

**THE AUSTRALIAN BASELINE SEA LEVEL  
MONITORING PROJECT**

**MONTHLY DATA REPORT**

**JANUARY 2004**



**Australian Government**

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**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**

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**Quality Certification:**

I authorise the issue of this Australian Baseline Sea Level Monitoring Project Monthly Data Report for January 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

JANUARY 2004

### NOTES ON THE DATA FOR JANUARY 2004

Sea level data return (Figures 1 and 15) in January was excellent for all stations. Note that the sea level data from Cape Ferguson will be adjusted after a levelling survey is conducted (in February 2004) and a new datum is determined.

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 was again intermittently erroneous throughout January. All of the wind data from Cocos Islands was also erroneous in January. These values and the corresponding incident wind directions have been removed (Figures 4, 5 and 6).

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

The barometric pressure anomalies (Figure 11) continued to be positive at Cocos Islands and Cape Ferguson and remained negative at Port Kembla, Spring Bay, Portland, Port Stanvac and Hillarys in January. The barometric pressure anomalies changed from positive to negative at Rosslyn Bay and Burnie and changed from negative to positive at all other stations in January.

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 January values. Note that the long-term ranges are calculated using the historical sets of January data for each station *excluding* the current month of data.

For all stations the mean air temperature for January 2004 was generally consistent with the long term January mean. The maximum air temperature at Groote Eylandt (34.1°C) was higher than the previously recorded maximum for January. The minimum air temperature at Burnie (7.8°C) was lower than the previously recorded minimum for January.

The January 2004 mean water temperature for most sites was also consistent with the long-term January mean. The minimum water temperature at Esperance (22.0°C) and Burnie (12.8°C) was lower than the previously recorded minimum for January. The maximum water temperature at Broome (29.2°C) was higher than the previously recorded maximum for January.

The mean barometric pressure for January 2004 was consistent with the long-term January mean for each station.

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.

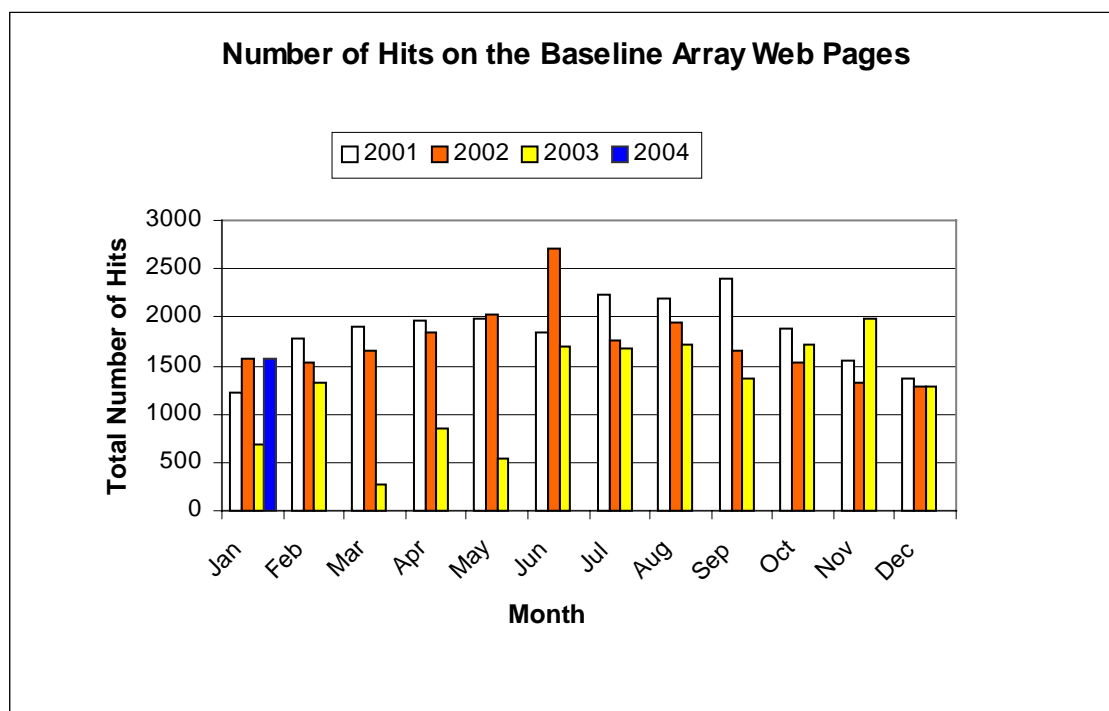
Figure 17 shows the short-term sea level trends for each SEAFRAME location included in the Australian Baseline Sea Level Monitoring Project. Table 1 lists the commencement of operation, the sea level trend for the entire record (plotted in Figure 17) and the change in trend with respect to the analysis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

Location	Installation Date	Sea Level Trend (mm/yr)	Change from previous month
Cocos Islands	Sep 1992	+11.5	-0.1
Groote Eylandt	Sep 1993	+13.7	-0.6
Darwin	May 1990	+11.1	-0.2
Broome	Nov 1991	+14.0	-0.3
Hillarys	Nov 1991	+10.7	-0.2
Esperance	Mar 1992	+7.6	-0.3
Thevenard	Mar 1992	+5.9	-0.2
Port Stanvac	Jun 1992	+6.9	-0.1
Portland	Jul 1991	+3.3	+0.1
Lorne	Jan 1993	+2.5	+0.2
Stony Point	Jan 1993	+2.1	+0.2
Burnie	Sep 1992	+3.9	0.0
Spring Bay	May 1991	+3.8	+0.2
Port Kembla	Jul 1991	+5.3	+0.1
Rosslyn Bay	Jun 1992	+4.1	-0.4
Cape Ferguson	Sep 1991	+5.5	-0.3

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 January 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.

Contact address:

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The Commonwealth Bureau of Meteorology  
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Email: <http://www.ntf.flinders.edu.au/TEXT/STAFF/contact.html>  
Website: <http://www.ntf.flinders.edu.au/>

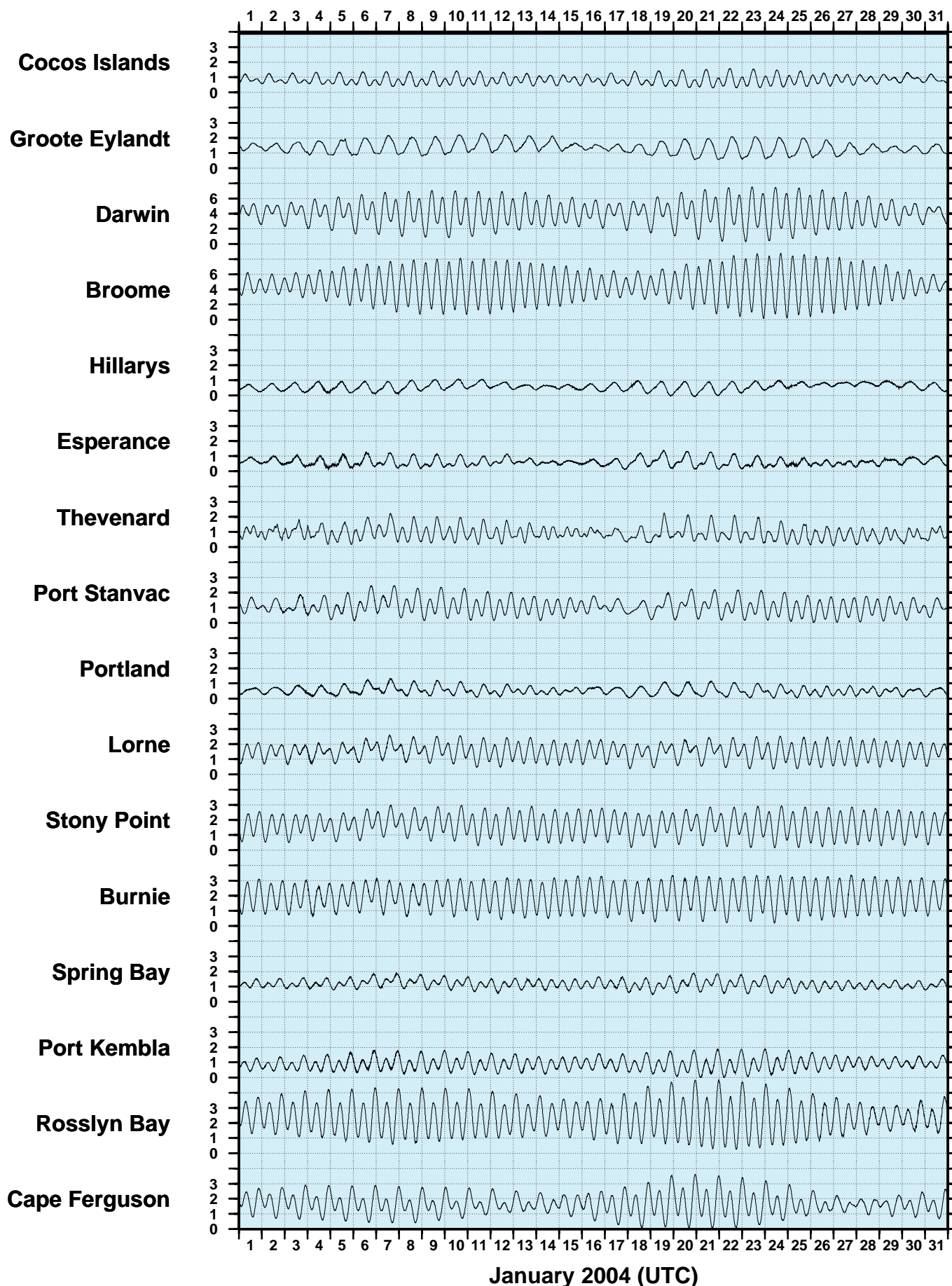
Please note the following:

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

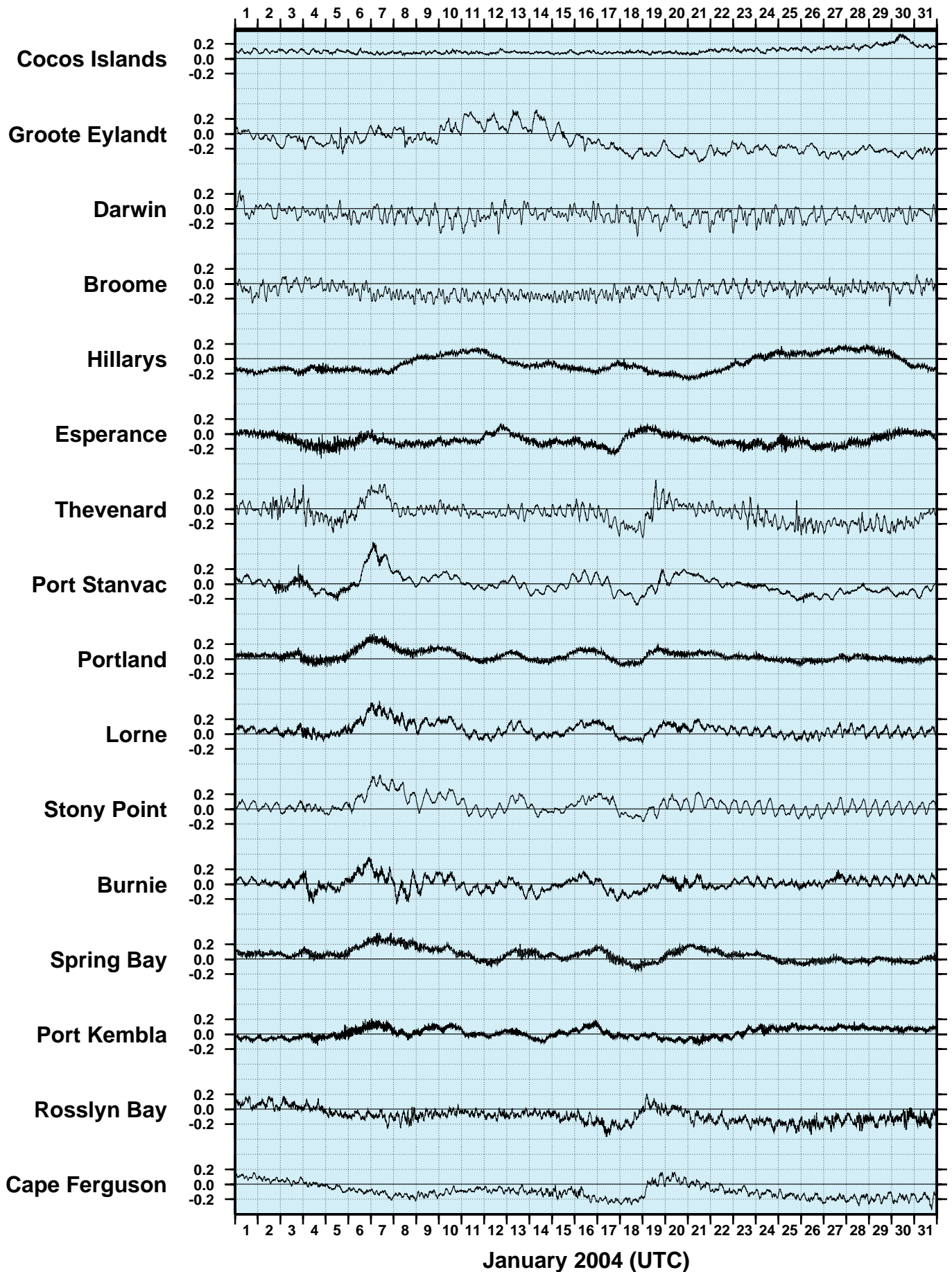
**JANUARY 2004**  
**SIX MINUTE SEA LEVEL OBSERVATIONS (m)**



January 2004 (UTC)

Figure 2

**JANUARY 2004**  
**SIX MINUTE RESIDUAL WATER LEVELS (m)**





**Figure 3**  
**JANUARY 2004**  
**SIX MINUTE RESIDUALS**  
**ADJUSTED FOR ATMOSPHERIC PRESSURE (m)**

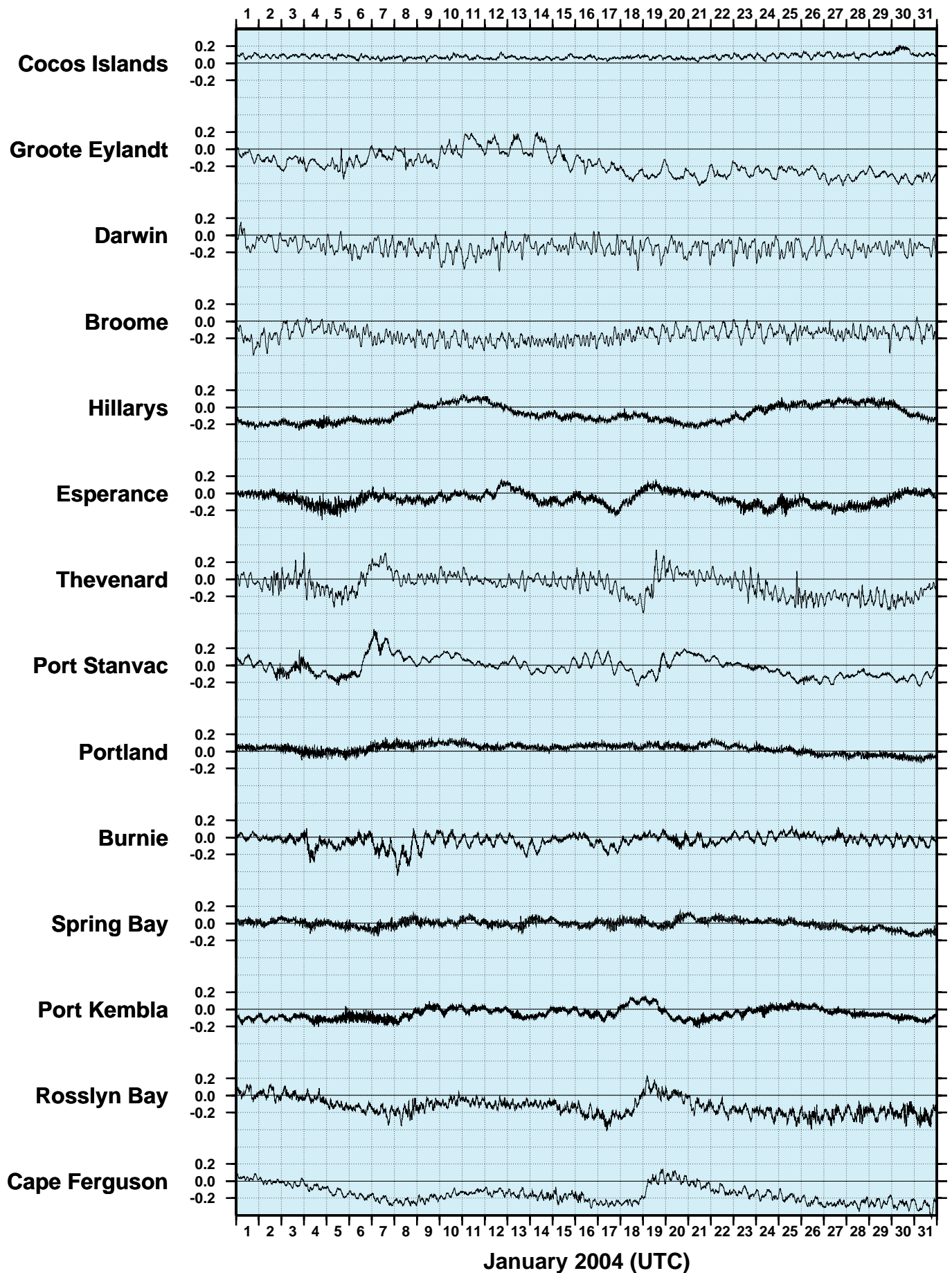


Figure 4

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

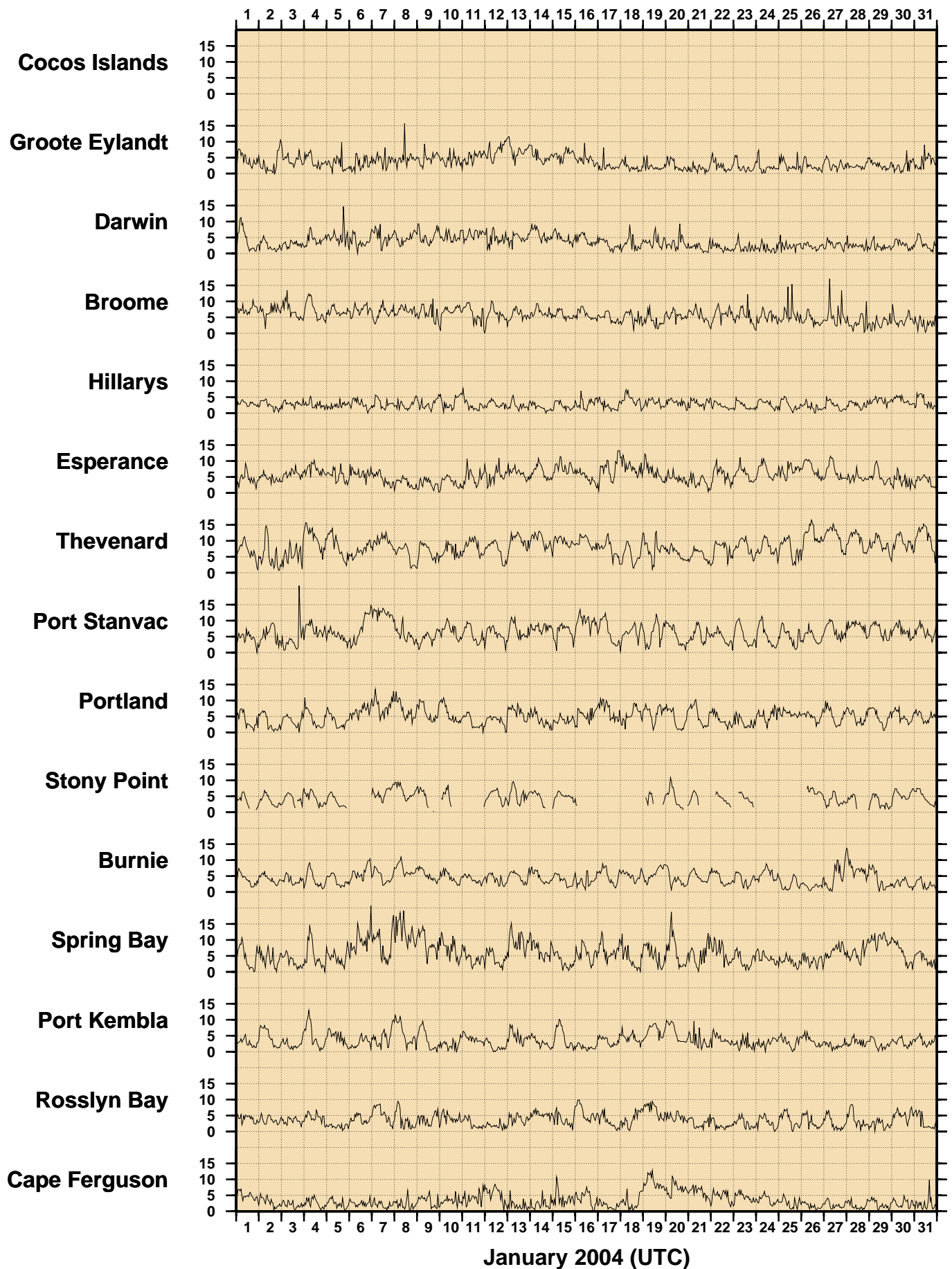


Figure 5

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

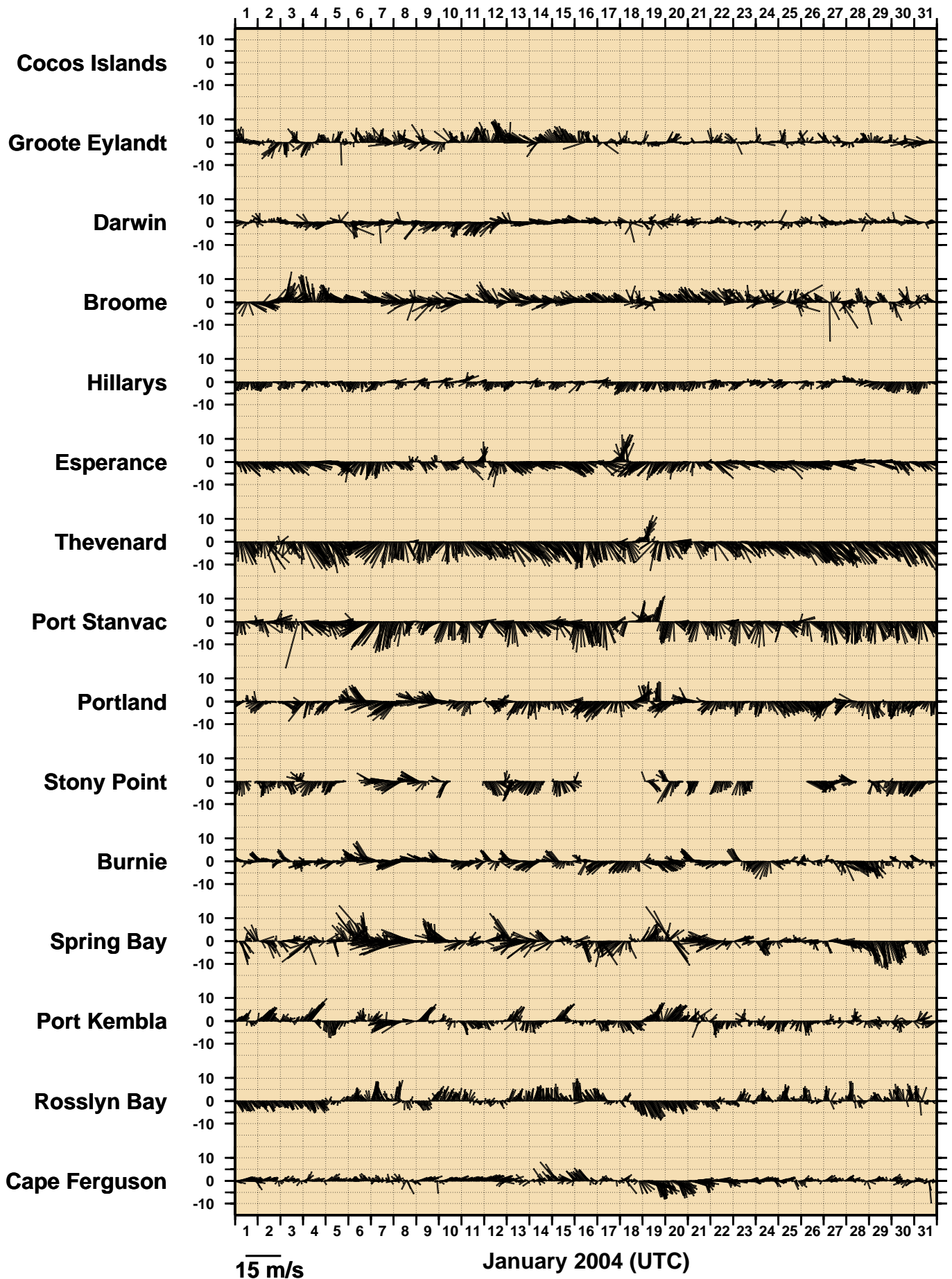


Figure 6

**JANUARY 2004**  
**HOURLY MAXIMUM WIND GUSTS (m/s)**

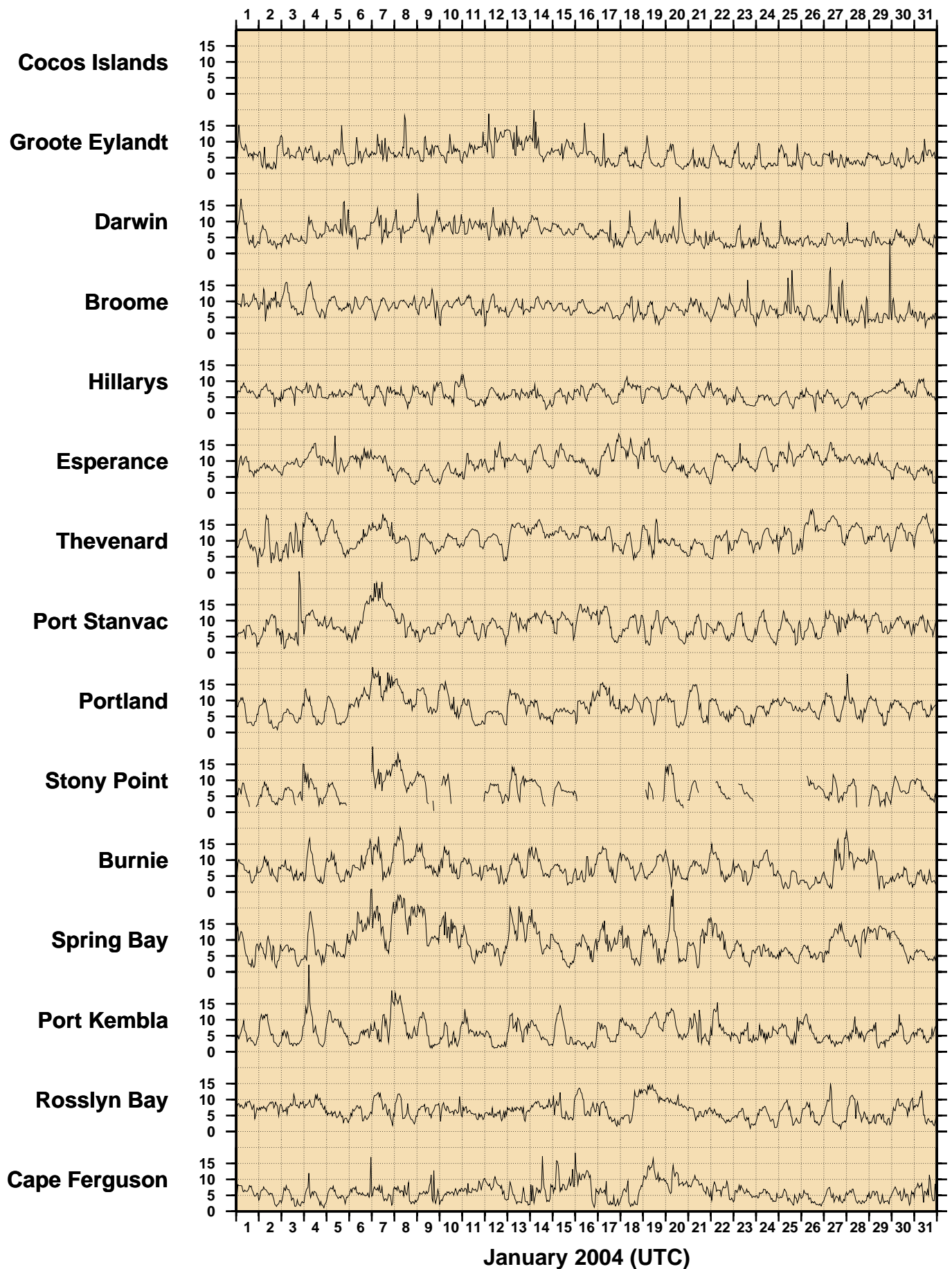




Figure 7

**JANUARY 2004**  
**HOURLY AIR TEMPERATURES (°C)**

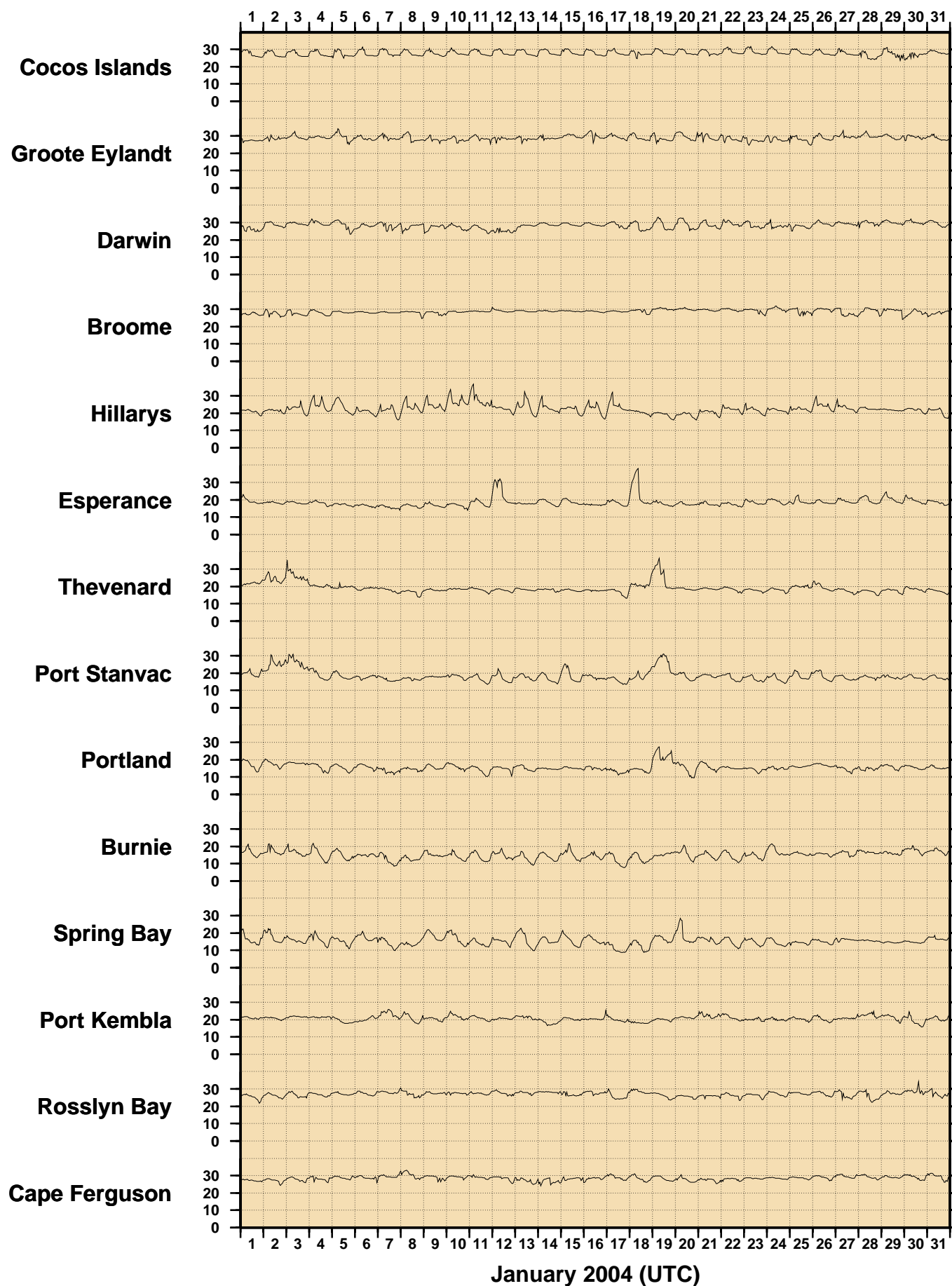


Figure 8

**JANUARY 2004**  
**HOURLY WATER TEMPERATURES (°C)**

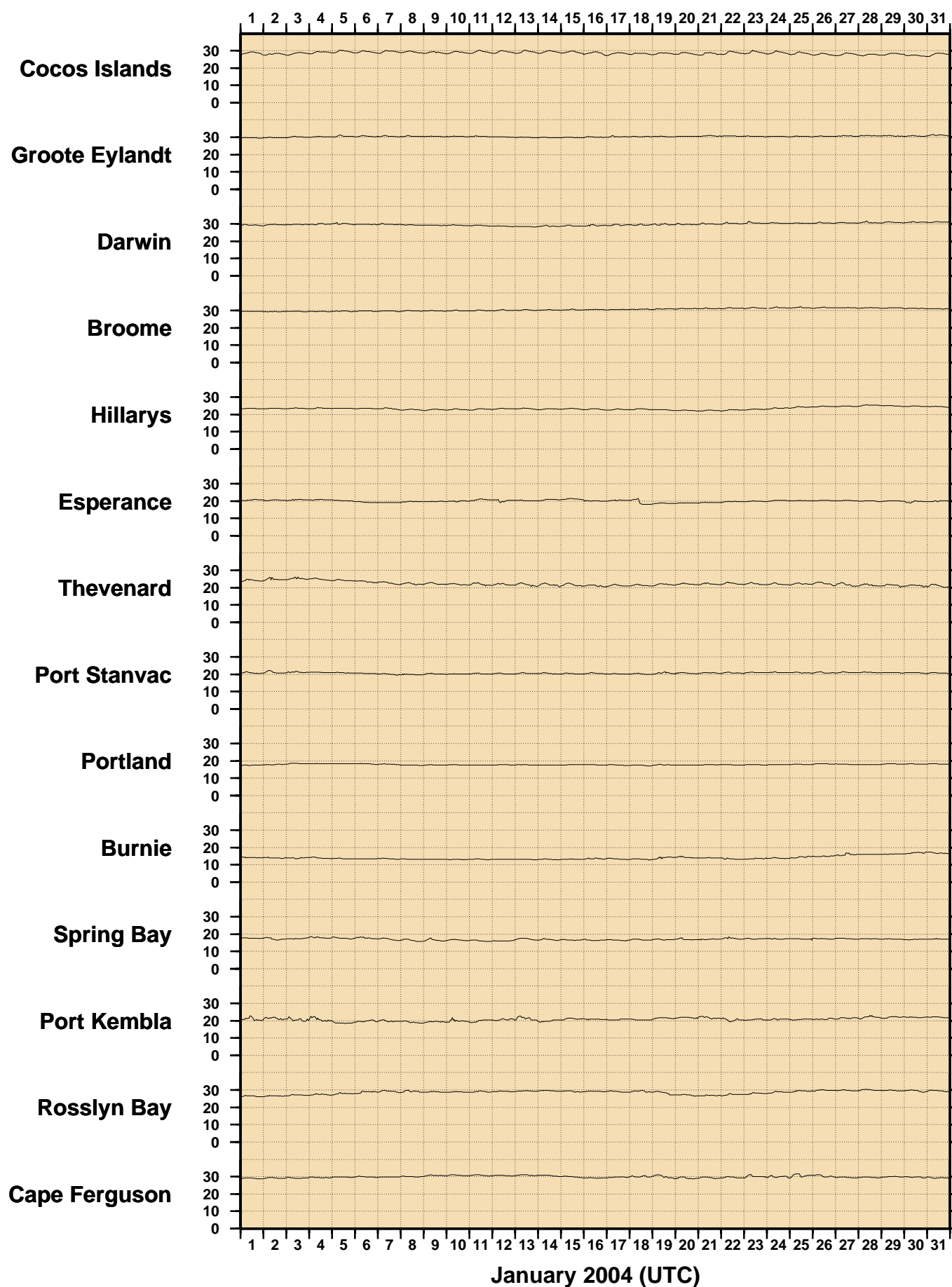
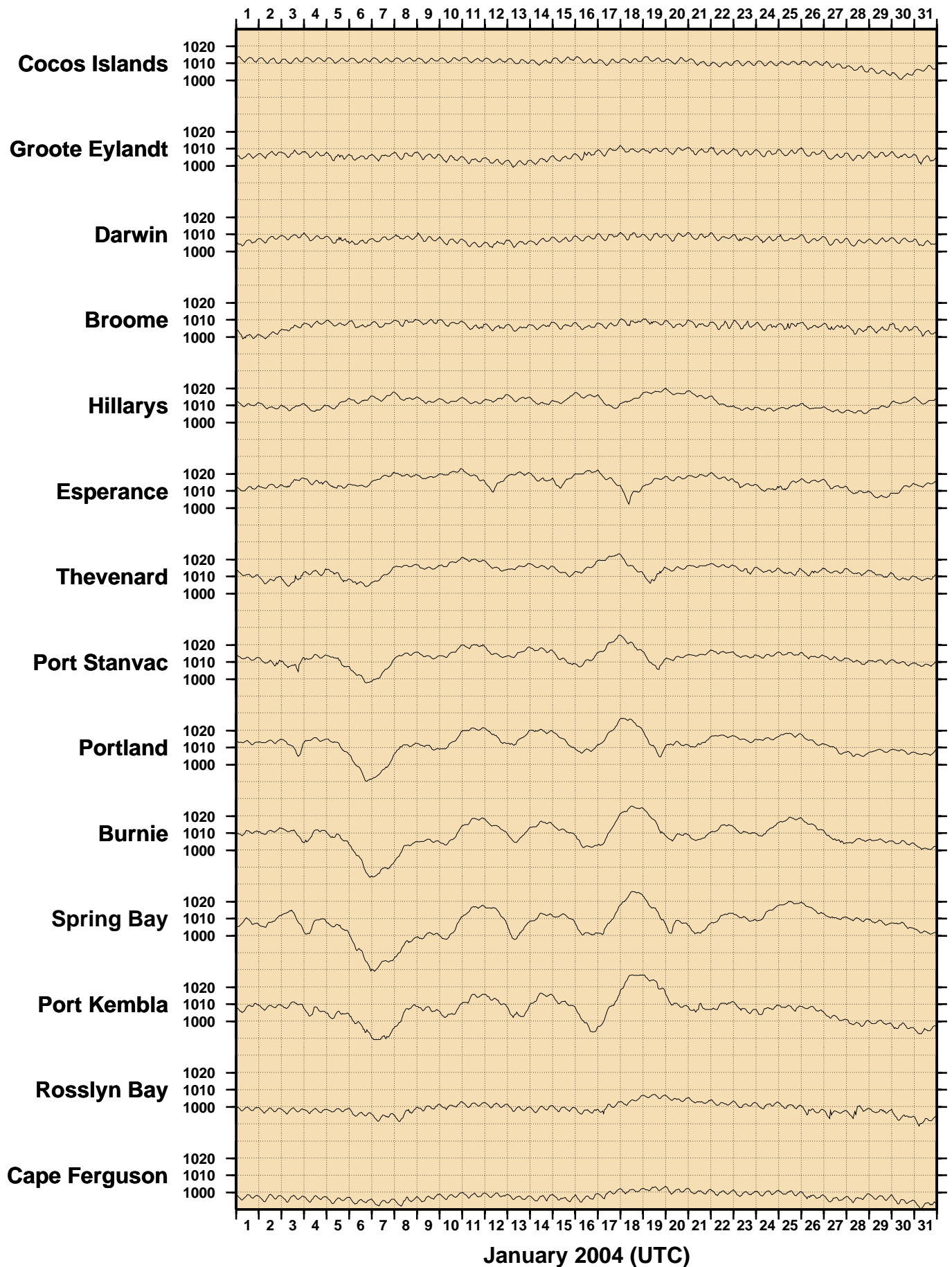


Figure 9

**JANUARY 2004**  
**HOURLY ATMOSPHERIC PRESSURE (hPa)**



**Figure 10**  
**SEA LEVEL ANOMALIES THROUGH JANUARY 2004 (m)**

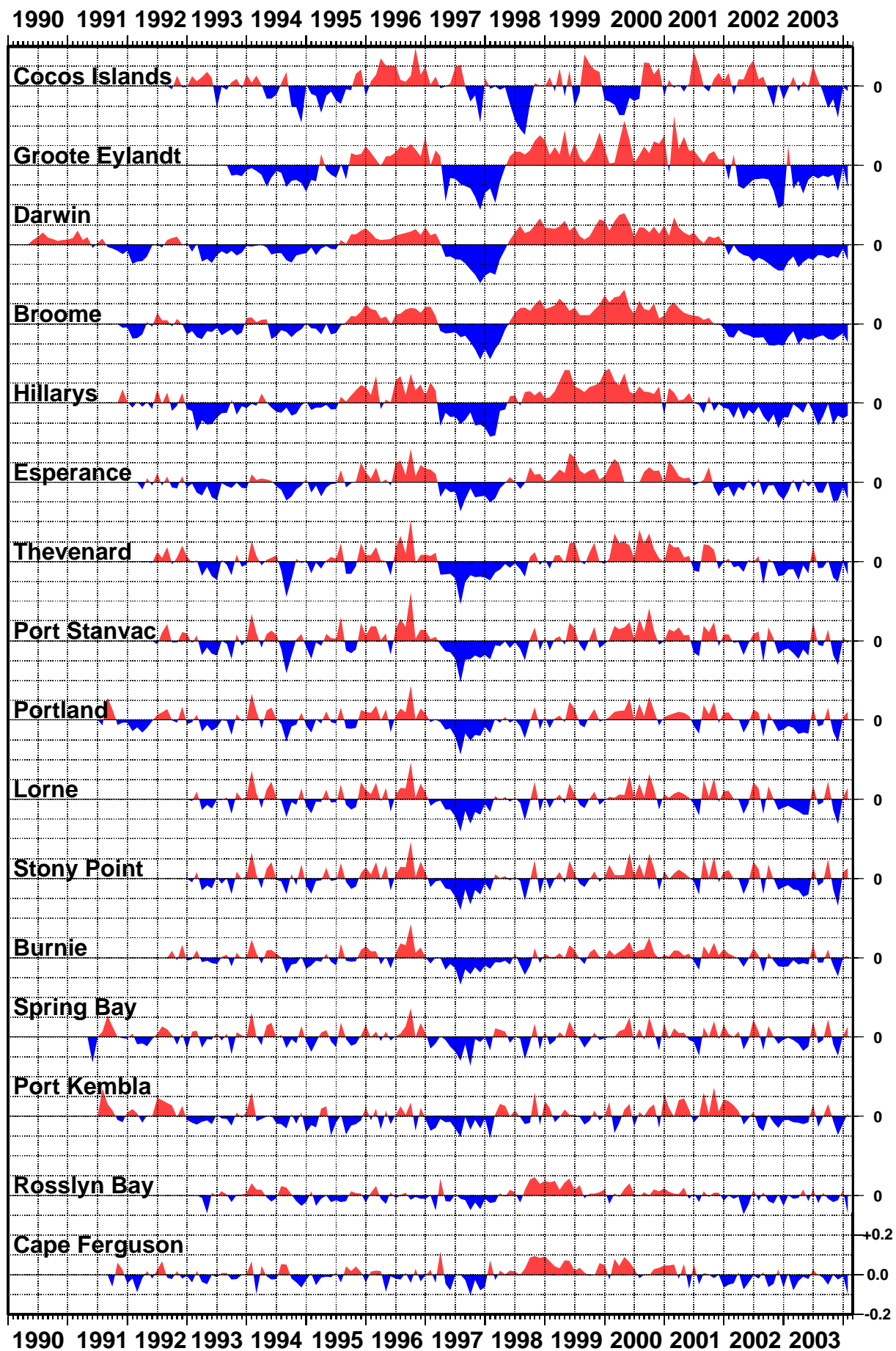




Figure 11

# BAROMETRIC PRESSURE ANOMALIES THROUGH JANUARY 2004 (hPa)

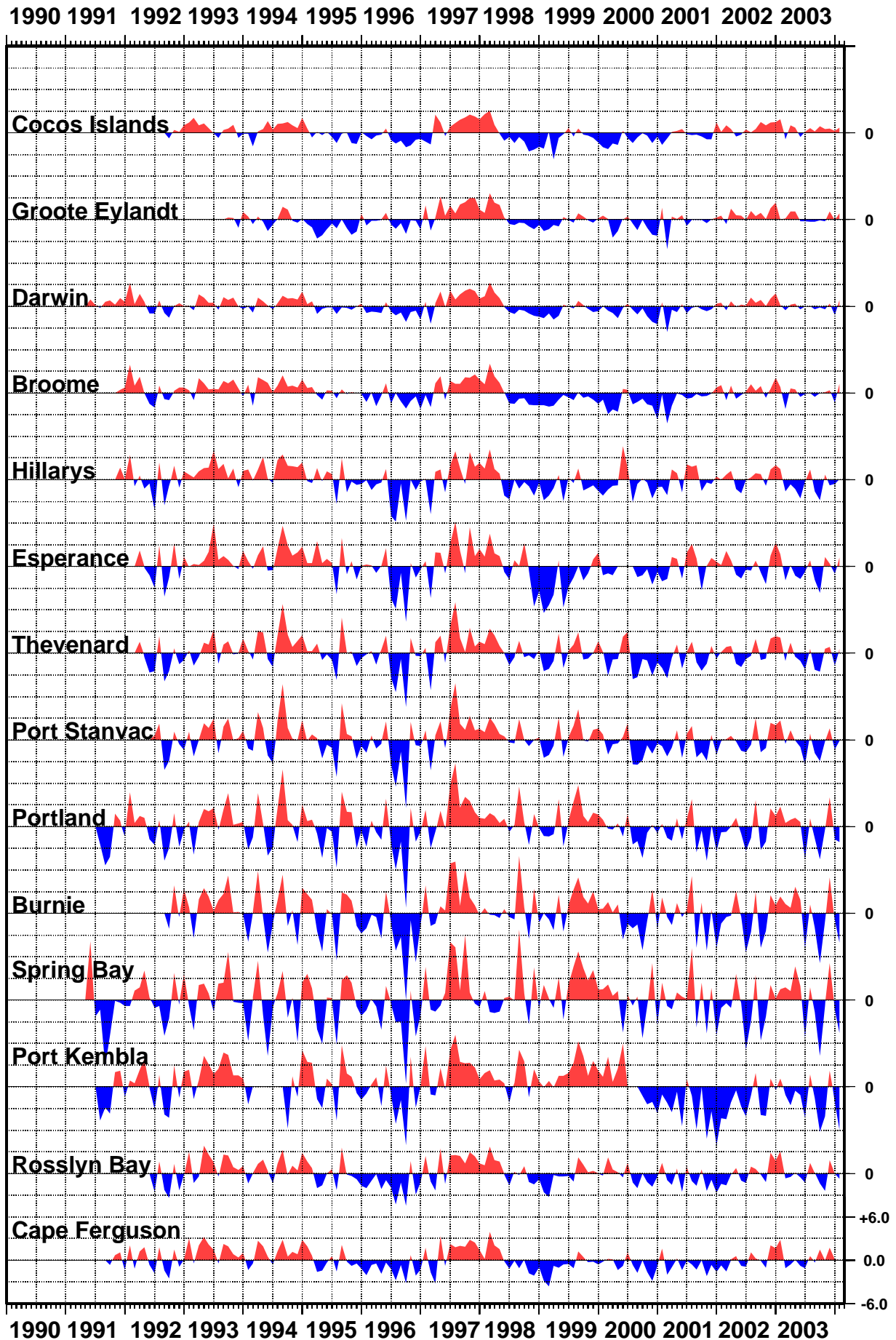
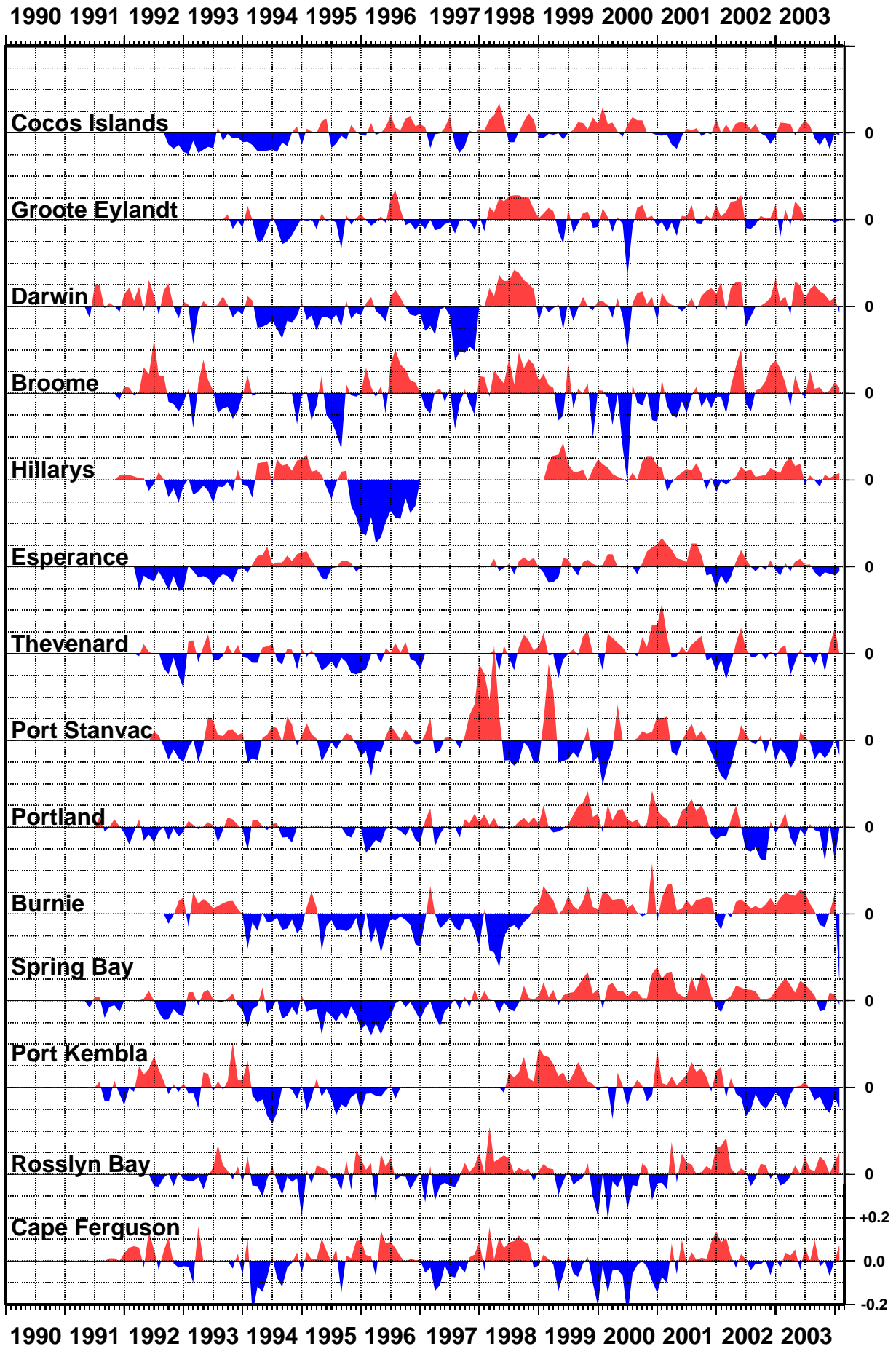
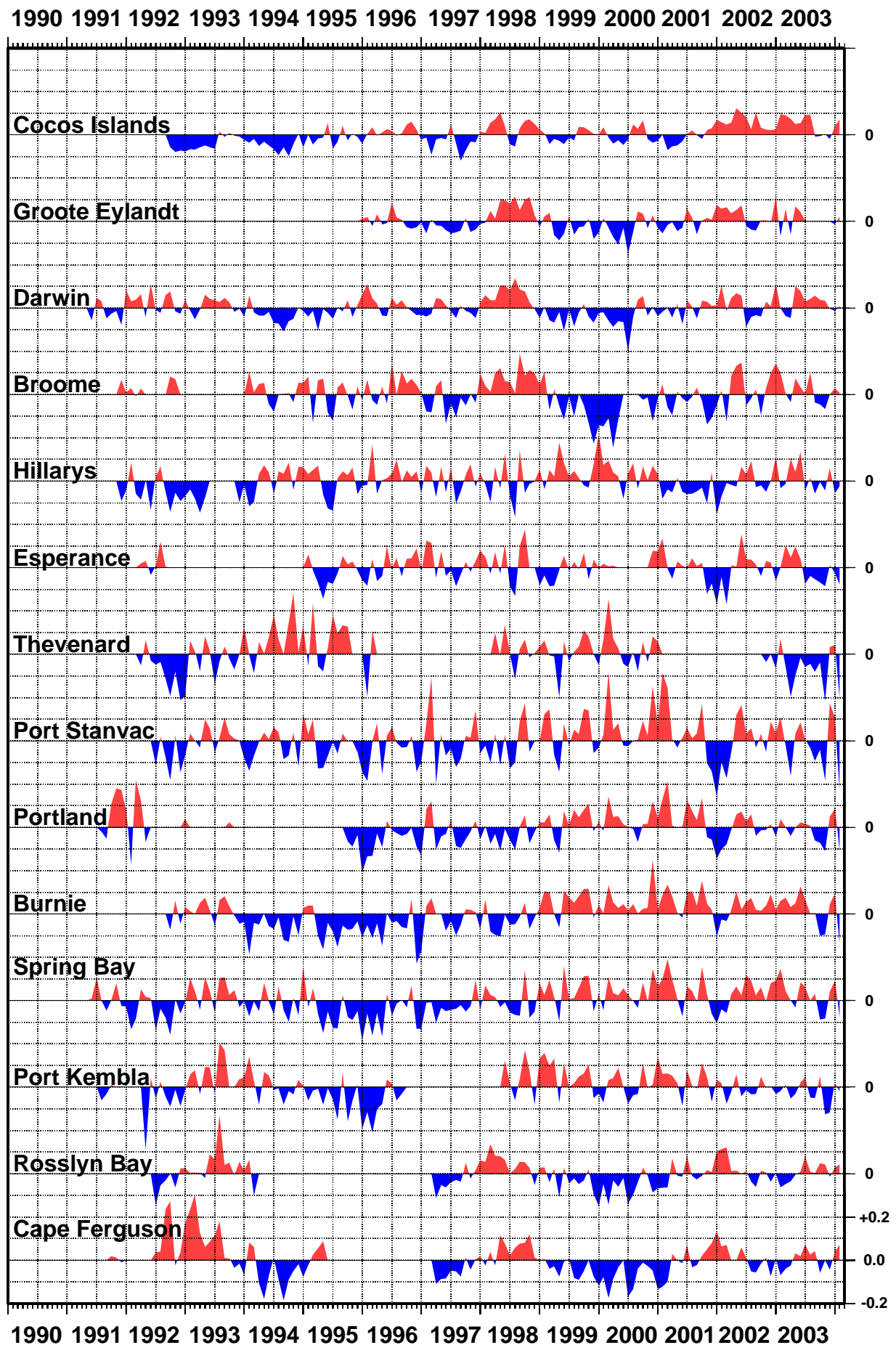


Figure 12

# WATER TEMPERATURE ANOMALIES THROUGH JANUARY 2004 (°C)

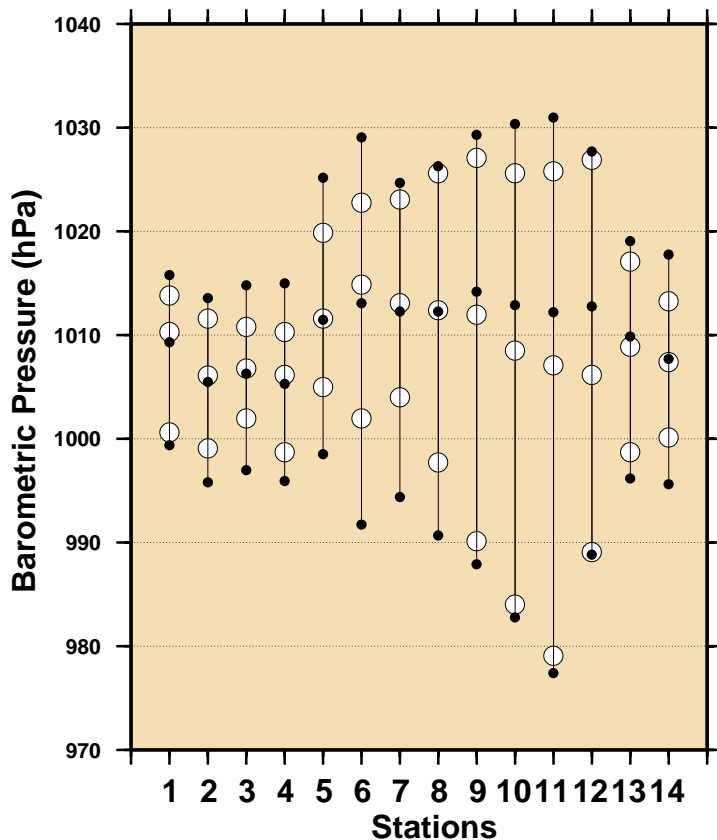
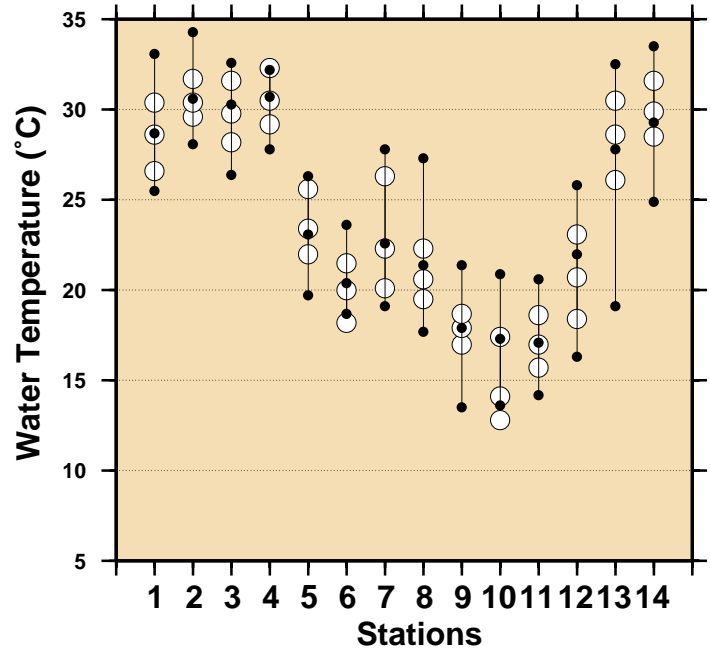
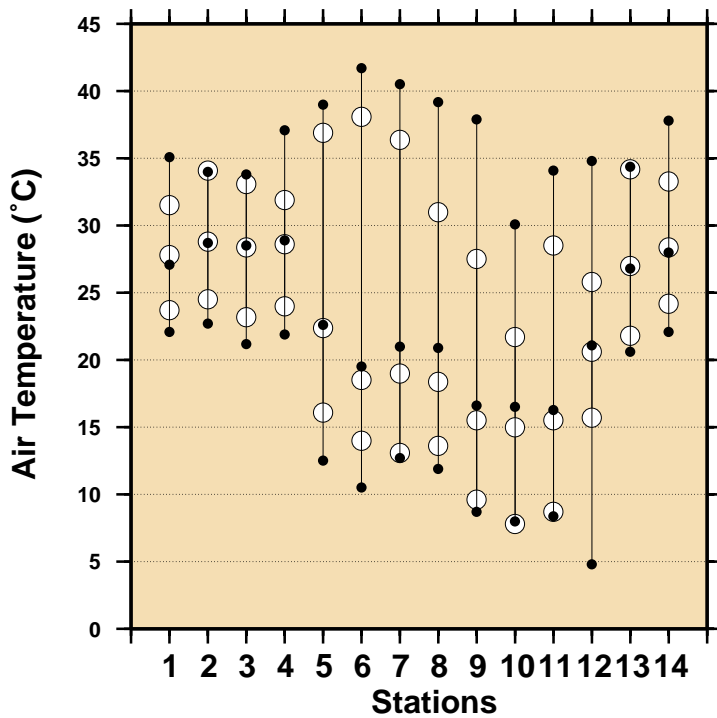


**Figure 13**  
**AIR TEMPERATURE ANOMALIES**  
**THROUGH JANUARY 2004 (°C)**



**Figure 14**

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



**Stations**

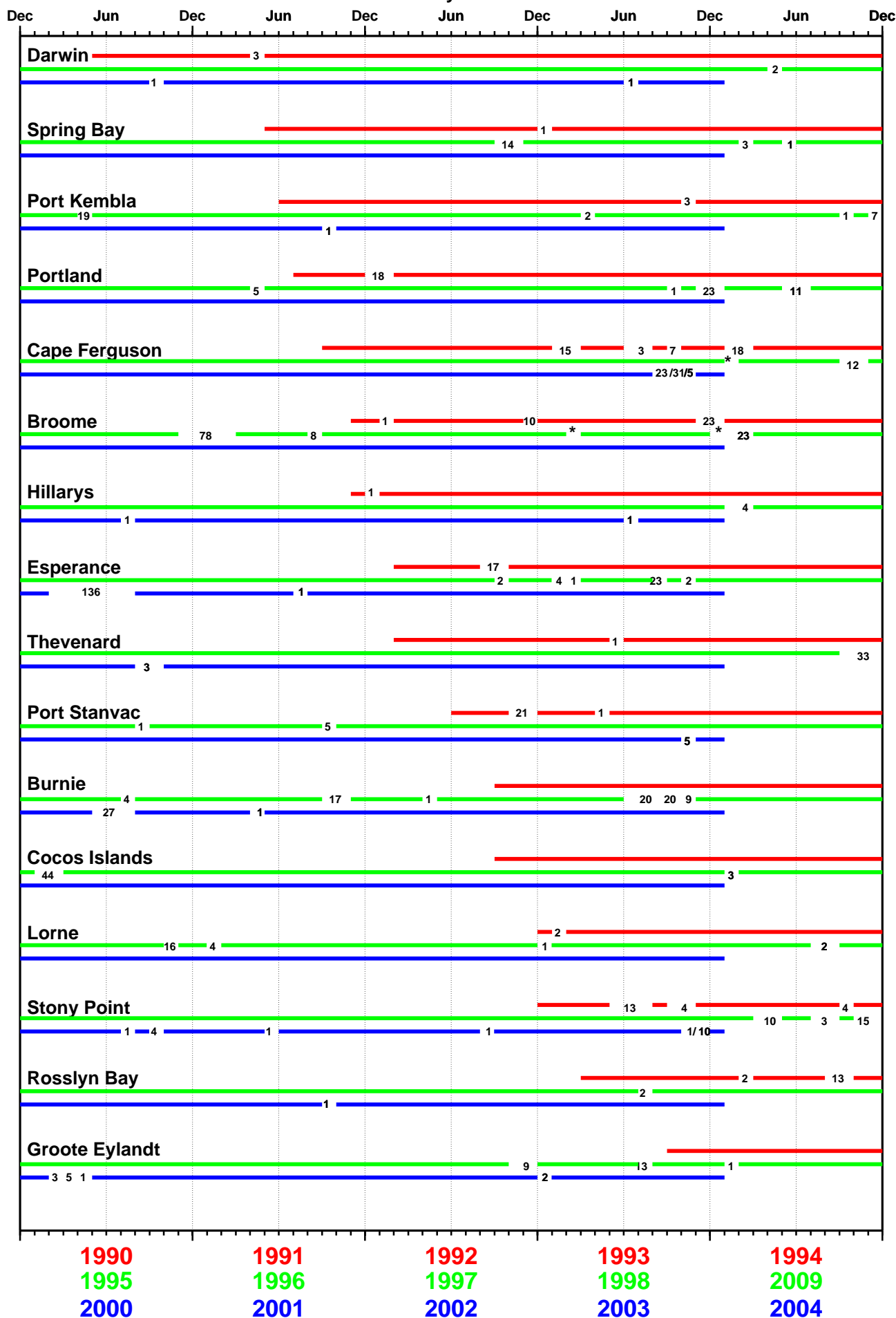
- 1 - Cocos Islands
- 2 - Groote Eylandt
- 3 - Darwin
- 4 - Broome
- 5 - Hillarys
- 6 - Esperance
- 7 - Thevenard
- 8 - Port Stanvac
- 9 - Portland
- 10 - Burnie
- 11 - Spring Bay
- 12 - Port Kembla
- 13 - Rosslyn Bay
- 14 - Cape Ferguson

- January 2004 Maximum
- January 2004 Mean
- January 2004 Minimum
- Long Term January Maximum
- Long Term January Mean
- Long Term January 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 JANUARY 2004 (m)

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

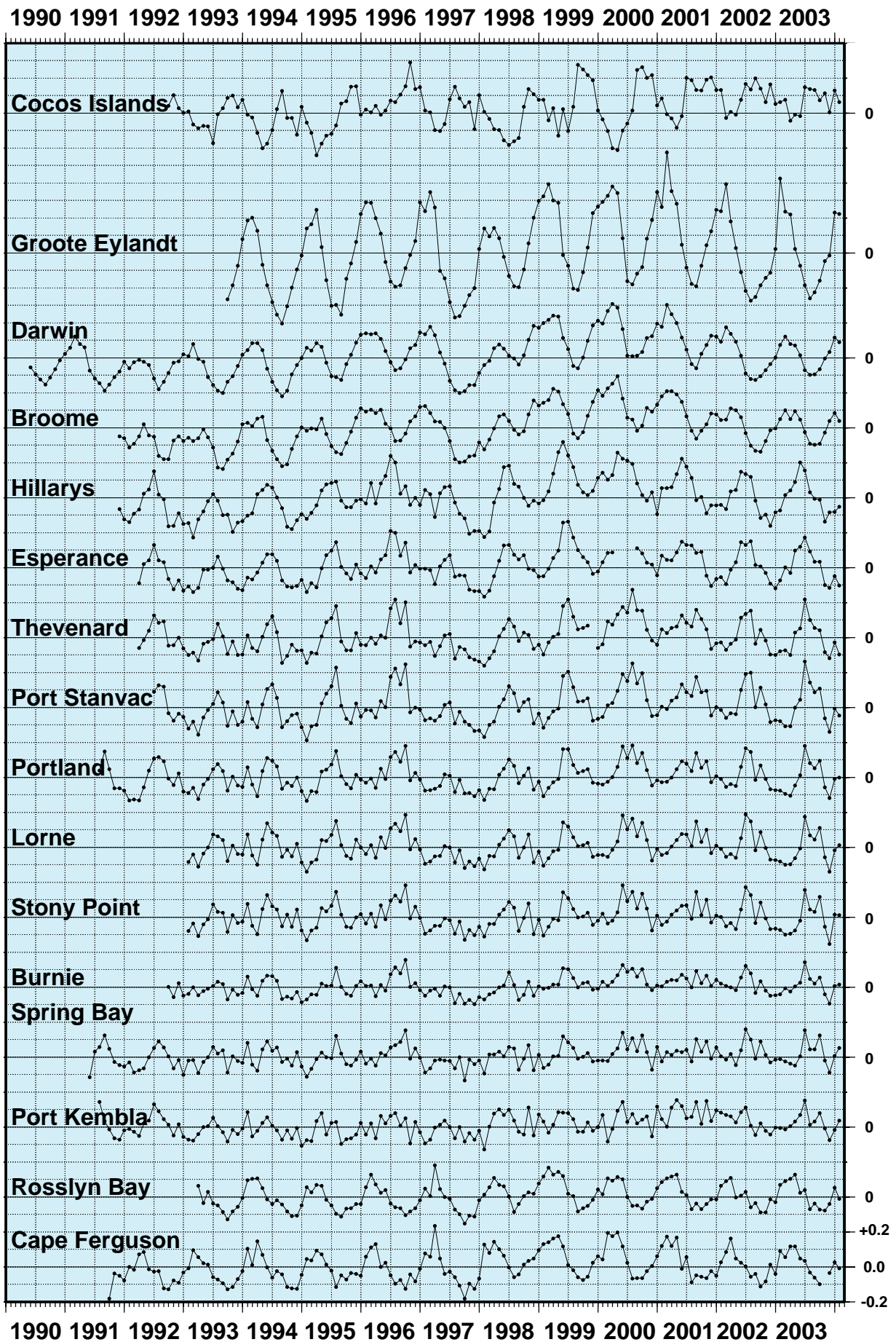


Figure 17

## SEA LEVEL TRENDS THROUGH JANUARY 2004 (mm/year)

