Using a gridded ocean temperature and salinity field based on observations, we investigated the recent baroclinic sea level change. Patterns of the long-term regional sea level change are principally determined by the baroclinic component (density change) due to movements and transformations of water mass. We decomposed the baroclinic response into vertical modes of ocean climatological stratification, considering vertical structure of the baroclinic pressure change. The first baroclinic mode was responsible for about 80% of the variance in the baroclinic response, suggesting that the regional patterns of sea level change are mainly determined by vertical displacement of the main pycnocline. The second and third modes are responsible for about 12% and 4% respectively. We also found the density changes in subtropical mode waters. Pattern of the steric change due to the transformation of mode waters is well corresponding with the composite pattern of second and third baroclinic modes. These results suppose that the water mass quality changes are important to reproduce the local sea level change, especially in the subtropical regions. Similar regional sea level response is shown in a future projection under CO2-induced global warming using a climate model (Suzuki and Ishii, 2011), suggesting that the elucidation of the regional sea level response to the changes in the water mass is indispensable to improve the future projection of regional sea level change.