ON THE USE OF SATELLITE ALTIMETER DATA TO ENHANCE BATHYMETRIC INTERPRETATIONS IN AREAS OF SPARSE SOUNDINGS

By Walter H. F. SMITH
U.S. National Oceanic and Atmospheric Administration
National Environmental Satellite Data and Information Service
Laboratory for Satellite Altimetry, code E/RA-31
Silver Spring, Maryland USA

Executive Summary

It is an honor to be included in this celebration and to be scheduled in the future-looking section of the Centenary. Satellite altimetry is an indirect mapping technique that yields gravity anomalies that may be partially correlated with bathymetry under certain geologic conditions. Even under optimal conditions, the ultimate resolution of the technique is bounded by physical laws; resolvable features must have a width and length in plan view as large as, or larger than, the mean depth of the surrounding sea floor. Currently available data have not yet achieved this resolution, and are in fact two to three times worse in resolved length (four to nine times worse in resolved area). I am optimistic about the prospects of improving this resolution, first by reprocessing existing data, and later with a new dedicated altimeter mission. The main virtue of satellite remote sensing is globally uniform data quality at low cost, something shipboard surveys cannot provide. Therefore I believe that satellite reconnaissance of ocean floor structure will continue to play an important role in ocean mapping. I hope I may also have the pleasure of a continuing role in GEBCO.