The distribution of water in the Earth's mantle provides important insights into the processes of global water circulation. However, inferring the water distribution has been hampered by the lack of critical experimental data and observations. During the last several years, key experimental data on the sensitivity of geophysically observable properties to water content have become available, and new geophysical observations have also been accumulated. In this talk, I will review the current status of mineral physics observations related to water and partial melting. Many of the seismological observations are insensitive to water content but sensitive to other factors such as major element chemistry, whereas electrical conductivity is sensitive to water content and insensitive to other factors. By comparing the observed electrical conductivity distribution in the Earth's mantle with mineral physics observations, I conclude that the water content in the Earth's mantle is heterogeneous and layered: water content in the transition zone is, on average, larger than that of the upper mantle. This observation suggests partial melting at ~410-km. A thermodynamic consideration shows that most of the upper mantle above 410-km must also be partially molten, although the influence of partial melting on physical properties is small except for the deep upper mantle where melt likely wets grain-boundaries completely. In these regions, complete wetting leads to a significant reduction in seismic wave velocities, which is consistent with seismological observations. Partial melting at 410-km buffers the water content in the upper mantle thereby stabilizes the ocean mass.