

Field observations from long-term monitoring sites in St. John, USVI.

Website: <https://www.bco-dmo.org/dataset/735106>

Data Type: Other Field Results

Version: 1

Version Date: 2018-09-18

Project

» [The ecophysiological basis of the response of coral larvae and early life history stages to global climate change](#)
(Climate_Coral_Larvae)

Contributors	Affiliation	Role
Edmunds, Peter J.	California State University Northridge (CSU-Northridge)	Principal Investigator
Evensen, Nicolas R.	University of Queensland	Contact
Ake, Hannah	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract

Field observations from long-term monitoring sites in St. John, USVI.

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Coverage

Spatial Extent: Lat:18.32 Lon:-64.723

Dataset Description

Data published in Marine Biology paper entitled "Interactive effects of ocean acidification and neighboring corals on the growth of *Pocillopora verrucosa*".

Acquisition Description

Methodology found in associated publication.

Processing Description

BCO-DMO Data Manager Processing Notes:

* modified parameter names to conform with BCO-DMO naming conventions

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Related Publications

Evensen, N. R., & Edmunds, P. J. (2016). Interactive effects of ocean acidification and neighboring corals on the growth of *Pocillopora verrucosa*. *Marine Biology*, 163(7). doi:[10.1007/s00227-016-2921-z](https://doi.org/10.1007/s00227-016-2921-z)

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Parameters

Parameter	Description	Units
Site	Site of sampling	unitless
Pocillopora_colonies	Colonies of each genus were inferred to be interacting and competing for space when they were	count
Pocillopora_Pocillopora_interactions	Photoquadrats (0.25 m ²) were used to quantify the frequency of interactions between adjacent Pocillopora colonies, and between adjacent colonies of Pocillopora and Acropora	count
Pocillopora_conspecific_interactions	Photoquadrats (0.25 m ²) were used to quantify the frequency of interactions between adjacent Pocillopora colonies, and between adjacent colonies of Pocillopora and Acropora	count
Acropora_colonies	Colonies of each genus were inferred to be interacting and competing for space when they were	count
Acropora_Pocillopora_interactions	The number of colonies inferred to be engaged in spatial competition based on analyses of the photoquadrats was expressed as a percentage of the total number of Pocillopora and Acropora colonies in each photoquadrat, and the results were averaged among photoquadrats	count
Acropora_interspecific_interactions	The number of colonies inferred to be engaged in spatial competition based on analyses of the photoquadrats was expressed as a percentage of the total number of Pocillopora and Acropora colonies in each photoquadrat, and the results were averaged among photoquadrats	count
Pocillopora_interspecific_interactions	The number of colonies inferred to be engaged in spatial competition based on analyses of the photoquadrats was expressed as a percentage of the total number of Pocillopora and Acropora colonies in each photoquadrat, and the results were averaged among photoquadrats	count

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Deployments

MCR_Edmunds

Website	https://www.bco-dmo.org/deployment/640059
Platform	Richard B Gump Research Station - Moorea LTER
Start Date	2010-01-01
End Date	2016-12-31
Description	Ongoing studies on corals

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Project Information

The ecophysiological basis of the response of coral larvae and early life history stages to global climate change (Climate_Coral_Larvae)

Coverage: Moorea, French Polynesia; Southern Taiwan; California State University Northridge

Tropical coral reefs face a suite of environmental assaults ranging from anchor damage to the effects of global climate change (GCC). The consequences are evident throughout the tropics, where many coral reefs have lost a substantial fraction of their coral cover in a few decades. Notwithstanding the importance of reducing the impacts of environmental stresses, the only means by which these ecosystems can recover (or simply persist) is through the recruitment of scleractinians, which is a function of successful larval development, delivery, settlement, metamorphosis, and post-settlement events. Despite wide recognition of the importance of these processes, there are few pertinent empirical data, and virtually none that address the mechanisms mediating the success of early coral life stages in a physical environment varying at multiple spatio-temporal scales. The objective of this research is to complete one of the first comprehensive ecophysiological analyses of the early life stages of corals through a description of: (1) their functionality under 'normal' conditions, and (2) their response to the main drivers of GCC. These analyses will be completed for 2 species representative of a brooding life history strategy, and the experiments will be completed in two locations, one (Taiwan) that provides unrivalled experience in coral reproductive biology, and superb microcosm facilities, and the other (Moorea), with access to a relatively pristine environment, a well described ecological and oceanographic context (through the MCR-LTER), and the capacity to bring a strong biogeographic contrast to the project. The results of the study will be integrated through modeling to explore the effects of GCC on coral community structure over the next century. The following publications and data resulted from this project: 2013 Wall CB, Fan TY, Edmunds PJ. Ocean acidification has no effect on thermal bleaching in the coral *Seriatopora caliendrum*. *Coral Reefs* 33: 119-130. Symbiodinium_*Seriatopora* photosynthesis Symbiodinium_*Seriatopora* PI curve Symbiodinium_*Seriatopora* temp-salinity-light Symbiodinium_*Seriatopora* water chemistry- Download complete data for this publication (Excel file) 2013 Wall CB, Edmunds PJ. In situ effects of low pH and elevated HCO₃⁻ on juvenile *Porites* spp. in Moorea, French Polynesia. *Biological Bulletin* 225:92-101. Data at MCR and PANGAEA: doi.pangaea.de/10.1594/PANGAEA.833913- Download complete data for this publication (Excel file) 2013 Vivian R Cumbo, Peter J Edmunds, Christopher B Wall, Tung-Yung Fan. Brooded coral larvae differ in their response to high temperature and elevated pCO₂ depending on the day of release. *Marine Biology* DOI 10.1007/s00227-013-2280-y. Data also at PANGAEA: doi.pangaea.de/10.1594/PANGAEA.831612 brooded coral larvae 2 - carbonate chemistry brooded coral larvae 2 - larval release March 2003-2008 brooded coral larvae 2 -

respiration_photosynth_mortality- Download complete data for this publication (Excel file) 2013 Edmunds PJ, Cumbo VR, Fan TY. Metabolic costs of larval settlement and metamorphosis in the coral *Seriatopora caliendrum* under ambient and elevated pCO₂. *Journal Experimental Marine Biology and Ecology* 443: 33-38 Data also at PANGAEA: doi:10.1594/PANGAEA.821644Coral post-settlement physiology- Download complete data for this publication (Excel file) 2013 Aaron M Dufault, Aaron Ninokawa, Lorenzo Bramanti, Vivian R Cumbo, Tung-Yung Fan, Peter J Edmunds. The role of light in mediating the effects of ocean acidification on coral calcification. *Journal of Experimental Biology* 216: 1570-1577.coral-light expt.- PARcoral-light expt.- carbonate chemistrycoral-light expt.- temp_salinitycoral-light expt.- growthcoral-light expt.- proteincoral-light expt.- survival- Download complete data for this publication (Excel file) 2012 Cumbo, VR, Fan TY, Edmunds PJ. Effects of exposure duration on the response of *Pocillopora damicornis* larvae to elevated temperature and high pCO₂. *J Exp Mar Biol Ecol* 439: 100-107. Data is also at PANGAEA: doi:10.1594/PANGAEA.823582brooded coral larvae 3 - carbonate chemistrybrooded coral larvae 3 - lightbrooded coral larvae 3 - mortalitybrooded coral larvae 3 - proteinbrooded coral larvae 3 - respiration and proteinbrooded coral larvae 3 - respiration raw databrooded coral larvae 3 - symbiont densitybrooded coral larvae 3 - tank temperature- Download part 1 of data for this publication (Excel file)- Download tank parameters data for this publication (Excel file) 2012 Cumbo, VR, Fan TY, Edmunds PJ. Physiological development of brooded larvae from two pocilloporid corals in Taiwan. *Marine Biology* 159: 2853-2866.brooded coral - carbonate chemistrybrooded coral - releasebrooded coral - respirationbrooded coral - settlement competencybrooded coral - size_Julybrooded coral - size_protein_symbionts_photosynth- Download complete data for this publication (Excel file) 2012 Dufault, Aaron M; Vivian R Cumbo; Tung-Yung Fan; Peter J Edmunds. Effects of diurnally oscillating pCO₂ on the calcification and survival of coral recruits. *Royal Society of London (B)* 279: 2951-2958. doi:10.1098/rspb.2011.2545 Data is also at PANGAEA: doi:10.1594/PANGAEA.830185recruit_growth_arearecruit_growth_weightrecruit_seawater_chemistryrecruit_survival- Download complete data for this publication (Excel file) 2011 Edmunds PJ, Cumbo V, Fan TY. Effects of temperature on the respiration of brooded larvae from tropical reef corals. *Journal of Experimental Biology* 214: 2783-2790. CoralLarvae_comparison_respirCoralLarvae_releaseCoralLarvae_respirCoralLarvae_size- Download complete data for this publication (Excel file)

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1415268
NSF Division of Ocean Sciences (NSF OCE)	OCE-1637396

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