

## North Brazil Shelf

### Overview

The North Brazil Shelf extends from Venezuela (10°N, 60°W) to the eastern edge of Brazil (5°S, 35°W). The area contains a continental shelf reaching up to 200 km in width and is influenced by the North Brazil Current. In addition to internal wave activity, the region experiences macrotides, upwellings along the shelf edge and outflow of Amazon River [LME 2004].

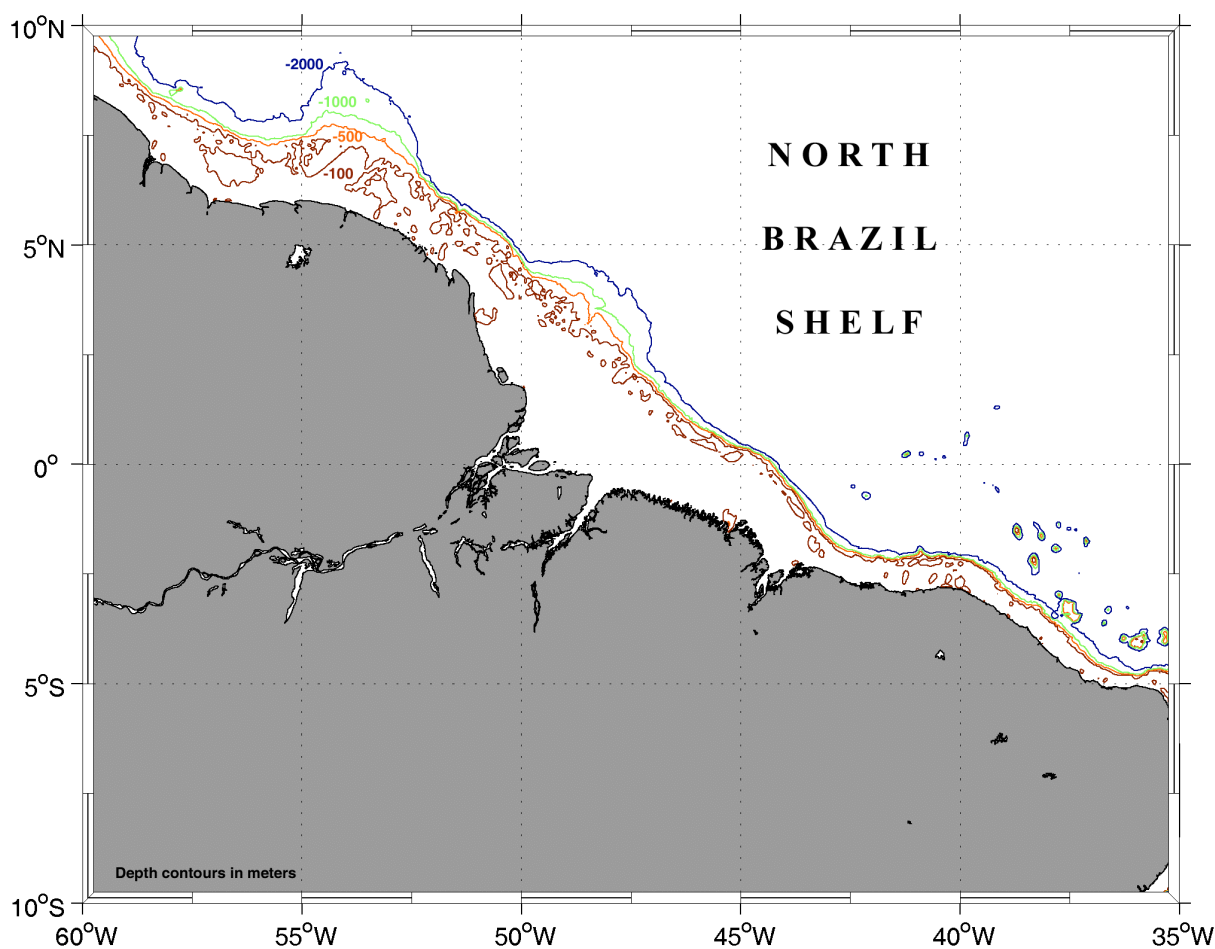


Figure 1. Bathymetry of the North Brazil Shelf. [Smith and Sandwell, 1997]

## Observations

There has been very little scientific research on the internal waves on the Northeast coast of Brazil. Satellite imagery shows both seaward and shoreward propagating waves packets. The number and geographic distribution of packets indicated a number of source locations along the shelf. Both the seaward and shoreward waves are very fine scale with no more than 250 to 500 meter separation between individual solitons. Packet separations are roughly 45 km for the shoreward waves (~1.0 m/s speed) and 24 to 30 km for seaward waves (0.5 to 0.65 m/s speed).

Table 1 shows the months of the year during when internal waves have been observed.

Table 1 - Months when internal waves have been observed on the North Brazil Shelf.  
 (Numbers indicate unique dates in that month when waves have been noted)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
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## References

Large Marine Ecosystems of the World: LME #17: North Brazil Shelf; January 2004

<http://na.nefsc.noaa.gov/lme/text/lme17.htm>

Smith, W. H. F., and D. T. Sandwell, 1997; Global seafloor topography from satellite altimetry and ship depth soundings, *Science*, v. **277**, 1957-1962

[http://topex.ucsd.edu/marine\\_topo/mar\\_topo.html](http://topex.ucsd.edu/marine_topo/mar_topo.html)

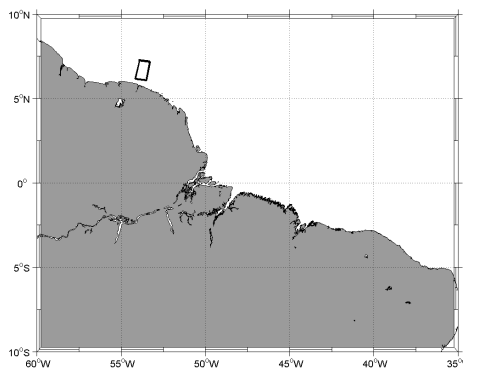
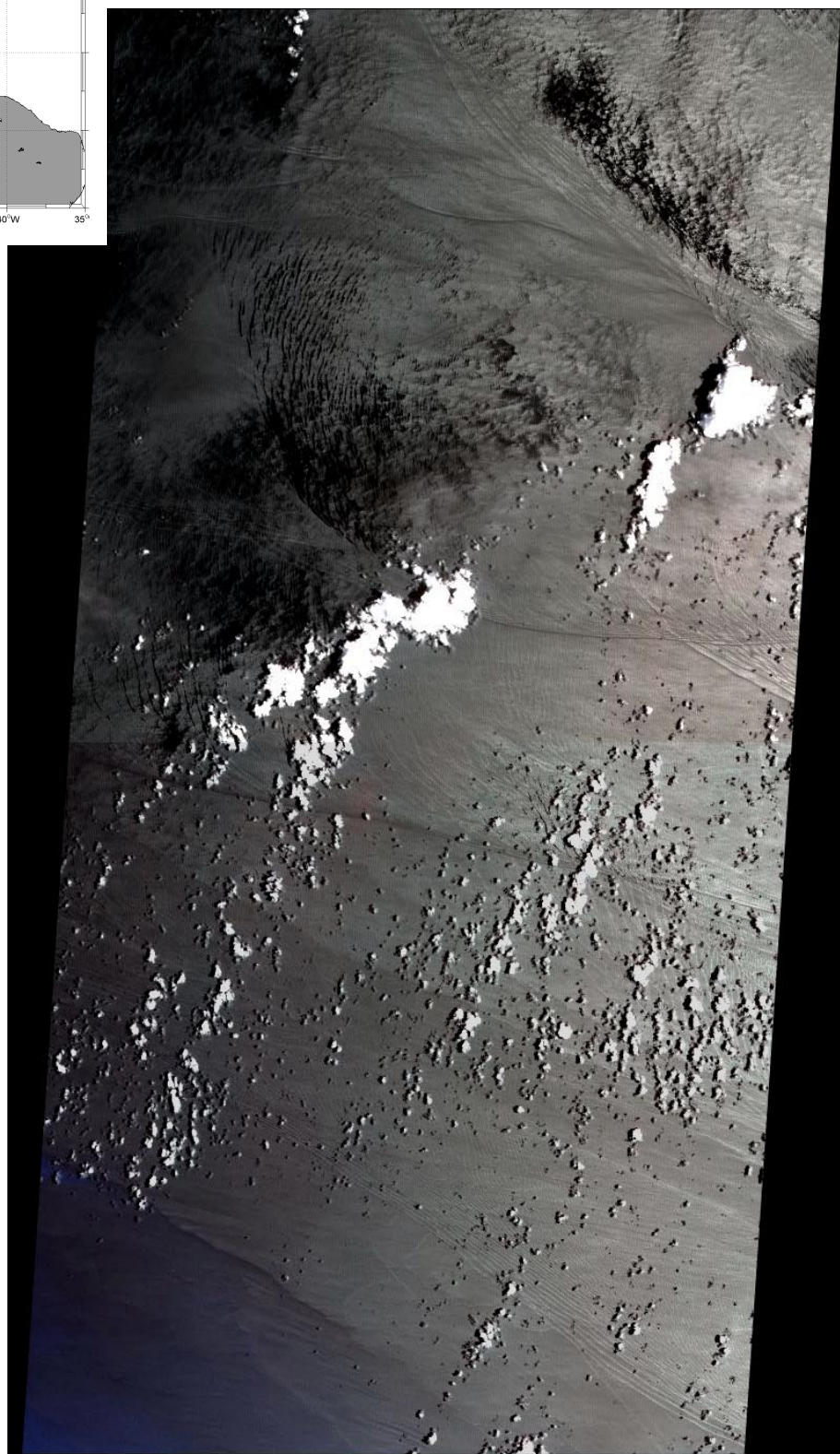


Figure 2. ASTER false color VNIR image over the North Brazil Shelf acquired on 20 September 2000 at 1424 UTC. The image shows a number of internal wave signatures of shoreward propagating packets. Current signatures and atmospheric mottling are also visible. Imaged area is 60 km x 120 km.





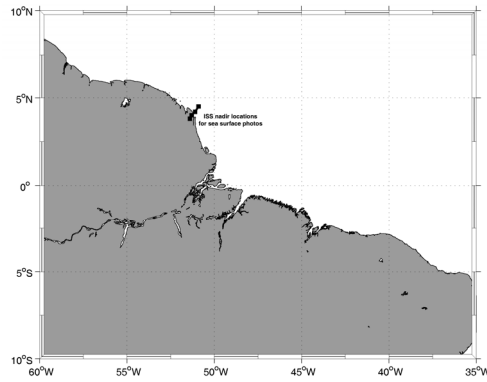
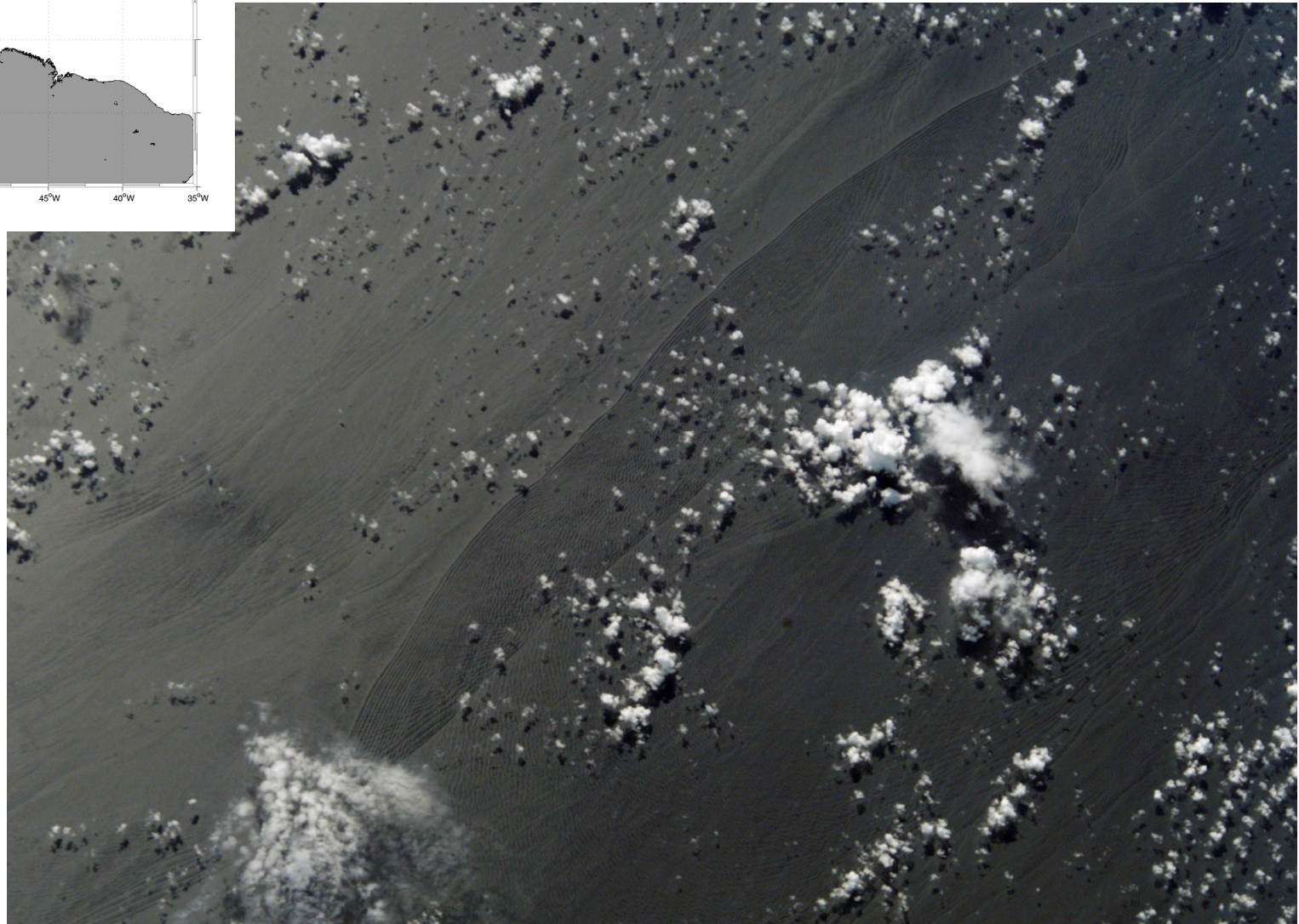


Figure 3. Astronaut photograph (ISS005-E-5322) acquired on 18 June 2002 at 1256 UTC. The image shows internal wave surface signatures similar to those observed in SIR-C SAR image (Figure 4). Orientation and image size unknown. [Image courtesy of Earth Sciences and Image Analysis, NASA-Johnson Space Center (<http://eol.jsc.nasa.gov>)]





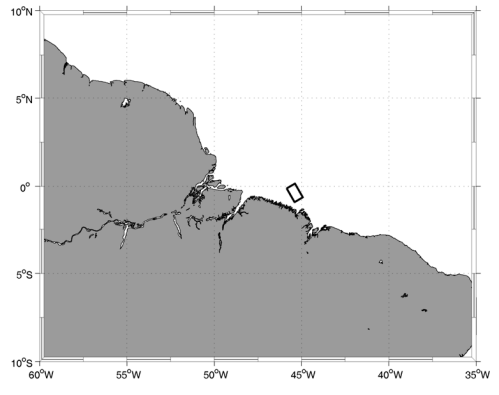
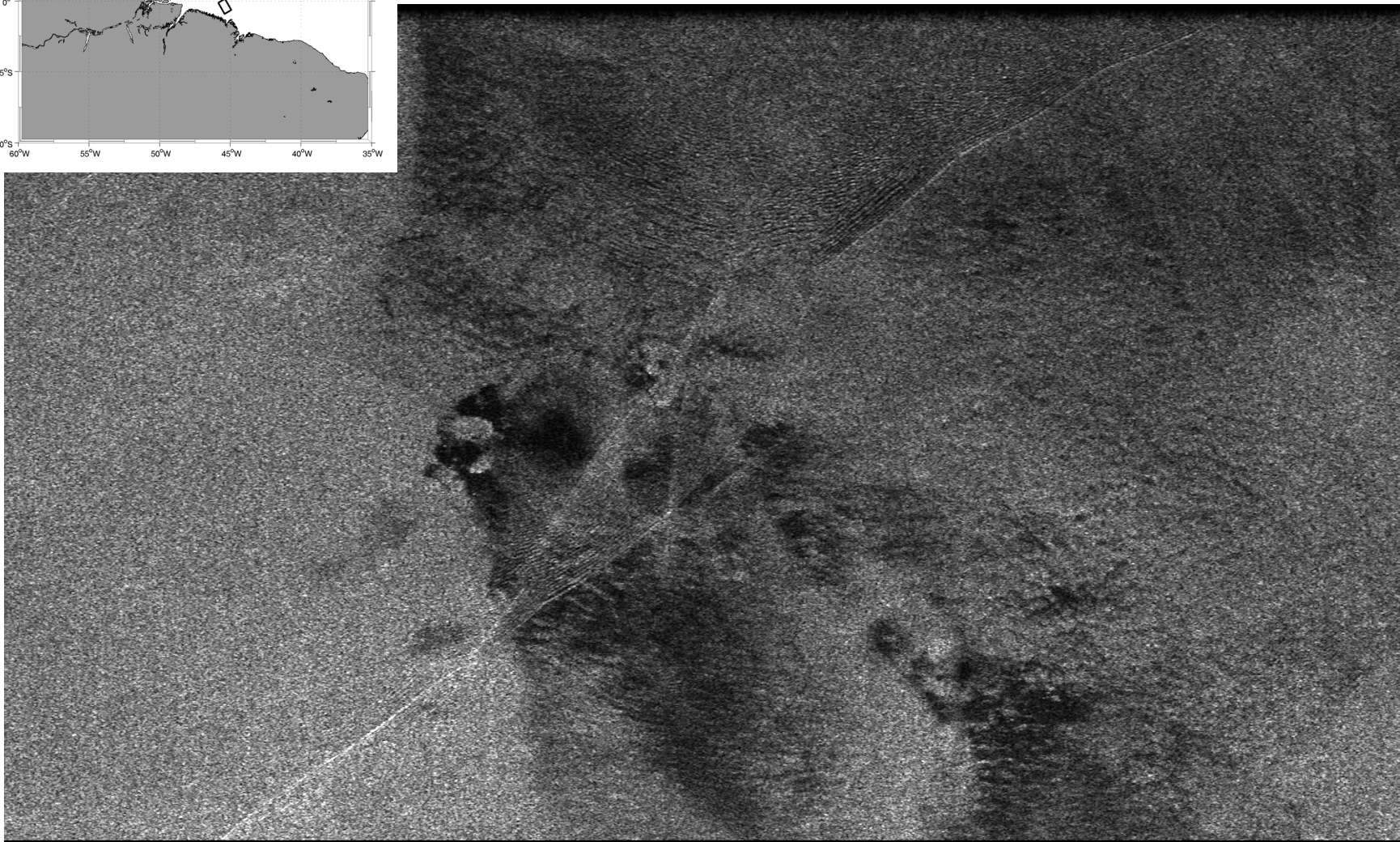


Figure 4. SIR-C SAR Survey image acquired on 15 April 1994 at 1715 UTC (DT102.5 Segment 2). The image shows the signature of internal waves on the North Brazil Shelf propagating shoreward. Imaged area is 100 km x 61 km.





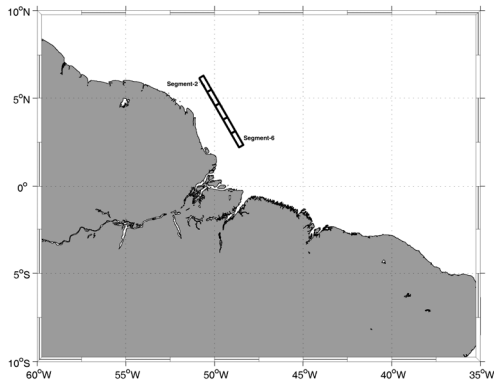
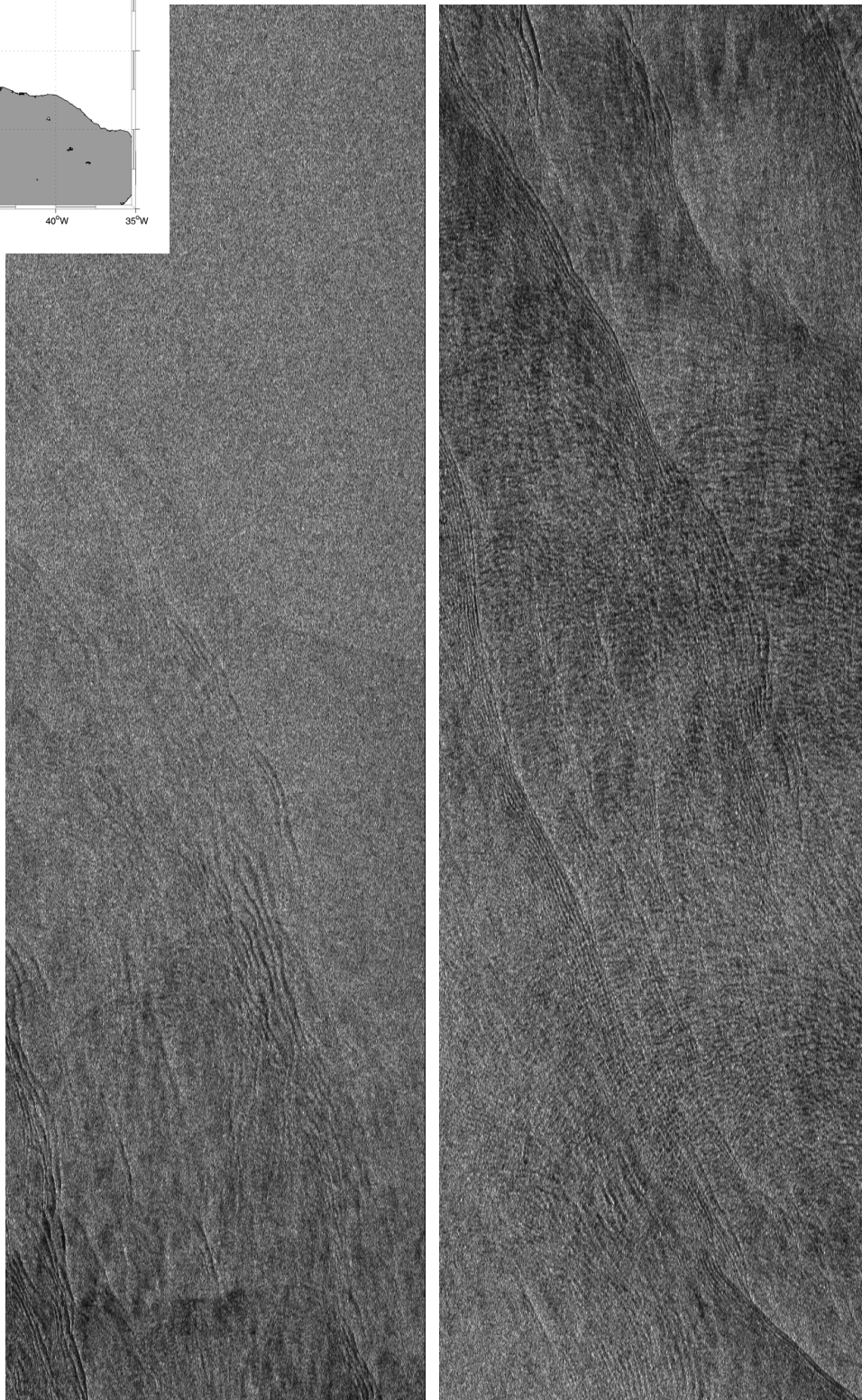


Figure 5. SIR-C SAR Survey images acquired on 7 October 1994 at 1705 UTC (DT118.5, Segments 2, 3). The image shows the signature of fine scale internal waves on the North Brazil Shelf propagating seaward. Each imaged area is 100 km x 31.2 km.





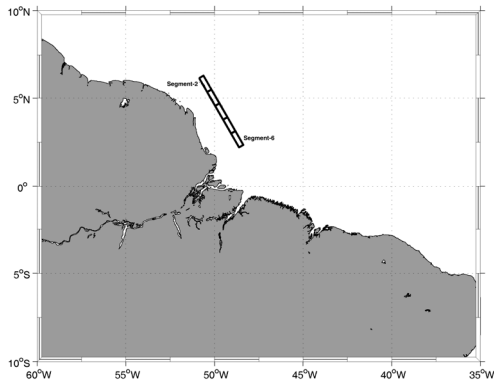
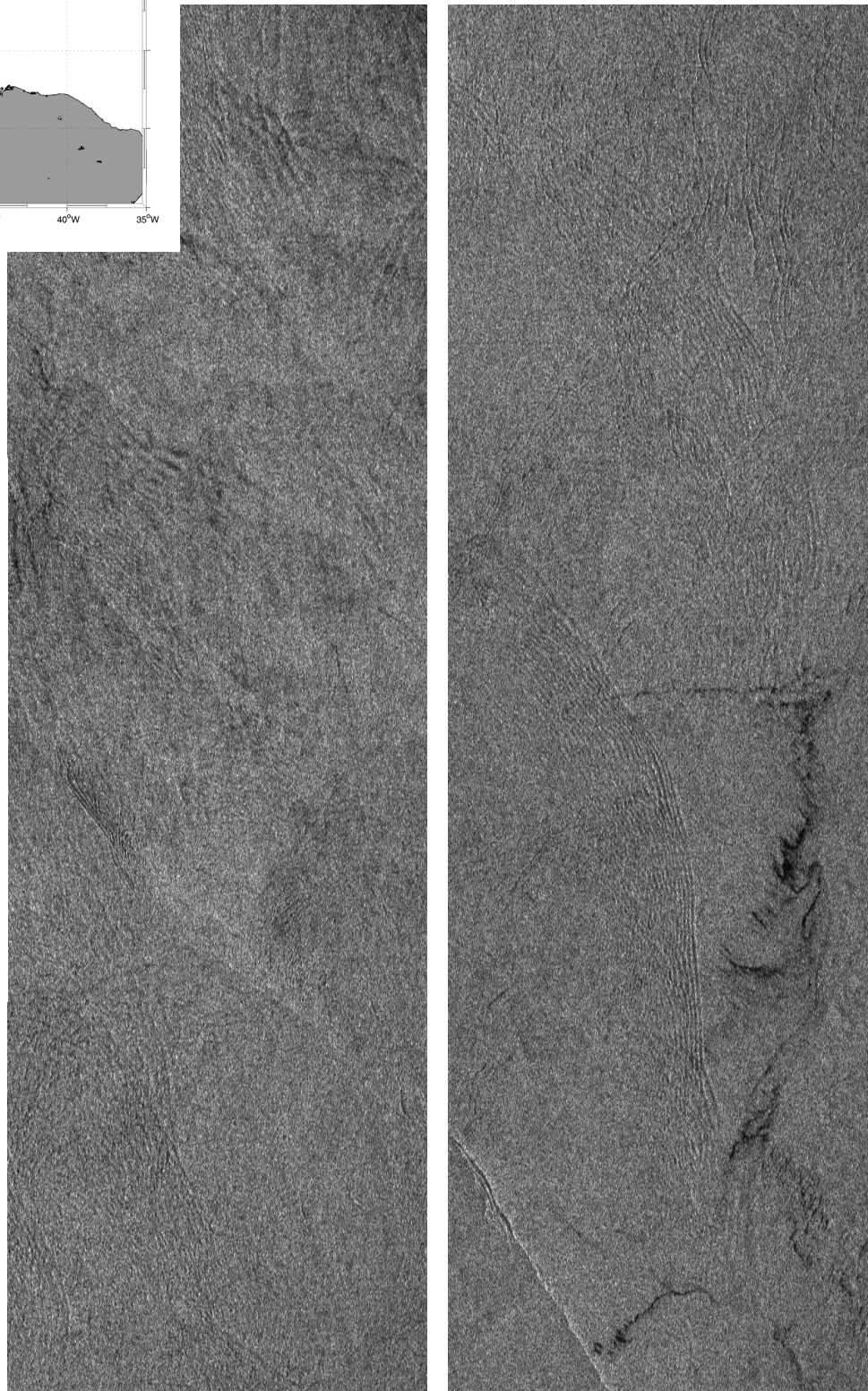


Figure 6. SIR-C SAR Survey images acquired on 7 October 1994 at 1705 UTC (DT118.5, Segments 4, 5). The image shows the signature of fine scale internal waves on the North Brazil Shelf propagating seaward. Each imaged area is 100 km x 31.2 km.



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