While the GRACE mission is providing an unprecedented insight into the time variations in Earth's gravity field, the determination of the longest wavelength gravity field components from satellite laser ranging (SLR) is still an important component. In particular, GRACE is insensitive to the geocenter variations that are well-observed by SLR. The non-tidal annual geocenter motion reflects the largest-scale (equivalent to degree-1) seasonal mass redistribution in the Earth system, so it is essential for a complete description of the total mass transport. With two decades of SLR tracking from LAGEOS-1 and -2, it is also possible to look for long-term non-linear geocenter motion, which will reflect non-steady mass redistribution such as accelerated glacier and ice sheet mass loss. In addition, the GRACE estimates for the degree-2 zonal coefficient (J2) are affected by apparent tide-like aliases. SLR provides not only an estimate that is essential for the GRACE mission period, it also provides the context for the more recent changes compared to the history of J2 variations over more than three decades. The SLR time series of the low degree terms provides the long-term history of the longest wavelength gravity changes, which should be continued not only through the likely gap after GRACE but also during the GRACE Follow-On mission.