Southeast United States

Overview

The Southeast United States coast extends approximately 1500 km along the Atlantic Ocean from the Straits of Florida to Cape Hatteras, North Carolina (Figure 1). The continental shelf in the region reaches up to approximately 200 km off shore and the region is strongly influenced by the Gulf Stream Current with minor upwelling occurring along the Gulf Stream front [LME 2004].

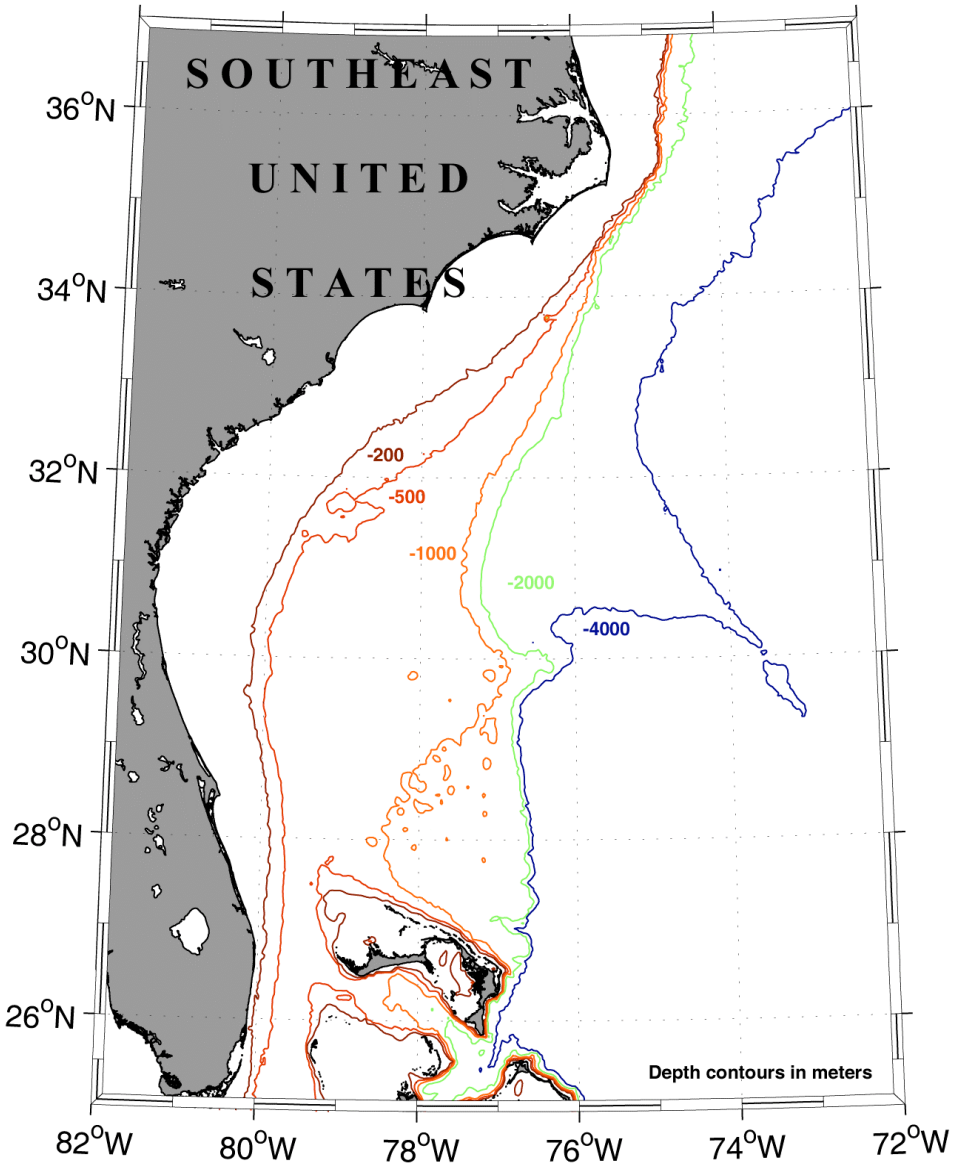


Figure 1. Bathymetry of Southeast United States [Smith and Sandwell, 1997].

Observations

There has been very little scientific study of internal waves along the Southeast United States. Fu and Holt [1982] pointed out internal waves off the Florida Coast near Cape Canaveral and in the presence of the Gulf Stream (Figure 2). The waves are located very close to shore, inside the 100 meter isobath and are very fine scale with wavelengths between 300 to 500 meters. SEASAT imagery also revealed the presence of fine scale internal waves off the outer banks of North Carolina (Figure 3).

Perhaps one of the more interesting SEASAT images was acquired near 32.5^{o}N, 73.0^{o}W over the Blake Escarp (Figure 4). The open ocean scene shows a number internal wave signatures in a complex pattern in more than 4000 meters of water away from any bathymetric variation.

Table 1 - Months when internal waves have been observed off the southeast coast of the United States.
(Numbers indicate unique dates in that month when waves have been noted)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
				1		2		1			

References

Apel, J.R., 1999, "Are Strongly Sheared Baroclinic Currents Sources for Internal Solitons?" IOS/WHOI/ONR, 1998: Internal Solitary Wave Workshop Papers. *Woods Hole Oceanographic Institution Technical Report* WHOI-99-07, Edited by T. Duda and D. Farmer. http://www.whoi.edu/science/AOPE/people/tduda/isww/text/index.html.

Fu, L.L., and B. Holt, 1982, Seasat Views Oceans and Sea Ice with Synthetic Aperture Radar, JPL Publication 81-120

Large Marine Ecosystems of the World: LME 6: Southeast U.S. Continental Shelf; January 2004, http://na.nefsc.noaa.gov/lme/text/lme6.htm

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

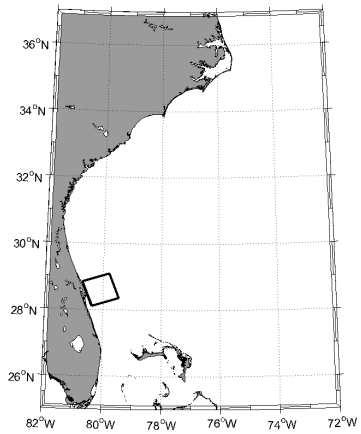
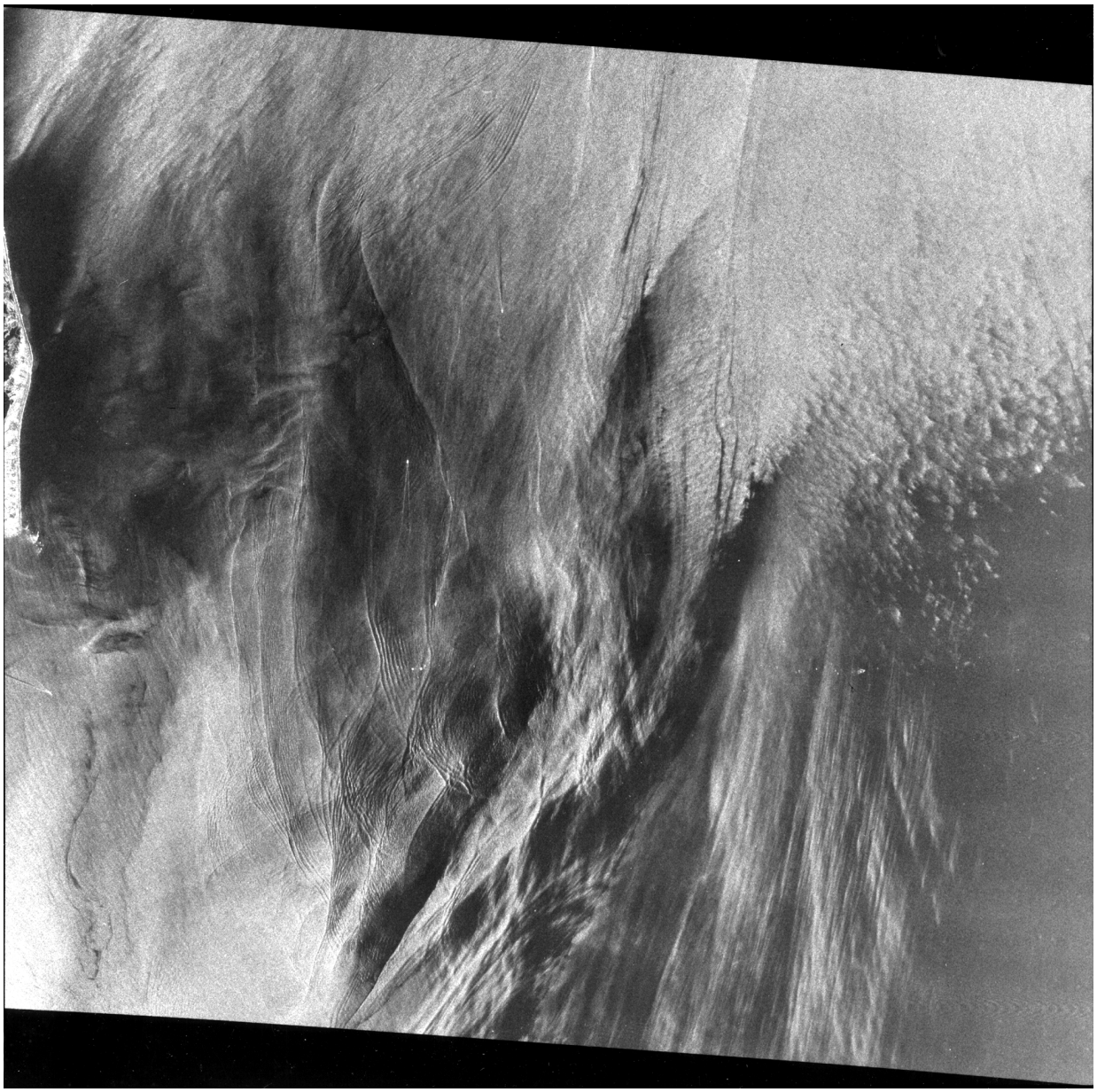


Figure 2. SEASAT (L-band, HH) SAR image of internal waves off Cape Canaveral, Florida acquired on 25 July 1978 at 1118 UTC (Rev 407). Imaged area is approximately 100 km x 100 km. [Image courtesy of NASA JPL]



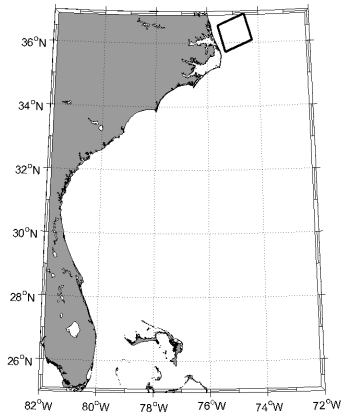
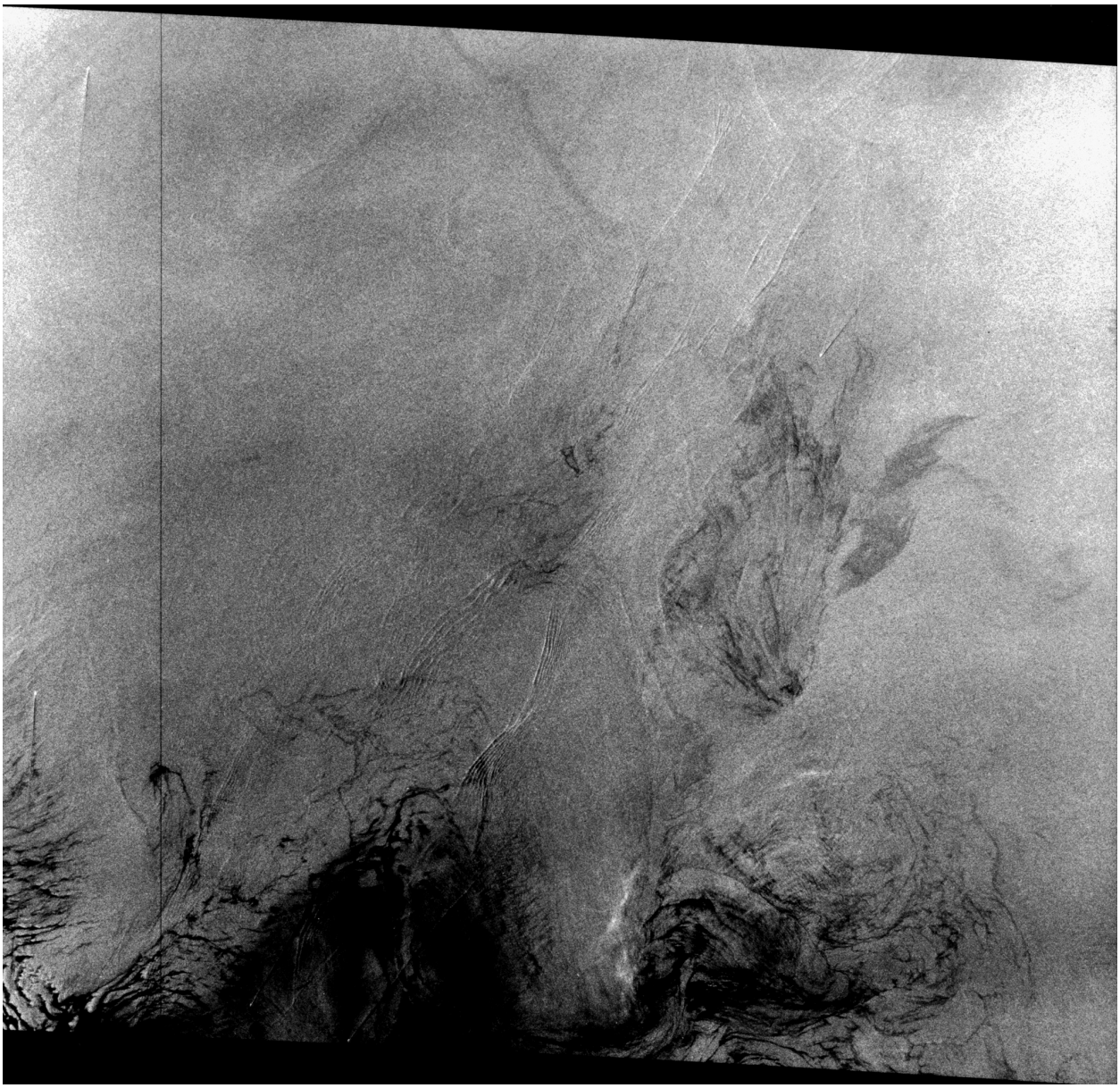


Figure 3. SEASAT (L-band, HH) SAR image of internal waves near North Carolina coast acquired on 22 September 1978 at 1455 UTC (Rev 1253). Imaged area is approximately 100 km x 100 km. [Image courtesy of NASA JPL]



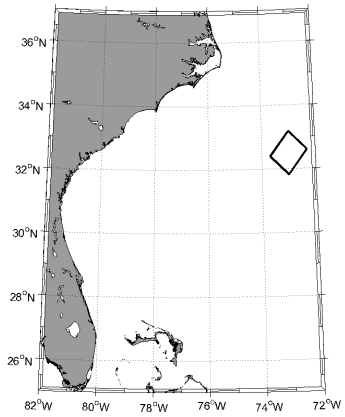
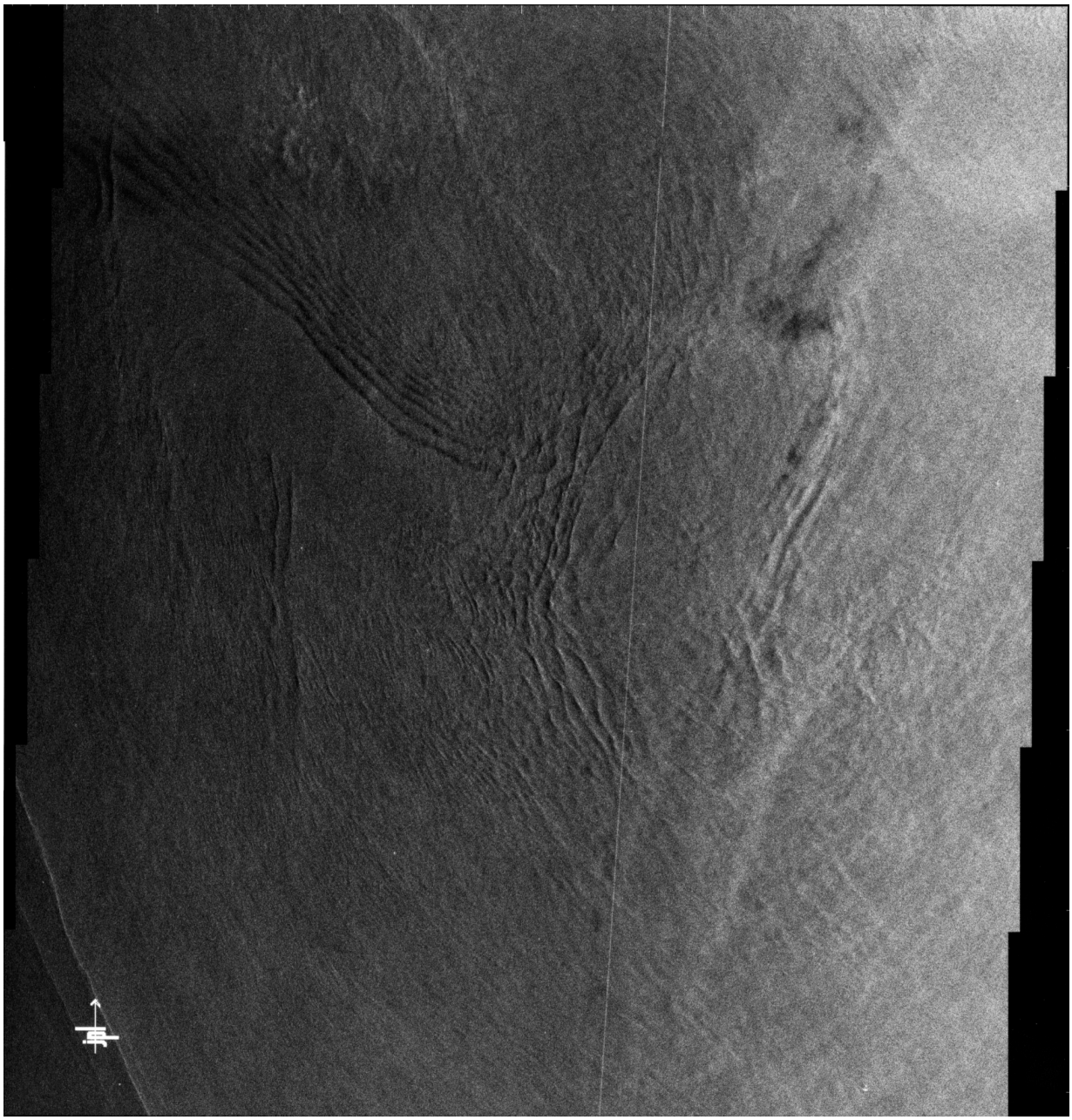


Figure 4. SEASAT (L-band, HH) SAR image of internal waves near the Blake Escarp acquired on 13 July 1978 at 2307 UTC (Rev 242). Imaged area is approximately 100 km x 100 km. [Image courtesy of NASA JPL]



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