

Local to Global Drivers of Past and Future Sea-Level Change



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[Zoom Link \(Mixed-mode\)](#)

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Geological proxies provide valuable archives of the sea-level response to past climate variability over periods of more extreme global mean surface temperatures than the brief instrumental period. The geological record provides information to assess the relationship between sea level and climate change to develop a firmer basis for projecting the future. Characterizing past sea-level changes and projecting future sea-level rise shares two key challenges: (1) regional and local sea-level changes vary substantially from the global mean, requiring understanding of regional variability to interpret records of past changes and generate local projections, and (2) uncertainty persists in both records of past changes and in the physical and statistical modeling approaches used to project future changes, requiring careful quantification and statistical analysis.

Here, the mechanisms that drive spatial variability and methodologies and data sources for piecing together lines of evidence related to past sea-level variability are reviewed. Recent efforts to develop standardized global databases of past sea-level change to estimate the magnitudes and rates of global mean sea-level change and identify trends in spatial variability and its driving mechanisms are also summarized. In particular, the most recent interglacial period, the Holocene, is the focus of this talk. The spatial and temporal variability of relative sea level during these time periods, key gaps in space and time, and locations that provide important insight into geophysical models are highlighted and explored. Finally, regional case studies are used to illustrate how proxy data may improve future projections, and conversely how future projections can guide the development of new sea-level research questions to further constrain projections.



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