Table 2.1. Estimates of Eustatic Sea Level Rise Based on Tide Gage Data (adapted from Barnett, 1983; and Hicks, 1978)

Author(s)	Estimate (cm/100 yr)
Thorarinsson (1940)	> 5
Gutenberg (1941)	11 ± 8
Kuenen (1950)	12 to 14
Lisitzin (1958)	11.2 ± 3.6
Fairbridge and Krebs (1962)	12
Hicks (1978)	15 (U.S. only)
Emery (1980)	30
Gornitz *et al.* (1982)	12 (10 cm excluding long-term trend)
Barnett (1983)	15

could be interpreted as due to atmospheric forcing or long water wave (Rossby wave) motions. As an example, the records at San Francisco and Honolulu were found to be coherent at periods of 5 to 10 years and longer, although with a phase lag. A comparison of the energy spectra obtained from these two stations is presented as Fig. 2.1a and other spectral information is presented in Figs. 2.1b,c,d. The amplitudes of these coherent components are 5-15 cm. Similar coherence results were found for tide gage records located on both sides of the Atlantic. Sturges concluded that the available records are contaminated by substantial energy with periods up to 40 to 50 years, thus exacerbating the problem of identifying any change in the rate of SLR. The ability to extract the SLR signal may possibly be enhanced through an analysis which recognizes the probable cause of the noise components, thereby guiding their removal from the record.

Aubrey and Emery (1983) applied the method of eigenanalysis to United States tide gage data in an attempt to identify fluctuations that were spatially and temporally coherent. This method, among the most sophisticated applied to date, has the potential advantage of retaining in the first few temporal eigenfunctions, those fluctuations that have the same form and that are either exactly in or exactly out of phase. The principal disadvantage is that the method is purely statistical and does not recognize the physics of the phenomenon, although it may isolate features that will assist in identifying physical components. A particular drawback is that the method