Observations of sea level change have been made at a small number of tide gauges since the 1800s. Beginning in the 1990s, a truly global measurement of sea level change over the majority of the ocean was finally possible with the launch of precise radar altimeter missions like TOPEX/Poseidon and its successors, Jason-1 and the Ocean Surface Topography Mission (OSTM). At the same time, measurements at tide gauges with collocated GPS receivers helped scientists separate the effects of rising sea level and local uplift and subsidence. More recently, with the start of the Gravity Recovery and Climate Experiment (GRACE) and the in situ Argo float program in 2002, we have been able to quantify not only the total sea level change, but also the major components (mass and temperature) independently for the first time.

In this presentation, we will review the history and current status of the sea level observing system and discuss what we have learned about spatial and temporal variability of mean regional sea-level change. We will present recent comparisons of altimetry, GRACE, and Argo data and discuss the relative contributions of heating and mass changes to total sea level change over the last decade. Finally, we will review the potential that this system will be maintained over the next decade.