

New Zealand

Overview

The New Zealand is located in the western South Pacific Ocean and is made up of two main islands separated by the Cook Strait. The islands are surrounded by a continental shelf that is narrowest in the northeast and southwest and widest over the northwest and southeast plateaus (Figure 1). The region is influenced by the warm South Equatorial Current [LME 2004].

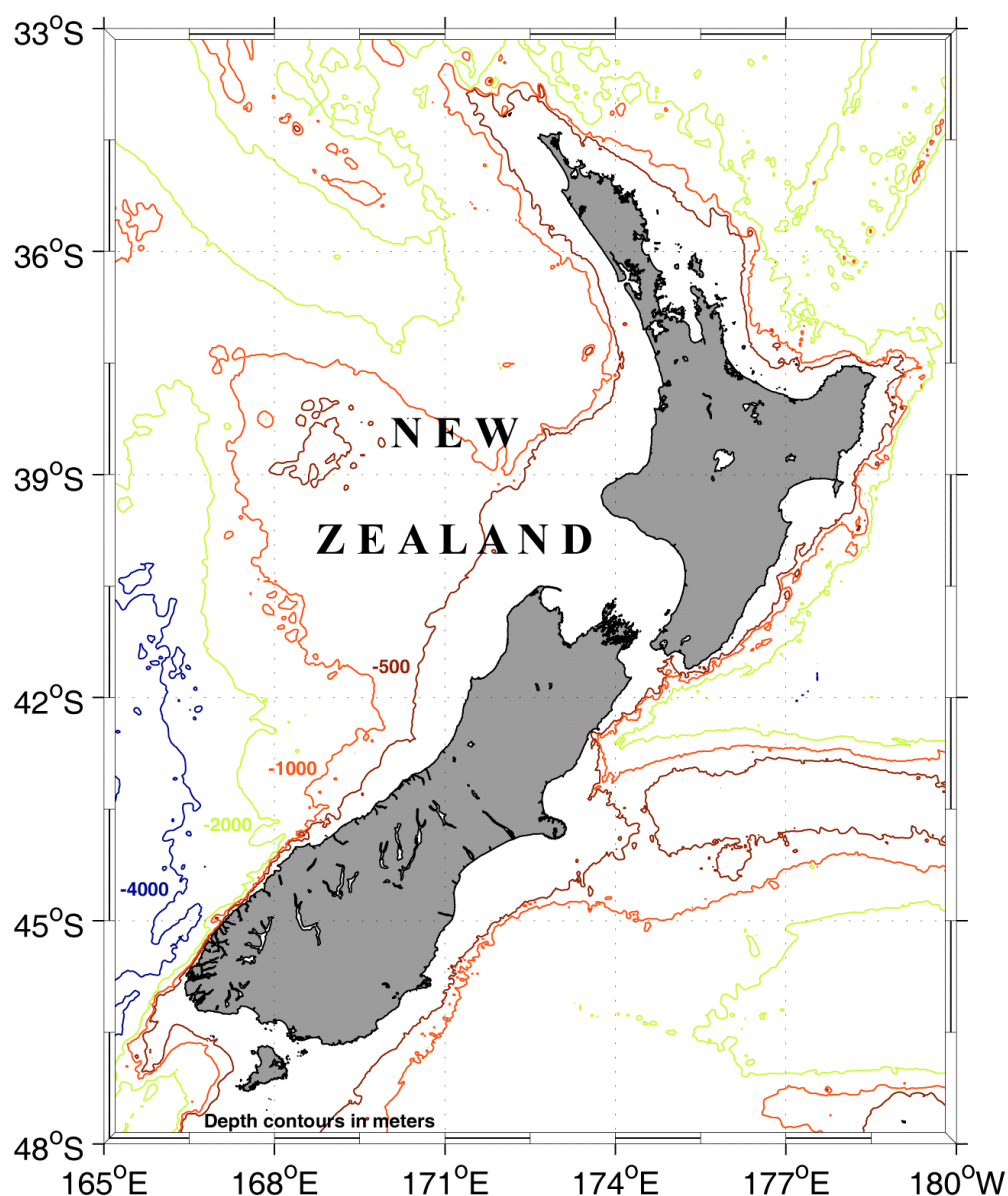


Figure 1. Bathymetry around New Zealand [Smith and Sandwell, 1997].

Observations

There has been little scientific study of internal waves around New Zealand. Sharples et al. [2001] note the presence of internal waves in SAR imagery acquired over the northeast coast (Figure 3). Thermistor and current meter measurements in the same region collected between 25 November and 8 December 1998 (Figure 4) show 60-m amplitude solitons in 100 m water depth [E. Abraham, personal communication]. Limited satellite imagery shows internal wave signatures characteristic of fine scale continental shelf waves observed elsewhere. Due to the high latitude of New Zealand, internal wave occurrences are expected to be limited to the austral summer and early autumn (November to March). Table 1 shows the months of the year when internal wave observations have been made.

Table 1 - Months when internal waves have been observed around New Zealand
 (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 | 4 |

References

- Large Marine Ecosystems of the World: LME 46: New Zealand Shelf; January 2004
<http://na.nefsc.noaa.gov/lme/text/lme46.htm>
- Sharples, J., C. M. Moore and E. R. Abraham, 2001; Internal tide dissipation, mixing, and vertical nitrate flux at the shelf edge of NE New Zealand, *J. Geophys. Res.* 106 (C7), 14069 – 14081
- 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

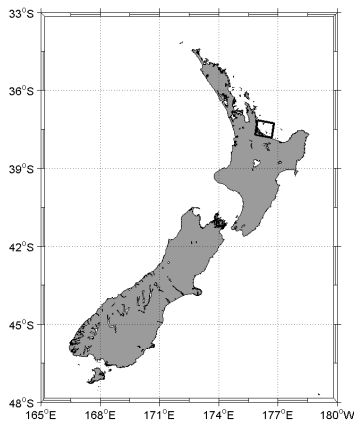
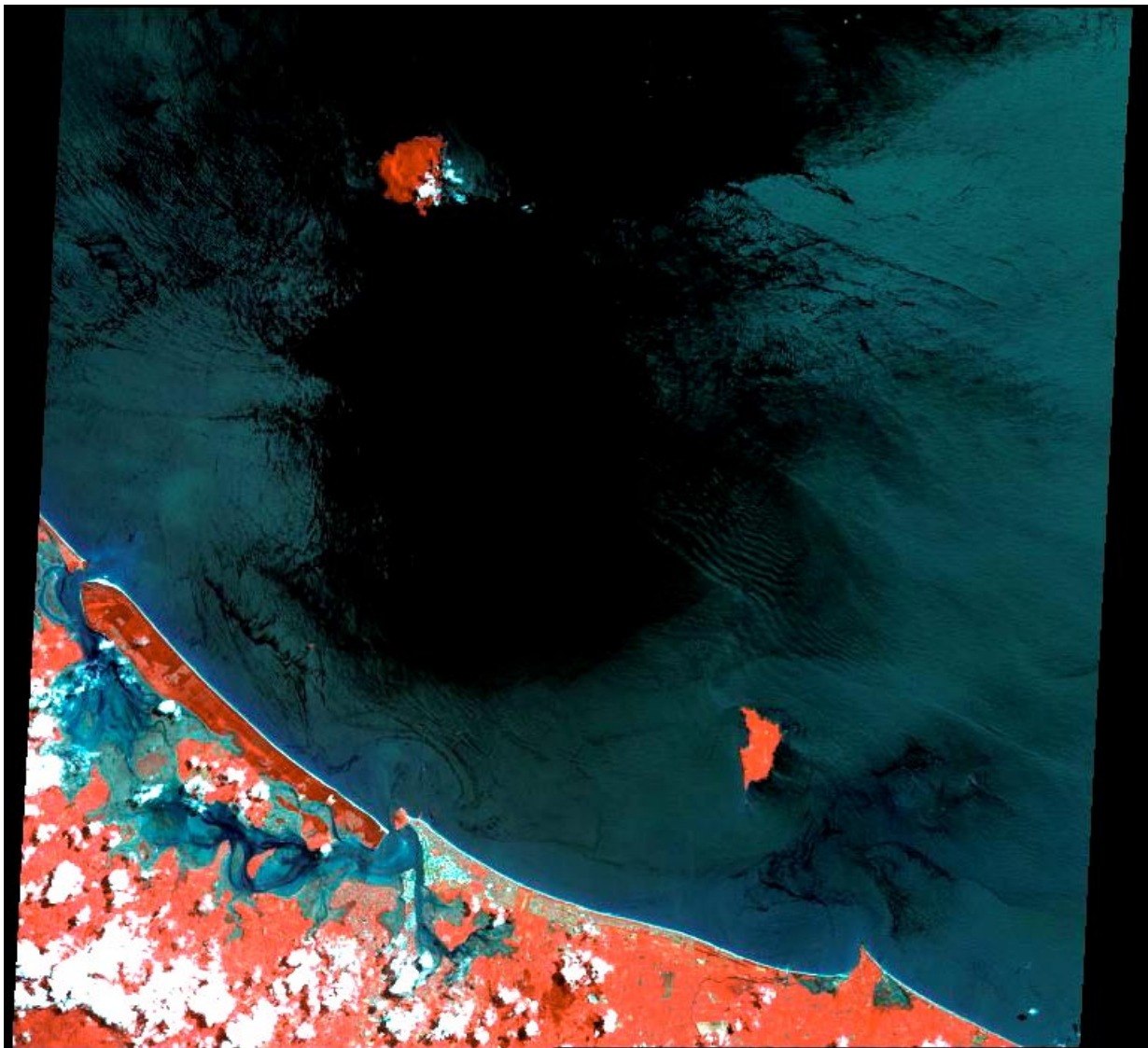


Figure 2. ASTER false-color VNIR image over the northern New Zealand acquired on 4 December 2003 at 2224 UTC. The image shows the signature of a single internal wave packet aligned parallel to shore. Imaged area is 60 km x 60 km.



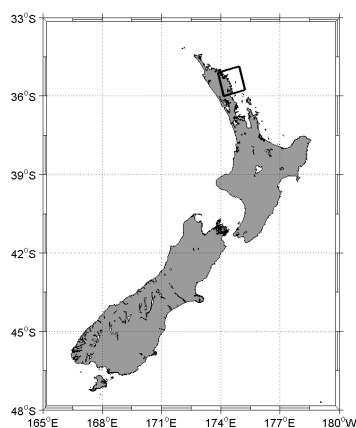
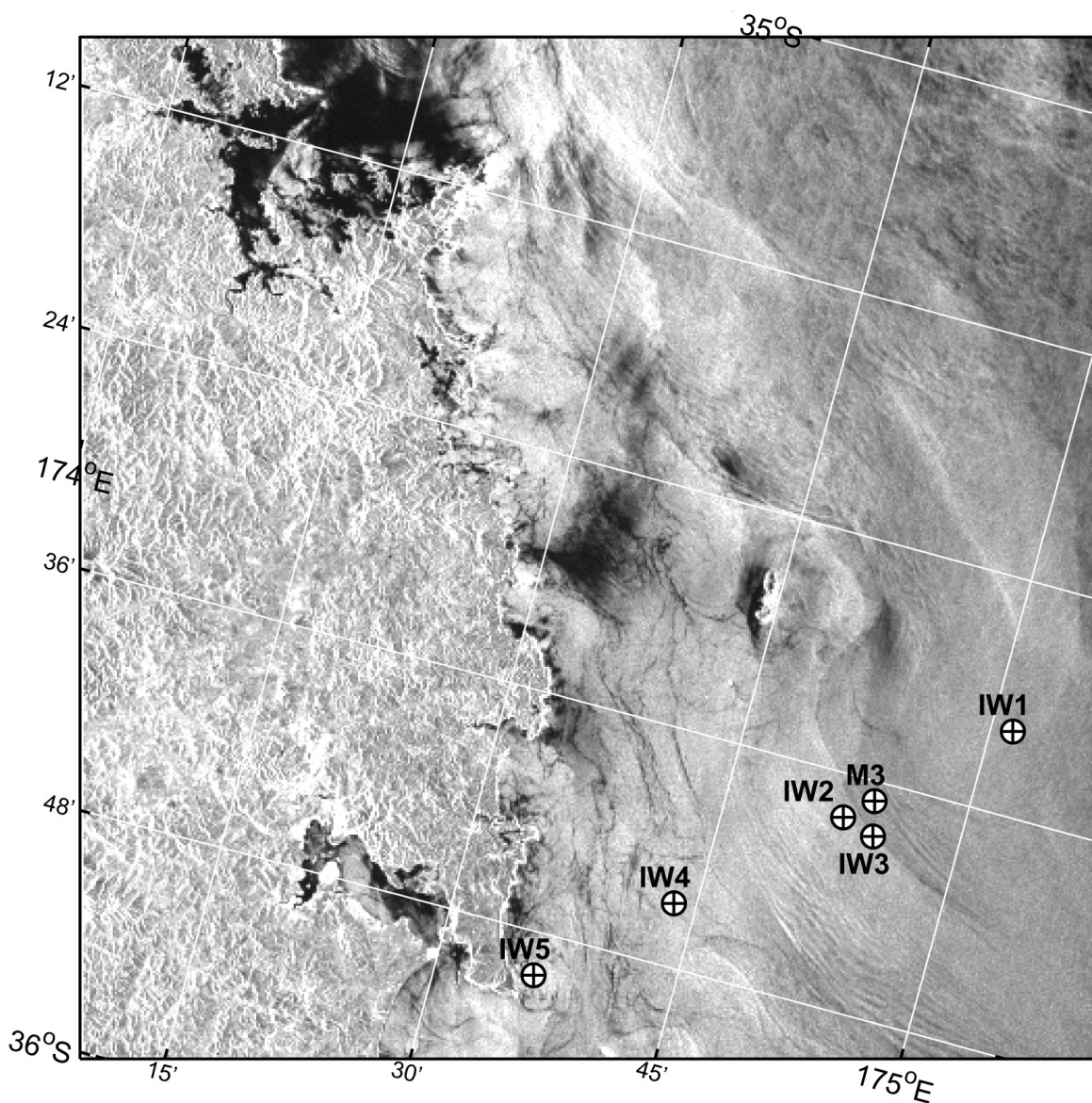


Figure 3. Section of an ERS-1 (C-band, VV) SAR image over mage over northern coast New Zealand acquired on 16 November 1995 at 1129 UTC (orbit 22684, frame 6471). Interpacket separation of the packets near the bottom is 15 km. Moorings were deployed as part of an in situ measurement program between 25 November and 8 December 1998 [Sharples et al. 2001]. Thermistor and current meter measurements by the island show 60-m amplitude solitons [E. Abraham, personal communication]. Original image ©ESA 1995. [Image courtesy of Edward Abraham, National Institute of Water and Atmospheric Research, Wellington, New Zealand]



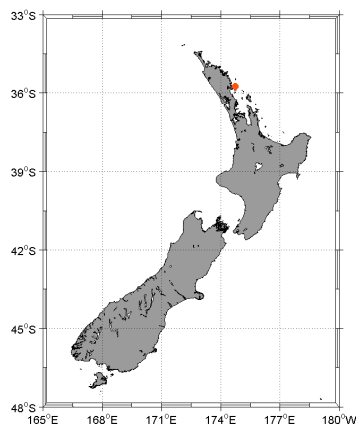
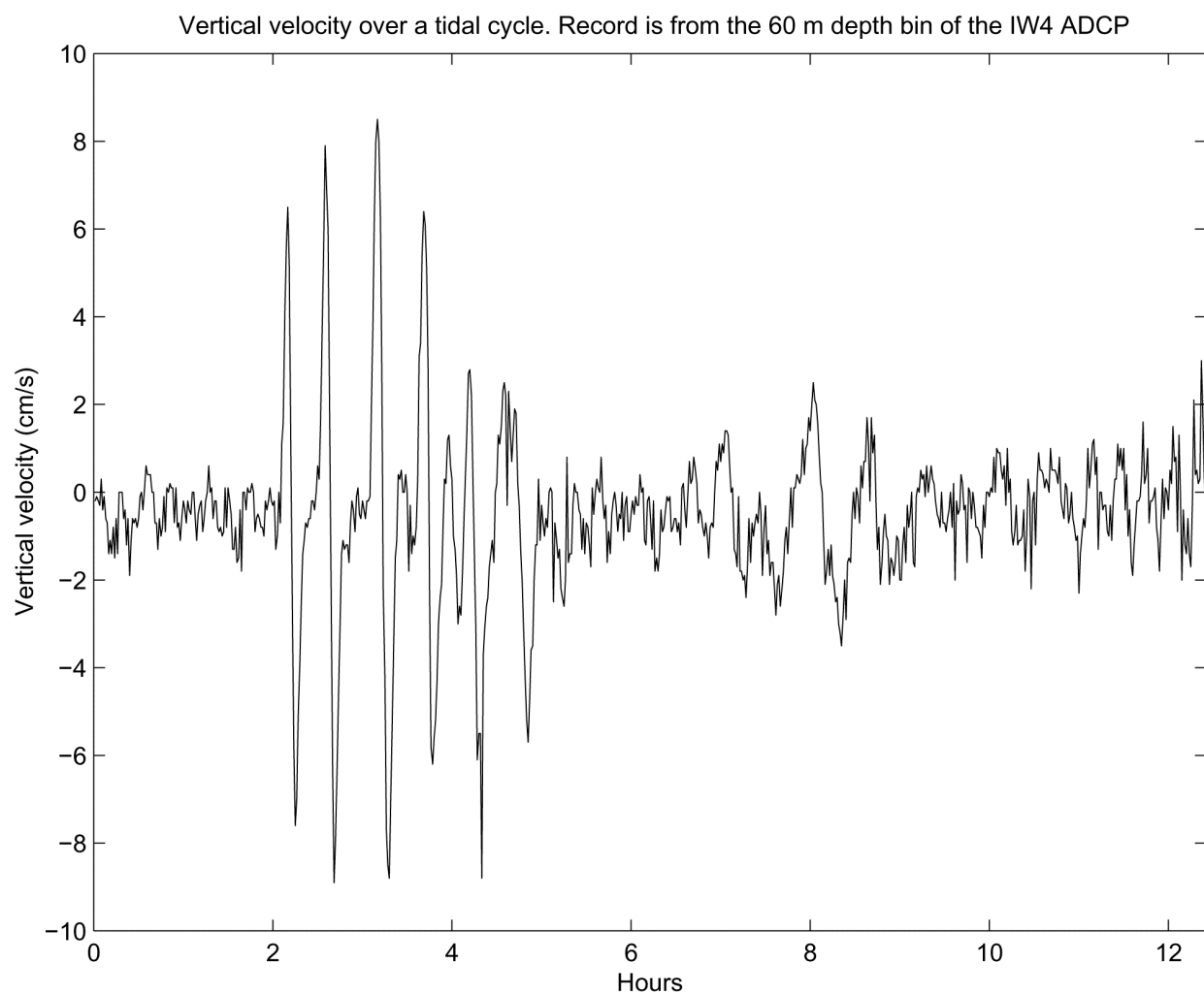


Figure 4. A tidal period of vertical velocity from a moored ADCP at IW4 [see figure 3]. Moorings were deployed as part of an in situ measurement program between 25 November and 8 December 1998. [Image courtesy of Edward Abraham, National Institute of Water and Atmospheric Research, Wellington, New Zealand]



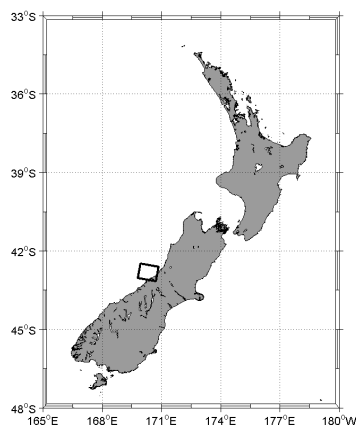


Figure 5. ASTER false-color VNIR image over the western New Zealand acquired on 1 January 2001 at 2256 UTC. The image shows the signature of fine scale internal waves propagating shoreward. Imaged area is 60 km x 60 km.

