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Simulated warm water access to the Amundsen Sea continental shelf

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The West Antarctic Ice Sheet is losing mass at an accelerating rate, contributing to sea level rise. Ocean forcing is considered to be the main driver of this mass loss, associated with warm intrusions of Circumpolar Deep Water onto the continental shelf. Here we describe these intrusions, focussing on the role of the Amundsen Undercurrent. The Amundsen Undercurrent is an eastward, bottom-intensified current located at the shelf break/upper slope that transports warm Circumpolar Deep Water. This current enters the continental shelf through deep canyons that connect the shelf break with ice shelf cavities, bringing oceanic heat to the base of the ice shelves. We use a regional ocean model to introduce the forcing mechanisms of the Amundsen Undercurrent and the drivers of its temporal variability. We conclude by discussing how this variability ultimately influences melting of ice shelves in the Amundsen Sea.