New Guinea

Overview

New Guinea is located in the western Equatorial Pacific Ocean. The Island is immediately north of Queensland Australia and adjacent to the Bismark Archipelago. (Figure 1). The region is influenced by the warm South Equatorial Countercurrent.

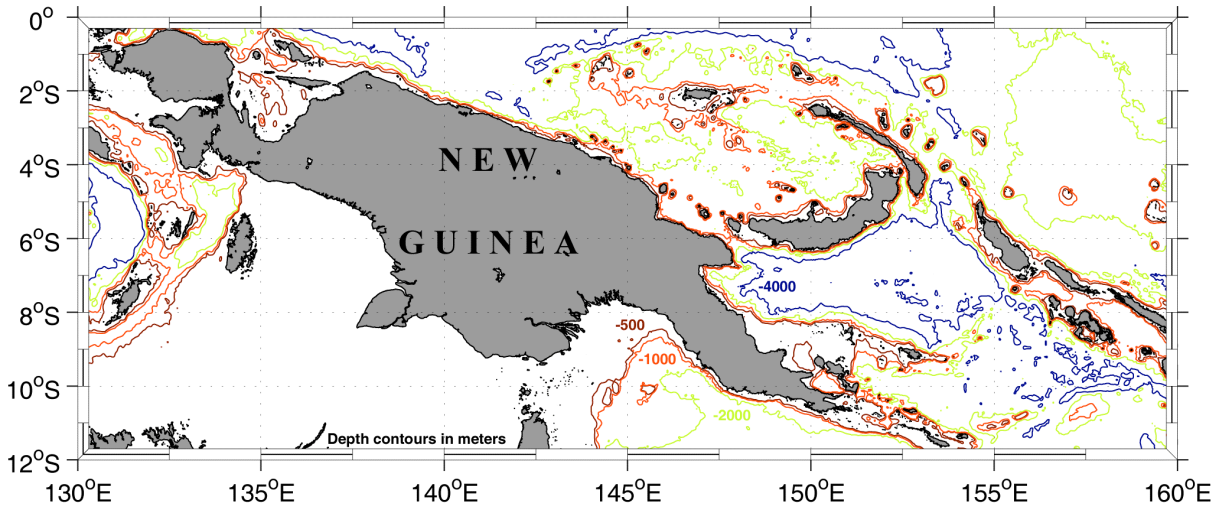


Figure 1. Bathymetry of the area surrounding New Guinea [Smith and Sandwell, 1997]

Observations

There has been some scientific investigation on internal waves in the equatorial Pacific Ocean near New Guinea. Pinkel et al. [1997, 1999, 2000] reports on internal wave packets observed with the spring tides of late November 1992, and early January and early February 1993 northeast of New Guinea during the TOGA COARE experiment [Webster and Lukas, 1992]. Pinkel et al. [2000] reports internal wave packets with 1-3 crests propagating northeastward at 2.4 – 2.8 m/s. The generation point of the waves was surmised to be in the Nuguria Island group (3°S, 153°E). The wave occurrences appeared in fixed phase with the semidiurnal tide and had downward displacements in excess of 60 m and peak velocities greater than 80 cm/s (Figure 2).

Satellite observations also show the presence of internal wave signatures along the southern coast of New Guinea in the Gulf of Papua (Figure 3) and along the western side of the south coast over the continental shelf in the Arafura Sea (Figure 4).

Table 1 - Months when internal waves have been observed around New Guinea
(Numbers indicate unique dates in that month when waves have been noted)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
4	6		1								1

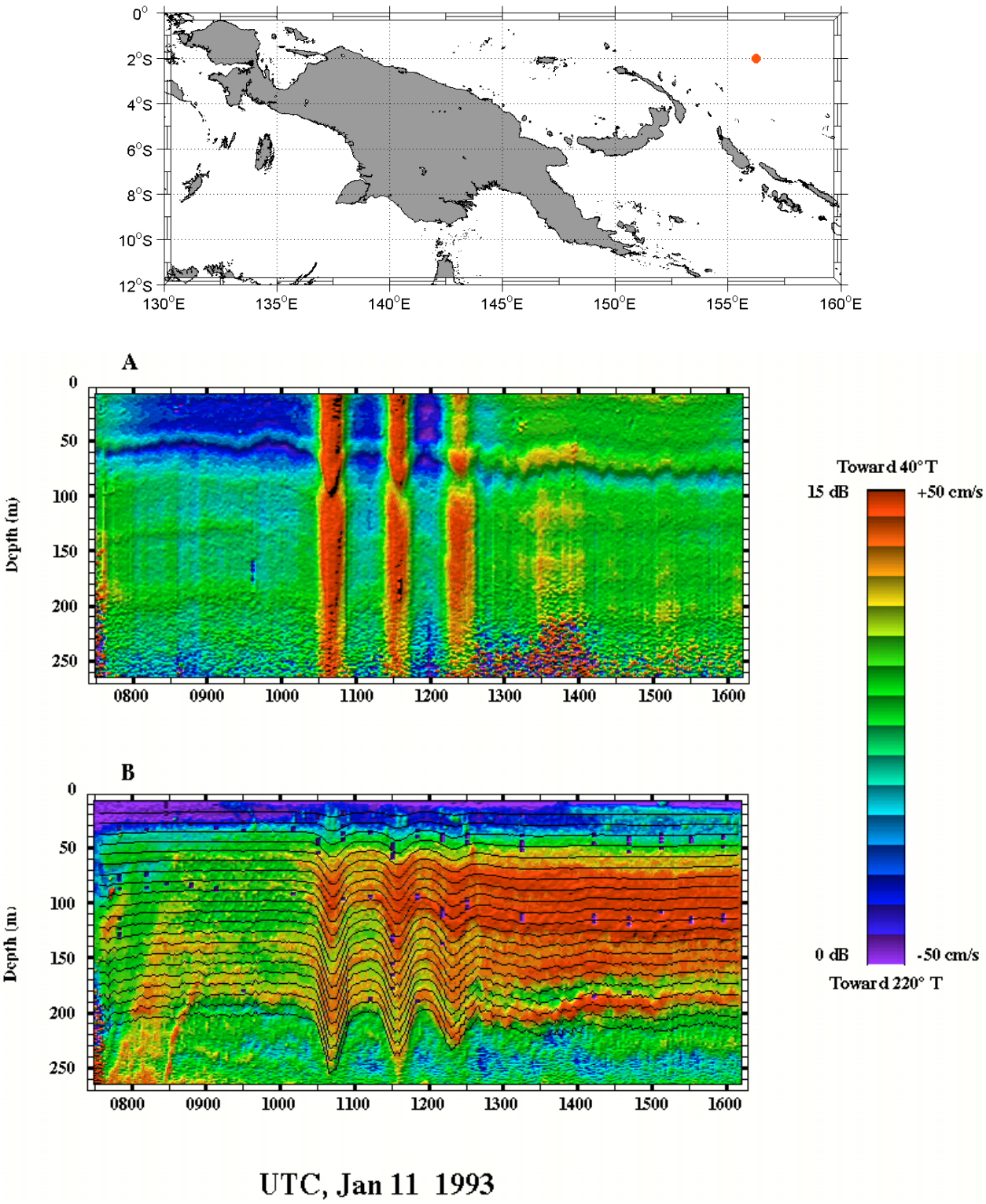
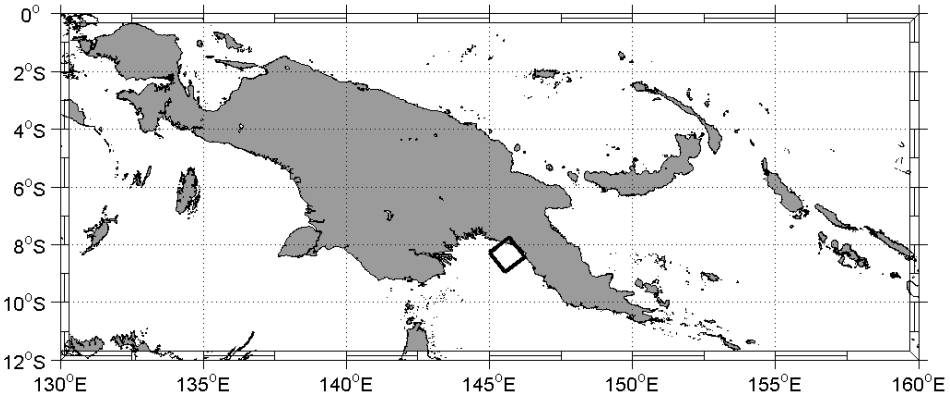


Figure 2. The passage of a soliton event on 11 January 1993 near 2.08°S, 156.30°E (over the Ontong-Java Plateau) measured during TOGA COARE. (A) The along path (40°-240°) component of absolute ocean velocity. (B) The acoustic scattering strength at 161 KHz. Colors represent a variation on a logarithmic scale over a factor of 30 with calculated flow streams shown in black. Three solitons are visible. [After Pinkel 1999, 2000]



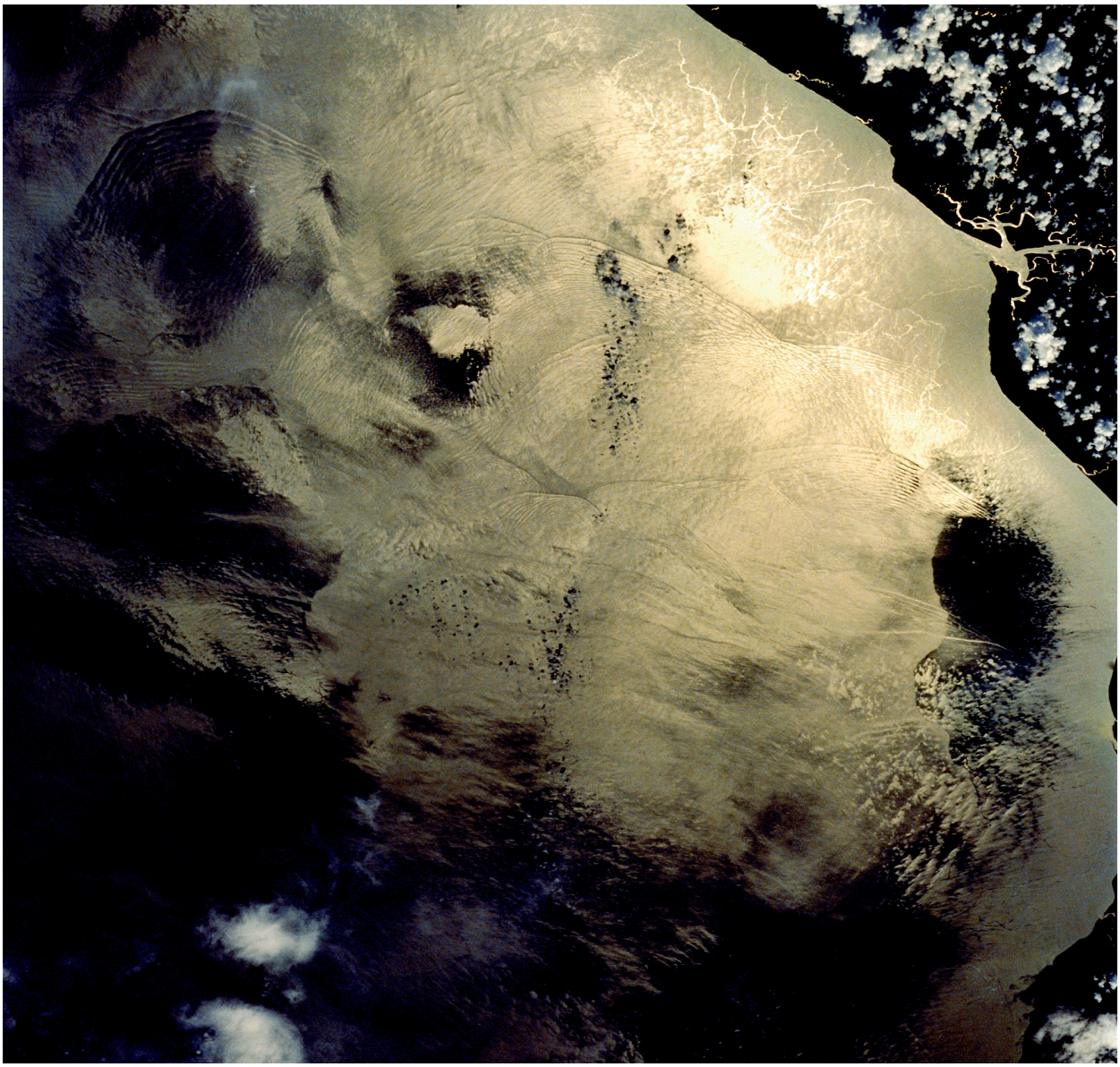


Figure 3. Astronaut Photograph (STS61B-37-79) acquired on 1 December 1985 at 0026 UTC. The image shows internal wave activity in the Gulf of Papua. Imaged area is approximately 130 km x 130 km [Image courtesy of Earth Sciences and Image Analysis Laboratory, NASA Johnson Space Center (http://eol.jsc.nasa.gov)]

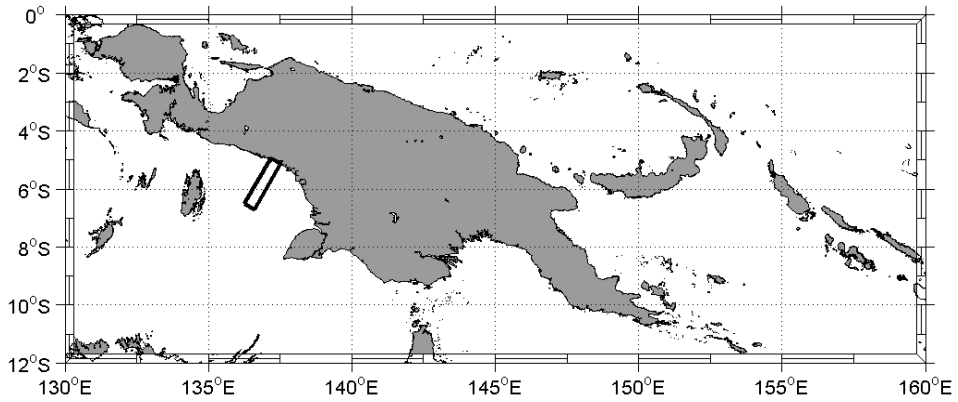
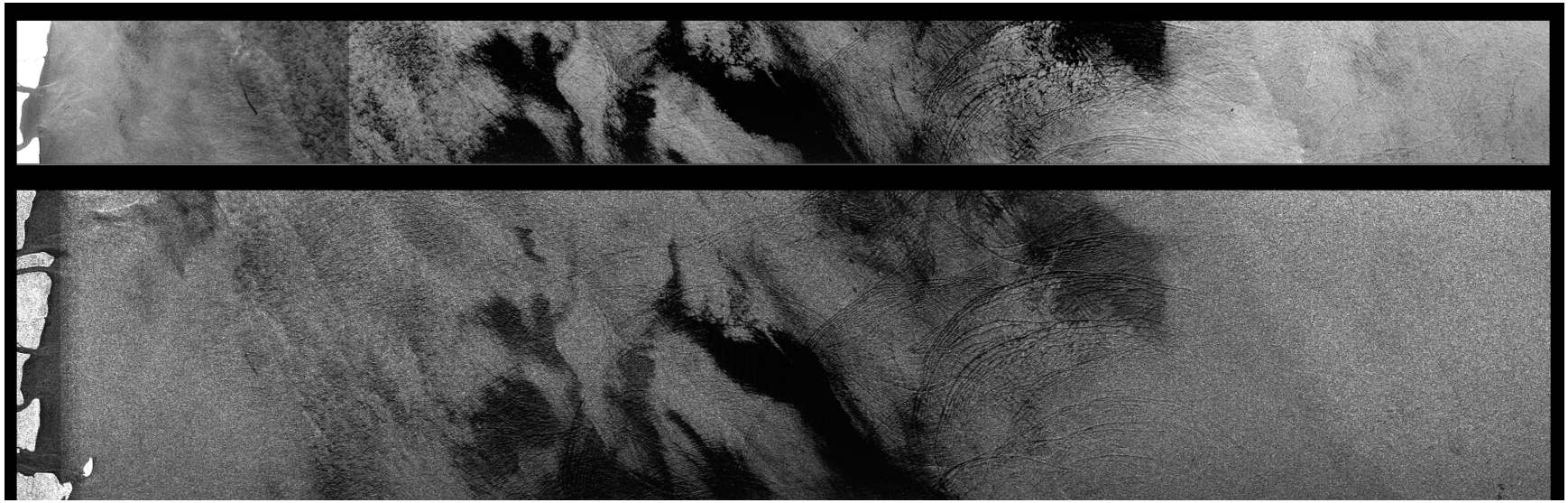


Figure 4. SIR-C/X-SAR imagery over southwest New Guinea in the Arafura Sea acquired on 7 October 1994 at 1619 UTC (DT117.62). The image shows a complex internal wave field propagating east toward the coast. Dark areas are regions of low surface roughness. The SIR-C (C-Band) survey image is at bottom, the X-SAR (X-Band) survey image at top. SIR-C imaged area is 200 km x 42.4 km.



References

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