



Let's talk about sea level rise

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 Inspire Area – European Digital Ocean Pavilion

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Melting Giants: How Polar Ice Sheets Shape Our Future Sea Levels

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Polar ice sheets, primarily in Greenland and Antarctica, are critical components of the Earth's climate system and major contributors to global sea level. Formed from compacted snowfall over millennia, these vast ice masses gain and lose volume through accumulation and ablation processes, including surface melting, iceberg calving, and oceanic interactions. While historically balanced, recent decades have seen accelerating mass loss, particularly from Greenland and West Antarctica.

This talk explores the physical processes behind ice sheet behaviour and their evolving contribution to sea level rise. It traces the journey of snow to ice, explains how calving and melting accelerate loss, and illustrates the critical role of feedback loops, particularly in Greenland, where melting intensifies as the surface lowers. The talk also turns to Antarctica, where warming ocean waters threaten the structural integrity of ice shelves—giant floating platforms that hold back inland ice. Their collapse could trigger marine ice sheet instability, a tipping point that may lead to irreversible loss.

Sea level is currently rising at about 4 mm per year—twice the rate of the 20th century—and will continue to do so well beyond our lifetimes. While high-end sea-level rise projection remain uncertain, they are physically plausible and carry significant risk, with potential rises exceeding 10 meters by 2300 in extreme scenarios. These projections underscore the urgent need to both mitigate greenhouse gas emissions and adapt to the ongoing and future impacts of sea-level change.

The talk concludes with the broader message: sea-level rise is no longer a distant possibility. It is happening, it is accelerating, and it will reshape our coastlines. We must act decisively to limit global warming—and prepare now for a future shaped by rising seas.

