

**THE AUSTRALIAN BASELINE SEA LEVEL
MONITORING PROJECT**

MONTHLY DATA REPORT

FEBRUARY 2004



Australian Government

Bureau of Meteorology

This report was prepared under the Australian Greenhouse Science Program for the Australian Greenhouse Office, supported by the National Tidal Centre, Bureau of Meteorology.



Australian Government

Bureau of Meteorology

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Quality Certification:

I authorise the issue of this Australian Baseline Sea Level Monitoring Project Monthly Data Report for February 2004 in accordance with National Tidal Centre Quality Assurance procedures.

William Mitchell
Manager - National Tidal Centre

The Australian Baseline Sea Level Monitoring Project

Monthly Data Report

FEBRUARY 2004

NOTES ON THE DATA FOR FEBRUARY 2004

Sea level data return (Figures 1 and 15) in February was excellent for all stations.

The residuals (Figures 2 and 3), the difference between the observations and the tidal predictions, are the non-tidal components of the sea level observations. The residuals are primarily the consequence of short-term meteorological effects (Figures 5 and 9).

Wind speed and wind gust data from Stony Point remained intermittently erroneous throughout February. All of the wind data from Cocos Islands was also erroneous in February. These values and the corresponding incident wind directions have been removed (Figures 4, 5 and 6). The air temperature data from Rosslyn Bay was erroneous throughout February and was removed from the record.

The sea level anomalies (Figure 10) changed from positive to negative at Portland, Lorne, Stony Point and Burnie and from negative to positive at Cocos Islands. They remained positive at Spring Bay and Port Kembla and continued to be negative at all other stations in February.

The barometric pressure anomalies (Figure 11) remained negative at Port Kembla, Spring Bay, Portland, Port Stanvac, Rosslyn Bay and Burnie and changed from positive to negative at the remaining sites in February.

It is difficult to relate the water and air temperature anomalies (Figures 12 and 13) directly to those of barometric pressure and sea level without considering other effects, such as localised currents, wind speeds and directions. The anomalies are primarily used to quality check the water and air temperature data.

Figure 14 compares the mean, maximum and minimum values for air temperature, water temperature and barometric pressure for the current month with the long-term February values. Note that the long-term ranges are calculated using the historical sets of February data for each station *excluding* the current month of data.

For most stations the mean air temperature for February 2004 was generally consistent with the long term February mean. The maximum air temperature at Cocos Islands (35.2°C) and Broome (34.6°C) was higher than the previously recorded maximum for February. The minimum air temperature at Cocos Islands (22.7°C) and Portland (8.9°C) was lower than the previously recorded minimum for February.

The February 2004 mean water temperature for most sites was also consistent with the long-term February mean. The minimum water temperature at Port Kembla (18.1°C) was lower than the previously recorded minimum for February. The maximum water

temperature at Hillarys (26.2°C) was higher than the previously recorded maximum for February.

The mean barometric pressure for February 2004 was generally consistent with the long-term February mean for each station. The minimum barometric pressure at Hillarys (996.3 hPa), Esperance (992.9 hPa) and Thevenard (995.8 hPa) was lower than the previously recorded minimum for February.

Figure 16 shows the monthly mean sea levels with respect to an arbitrary fixed offset from the zero of the tide gauge. The mean sea level plot shows seasonal variations in sea level in contrast to the sea level anomalies plot (Figure 10), which has the seasonal signal removed from the data.

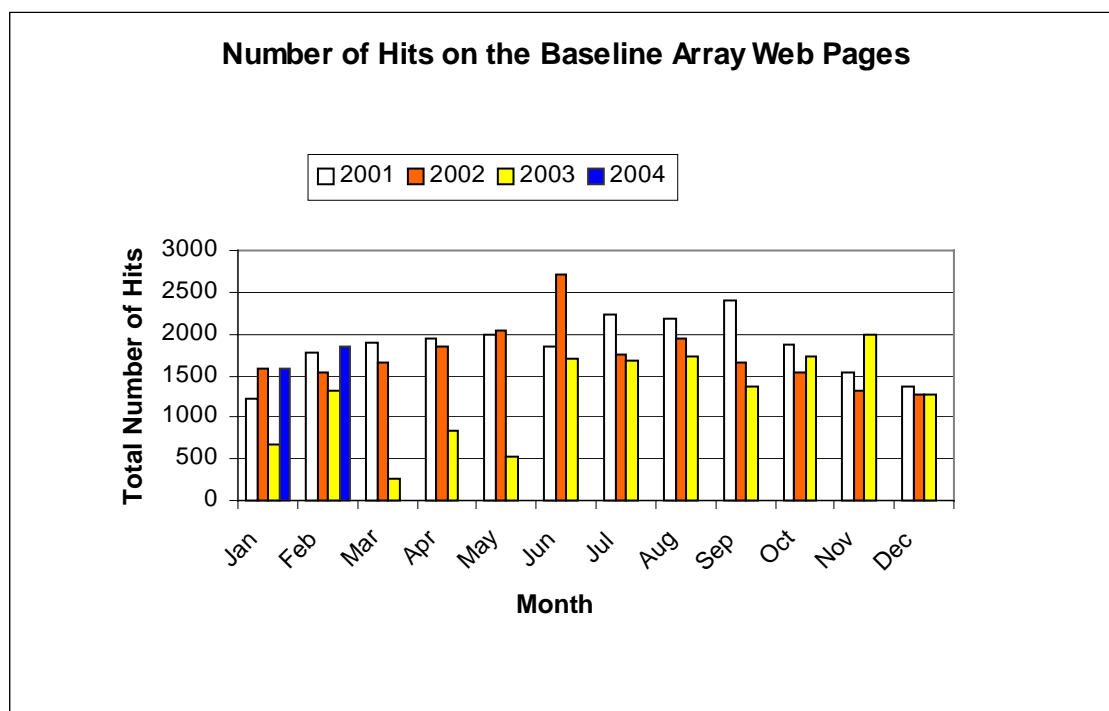
Figure 17 shows the short-term sea level trends for each SEAFRAME location included in the Australian Baseline Sea Level Monitoring Project. Table 1 lists the commencement of operation, the sea level trend for the entire record (plotted in Figure 17) and the change in trend with respect to the analysis of the previous month.

Table 1: Tide gauge installation dates, short-term sea level trends and change in trend from the previous month for the Australian Baseline array to February 2004.

Location	Installation Date	Sea Level Trend (mm/yr)	Change from previous month
Cocos Islands	Sep 1992	+11.6	+0.2
Groote Eylandt	Sep 1993	+13.4	-0.3
Darwin	May 1990	+11.0	-0.1
Broome	Nov 1991	+13.7	-0.3
Hillarys	Nov 1991	+10.7	-0.1
Esperance	Mar 1992	+7.5	0.0
Thevenard	Mar 1992	+5.8	0.0
Port Stanvac	Jun 1992	+6.9	-0.1
Portland	Jul 1991	+3.2	-0.1
Lorne	Jan 1993	+2.5	-0.1
Stony Point	Jan 1993	+2.0	-0.1
Burnie	Sep 1992	+3.7	-0.1
Spring Bay	May 1991	+3.8	0.0
Port Kembla	Jul 1991	+5.3	0.0
Rosslyn Bay	Jun 1992	+3.9	-0.2
Cape Ferguson	Sep 1991	+5.3	-0.2

The number of hits to the Australian Baseline Sea Level Monitoring project web pages from 2001 to January 2004 is given in Table 2.

Table 2: Number of hits on the Australian Baseline Sea Level Monitoring Project web pages from 2001 to February 2004.



Please note: Tide gauges at Stony Point and Lorne do not record air temperature, water temperature and barometric pressure data and are not present in Figures 3,7,8,9,11,12,13 and 16. The tide gauge at Lorne does not record wind data and is not present in Figures 4, 5 and 6.

The *Monthly Data Report* is prepared by the NTC, Bureau of Meteorology for Environment Australia. Staff members produce the text, plots and tables.

Further information on the *Monthly Data Report* and other projects conducted by the NTC, Bureau of Meteorology can be obtained from the following address.

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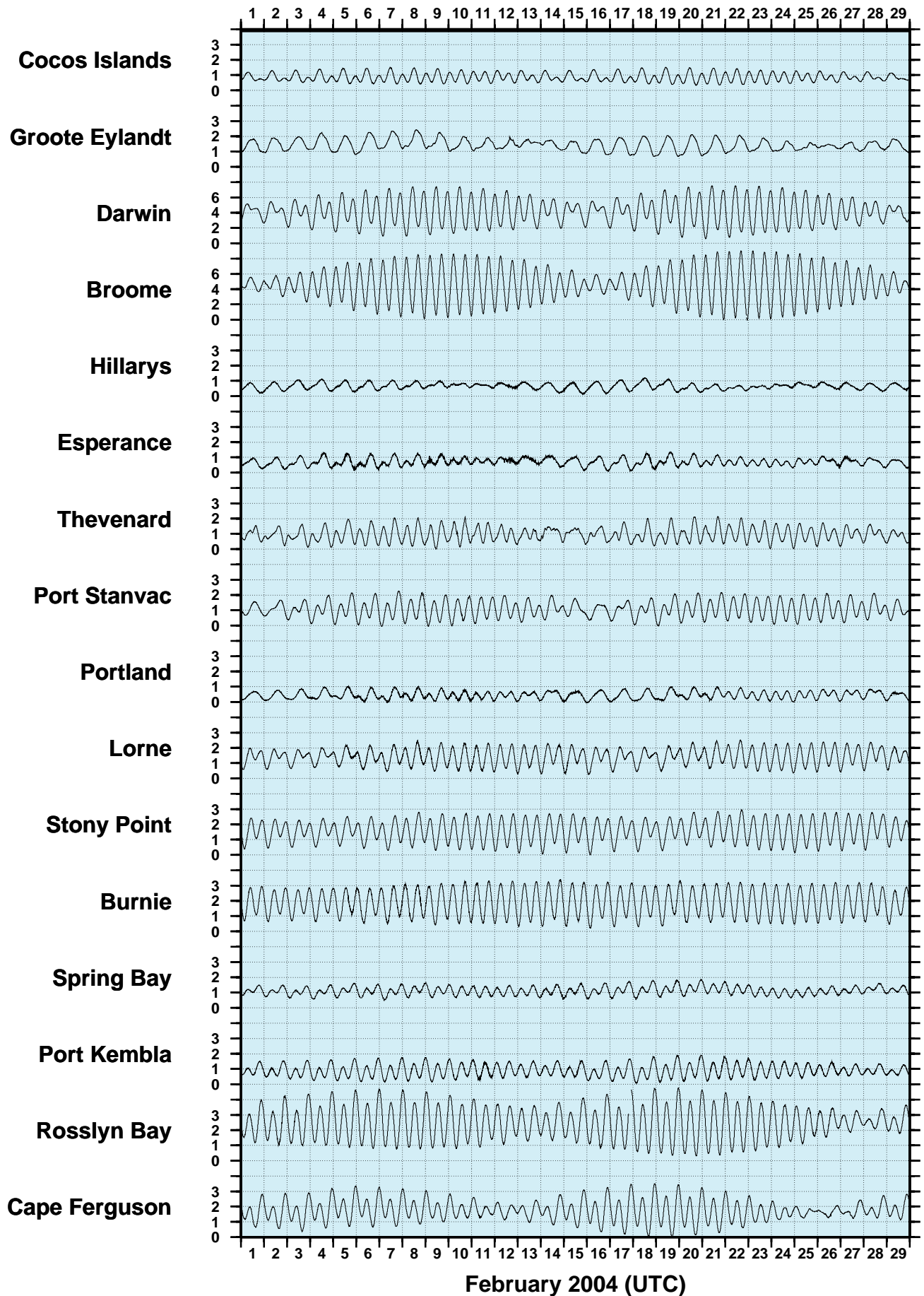
Please note the following:

While all care has been taken in the collection, analysis and compilation of the data, it is supplied on the condition that neither the *Commonwealth of Australia* nor the NTC, Bureau of Meteorology shall be liable for any loss or injury whatsoever arising from the use of the data. The Commonwealth of Australia holds copyright for material contained in this document.

Individuals and organisations are advised that quality controlled six-minute or hourly data from these stations are available on request from the NTC, Bureau of Meteorology. Some handling fees may be charged. For commercial agencies requesting data, some additional costs may be levied.

Figure 1

FEBRUARY 2004
SIX MINUTE SEA LEVEL OBSERVATIONS (m)



February 2004 (UTC)

Figure 2

FEBRUARY 2004
SIX MINUTE RESIDUAL WATER LEVELS (m)

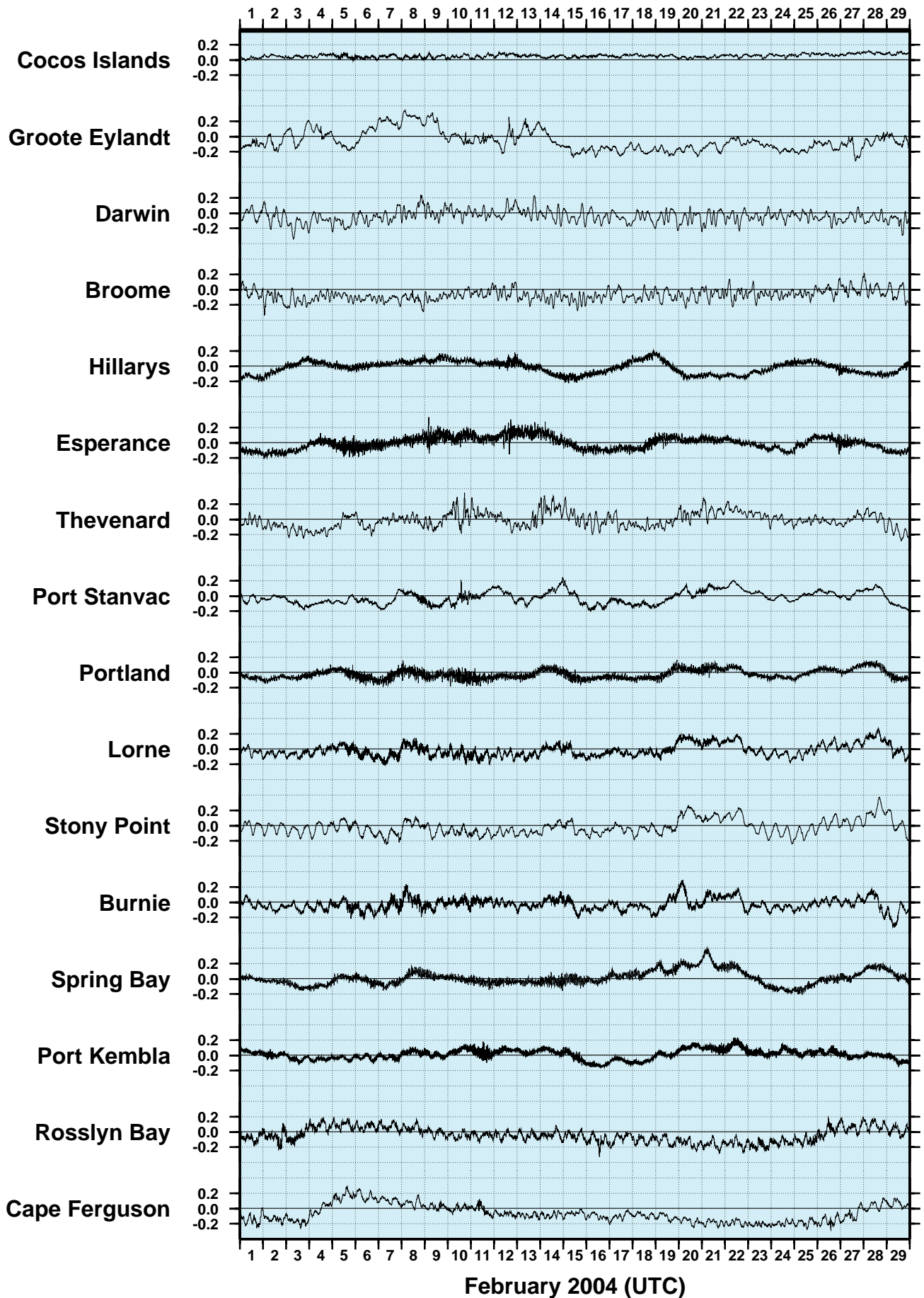


Figure 3

FEBRUARY 2004
SIX MINUTE RESIDUALS
ADJUSTED FOR ATMOSPHERIC PRESSURE (m)

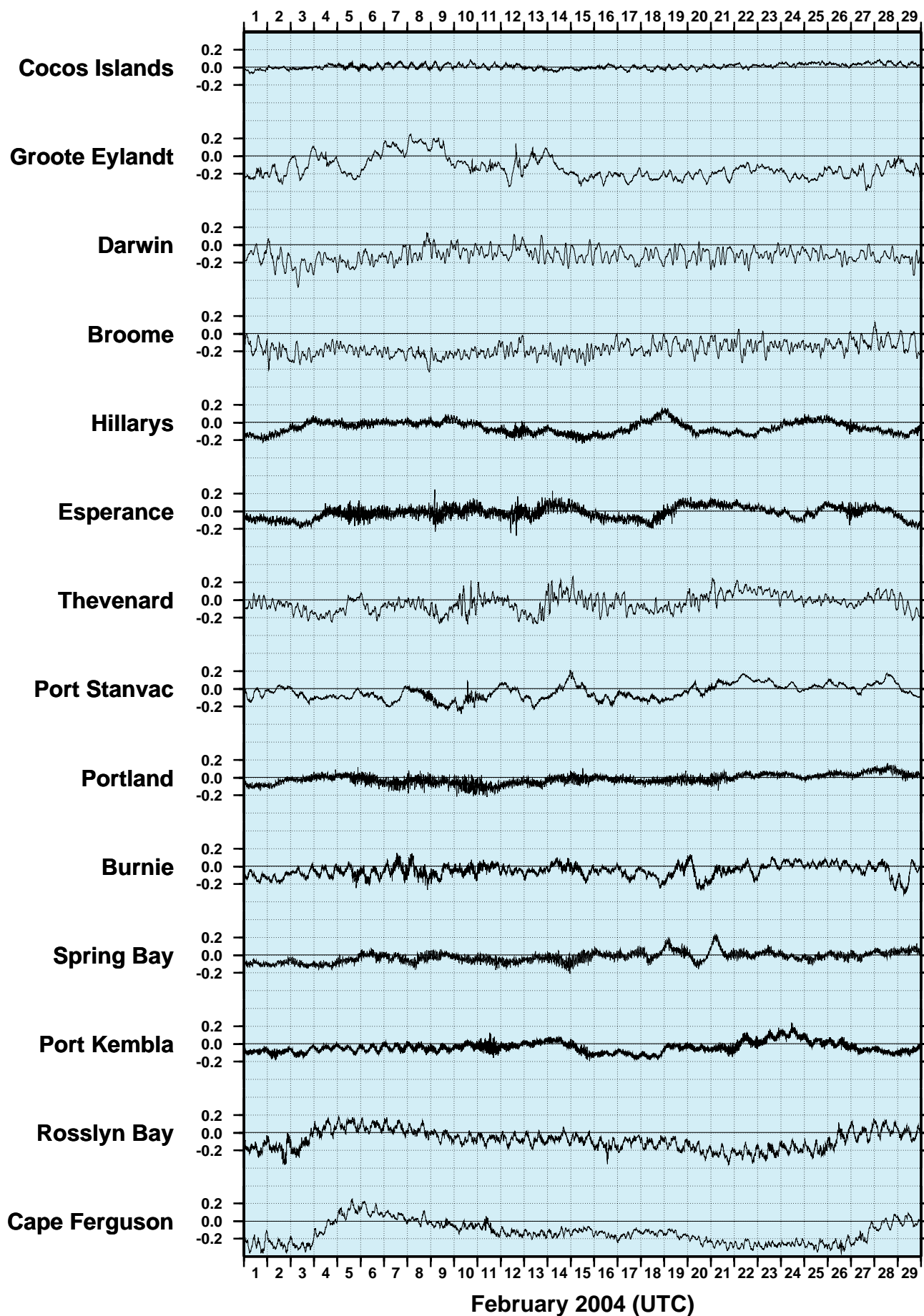


Figure 4

**FEBRUARY 2004
HOURLY WIND SPEEDS (m/s)**

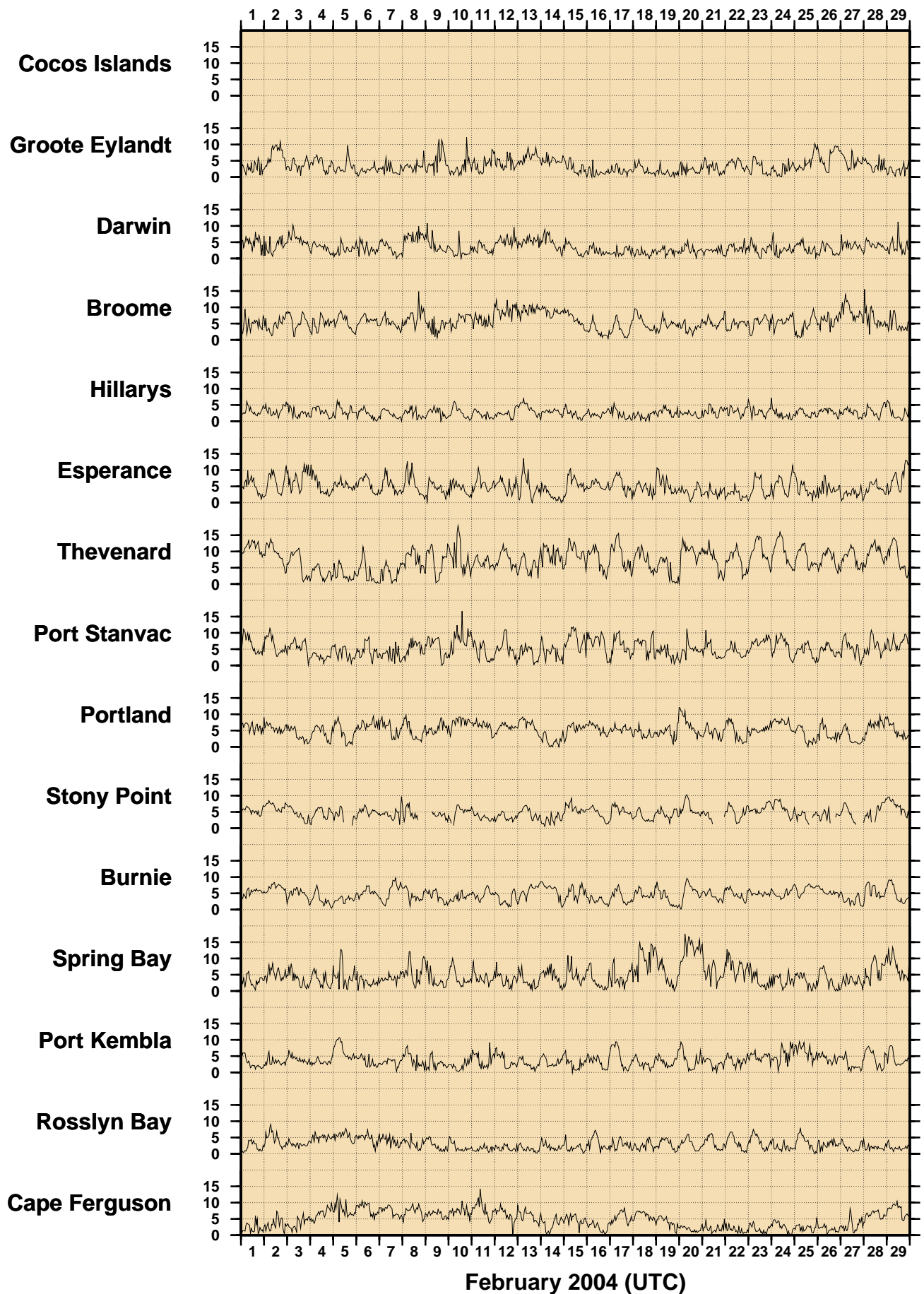


Figure 5

FEBRUARY 2004
HOURLY INCIDENT WINDS (m/s, deg True)

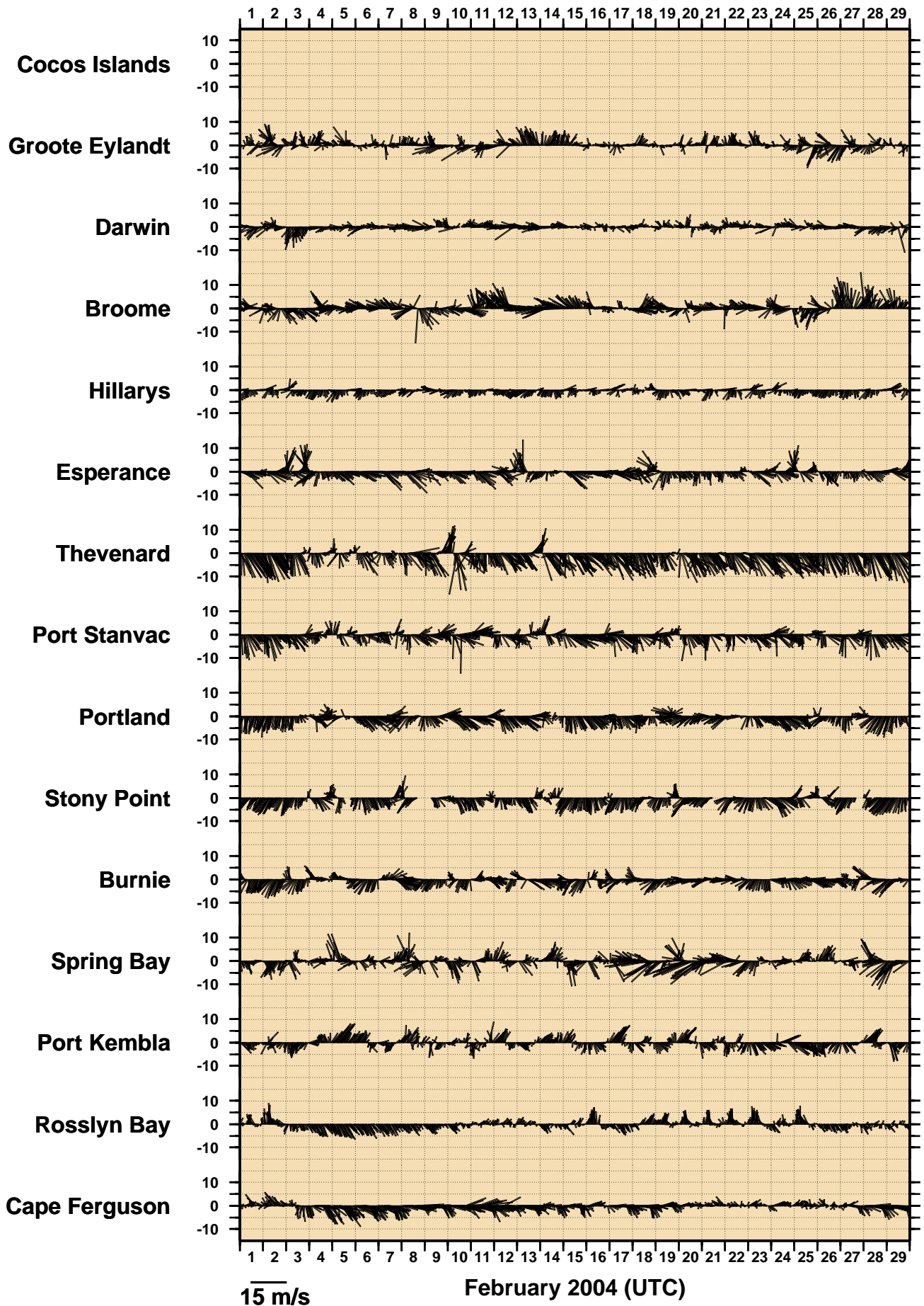


Figure 6

FEBRUARY 2004
HOURLY MAXIMUM WIND GUSTS (m/s)

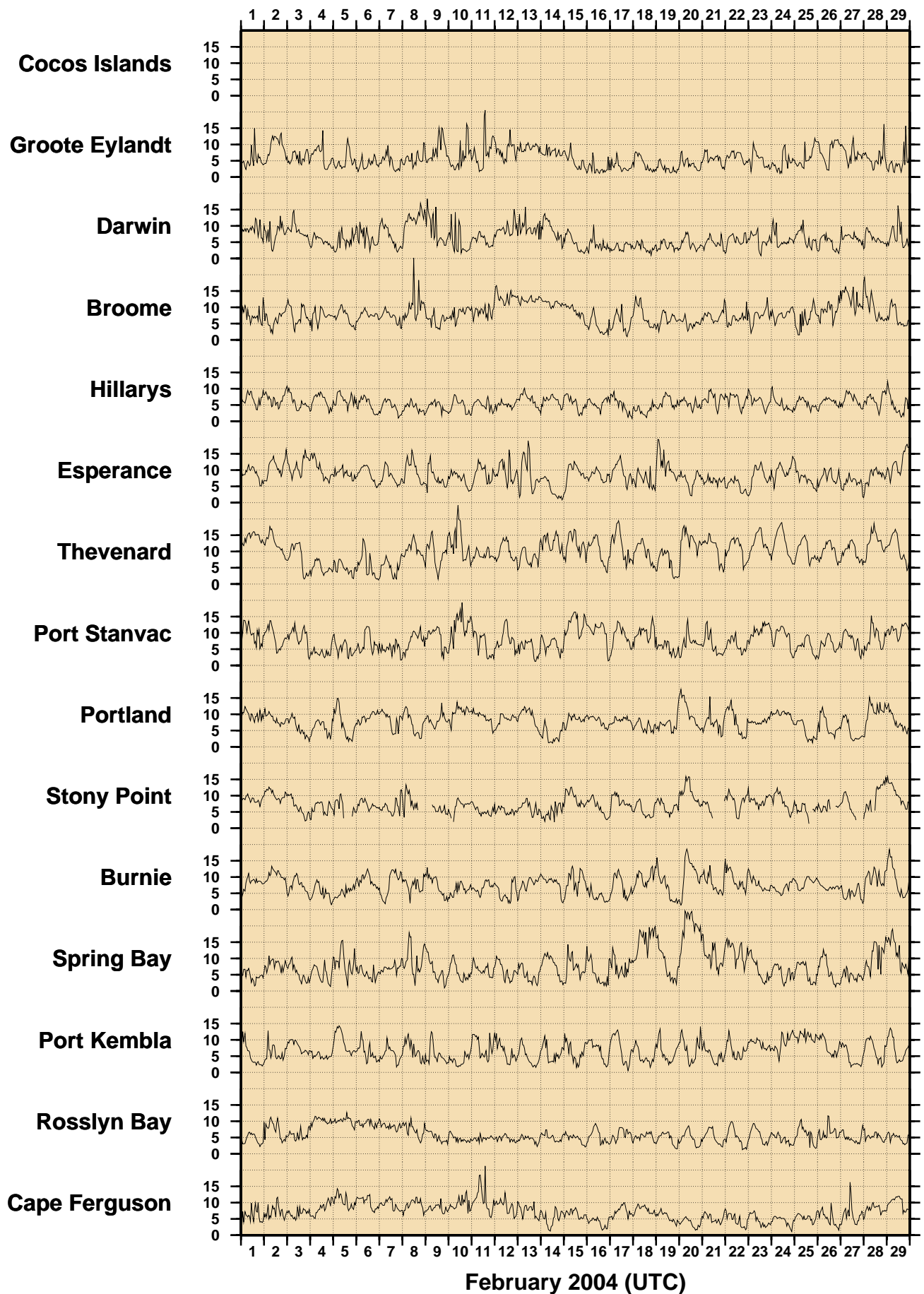


Figure 7

FEBRUARY 2004
HOURLY AIR TEMPERATURES (°C)

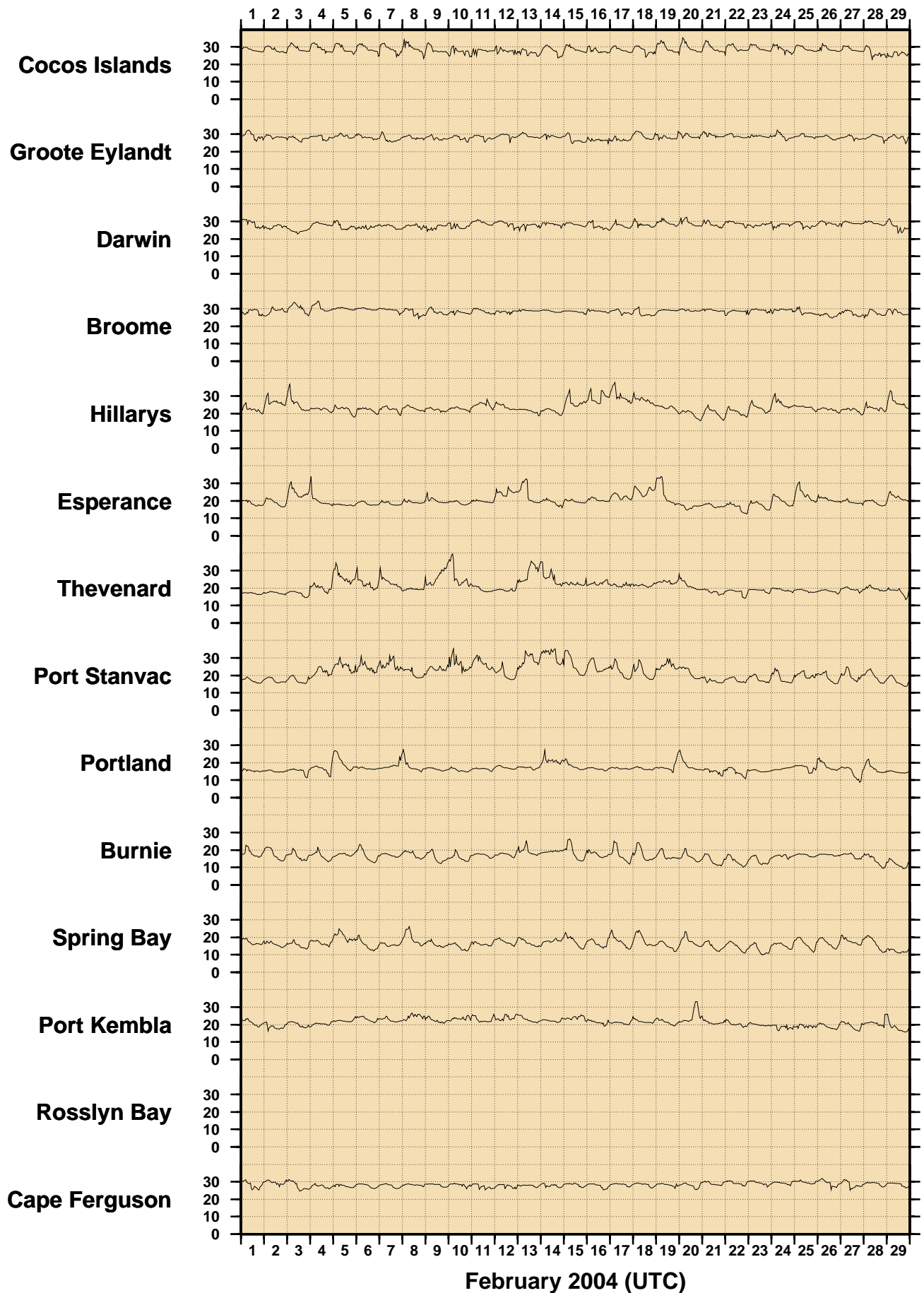


Figure 8

FEBRUARY 2004
HOURLY WATER TEMPERATURES (°C)

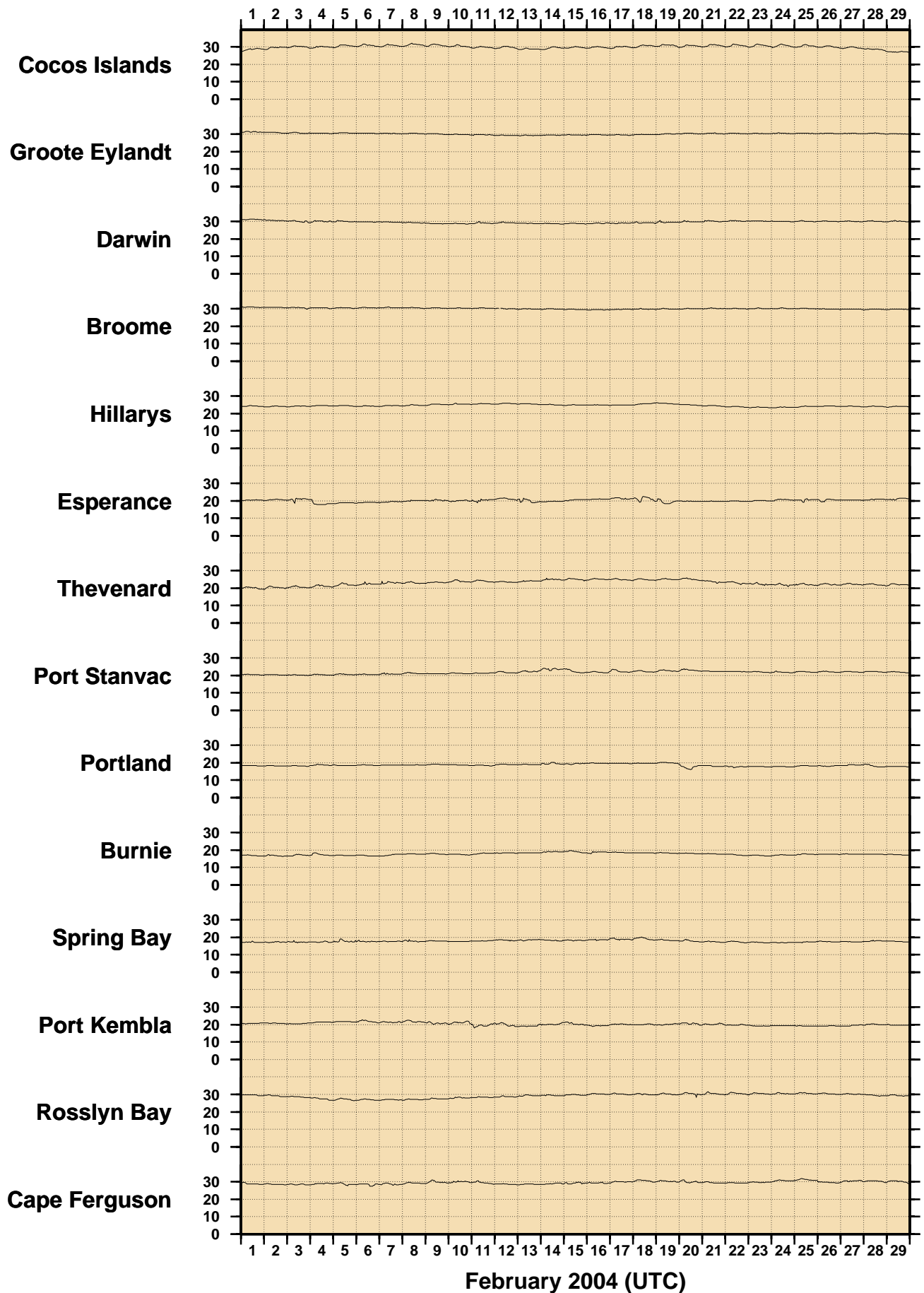


Figure 9

FEBRUARY 2004
HOURLY ATMOSPHERIC PRESSURE (hPa)

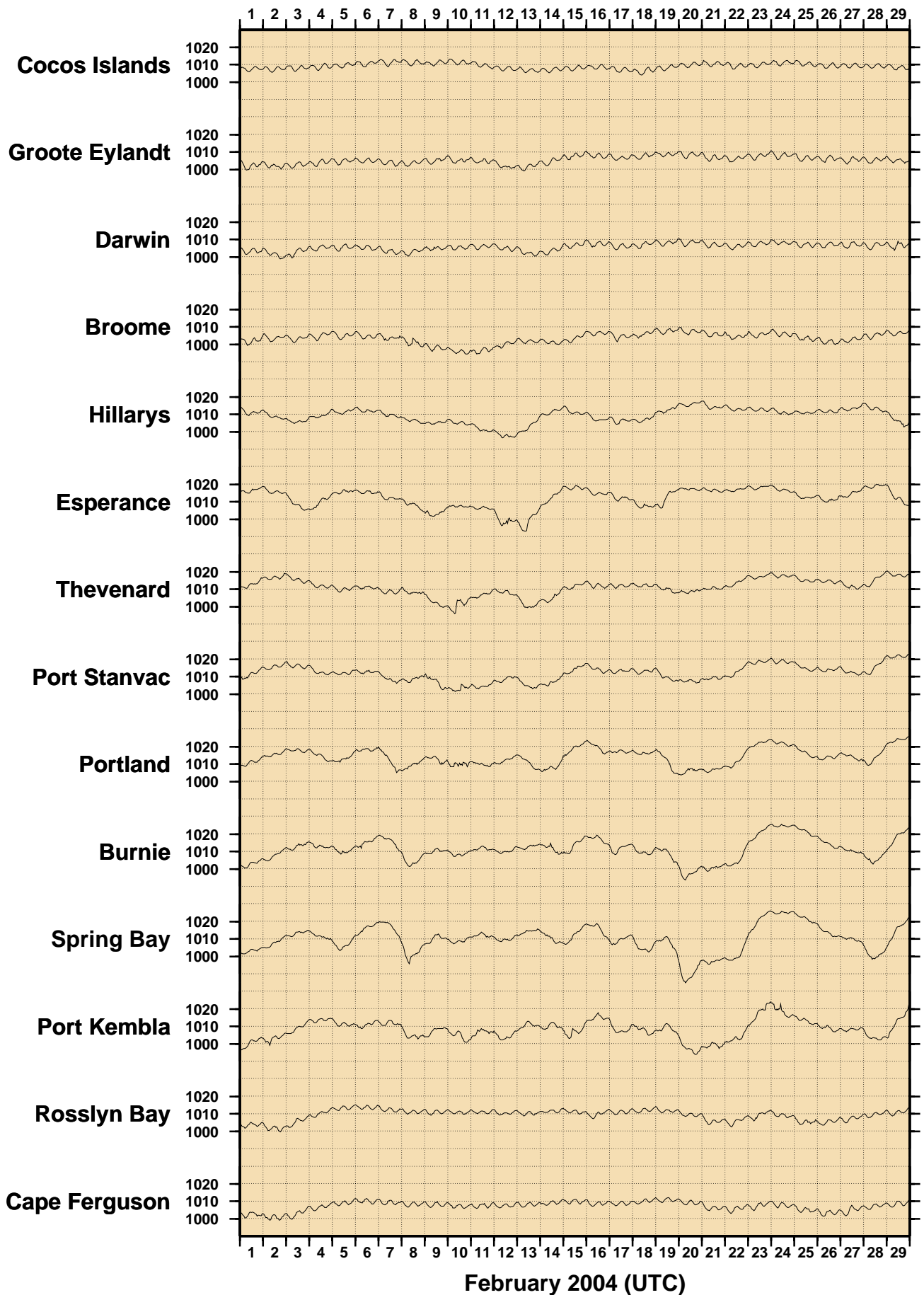


Figure 10
SEA LEVEL ANOMALIES THROUGH FEBRUARY 2004 (m)

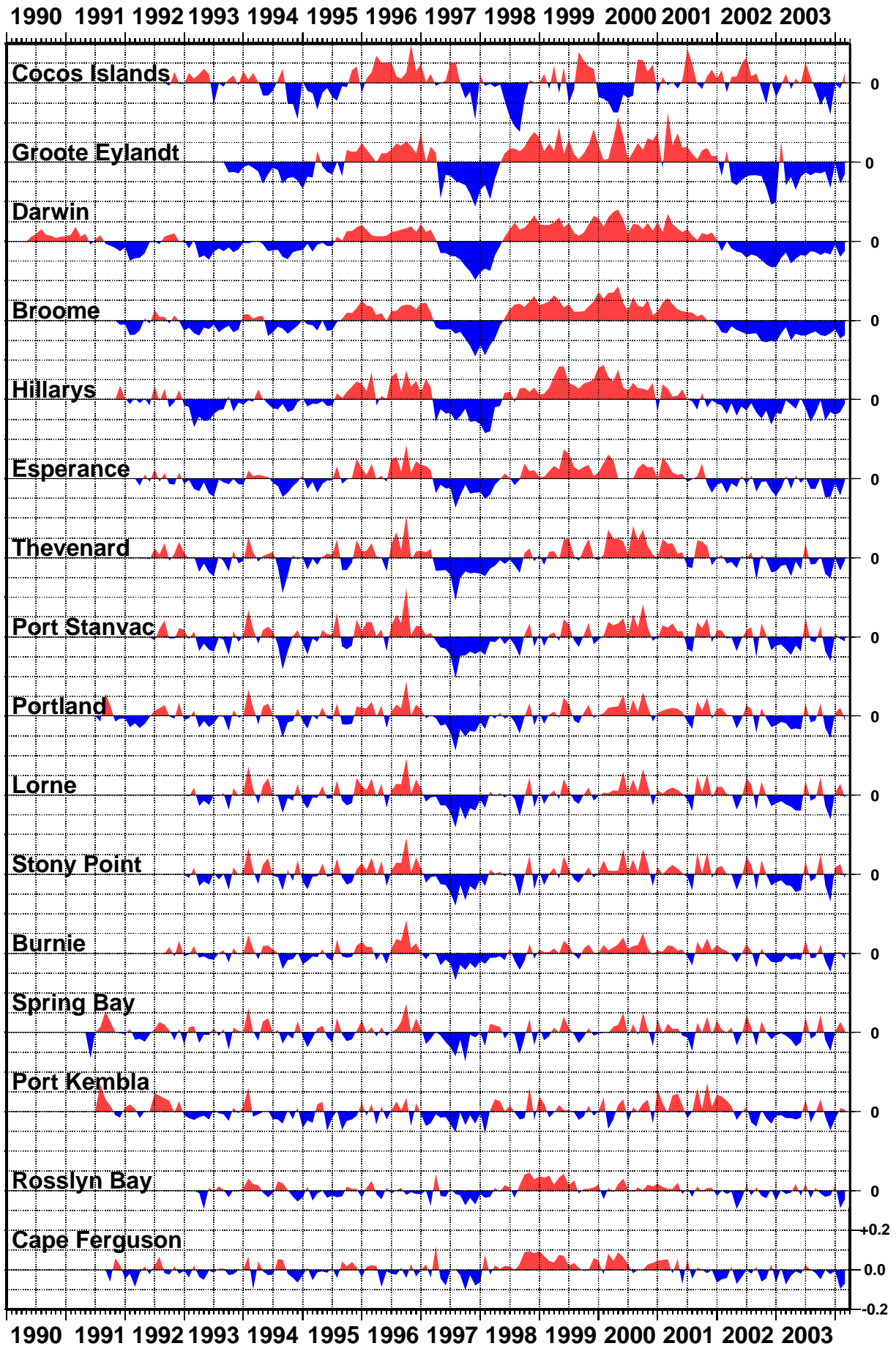


Figure 11

BAROMETRIC PRESSURE ANOMALIES THROUGH FEBRUARY 2004 (hPa)

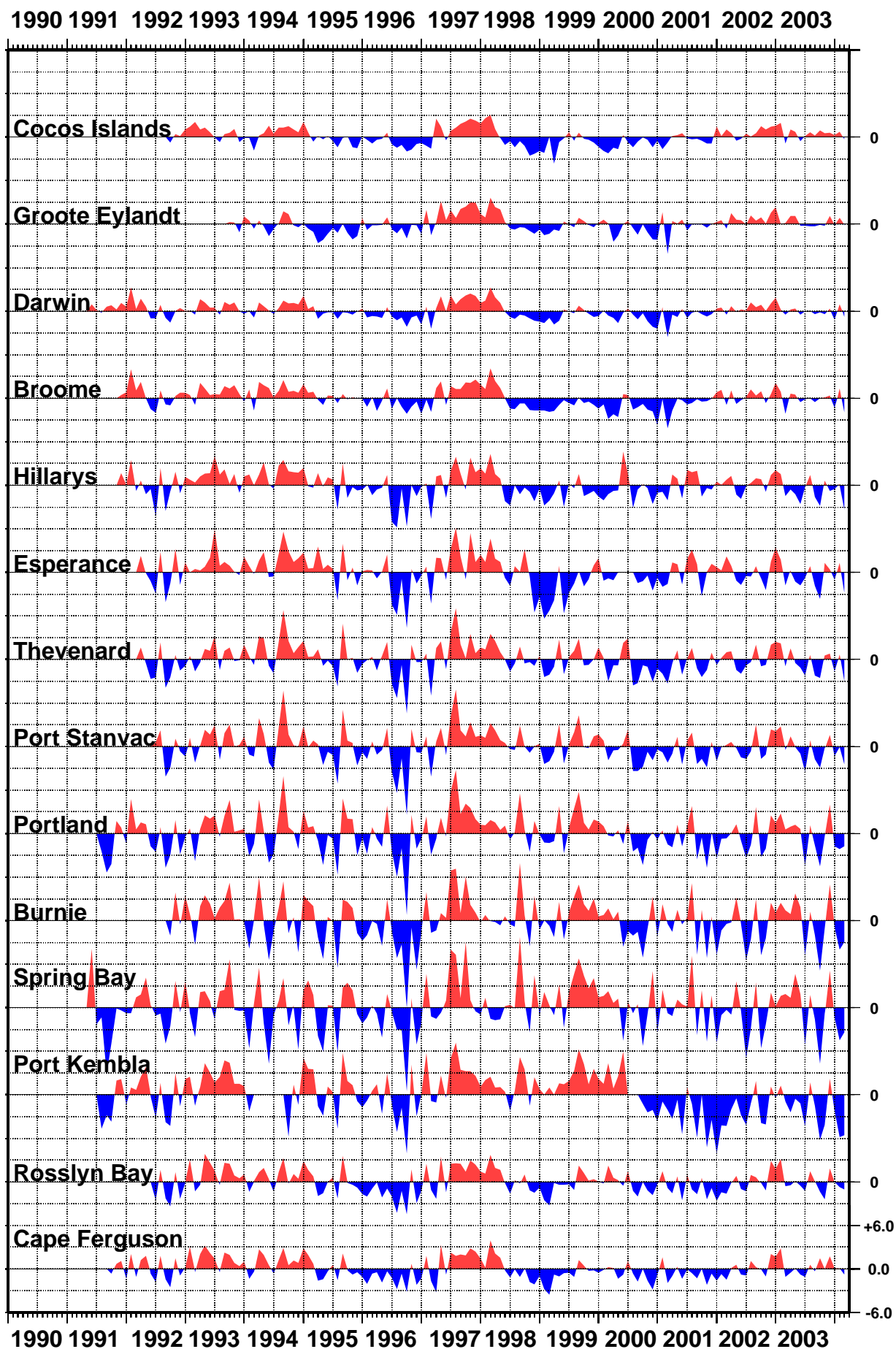


Figure 12

WATER TEMPERATURE ANOMALIES THROUGH FEBRUARY 2004 (°C)

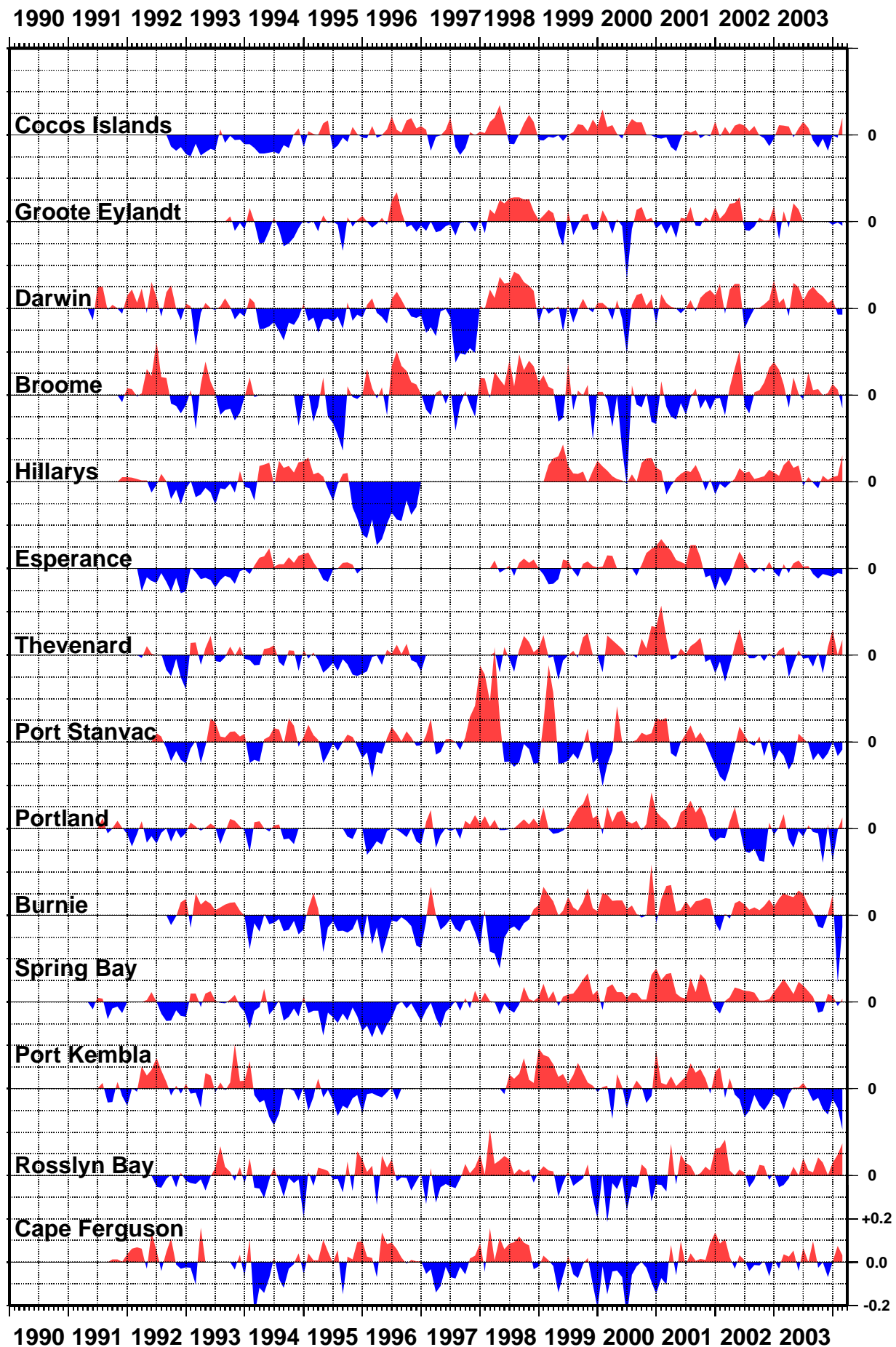


Figure 13
AIR TEMPERATURE ANOMALIES
THROUGH FEBRUARY 2004 (°C)

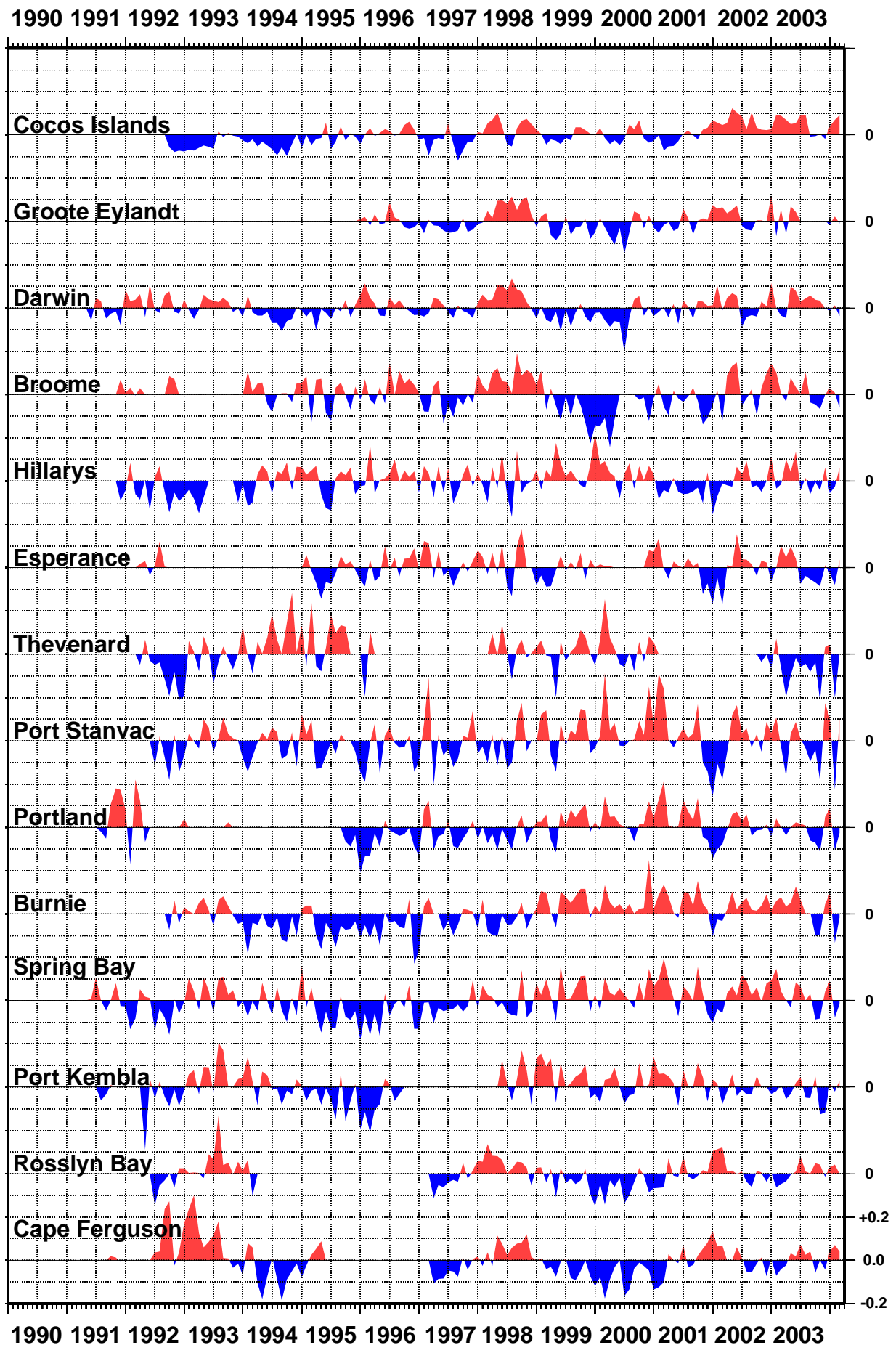
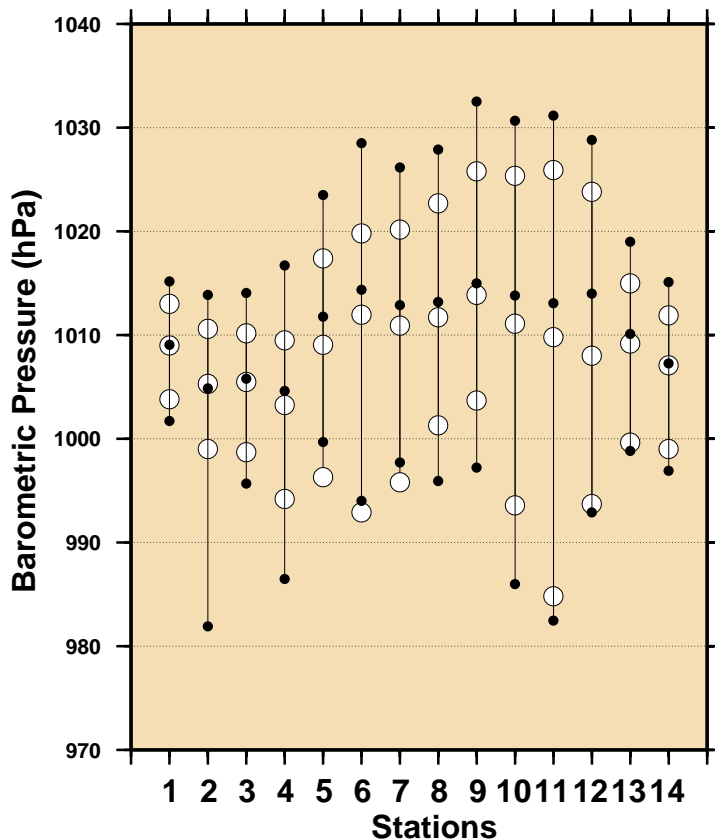
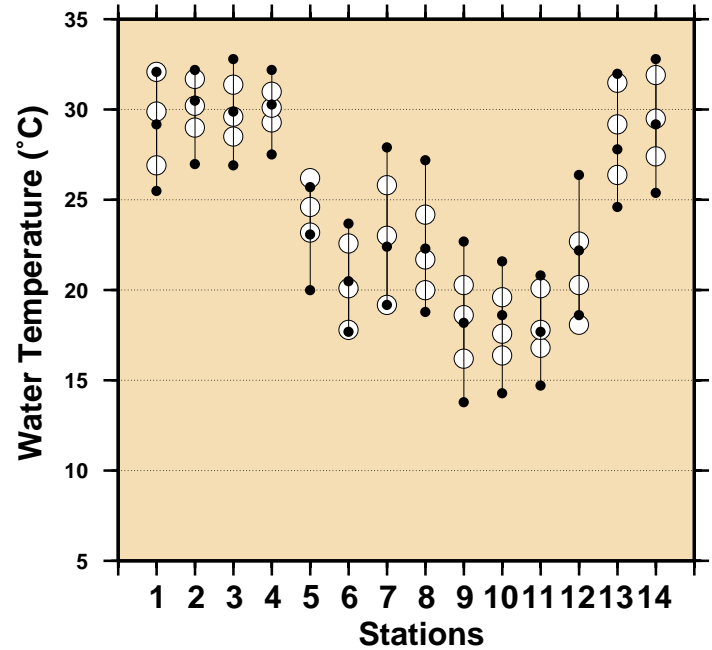
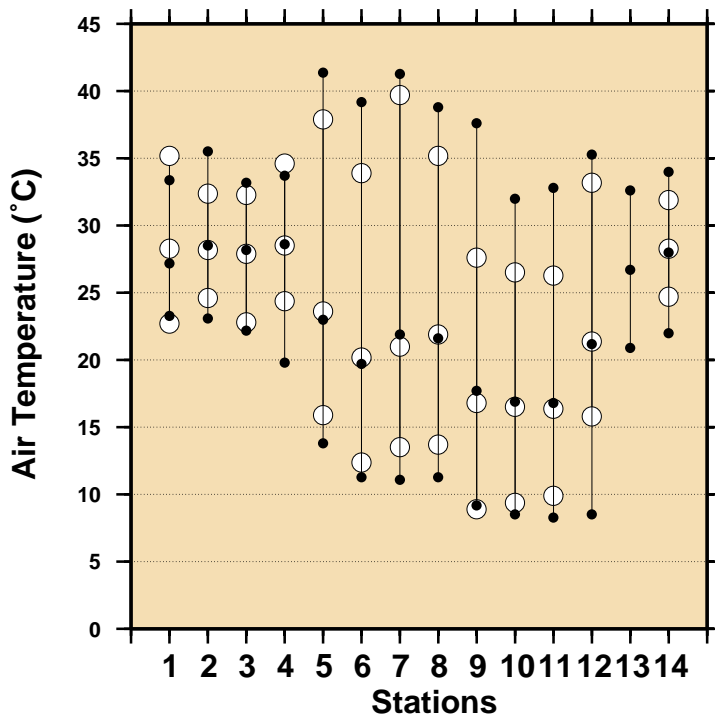


Figure 14

Comparison of February 2004 Max, Min & Mean with Long Term February Values.



Stations

- 1 - Cocos Islands
- 2 - Groote Eylandt
- 3 - Darwin
- 4 - Broome
- 5 - Hillarys
- 6 - Esperance
- 7 - Thevenard
- 8 - Port Stanvac
- 9 - Portland
- 10 - Burnie
- 11 - Spring Bay
- 12 - Port Kembla
- 13 - Rosslyn Bay
- 14 - Cape Ferguson

- February 2004 Maximum
- February 2004 Mean
- February 2004 Minimum
- Long Term February Maximum
- Long Term February Mean
- Long Term February Minimum

Figure 15 SEA LEVEL DATA RETURN

THE NUMBER OF DAYS OF MISSING DATA ARE INDICATED
GAPS INCLUDE TRANSMISSION, POWER AND LOGGER FAILURE

* Patchy record

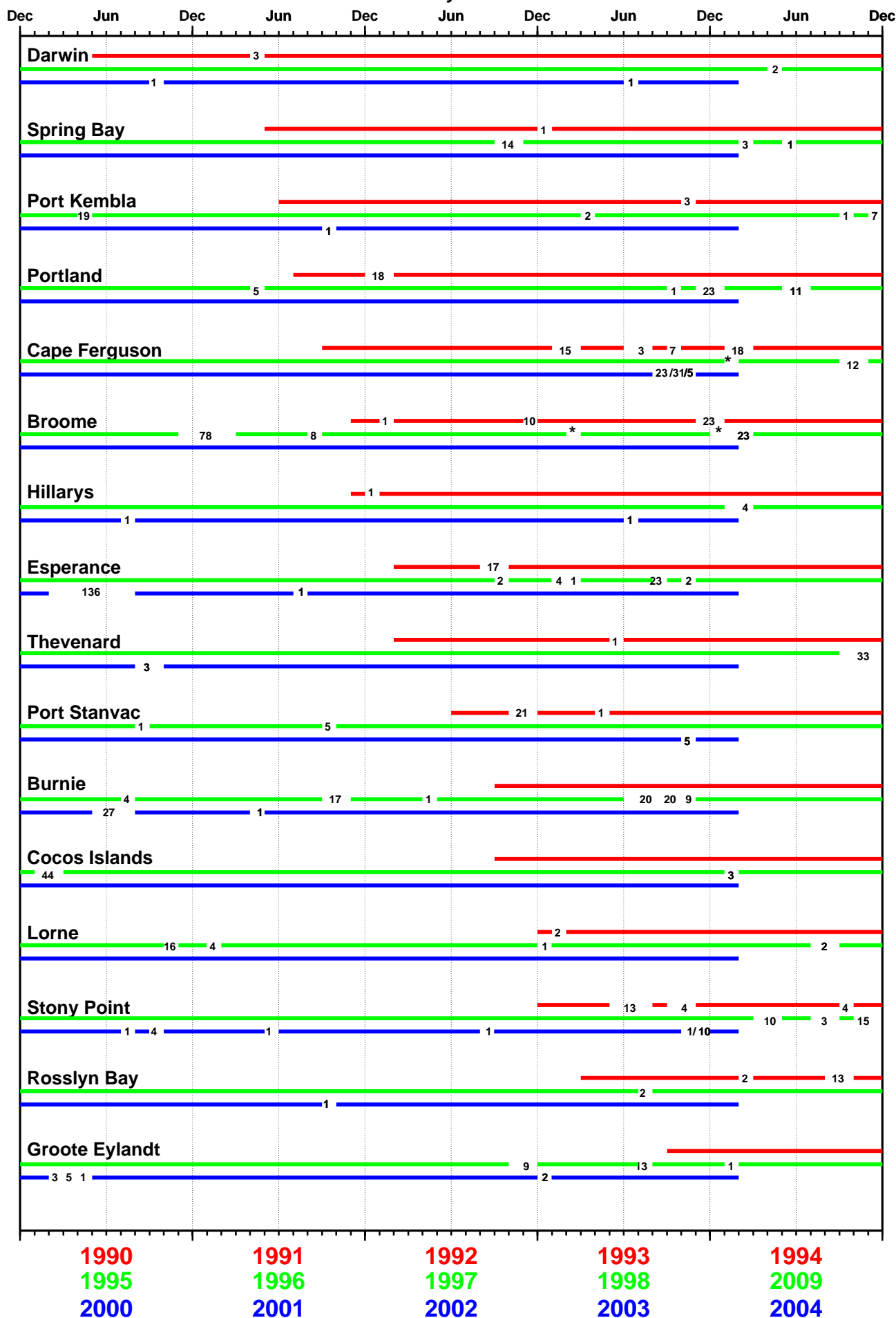


Figure 16

MONTHLY MEAN SEA LEVELS TO FEBRUARY 2004 (m)

The zero line represents an arbitrary fixed offset from the zero of the tide gauge.

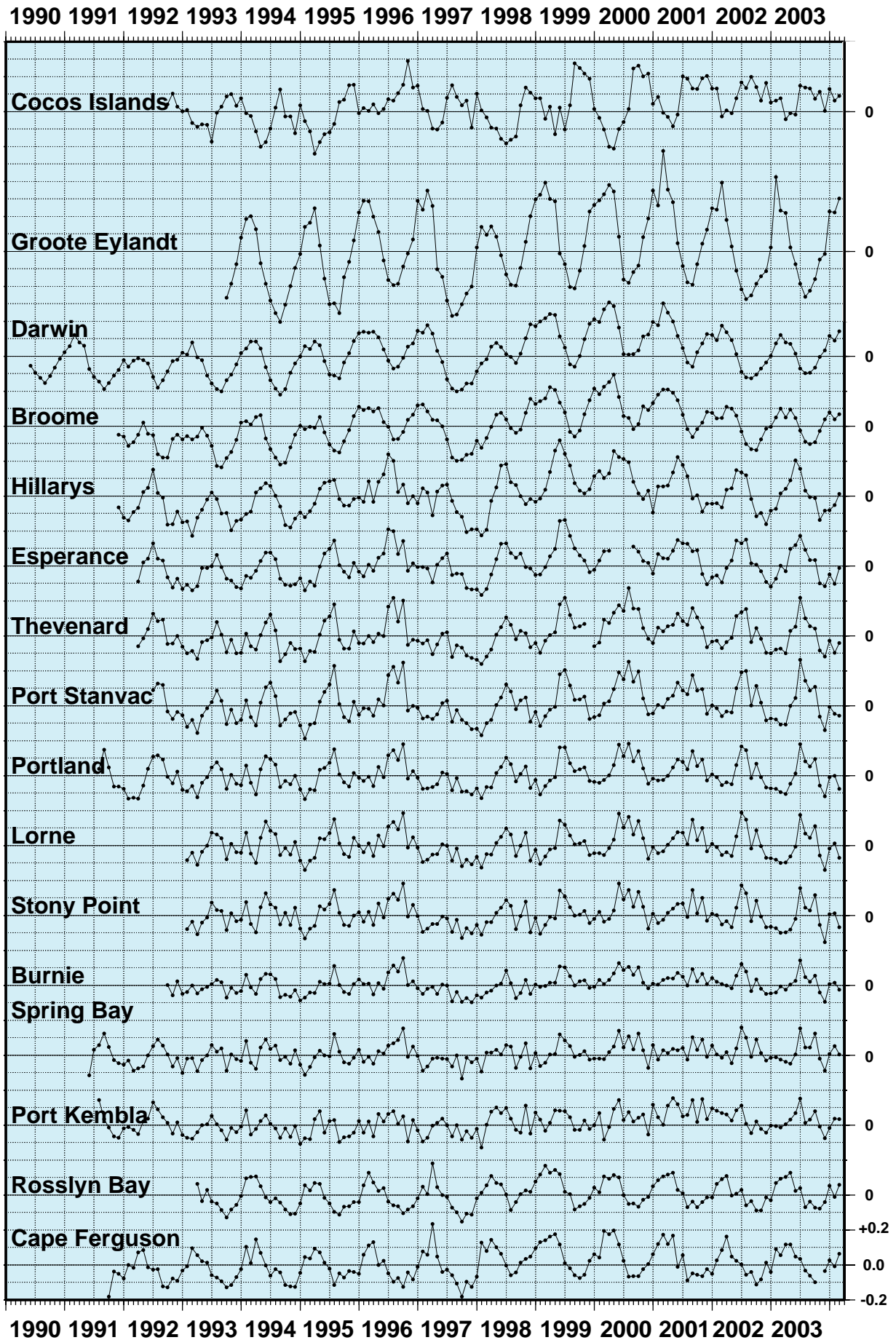


Figure 17

SEA LEVEL TRENDS THROUGH FEBRUARY 2004 (mm/year)

