

Using Shuttle Radar Topography Mission data for updating coastal marine navigation charts

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It has become apparent in recent years that our ability to navigate has outstripped the accuracy of our marine navigation charts. Using a GPS receiver, anyone can find their position on the earth to within 100 m. However, marine navigation charts, especially for areas outside the US, are often based on old surveys, some as old as 100 years, and many have been found to depict islands and coastlines as much as several nautical miles from their true position. The Shuttle Radar Topography Mission (SRIM) will produce maps of all land between about 60 degrees N and S latitude, including coastlines and islands, at 30 m horizontal resolution, with approximately 10 m horizontal accuracy. If the digital topographic data and images are suitable for consistent and reliable detection of shorelines and islands, then they could be used as a basis for a global update of marine navigation charts. This would also pave the way for the use of higher-resolution systems. As SRIM data become available, we will seek to characterize the data sets and their suitability for updating of marine navigation charts in an efficient and cost-effective way. Questions to be answered include:

What algorithm should be used to detect coastlines?  
What is the detection threshold of the SRIM topographic and image data?  
What is the effect of varying SRIM imaging parameters on detectability?

\* Work performed under contract to NASA.