

**RAPID CLIMATE CHANGE IN THE OCEAN WEST OF THE ANTARCTIC PENINSULA DURING THE SECOND HALF OF THE 20TH CENTURY**

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The climate of the Western Antarctic Peninsula (WAP) is the most rapidly changing in the Southern Hemisphere, with a rise in atmospheric temperature of nearly 3°C since 1951 and associated cryospheric impacts. We demonstrate here, for the first time, that the adjacent ocean showed profound coincident changes, with surface summer temperatures rising more than 1°C and a strong upper-layer salinification. Initially driven by atmospheric warming and reduced rates of sea ice production, these changes constitute positive feedbacks that will contribute significantly to the continued climate change. Marine species in this region have extreme sensitivities to their environment, with population and species removal predicted in response to very small increases in ocean temperature. The WAP region is an important breeding and nursery ground for Antarctic krill, a key species in the Southern Ocean foodweb with a known dependence on the physical environment. The changes observed thus have the potential to have significant impacts on the regional ecosystem.