), Jenny CHEUNG\* (2018 - present), Johnny RICHARDS\* (2017 - present), Chloe WEBSTER\* (2016 - 2017)

*Thesis Internal Examiner: 11 research postgraduate theses in total (1 external to HKU)*  
 Nicolas ORY (Ph.D. 2014), Marielle DUMESTRE (Ph.D. 2016), Gomen SEE (MPhil, 2017), Calton LAW (Ph.D. 2017), Chia Voon PAO (Ph.D. 2017), Archer WONG (MPhil 2016), Yueqiong NI (2018), Jing CHEN, Ackley LANE (Ph.D. 2014), Genbo XU (Ph.D. 2014), Patrick BUERGER (JCU/AIMS Ph.D. 2017)

## 2. Evidence of teaching mastery and achievements

*Selected comments from Student Evaluations of Teaching and Learning (SETL)*

### **ENVS2013: Environmental Oceanography (2014-16)**

*“The objectives of the course are very clear, with tests, exams to help us understand the concepts.”*

*“A flexible course structure (spread out assignment weighting) we do not worry about the exam covering a lot to recite. Many activities made me think more critically and provided a lot of time to discuss with other classmates.”*

*“Instead of having a final exam, it contains 3 mid-term exams which enhance a certain level of understanding of the course in the term.”*

*“Discussion sessions and v. Good assessment methods. I like the way he put separated exams throughout the course. It helps me pick up the course content easily.”*

*“I love all the interactive components of class, like the online poll and discussion section. I also get very helpful and patient answers when I ask questions about the lectures.”*

### **ENVS2001: Methods in Environmental Science (2013 - present)**

*“The online tools were great means and the website was very clear and effective - I think Dr Baker was the first instructor in my experience to use so much effective materials! And the assessments were very suitable - just right in the workload and in the thought caused.”*

*“the materials were posted on his own website and it is much better than moodle because the format is clear and the design is attractive.”*

*“He gives us enough "space" to think and look into something that we would interested in. No matter during our lab process and lecture.”*

*“I agree the use of online tutorial sessions to help learning. It facilitates many students to do it whenever they are free and prevent time clash with other courses. He is willing to help students whenever they are in trouble.”*

*“prepare very well before the class. He is a very professional teacher.”*

*“The teacher's website is good for us to learn as it include lots of reference information and very beautiful design!”*

*“The tutorial videos and protocols are very detailed and informative which help me understand more about the topics and the experiments.”*

*“The labs are very useful and also Baker delivered the knowledge clearly! The video part in the website is good as it can enhance the skills of the lab before doing it! Baker is nice while we asked him questions!”*

*“Interactive, passionate had good english unlike many lecturers in HKU. Friendly, and offered opportunities for some passionate students to volunteer out of the course.”*

*“He is interesting an inspiring, The activities arranged were fun and interactive.”*

*“The teacher is very supportive and willing to interact with us.”*

*“We have many chances to interact and communicate with prof.”*

*“The course provides experiences that other course cannot provide, especially hands-on experiences.”*

*“Different format of lessons (lab, field trip, lecture) are diverse and interesting.”*

### **BIOL4302: Ecological Impact Assessment (2015 - 2017)**

*“Dr Baker is knowledgable marine ecologist and gives handful information about the impacts to marine environment”*

*“the best thing about the course is involving a lot critical issues to examine the EIA. The whole mechanism, other countries' examples, process, policy, ordinance etc.”*

*“The coursework really helps us think and apply what we learn in the lesson.”*

### **Curriculum Development**

#### ***Common Core***

In 2017, I designed and launched a common core course called “*War, Peace, and the Natural World*” which is based in the emergent discipline of “warfare ecology”. The course is part of the Scientific and Technological Literacy Area of Inquiry, and aims to instill students with a deeper understanding of how human conflicts affect nature’s biodiversity and the functioning and services provided by ecosystems. The course nurtures students to think critically about decisions made in war and peace and the positive and negative repercussions of those decisions from an environmental perspective. This is a lecture-based course which blends history and story-telling with fundamental elements of Conservation Biology. Novel assessments include writing short stories (aimed for a younger audience) and short films on environmental impacts of war posted to YouTube (example: <https://youtu.be/3FgWv4jY418>).

### *Environmental Science*

I was recruited to contribute to the nascent ENVS program and have been a bit of a “swiss-army knife” for teaching within the major. Upon starting my employment I substituted for half the lectures of *ENVS2008: Pollution* due to the co-instructors emergency leave of absence. I also took over teaching *ENVS2013: Environmental Oceanography* from a departed colleague, and re-booted the course from scratch. For the latter, I implemented innovative assessment methods and discussion group tutorials which were reviewed favorably by students, though I was re-assigned by the major coordinator to other courses thereafter. During this time, I developed and launched *ENVS2001: Methods in Environmental Science* which is a compulsory “core” course of the major, aimed at teaching students practical, hands-on skills. The course curriculum is entirely of my own design. This course is unique as it trains students to think about ways of evaluating environmental problems through tools (ranging from water, soil and air quality monitoring to DNA extraction and PCR) and experimental design. Here, I have developed a unique pedagogy with “flipped classroom” lectures and tutorials and intensive, hands-on laboratory sessions and field trips. After 10 weeks of training, students then engage in team-based research projects. Two groups have continued their research beyond the semester, culminating in a peer-reviewed scientific article published in *Marine Pollution Bulletin* (Cheung, *et al.* 2015) and another group has a manuscript (Chan *et al.*, submitted to *PNAS*) for peer-review.

### *Ecology & Biodiversity*

As a member of the Ecology and Biodiversity Research Division of the School of Biological Sciences, I have contributed to co-teaching courses such as *BIOL2160: Marine Biology* and *BIOL4302: Environmental Impact Assessment*. In 2017, I assumed the role of coordinator of *BIOL6001: Presentation Skills in Biological Sciences* (postgraduate compulsory course). I have since stepped away from both undergraduate courses while the latter will be an area of future development. I aim to rename the course “*Science Communication*” and integrate more professional development workshops for all interested research post-graduate students.

### Teaching Awards

Nil

### **Service**

#### 1a. Service Responsibilities (HKU)

Chairman: Staff Student Consultative Committee (ENVS major): 2014-15

ENVS Academic Advisor: 2013-15

SBS Course Selection Advisor, E&B major: 2014-15

SWIMS Expansion Committee: 2015 - ongoing

SWIMS Advisory Board: 2016 - ongoing

Faculty of Science BSc Admissions Committee: 2015 - ongoing

SBS Undergraduate Teaching Committee: 2015 - 18

ENVS Management Committee: 2015 - 17

SBS Executive Committee\*: 2015 - ongoing

SWIMS Dive Program Manager: 2013 - ongoing

\*through the SBS Executive Committee I oversaw the re-development of the SBS and SWIMS websites.

1b. Service Responsibilities (external)

Councilor (by election): International Society for Reef Studies (ISRS): 2015 - 19

Invited Participant: HKSAR Policy Address: 2016 - 18

Invited Participant: HKSAR Budget Consultation: 2018

1c. Demonstration of community service and knowledge exchange*Contract research*

2018 *Provision of Service of Monitoring of Restored Hard Corals at Hoi Ha Wan Marine Park (Ref: AFCD/SQ/177/17/C) (\$600,000 HKD)*

2017 *Airport Authority of Hong Kong via Mott MacDonald Hong Kong, Ltd., 3RS Environmental Team Service (Project no. 355482) (\$2,207,513 HKD)*

2016 *Agriculture, Fisheries and Conservation Department of the HKSAR, Provision of Service of Hard Coral Restoration at Hoi Ha Wan Marine Park (Ref: AFCD/SQ/3/16/C) (\$1,049,600 HKD)*

2016 *WWF-Hong Kong, DNA Study on Threaten Seafood (WWF Contract No. 16-072) (\$26,011 HKD)*

2016 *Agriculture, Fisheries and Conservation Department of the HKSAR, Provision of Service for Genetic Identification of Shark Fins (Ref: AFCD/SQ/134/15C) (\$43,400 HKD)*

2015 *Government of Barbados via W.F. Baird & Assoc., Ltd. Barbados Coastal Risk Assessment and Management Program – Components 1 & 2 (\$296,751 HKD)*

*Outreach Workshops & Exhibits*

From 2015 - 2017, my lab ran the Faculty of Science, Junior Science Institute workshop entitled "Ocean Odyssey" at the Swire Institute of Marine Science. During that time it was among the top-rated workshops offered to local secondary students.

In 2016, we partnered with the Hong Kong Maritime Museum, AFCD, and Conservation International on a museum exhibit and series of public outreach events entitled "Corals, our underwater living treasures". My group brought live corals for display at local shopping malls and museum, gave public lectures, and led eco-tours.

<http://www.hkmaritimemuseum.org/eng/about-us/media-room/press-releases/19/77/483/maritime-museum's-newest-exhibit-on-corals-inspires-hong-kong-to-bring-back-our-underwater-living-treasures.html>

*Press (active links embedded)*

2017 SCMP Article "[To dive for: Learning to dive in challenging Hong Kong makes for a stronger skill set](#)" 1) I was interviewed and quoted in this article about diving in Hong Kong, 2) this article raised awareness for Hong Kong's marine biodiversity

2017 Gulf Times Article "[Hong Kong is setting standards in coral reef restoration](#)" 1) I was interviewed for this exclusive article on coral restoration efforts in Hong Kong, 2) the article highlights the important toolkit for restoration of coral reefs

2017 SCMP Article "*Hong Kong's coral in crisis as climate change and pollution take their toll*" 1) I was interviewed and quoted in this article. 2) this article raises awareness of coral biodiversity in Hong Kong, and major threats to their conservation locally and worldwide. The article is centered on our exhibit at the Hong Kong Maritime Museum

2017 SCMP Article "*Hong Kong fish farmers claim proliferation of red tides is worst 'unnatural disaster' to hit industry in years*" 1) I was interviewed and quoted in this article. 2) the article raises awareness of the increasing environmental problems and causes associated with harmful algal blooms in Hong Kong.

2017 BBC Article "*How to save the world's most trafficked mammal*" 1) I was a member of the HKU team interviewed for this special article in the BBC series "Future World". I was directly quoted in the article. 2) This article raised awareness of Hong Kong's role in international wildlife trade, and our group's activities to assist with enforcement and research.

2017 CNN Article "*Great Barrier Reef suffering 'unprecedented' damage*" 1) I was interviewed for comment on reports of bleaching on the Great Barrier Reef, 2) the article raises public awareness of the costs of climate change on coral reef ecosystems

2017 RTHK Radio Interview "*Animals in Man's World*" 1) I was interviewed for the RTHK podcast series "Animals in Man's World" which focused on our Conservation Forensics initiative at HKU. 2) This interview raised awareness of the issues surrounding Hong Kong's wildlife trade, and the ongoing work by myself and my colleagues.

2016 SCMP Article "*CY Leung should explain what's being done on rubbish problem, former top Hong Kong media official says*" 1) I was interviewed and quoted in this article on 2016's marine debris epidemic. 2) the article raised awareness for the issue and possible links to climate change factors.

2016 CNN Article "*Ocean oxygen levels drop 2% in 50 years, Nature study finds*" 1) I was asked to read and comment on an article published in Nature. I was quoted in the article. 2) the article raises awareness of global warming's effects on ocean habitability.

2016 The Gua Article "*Illegal eel: who is pilfering Europe's catch?*" 1) I was featured in this article which highlights our work on EU eel trafficking. 2) the article raises awareness of the trade and our collaboration with government and NGOs to increase enforcement.

2015 Al Jazeera English Daily News Feature "*Hong Kong coral reef thrives despite pollution*" 1) Myself and my team were interviewed in a daily news feature for the network. The feature aired on the daily news segment and was posted as an online article. 2) The feature raised awareness of Hong Kong's coral biodiversity and threats to its future conservation.

2015 SCMP Article "*Why Hong Kong's remarkably diverse marine ecosystem is in peril*" 1) I was interviewed for this feature article on Hong Kong's coral communities. 2) This article raised public awareness for marine biodiversity and threats to its conservation.

2015 CNN Article "*Stunning blue hue as algae lights up Hong Kong harbor*" 1) I was interviewed and quoted in this online article on harmful algal blooms in Hong Kong 2) my contribution raises awareness on climate change and pollution contributing to worsening ecosystem degradation.

2014 Post Magazine Feature Article "*Reef Encounters*" 1) I was interviewed and quoted in this print and online article on coral conservation in Hong Kong, 2) this article raises awareness of the outlook for corals in Hong Kong in the midst of stressors and improved management efforts.



*Public Lectures*

- 2017 Invited Secondary School Lecture: *My life as a marine biologist*, Shanghai American School, Shanghai, China.
- 2016 Invited Public Lecture: *Biology and ecology of corals*, Hong Kong Reef Check Opening Ceremony, Hong Kong Agriculture, Fisheries and Conservation Department, HKSAR Government.
- 2016 Invited Public Lecture: *Building Blue Networks: Measuring and Conserving Marine Biodiversity*, Hong Kong Maritime Museum.
- 2016 Invited Seminar Series speaker, *Hong Kong corals through space and time: adventures in pollution and symbiosis*, Hong Kong University of Science and Technology
- 2014 Invited Seminar Series *Nitrogen sources from developed shores causes coral reef decline*, 2<sup>nd</sup> Annual South Pacific Asian Marine Science Symposium, University of Guam, Guam
- 2014 Invited Seminar Series, *Biogeochemical patterns among invert-microbe symbioses*, University of the Ryukyus, Japan

*Service Trips*

- 2017 HKU-NTU Joint Ph.D. Workshop, Singapore
- 2016 HKU mainland interviews, Harbin, China