discussion of compaction effects). It is worth noting that this is probably the only component that realistically can be controlled by humans. The obvious general but not universal correlation of areas of tide gage locations and ground fluid extraction near population concentrations justifies a possible concern over this activity. Also the fact that these are the areas that continued RSL rise may contribute most to the ultimate response cost (relocation, defense, repair, etc.) makes it important that the significance of anthropogenically induced subsidence be quantified and possibly controlled as early as possible.

Very simple and sensitive compaction meters have been utilized in quantifying this effect in the vicinity of Osaka and Niigata, Japan among other locations. A schematic of two such gages is presented in Fig. 2.7. Each installation consists of an outer casing lining a hole drilled to some depth, h. The inner pipe of slightly smaller diameter is founded on the stratum at depth h. Thus the relative vertical movement between the top of the inner pipe and the general ground level represents the total compaction over the upper sediment column of thickness, h. To establish differential compaction, several such devices would be required at each location of interest. Ideally installations would be made near tide gages and also remote from cities but say inland and in the same geological formations as those near the tide gages. These gages would commence yielding valuable data immediately, and it may be possible to supplement the compaction data collected with models using data representing the geological formations and the history of past ground fluids extraction to estimate earlier compaction. Such results would be invaluable in providing more reliable estimates of past and future eustatic sea level rise.

New Tide Gage Data - Referring to Figs. 2.3 and 2.4a, it is clear that the southern hemisphere is especially deficient in long-term tide gage data. A number of relative short-term tide gage records are available along the east and west coasts of South America; however, there needs to be an effort on an international basis to install and maintain additional gages to provide a representative distribution. In addition to the southern hemisphere, more insular tide gages and tide gages along the open coast are needed. A first phase effort could be a survey to identify such sites.