



This global map of the trend of sea surface height (SSH) is estimated from the combined data from TOPEX/POSEIDON and Jason-1 from 1993 through 2004. Complex patterns of spatial variability are clearly shown. In the North Pacific the pattern of variability is similar to that of the Pacific Decadal Oscillation, in part caused by wind-driven long-period Rossby waves. The SSH trends in the North Atlantic are caused by a slowdown of the circulation of the subpolar gyre of the North Atlantic Ocean, leading to a decrease of the northward heat transport of the ocean.

In the South Atlantic and South Pacific, the marked striations are roughly consistent with the characteristics of Rossby wave fronts, reflecting a possible role of Rossby waves in the decadal change of ocean circulation. In the Southern Ocean the spatial pattern shows the characteristics of a wavenumber-2 Antarctic Circumpolar Wave, with two minima centered at longitudes of 30°-60° and 210°-240°. These waves travel eastward around Antarctica in 8 to 9 years.

The decadal trend of SSH in the Indian Ocean suggests that there is a decrease in the northward geostrophic flow of the upper ocean and hence a reduction of the ventilation of the tropical Indian Ocean by the cold water from the South Indian Ocean, responsible for a long-term warming of the upper Indian Ocean.