Gravity waves play significant roles in the dynamics and transport/mixing processes in the atmosphere and they can also affect the global energy budget due to the important roles they play in the formation of cirrus clouds in the upper troposphere and lower stratosphere. With the availability of various satellite and in-situ data, we have come a long way in understanding gravity waves in different regions of the atmosphere. Nevertheless, the sorely needed information on the global characteristics of gravity wave parameters such as momentum flux and horizontal propagation direction still remains largely elusive. The GPS radio occultation (RO) technique provides global temperature retrievals in the troposphere and stratosphere. We have developed an algorithm based on the cross-wavelet method to derive the global estimates of gravity wave parameters (including momentum flux and horizontal propagation direction) from the combined COSMIC/CHAMP GPS RO temperature retrievals. In this presentation, we will show some preliminary results on the global estimates of gravity wave horizontal propagation directions and momentum fluxes. As a validation of the new wave parameter retrieval method, we will compare the GPS results with wave parameters derived from the U.S. high vertical resolution radiosonde data using the more conventional Stokes parameter method when and where the data overlap.