Intraseasonal oscillations (ISOs) in the East Asian summer monsoon (EASM) exhibit significant change in interannual to interdecadal time scales. The changes in ISOs are modulated by contributing factors such as the hydrologic cycle, ENSO, and Arctic Oscillation (AO). In this study, we investigate the changes in ISOs and the relationship with the contributing factors. It was found that accelerations in hydrologic cycle, which is related to the enhanced evaporation and moist transport toward the East Asia, are deeply associated with the intensification in ISO. In addition, the change in the ISO-ENSO relationship was significantly shown in the atmospheric bridge process of the Indian ocean SST warming – the suppressed convection over the western North Pacific (WNP) – WNP subtropical high. The changes in the summertime ISO-ENSO relationship appear more evidently in time lag of about 9 month than in the simultaneous moment. The association with AO, meanwhile, is less significant than that with ENSO. The contribution from the hydrologic cycle, ENSO, and AO in modulating the change in ISOs is different from each decadal period. It may be due to the distinct coupling (or decoupling) process between the factors and ISOs in other decadal periods.