

# RELATIVE ABUNDANCE OF MACROALGAE (RAM) ON NORTHWESTERN HAWAIIAN ISLAND REEFS<sup>1</sup>

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## ABSTRACT

The Northwestern Hawaiian Islands (NWHI) represent one of the last relatively intact tropical reef ecosystems in existence, yet macroalgal community dynamics of the 10 atolls, islands, and reefs situated in the NWHI Coral Reef Ecosystem Reserve remain virtually unknown. This manuscript is the first to provide distributional maps of six common species along the NWHI chain, statistically compare sites from differing habitats and islands based on relative abundance of macroalgae (RAM), and look for temporal differences in macroalgal populations. Our findings reveal that the abundance of most macroalgal species is low, but that members of *Halimeda* and *Microdictyon* can be extremely common and in some cases form dense monotypic meadows on the reef. Other genera, such as *Styopodium*, *Lobophora*, and *Laurencia*, become increasingly prevalent in northwesterly atolls of the Hawaiian Archipelago. The RAM across the NWHI chain as a whole remained relatively static for the years surveyed. However, slight changes occurred at Kure and Midway atolls where coral bleaching events were documented in 2002 and 2004.

## INTRODUCTION

Qualitative understanding of the marine algal flora of the Northwestern Hawaiian Islands (NWHI) has improved dramatically since 2000 as the National Oceanic and Atmospheric Administration (NOAA) Pacific Island Fisheries Science Center's Coral Reef Ecosystem Division (CRED) and multi-agency Northwestern Hawaiian Islands Reef Assessment and Monitoring Program (NOWRAMP) began conducting annual research expeditions to these remote reefs. Comprehensive lists of reported algal species have been compiled (Abbott, 1989 and 1999; Abbott and Huisman, 2003), several algal species new to science described (Abbott and McDermid, 2001 and 2002; Vroom and Abbott, 2004a and b; Vroom, 2005), and reproductive processes for some algal species reported for the first time (Vroom and Smith, 2003). Yet despite this dramatic increase in phycological activity, very little quantitative research has been published to provide

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<sup>1</sup>This research was conducted under JIMAR's Coastal Research Theme as part of a cooperative study of the Northwestern Hawaiian Islands Coral Reef Ecosystem. The study is funded and directed by NOAA Pacific Islands Fisheries Science Center, Honolulu, HI.

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