

# 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
<a href="#">Geange, Shane</a>	Department of Conservation - Wellington, New Zealand	Principal Investigator, Contact
<a href="#">Shima, Jeffrey</a>	Victoria University of Wellington	Co-Principal Investigator
<a href="#">Stier, Adrian</a>	University of California-Santa Barbara (UCSB)	Co-Principal Investigator
<a href="#">Biddle, Mathew</a>	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.

## Table of Contents

- [Coverage](#)
- [Dataset Description](#)
  - [Methods & Sampling](#)
  - [Data Processing Description](#)
- [Data Files](#)
- [Related Publications](#)
- [Parameters](#)
- [Deployments](#)
- [Project Information](#)
- [Funding](#)

## 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)

## Methods & Sampling

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):  $8.40 \pm 4.91$  m<sup>2</sup>, and  $8.23 \pm 4.06$  m<sup>2</sup>, 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.

## Data Processing Description

Abundance of *Thalassoma Hardwicke*, *T. quinquevittatum* 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.

[ [table of contents](#) | [back to top](#) ]

---

## Data Files

File
<b>Geangeetal_2013_CompetitiveHierarchies_Spatialcovariance.csv</b> (Comma Separated Values (.csv), 5.52 KB) MD5:01a200b7462ca4bf916032683c6db9f0
Primary data file for dataset ID 727076

[ [table of contents](#) | [back to top](#) ]

---

## 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*

[ [table of contents](#) | [back to top](#) ]

---

## 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 <sup>-2</sup> ) of <i>Thalassoma hardwicke</i>	count per square meters (m <sup>-2</sup> )
thqu	The density (m <sup>-2</sup> ) of <i>Thalassoma quinquevittatum</i>	count per square meters (m <sup>-2</sup> )
gova	The density (m <sup>-2</sup> ) of <i>Gomphosus varius</i>	count per square meters (m <sup>-2</sup> )
lat	Latitude in decimal degrees.	decimal degrees
lon	Longitude in decimal degrees.	decimal degrees

[ [table of contents](#) | [back to top](#) ]

---

## Deployments

### Osenberg\_et\_al\_Moorea

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/644752">https://www.bco-dmo.org/deployment/644752</a>
<b>Platform</b>	Osenberg et al Moorea
<b>Start Date</b>	2003-05-19
<b>End Date</b>	2015-07-12

[ [table of contents](#) | [back to top](#) ]

---

## 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](#)).

[ [table of contents](#) | [back to top](#) ]

---

## Funding

Funding Source	Award
<a href="#">NSF Division of Ocean Sciences (NSF OCE)</a>	<a href="#">OCE-0242312</a>

[ [table of contents](#) | [back to top](#) ]