

THE AUSTRALIAN BASELINE SEA LEVEL MONITORING PROJECT

MONTHLY DATA REPORT

FEBRUARY 2003



This report was prepared under the Australian Greenhouse Science Program for the Australian Greenhouse Office, supported by NTF Australia at the Flinders University of South Australia.



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Quality Certification:

I authorise the issue of this Australian Baseline Sea Level Monitoring Project Monthly Data Report for February 2003 in accordance with National Tidal Facility Australia Quality Assurance procedures.

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The Australian Baseline Sea Level Monitoring Project

Monthly Data Report

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NOTES ON THE DATA FOR FEBRUARY 2003

Sea level data return in February was excellent at most stations (Figures 1 and 15). The exceptions were: Groote Eylandt (gauge reset), Burnie (calibration and maintenance), Rosslyn Bay (unknown cause) and Cape Ferguson (unknown cause). Small gaps of less than 24 hours remain in the data from these gauges. The phone link to the Groote Eylandt gauge was restored and all available February data retrieved.

The residuals (Figures 2 and 3), or 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) and may result in elevated or depressed sea level observations.

The wind speeds and gusts at Stony Point were recording zero values for relatively long periods throughout February. These erroneous values and the corresponding incident winds have been removed (Figures 4, 5 and 6).

The sea level anomalies (Figure 10) remained negative at most sites in February. The only exceptions being Groote Eylandt where the sea level anomalies changed from positive to negative and Cocos Islands where the sea level anomalies changed from negative to positive.

The barometric pressure anomalies (Figure 11) remained positive at Groote Eylandt, Portland, Burnie and Spring Bay in February but changed from positive to negative at the other sites.

With regard to the water and air temperature anomalies in Figures 12 and 13 respectively, it must be noted that there are large gaps in the data for several stations, where the data collected appeared to be erroneous.

It is difficult to relate the water and air temperature anomalies directly to those of barometric pressure and sea level without considering other effects, such as localised currents, wind speeds and directions. However, the anomalies are very useful in controlling the quality of the water and air temperature data at the Baseline stations.

Figure 16 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 temperatures for February 2003 were generally consistent with the long term February means. Record maximum air temperatures were recorded at

Cocos Islands (36.4°C) and Darwin (34.0°C) in February. Record minimum air temperatures were recorded at Cocos Islands (23.0°C), Burnie (8.2°C) and Rosslyn Bay (20.4°C) in February.

The mean water temperatures recorded at all sites in February 2003 were generally consistent with the long-term February values. A record maximum water temperature was recorded at Cocos Islands (33.2°C) and Broome (32.6°C) in February. No record minimum water temperatures were recorded in February 2003.

The mean barometric pressures in February 2003 were generally consistent with the long-term February values at most sites. No record maximum barometric pressures were recorded in February 2003. Record minimum Barometric pressures were recorded at Broome (986.0 hPa), Rosslyn Bay (997.6 hPa) and Cape Ferguson (996.2 hPa) in February 2003.

Figure 14 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 14) and the change in trend with respect to the analysis of the previous month.

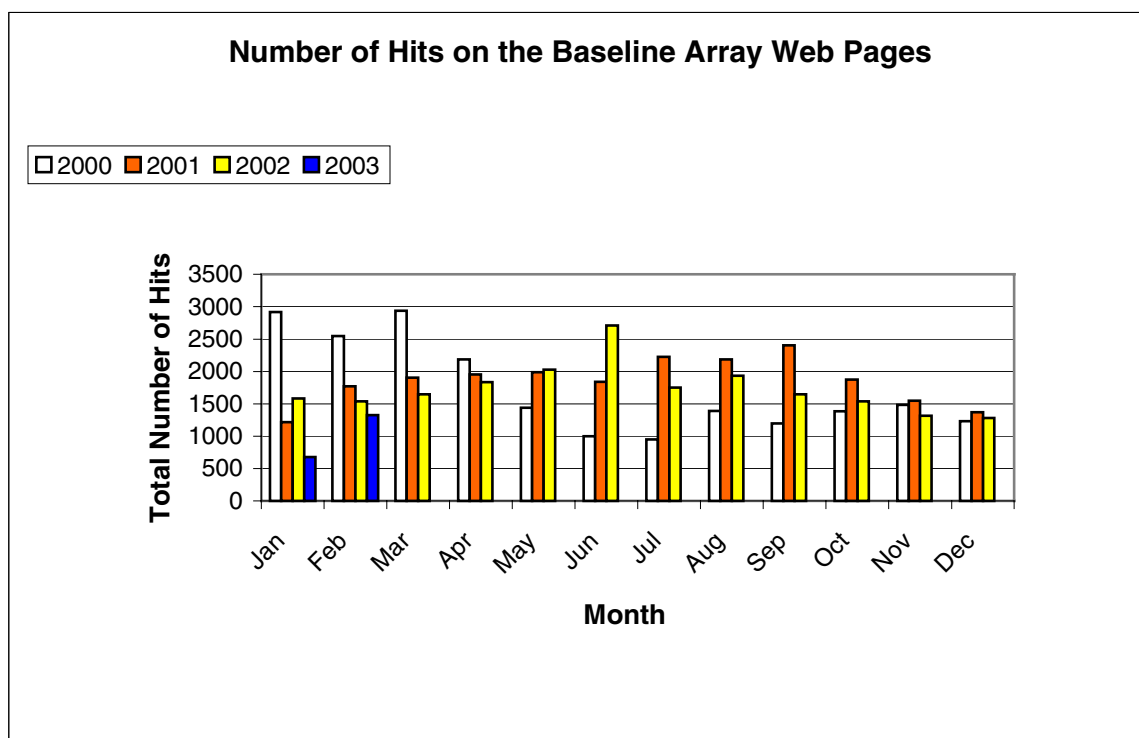
Table 1: Tide gauge installation dates, short-term sea level trends and change in trend from the previous month for the Australian Baseline array to February 2003.

Location	Installation Date	Sea Level Trend (mm/yr)	Change from previous month
Cocos Islands	Sep 1992	+12.9	+0.2
Groote Eylandt	Sep 1993	+18.8	-0.9
Darwin	May 1990	+13.6	-0.2
Broome	Nov 1991	+17.5	-0.2
Hillarys	Nov 1991	+13.3	-0.1
Esperance	Mar 1992	+9.7	0.0
Thevenard	Mar 1992	+7.8	-0.2
Port Stanvac	Jun 1992	+8.3	-0.3
Portland	Jul 1991	+4.3	-0.2
Lorne	Jan 1993	+3.6	-0.3
Stony Point	Jan 1993	+3.4	-0.3
Burnie	Sep 1992	+4.7	-0.1
Spring Bay	May 1991	+4.2	-0.1
Port Kembla	Jul 1991	+6.0	-0.1
Rosslyn Bay	Jun 1992	+4.9	-0.1
Cape Ferguson	Sep 1991	+6.3	-0.3

Figure 17 shows the monthly mean sea levels with respect to an arbitrary fixed offset from the zero of the tide gauge. This plot clearly shows significant correlation in seasonal signals between stations, in contrast to the sea level anomalies plot (Figure 10), which has the seasonal signal removed from the data.

The number of hits to the Australian Baseline Sea Level Monitoring project web pages from 2000 to February 2003 is given in Table 2.

Table 2: Number of hits on the Australian Baseline Sea Level Monitoring Project web pages from 2000 to 2003.



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 NTF Australia for Environment Australia. Staff members produce the text, plots and tables.

Further information on the *Monthly Data Report* and other projects conducted by NTF Australia can be obtained from the following address.

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

Figure 1

**FEBRUARY 2003
SIX MINUTE SEA LEVEL OBSERVATIONS (m)**

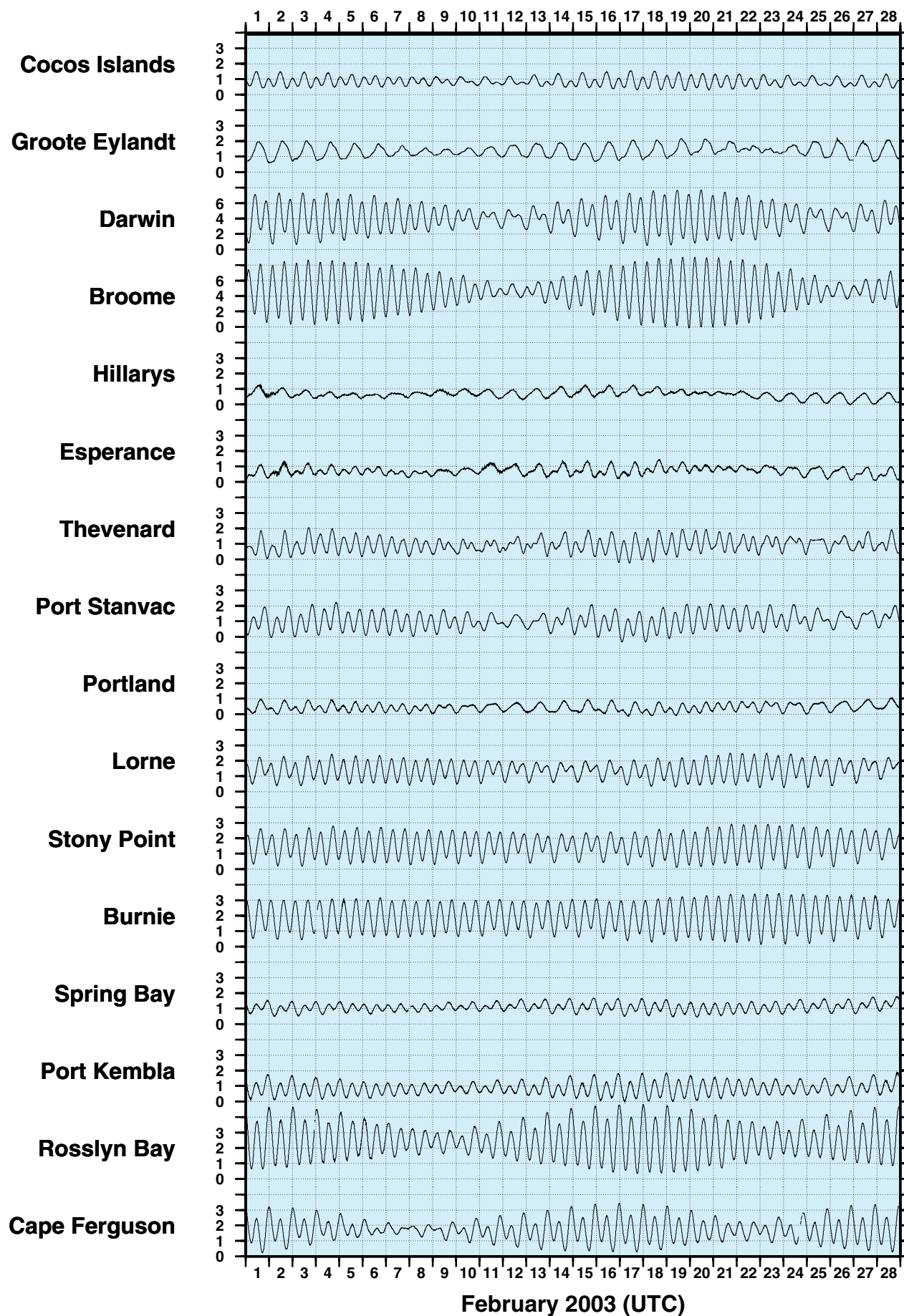


Figure 2

**FEBRUARY 2003
SIX MINUTE RESIDUAL WATER LEVELS (m)**

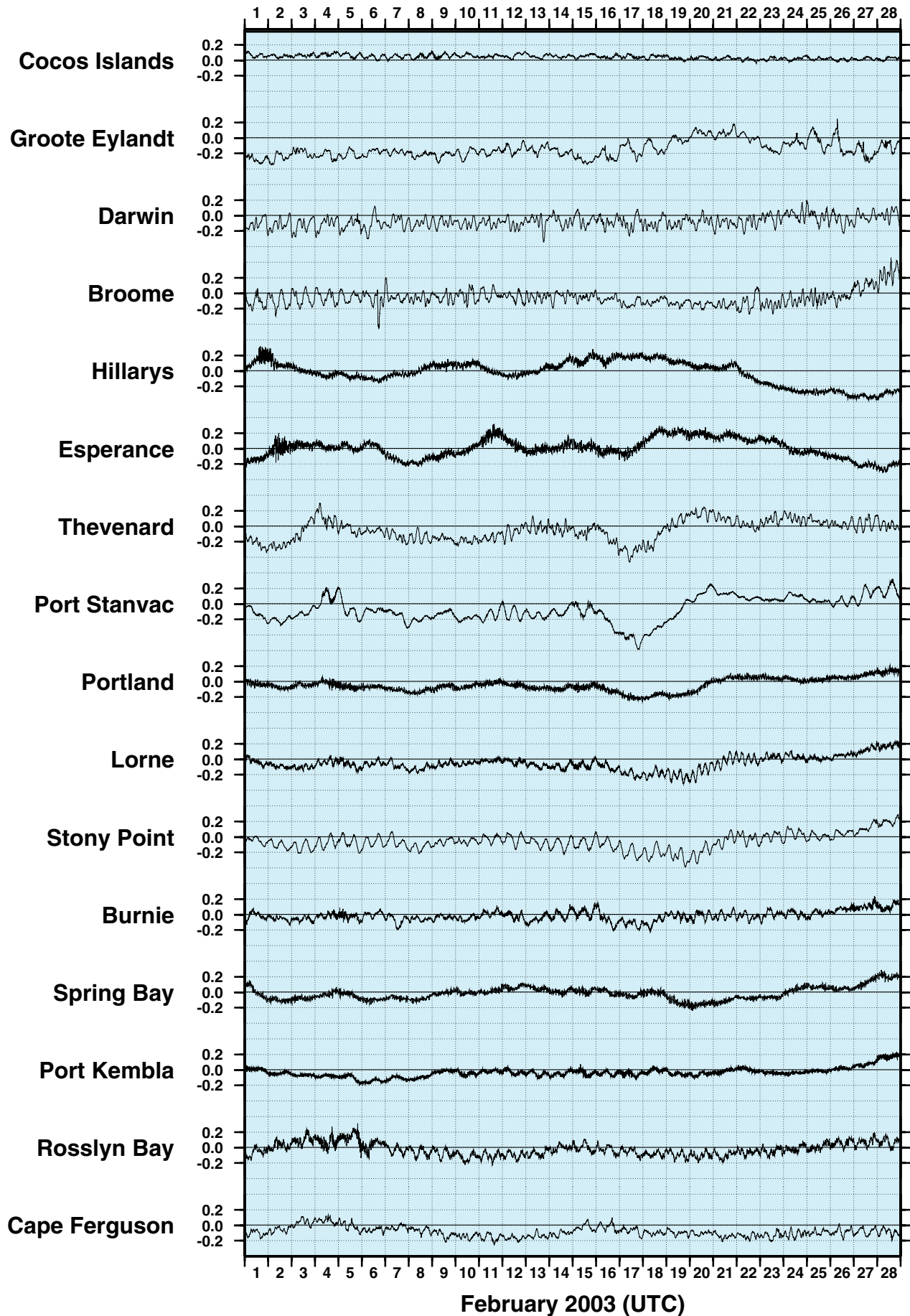


Figure 3
FEBRUARY 2003
SIX MINUTE RESIDUALS
ADJUSTED FOR ATMOSPHERIC PRESSURE (m)

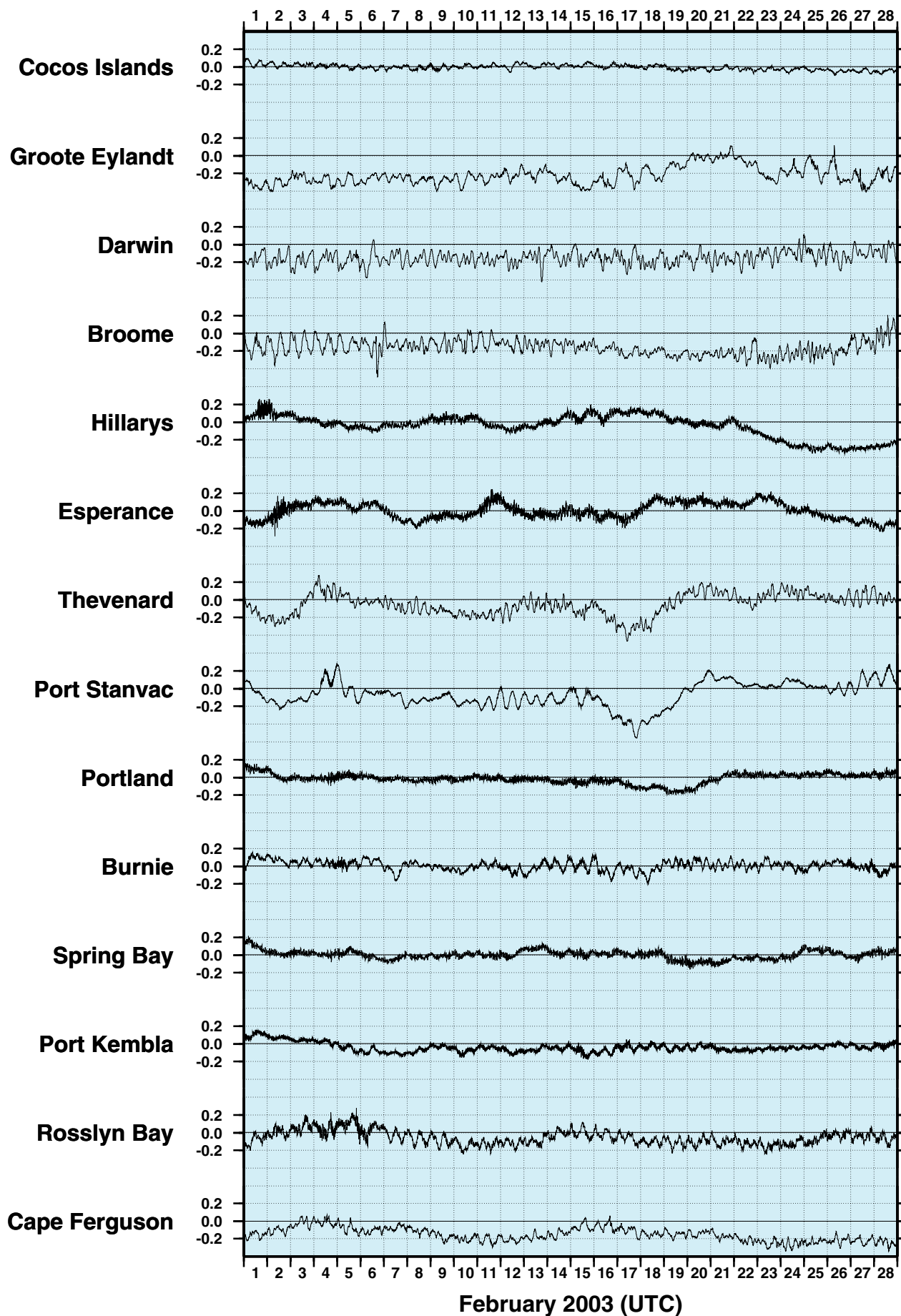


Figure 4

**FEBRUARY 2003
HOURLY WIND SPEEDS (m/s)**

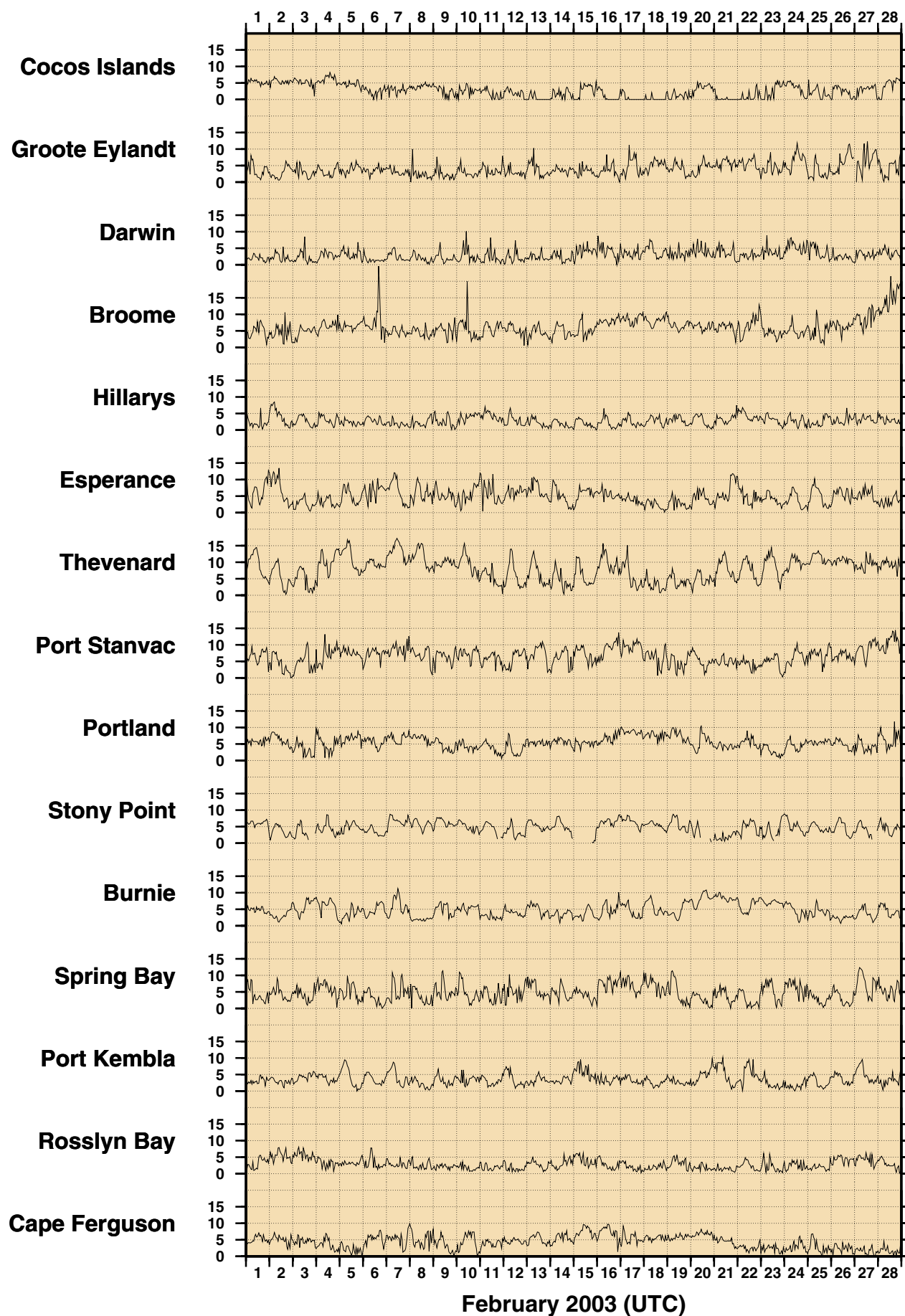


Figure 5

FEBRUARY 2003
HOURLY INCIDENT WINDS (m/s, deg True)

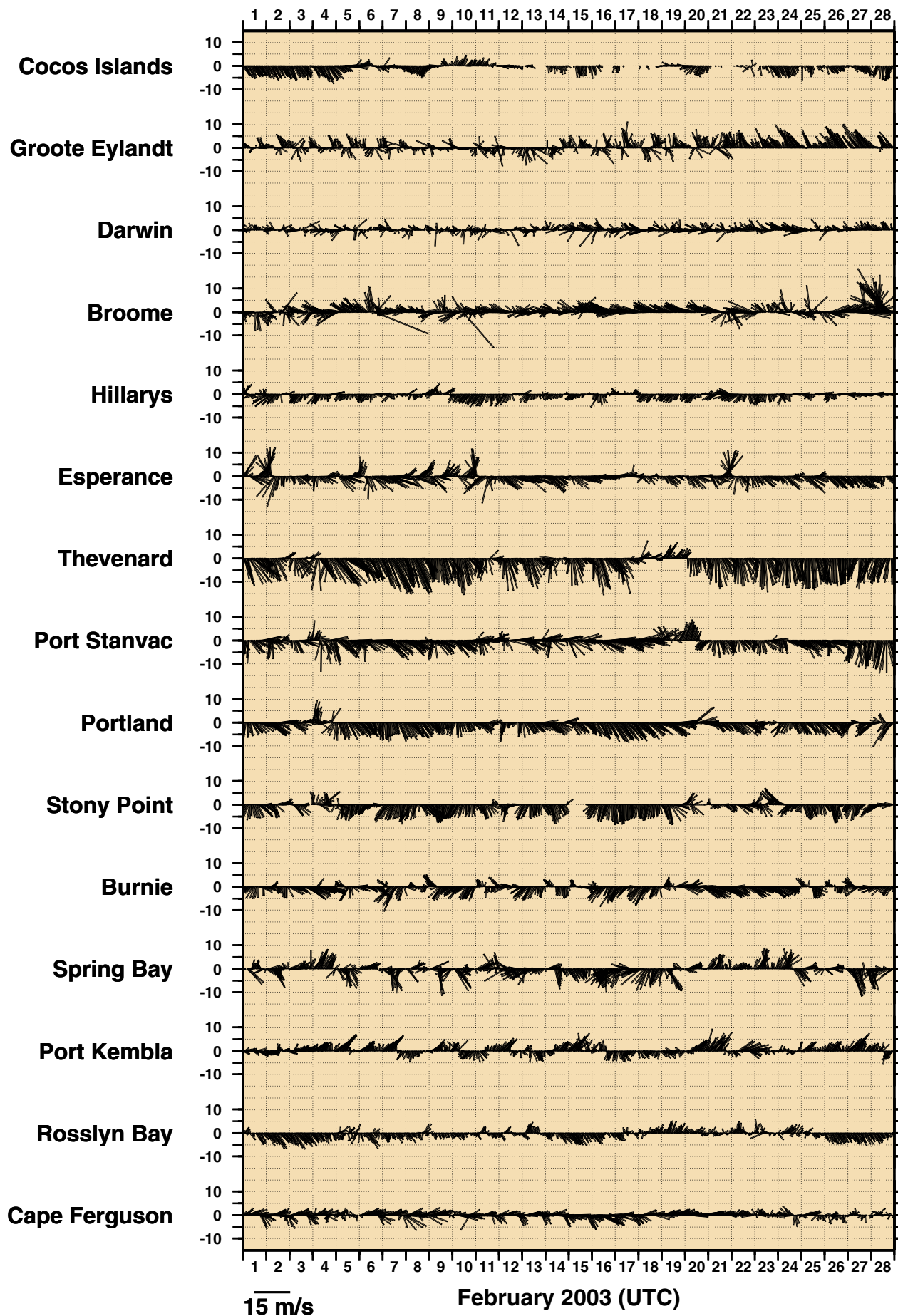


Figure 6

FEBRUARY 2003
HOURLY MAXIMUM WIND GUSTS (m/s)

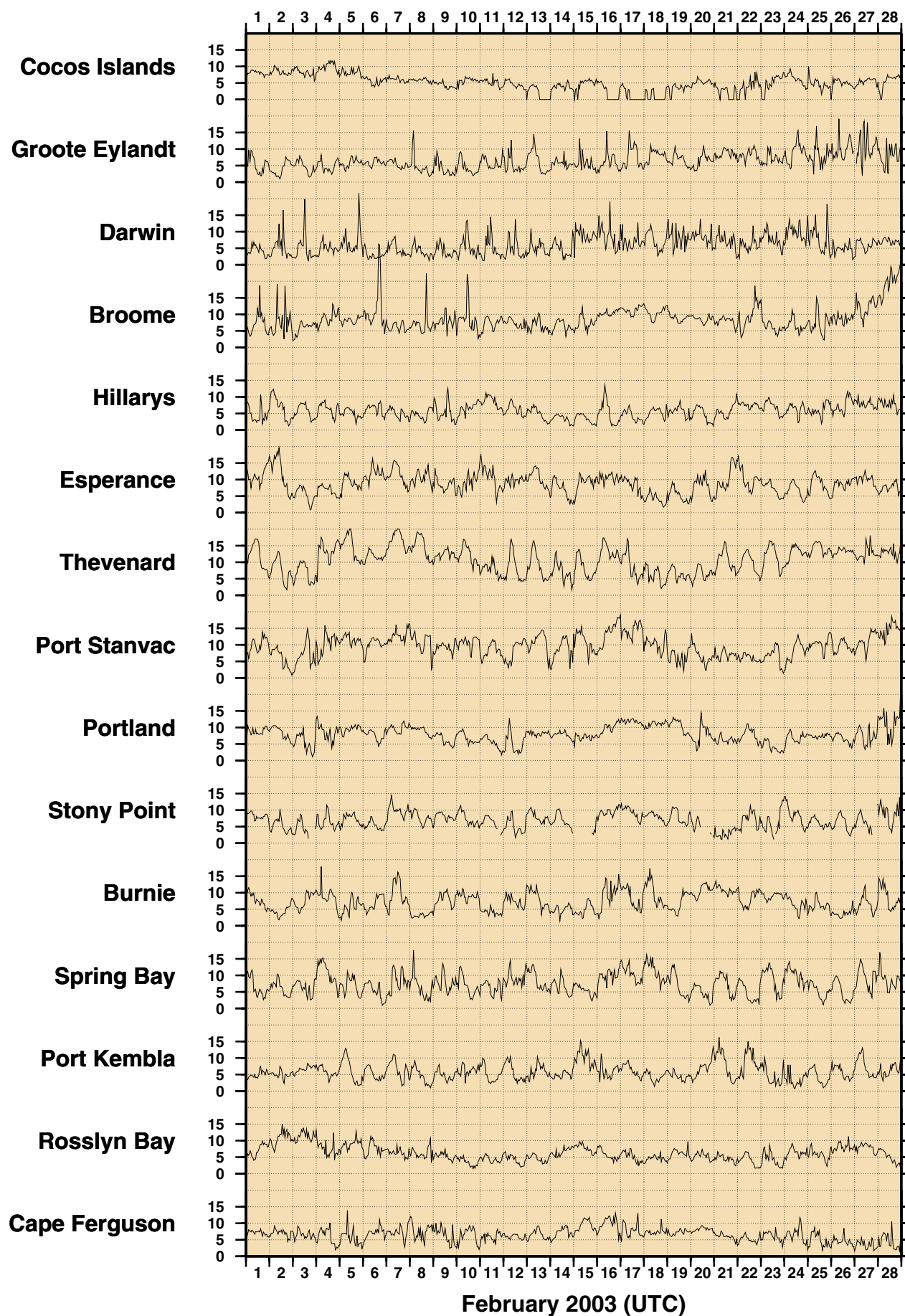


Figure 7

FEBRUARY 2003
HOURLY AIR TEMPERATURES (°C)

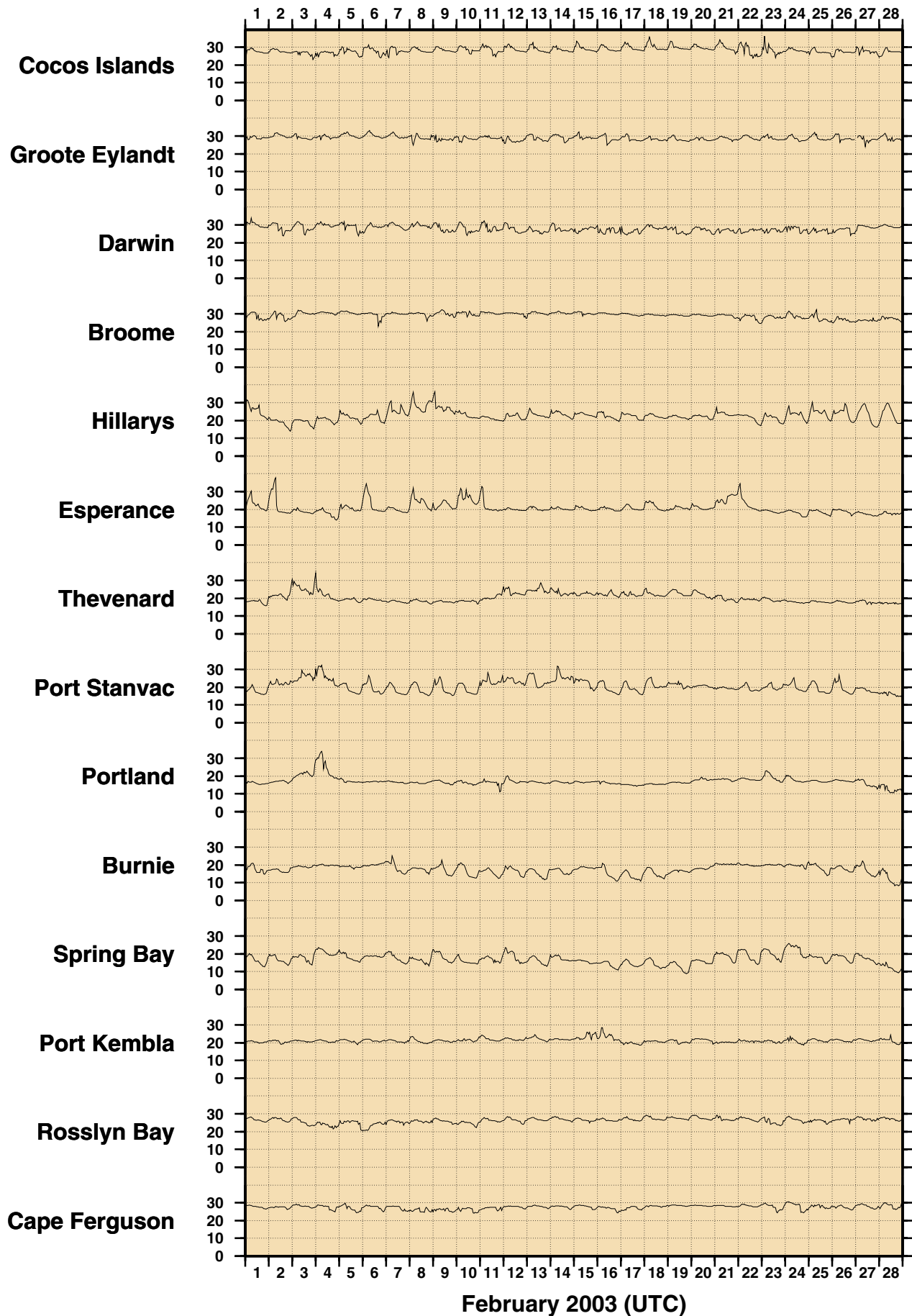


Figure 8

FEBRUARY 2003
HOURLY WATER TEMPERATURES (°C)

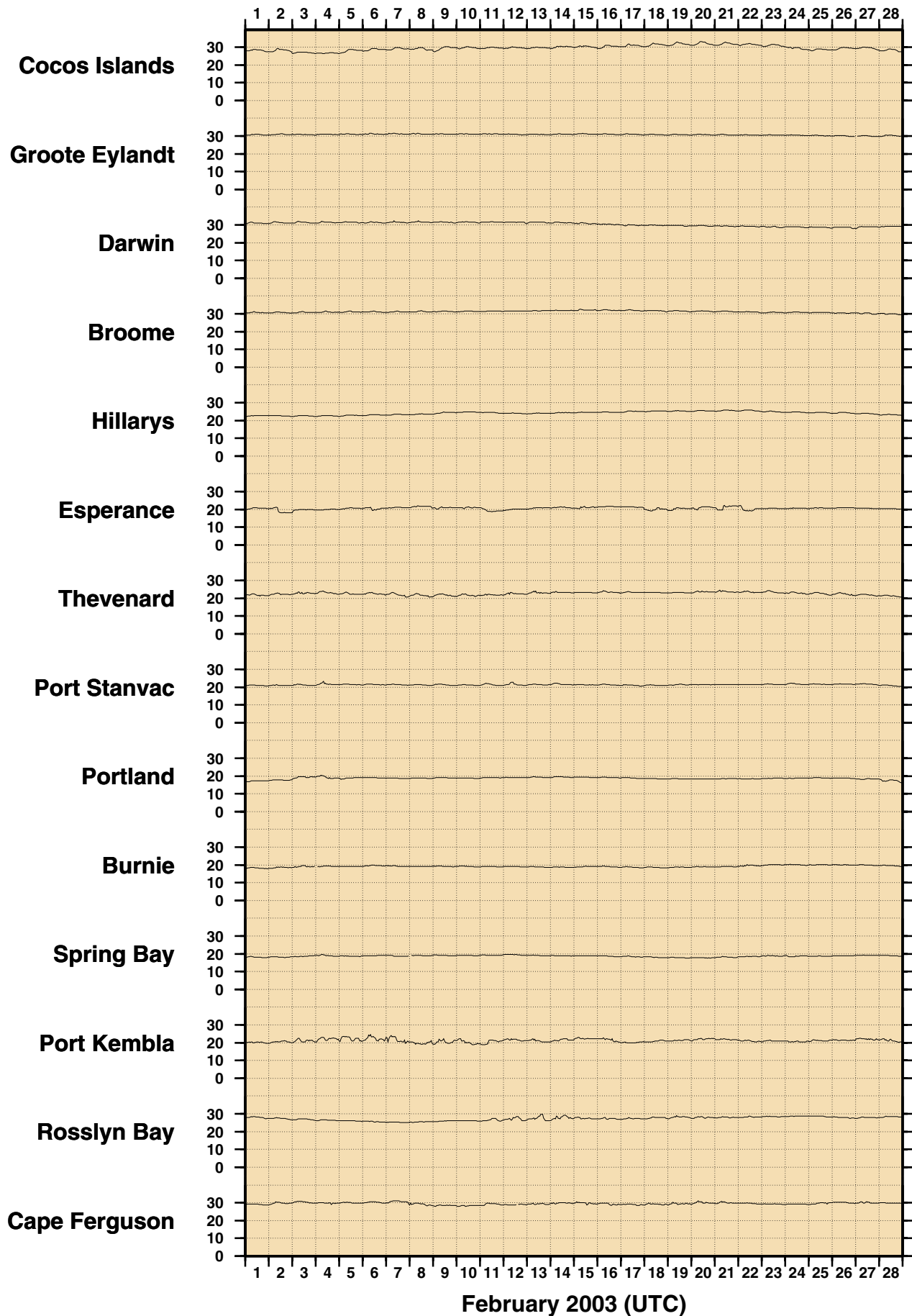


Figure 9

FEBRUARY 2003
HOURLY ATMOSPHERIC PRESSURE (hPa)

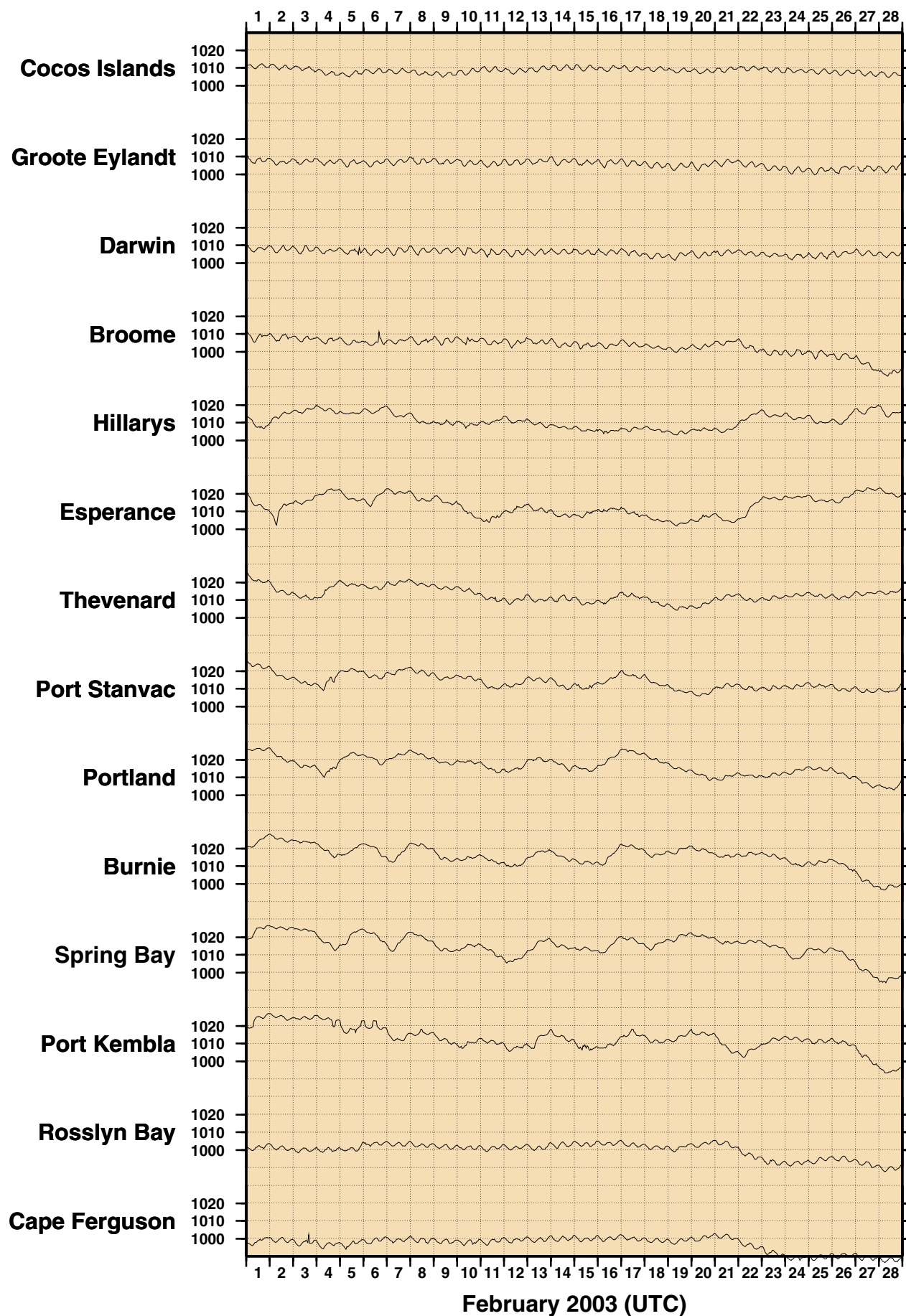


Figure 10
SEA LEVEL ANOMALIES THROUGH FEBRUARY 2003 (m)

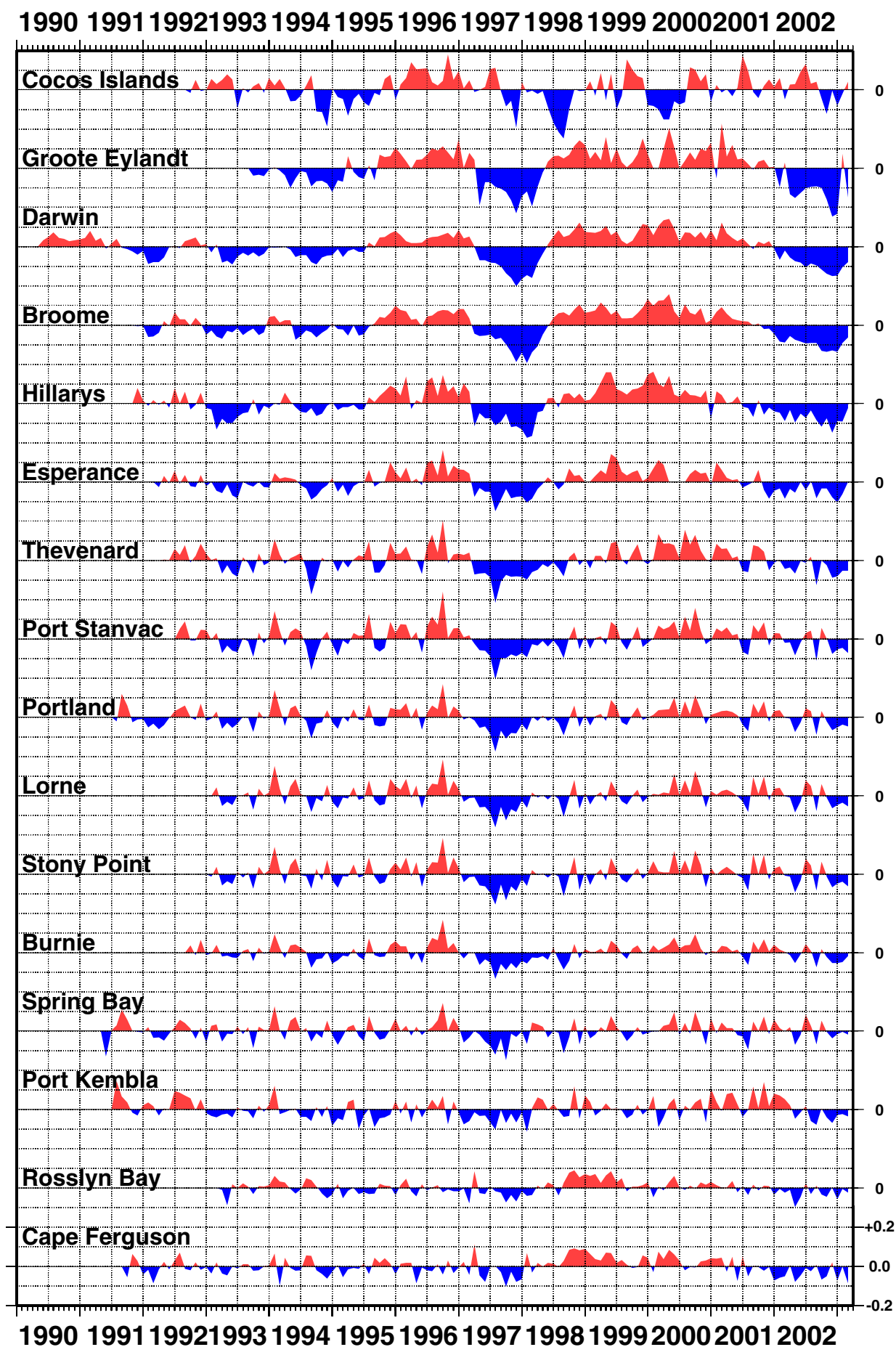


Figure 11

**BAROMETRIC PRESSURE ANOMALIES
THROUGH FEBRUARY 2003 (hPa)**

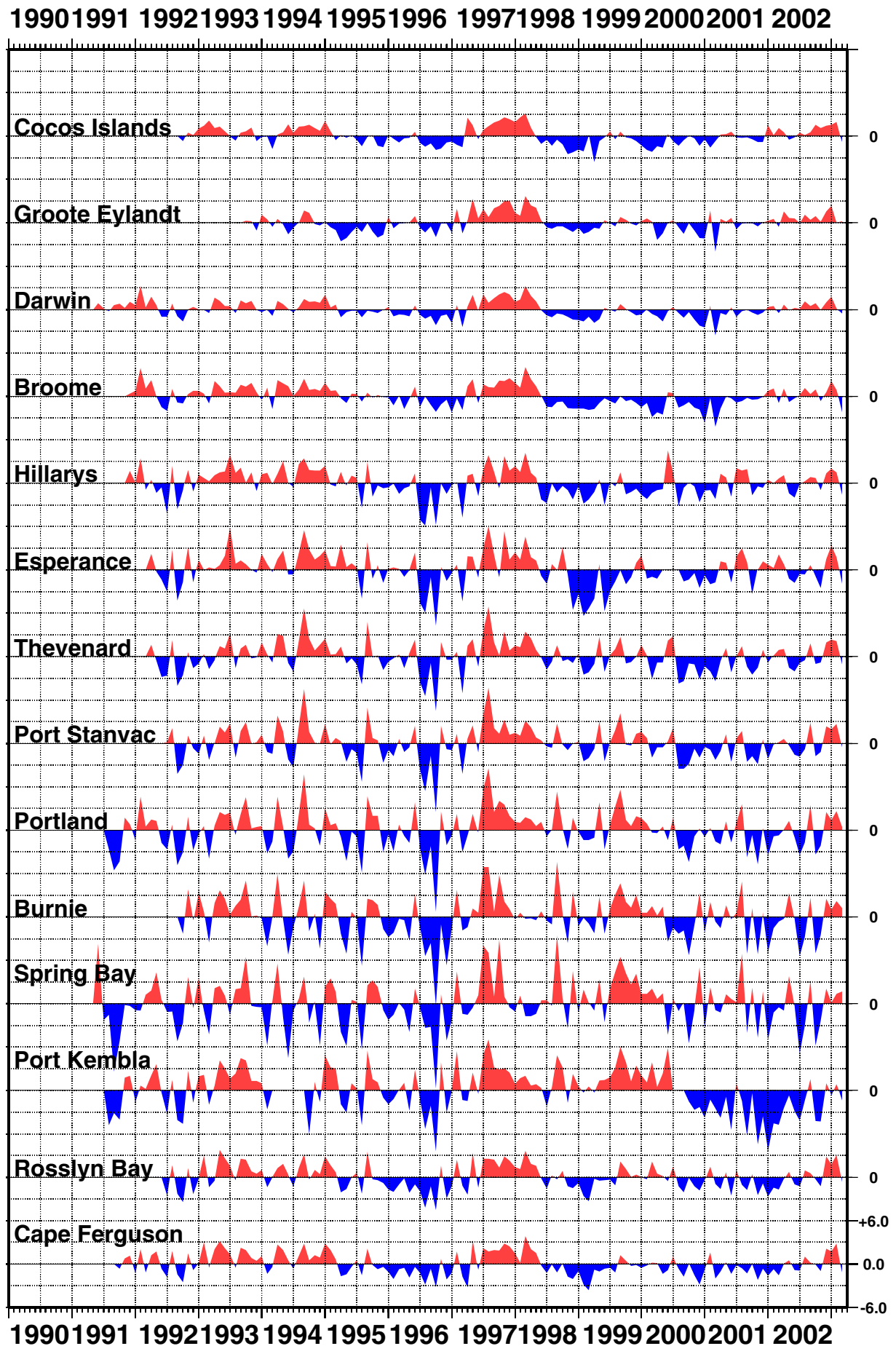


Figure 12

WATER TEMPERATURE ANOMALIES THROUGH FEBRUARY 2003 (°C)

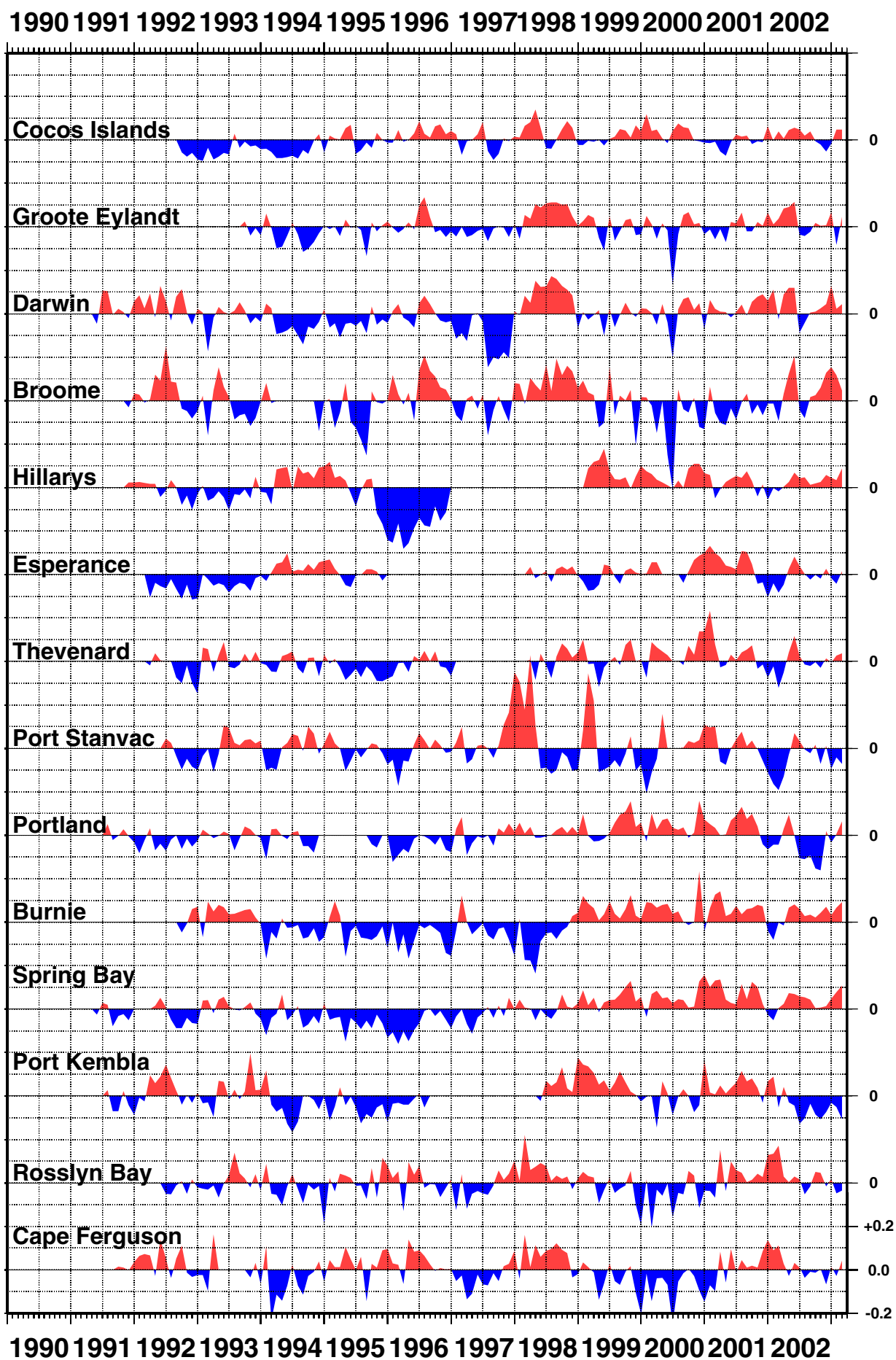


Figure 13

**AIR TEMPERATURE ANOMALIES
THROUGH FEBRUARY 2003 (°C)**

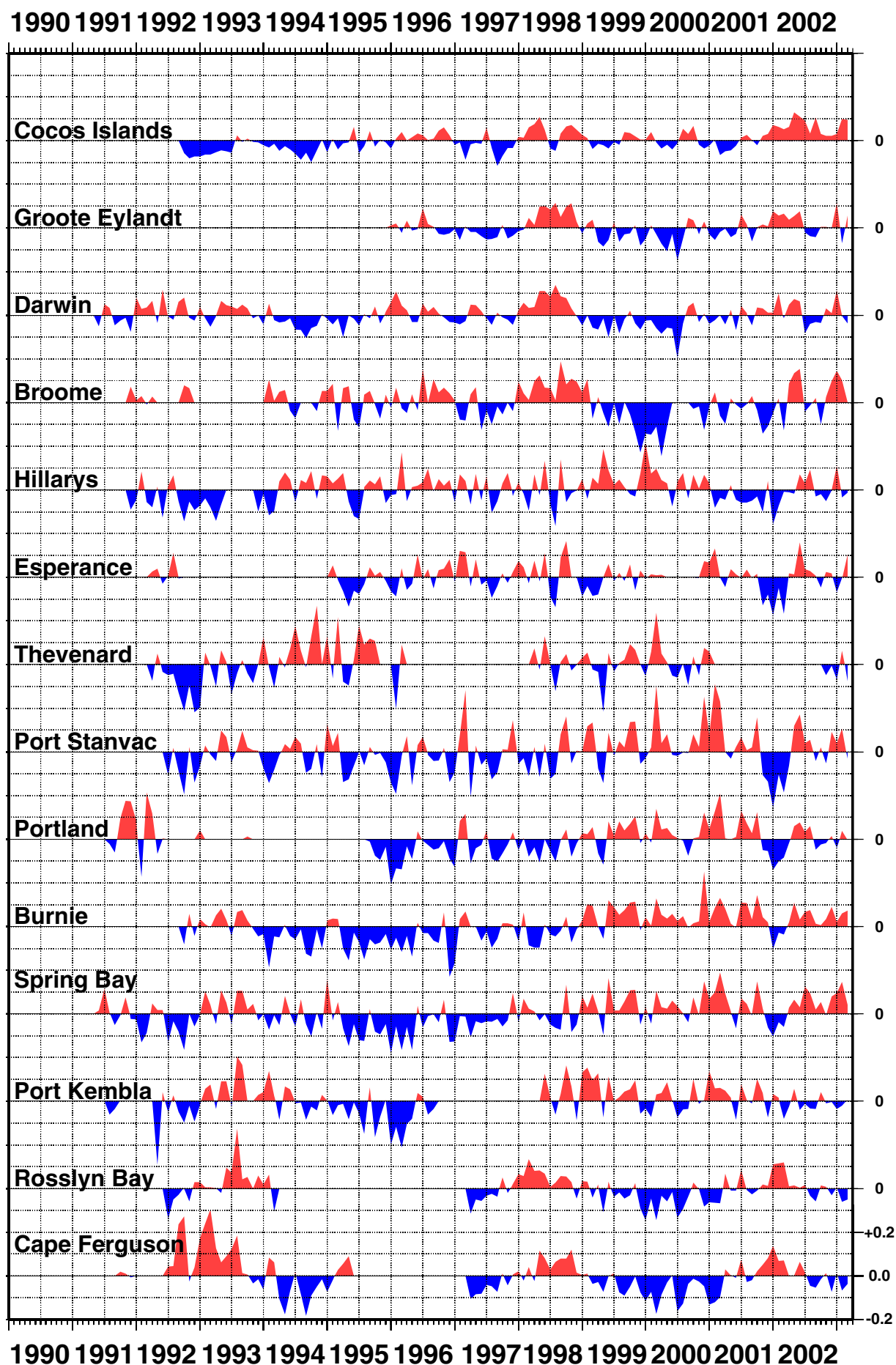


Figure 14

SEA LEVEL TRENDS THROUGH FEBRUARY 2003 (mm/year)

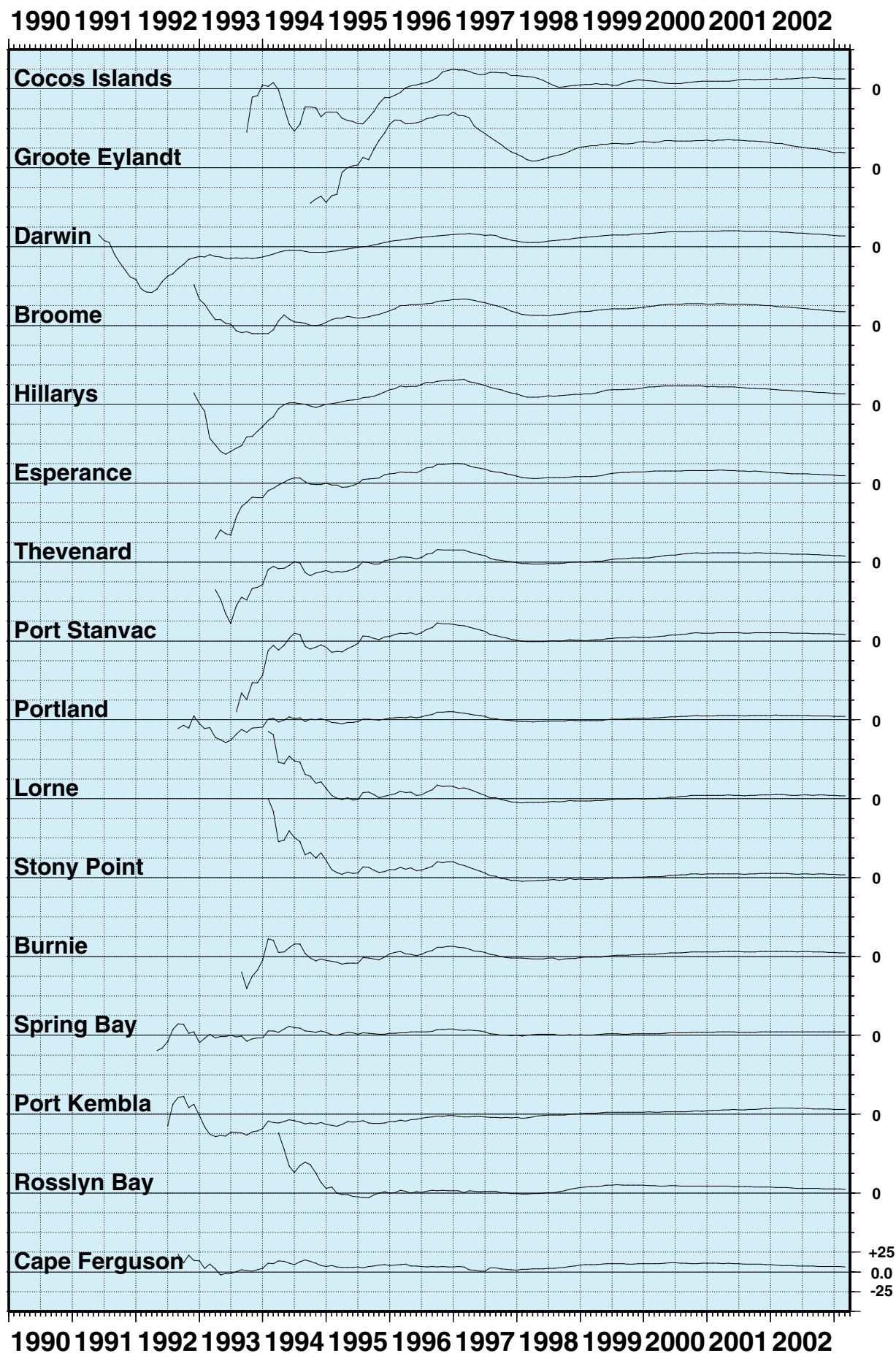


Figure 15 SEA LEVEL DATA RETURN

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

* Patchy record

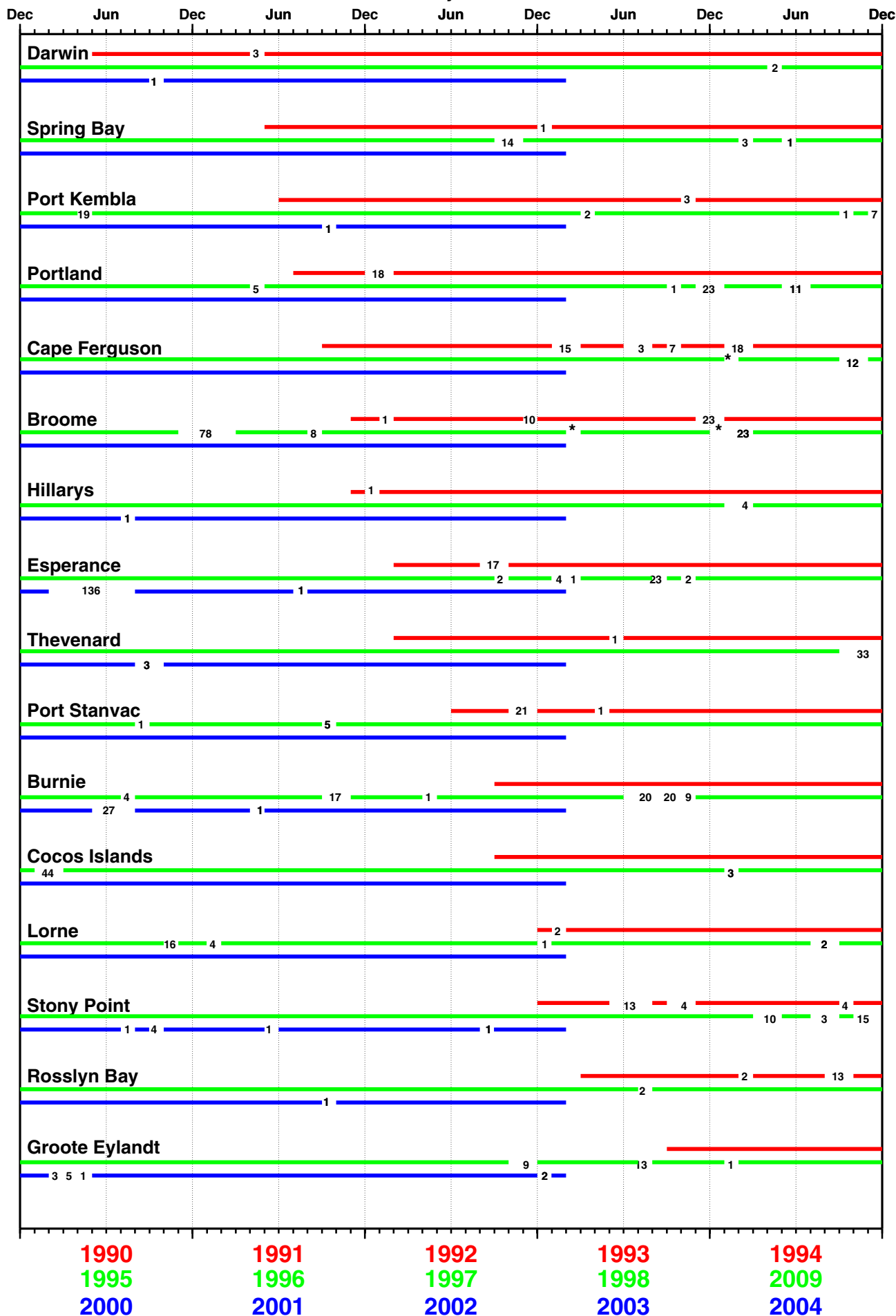
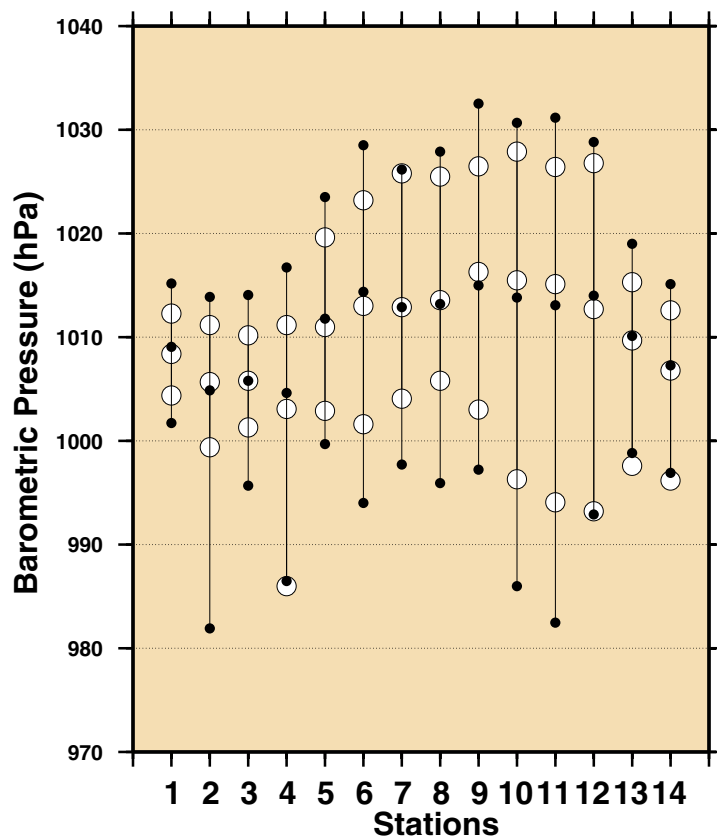
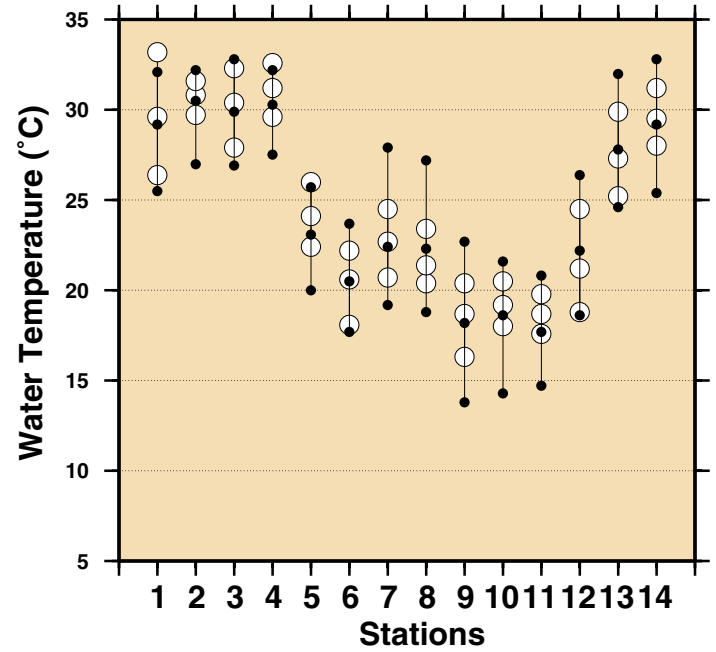
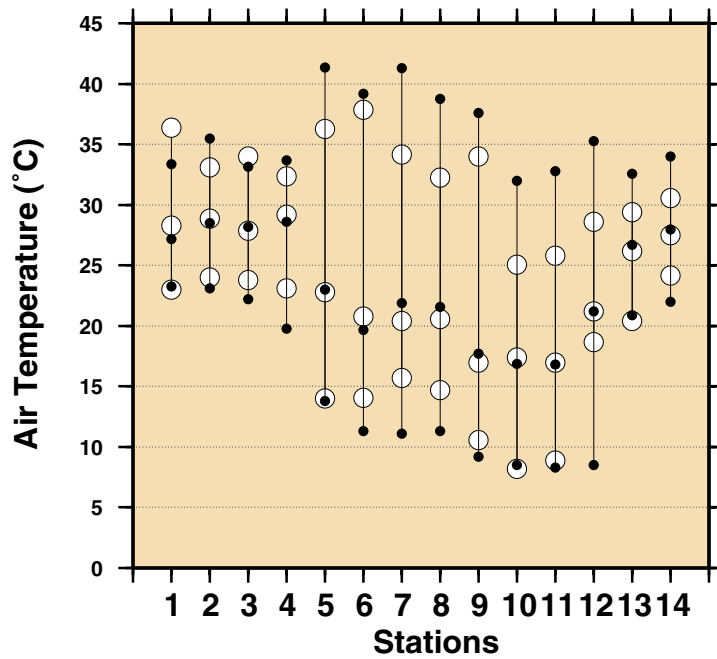


Figure 16
Comparison of February 2003 Max, Min & Mean with
Long Term February Values.



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 2003 Maximum
- February 2003 Mean
- February 2003 Minimum
- Long Term February Maximum
- Long Term February Mean
- Long Term February Minimum

Figure 17

MONTHLY MEAN SEA LEVELS TO FEBRUARY 2003 (m)

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

