

Spatial covariance on the background fish community at the start of experimental runs in Moorea, French Polynesia from 2003-2015

Website: <https://www.bco-dmo.org/dataset/727076>

Data Type: experimental

Version: 1

Version Date: 2017-10-05

Project

» [Cryptic density dependence: the effects of spatial, ontogenetic, and individual variation in reef fish](#)
(CDD_in_Reef_Fish)

Contributors	Affiliation	Role
Geange, Shane	Department of Conservation - Wellington, New Zealand	Principal Investigator, Contact
Shima, Jeffrey	Victoria University of Wellington	Co-Principal Investigator
Stier, Adrian	University of California-Santa Barbara (UCSB)	Co-Principal Investigator
Biddle, Mathew	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract

Spatial covariance on the background fish community at the start of experimental runs in Moorea, French Polynesia from 2003-2015.

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Coverage

Spatial Extent: N:-17.471 E:-149.7853 S:-17.47953 W:-149.84798

Temporal Extent: 2003 - 2015

Dataset Description

This dataset is from a manipulative experiment the relative competitive abilities of juveniles of three closely related species of reef fish (bird wrasse, *Gomphosus varius*; fivestripe wrasse, *T. quinquevittatum*; and the sixbar wrasse, *Thalassoma hardwicke*).

Site locations:

Teaharoa West: 17 28.397'S, 149 47.592'W

Teaharoa East: 17 28.260'S, 149 47.118'W

Vaipahu: 17 28.772'S, 149 50.879'W

For additional data, please see Related Datasets section.

Related Datasets:

- Geange_et_al_2013 Competitive Hierarchies: <https://www.bco-dmo.org/dataset/727026>
- Geange_et_al_2013 Competitive Hierarchies Background Community: <https://www.bco-dmo.org/dataset/727058>
- Geange_et_al_2013 Competitive Hierarchies Lengths: <https://www.bco-dmo.org/dataset/727043>
- Geange_et_al_2013 Competitive Hierarchies Spatial Covariance: <https://www.bco-dmo.org/dataset/727076> (current page)

Acquisition Description

To determine the in situ spatial covariation of superior and inferior competitors, we surveyed the density of the 3 species at 3 locations. Each location consisted of 2 sites that were arrayed perpendicular to the reef crest: a 'crest' site (~95 m shoreward of the reef crest) and a 'lagoon' site (~190 m shoreward of the reef crest). At each site, we haphazardly selected 16 patch reefs of similar surface area (mean \pm SD): 8.40 ± 4.91 m², and 8.23 ± 4.06 m², for the crest and lagoon locations, respectively. On each reef and the surrounding 1 m halo, we counted juveniles of the 3 focal species, which we converted to densities. Juveniles were defined as individuals with SL < 25 mm. Surveys were conducted between 08:00 and 16:00 h.

Processing Description

Abundance of *Thallasoma Hardwicke*, *T. quinquevitattum* and *Gomphosus varius* have been converted to densities.

BCO-DMO Processing:

- added conventional header with dataset name, PI name, version date
- modified parameter names to conform with BCO-DMO naming conventions
- appended the fields lat and lon to include the coordinates for each site, accompanying the data.

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Related Publications

Geange, S., Stier, A., & Shima, J. (2013). Competitive hierarchies among three species of juvenile coral reef fishes. *Marine Ecology Progress Series*, 472, 239–248. doi:[10.3354/meps10015](https://doi.org/10.3354/meps10015)
General

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Parameters

Parameter	Description	Units
site	unique identifier for each reef in survey	unitless
position	unique identifier indicating if reef was located near the reef crest or offshore	unitless
reef	unique identifier for each reef	unitless
thha	The density (m ⁻²) of <i>Thalassoma hardwicke</i>	count per square meters (m ⁻²)
thqu	The density (m ⁻²) of <i>Thalassoma quinquevittatum</i>	count per square meters (m ⁻²)
gova	The density (m ⁻²) of <i>Gomphosus varius</i>	count per square meters (m ⁻²)
lat	Latitude in decimal degrees.	decimal degrees
lon	Longitude in decimal degrees.	decimal degrees

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Deployments

Osenberg_et_al_Moorea

Website	https://www.bco-dmo.org/deployment/644752
Platform	Osenberg et al Moorea
Start Date	2003-05-19
End Date	2015-07-12

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Project Information

Cryptic density dependence: the effects of spatial, ontogenetic, and individual variation in reef fish (CDD_in_Reef_Fish)

Coverage: Moorea, French Polynesia (-17.48, -149.82)

Description from NSF award abstract:

Ecologists have long been interested in the factors that drive spatial and temporal variability in population density and structure. In marine reef systems, attention has focused on the role of settlement-the transition of pelagic larvae to a benthic stage-and on density-dependent processes affecting recently settled juveniles. Recent data suggest that co-variance in settlement and subsequent density-dependent survival can obscure the patterns of density dependence at larger scales, a phenomenon called cryptic density dependence. This research will explore the mechanisms that underlie the spatial covariance of settlement and site quality - a process that has received little attention in the standard paradigm. These mechanistic studies of cryptic density dependence will facilitate the development of new frameworks for fish population dynamics that incorporate larval ecology, habitat quality, density dependence, life history, and the patterns and implications of spatial covariance among these factors. More generally, the work provides a specific empirical context, and a general theoretical treatment, of cryptic heterogeneity (hidden individual variation in demographic rates).

Note: Drs. Craig W. Osenberg and Ben Bolker were at the University of Florida at the time the NSF award was granted. Dr. Osenberg moved to the University of Georgia during the summer of 2014 ([current contact information](#)). Dr. Bolker moved to McMaster University in 2010 ([current contact information](#)).

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0242312

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