COMMUNITY-LEVEL RESPONSES OF INTERTIDAL SEAWEEDS TO A MARINE HEATWAVE IN CENTRAL BRITISH COLUMBIA

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Among the most concerning recent news in marine science concerns population and ecosystem responses to acute increases in temperature, or marine heatwaves. Known impacts of marine heatwaves include changes in population size and structure, range shifts, and species replacements for one or a few species within an ecosystem, but we have yet to adequately explore how marine heatwaves affect entire communities. We utilize a nine-year time series of intertidal seaweed cover across three sites at high taxonomic resolution from Calvert Island, British Columbia, Canada, to explore the impacts of a recent wide-ranging heatwave – the ‘blob’ of 2014-2016. We find that while local species richness remained relatively stable throughout the time series, total algal cover fluctuated greatly, decreasing during the heatwave at all sites and rebounding afterwards at most. Assemblages changed in a variety of ways, from largely oscillatory dynamics in low intertidal and wave-exposed areas to more directional trajectories in high intertidal wave-protected areas. Across >100 species of seaweed and invertebrates, we found several taxon-specific responses during the heatwave, with sessile invertebrates being more sensitive to winter temperature anomalies and seaweeds to summer anomalies. Our results support growing evidence that ecological impacts of climate disruptions are dependent on existing spatial heterogeneity in the environment, and the varied responses we document across species suggest that predictions around ecological responses to abiotic stress may require updating.