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Past and Present Consequences of Massive Carbon Release for the Earth System

Abstract: Carbon release rates from anthropogenic sources have reached a record high of more than 10 Pg C/y in 2014. Due to uncertainties in climate system feedbacks, the impact of the rapid carbon release on future climate and ocean biogeochemistry is difficult to predict accurately. This presentation will provide a modern- and paleo- perspective on the magnitude and rate of anthropogenic CO₂ emissions. I will discuss effects of ocean acidification on marine organisms, the long-term legacy of mankind's fossil fuel burning, and geologic analogues from past climate episodes that may guide future climate change assessment. If time permits, I will examine proxies for past seawater carbonate chemistry and their validation, focusing on boron isotopes and boron/calcium ratios in biogenic and synthetic carbonates.