# Environmental Stressors Shift Microbial Influence on Sea Star Wasting Disease

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Once a prominent keystone predator along intertidal zones in coastal regions, asteroid (commonly known as sea stars, class Asteroidea) populations have dropped significantly since the 2013 mass mortality outbreak event of sea star wasting disease (SSWD). Their loss has contributed to the disruption of entire intertidal communities. Despite widespread mass mortalities, prior investigations in SSWD etiology have remained elusive. While viral causative agents were considered, results remained inconclusive. The widespread, temporally synchronous outbreak pattern provoked questions about the role of environmental and microbial dynamics in relation to wasting. To assess whether environmental stressors and microbial composition shifts create conditions associated with SSWD, we conducted a literature review on the implications environmental and microbial dynamics have that may drive SSWD. We found that environmental anomalies (i.e. abrupt changes in sea water temperature and intense upwelling events) change microbial composition along asteroid respiratory surfaces. This shift favors opportunistic bacterial growth—particularly *Vibrio pectenicida*—fueled by excess dissolved organic matter, which drives localized hypoxia and physiological stress that result in wasting. Improving monitoring of environmental anomalies and microbial composition shifts may help predict locations vulnerable to wasting, and drive efforts to prevent or treat affected sites and animals.