This dataset is a collation of 3-year direct measurement values of N2O concentrations and fluxes for East Qinghai-Tibet Plateau (EQTP) streams and rivers, along with information on location, hydrological, physical, and chemical conditions of the study sites. Given the rarity and high value of this EQTP data set, it will be very valuable for the next update to global riverine N2O flux estimates.