

# The Tidal Measurements of James Cook during the Voyage of the *Endeavour* (Philip Woodworth, NOC and Glen Rowe, LINZ)

This is the 250th anniversary of Cook's voyage on the *Endeavour*



HM Bark Endeavour



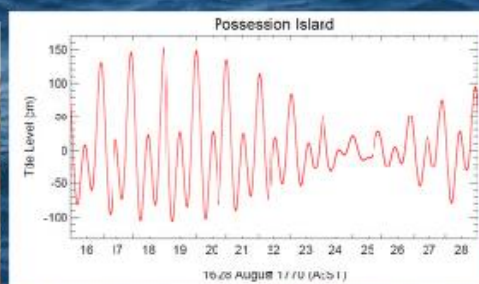
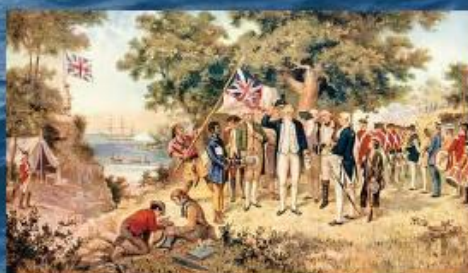
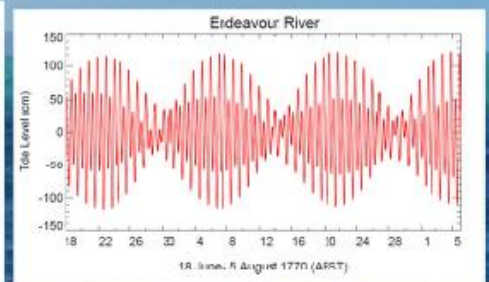
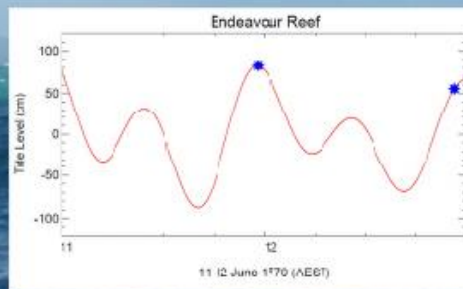
West to east circumnavigation to Tahiti, New Zealand and Australia



Cook measured the tide at 14 locations, parameterised as **RANGE AT NEW AND FULL MOON** and **HIGH WATER FULL AND CHANGE** (i.e Amplitude and Phase) following the usual practice in European waters where tides are predominantly semidiurnal.

The tides in New Zealand are also largely semidiurnal but these parameters proved to be unsuitable in Australia where tides are more mixed or even diurnal.

Diurnal tides were evident when the Endeavour ran aground on the Great Barrier Reef (blue stars show times aground and refloated). Cook later studied the diurnal tide at Endeavour River (Cooktown) shown here using tidal predictions.



Diurnals are also important at Possession Island where Cook took possession of Australia for King George III on 22 August 1770.

Cook's measurements were shown to be accurate to 0.5 ft in Range and 0.5 hr in HWFC. They were included in Lalande's 1781 compilation of tidal data and later by Whewell in making the first global tidal charts.

More information in Woodworth and Rowe (History of Geo- and Space Sciences, 2018)

ET DU REFLUX DE LA MER. 347	
Guzquill ( voyez art. 210 ), marée de 10 pieds	6 0
Panama ( voyez art. 212 ), marée de 6 à 7 pieds	5 0
I L E S D U S U D M E R D U S R O C ( voyez art. 216 ).	
Ohiboo, l'une des Marquises, lat. 10° Sud, long. 158° 30'	3 0
Miré de 4 pieds.	
Il de Tahiti, latitude 17° Sud, long. 158°, suivant le	
Captaine Cook, la hauteur est d'environ 15 pouces	0 15
Il d'Ulivera, lat. 16° 45' Sud, long. 156° 3', 11° 36' du main.	
Marée de 7 pouces ( voyez art. 211 ).	
Nouvelle Zélande, ou Terre des Esz; baie de Tologa,	
31' de large, 129° de longitude, la marée est	
de 5 à 6 pieds, suivant le voyage de Cook, de Banks	
& Solander, Tom. III, pag. 95	6 0
Tama, Port de la Révolucion, lat. 19° 38' Sud, long.	
172° 25', marée de 3 pieds ( voyez art. 213 )	3 45

## PHILOSOPHICAL TRANSACTIONS:

### Essay towards a First Approximation to a Map of Cotidal Lines

W. Whewell

Phil. Trans. R. Soc. Lond. 1833:123, 147-236, published 1 January 1833

Lalande, 1781