

Trematode recruitment data from Carpinteria Salt Marsh in California (Parasite Populations project)

Website: <https://www.bco-dmo.org/dataset/718374>

Data Type: experimental

Version: Final

Version Date: 2017-10-26

Project

» [OCE-PRF Track 1 \(Broadening Participation\): Determinants of parasite populations in an estuarine system](#)
(Parasite_Populations)

| Contributors | Affiliation | Role |
|-----------------------------|---|------------------------|
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Coverage

Spatial Extent: Lat:34.401402 Lon:-119.538479

Dataset Description

Host density increases parasite recruitment but decreases host risk in a snail-trematode system.

Methods & Sampling

At eight sites at Carpinteria salt marsh, I deployed uninfected snails in 83 5-gallon bucket-size cages. Each cage contained 1, 5, 25, or 100 uninfected snails. Cages were permeable to trematode eggs and miracidia, but not permeable to snails. After 4 months, I measured the influence of snail density on the number of infected snails in each cage (exp_recruitment dataset) and per capita infection risk (exp_risk dataset). I statistically controlled for snail size, the input of trematode infective stages, and snail biomass surrounding the cage. Detailed methods are available in the associated publications.

Data Processing Description

All statistical analyses were run in R (version 3.2.2; R Development Core Team 2015) using the lme4 package.

BCO-DMO Data Processing Notes:

- changed "long" column name to "lon"

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Data Files

| File |
|--|
| recruitment.csv (Comma Separated Values (.csv), 80.87 KB) MD5:da3805be7b863fa8e6d7c016b7689f94 |
| Primary data file for dataset ID 718374 |

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Related Publications

Bates, D., Maechler, M., & Bolker, B. (2013). lme4: Linear mixed-effects models using S4 classes. R package version 0.999999-2.

Software

Buck, J. C., Hechinger, R. F., Wood, A. C., Stewart, T. E., Kuris, A. M., & Lafferty, K. D. (2017). Host density increases parasite recruitment but decreases host risk in a snail-trematode system. *Ecology*, 98(8), 2029–2038. doi:[10.1002/ecy.1905](https://doi.org/10.1002/ecy.1905)

Methods

Buck, J. C., Wood, A. C., Cook, I.M., and Lafferty, K. D. (2017). Parasite Recruitment and Host Risk in a Snail-Trematode System at Carpinteria Salt Marsh, 2012-2015 Field Experiment [Data set]. U.S. Geological Survey. <https://doi.org/10.5066/f7gx48p2> <https://doi.org/10.5066/F7GX48P2>

Methods

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Parameters

| Parameter | Description | Units |
|------------|---|-------------------------|
| site | Site Identifier | unitless |
| lat | Latitude | decimal degrees |
| lon | Longitude | decimal degrees |
| cage | Cage number | unitless |
| snail | Snail ID number | unitless |
| length | Snail length | millimeters |
| mass | Snail mass (wet weight - no shell) | grams |
| egginf | Snail infected with egg-transmitted trematode; 1=yes; 0=no | unitless |
| mirainf | Snail infected with mira-transmitted trematode; 1=yes; 0=no | unitless |
| cagebmdens | Snail biomass density in cage | grams per meter squared |
| surrbmdens | Snail biomass density surrounding a cage | grams per meter squared |
| eggfhi | Influence of final hosts for egg trematodes | grams ^{3/4} |
| mirafhi | Influence of final hosts for mira trematodes | grams ^{3/4} |

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Instruments

| | |
|---|-------------------------------|
| Dataset-specific Instrument Name | Cage |
| Generic Instrument Name | Fish Cage |
| Dataset-specific Description | Used in trematode experiments |
| Generic Instrument Description | Used to catch fish. |

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Deployments

Carpinteria_Salt_Marsh

| | |
|-----------------|---|
| Website | https://www.bco-dmo.org/deployment/718116 |
| Platform | shoreside Calif_shore |

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Project Information

OCE-PRF Track 1 (Broadening Participation): Determinants of parasite populations in an estuarine system (Parasite_Populations)

Website: https://www.nsf.gov/awardsearch/showAward?AWD_ID=1420273

Coverage: Carpinteria Salt Marsh -- Carpinteria, CA

Parasites are now recognized as integral members of ecological communities, yet thorough investigation of the relative influences of the complex factors controlling their populations has not been undertaken. In this two year postdoctoral research fellowship, the fellow will pursue empirical and theoretical investigations into the relative influences of bottom-up and top-down regulation and recruitment limitation on parasite populations in an estuarine system. The research will take place at the University of California, Santa Barbara (UCSB) under the direction of the lead sponsoring scientist Kevin Lafferty. The fellow will also work with a second sponsoring scientist, Jan Medlock at Oregon State University. The fellow will broaden participation of under-represented groups in ocean sciences by designing a teachable unit on host-parasite interactions and presenting this activity to groups of K-12 students.

In this research effort, the fellow will investigate the relative influences of host density and eutrophication (bottom-up influences), concomitant predation, predation on free-swimming parasite stages, and intraguild predation (top-down influences), and recruitment limitation in a guild of trematode parasites with complex life cycles. Results of experimental and survey work will be supplemented with data from ongoing and completed projects in the UCSB Ecological Parasitology Laboratory to parameterize mathematical models describing the system. Under the direction of the second sponsoring scientist, modified 'macroparasite' equations will be used to model the dynamics of parasite populations, and test the relative influences of bottom-up effects, top-down influences, and recruitment limitation. Research findings will contribute to the growing body of knowledge on the relative influence of bottom-up vs. top-down effects on population dynamics and the role of recruitment in limiting populations.

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Funding

| Funding Source | Award |
|--|-----------------------------|
| NSF Division of Ocean Sciences (NSF OCE) | OCE-1420273 |

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