Lambeck and Nakiboglu (1984) have carried out an analysis of the effect of post-glacial adjustment on estimates of ESLR. For this purpose, a viscous model of the earth was adopted with the assumption of a uniform mantle viscosity. To quantify the effect of rebound on estimates of ELSR as determined from tide gage records, the apparent or RSL rises predicted by the model without any additional water mass or steric changes were computed for the same eight long-term tide gage stations selected by Barnett (1983). Two values of viscosity, μ, were used: Model 1, $\mu = 5 \times 10^{21}$p and Model 2, $\mu = 10^{22}$p. for the eight stations, Models 1 and 2 predicted apparent (relative) sea level rises of 0.5 and 0.8 mm/yr, respectively whereas Barnett found 1.5 mm/yr. Based on this comparison, Lambeck and Nakiboglu conclude that the post-glacial rebound contribution may be as high as 30% to 50% of published estimates of ESLR.

A limited analysis has been carried out here to attempt to determine the effects of employing only the lower latitude tide gate data. The U.S. data for the East and West coasts and Gulf of Mexico as published by Hicks et al. (1983) were used. The trend estimates in Hicks et al. were simply plotted against latitude as presented in Fig. 2.5. A problem is that the data only encompass latitudes from approximately 25° to 58° and thus it is necessary to extrapolate liberally. At the lower latitudes, the data were extrapolated uniformly at approximately 3.2 mm/yr and at the higher latitudes, due to the uncertainties, two extrapolations were adopted to determine sensitivity as presented in Fig. 2.5. Based on the latitudinal variation, $\dot{\eta}(\phi)$, estimates of the ESLR, $\dot{\eta}_E$, were based on the following

$$\dot{\eta}_{E_j} \approx \int_0^{\pi/2} \dot{\eta}_j(\phi) \cos\phi \, d\phi \qquad (2.1)$$

where j = I,II represents the different high latitude extrapolations. The resulting values were

$$\dot{\eta}_{E_I} = 0.32 \text{ mm/yr, Extrapolation I}$$
$$\dot{\eta}_{E_{II}} = 0.67 \text{ mm/yr, Extrapolation II}$$

These results are qualitatively in agreement with those of Lambeck and Nakiboglu.