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Tide gauge sea level records have interannual to multi-decadal variability which is correlated with meteorological variability and which can overwhelm the signal associated with global sea level rise. Removing this variability will improve global sea level estimates, while knowing the spatial and temporal structure of this variability is interesting from a straight science prospective.

This talk will compare sea level from an ensemble of seven ocean reanalysis and synthesis products with gauge time series from a representative set of 87 tide gauge station locations. The comparison is carried out for both a half-century base period and a century long extended period. We find generally good agreement for the half-century period with ensemble average correlations in excess of 0.55 and RMS differences of 2.2 cm, reducing to a correlation of 0.5 for the extended period. A significant fraction of the difference between tide gauge sea level and product sea level is associated with meteorological variability currently represented by the reanalysis/synthesis products. We interpret this result as indicating that there are residual errors in current atmospheric reanalyses that are contaminating current ocean reanalysis/synthesis products. The broader conclusions, though, are the positive statements that 1) much of the interannual to multi-decadal variability that appears in the tide gauge records is meteorologically driven and 2) that ocean products can be used to isolate this variability from the signal associated with the underlying global sea level rise.
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