

principles" with the addition that the global viscous model would be employed for interpretation, guidance and confirmation of the results obtained.

Most approaches of direct analysis attempt to reduce the noise in a record on a station-by-station basis through determining some sort of RSL estimate through fitting to the data. Unfortunately, the noise in individual records is such that at least 20 to 40 years of data must be available at the individual gages before these results can be considered meaningful. An approach that would make these results meaningful early after their availability is the weighted averaging of many stations along a coastline to establish a more stable value. This averaging length could encompass, for example, the North American or North and South American shoreline(s). Thus, if a wave with length exceeding the expanse of the stations encompassed were contributing to the "noise", this process would tend to reduce or (in the very fortuitous cases) eliminate its contribution. By first averaging over long segments of the shoreline, weighting each station by its alongshore influence length, then combining appropriately the results for various such shoreline segments, a much more stable year by year value could be obtained, i.e. Eqs. 2.3 and 2.4. This would allow effective use of such data as are available for the east coast of South America where eight of the twelve available gages are less than 30 years in duration. As is evident from Fig. 2.6 which presents the mean annual sea level variation of Pensacola, Florida, 30 years is not adequate to obtain a stable estimate from an individual gage.

2.4.2 Need for New Data

There are two types of new data that would contribute to improved estimates of ESLR: those that contribute immediately and those that would require a data base of at least several years before meaningful results could be obtained. It is anticipated that even with the potential benefits of satellite altimetry, at least one decade and possibly two decades will be required before adequate confidence will be placed in these data to yield accepted reliable estimates of eustatic sea level rise. Three research needs in the category of "new data" are described below.

Compaction Gages - As is well-documented by a number of studies, withdrawal of ground water and hydrocarbons can contribute to substantial subsidence and thereby a "relative sea level rise" (see also section 2 for a