

**LOCAL AND REGIONAL PATTERNS IN THE COMMUNITY STRUCTURE OF CORALS.**

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Community ecologists now recognize that to understand patterns of biodiversity, there is an urgent need to synthesize large-scale phenomena with local processes. This demands a multi-scale or hierarchical approach. We have begun a multi-scale study of the composition and relative abundances of corals along the pacific diversity gradient, from indonesia to french polynesia. Our goals are to examine how local diversity responds to variation in the size of the regional species pool, and to quantify the relative variation in community composition at different scales (ie. Among adjacent Schleyer cent zones, sites, islands and regions). So far, we have sampled 52 sites on 14 islands within four regions (png, the solomon islands, samoa, and french polynesia), a total of 1,560 x 10m transects. Most variation in diversity and community structure occurs at the smallest and largest scales - among depth zones (the reef flat, crest and slope) and among geographic regions - compared to adjacent sites and islands that are much more homogeneous. Surveys of juvenile corals reveal major differences in the underlying dynamics of different regions. For example, over half of the coral recruits in png and the solomon islands belong to genera that are absent entirely in samoa and french polynesia. Widespread species typically vary in abundance among regions by an order of magnitude or more, highlighting the need to quantify biogeographical patterns using ecological as well as taxonomic data.