

## Southeast Africa

### Overview

Southeast Africa extends northward from the east coast of South Africa ( $34^{\circ}\text{S}$ ,  $28^{\circ}\text{E}$ ) up along the Mozambique coast bordering the Mozambique Channel ( $18^{\circ}\text{S}$ ,  $36^{\circ}\text{E}$ ) (Figure 1). A significant continental shelf exists in the areas around Maputo Bay and Bight of Sofala. The region is influenced by the flow of the warm Agulhas current.

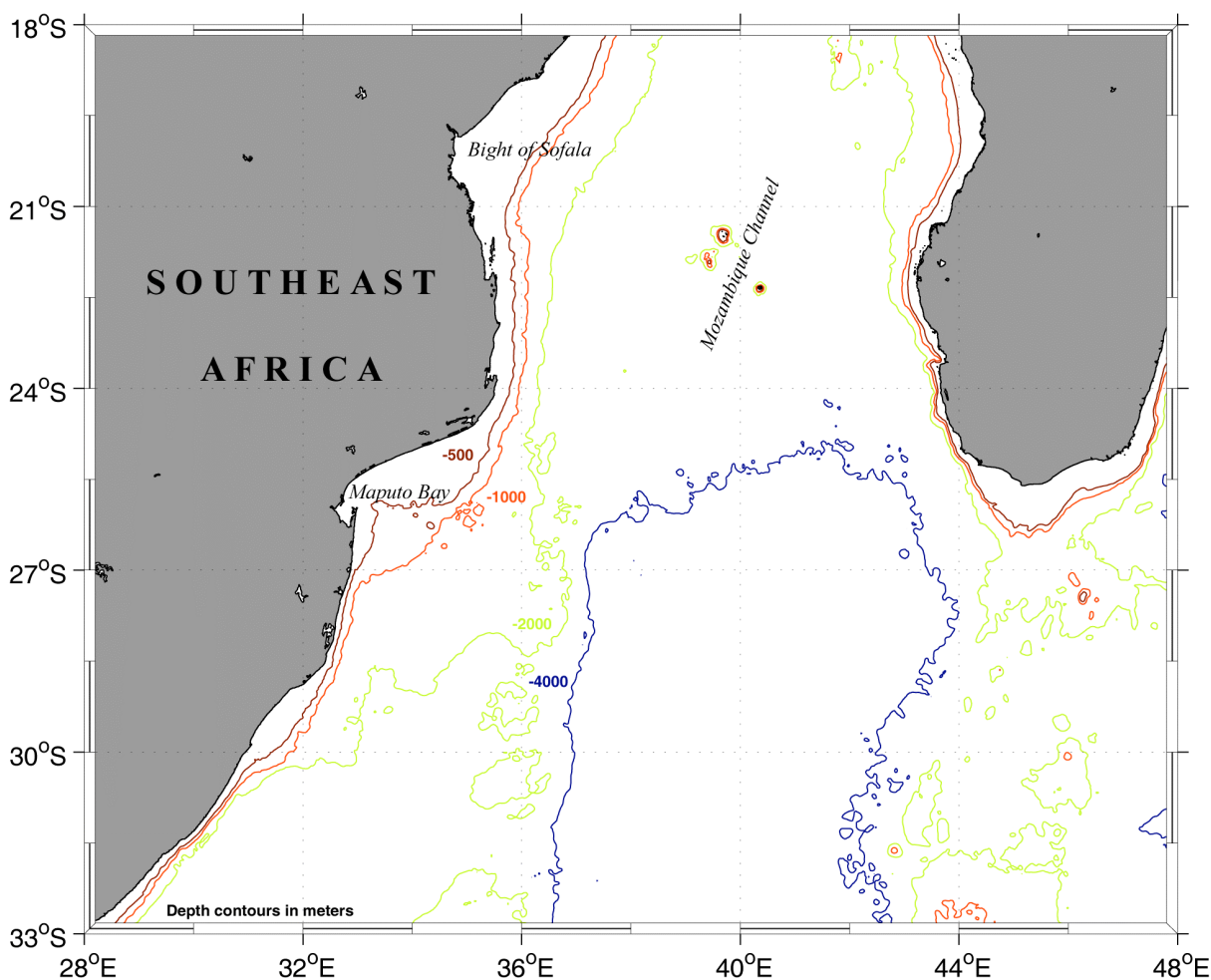


Figure 1. Bathymetry of Southeast Africa [Smith and Sandwell, 1997]

### Observations

There has been some scientific research on internal wave occurrences along Southeast Africa. Preliminary work using satellite imagery by da Silva shows wave occurrences around Maputo Bay (Figures 3 and 4). The shoreward propagating waves were aligned roughly parallel with the eastern edge of the shelf. The wavelength of the leading soliton is on the order

of 1.5 to 2.0 km, with a packet separation of 35 to 40 km. Assuming semi-diurnal generation, this yields a propagation speed of 0.75 to 1.0 m/s. These values are all consistent with continental shelf generated internal waves observed elsewhere in the world.

Figure 2 shows an internal wave signature propagating in the along shore direction along with strong current signatures. This suggests that the Agulhas flow have some effect on wave generation in the area. Table 1 shows the months of the year when internal wave observations have been made.

Table 1 - Months when internal waves have been observed off Southeast Africa  
 (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

Smith, W. H. F., and D. T. Sandwell, Global seafloor topography from satellite altimetry and ship depth soundings, *Science*, v. 277, p. 1957-1962, 26 Sept., 1997.  
[http://topex.ucsd.edu/marine\\_topo/mar\\_topo.html](http://topex.ucsd.edu/marine_topo/mar_topo.html)

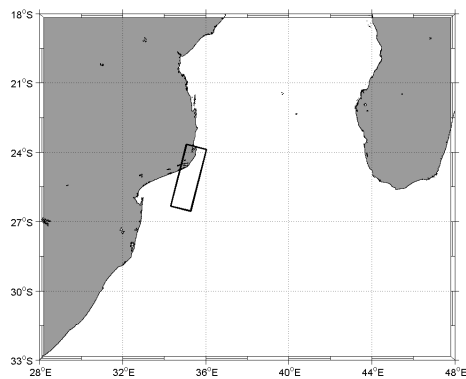
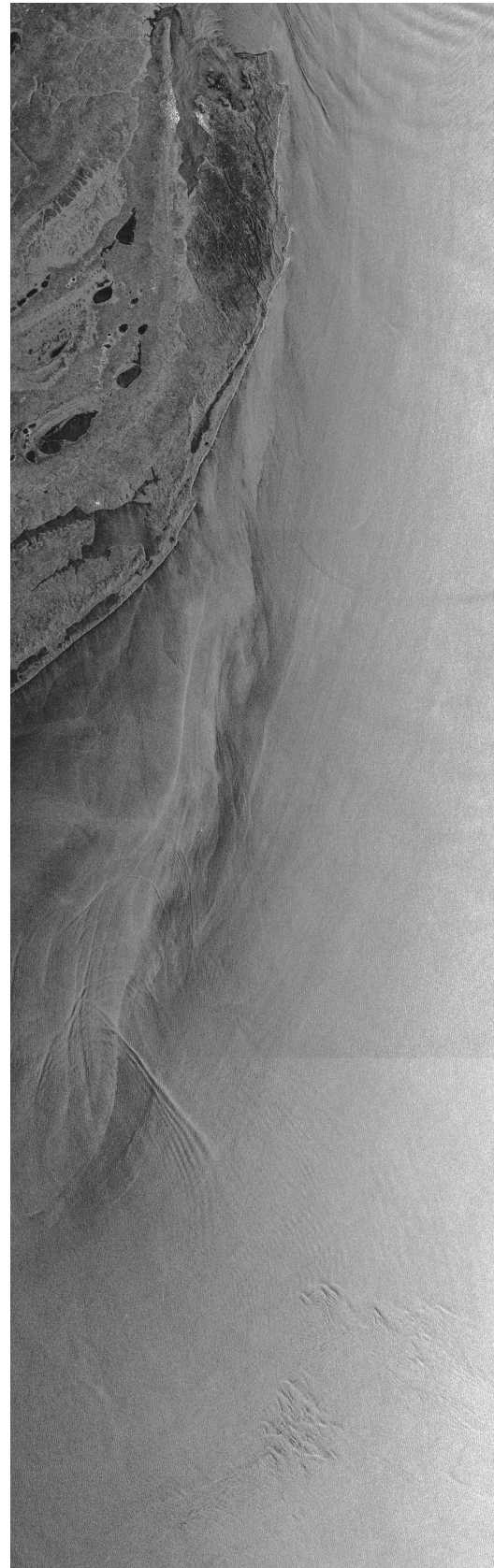


Figure 2. (Right) ERS-2 (C-band, VV) SAR images off Mozambique acquired on 7 January 2002 at 0739 UTC (orbit 35116, frames 4095, 4113, 4131). The image shows the signature of internal waves propagating to the northeast along with current signatures. Imaged area is 100 km x 300 km. ©ESA 2002. (Below) An enlargement showing the internal wave signature. Imaged area roughly 43 km x 70 km. [Image José da Silva Instituto de Oceanografia, Lisbon, Portugal]





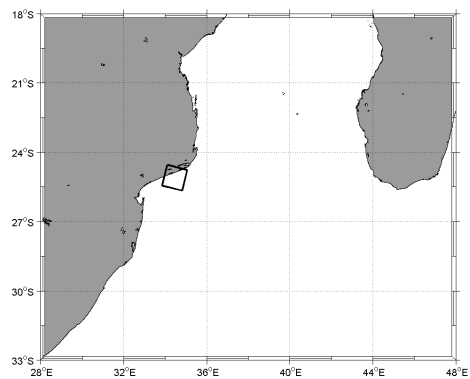


Figure 3. ERS-2 (C-band, VV) SAR images off Mozambique acquired on 13 January 1996 at 0744 UTC (orbit 3825, frame 3825). The image shows two internal waves propagating toward the coast. Interpacket separation is approximately 41 km. Imaged area is 100 km x 100 km. ©ESA 1996. [Image courtesy José da Silva Instituto de Oceanografia, Lisbon, Portugal]



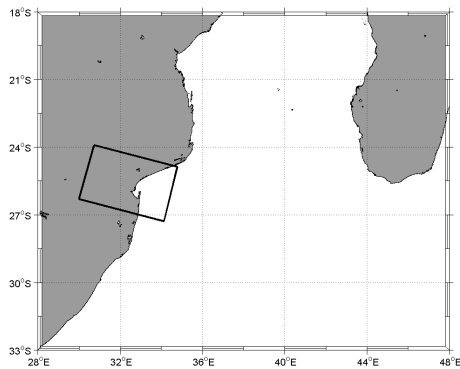
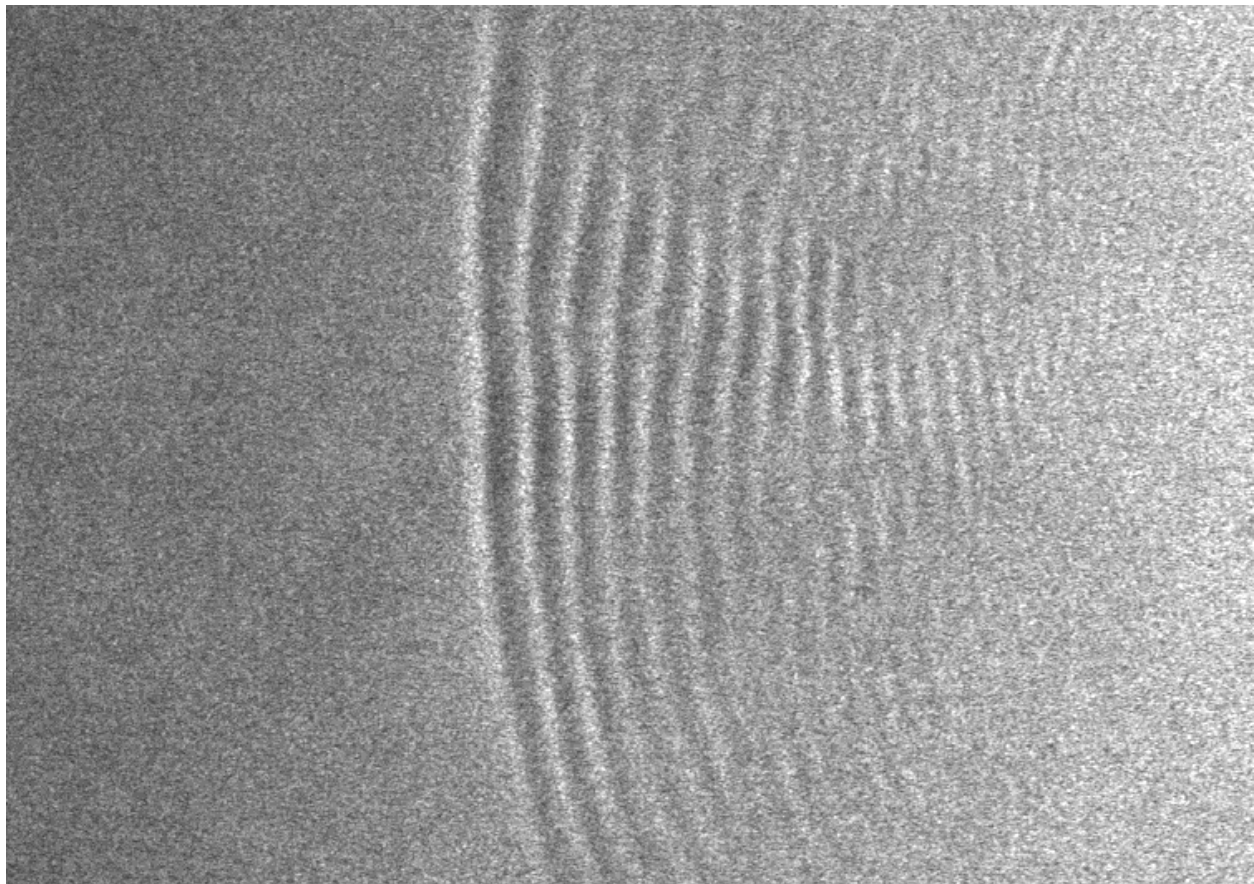


Figure 4 (Right) ENVISAT Wide Swath ASAR (C-band, VV) browse image of the Bay of Maputo acquired on 6 March 2003 at 0717 UTC (orbit 5299, frame 4140). The image shows two internal waves propagating shoreward. Imaged area is approximately 260 km x 260 km. ©ESA 2003. (Below) An enlargement showing the eastern most packet. Imaged area is approximately 56 km x 40 km. [Image courtesy of José da Silva Instituto de Oceanografia, Lisbon, Portugal]



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