ID: W2468636691

TITLE: Effectiveness of a deep-water coral conservation area: Evaluation of its boundaries and changes in octocoral communities over 13 years

AUTHOR: ['Swaantje Bennecke', 'Anna Meta×as']

ABSTRACT:

Over the past 15 years, multiple areas in the North Atlantic have been closed to destructive fishing practices to protect vulnerable deep-water coral ecosystems, known to provide habitat for diverse associated fauna. Despite the growing number of conservation measures, long-term studies on the recovery of deep-water coral communities from fisheries impacts remain scarce. In the Gulf of Maine, the Northeast Channel Coral Conservation Area (NECCCA)1 was established in 2002 to protect dense aggregations of the two numerically dominant octocoral species in the region, Primnoa resedaeformis and Paragorgia arborea. To evaluate the effectiveness of the conservation measures, we monitored shifts in abundance and size of these two coral species in the shallow section (400?700 m) of the NECCCA for 12 years after the fisheries closure. We also evaluated the appropriateness of the location of the deep boundaries of the NECCCA that were placed based on a precautionary approach with limited information on coral distribution at depths >500 m. Video transects were conducted with ROV "ROPOS" in 2001, 2006, 2010 and 2014. We found potential signs of recovery from fisheries impact at some of the shallow locations in 2014: higher coral abundance and the presence of some very large colonies as well as recruits compared to 2001 and 2006. However, spatial heterogeneity was pronounced and small colonies (<20 cm) indicative of successful recruitment were not found at all sites, underscoring the need for long-term protection measures to allow full recovery of impacted coral communities. At 700?1500 m different coral taxa were dominant than at the shallow locations and coral abundance peaked between 700 and1200 m. High abundance and diversity of corals at this depth range, 8?10 km southwest of the NECCCA, suggest that an extension of the southwest boundary should be considered. Comparably low coral abundance was found at depths of 1200?1500 m inside the NECCCA indicating an appropriate initial placement of the southeast boundary. These are the first long-term observations of protected deep-water octocoral communities which are needed for the effective management of deep-water coral conservation areas.

SOURCE: Deep-sea research. Part 2. Topical studies in oceanography/Deep sea research. Part II, Topical studies in oceanography

PDF URL: https://www.sciencedirect.com/science/article/am/pii/S0967064516301655

CITED BY COUNT: 18

PUBLICATION YEAR: 2017

TYPE: article

CONCEPTS: ['Coral', 'Fishery', 'Fishing', 'Coral reef', 'Abundance (ecology)', 'Habitat', 'Fauna', 'Marine protected area', 'Geography', 'Belt transect', 'Ecology', 'Oceanography', 'Environmental science', 'Biology', 'Geology']