Abstract: The transport mechanism of detrapped charges was investigated in thermally wet grown SiO_2 electrets which were first charged by the corona method or by electron-beam irradiation and then aged at different temperatures. The discharge and retrapping behavior was determined by measuring open-circuit TSD current spectra, the mean spatial charge depth, and the charge density. In this way the thermal activation process could be compared with the local redistribution and the decay of the trapped charges. It was found that fast retrapping plays the dominant role for the released negative charge carriers. For positive charge carriers, however, this could not be confirmed. Independently of the charging polarity, the aging procedure resulted in a controlled shift of the mean charge depth from a near-surface region up to several hundred nanometers deep into the bulk of SiO_2.