ISBW098: Mass seagrass declines, composition and spatial changes instigated by a marine heat wave in Shark Bay Marine Park

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The collection of extended time-series data provides a strong capacity to understand trends in seagrass declines and increases the capacity and confidence to inform management with greater certainty. Here, we present data from a long-term monitoring program in Shark Bay, an area that contains some of the most diverse and extensive seagrass meadows in the world, to illustrate the extent of spatial and temporal changes caused by an extreme climatic event. An unprecedented marine heat wave (peak SST were 2-5°C warmer than average) impacted several marine communities along the West Australian coastline during the 2010–2011 La Niña. Our combined assessments of extent and in-situ measurements detected significant changes in seagrass density and species composition at the landscape scale. For example, a loss of 21.5% in seagrass habitat occurred between 2002 and 2014, and major declines in the proportion of dense (>40% cover) seagrass occurred between 2002 and 2016 (from 72% to 55% of the total area). Broad-scale community composition assessments also demonstrated declines in the mean canopy cover of *Amphibolis antarctica* from 41% (±13.6 SE) in 1996 to 1.5% (±0.99 SE) in 2016, with the cover of sparse *Posidonia australis* meadows and bare sediment increasing. This work provides an example of utilizing habitat mapping as a tool (alongside in-situ measurements) to improve our understanding of seagrass declines, alterations in community composition as well as the implications in terms of the associated changes in ecosystem function; thereby providing knowledge to assess management effectiveness and refine practices to improve conservation efforts.

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ABSTRACTS

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