GEBCO SCIENCE DAY – SCRIPPS INSTITUTION OF OCEANOGRAPHY – 4 October 2011

Contributions of Airborne Lidar Bathymetric Technology for the Global Coastal Zone Bathymetry Data Base

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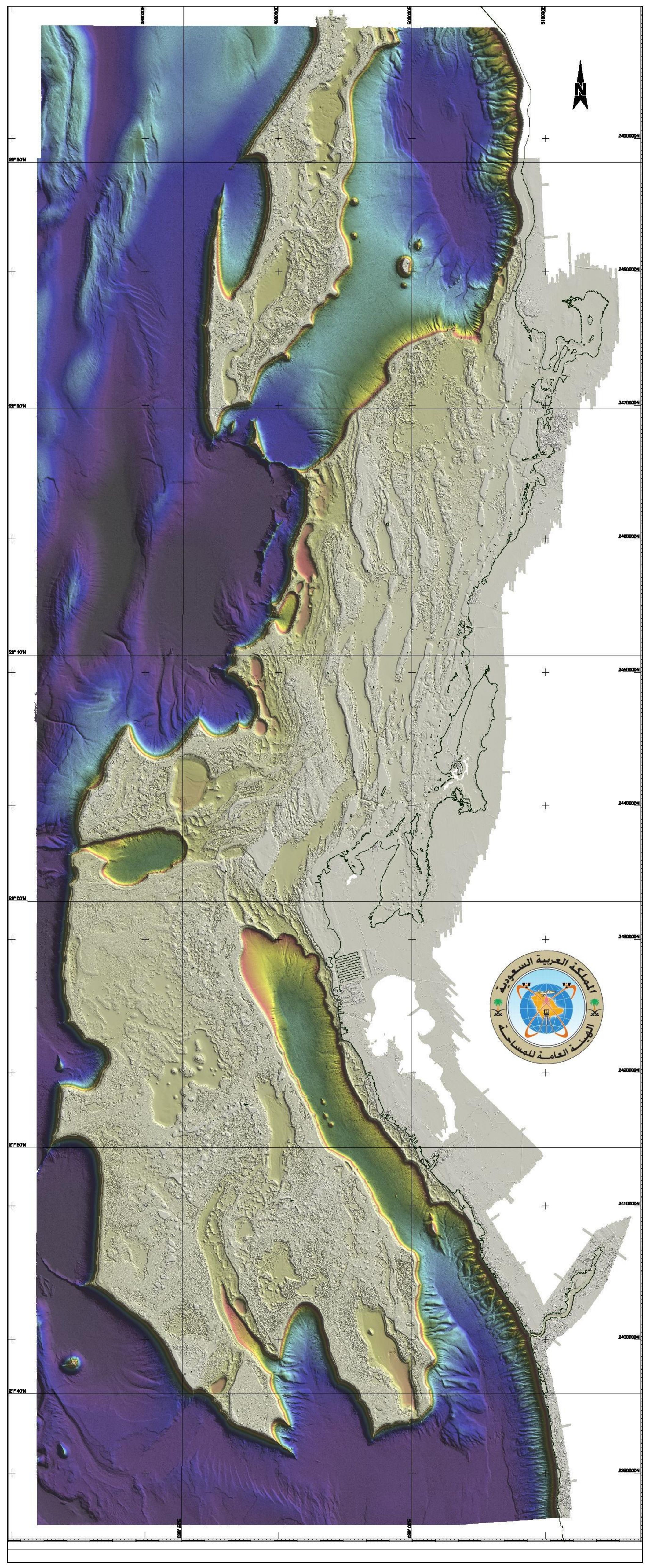
Airborne LiDAR Bathymetry (ALB)

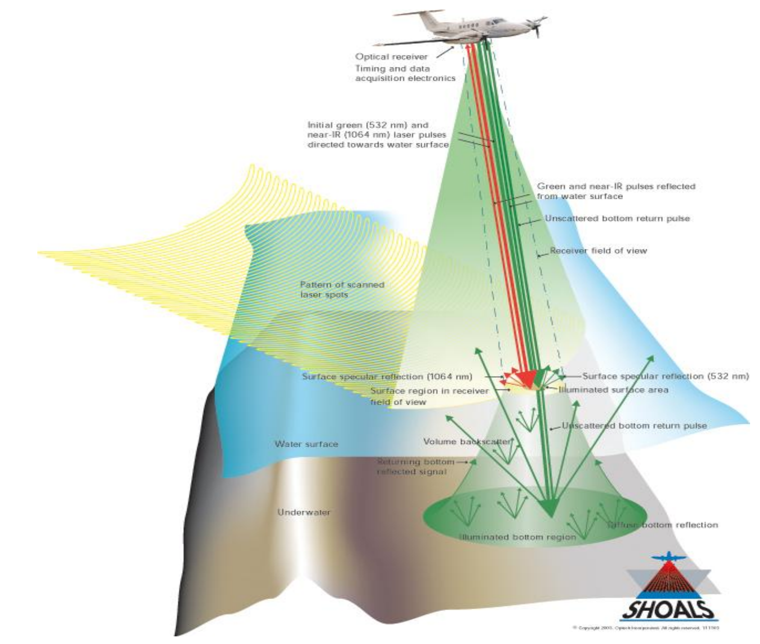
This poster highlights some examples of the growing contributions that ALB technology is making to regional-scale mapping of the coastal zones and shallow waters of the world. The acceptance of ALB as a valuable hydrographic technology has increased in many places. It also bears importantly on the first bulleted theme for this meeting "Merging topography, bathymetry, and shoreline data in the coastal zone."

Red Sea - Merged MBES data with ALB bathymetry & topography over nearly 4,000km^2 of coastal reef complex to IHO Standards.
For Kingdom of Saudi Arabia GCS.



Role of ALB Technology in Regional Mapping of the World's Coastal Zones

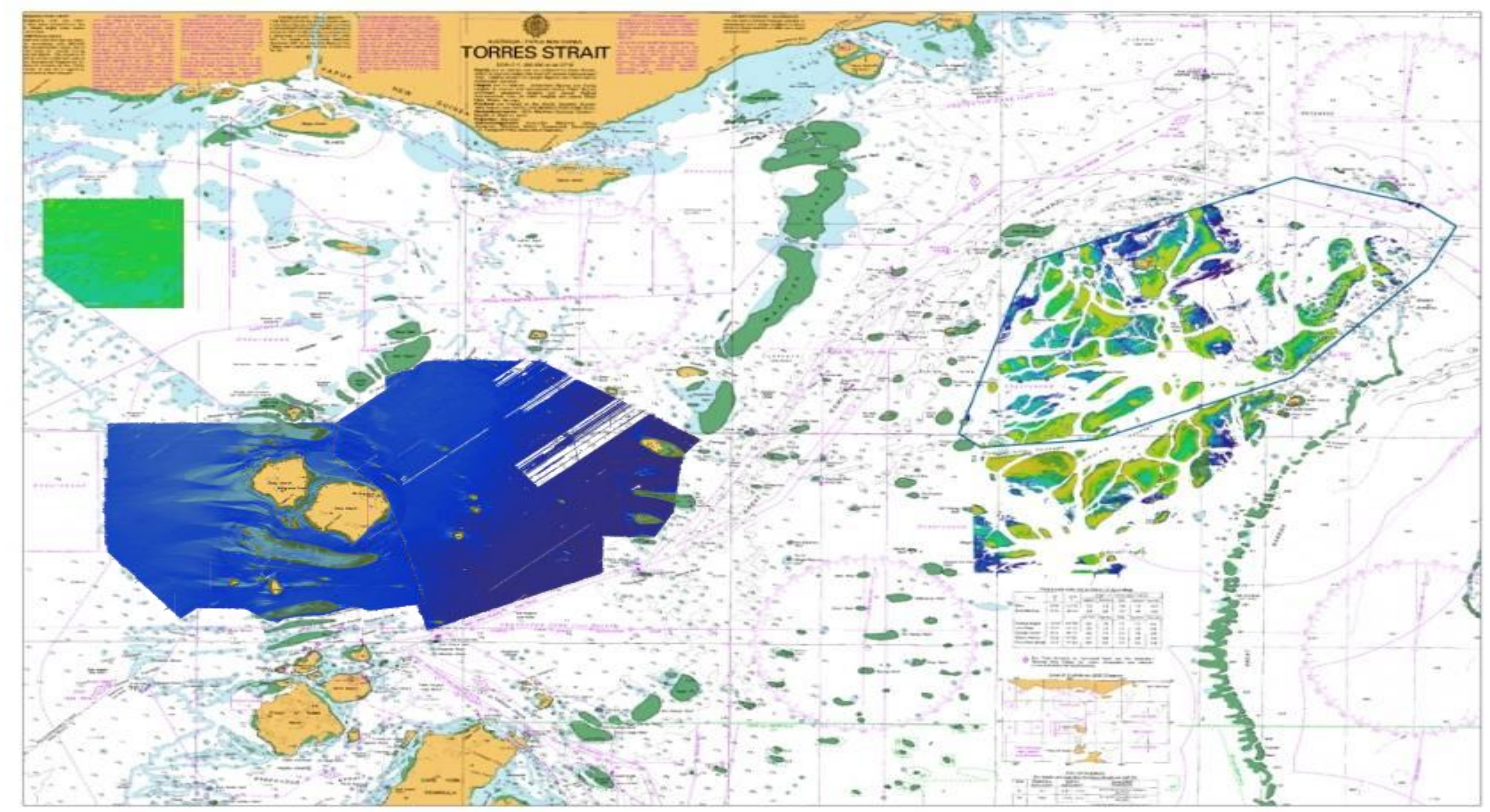
- Surveys the gap between onshore and offshore surveys
- Acquires data in very shallow waters
- More productive than vessel surveys in shallow waters
- Safer than vessel surveying in shallow waters
- A key component of nearshore nautical charting
- Valuable tools for environmental studies
- Seafloor Reflectance Imagery
- Airborne perspective – aerial images, hyperspectral
- Topographic surveying integrated for a continuous model of onshore and offshore elevations on the same datum



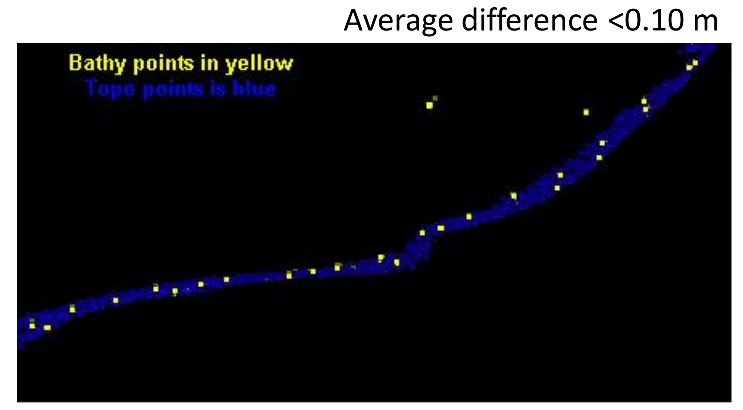
ALB Technology – The Basics

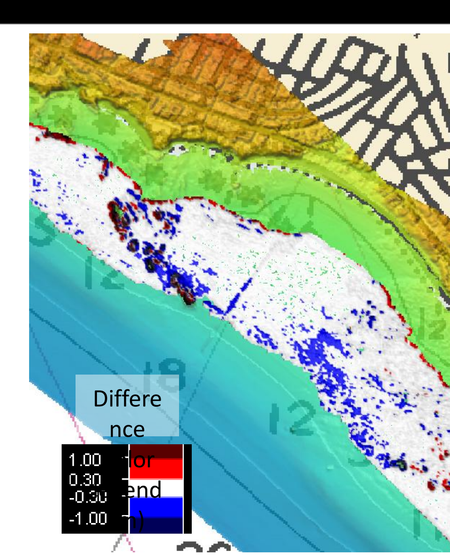
Worldwide locations of ALB survey operations conducted by Fugro on a global basis. There are dozens of additional surveys, such as those by SHOM in French Territories that could be added to this distribution. Also Fugro recently conducted ALB surveying a sites in the Canadian Arctic.

Torres Strait and the Great Barrie Reef – area of complex tidal dynamics with extensive changing shoals. ALB covered large previously unsurveyed areas totaling over 12,000km^2 .
For Australian Hydrographic Service.

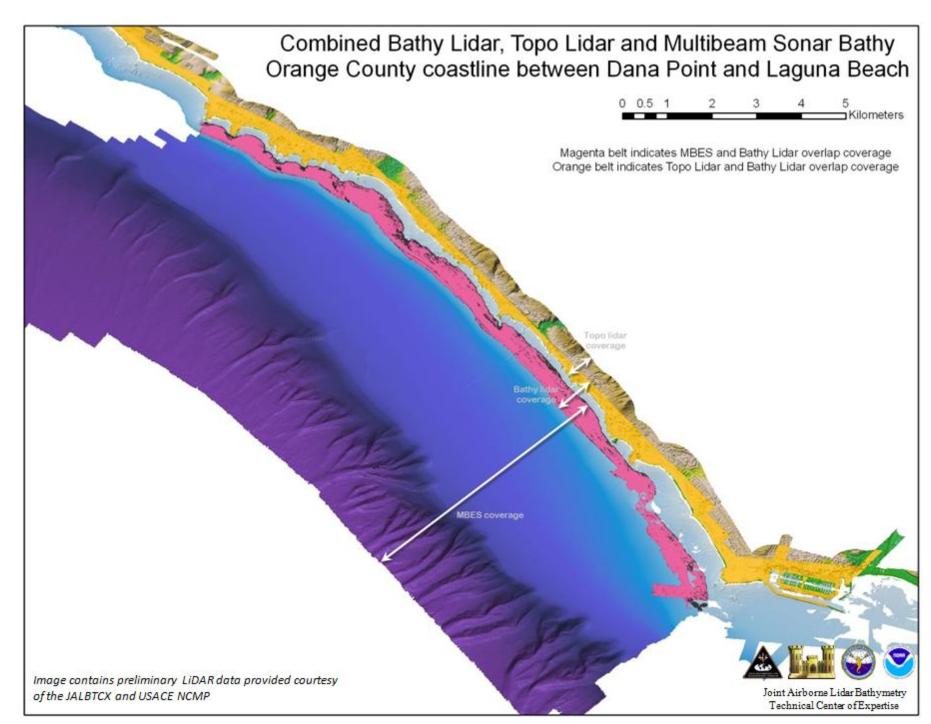


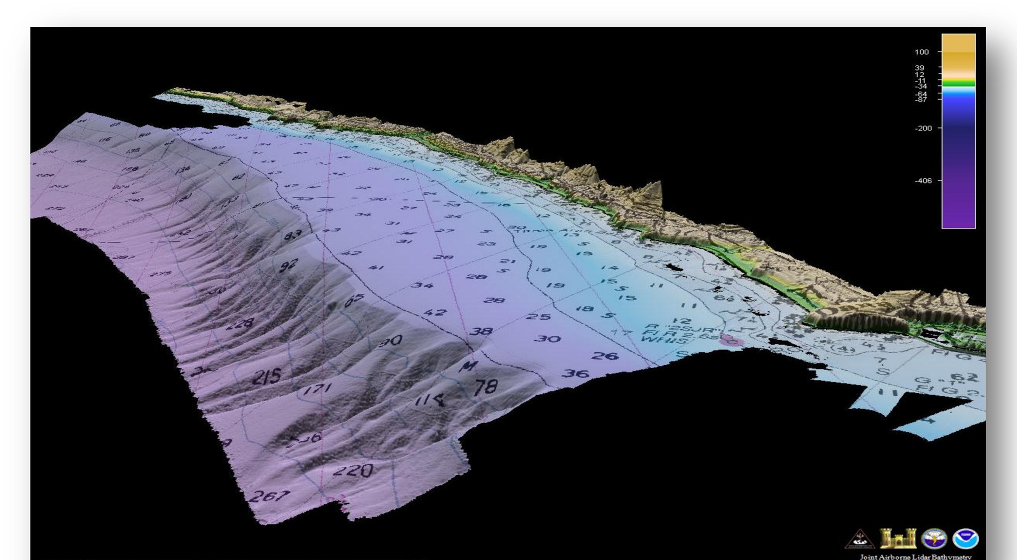
ALB & Topographic LiDAR - vertical agreement verified during initial stages
Mismatch tolerance same as accuracy requirement (<0.15 m RMSE)
Average difference <0.10 m



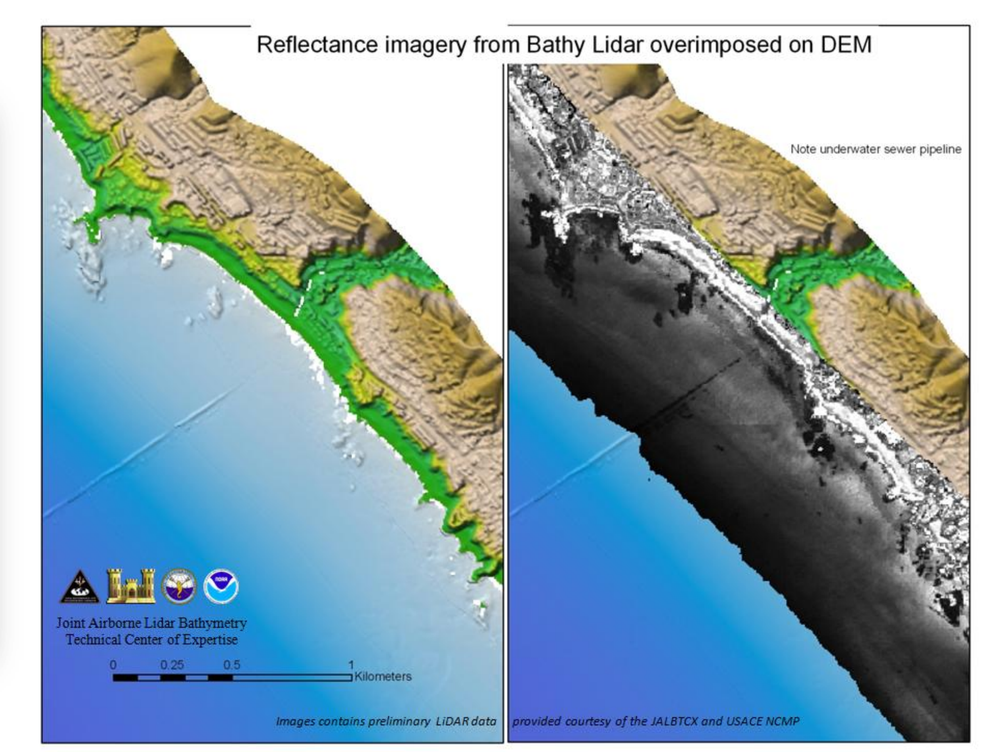


LIDAR and MBES Integration - Surface comparison shows good vertical agreement
Mean difference: -0.12 m & Std Dev: 0.27 m





Same as previous, but with chart in fathoms as underlay



ALB seafloor reflectance image