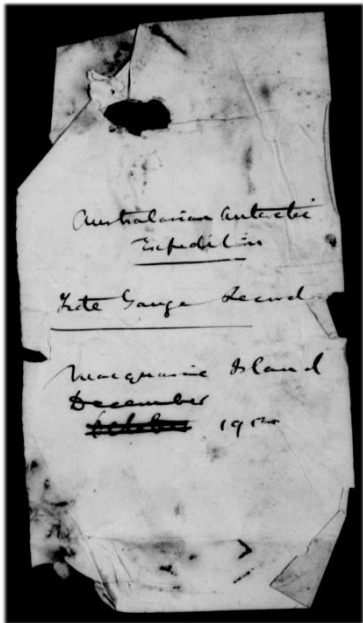
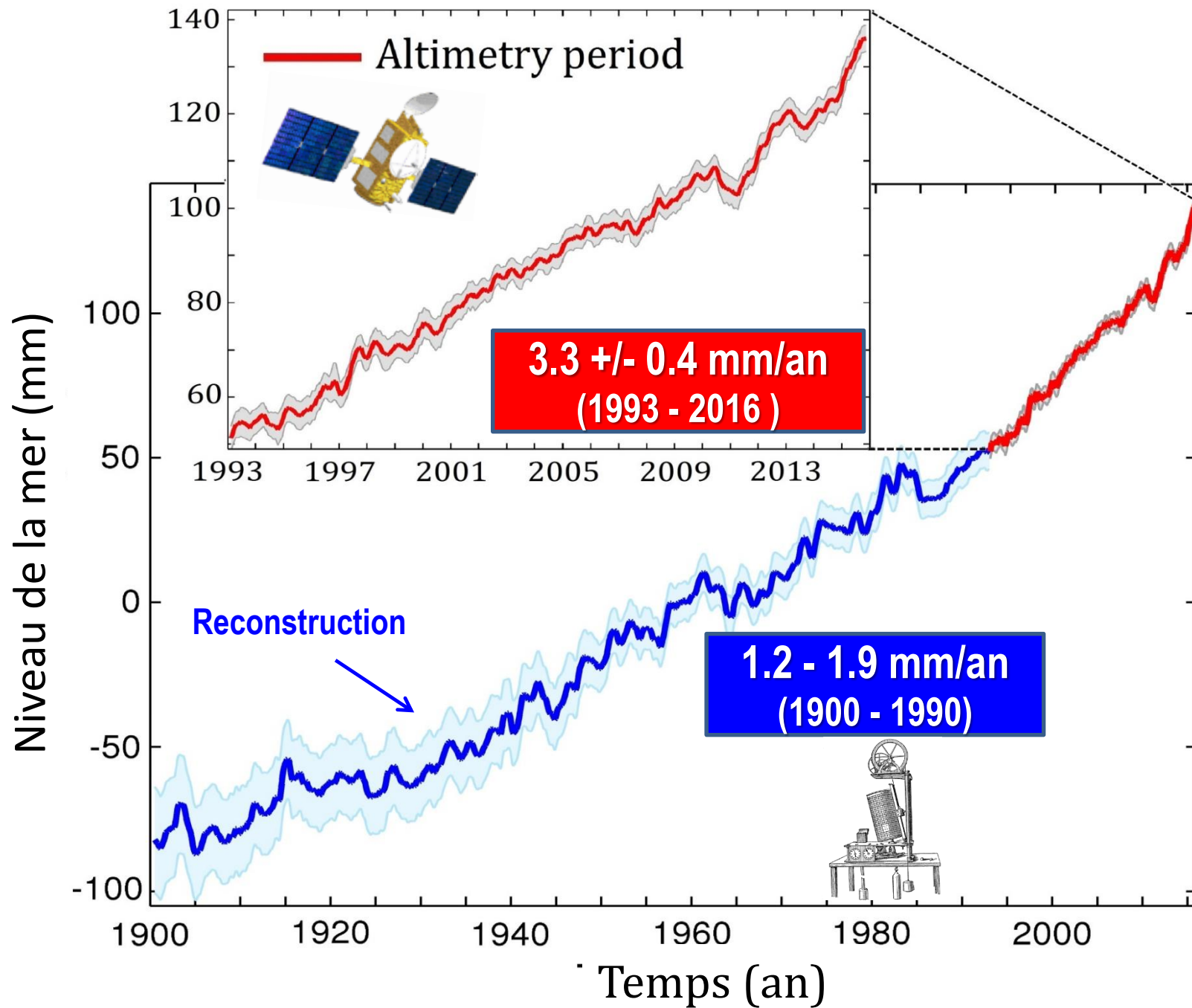


# SEA LEVEL TRENDS IN THE COMMONWEALTH BAY OVER THE LAST CENTURY FROM HISTORICAL DATA

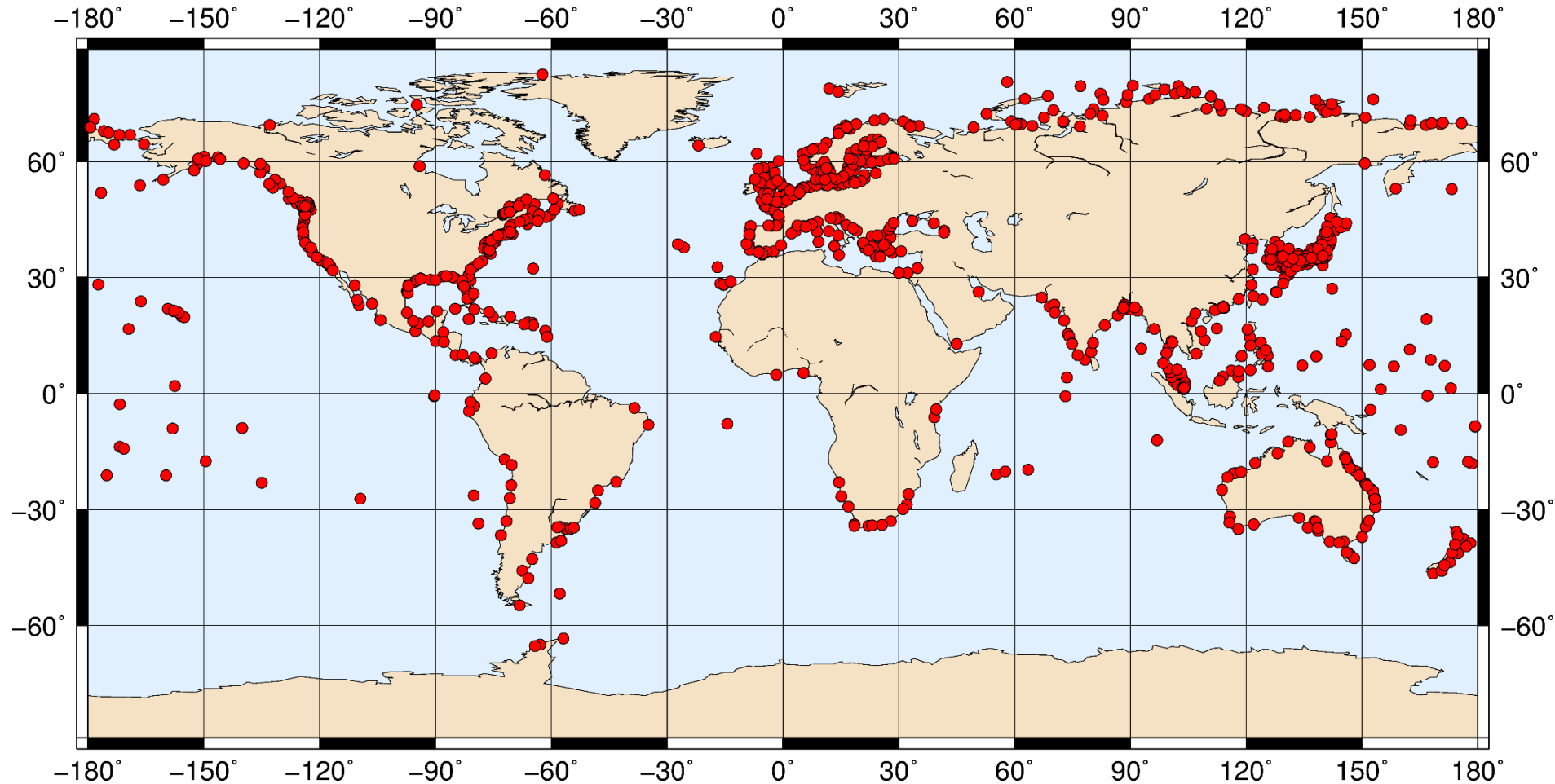
*L. Testut<sup>(1)</sup>, B. Legrésy<sup>(1)</sup>, C. Watson<sup>(3)</sup>, R. Coleman<sup>(3)</sup>,  
H. Broisma<sup>(5)</sup>, R. Handsworth<sup>(5)</sup>*



**Australian Government**  
**Australian Research Council**



# PSMSL data with a time span of 20 yr



What

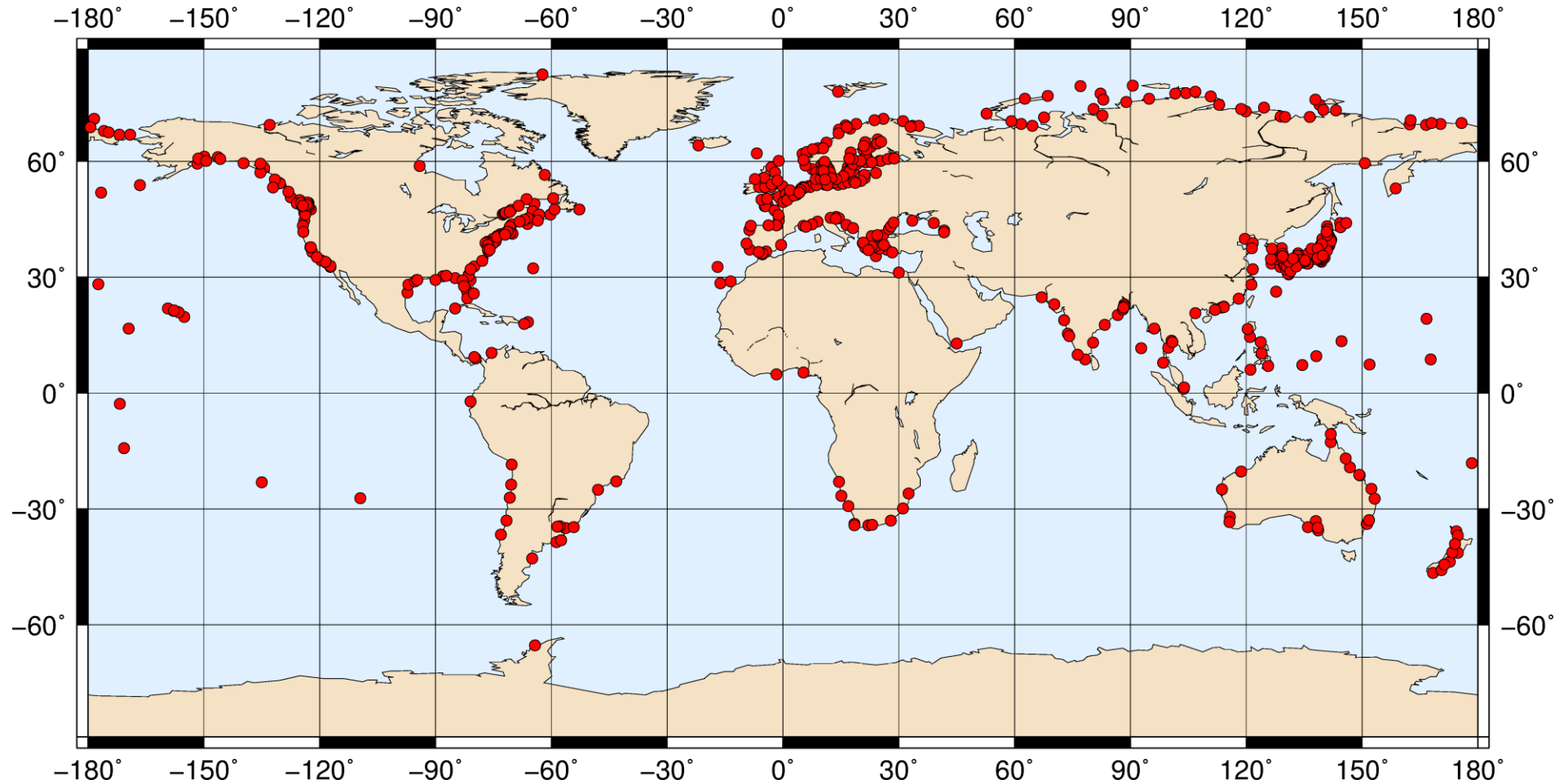
Why

How

Where

Who

# PSMSL data with a time span of 40 yr



What

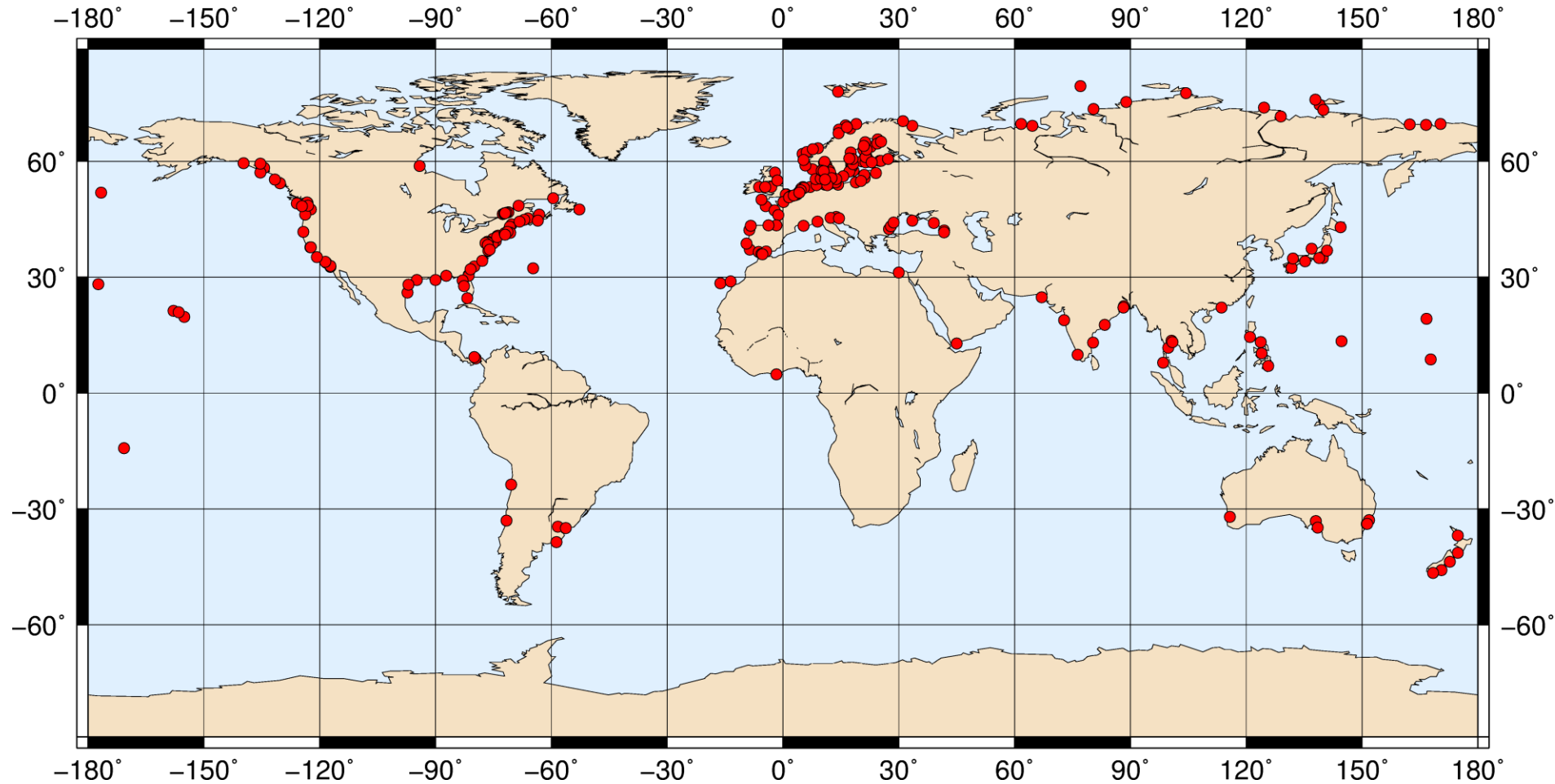
Why

How

Where

Who

# PSMSL data with a time span of 60 yr



What

Why

How

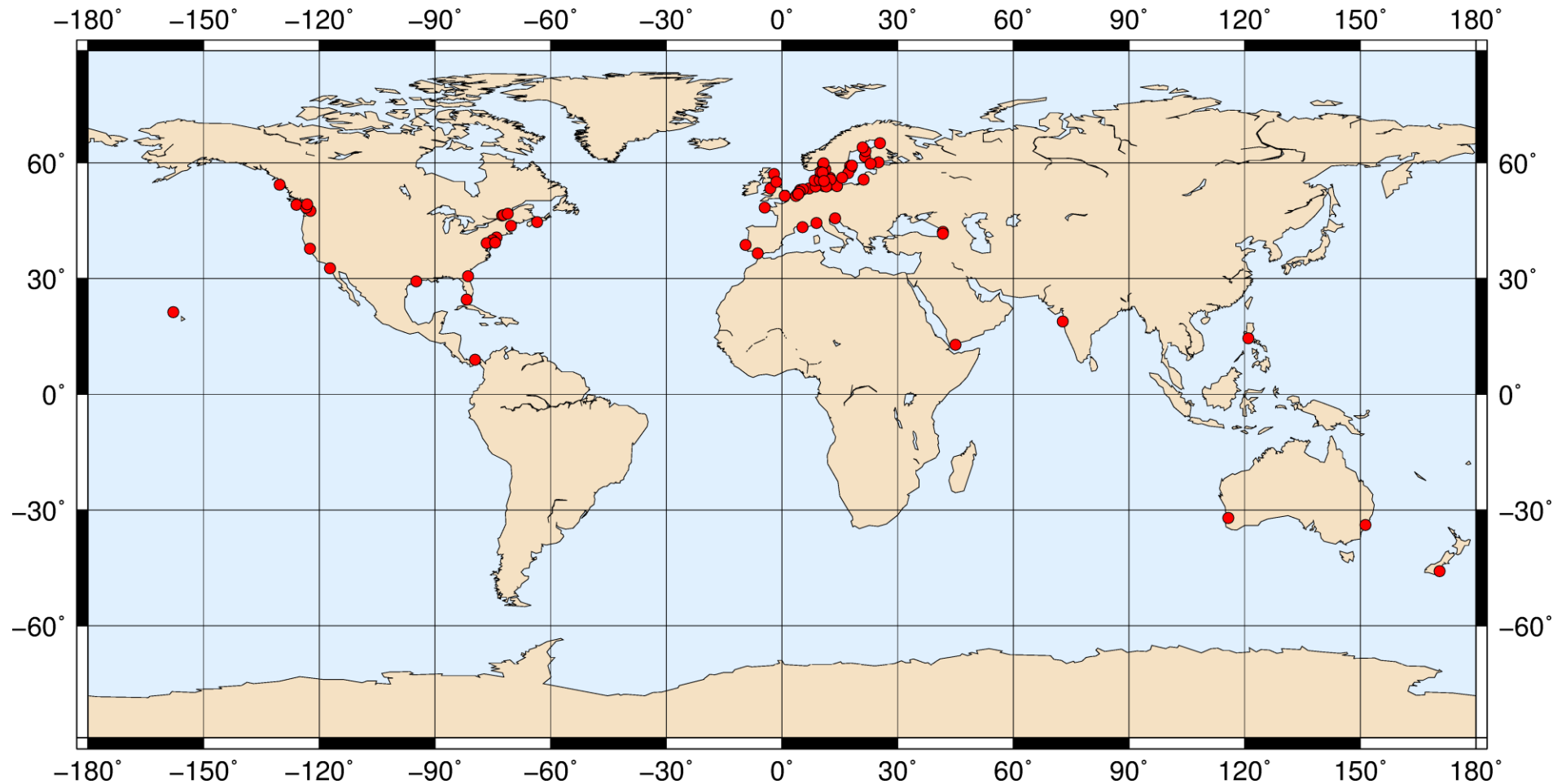
Where

Who





# PSMSL data with a time span of 100 yr



What

Why

How

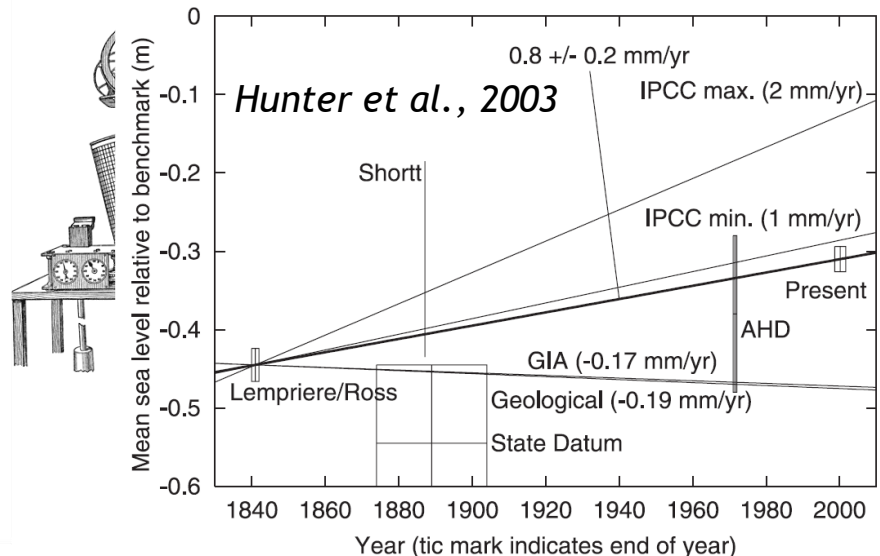
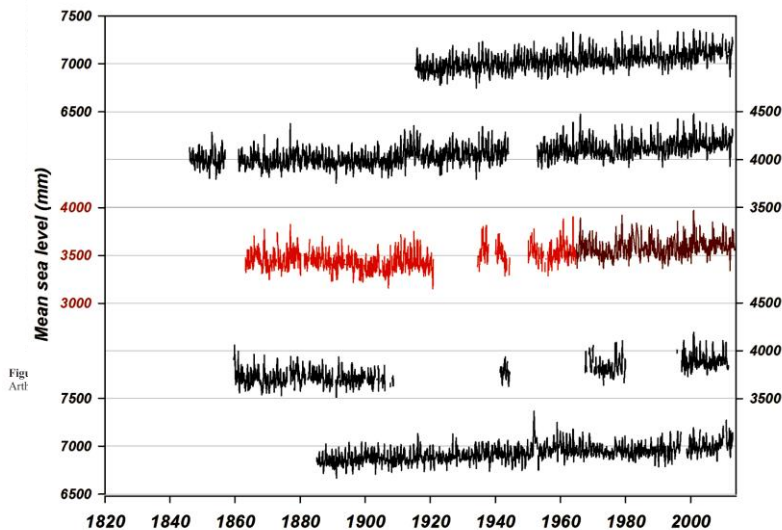
Where

Who

# What is Sea Level 'data archeology'\* ?

\* Woodworth, P. L. High waters at Liverpool since 1768: the UK's longest sea level record. *Geophys. Res. Lett.* **26**, 1589–1592 (1999).

This is the part of the Sea Level science which deal with the discovery, scanning, digitizing and quality control of *analogue tide gauge* (pole) charts and their connection to existing time series with the aim of (i) increasing in the past the length of a sea level time series or (ii) to estimate a sea level variation.





# Data Archeology Process

## Discovery

Luck

Archive

Inventory

History

## Digitization & QC

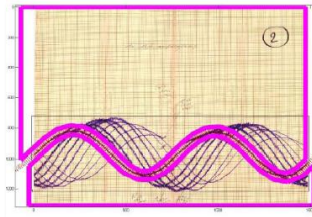
Marigrams

Levelling

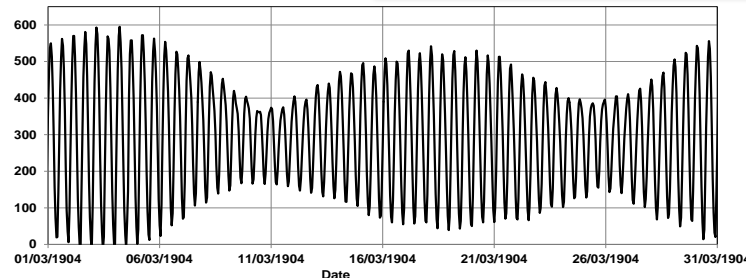
Ledgers

## Analyse

Time Serie/  
Sea level  
difference



MUSON		HAUTEUR	
HEURE	HAUTEUR	HEURE	HAUTEUR
0.0	0.0	0.0	0.0
1.5	1.5	1.5	1.5
3.0	3.0	3.0	3.0
4.5	4.5	4.5	4.5
6.0	6.0	6.0	6.0
7.5	7.5	7.5	7.5
9.0	9.0	9.0	9.0
10.5	10.5	10.5	10.5
12.0	12.0	12.0	12.0
13.5	13.5	13.5	13.5
15.0	15.0	15.0	15.0
16.5	16.5	16.5	16.5
18.0	18.0	18.0	18.0
19.5	19.5	19.5	19.5
21.0	21.0	21.0	21.0
22.5	22.5	22.5	22.5
24.0	24.0	24.0	24.0
25.5	25.5	25.5	25.5
27.0	27.0	27.0	27.0
28.5	28.5	28.5	28.5
30.0	30.0	30.0	30.0
31.5	31.5	31.5	31.5



# AAE EXPEDITION : D. MAWSON (1911-14)

## THE HOME OF THE BLIZZARD

AUSTRALASIAN ANTARCTIC EXPEDITION, 1911-1914



BY SIR DOUGLAS MAWSON

### REGIONAL MAP Showing the area covered by the AUSTRALASIAN ANTARCTIC EXPEDITION

1911-14,  
under SIR DOUGLAS MAWSON  
Including tracks of the "Aurora" and most  
of the deep-sea soundings.

Scale 1:15,000,000 or 1 inch = 237 Stat. Miles.

g. Great. h. Hand. m. Mid. o. One. r. Peak  
s. Sand. sh. Shale. st. Sandstone. of Clay. st. Stones

Soundings shown thus also indicate the bottom.

Antarctic summer cruise 1911-12 1912-13 1912-14  
1911-12 1912-13 1912-14



FIG. 2—THE TIDE GAUGE AT GARDEN BAY; MACQUARIE ISLAND.

Macquarie Is.

Cap Denison



Photos courtesy Mitchell Library, Australia

Modified Conical Projection, with regular meridians  
and irregular parallels 40' and 10'

Published by the Royal Geographical Society

ANTARCTIC REGIONS.  
AUSTRALASIAN EXPEDITION

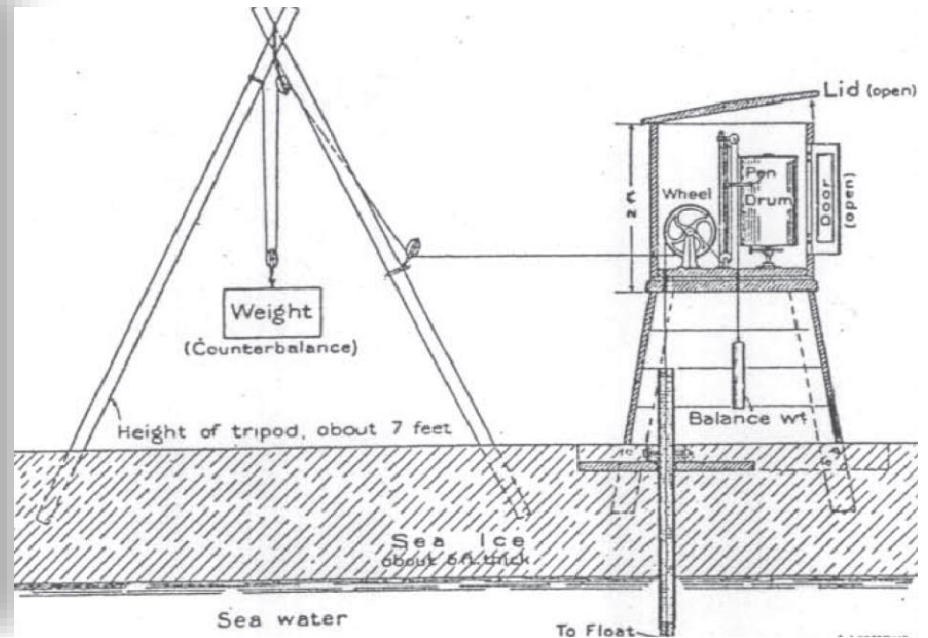


# THE TIDE GAUGE AT CAP DENISON IN 1912

1912



Photos courtesy Mitchell Library, Australia



	COMMONWEALTH BAY.										ADELIE LAND.										CAPE DENISON			
											JUNE: 1912										Local Civil time. noon.			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1																								
2																								
3														5.9	5.8	5.5	4.7	4.1	3.1	2.2	1.7	1.5	1.4	1.3
4	1.4	1.5	1.3	1.2	1.0	0.7	0.8	1.1	1.6	2.2	3.1	3.8	4.7	5.2	5.4	5.2	4.9	4.7	3.4	2.7	2.1	1.7	1.6	1.5
5	1.6	1.7	1.6	1.4	1.2	1.1	1.1	1.2	1.5	2.1	2.8	3.6	4.2	4.8	5.1	5.1	4.9	4.4	3.9	3.2	2.6	2.0	1.7	1.6
6	1.7	1.7	1.8	1.7	1.6	1.5	1.5	1.6	1.7	2.1	2.5	3.2	3.7	4.3	4.7	4.9	4.9	4.0	4.2	3.7	3.1	2.6	2.2	2.1
7	2.1	2.1	2.1	2.1	2.0	1.9	1.8	1.7	1.8	2.1	2.4	2.8	3.5	3.9	4.3	4.6	4.6	4.5	4.2	3.7	3.2	2.7	2.2	

Allowance has been made for error of setting of drum as noted under (1) otherwise these are drum readings without any corrections for thickening of ice or for scale

Allowance has been made for error of setting of drum as ??? otherwise these are drum readings without any corrections for thickening of ice or for scale

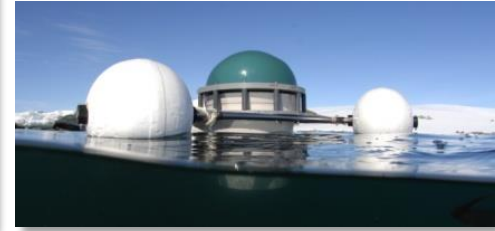
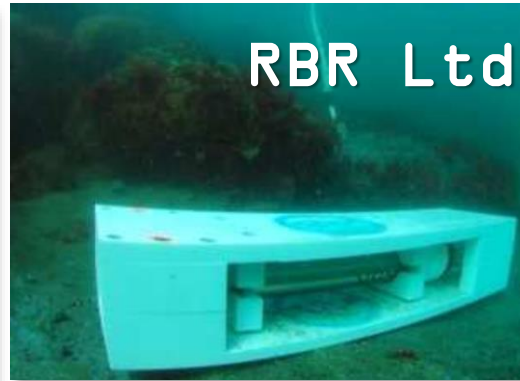
# THE TIDE GAUGE AT CAP DENISON IN 2008





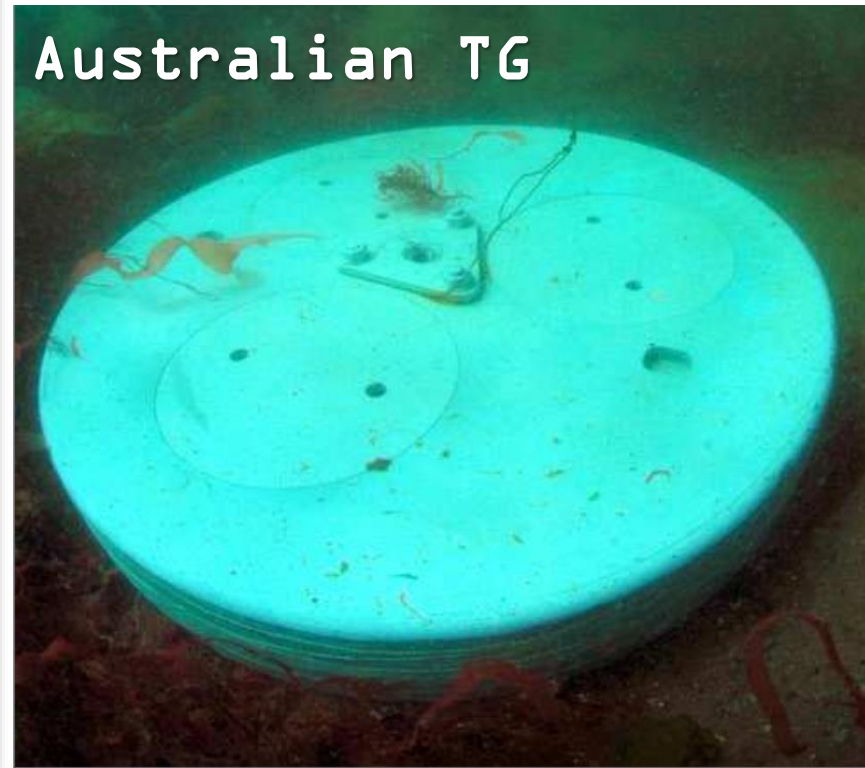
# THE TIDE GAUGE AT CAP DENISON IN 2008

2008



2 years of data

Australian TG



# THE TIDE GAUGE AT CAP DENISON AND TGBM

Step above water level (due to ice thickening)

26 May : D=15.3 cm rise of : 1.8 mm/day  
 16 July : D=24.7 cm rise of : 0.6 mm/day  
 09 Sept : D=28. cm

Linear interpolation on calibration date

08 July : D=23. cm [43 days after 26 May]  
 12 Aug : D=26.3 cm [27 days after 16 July]

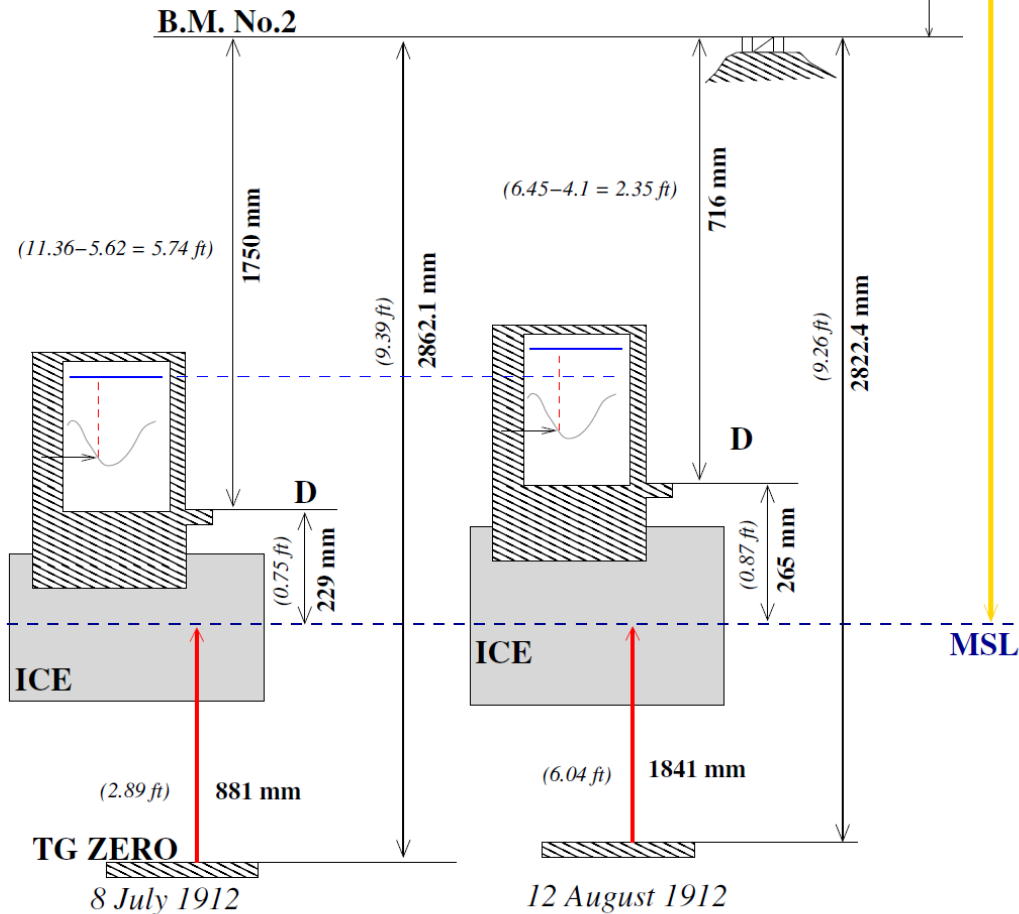
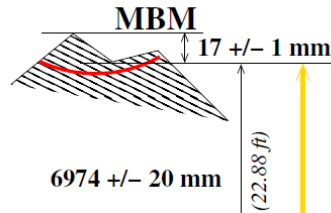


Figure 2.4: Levelling sheet of historical Tide Gauge System at Commonwealth Bay



# THE TIDE GAUGE AT CAP DENISON AND TGBM

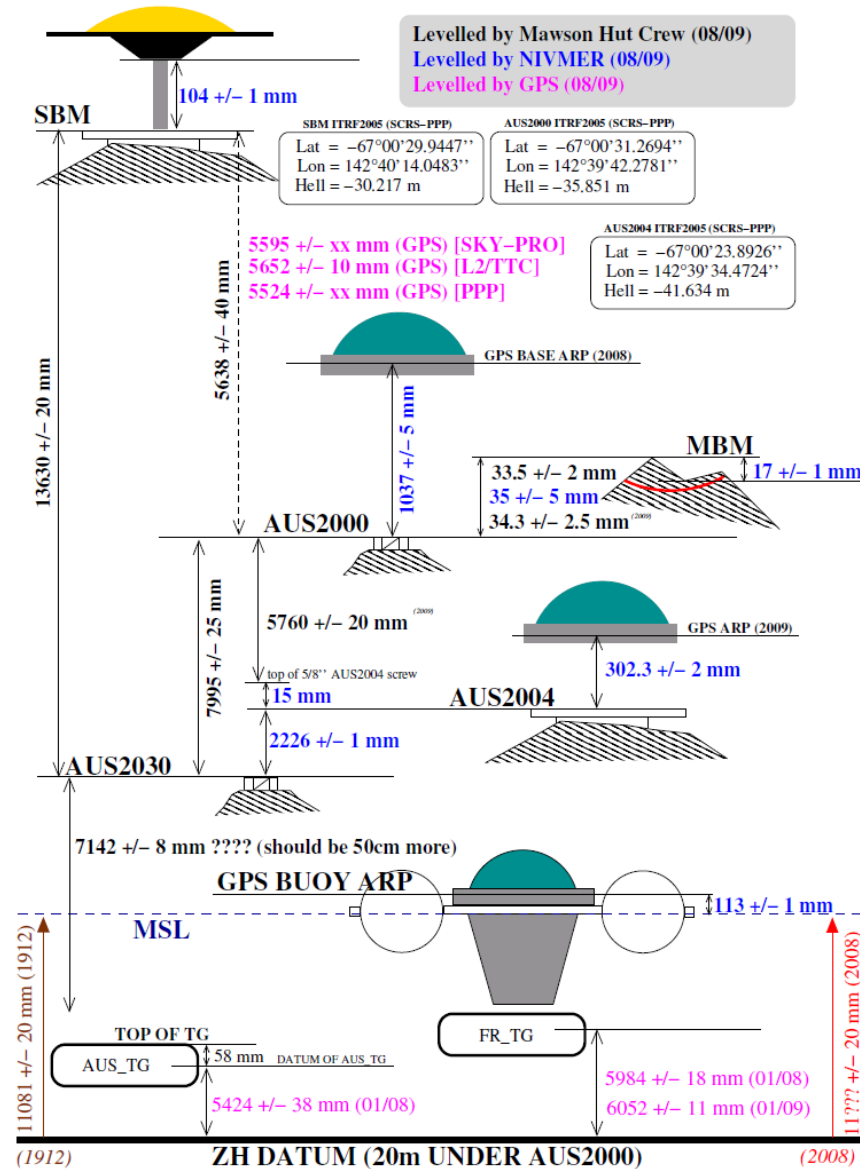
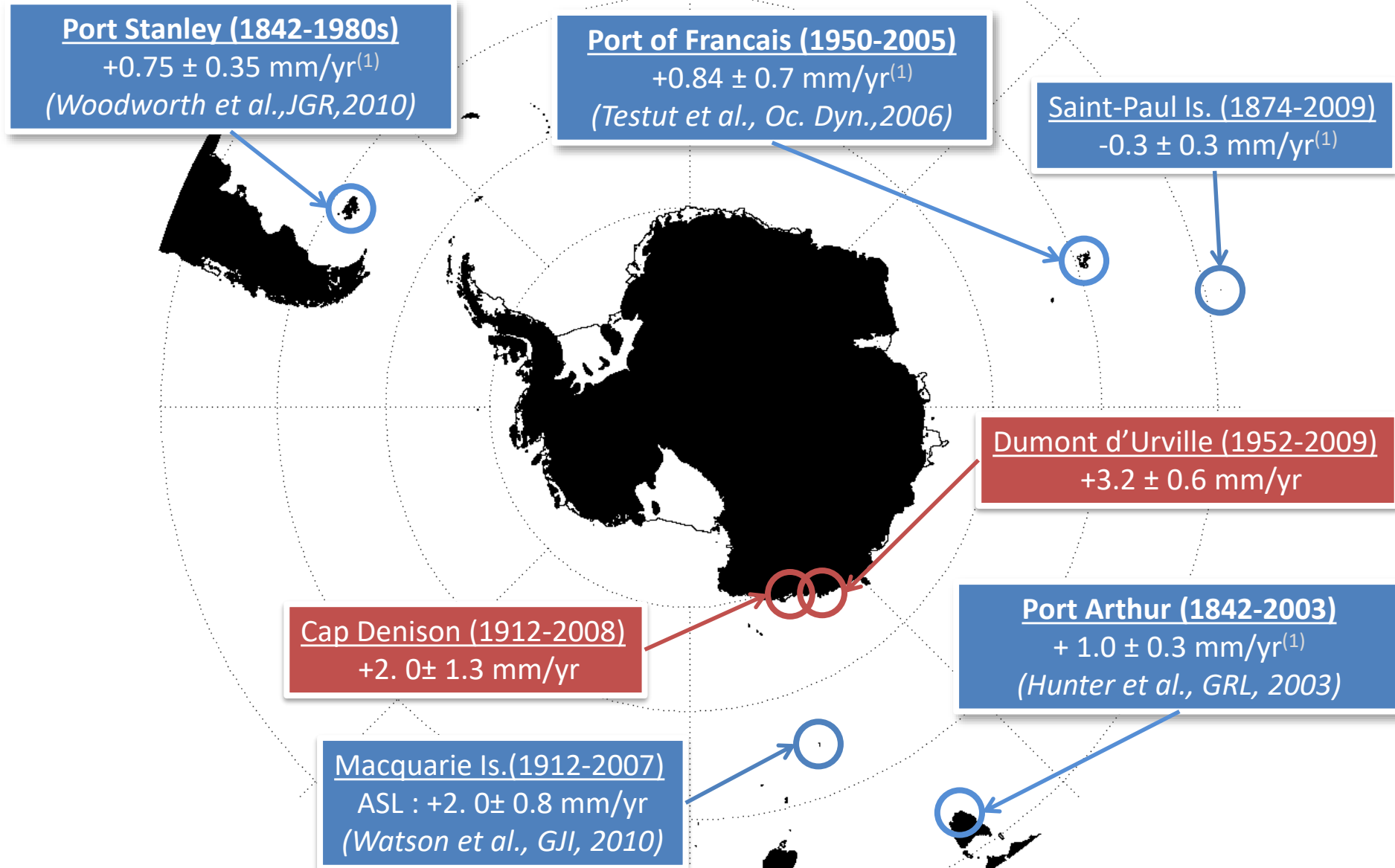


Figure 3.1: Levelling sheet of all instruments at Commonwealth Bay

# RSL TREND IN THE SOUTHERN OCEAN



(1) Corrected for GIA effect (Peltier et al., Ann. Rev. Earth. Planet. Sci., 2004)