



Measuring Sea Level Change (Vening Meinesz Medal Lecture)

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For over 75 years, the Permanent Service for Mean Sea Level (PSMSL) at the Proudman Oceanographic Laboratory has maintained the global data bank for long term sea level change information from tide gauges. This data set has in recent years received most attention in studies of sea level rise related to climate change. However, it is also valuable in research into ocean circulation variability (oceanography), vertical land movements (geology) and geodetic datums (geodesy). This presentation will review some of the main applications of mean sea level information so far. In addition, it will point to the role of tide gauges within what is becoming a powerful combination of gauges, GPS, absolute gravity, satellite altimetry and space gravity for the study of sea and land level variations on a global basis.

However, changes in mean levels are only one part of sea level research. Other topics include changes in extreme sea levels which are of practical importance as well as being interesting scientifically. Recent studies have begun to investigate changes in extremes worldwide, identifying those areas where secular changes in extremes tend to be determined by those in mean values, and areas where they are not. In addition, intriguing recent work has identified regional changes in ocean tides which are larger than expected from secular change in the tidal potential. Such tidal changes are also important within studies of extremes. This presentation will attempt to show the wide range of studies possible with a copious globally-distributed tide gauge data set, many of which are very relevant to the understanding of a changing world.