With the recent accumulation of the satellite ionospheric measurements the attention is now being directed towards investigating the impact of wave forcing from the lower atmosphere. Recently, when the level of solar and geomagnetic activity is very low, it is particularly appropriate for investigating the vertical coupling of the atmosphere-ionosphere system by atmospheric waves. The six-satellite Constellation Observing System for Meteorology, Ionosphere and Climate (COSMIC) mission makes routine ionospheric measurements over the entire globe using occultation techniques. These observations have been used in to develop global-scale maps of the electron density for altitudes between 100 km and 800 km and for the period of time between October 2007 and March 2009. From the electron density profiles the ionospheric parameters foF2 and hmF2 are obtained as well. These data are used for investigation of the global ionospheric response to the main atmospheric tides (24-h, 12-h and 8-h) forced from below. The temperature measurements from the Sounding of the Atmosphere using Broadband Emission Radiometry (SABER) instrument on the Thermosphere-Ionosphere-Mesosphere-Energetics and Dynamics (TIMED) satellite have been analyzed in order to derive the global spatial structure and temporal variability of the above mentioned atmospheric tides (migrating and nonmigrating) from the lower stratosphere to the lower thermosphere (20-120 km). The presentation will be focused mainly to the global distribution and temporal variability of the ionospheric response to the nonmigrating tides responsible for some ionospheric longitudinal structures intensively studied recently.