We investigated water vapor variations in the tropical lower stratosphere on seasonal, quasi-biennial oscillation (QBO), and decadal time scales using balloon-borne cryogenic frost point hygrometer data taken between 1993 and 2009 during various campaigns including the Central Equatorial Pacific Experiment (March 1993), campaigns once or twice annually during the Soundings of Ozone and Water in the Equatorial Region (SOWER) project in the eastern Pacific (1998–2003) and in the western Pacific and Southeast Asia (2001–2009), and the Ticosonde campaigns and regular sounding at Costa Rica (2005–2009). Quasi-regular sounding data taken at Costa Rica clearly show the tape recorder signal. The observed ascent rates agree well with the ones from the Halogen Occultation Experiment (HALOE) satellite sensor. Average profiles from the recent five SOWER campaigns in the equatorial western Pacific in northern winter and from the three Ticosonde campaigns at Costa Rica (10°N) in northern summer clearly show two effects of the QBO. One is the vertical displacement of water vapor profiles associated with the QBO meridional circulation anomalies, and the other is the concentration variations associated with the QBO tropopause temperature variations. Time series of cryogenic frost point hygrometer data averaged in a lower stratospheric layer together with HALOE and Aura Microwave Limb Sounder data show the existence of decadal variations: The mixing ratios were higher and increasing in the 1990s, lower in the early 2000s, and probably slightly higher again or recovering after 2004. Thus linear trend analysis is not appropriate to investigate the behavior of the tropical lower stratospheric water vapor.