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Ocean Tide Loading Computation

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This grant funds the maintenance, updating, and distribution of programs for computing ocean tide loading, to enable the corrections for such loading to be more widely applied in space-geodetic and gravity measurements. These programs, developed under funding from the CDP and DOSE programs, incorporate the most recent global tidal models developed from Topex/Poseidon data, and also local tide models for regions around North America; the design of the algorithm and software makes it straightforward to combine local and global models.

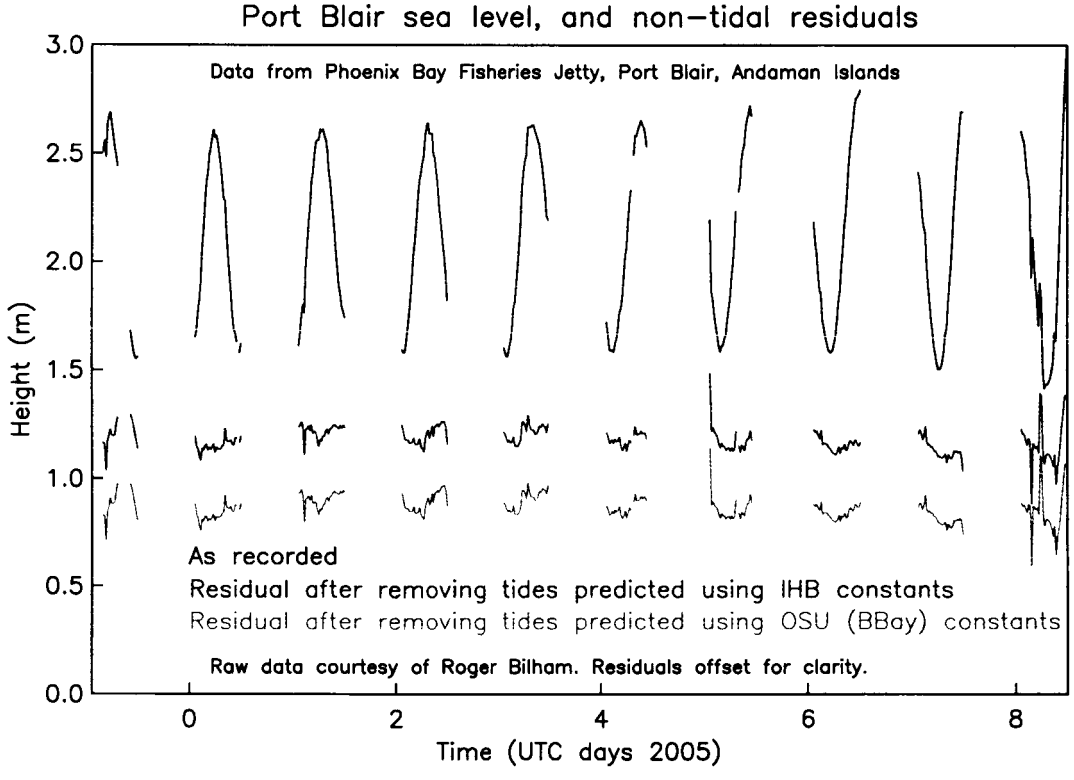

Figure 1

During the period covered by this progress report, the following improvements to the software were made, though at this time they have not been added to the distribution version:

- Improvement of the land-sea mask by incorporation of the latest coastline data from the Antarctic Digital Database, the revised version (1.5) of the GSHHS model of Wessel and Smith, and the NOAA Medium-Resolution Vector Shoreline for the United States.

- Inclusion of new local and global models, most notably the set from Oregon State University. These became of special interest following the Sumatra/Andaman earthquake of December 26, 2004. I have been collaborting with Aron Meltzner and others who are using ASTER imagery to estimate vertical motion of the Andaman Islands by looking at changes in shoreline location. Accurate tidal models are crucial to the success of this. I have compared the OSU model with the published harmonic constants (from 1933!) for Port Blair in the Andamans, and the prodicted tides from both with observations in this location, made available from Prof. J. Paul via prof. Roger Bilham. The results (Figure 1) show that either prediction satisfacotrily removes the tides from the observed sea level.
- Addition of new Green-function files to add the PREM Earth model, and also to include Green functions at various depths, for computing internal stresses.