

3.5.6.3 Special Bureau for Tides

The IERS Special Bureau for Tides collects datasets related to the effects of tides on Earth rotation and geocenter motions. The Special Bureau generates most of its own product data sets by analyzing the results of numerical computer models of the relevant geophysical fluids, in this case both ocean tides and atmospheric tides. The Bureau is therefore dependent upon the work of modelers to release their solutions to the EOP community; in the case of tides, this means solutions for both tidal elevations and tidal current or wind velocities on a global (or nearly global) grid. The data archive that the Bureau maintains has slowly grown as individual tidal investigators contribute to their modeling results. The data collected by the Special Bureau are publicly available via the internet at <<http://bowie.gsfc.nasa.gov/tides>>.

New research into oceanic and atmospheric tides includes:

- Determination of the Global character of the S1 ocean tide by numerical modeling and by analysis of Ocean Topography Experiment (TOPEX)/Poseidon satellite altimeter data
- Determination of the S3(p) pressure oscillation over the coterminous United States from the analysis of hourly barometer data from 180 stations [Ray and Poulouse, 2005]

The S1 ocean tide model is currently being tested in GPS operational data analysis software.

The IERS is considering including the Ray and Ponte [2003] S1 and S2 atmospheric tidal models as part of the station motion model. Updates on the status of the IERS decision as well as the in-phase and out-of-phase components of the loading effects due to this model can be found in grid format at <<http://www.ecgs.lu/atm>>. At the same location, the amplitudes and phases (or the in-phase and out-of-phase components) of the 3-dimensional deformations can be determined for any location on the surface of the Earth using an online calculator.

The Bureau endeavors to obtain newer tidal EOP solutions for long-period tides and for atmospheric tides. Several groups are now working on these topics, and the Bureau expects that additional data relevant to these tides can be added in the near future.

References

- Ray, R. and R.M. Ponte, Barometric tides from ECMWF operational analyses, *Annales Geophysicae*, 21, pp. 1897–1910, 2003.
- Ray, R. and G. D. Egbert, The Global S1 tide, *Jour. of Phys. Oceanography*, 34, pp. 1922–1935, 2004.
- Ray, R. and S. Poulouse, Terdiurnal surface-pressure oscillations over the continental United States, *Monthly Weather Review*, 113, pp. 2526–2534, 2005.

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