# Long-term change of the halocline in the global ocean

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Distribution and long-term change of the halocline in the upper layers of the world ocean were investigated via analysis of World Ocean Database 2013 (WOD13) using a simple definition of the halocline. The halocline was observed in the tropics, equatorward subtropical regions, and subpolar regions, but was absent from central subtropical regions. A strong halocline tended to occur in areas where the sea surface salinity (SSS) was low. Long-term change of the halocline was also observed in the world ocean: halocline was strengthened by more than 20% in the last thirty years in the global average. The change was relatively strong in the tropics, equatorward subtropical regions, and subpolar regions and was closely related with long-term change of SSS: the lower the SSS was, the stronger the halocline became. The correlation coefficient between the horizontal distributions of the halocline strength change and SSS change was -0.55 in the area of 60˚S-60˚N.

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