Many densely populated deltas and coastal areas on Earth are located in data-sparse regions, forcing researchers and policy makers to use low-resolution, global elevation data obtained from satellite platforms to do sea-level rise impact assessments. Using a new, high-accuracy elevation model of the Vietnamese Mekong delta, we show that the quality of such global data is insufficient. This may have profound implications for sea-level rise impact assessments worldwide, with elevation errors potentially larger than a century of sea level rise.