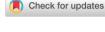DATA PAPER

ECOLOGY
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Ten years (2013–2023) of fish assemblage data collected seasonally with diver surveys on artificial and natural reefs

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Abstract

The study of assembly patterns and dynamics of organisms has long remained a foundational theme in ecology. Further, the relationship between assemblages and different habitats can provide important insight into ecological processes and guide management and conservation efforts (e.g., restoration, protected areas). We conducted underwater visual surveys of reef-fish assemblages at 14 sites in the eastern Gulf of Mexico, including 8 that were paired artificial and natural reefs. By using a paired design, we controlled biotic (e.g., larval supply), abiotic (e.g., depth), and socio variables (e.g., fishing access) to isolate the effect(s) of reef type. Trained scientific SCUBA divers with extensive experience with reef fishes from the broader tropical western Atlantic region conducted 10-min stationary surveys on the paired reefs each season (i.e., calendar quarters) for 10 years from spring 2013 to spring 2023. We also surveyed six additional artificial reefs from winter 2020 to spring 2023 that lacked natural reef pairs. During each survey, the divers identified and estimated the total lengths of all taxa observed within an imaginary cylinder around them. The imaginary cylinders had a radius of up to 7.5 m (depending on horizontal visibility) and extended from the seafloor to the highest visible water above the diver. During the study period, we conducted a total of 1349 surveys and counted 544,736 fish that represented 171 taxa (most at the species level). Analyses of these data have revealed habitat-specific heterogeneity of the fish assemblages at both taxonomic and functional trait levels, the importance of herbivory in structuring the benthos, and socio-ecological interactions in the system, among other findings. These data may be useful for other researchers interested in patterns and dynamics of populations and communities, functional traits, food web structure, and taxa–habitat relationships and for parameterizing statistical, joint distribution, metacommunity, and ecosystem models. In addition, because many of the observed taxa are of management concern, they may be useful for researchers interested in fisheries science. The data are free to use and are not copyright restricted. We ask users to cite this data paper.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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