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The drivers of decadal fluctuation in the global mean sea level rise

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Recent advances in satellite and in-situ measurements have enabled the monitoring of GMSL budget components and provided insights into ocean effects on the Earth's energy imbalance and hydrology. The global mean sea level rise slowed over the 2000s, which coincides with a global warming hiatus period, but has accelerated again since 2011. This decadal fluctuation in GMSL rise can be attributed to climate-related fluctuation in ocean heat and mass change. Sea level and Earth's energy budget results demonstrate that the decadal climate variability has resulted in ocean mass loss and decreased ocean heat uptake, slowing the GMSL rise rate during the 2000s. After ~2011, the climate-driven fluctuations of ocean mass, heat, and GMSL rise rate were reversed. This result highlights the importance of natural variability in understanding the ongoing sea-level rise.