

**THE AUSTRALIAN BASELINE SEA LEVEL
MONITORING PROJECT**

MONTHLY DATA REPORT

JUNE 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 June 2003 in accordance with National Tidal Facility Australia Quality Assurance procedures.

William Mitchell
A/Director - National Tidal Facility Australia

The Australian Baseline Sea Level Monitoring Project

Monthly Data Report

JUNE 2003

NOTES ON THE DATA FOR JUNE 2003

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

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 indicate elevated or depressed sea levels.

Wind speed and gust at Stony Point recorded zero values intermittently throughout June. These erroneous values and the corresponding incident wind directions have been removed (Figures 4, 5 and 6).

A break in the power supply is suspected to have caused the recording of erroneous wind directions at Groote Eylandt. The same system supplies power to the air and water temperature sensors (Figures 7 and 8), and as a consequence the data recorded by these sensors was also erroneous. The data for these three sensors have been removed from the record.

The sea level anomalies (Figure 10) continued to be negative at Groote Eylandt, Darwin, Broome, Hillarys and Esperance in June and changed from negative to positive at the other sites.

The barometric pressure anomalies (Figure 11) changed from negative to positive at Cocos Islands and from positive to negative at Burnie, Spring Bay, Rosslyn Bay and Cape Ferguson. The barometric pressure anomalies remained 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. The anomalies are primarily used to quality control 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 June values. Note that the long-term ranges are calculated using the historical sets of June data for each station *excluding* the current month of data.

For all stations the mean air temperatures for June 2003 were consistent with the long term June means. The maximum and minimum air temperatures were lower and higher respectively than those previously recorded in June.

The mean water temperatures recorded at most sites in June 2003 were consistent with the long-term June values. Maximum water temperatures at Burnie (15.4°C), Spring Bay (14.1°C), and Cape Ferguson (25.7°C) slightly exceeded previous maxima during June 2003, while minimum water temperatures were within those previously reported in June.

The mean barometric pressures in June 2003 were consistent with the long-term June values at most sites. The maximum barometric pressure recorded at Hillarys (1035.0 hPa) in June 2003 slightly exceeded previously recorded maxima in June. Minimum barometric pressures were higher than those previously recorded in June.

Figure 16 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.

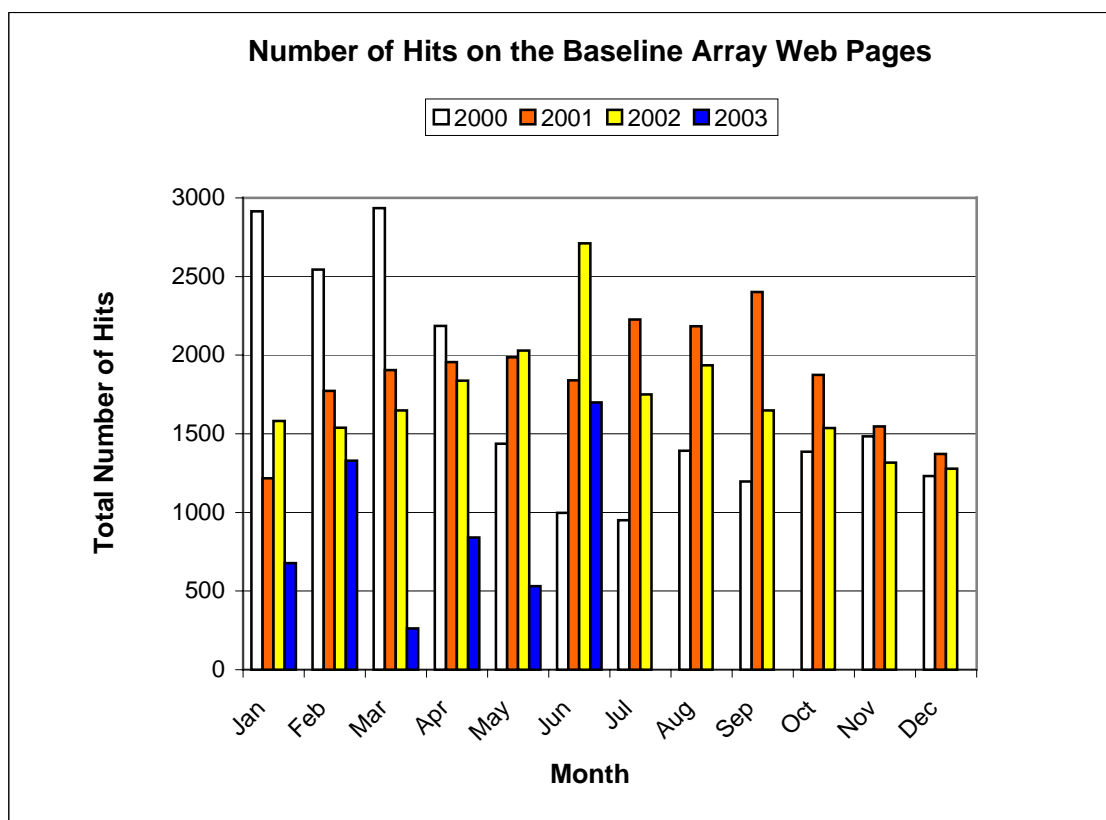
Figure 17 shows the short-term sea level trends for each SEAFRAME location included in the Australian Baseline Sea Level Monitoring Project. Table 1 lists the commencement of operation, the sea level trend for the entire record (plotted in Figure 17) and the change in trend with respect to the analysis 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 June 2003.

Location	Installation Date	Sea Level Trend (mm/yr)	Change from previous month
Cocos Islands	Sep 1992	+13.2	+0.4
Groote Eylandt	Sep 1993	+16.4	-0.4
Darwin	May 1990	+12.4	-0.3
Broome	Nov 1991	+15.9	-0.3
Hillarys	Nov 1991	+12.7	-0.2
Esperance	Mar 1992	+9.3	0.0
Thevenard	Mar 1992	+7.2	+0.3
Port Stanvac	Jun 1992	+7.7	+0.4
Portland	Jul 1991	+3.7	+0.2
Lorne	Jan 1993	+2.8	+0.3
Stony Point	Jan 1993	+2.4	+0.3
Burnie	Sep 1992	+4.5	+0.3
Spring Bay	May 1991	+3.9	+0.3
Port Kembla	Jul 1991	+5.8	+0.2
Rosslyn Bay	Jun 1992	+4.9	+0.1
Cape Ferguson	Sep 1991	+6.1	+0.1

The number of hits to the Australian Baseline Sea Level Monitoring project web pages from 2000 to June 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

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

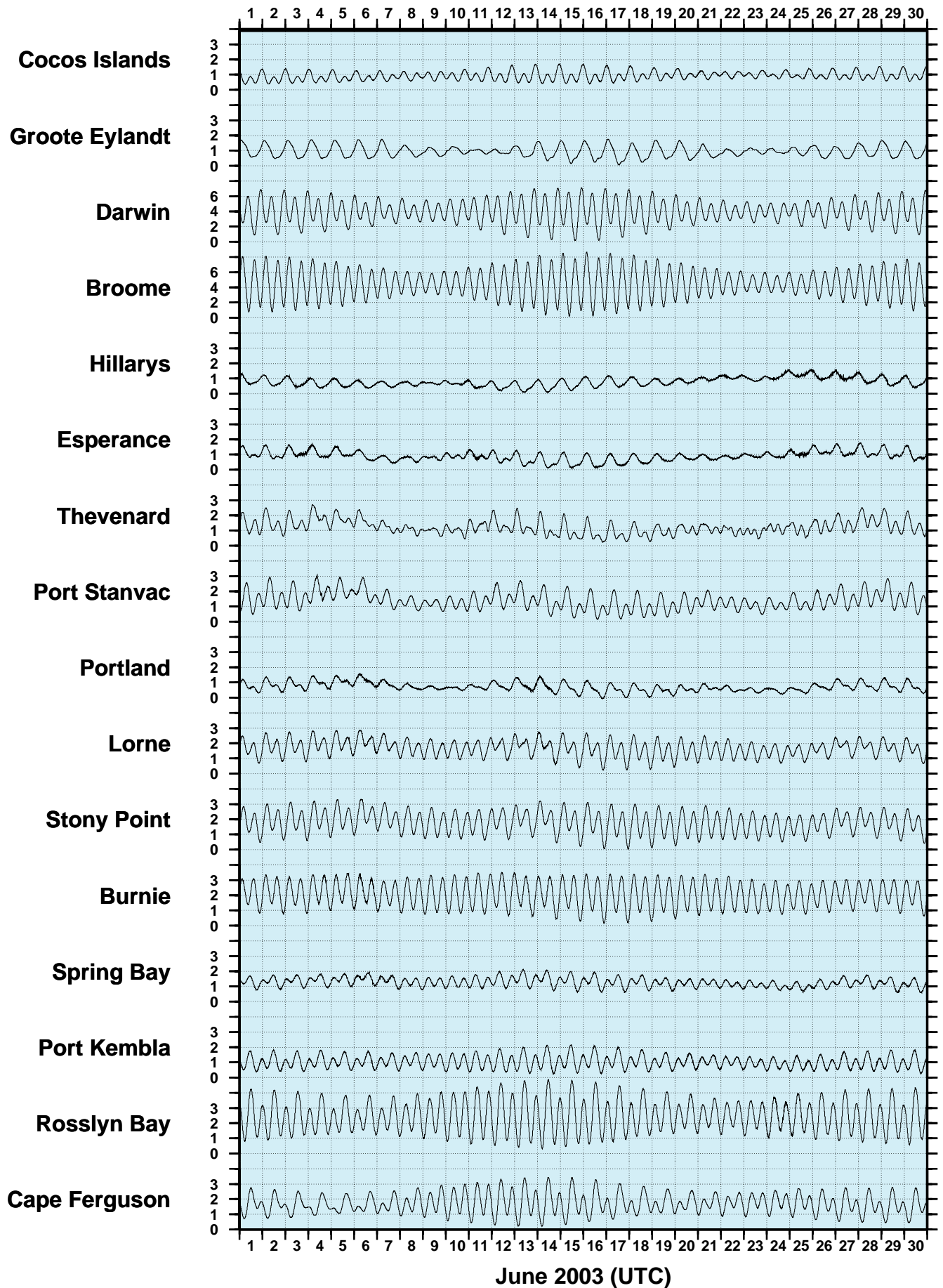


Figure 2
JUNE 2003
SIX MINUTE RESIDUAL WATER LEVELS (m)

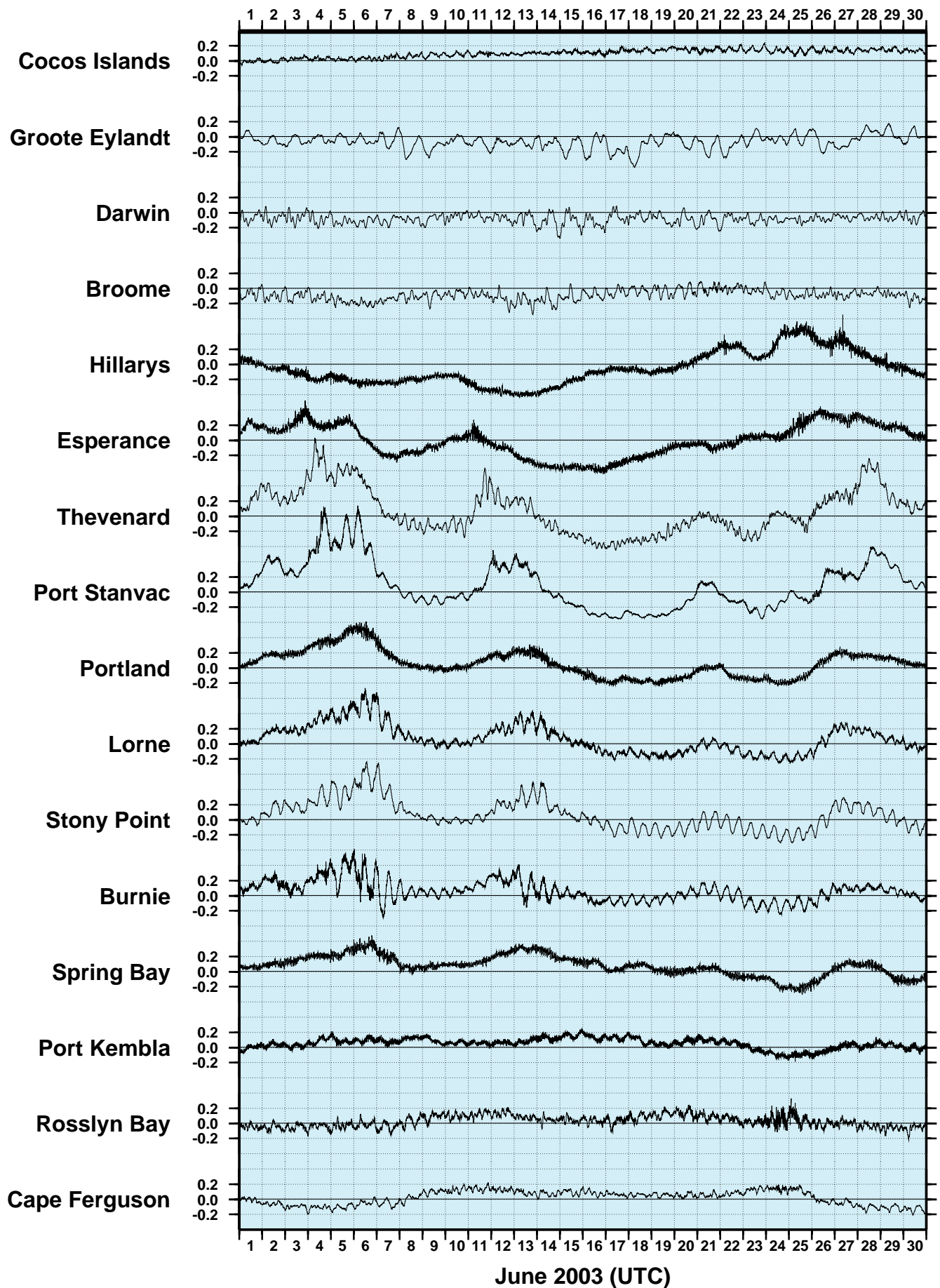


Figure 3
JUNE 2003
SIX MINUTE RESIDUALS
ADJUSTED FOR ATMOSPHERIC PRESSURE (m)

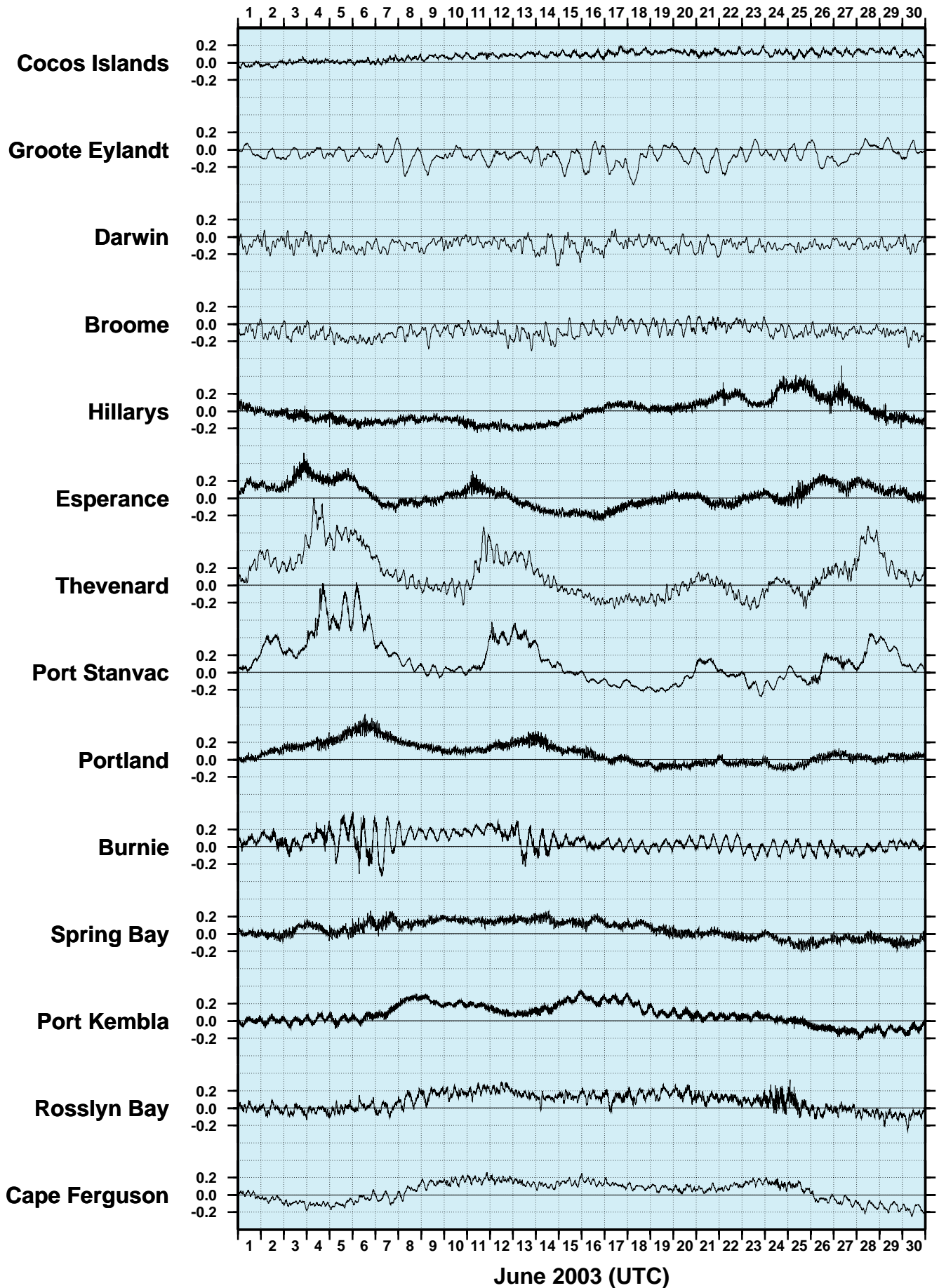


Figure 4

JUNE 2003
HOURLY WIND SPEEDS (m/s)

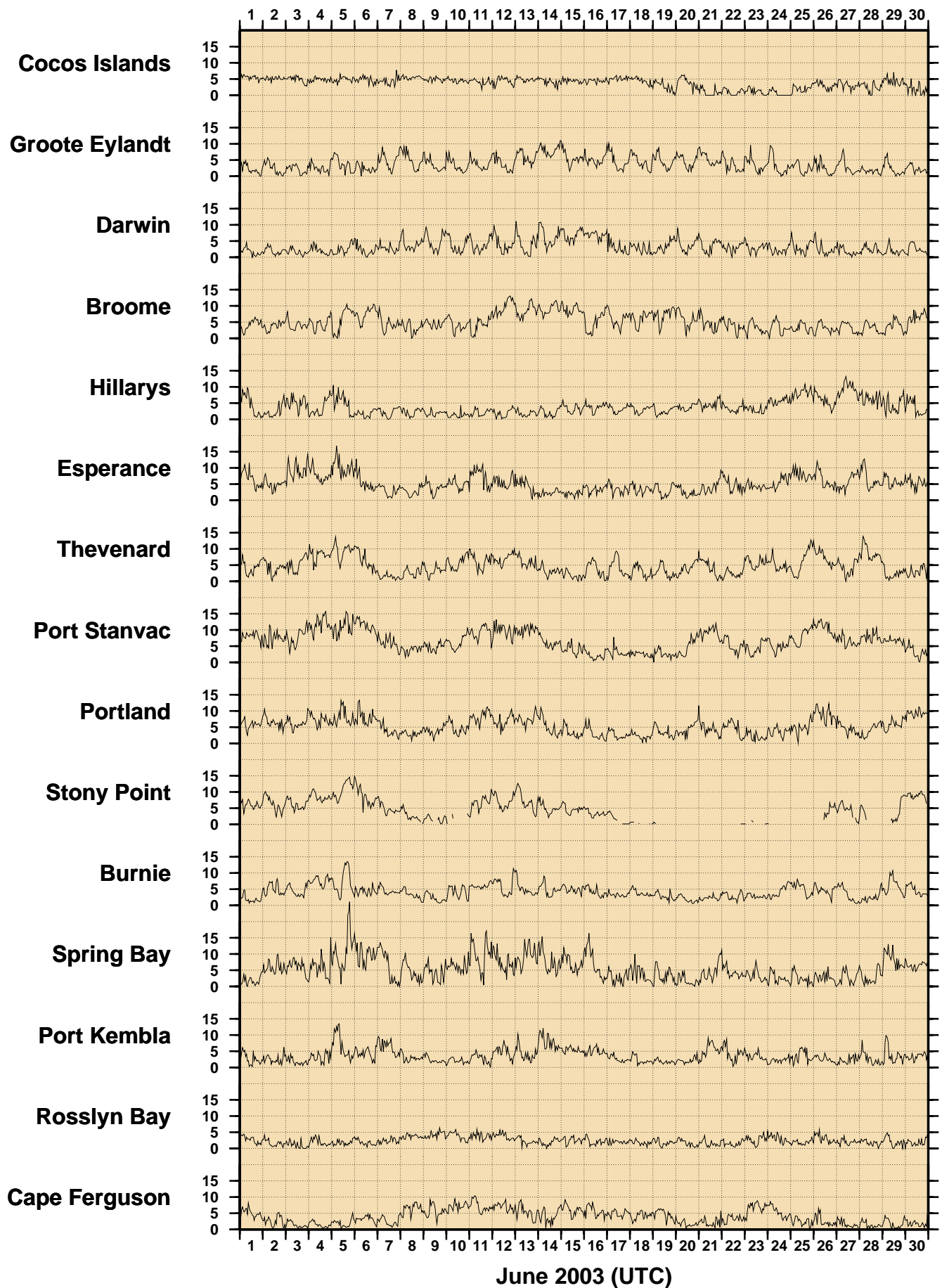


Figure 5

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

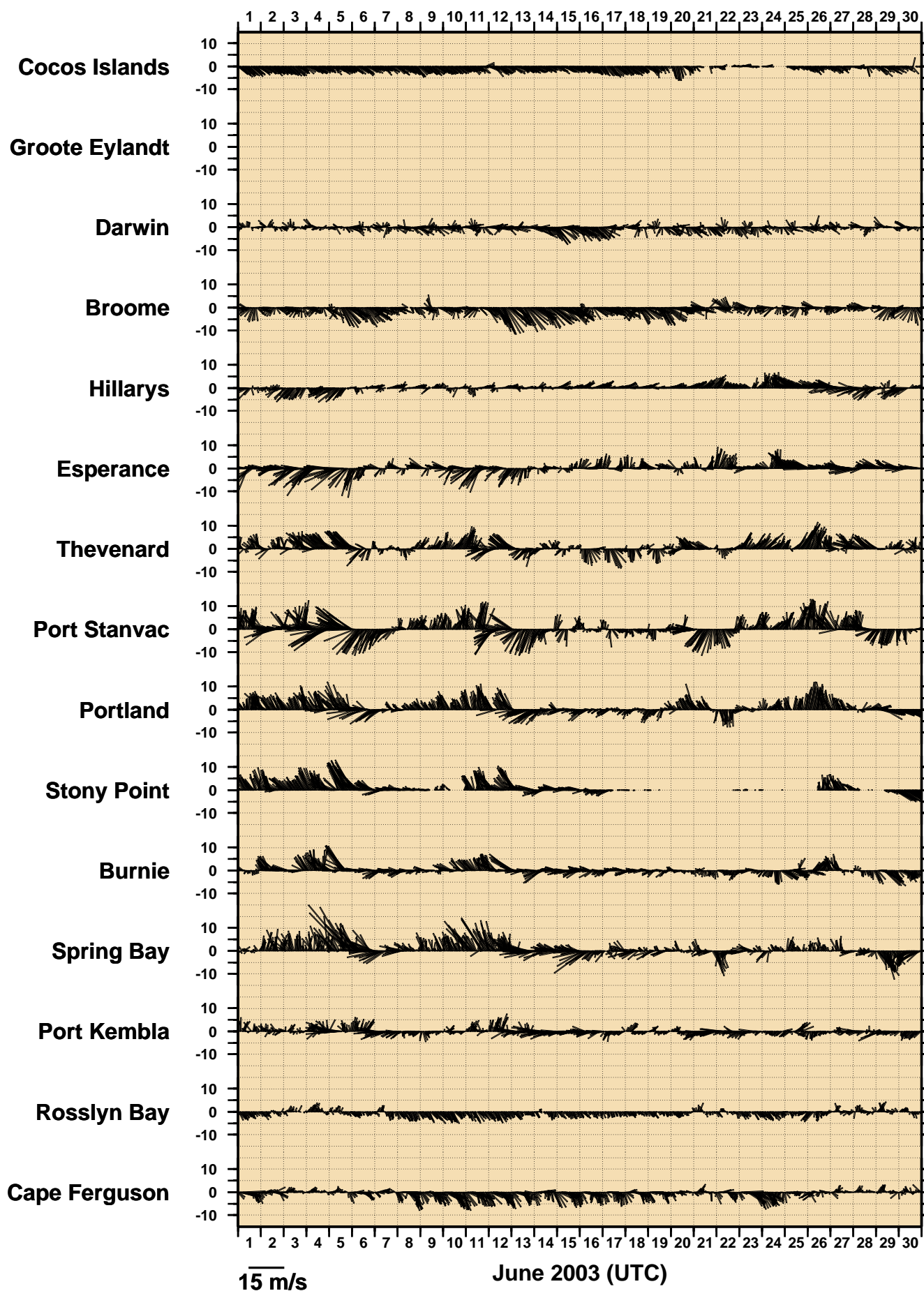


Figure 6

JUNE 2003
HOURLY MAXIMUM WIND GUSTS (m/s)

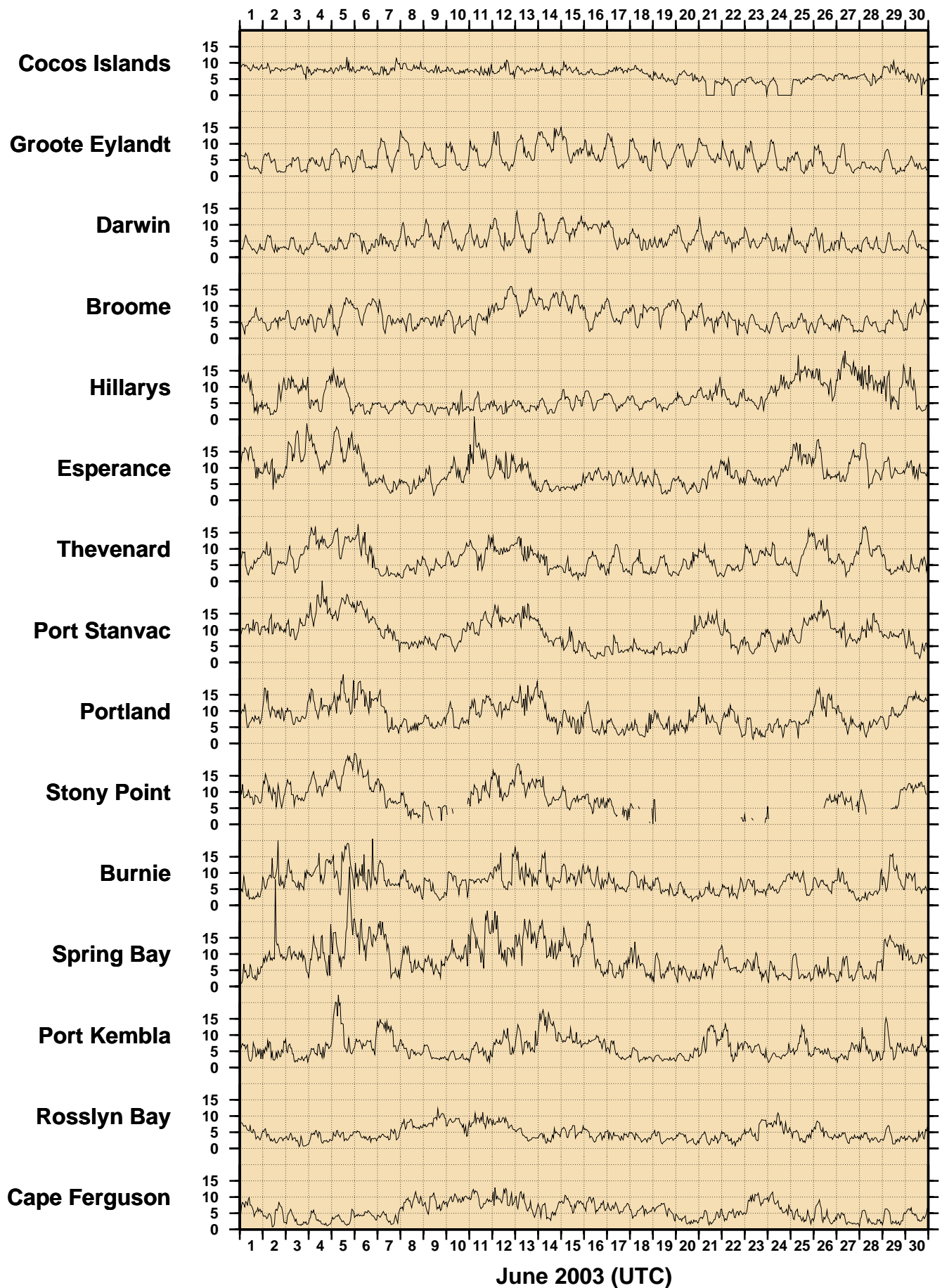


Figure 7

JUNE 2003
HOURLY AIR TEMPERATURES (°C)

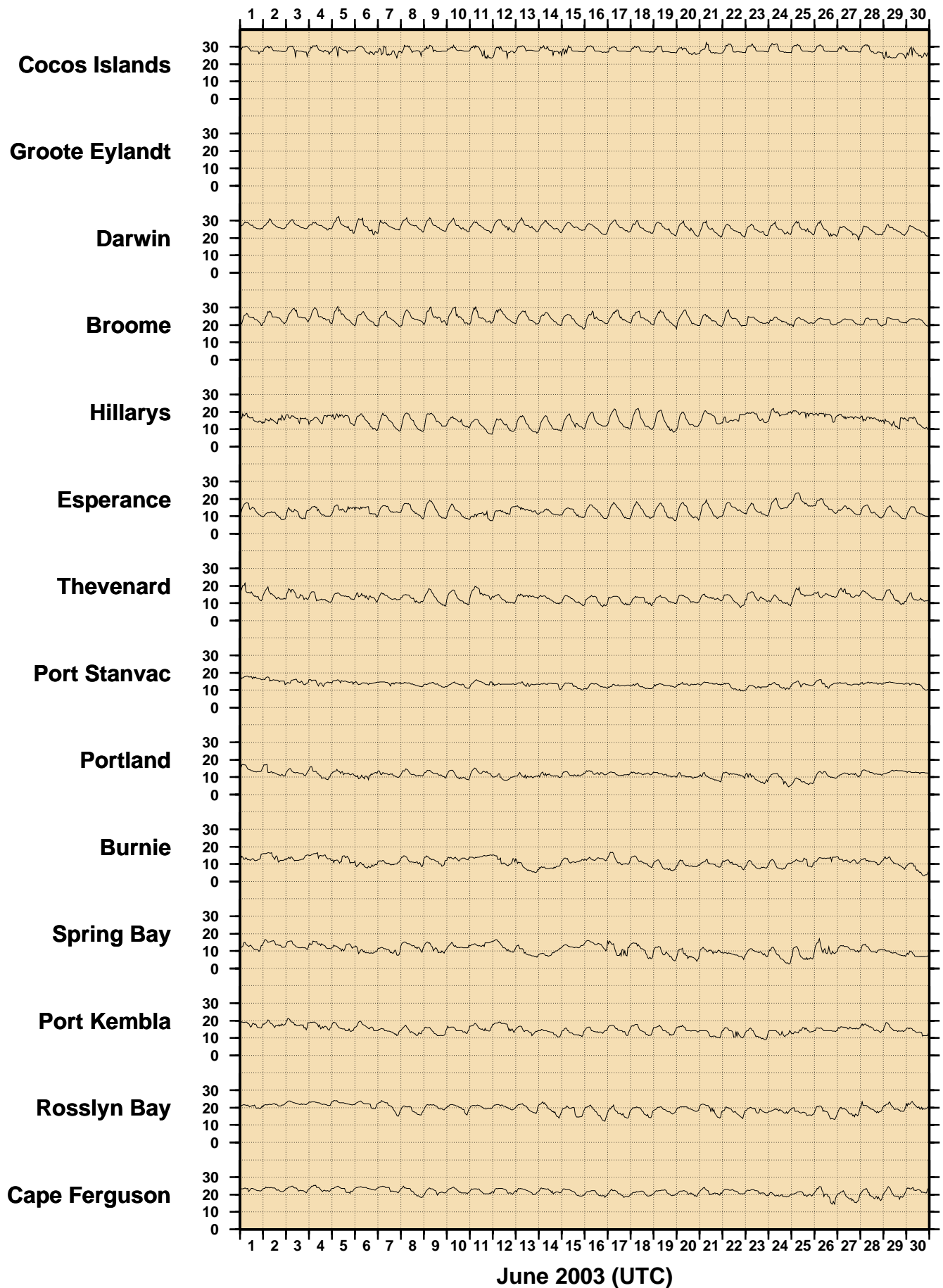


Figure 8

JUNE 2003

HOURLY WATER TEMPERATURES (°C)

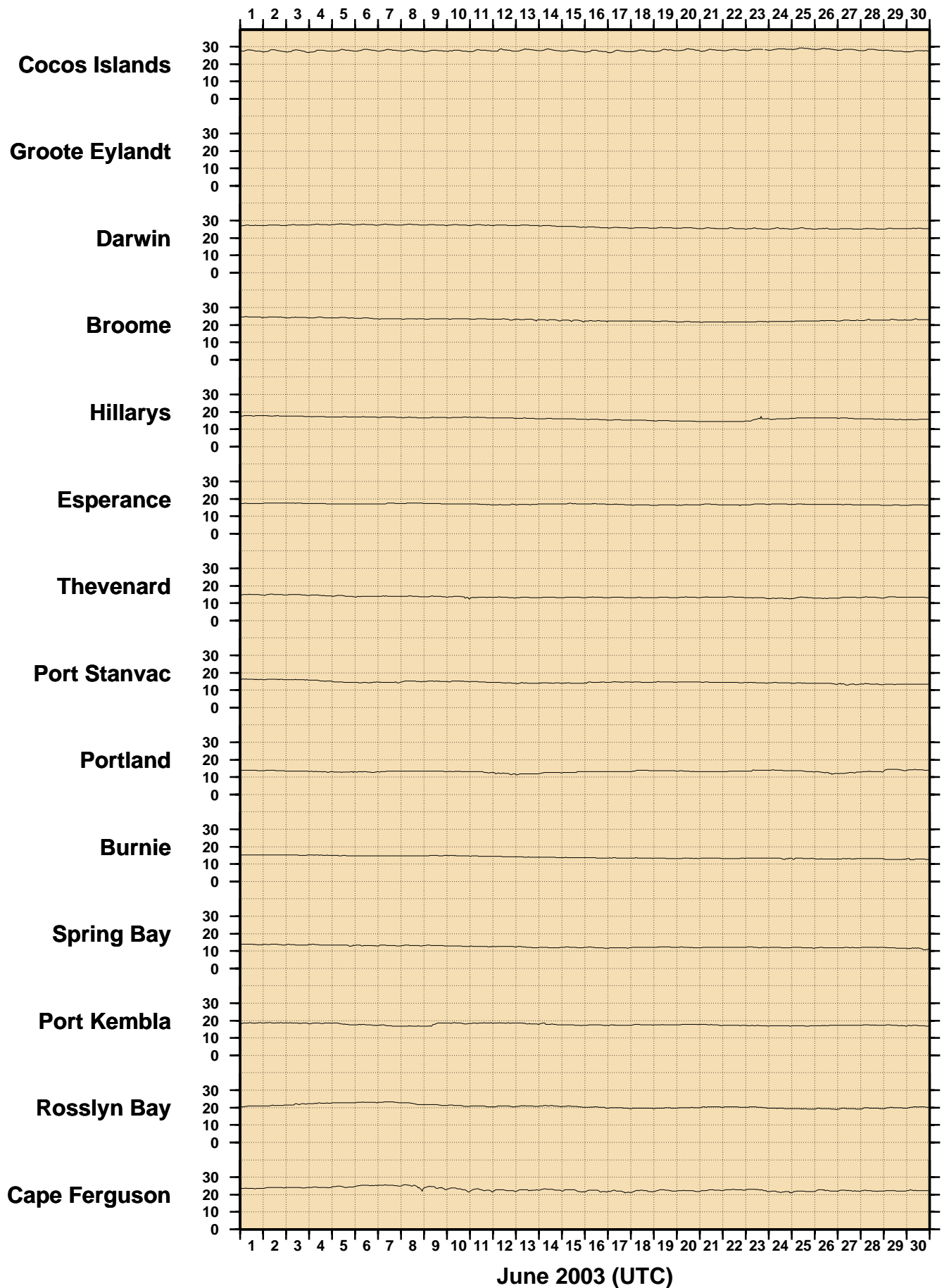


Figure 9

JUNE 2003
HOURLY ATMOSPHERIC PRESSURE (hPa)

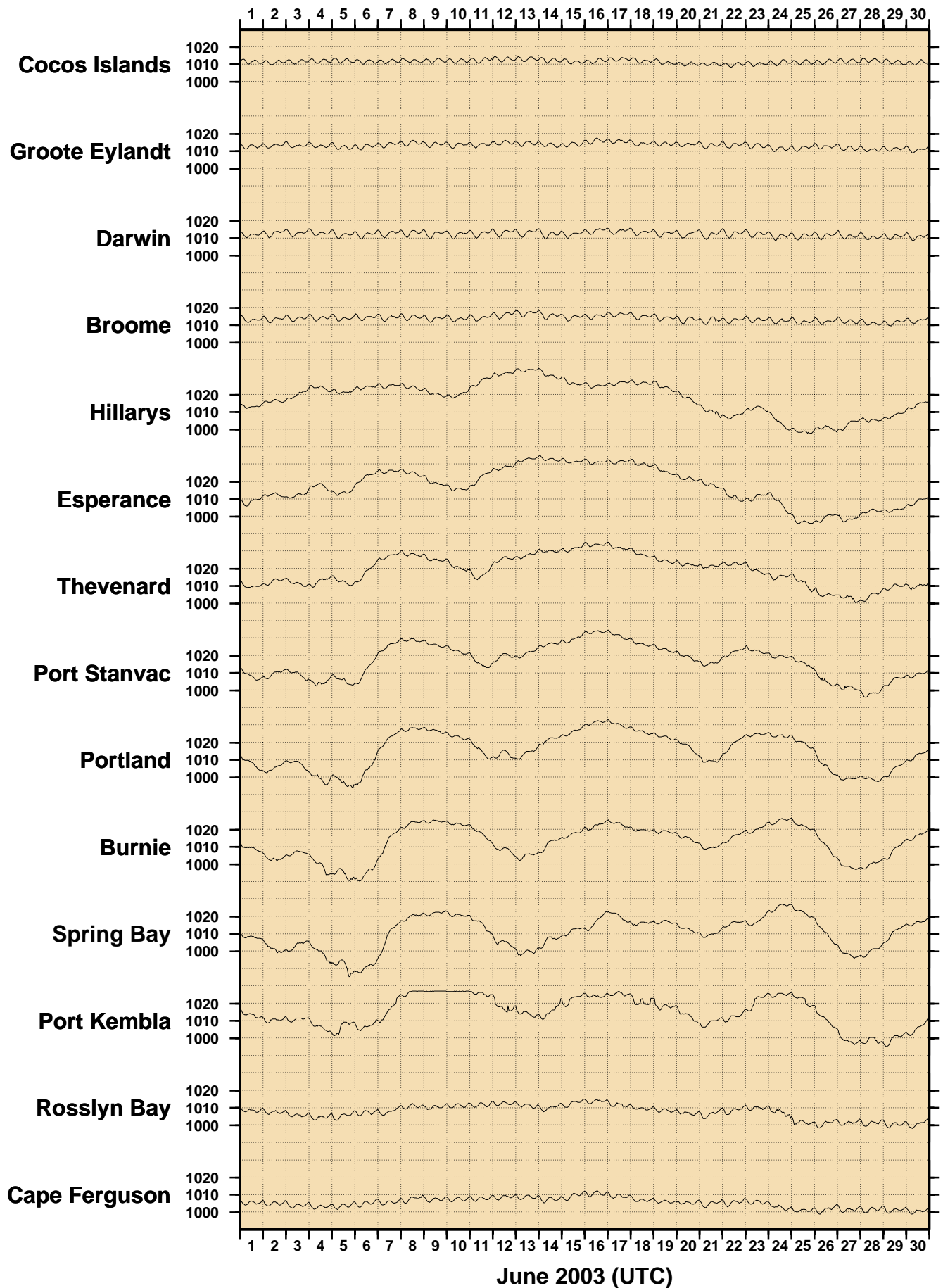


Figure 10
SEA LEVEL ANOMALIES THROUGH JUNE 2003 (m)

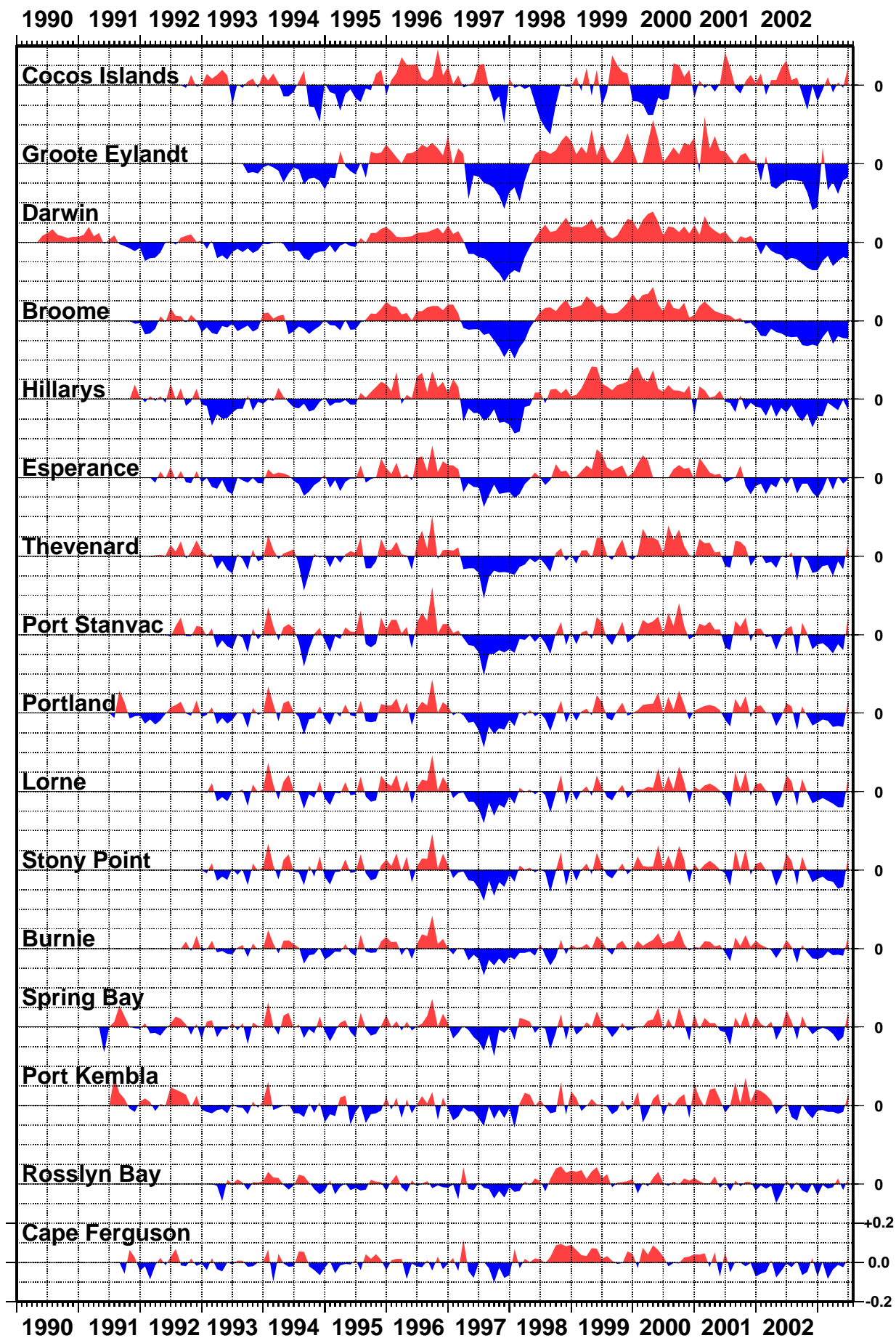


Figure 11

BAROMETRIC PRESSURE ANOMALIES THROUGH JUNE 2003 (hPa)

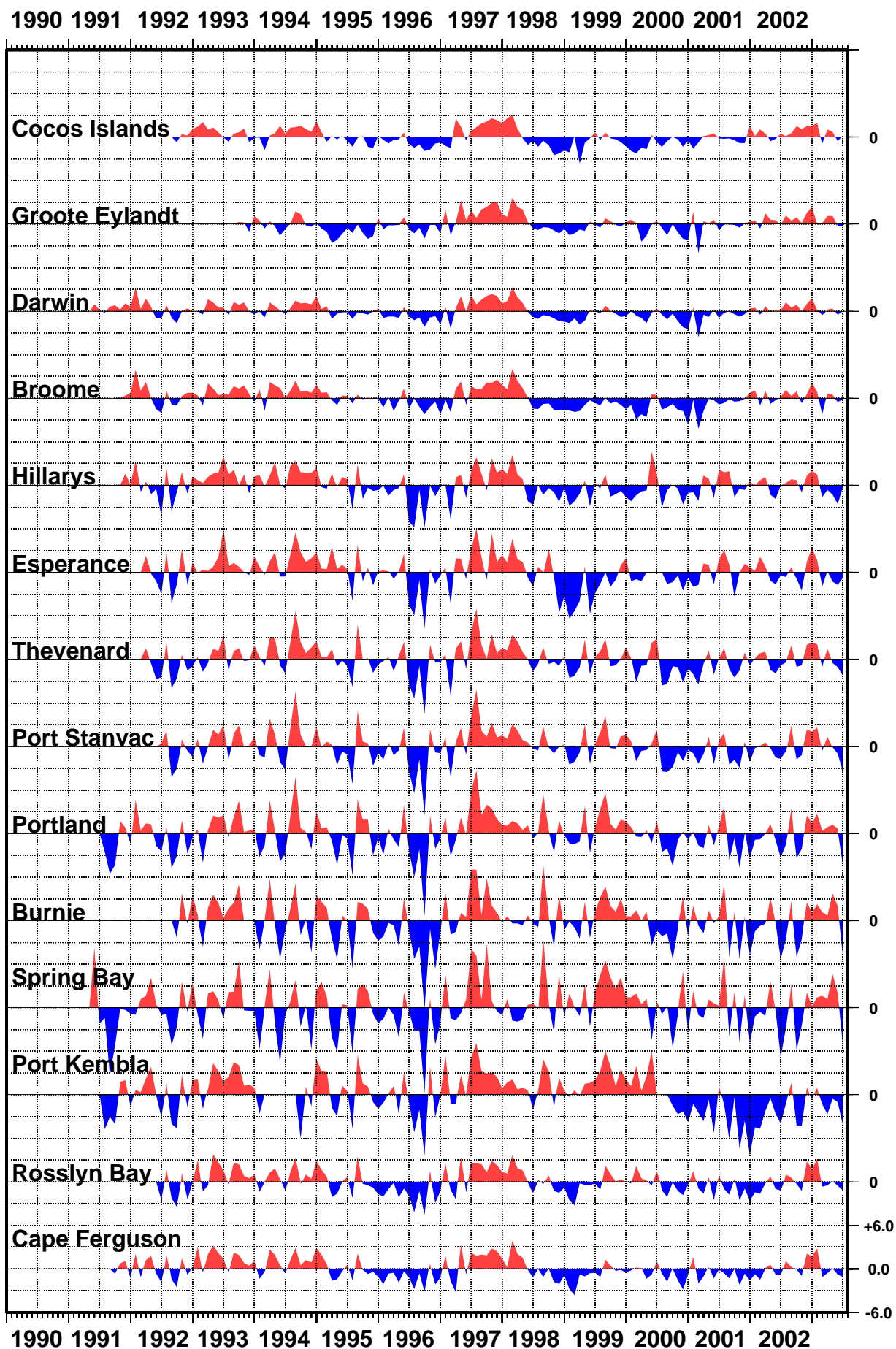


Figure 12

WATER TEMPERATURE ANOMALIES THROUGH JUNE 2003 (°C)

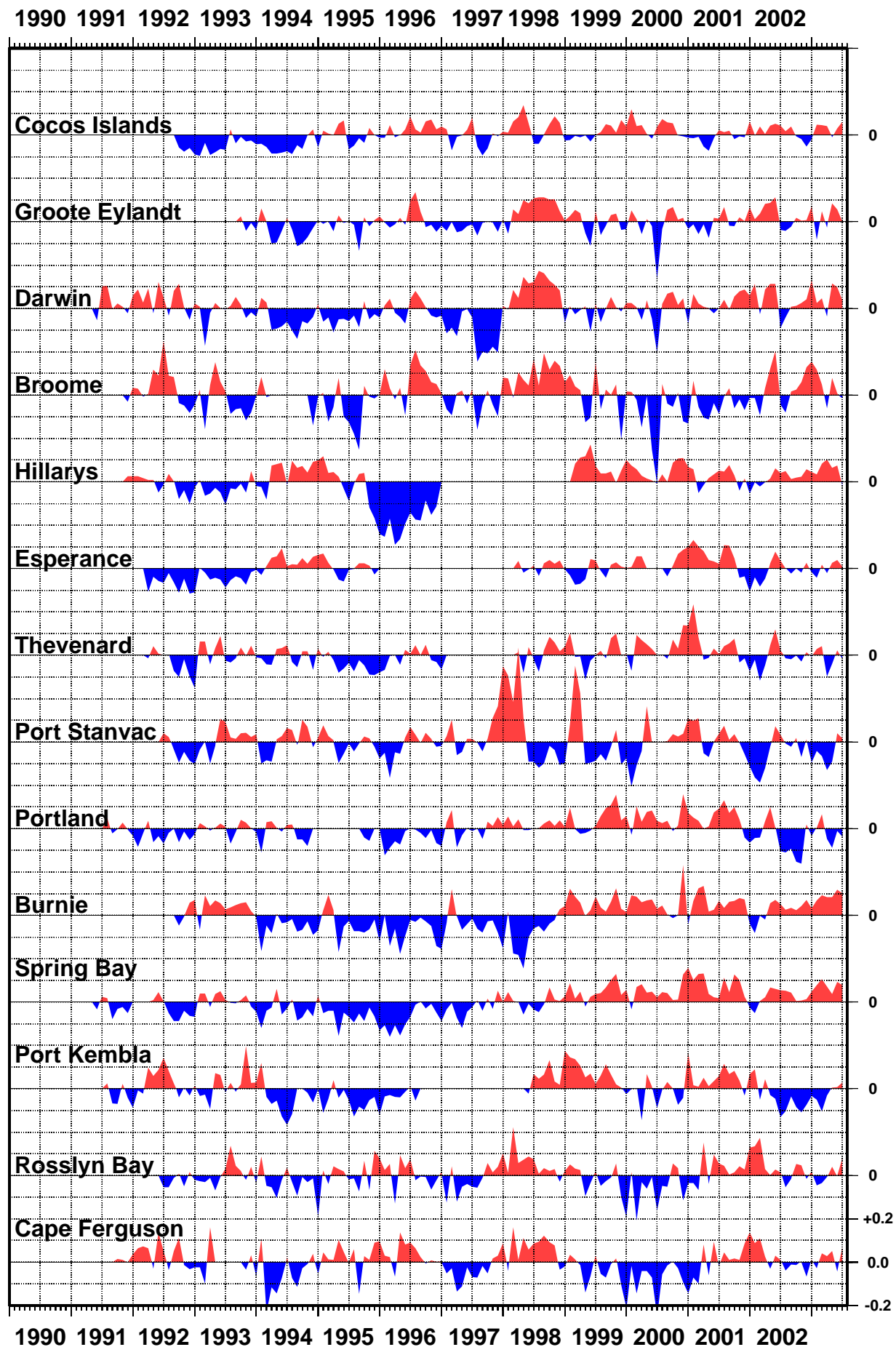


Figure 13
AIR TEMPERATURE ANOMALIES
THROUGH JUNE 2003 (°C)

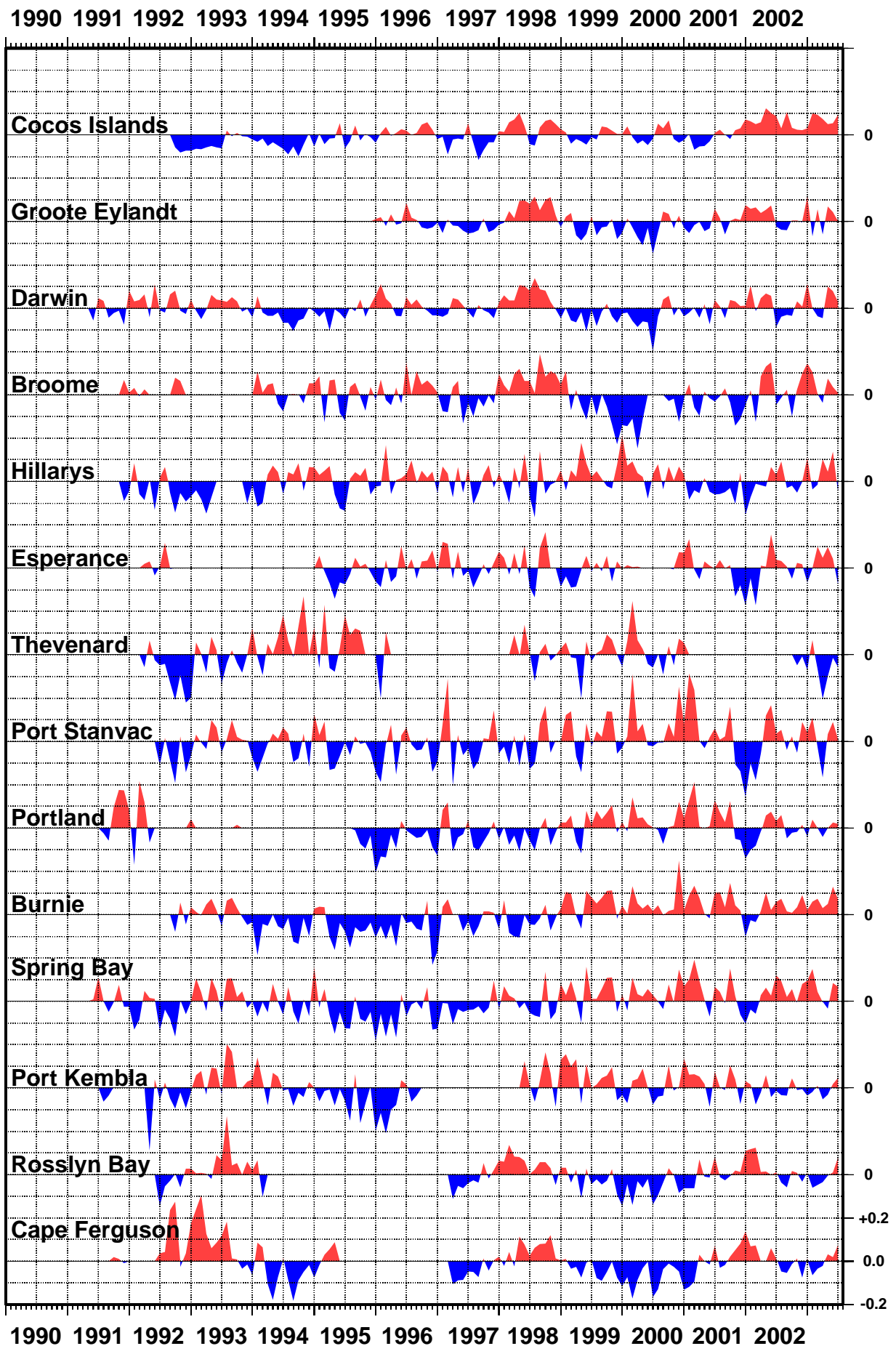
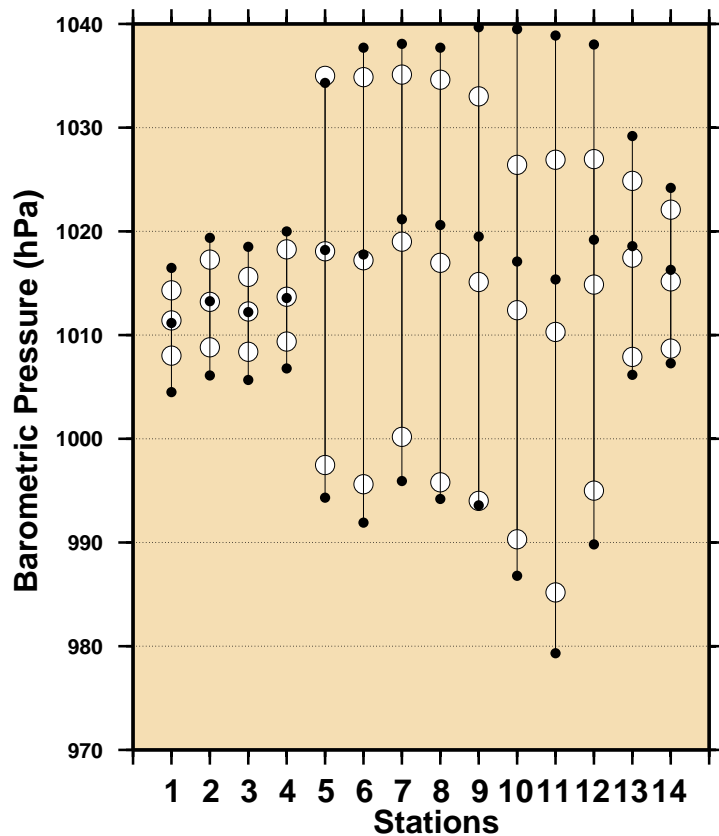
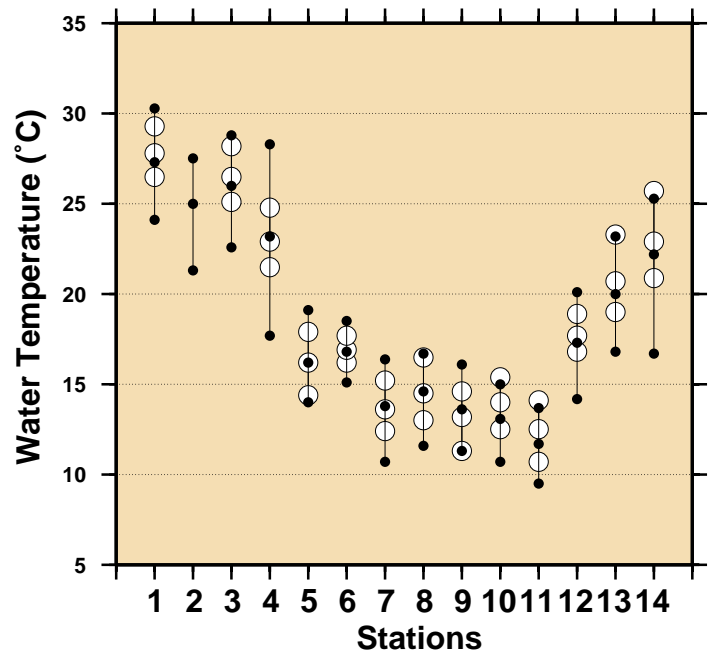
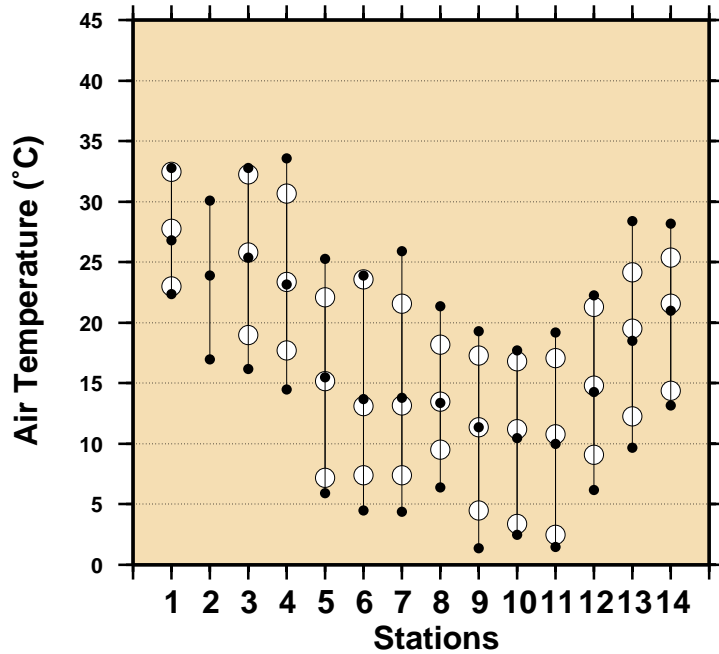


Figure 14
Comparison of June 2003 Max, Min & Mean with
Long Term June Values.



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

- June 2003 Maximum
- June 2003 Mean
- June 2003 Minimum
- Long Term June Maximum
- Long Term June Mean
- Long Term June 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

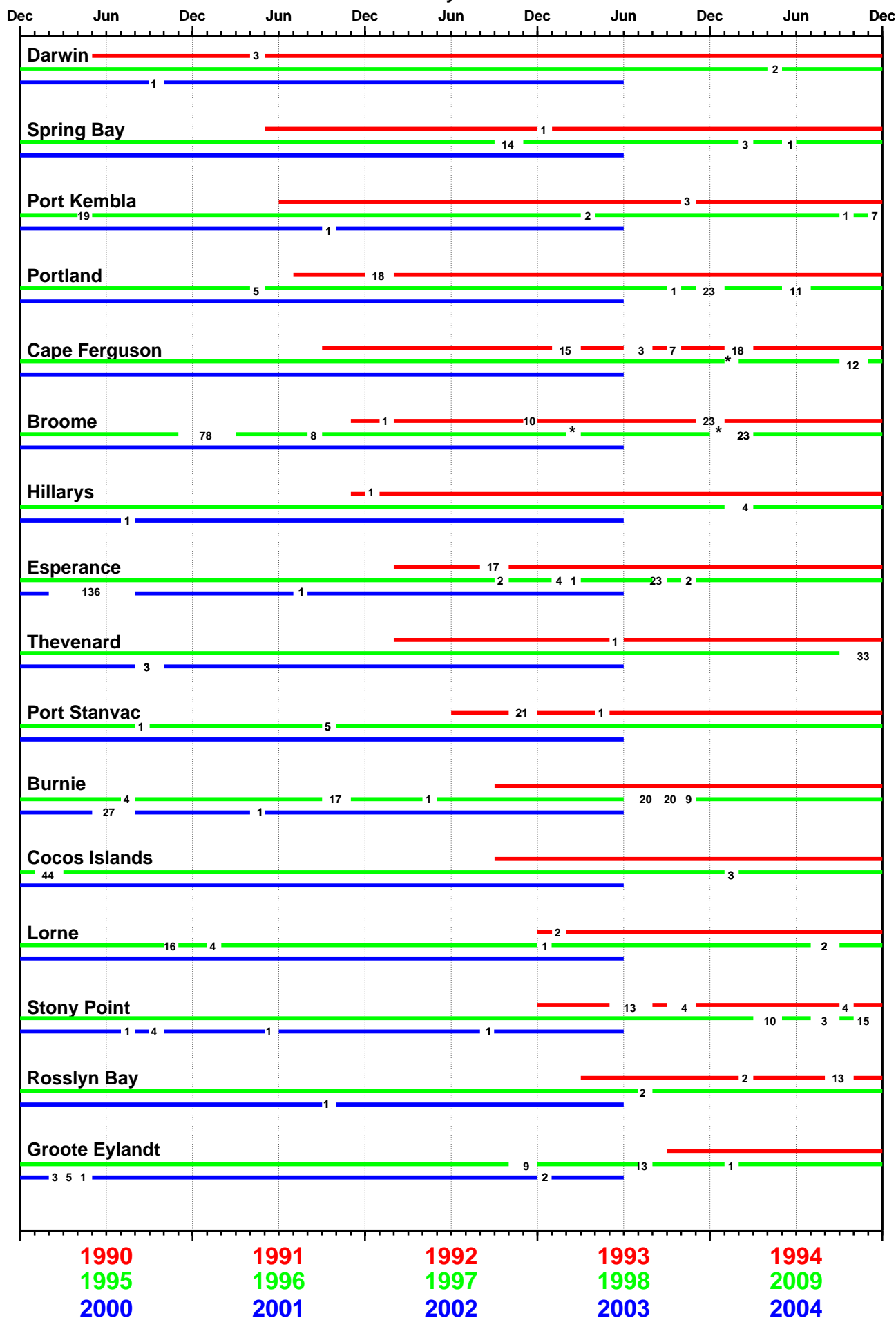


Figure 16

MONTHLY MEAN SEA LEVELS TO JUNE 2003 (m)

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

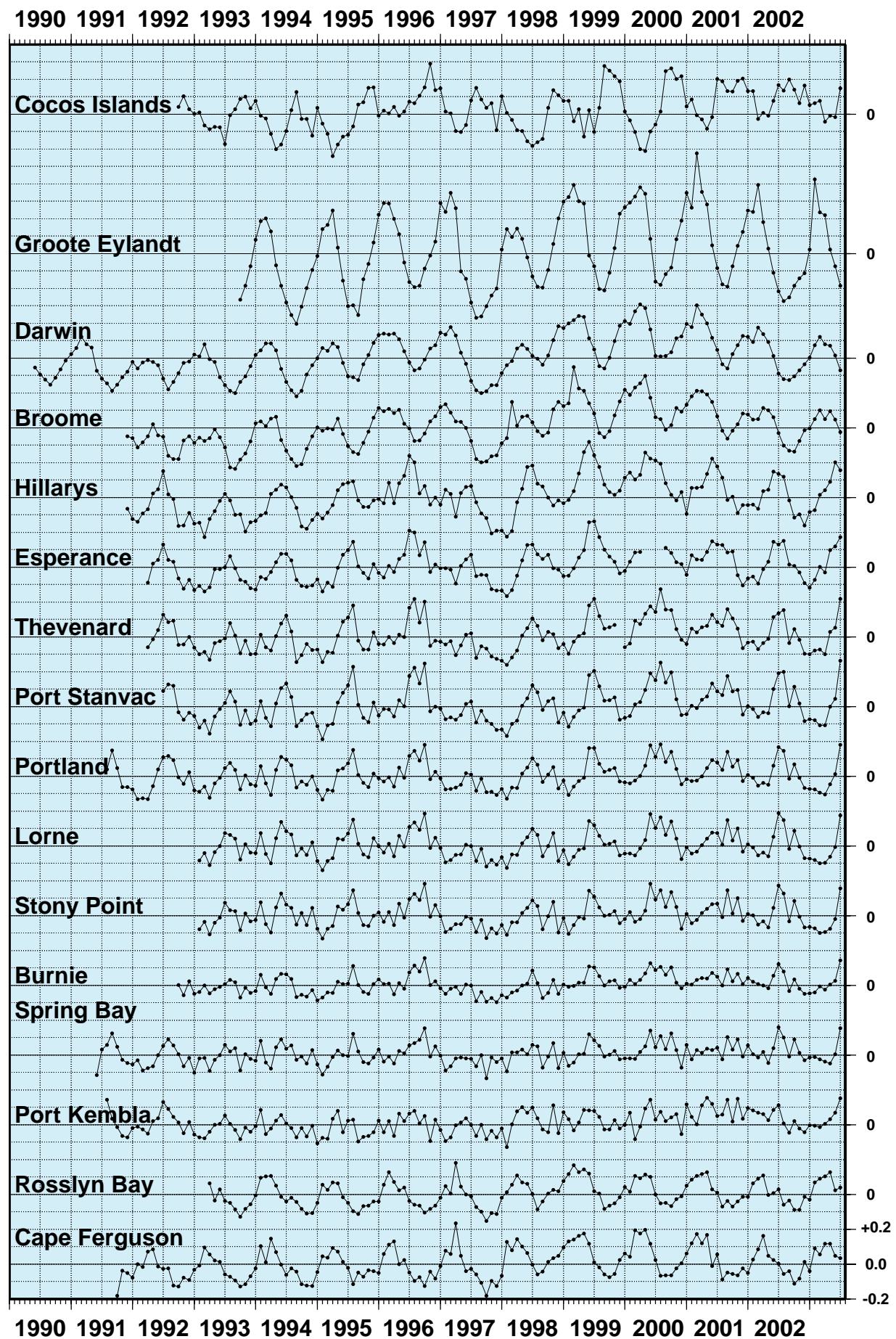


Figure 17

SEA LEVEL TRENDS THROUGH JUNE 2003 (mm/year)

