

Appendix F. Satellite Mapping Poster

WorldView-2 Satellite Mapping of the Nearshore Ecosystems around Timor-Leste: Goals, Challenges and Accomplishments



Julia S. Ehses, Russell Watkins, Katherine Landesman

Joint Institute for Marine and Atmospheric Research and NOAA Pacific Islands Fisheries Science Center, Coral Reef Ecosystem Program

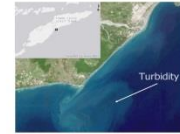
Abstract

Timor-Leste and the Coral Triangle region in general represent a hotspot of marine biodiversity. Coral reefs in the region provide an important source of food and income for local economies and provide coastal protection from storm and tsunami events. NOAA, along with partners from U.S. Agency for International Development (USAID), the U.S. Department of State, and the multilateral partnership of 6 countries in the Coral Triangle region, have been providing technical assistance to support implementation of an Ecosystem Approach to Fisheries Management (EAFM) in Timor-Leste. Despite numerous challenges, this project utilized high resolution WorldView-2 satellite imagery to provide seamless regional shallow water bathymetry and benthic habitat data and maps for nearshore waters around Timor-Leste. Prolonged high turbidity on the southeast and portions of the northeast coasts resulted in poor visibility and limited usability of some of the satellite images. The lack of relevant bathymetric and benthic habitat ground-truthing data has also been problematic. We addressed these issues by continuously adapting data processing methods to the quality of each satellite image. Here we present an overview of our seafloor depth derivation and habitat characterization methodology, which we use to obtain partially complete bathymetric data coverage and complete benthic habitat data coverage for the shallow (0-20 m) coastal seafloor around Timor-Leste. These data layers are an integral part of the EAFM under development for Timor-Leste.

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Challenges:

- Acquiring high-quality satellite imagery over a large region
- Adopting a consistent & broadly applicable data processing approach
- High turbidity - southeast Timor-Leste (see example →)
- Limited depth sounding data for pseudo bathymetry derivation & QC
- No benthic habitat ground-truth data

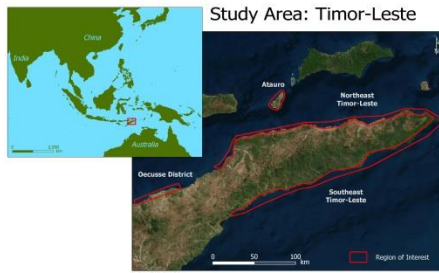


Accomplishments



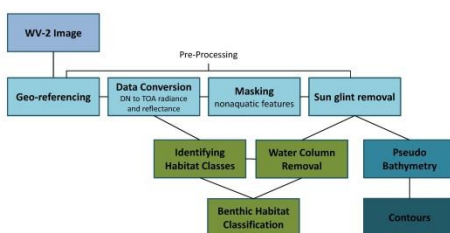
Region	# Processed Imagery	Pseudo Bathymetry	Benthic Habitat	Benthic Habitat Classes							
				Hard	Soft	Mangrove	Seagrass	Intertidal	Rocks *	Lagoon	
Atauro Island	3	15.5	20.52	7.06	3.57	0.06	2.39				
Oecusse District	6	19	29.4	3.84	6.77		1.99				
North Timor Leste	22	83.8	323.1	34.78	16.18	2.68	16.61	3.28	0.53	2.26	
South Timor Leste	57	152.6	152.6	13.4	14.7	0.11	2.79				
Total	62	118.3	525.62	59.08	41.22	2.85	23.78	3.28	0.53	2.26	

All units in km²
 Note that the category 'Deep Sea' was included in the total number of 'Benthic Habitat', but is not listed in the table because of its indefinite boundaries.
 * Rocks above water



Goals: provide complete satellite imagery, bathymetry, and benthic habitat coverage for Timor-Leste

Method Overview



Data Products

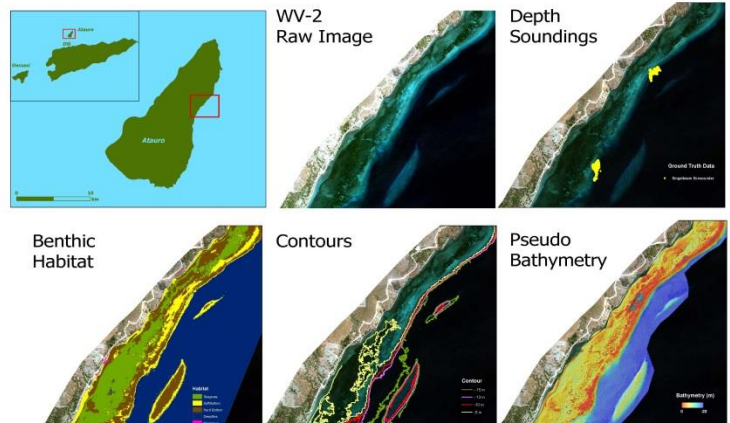


Figure 110. Satellite mapping poster presented at the 13th International Coral Reef Symposium, June 19-24, 2016, Honolulu, HI.