



Thermal Variability in the South Lake of Lake Champlain from 1997-1999

APPENDICES 1 - 17

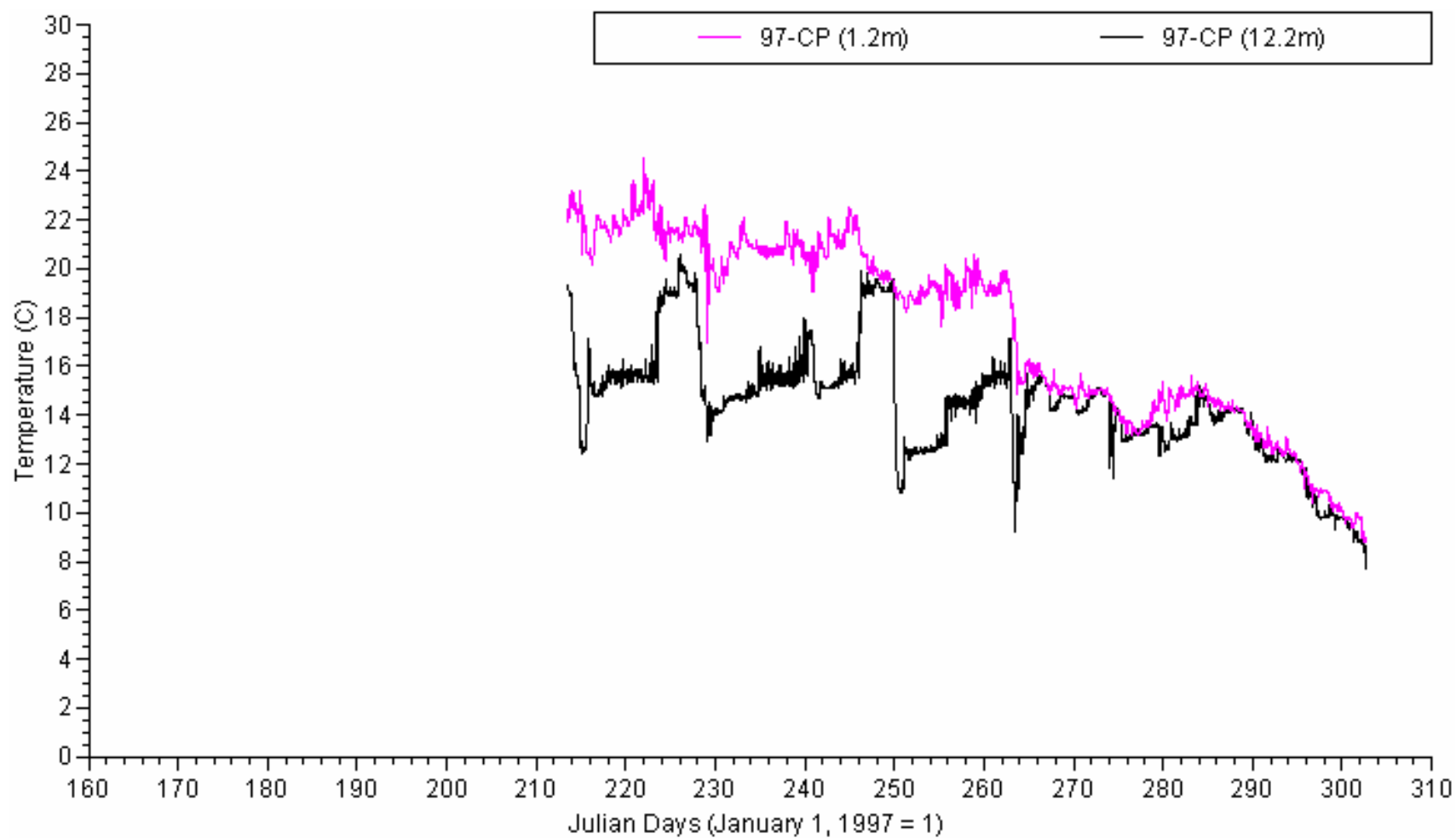
Prepared by

Tom Manley, Marine Research Corporation

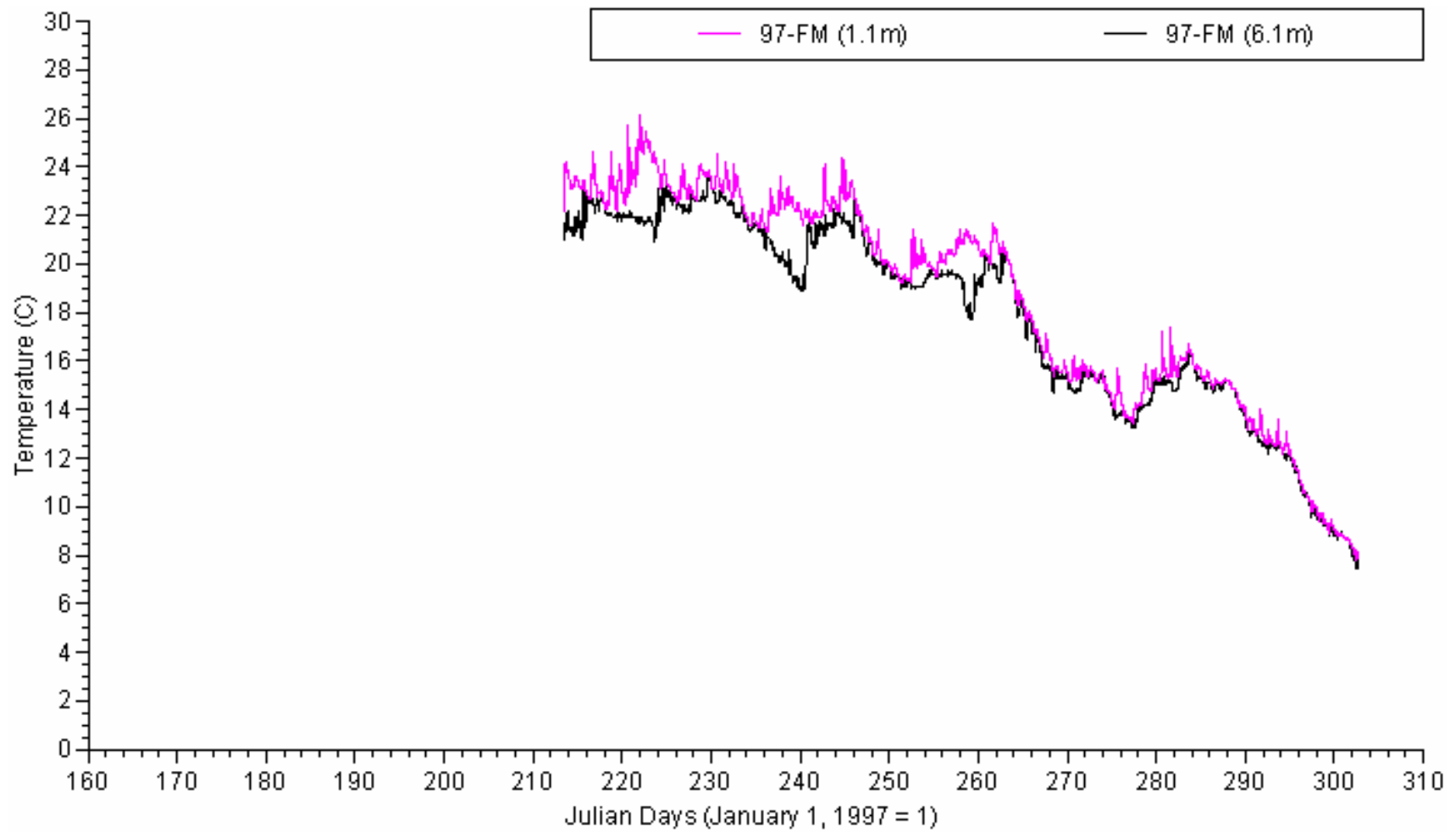
for
Lake Champlain Basin Program

September 2001

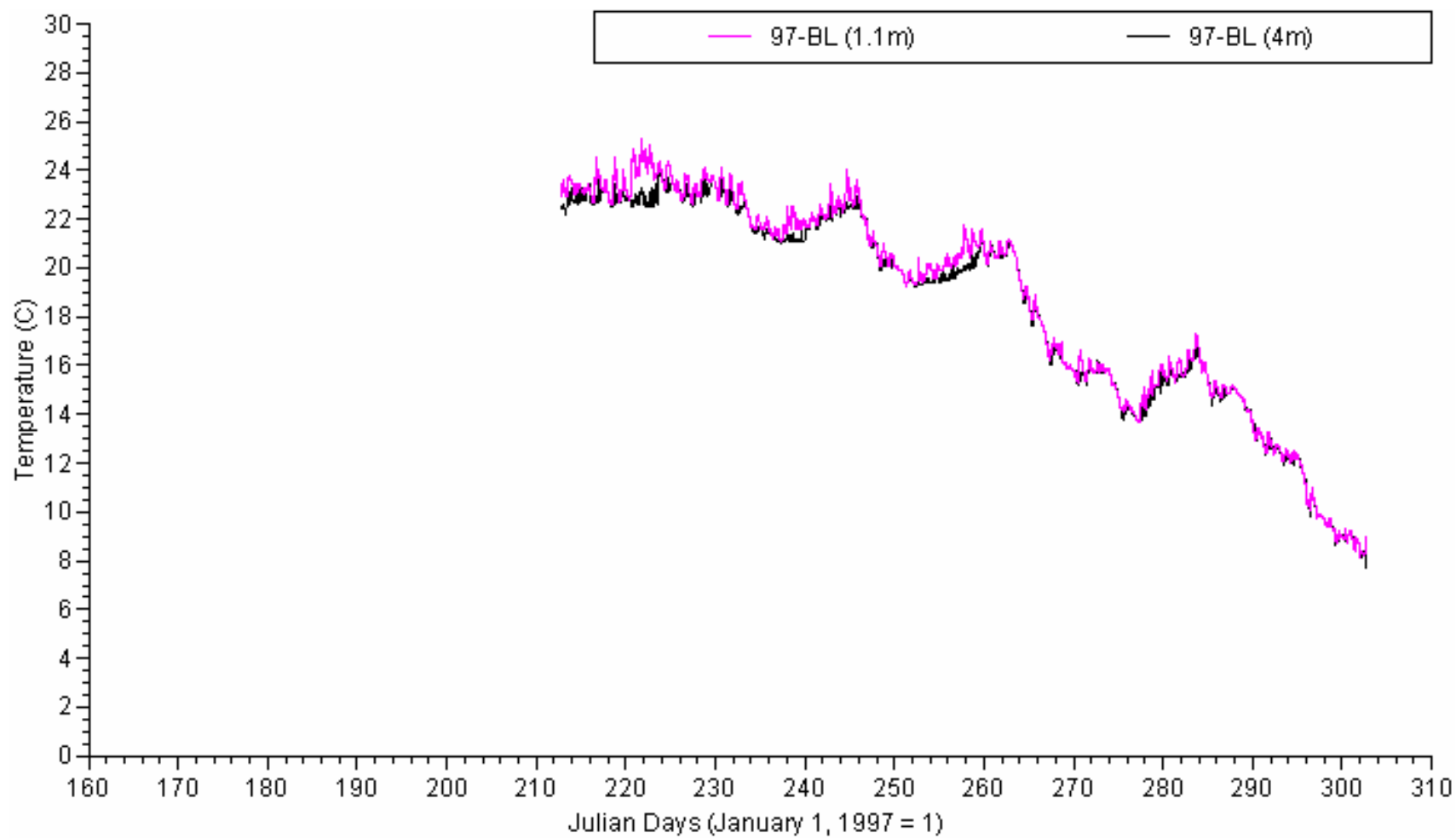
Appendix 1
1997 Plots of Thermal Data



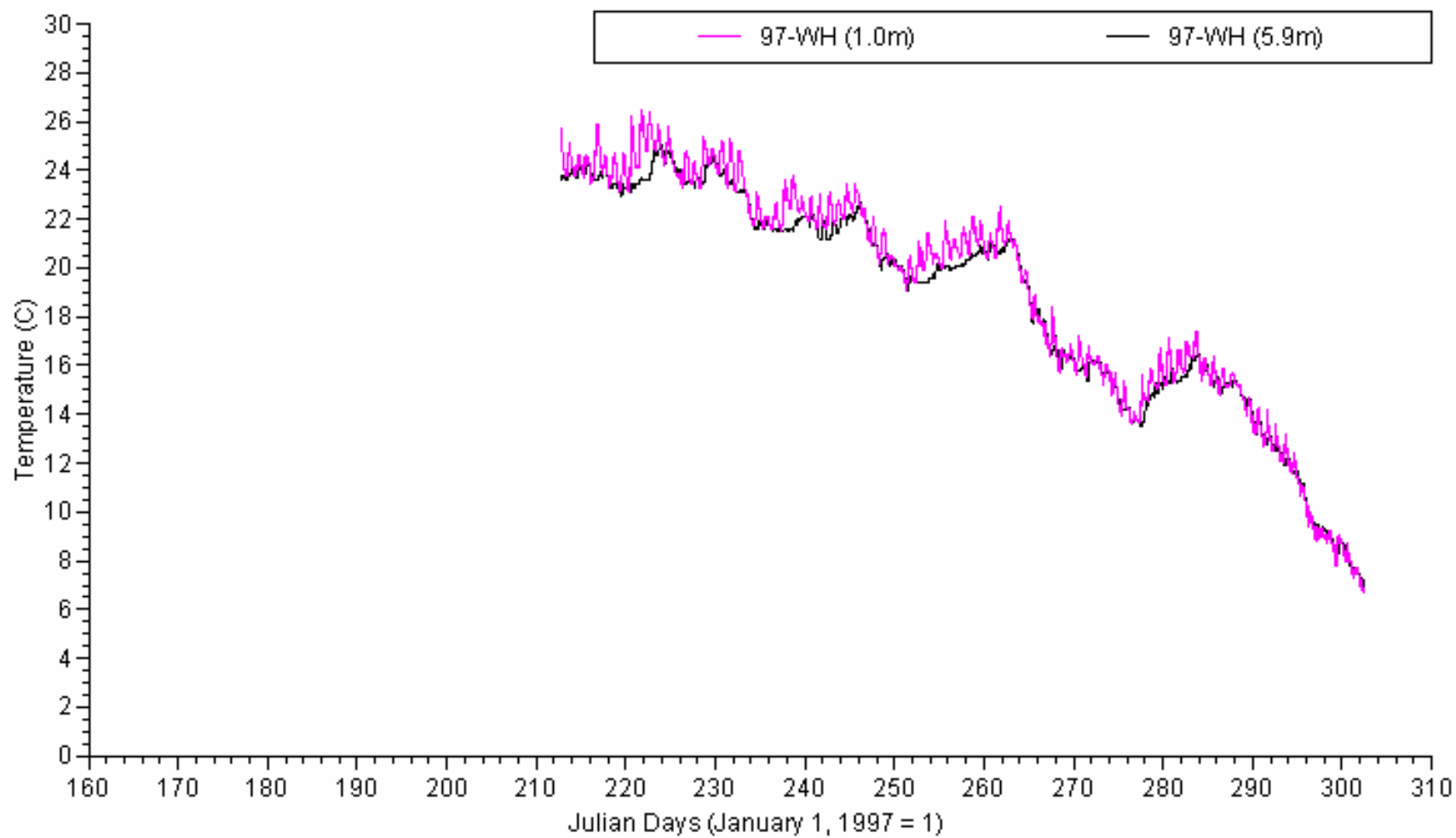
Appendix 1 – 97a. 1997 thermal data from Crown Point.



Appendix 1 – 97b. 1997 thermal data from Five Mile Point.

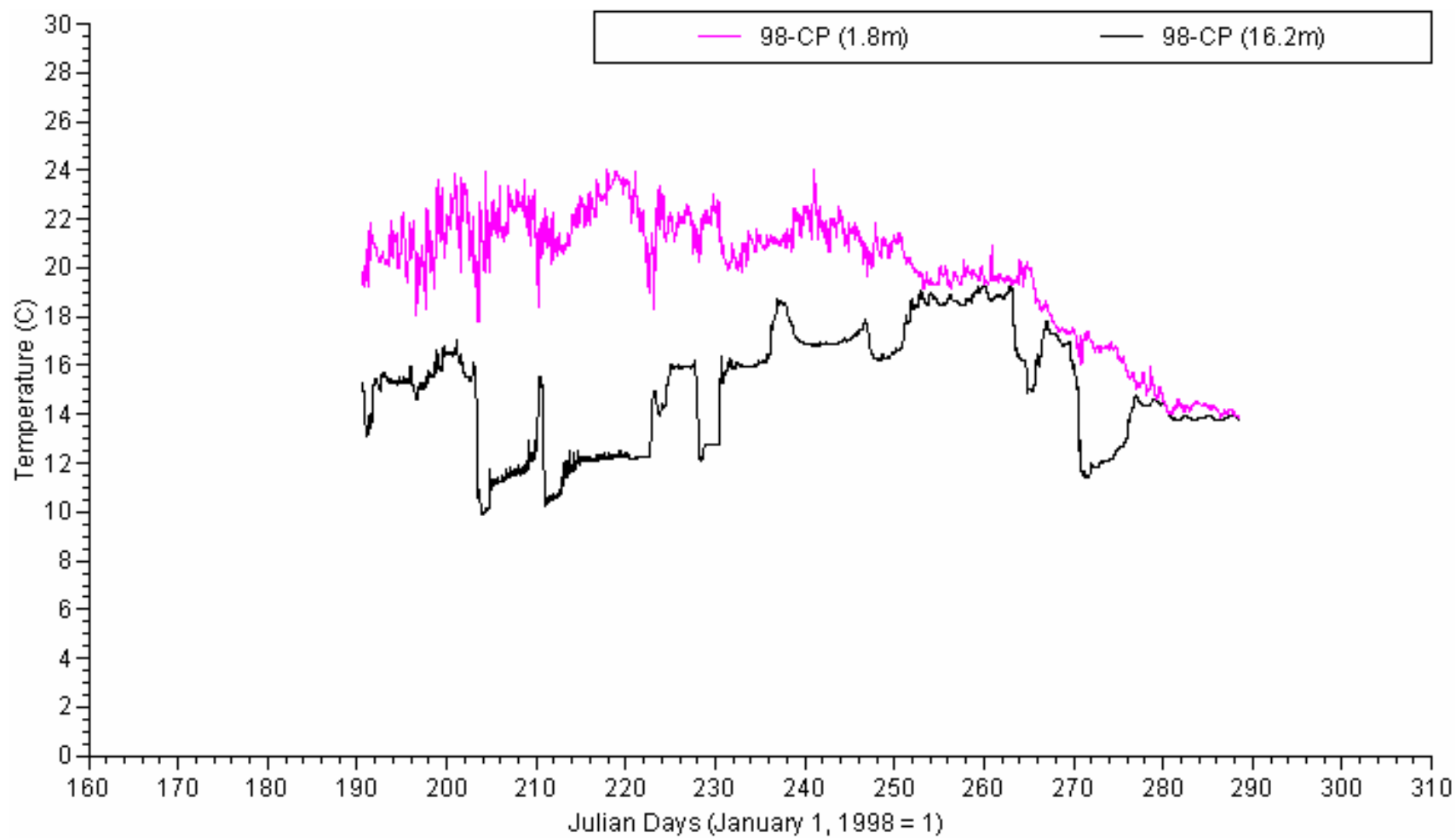


Appendix 1-97c. 1997 thermal data from Benson Landing.

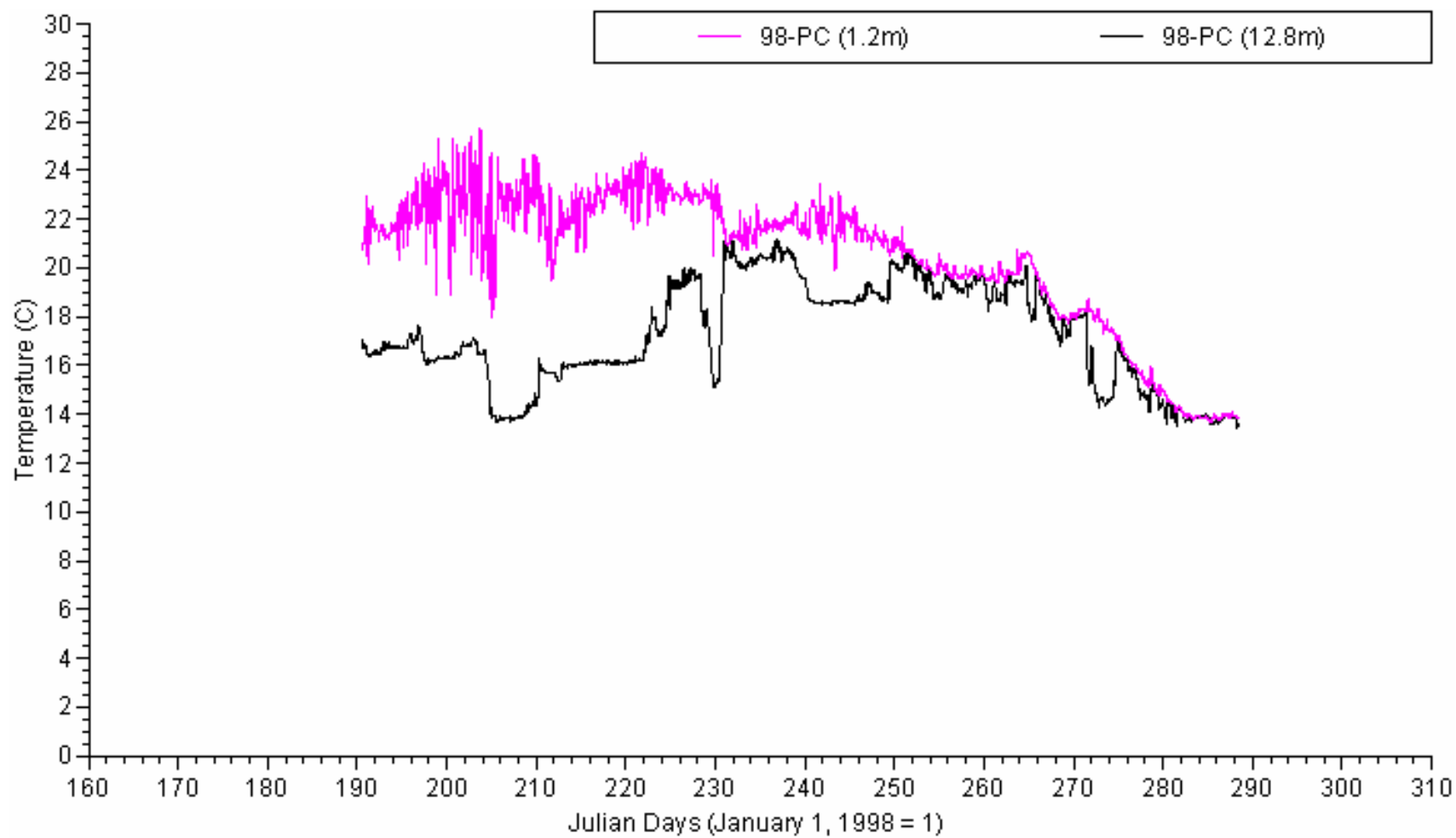


Appendix 1-97d. 1997 thermal data from Whitehall.

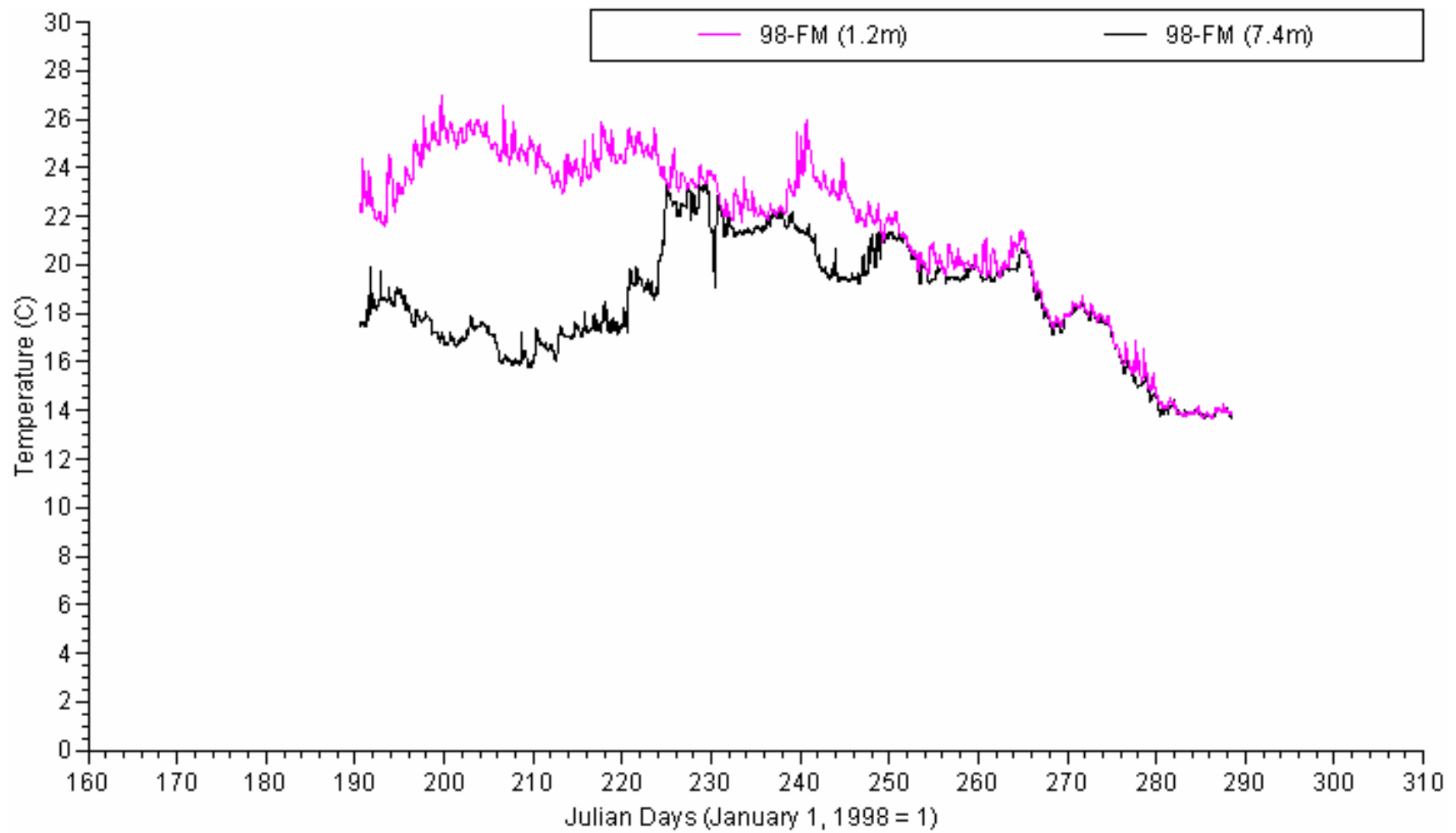
Appendix 2
1998 Plots of Thermal Data



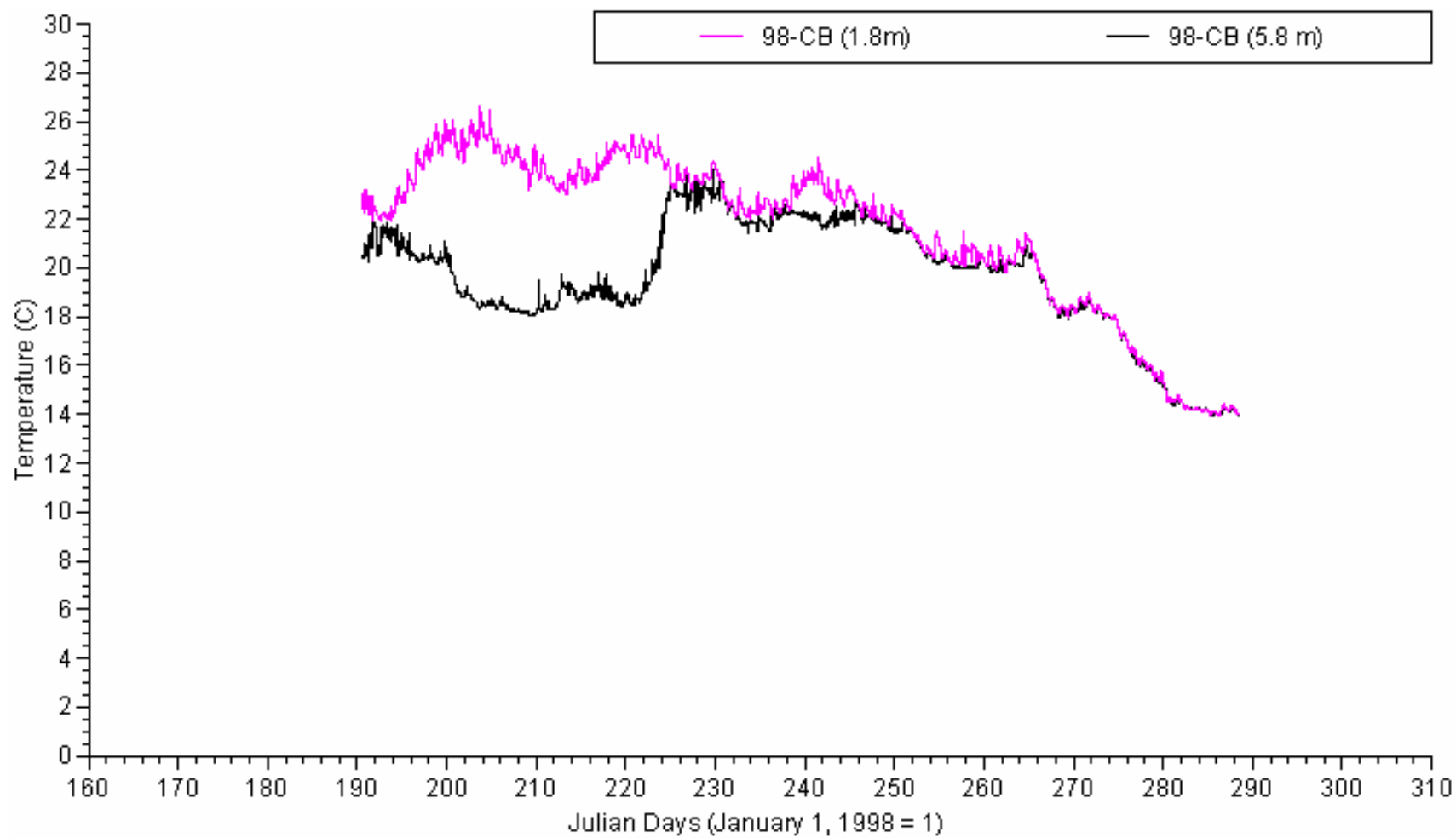
Appendix 2-98a. 1998 thermal data from Crown Point.



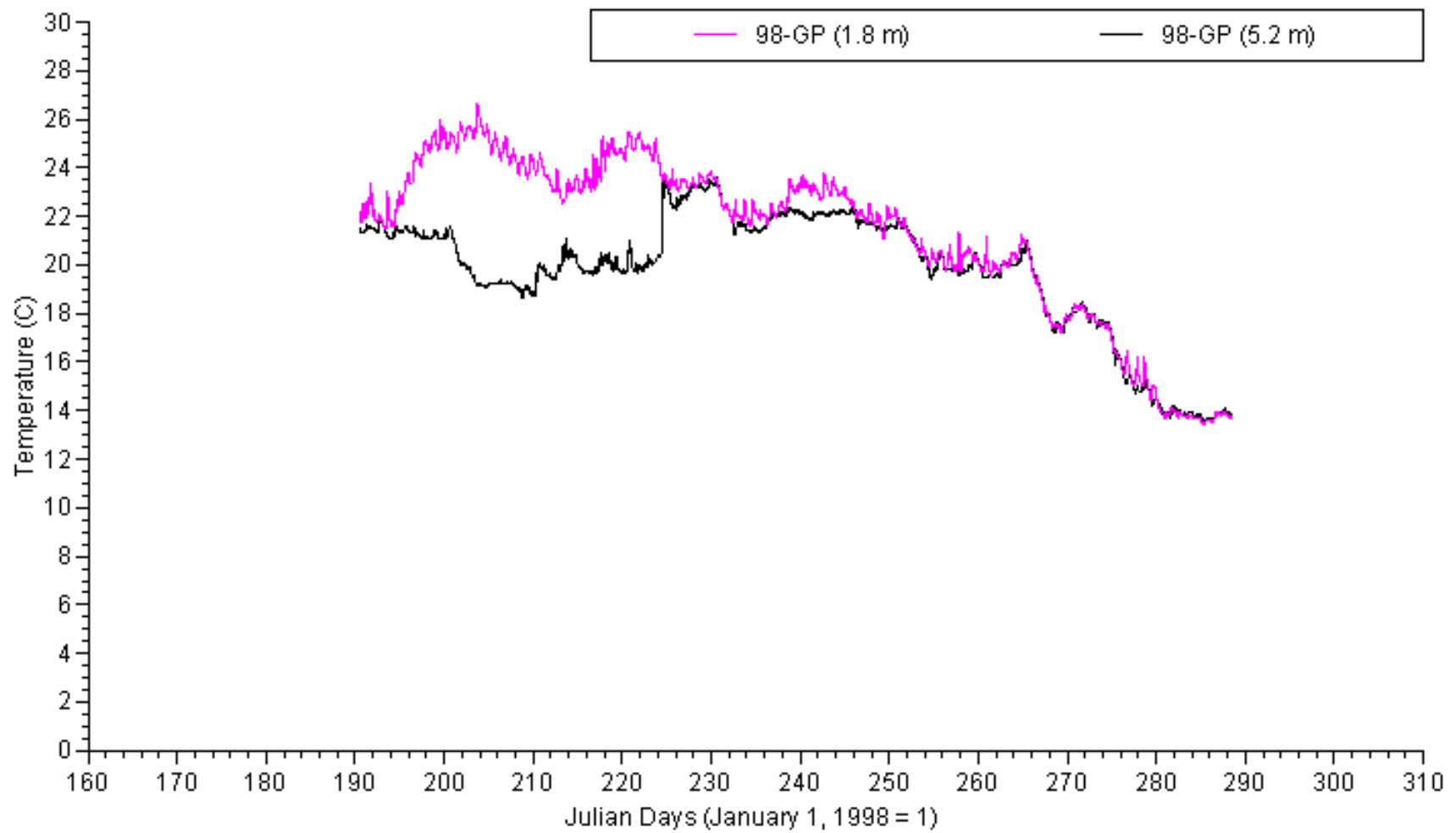
Appendix 2-98b. 1998 thermal data from Putnam Creek.



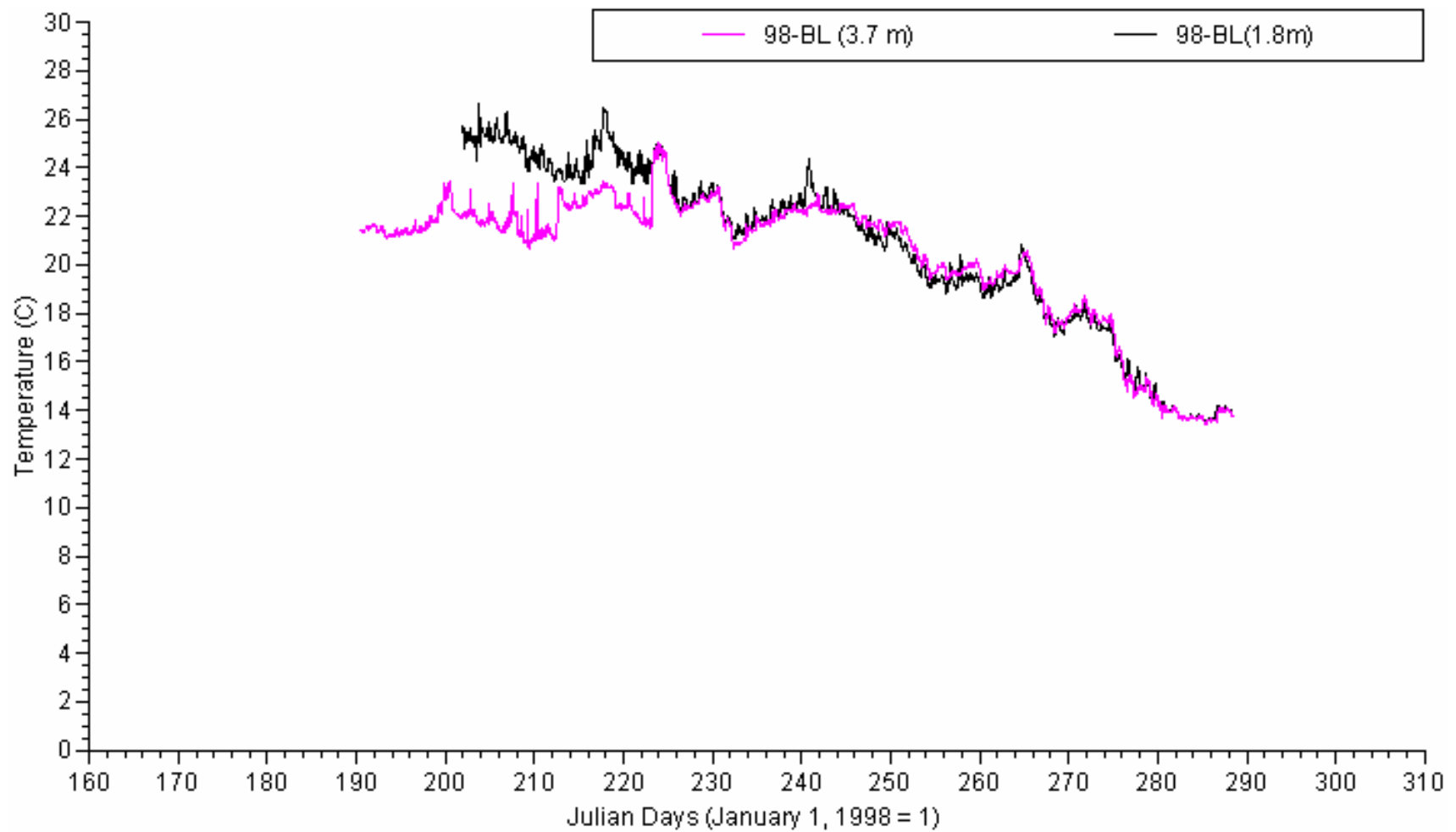
Appendix 2-98c. 1998 thermal data from Five Mile Point.



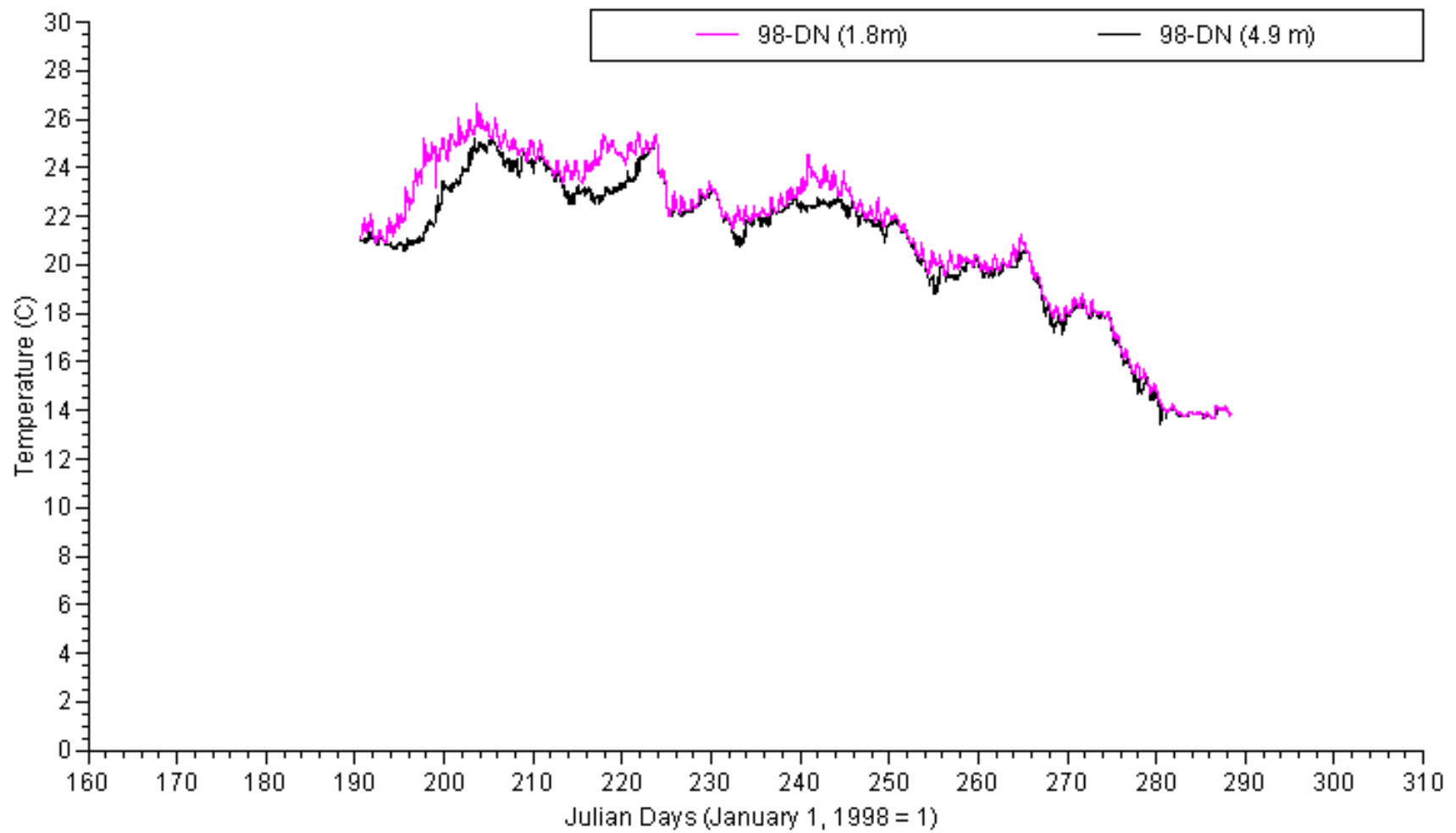
Appendix 2-98d. 1998 thermal data from Catfish Bay.



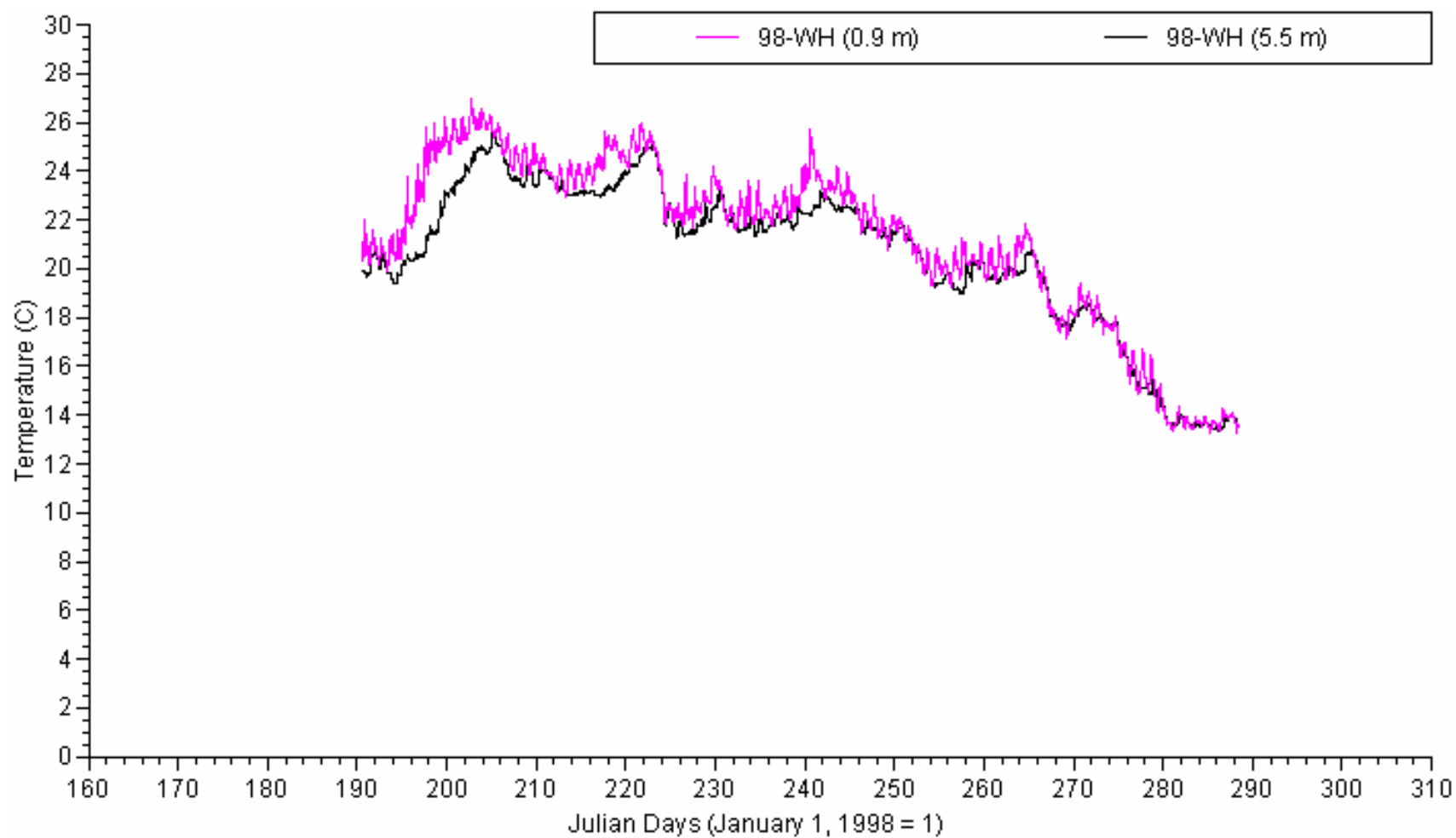
Appendix 2-98e. 1998 thermal data from Gourlie Point.



Appendix 2-98f. 1998 thermal data from Benson Landing.

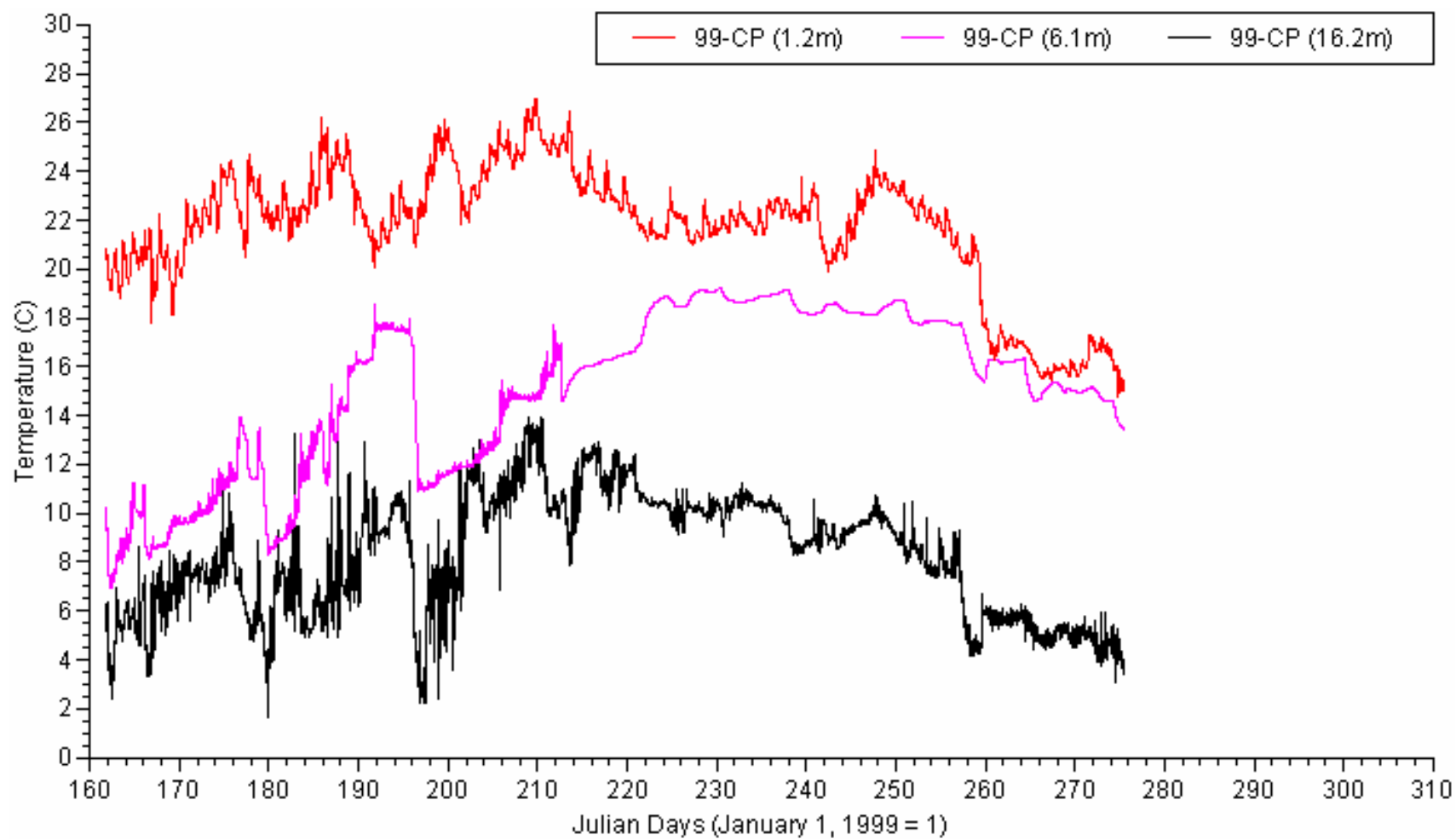


Appendix 2-98g. 1998 thermal data from Dresden Narrows.

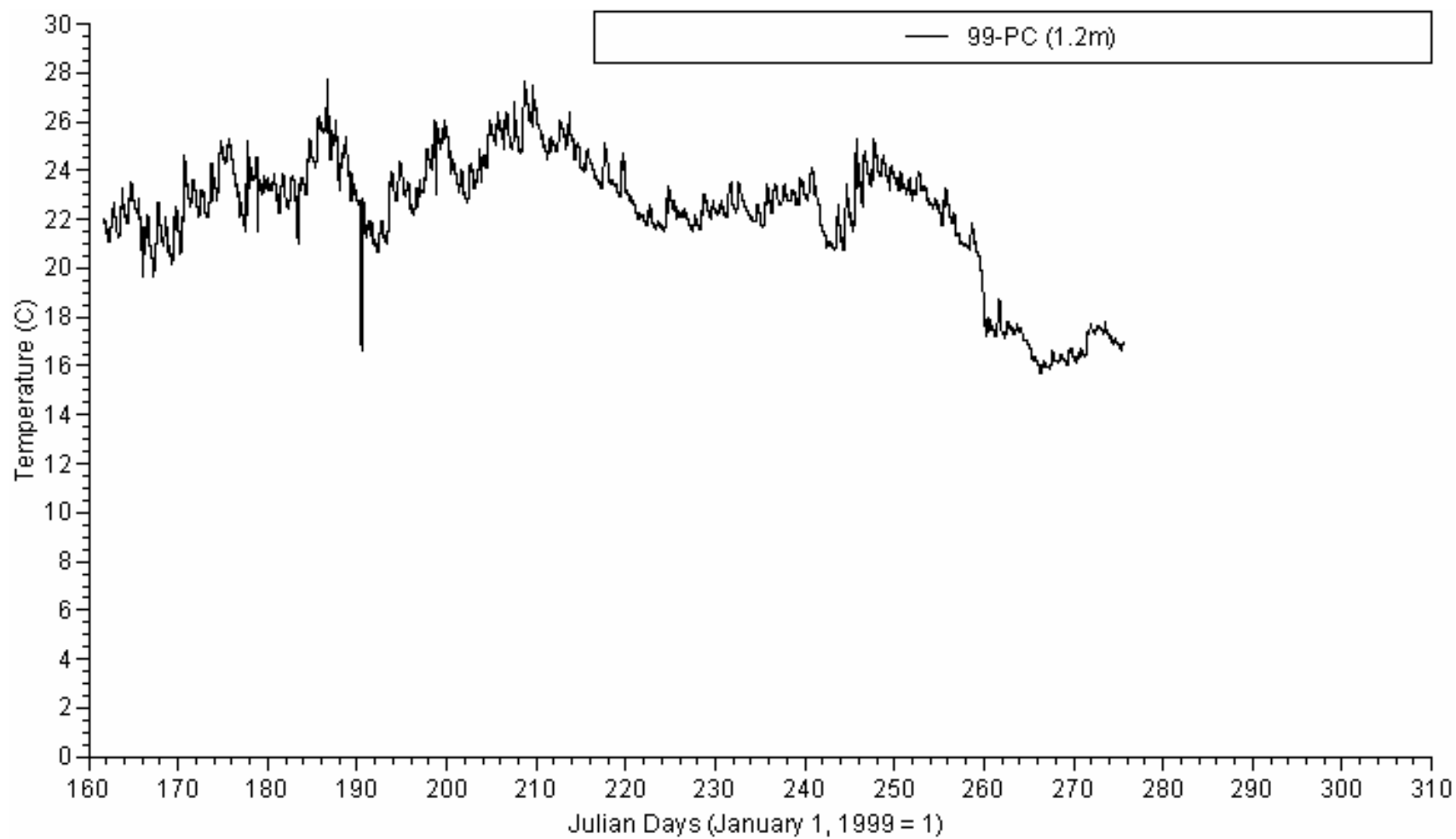


Appendix 2-98h. 1998 thermal data from Whitehall.

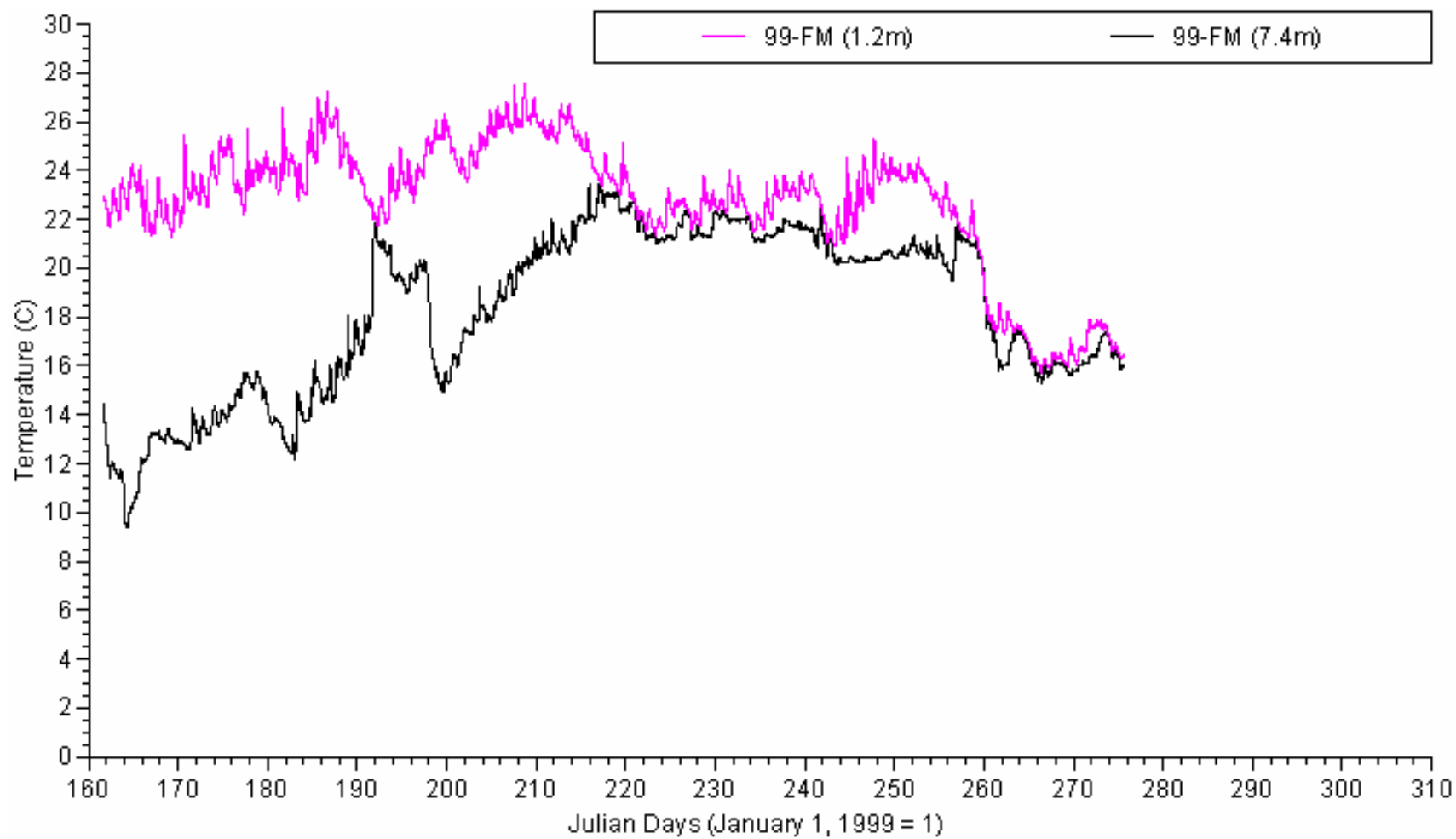
Appendix 3
1999 Plots of Thermal Data



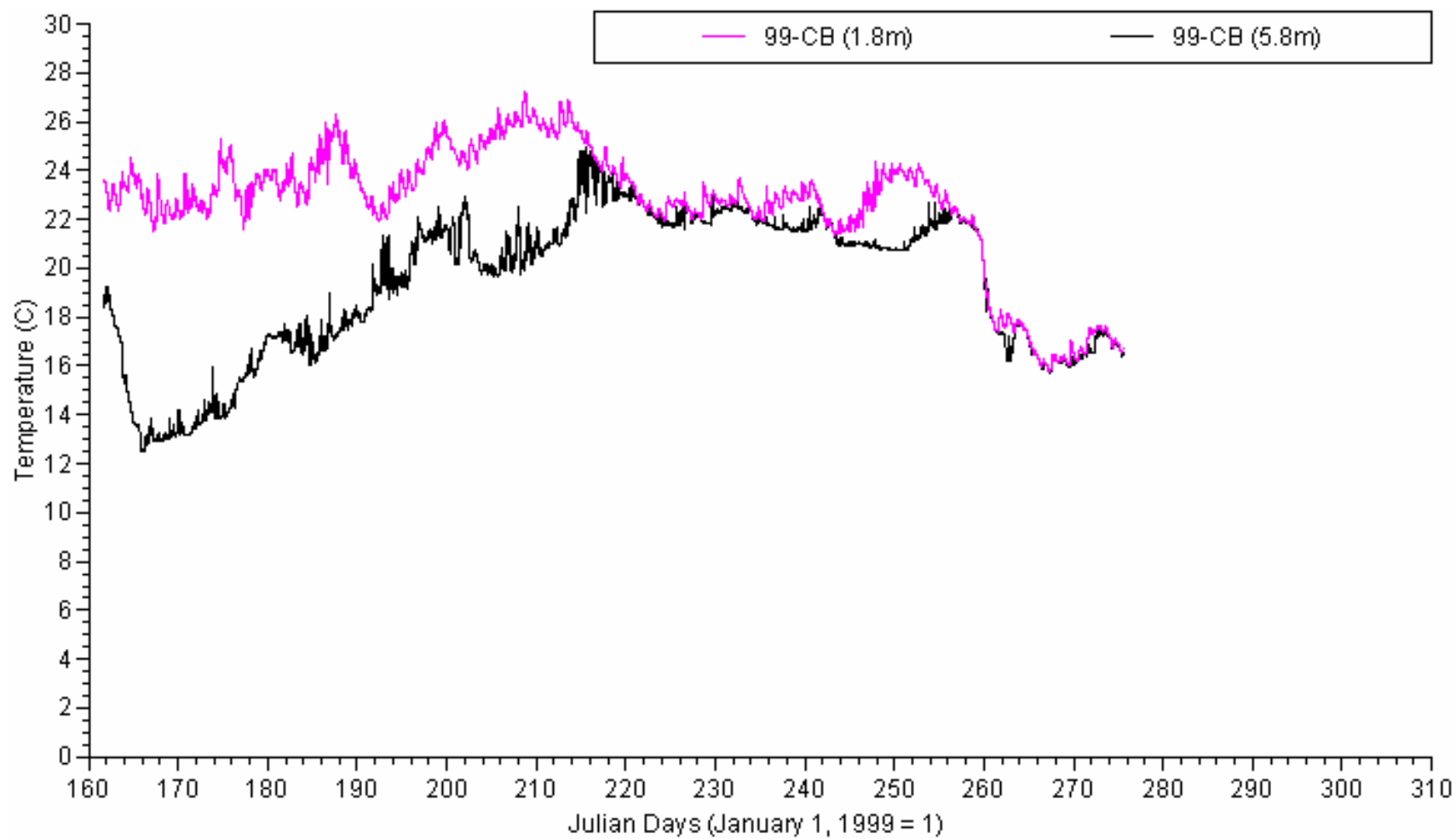
Appendix 3-99a. 1999 thermal data from Crown Point.



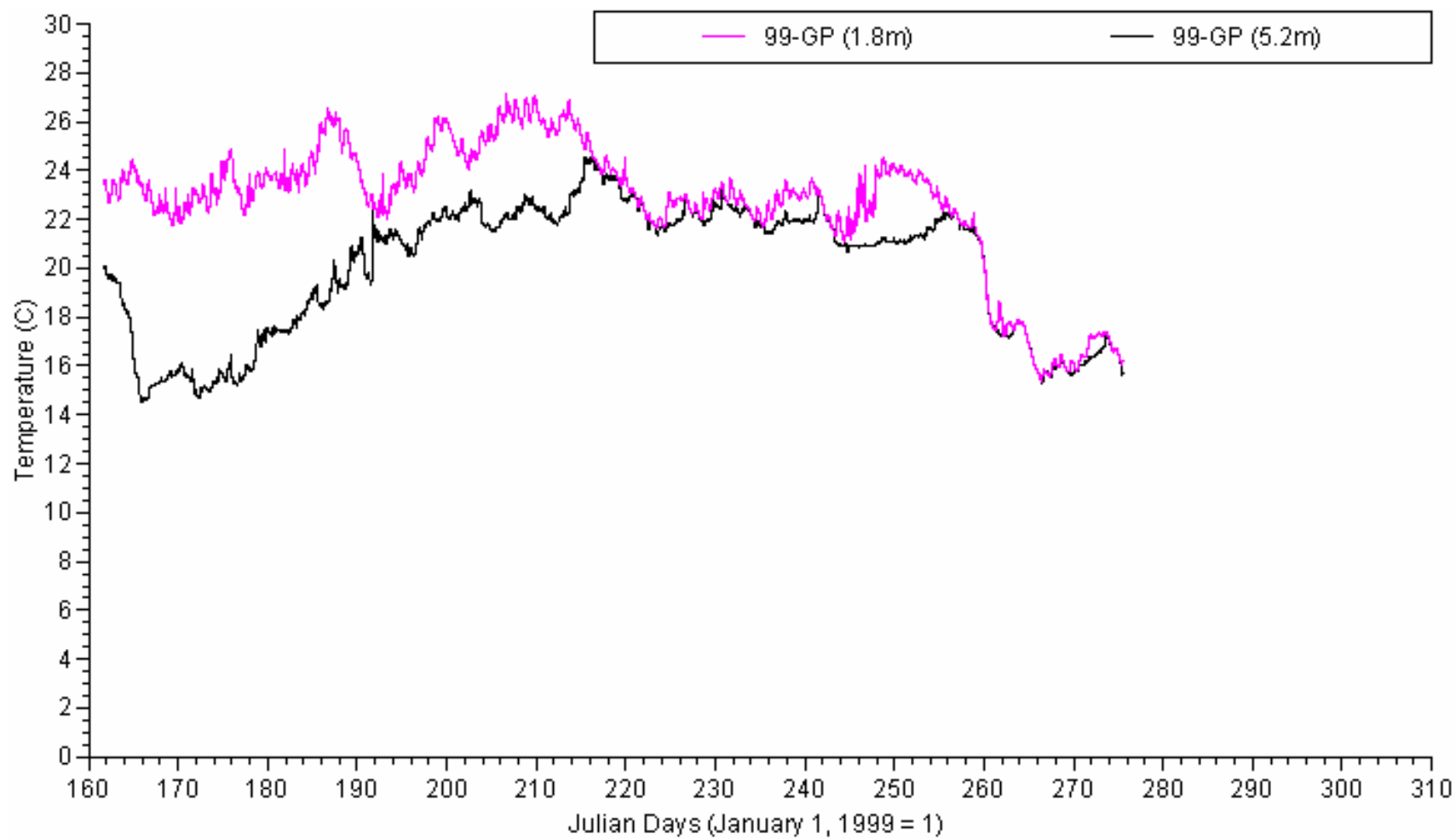
Appendix 3-99b. 1999 thermal data from Putnam Creek. During this time period, the deep sensor failed.



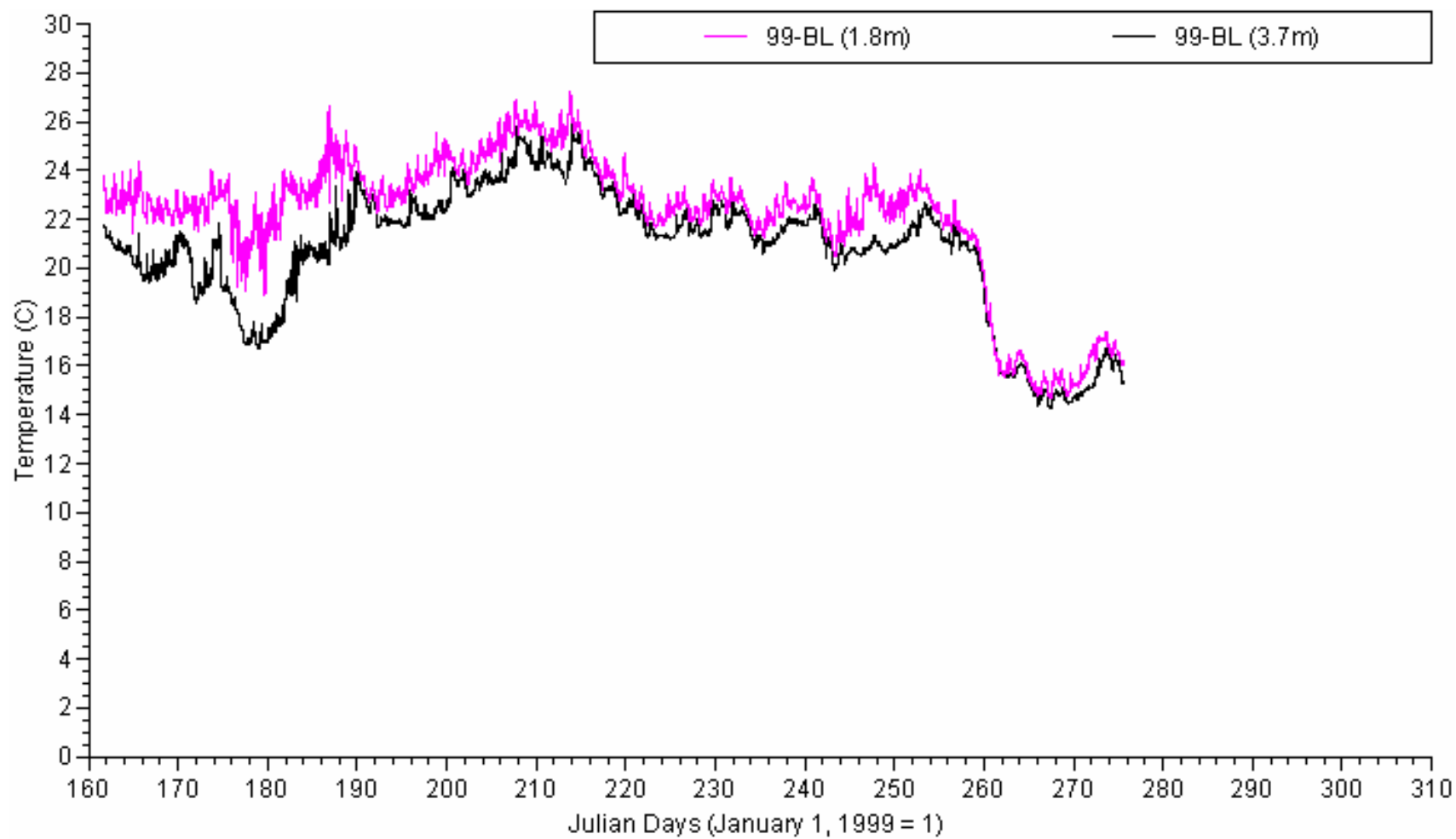
Appendix 3-99c. 1999 thermal data from Five Mile Point.



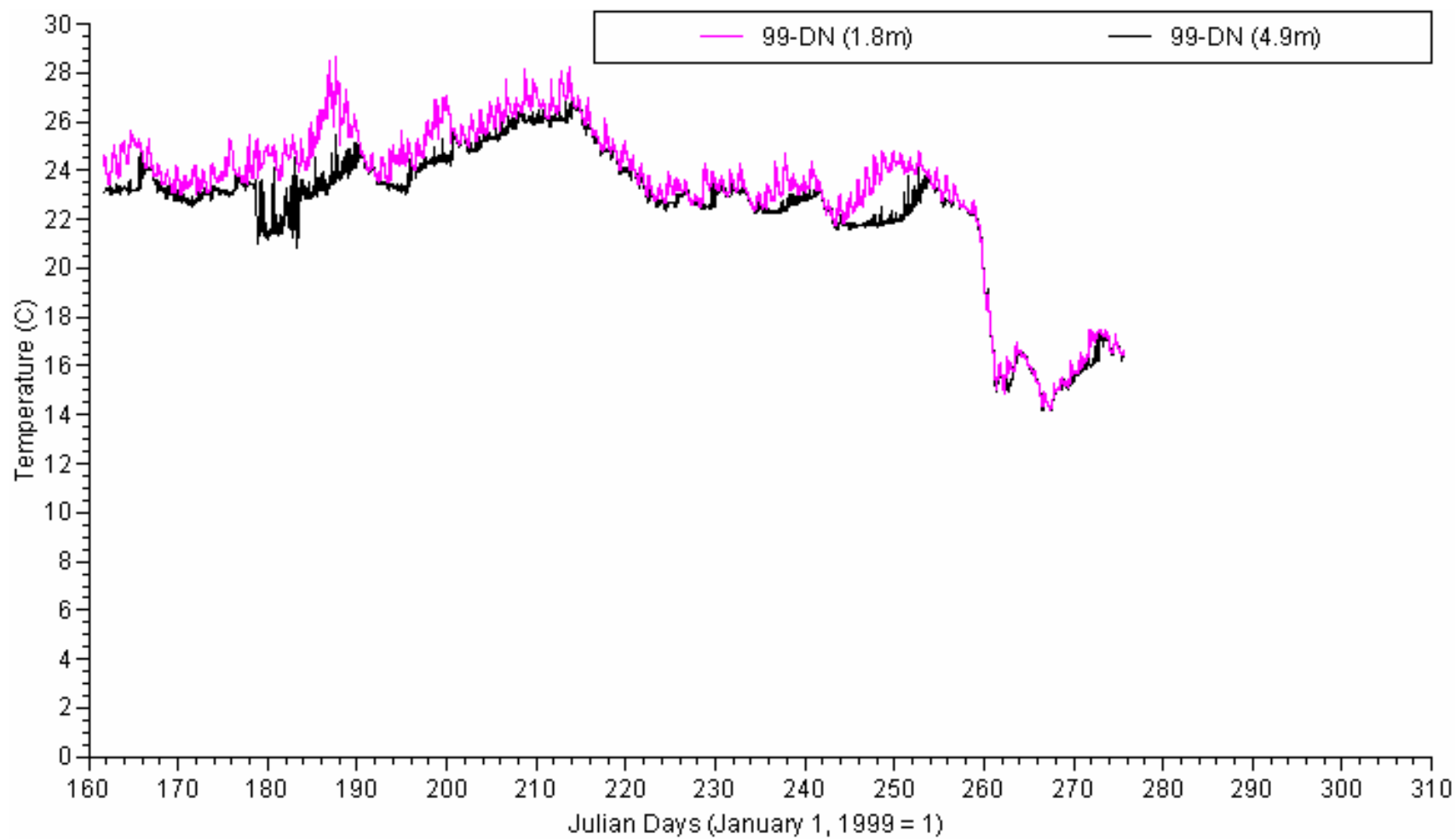
Appendix 3-99d. 1999 thermal data from Catfish Bay.



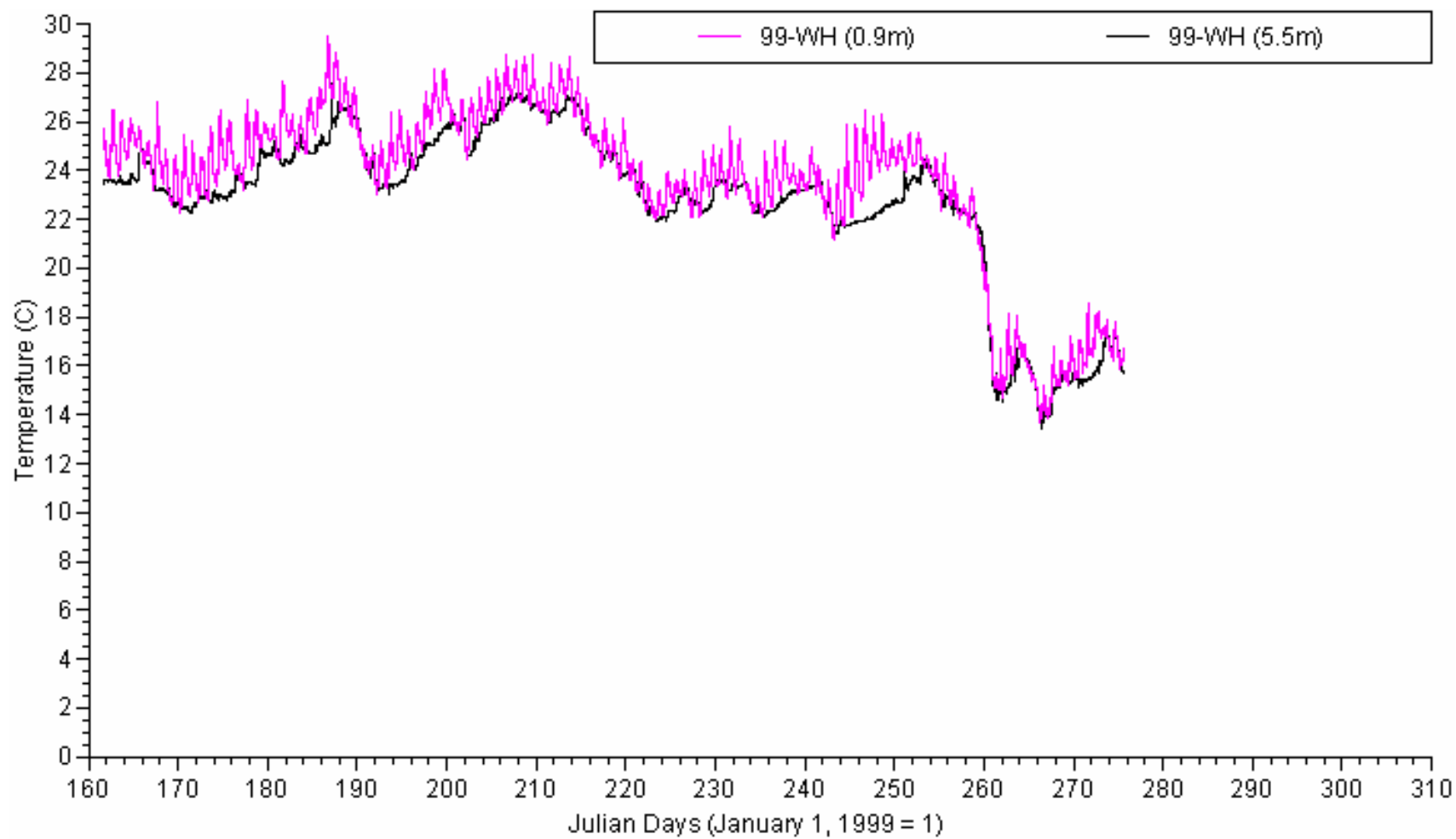
Appendix 3-99e. 1999 thermal data from Gourlie Point.



Appendix 3-99f. 1999 thermal data from Benson Landing.



Appendix 3-99g. 1999 thermal data from Dresden Narrows.



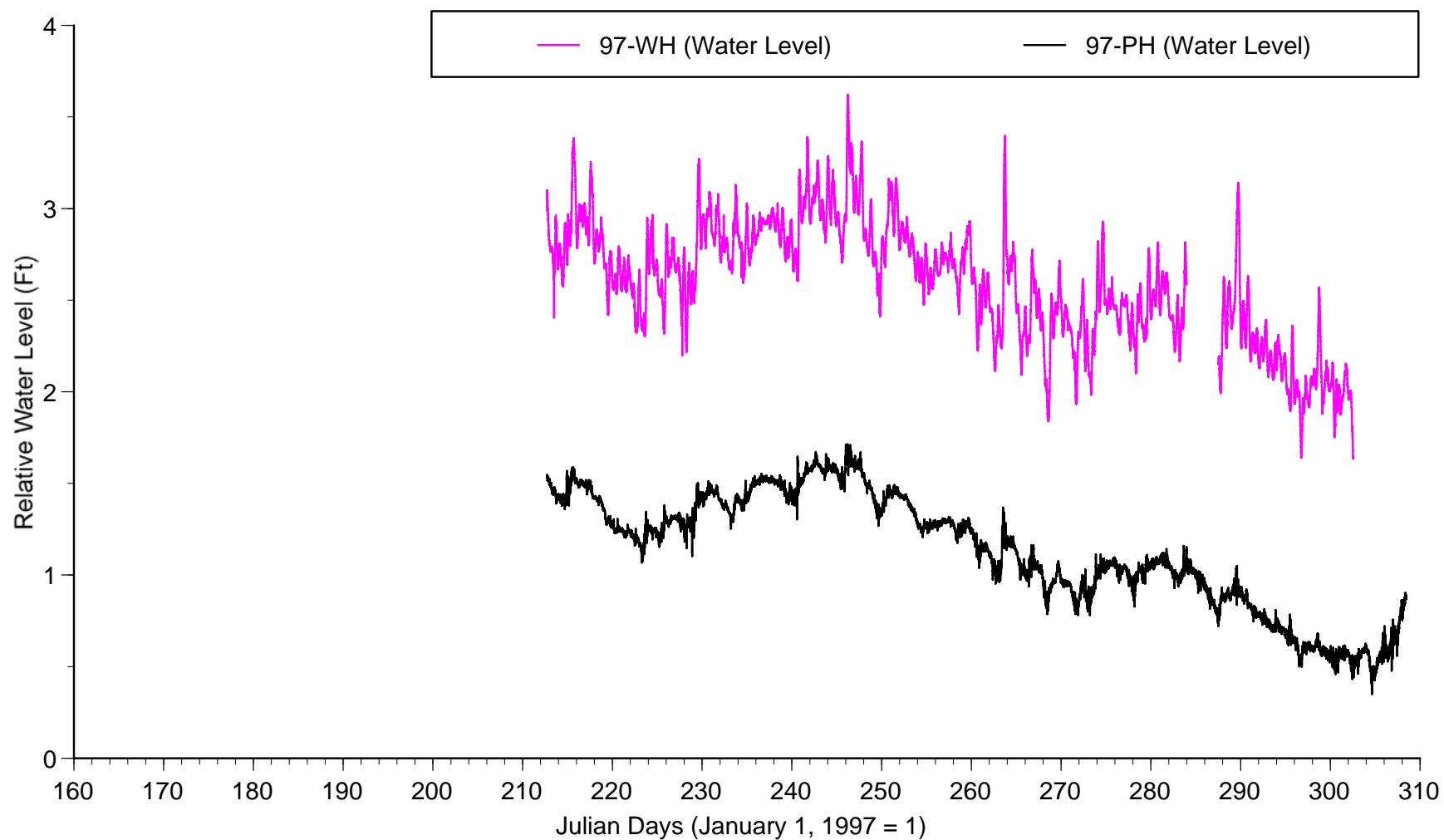
Appendix 3-99h. 1999 thermal data from Whitehall.

Appendix 4

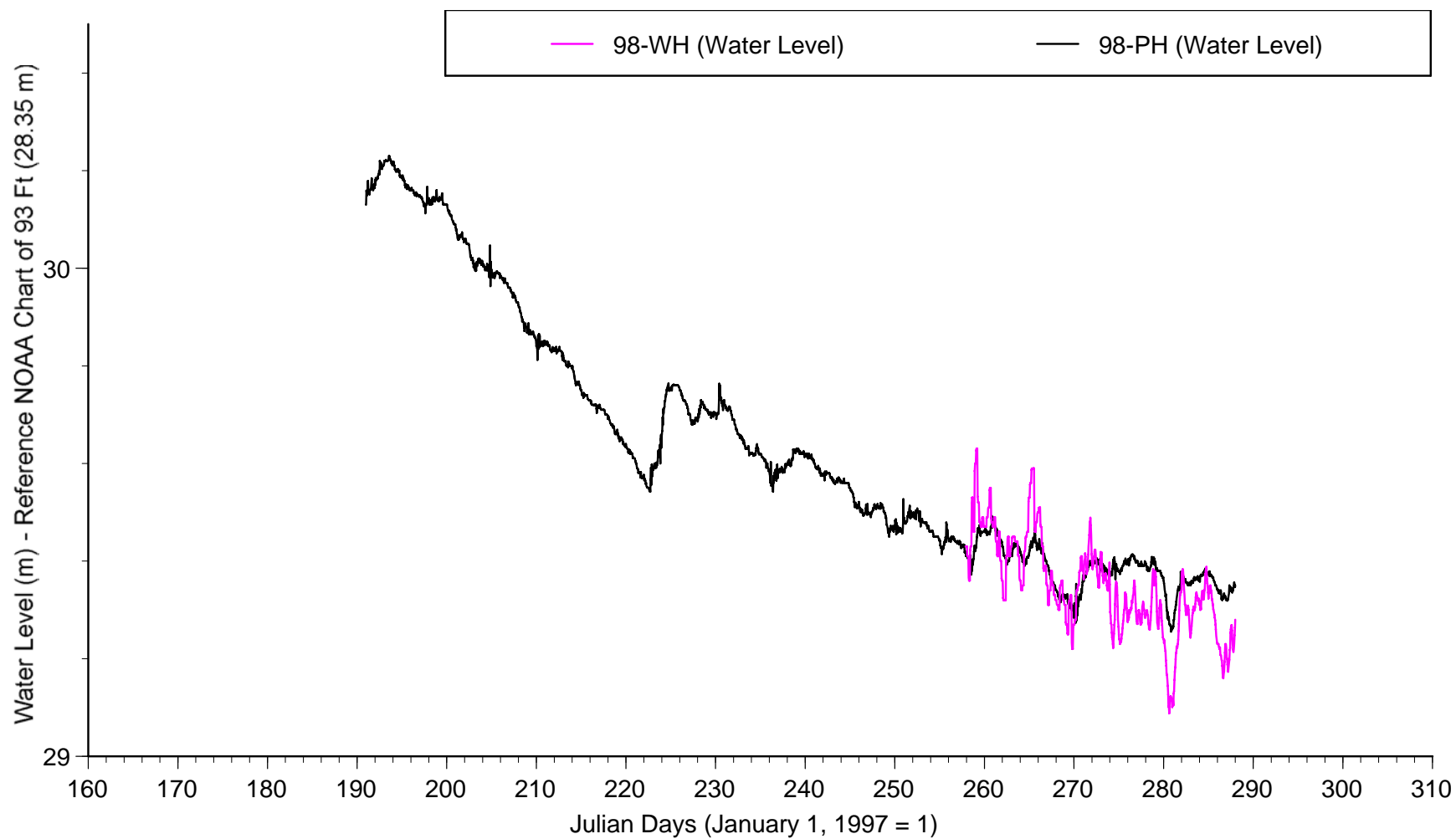
1997 – 1998 - 1999

Plots of Water Level Data

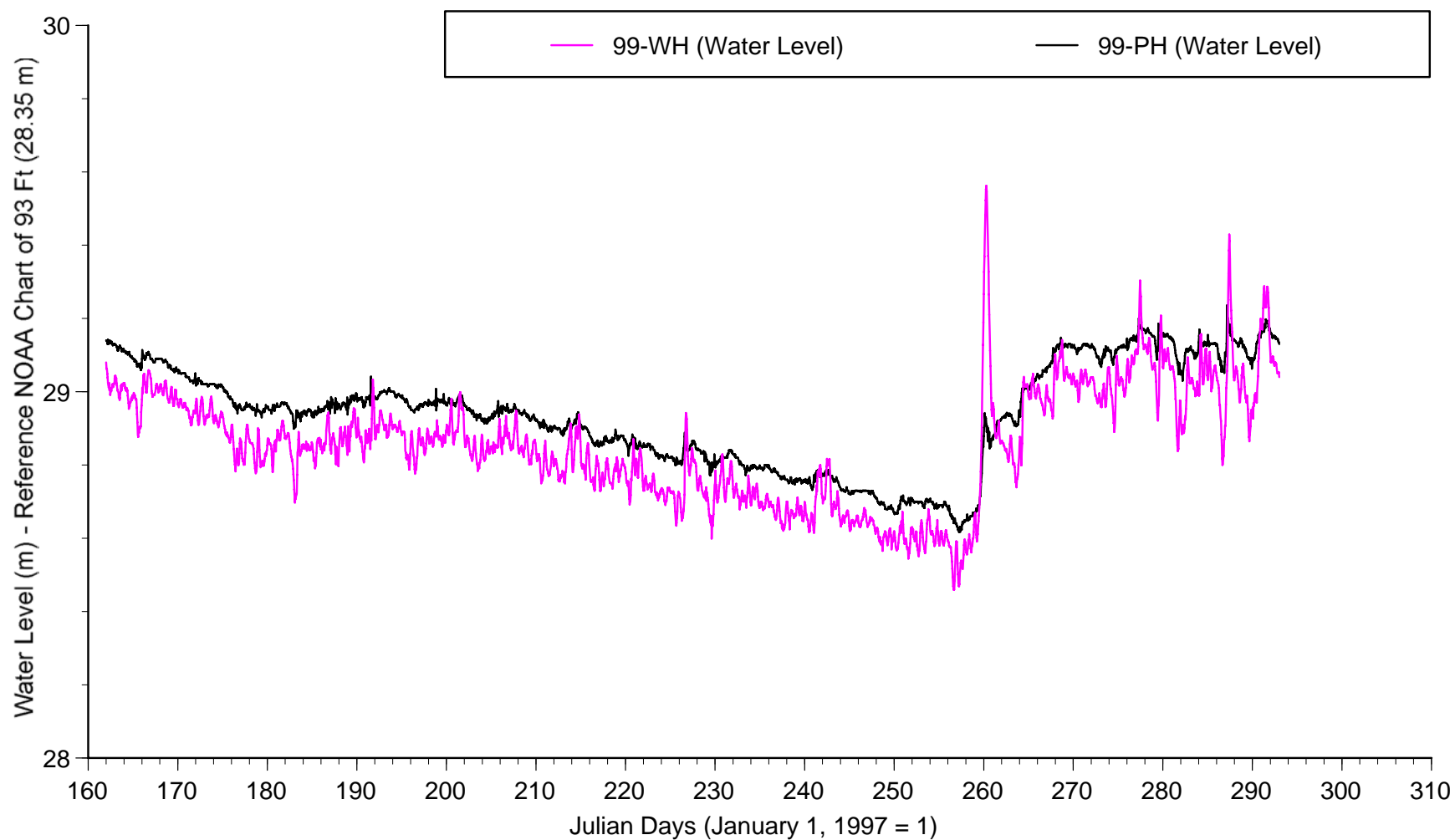
Port Henry (Stevens Point)
&
USCG Pier 32 (Whitehall)



Appendix 4a. 1997 water level data from Stevens Point at Port Henry, New York and the U.S. Coast Guard Pier No. 32 (our Whitehall site). Note that water levels are relative to each other and not absolute. Data at Whitehall between days 284 and 287 were removed due to a failure at the site.



Appendix 4b. 1998 water level data from Stevens Point at Port Henry, New York and the U.S. Coast Guard Pier No. 32 (our Whitehall site). Note that water levels are referenced to the NOAA charts of Lake Champlain (93 feet or 28.35 m). Data at Whitehall started at the end of the 1998 field program.



Appendix 4c. 1999 water level data from Stevens Point at Port Henry, New York and the U.S. Coast Guard Pier No. 32 (our Whitehall site). Note that water levels are referenced to the NOAA charts of Lake Champlain (93 feet or 28.35 m). The large spike in water level near the day 260 was a result of hurricane Floyd.

Appendix 5

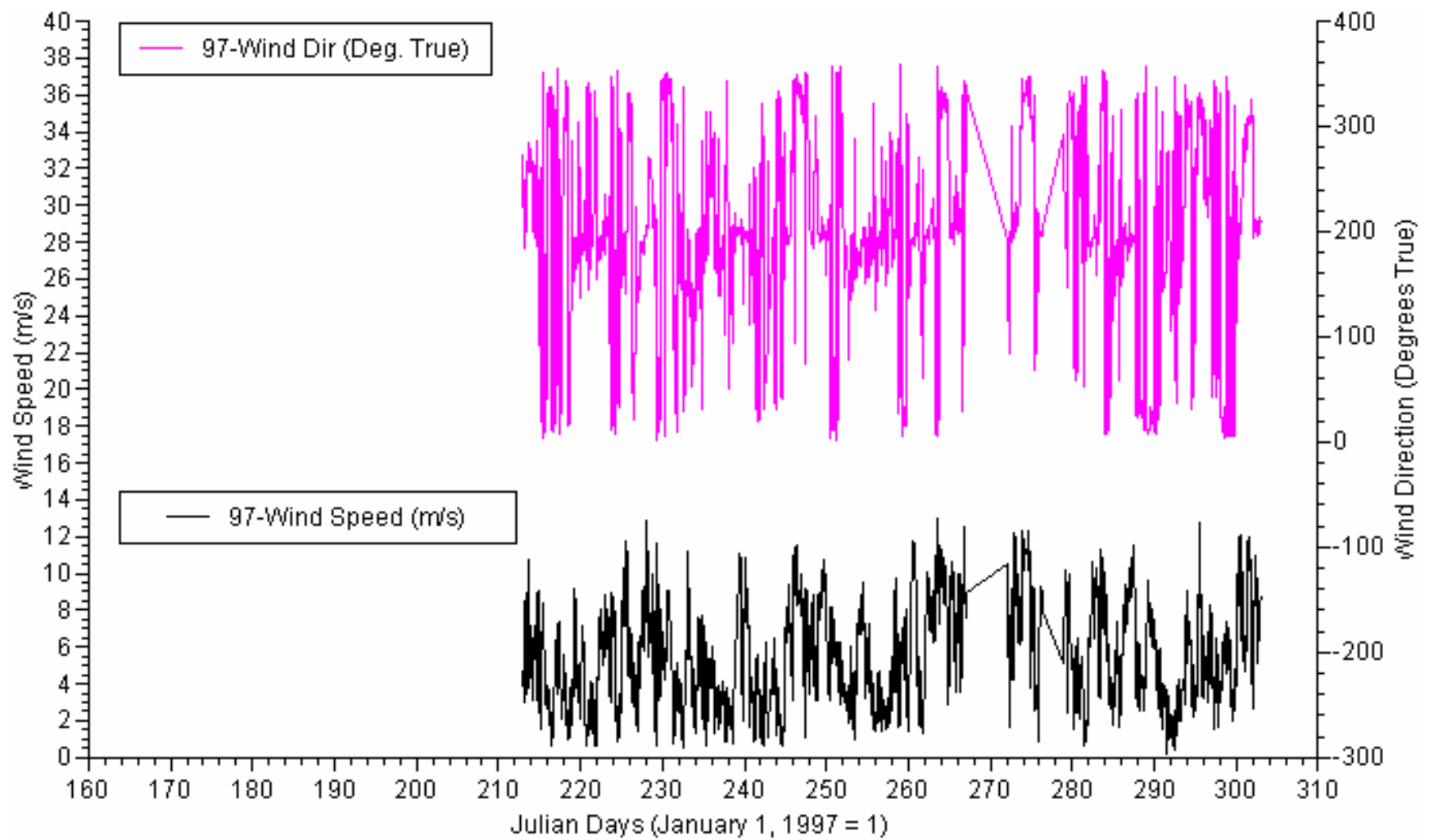
1997,
1998,
&
1999

Colchester Reef Meteorological Station (5a)

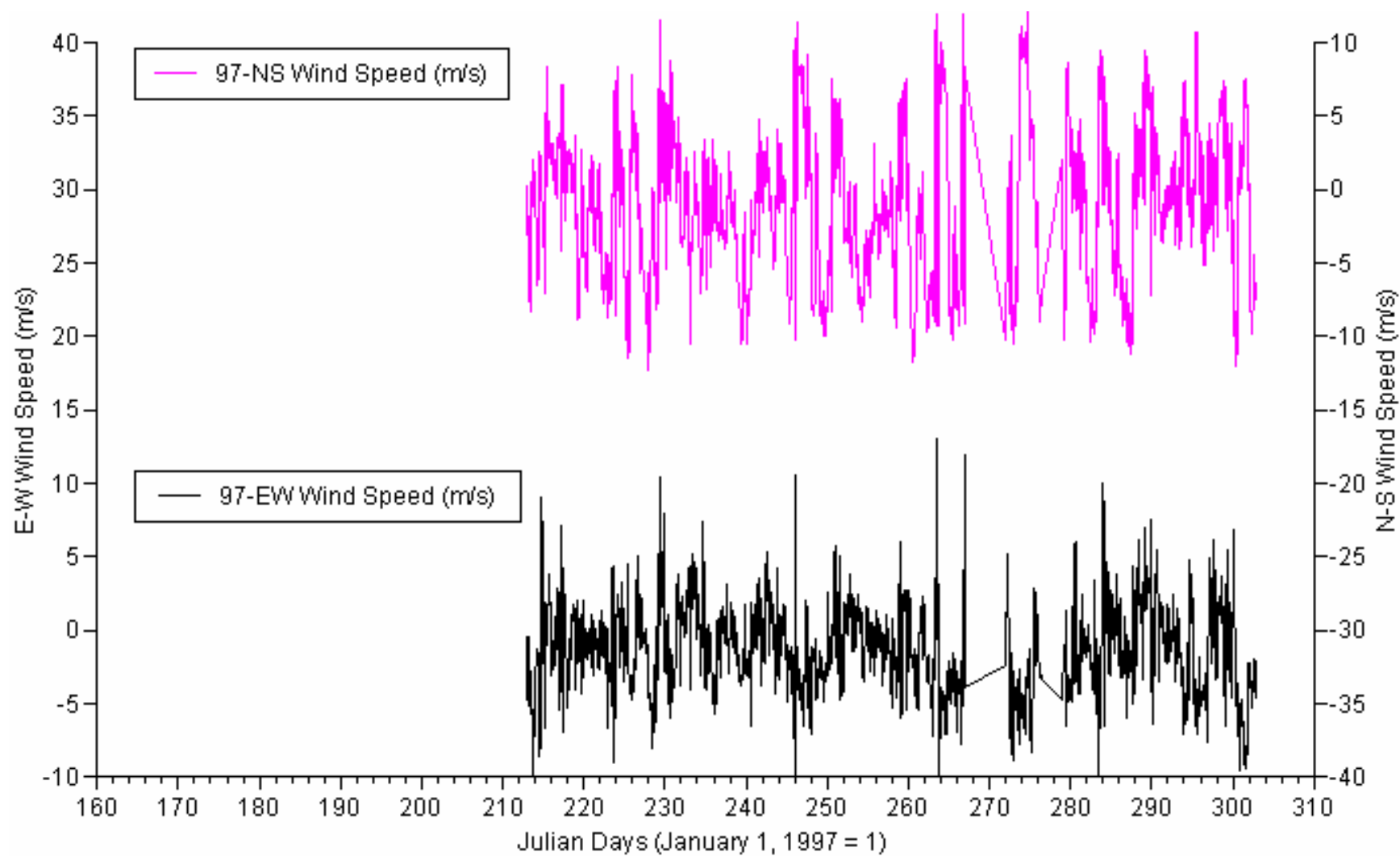
Burlington International Airport(5b)

International Paper Co. (5c)

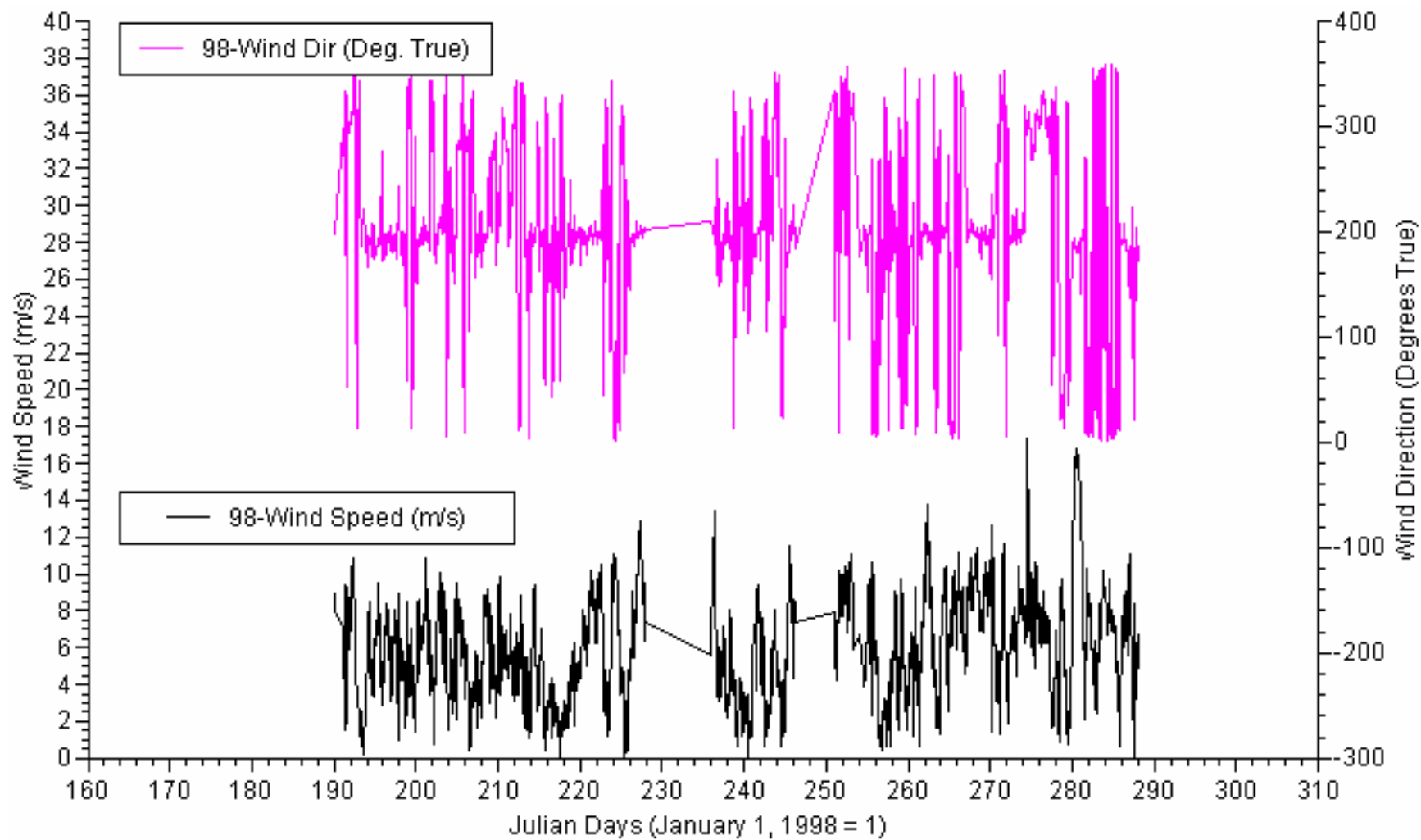
Wind Speed and Direction
&
Component Wind Speed Plots



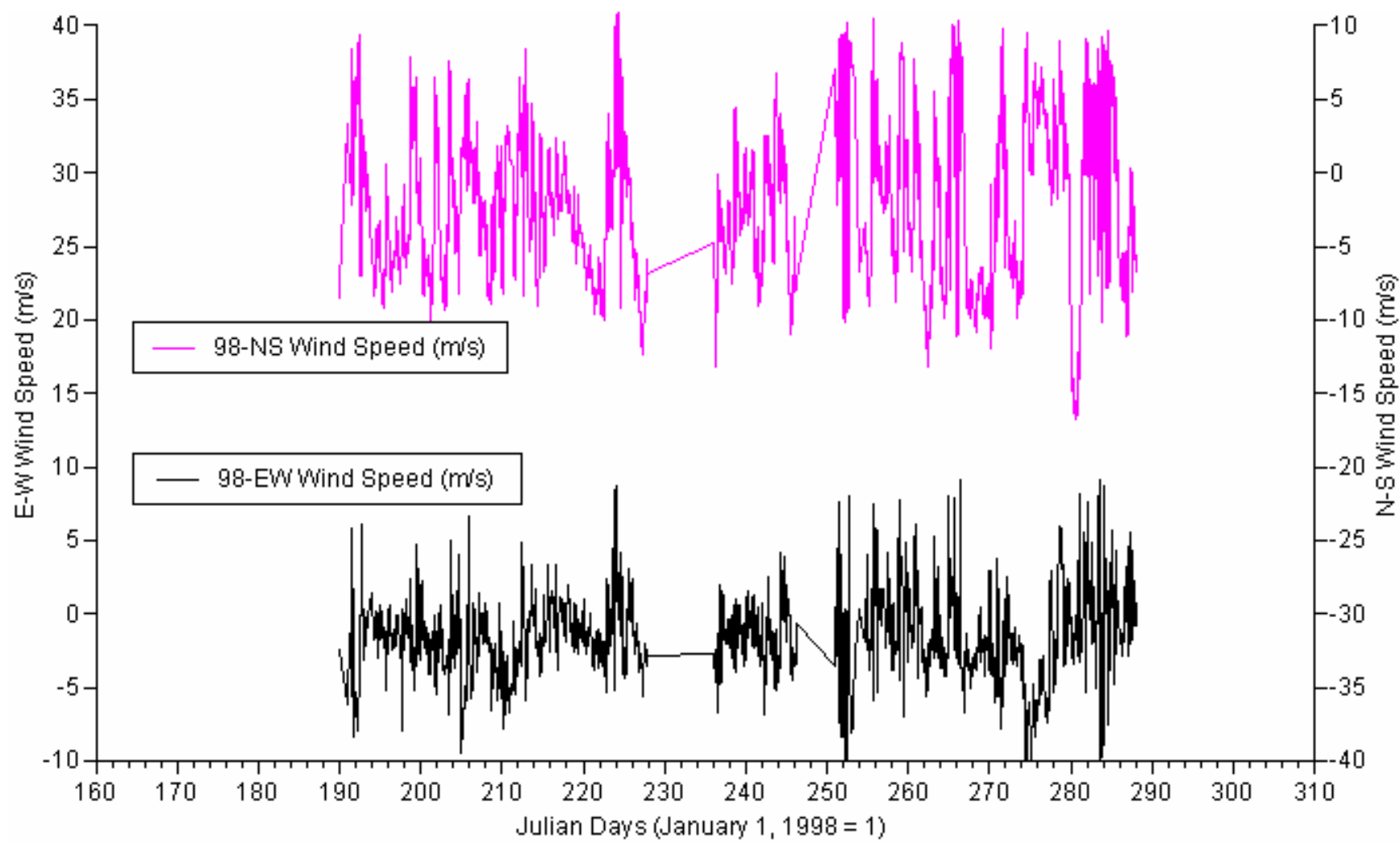
Appendix 5a-97a. 1997 wind speed and direction data from Colchester Reef, Lake Champlain.



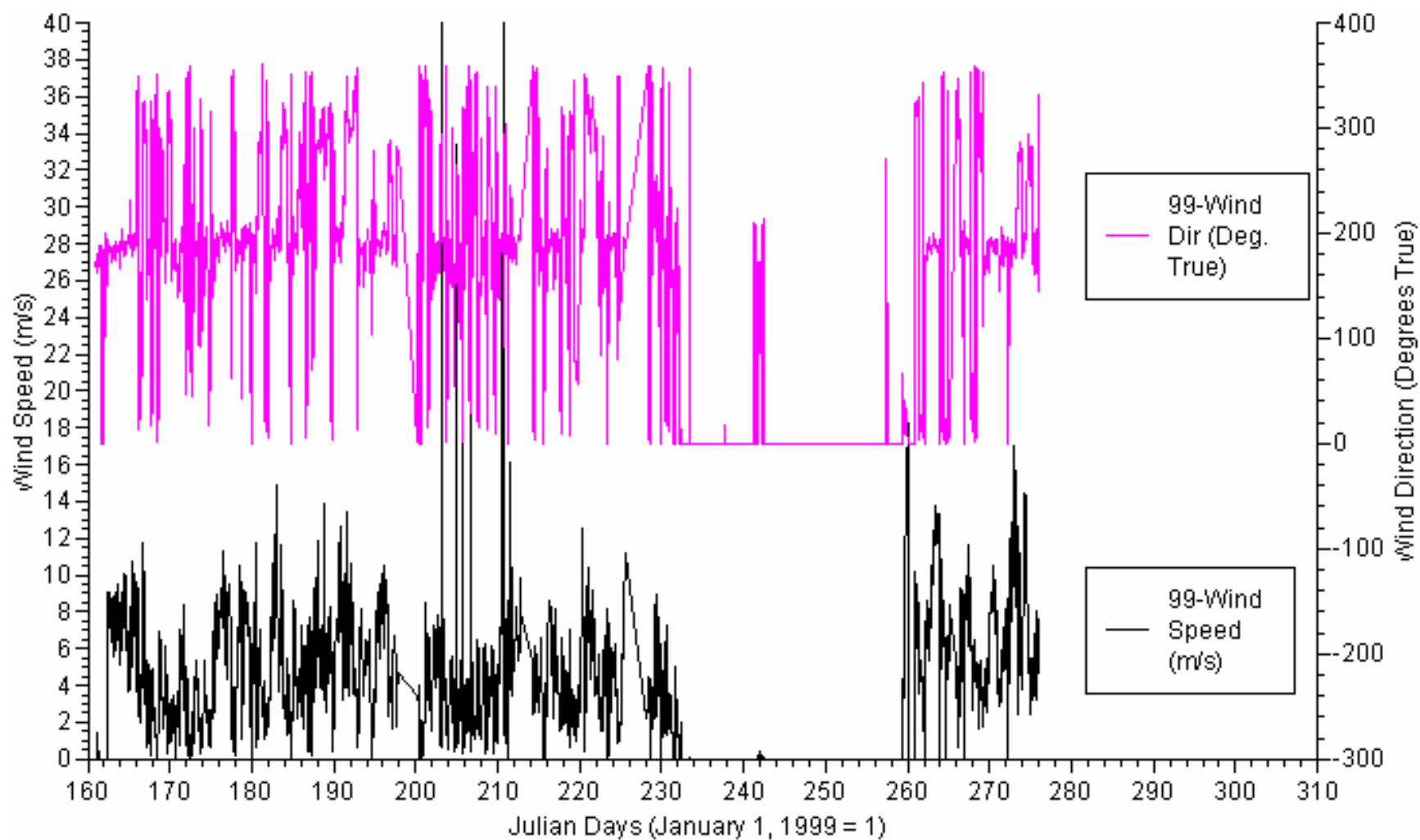
Appendix 5a-97b. 1997 wind speed components from Colchester Reef, Lake Champlain.



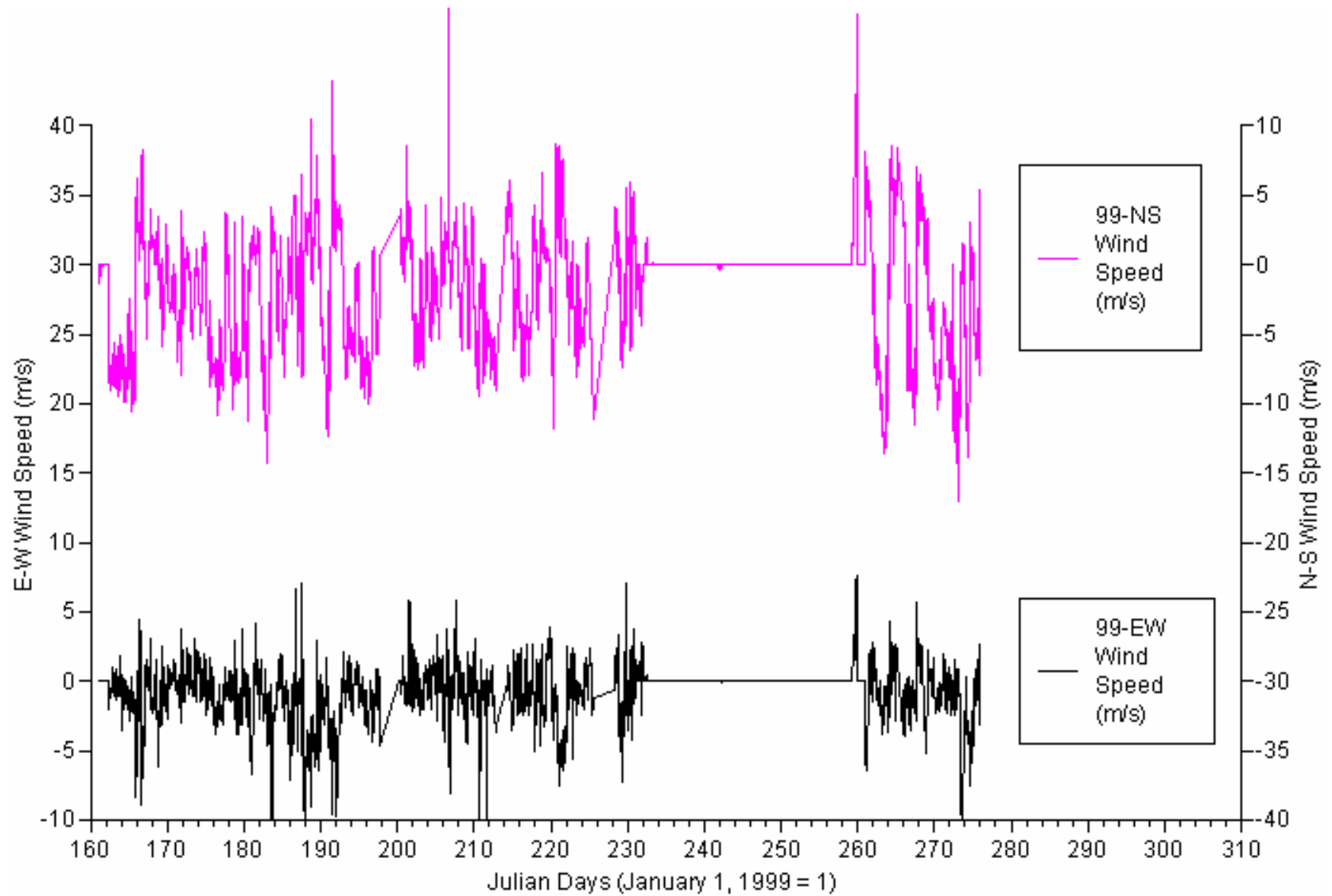
Appendix 5a-98a. 1998 wind speed and direction data from Colchester reef, Lake Champlain.



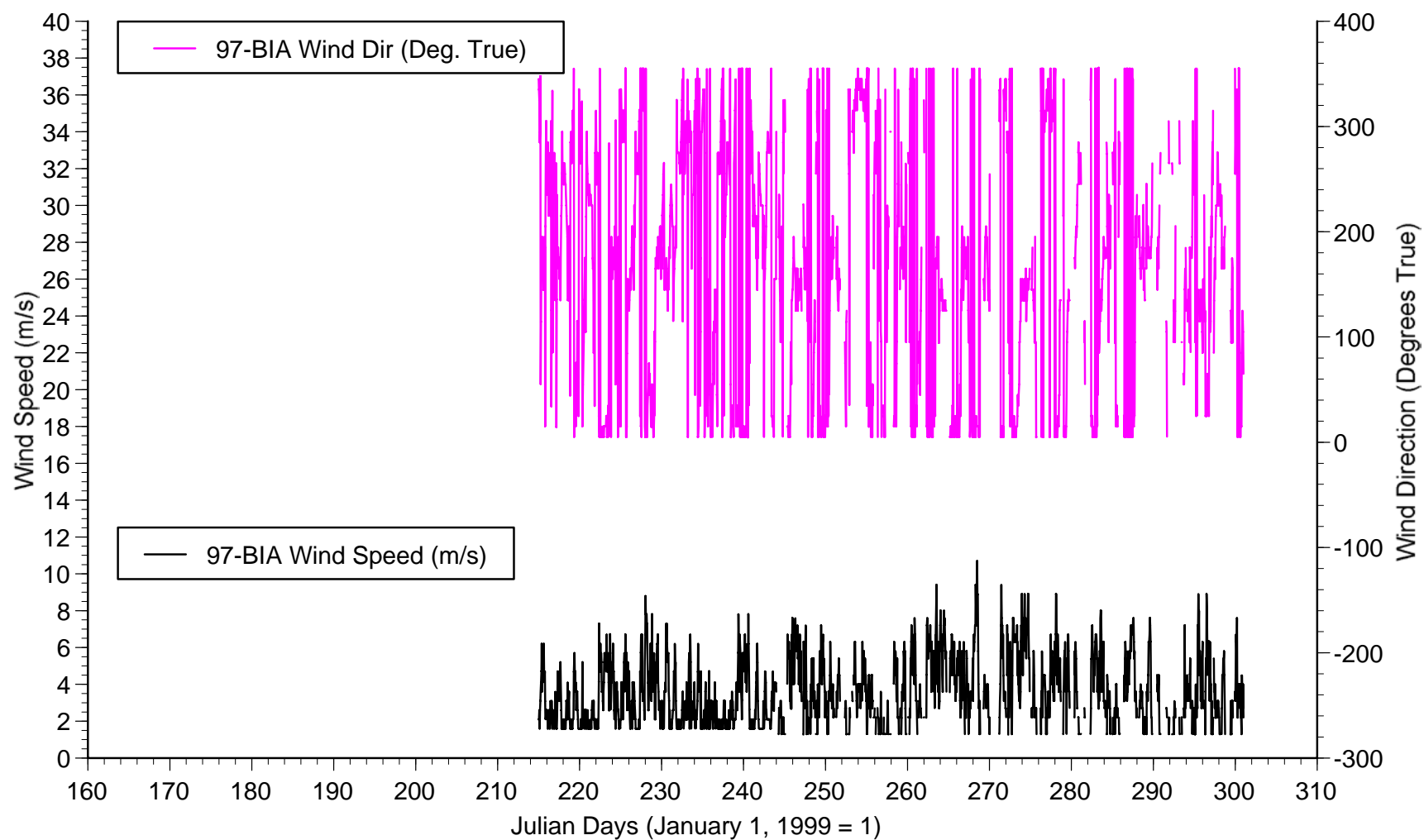
Appendix 5a-98b. wind speed components from Colchester Reef, Lake Champlain.



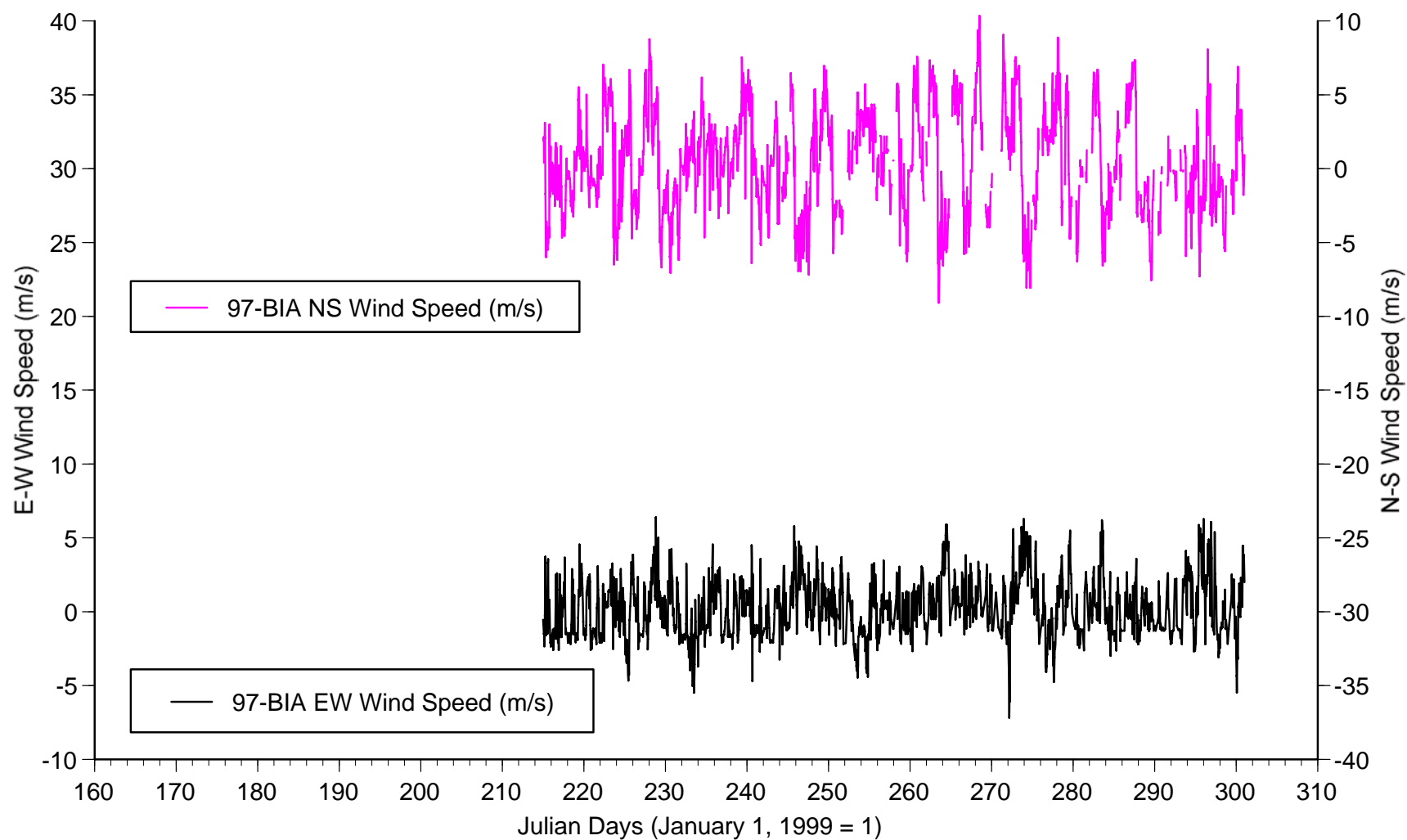
Appendix 5a-99a. 1999 wind speed and direction data from Colchester reef, Lake Champlain.



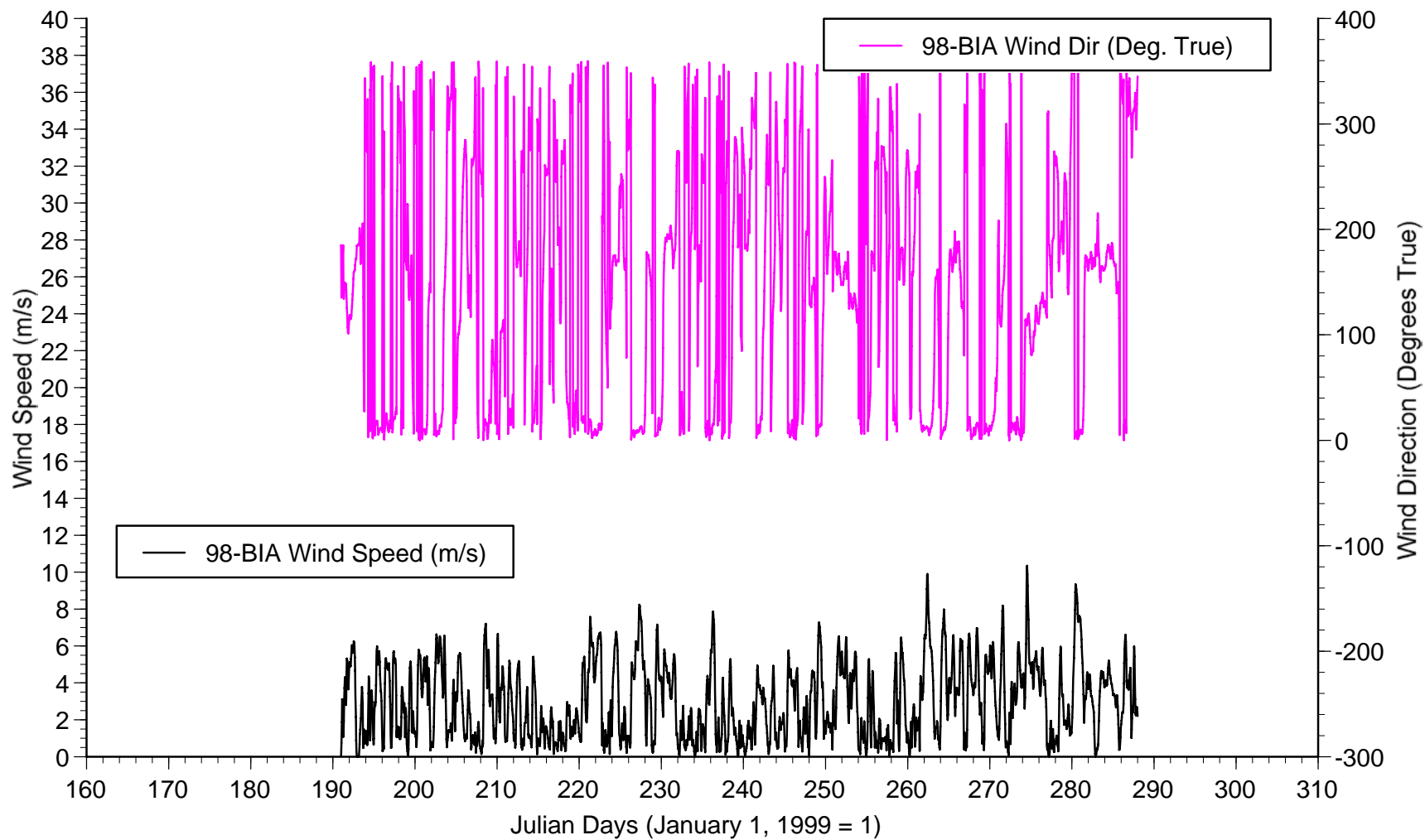
Appendix 5a-99b. 1999 wind speed components from Colchester reef, Lake Champlain.



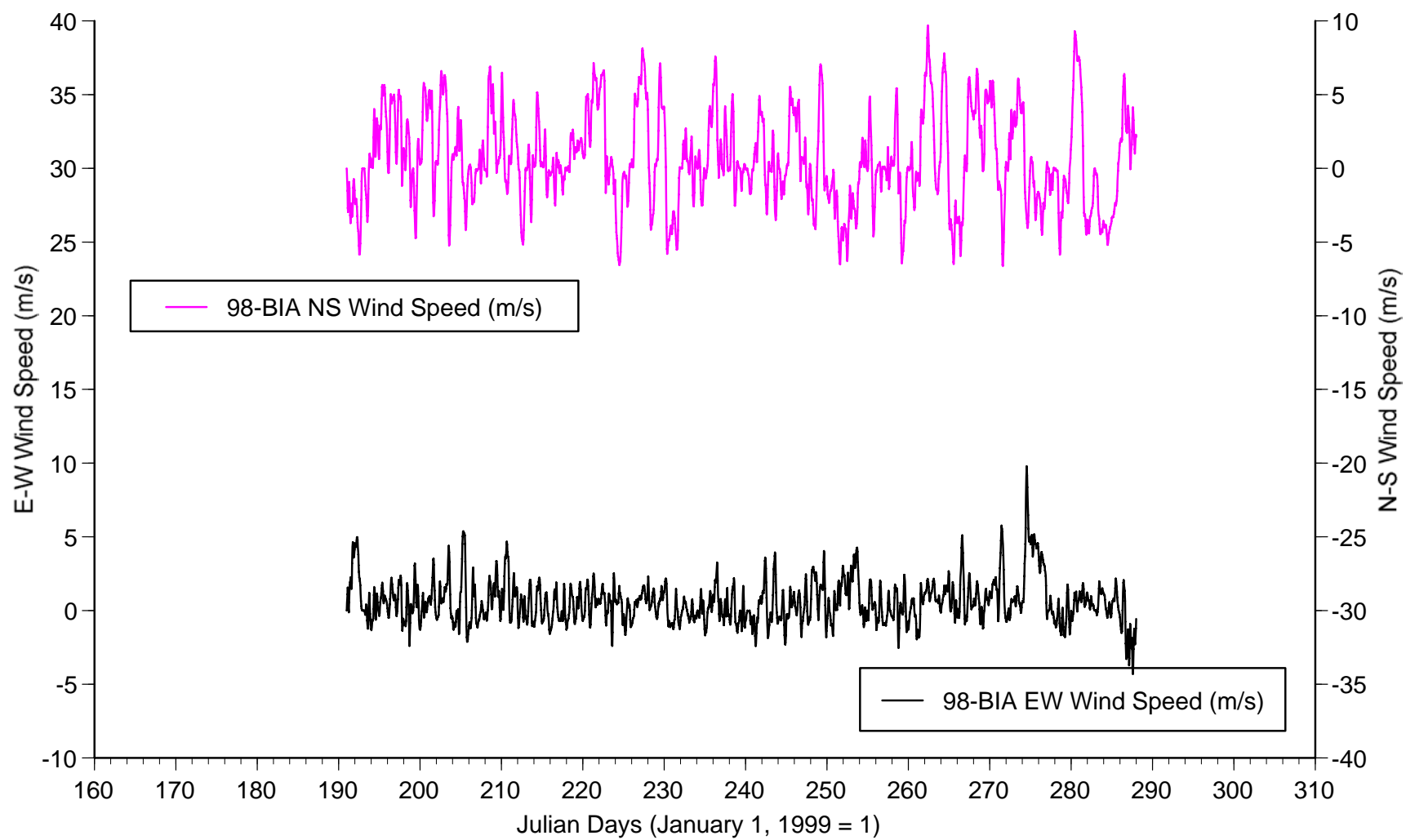
Appendix 5b-97a. 1997 wind speed and direction data from Burlington International Airport (BIA), Lake Champlain.



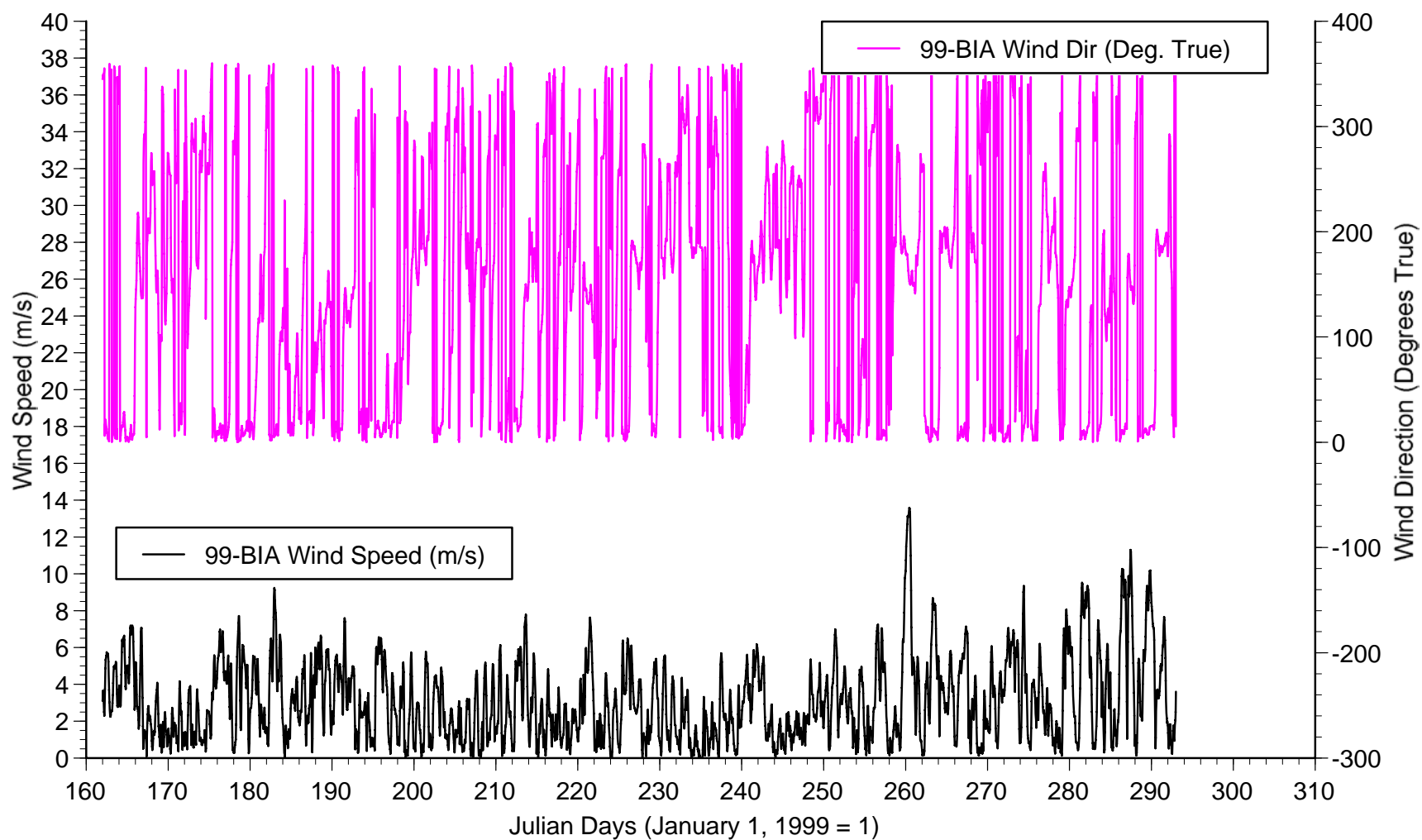
Appendix 5b-97b. 1997 wind speed components from Burlington International Airport (BIA), Lake Champlain.



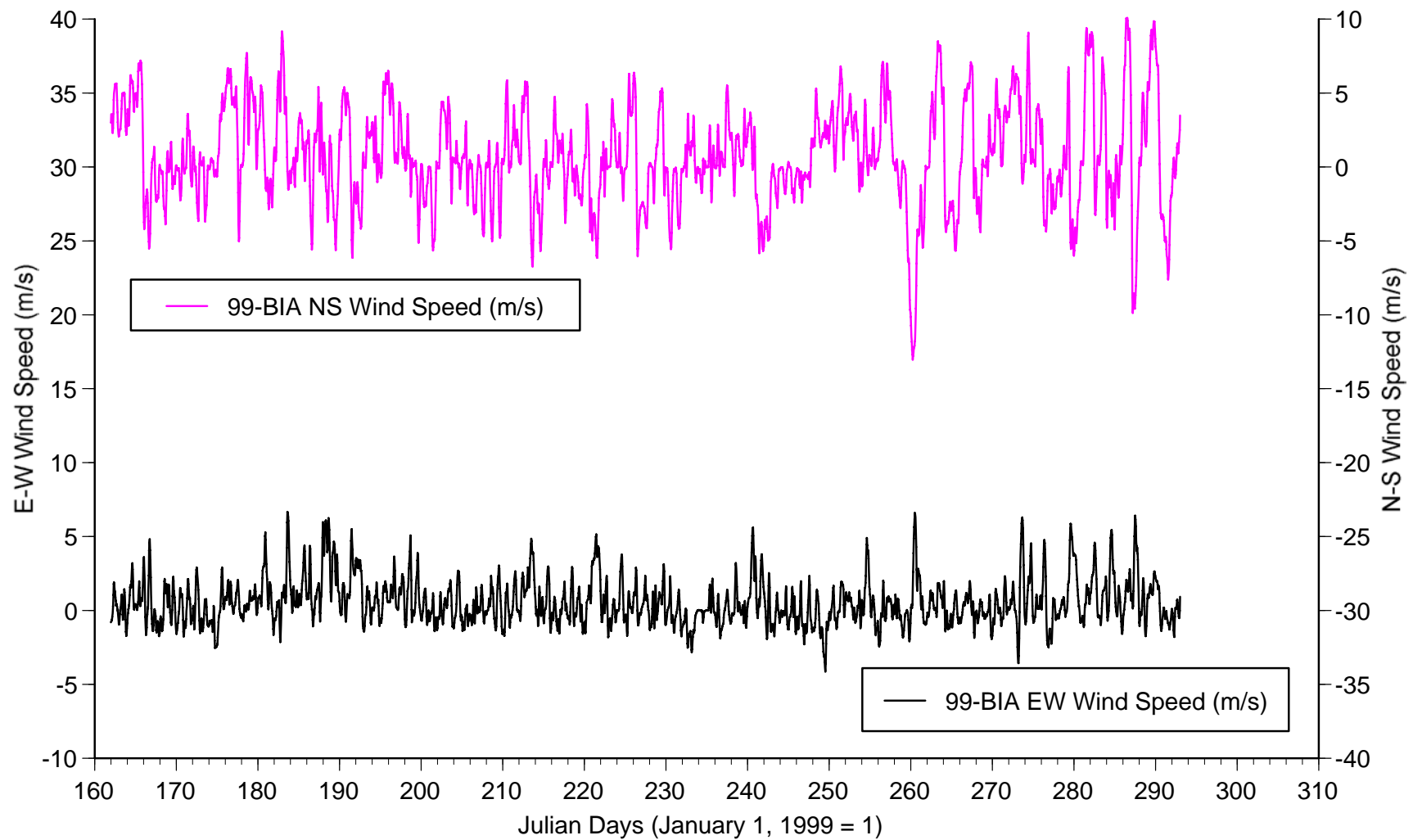
Appendix 5b-98a. 1998 wind speed and direction data from Burlington International Airport (BIA), Lake Champlain.



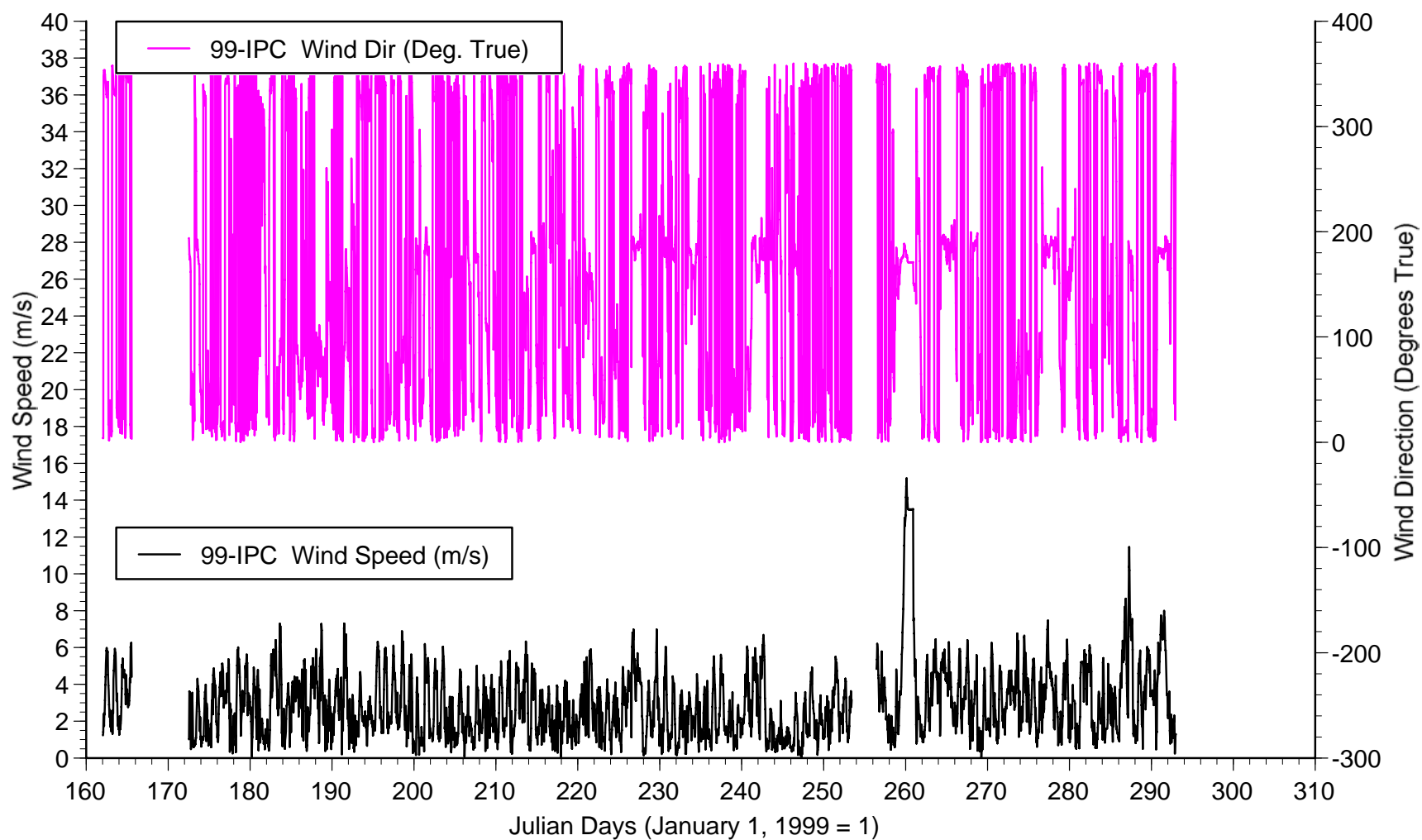
Appendix 5b-98b. wind speed components from Burlington International Airport (BIA), Lake Champlain.



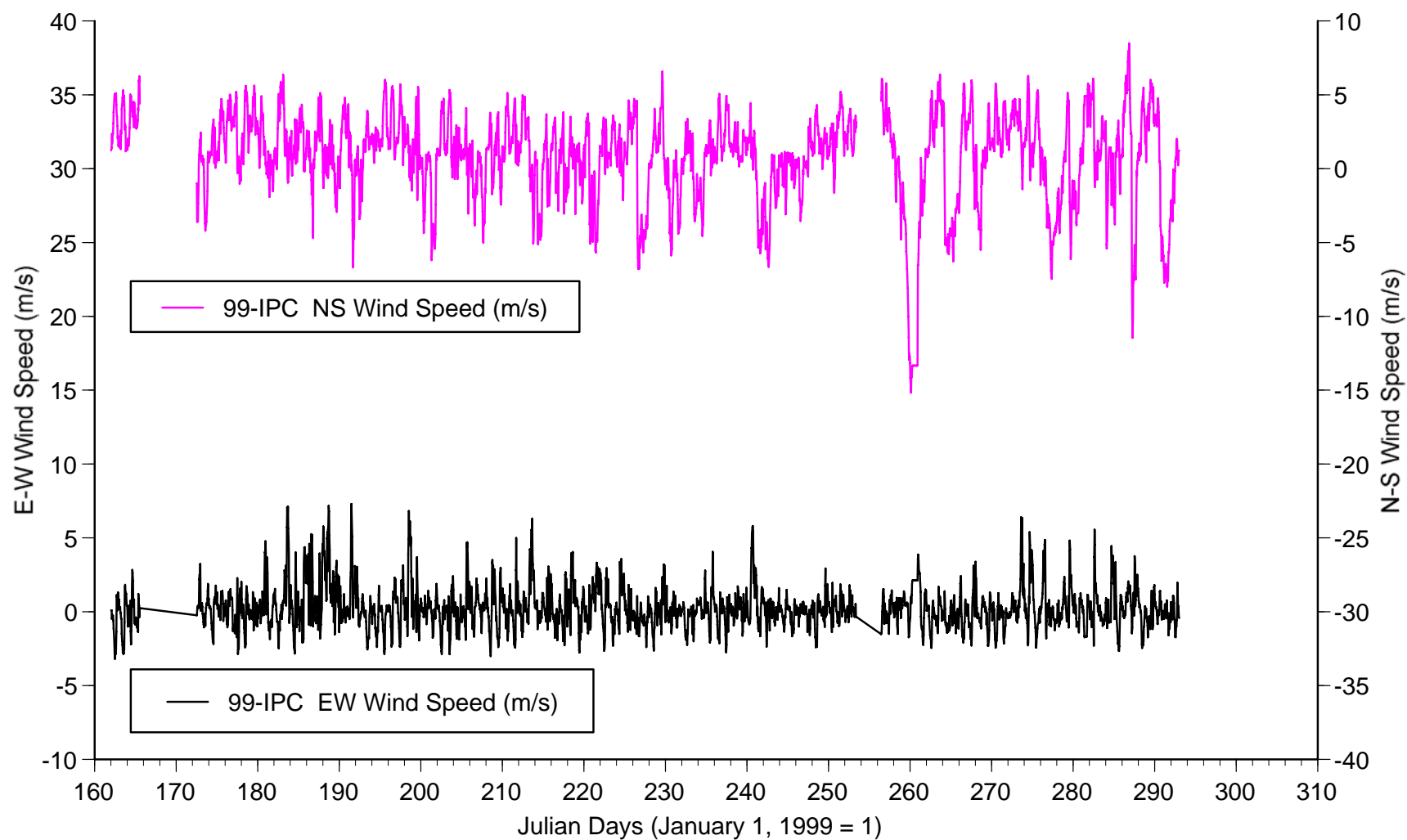
Appendix 5b-99a. 1999 wind speed and direction data from Burlington International Airport (BIA), Lake Champlain.



Appendix 5b-99b. 1999 wind speed components from Burlington International Airport (BIA), Lake Champlain.



Appendix 5c-99a. 1999 wind speed and direction data from International Paper Company (IPC), Lake Champlain.



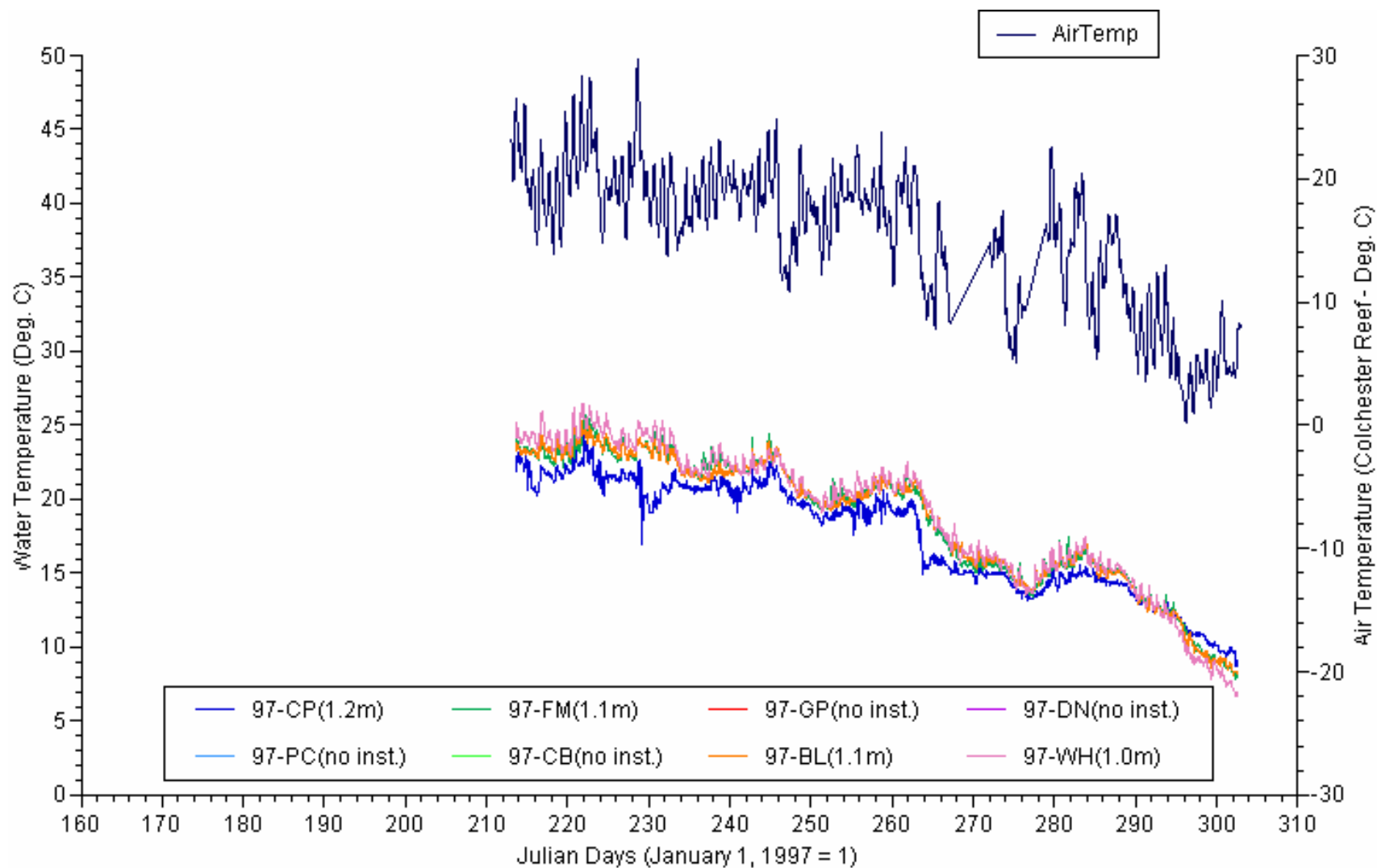
Appendix 5c-99b. 1999 wind speed components from International Paper Company (IPC), Lake Champlain.

Appendix 6

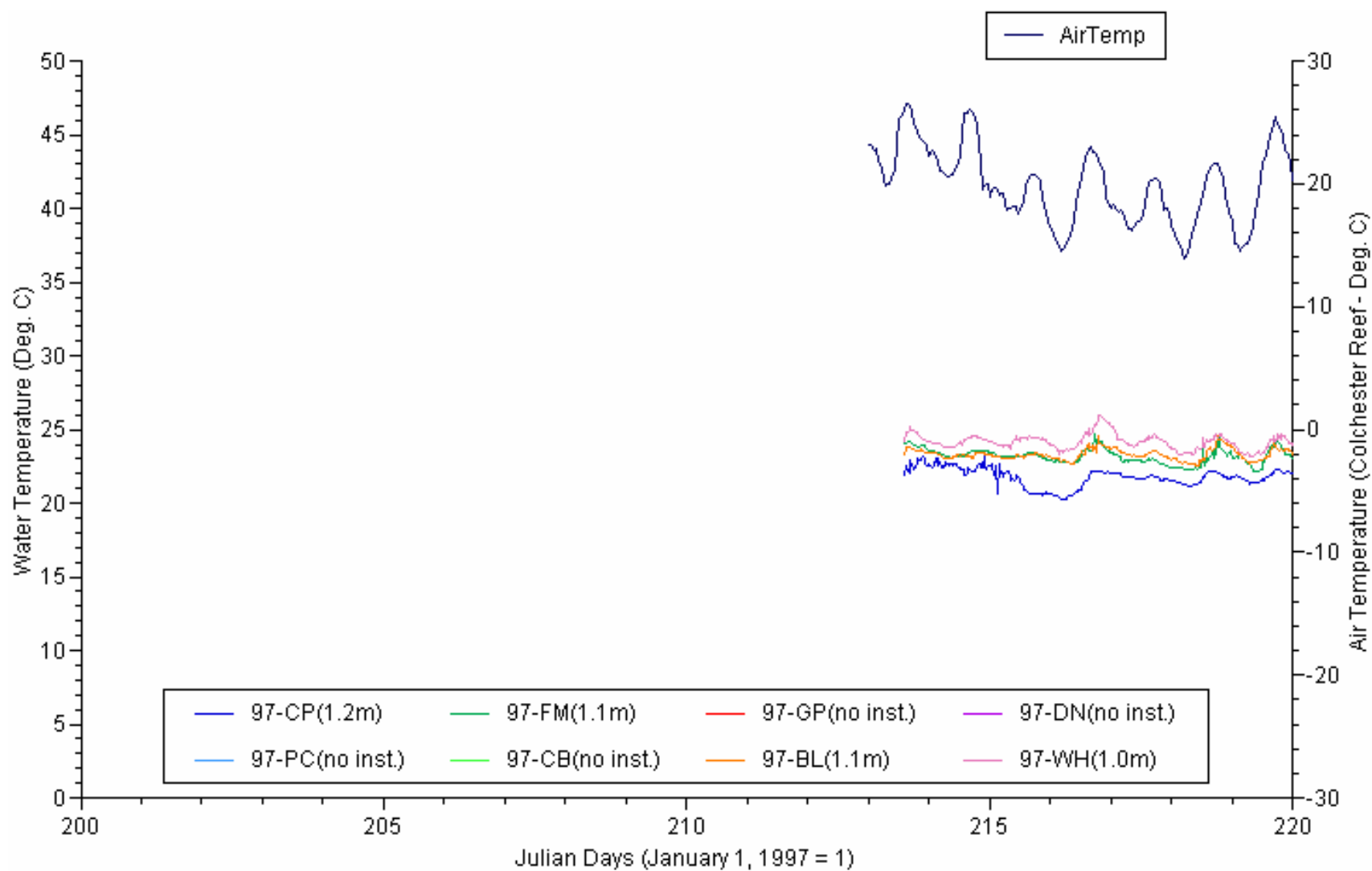
1997 - All Sites

Shallow Temperature Data (Non-Offset)
&
Colchester Reef Meteorological Air Temperatures

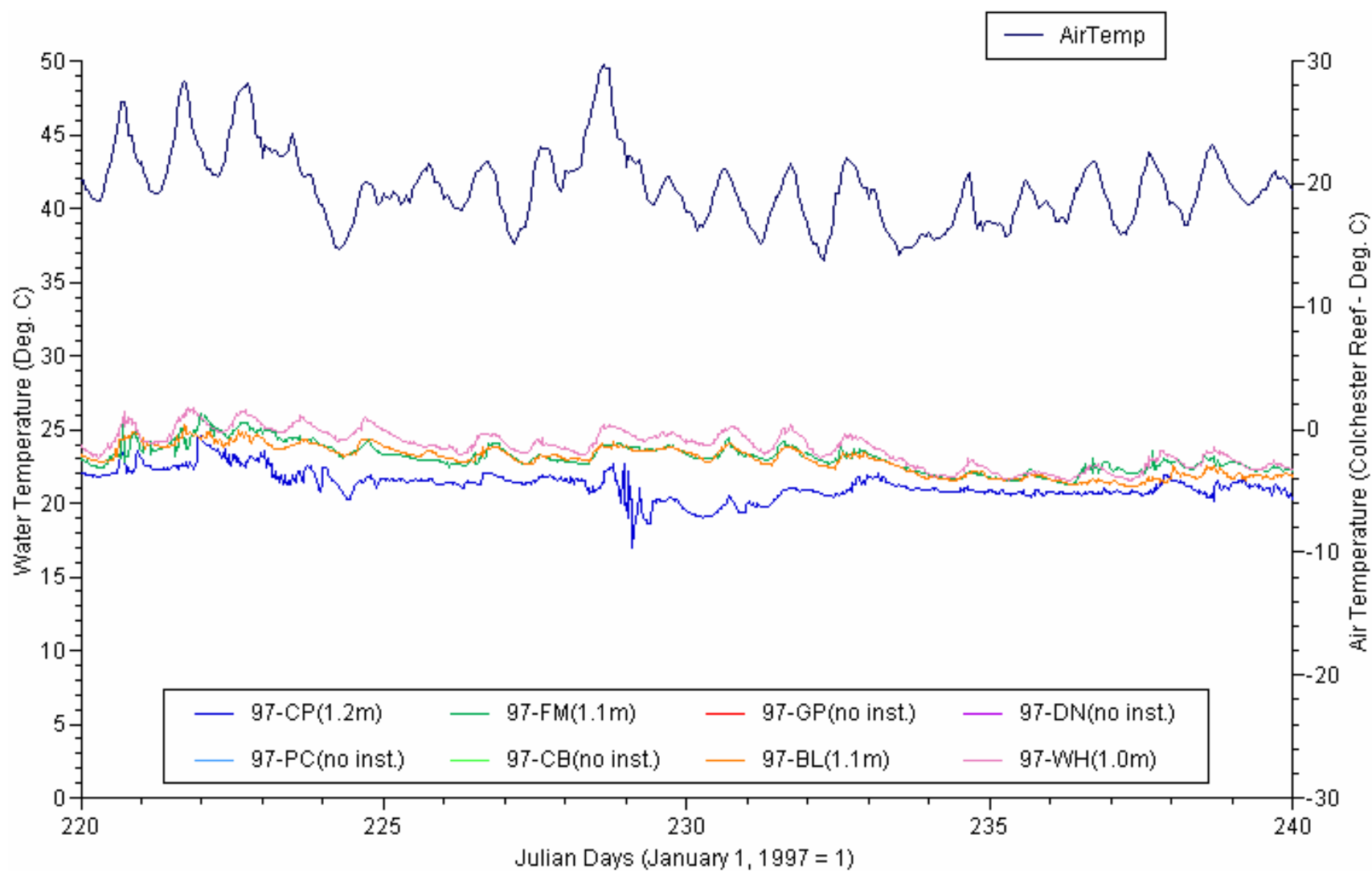
Total Duration
&
20-Day Expanded Plots



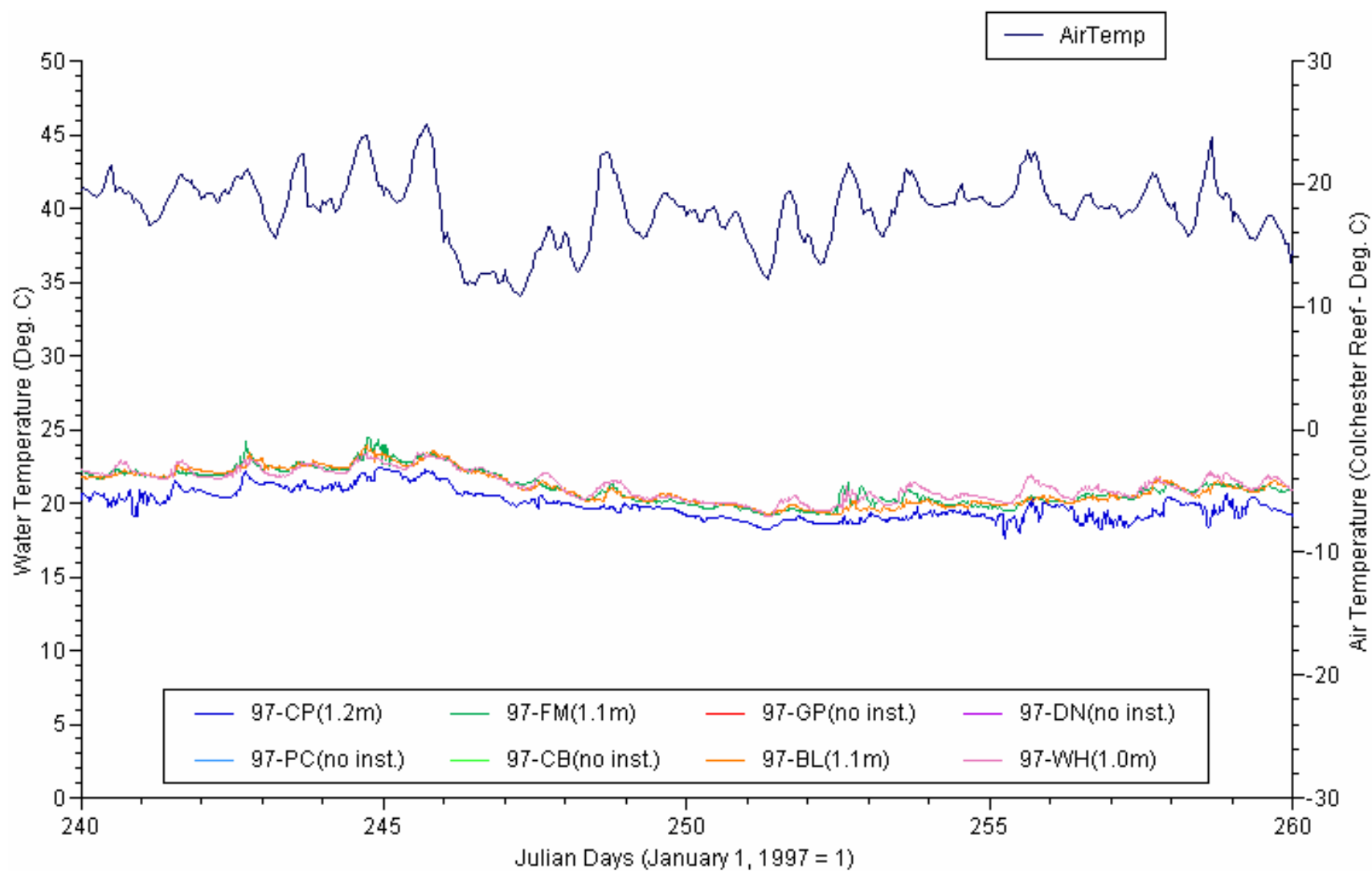
Appendix 6-97a. All 1997 surface tempertaure logger data along with air temperatures at Colchester Reef.



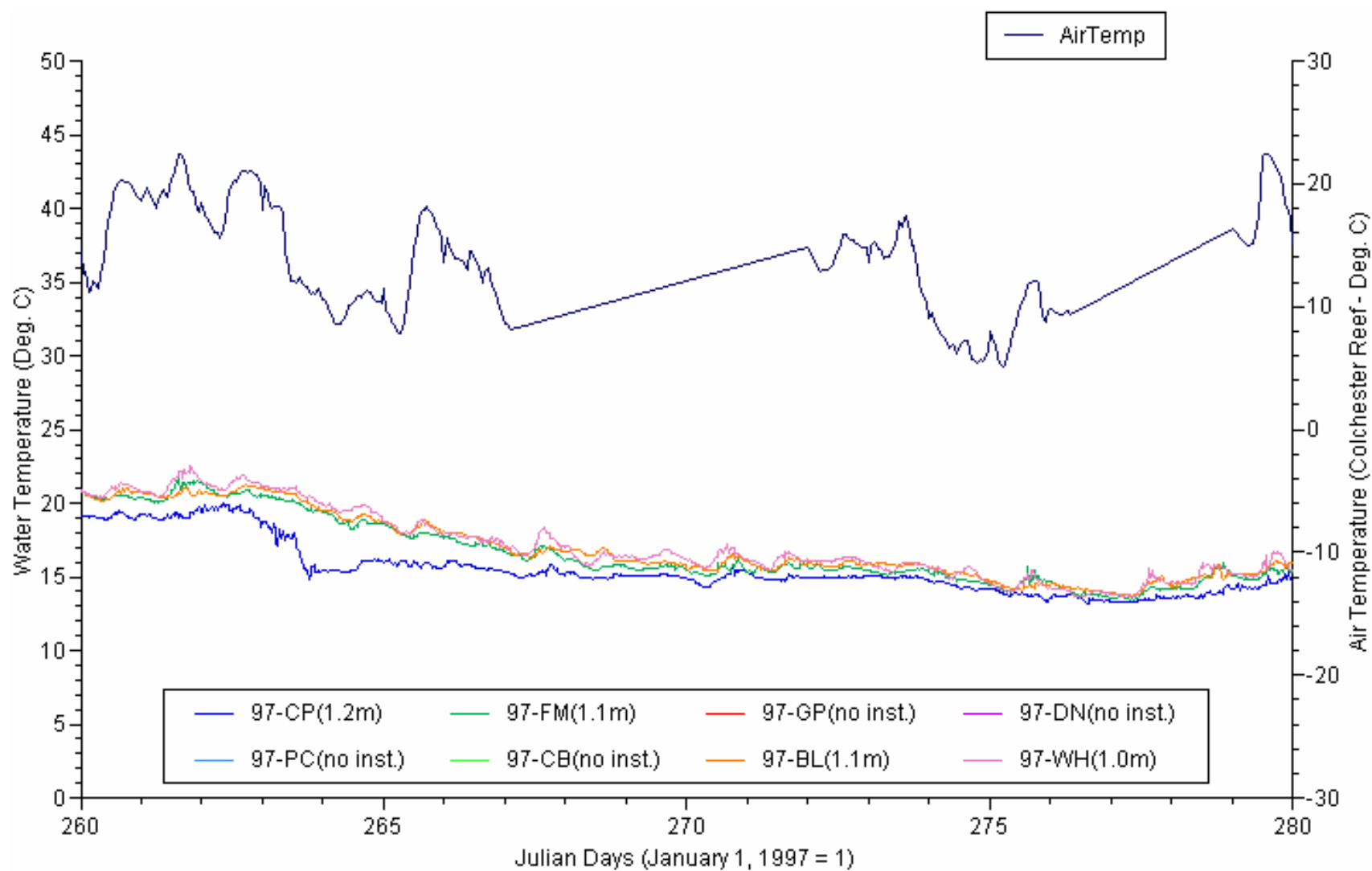
Appendix 6-97b. All 1997 surface tempertaure logger data along with air temperatures at Colchester Reef.



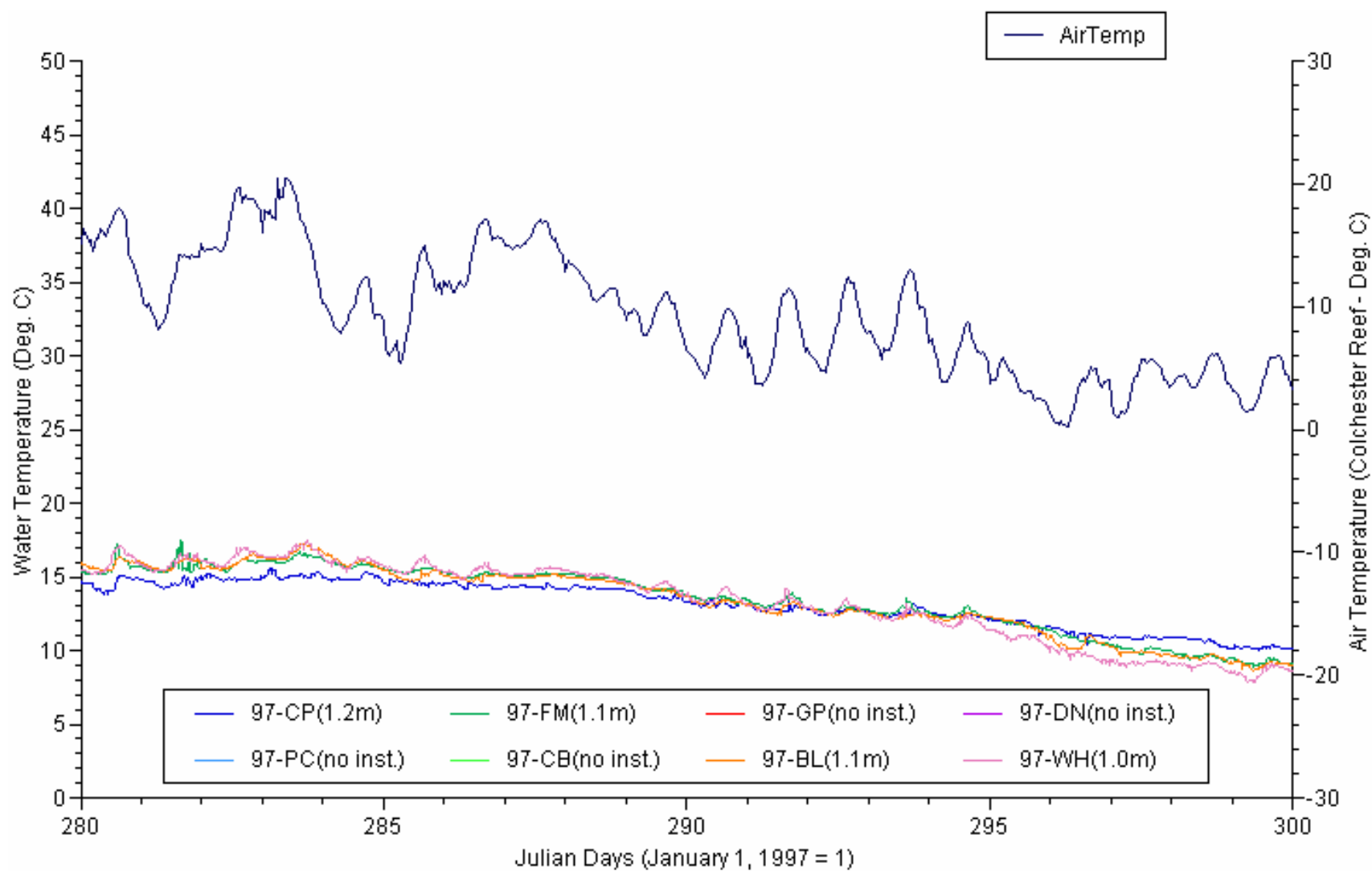
Appendix 6-97c. All 1997 surface tempertaure logger data along with air temperatures at Colchester Reef.



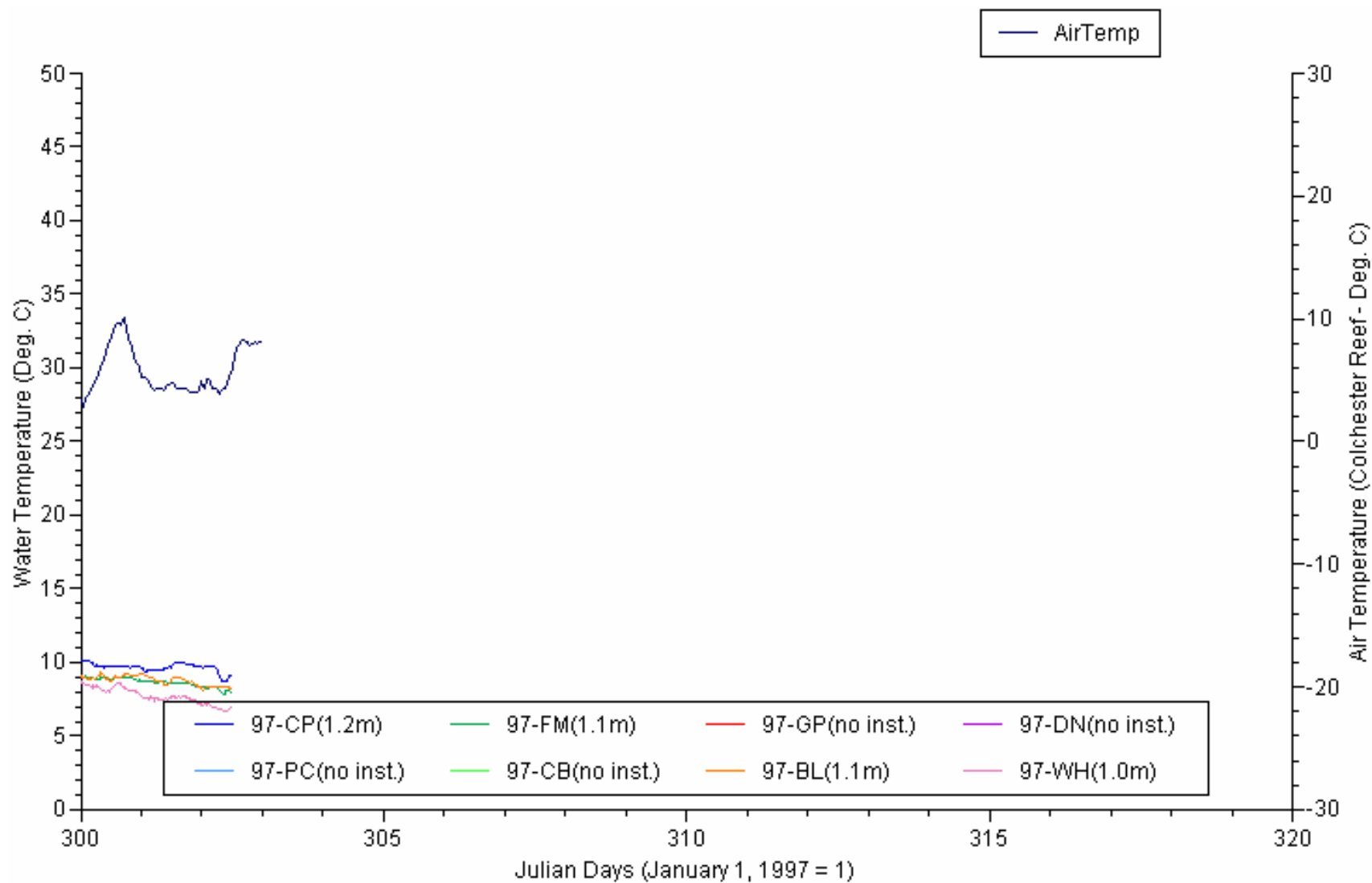
Appendix 6-97d. All 1997 surface temperature logger data along with air temperatures at Colchester Reef.



Appendix 6-97e. All 1997 surface tempertaure logger data along with air temperatures at Colchester Reef.



Appendix 6-97f. All 1997 surface tempertaure logger data along with air temperatures at Colchester Reef.



Appendix 6-97g. All 1997 surface tempertaure logger data along with air temperatures at Colchester Reef.

Appendix 7

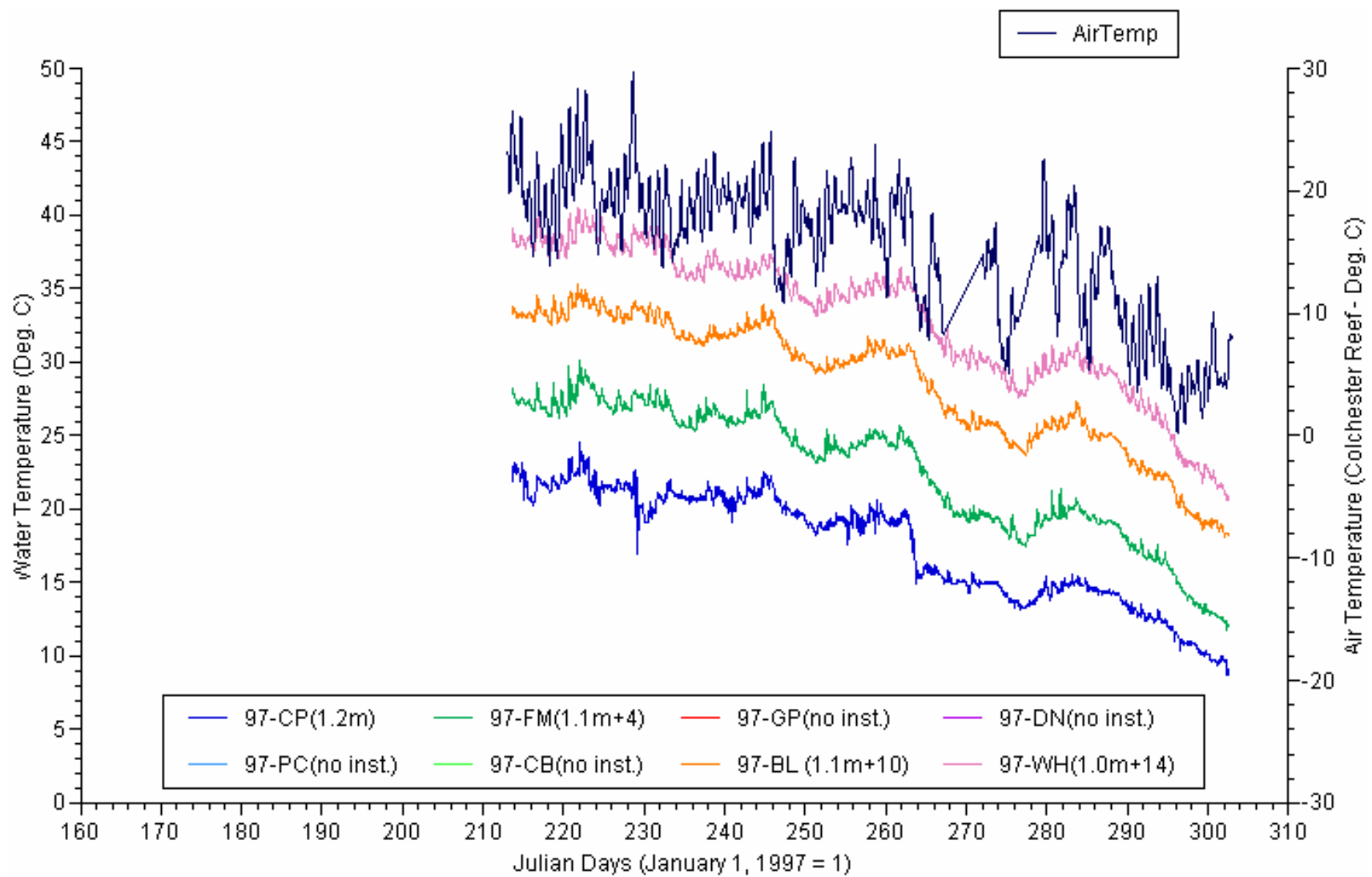
1997 - All Sites

Shallow Temperature Data (2 °C Offset) & Colchester Reef Meteorological Air Temperatures

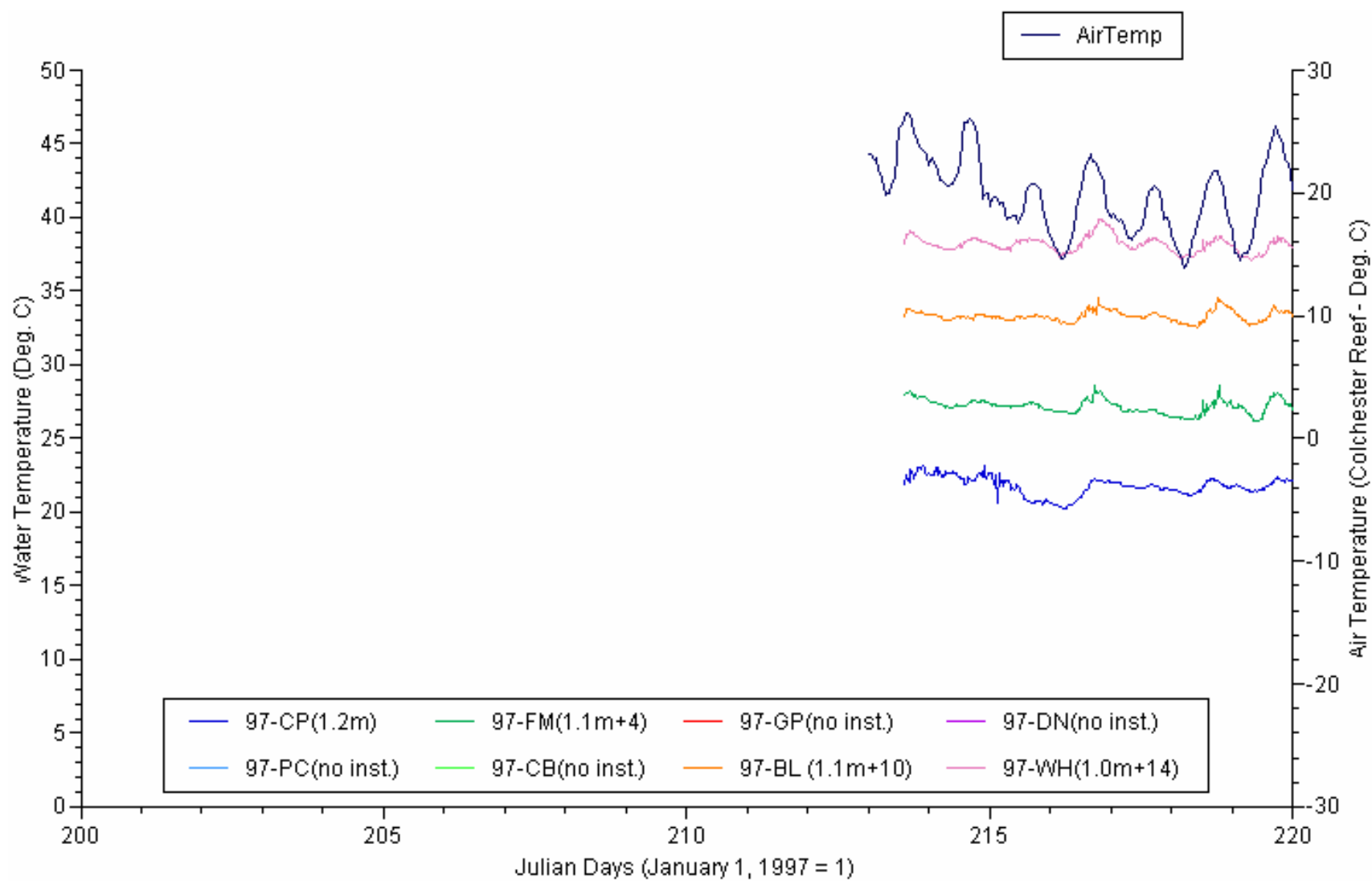
Total Duration
&
20-Day Expanded Plots

Note: Temperature offsets were applied to all sites except Crown Point in order to separate the data. The following temperature offsets were added to the sites on all subsequent plots:

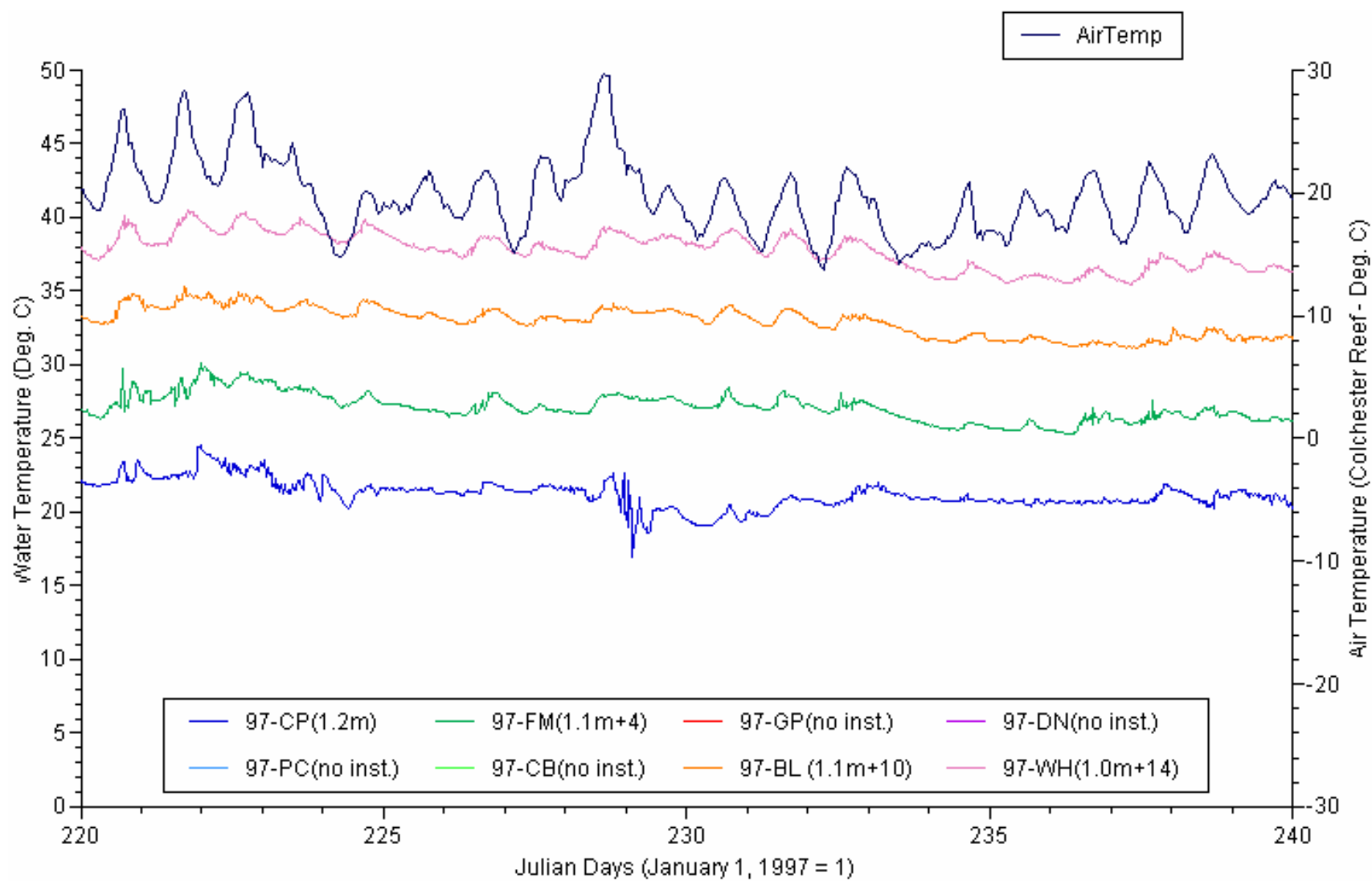
Putnam Creek (PC)	----->	+2 °C
File Mile Point (FM)	----->	+4 °C
Catfish Bay (CB)	----->	+6 °C
Gourlie Point (GP)	----->	+8 °C
Benson Landing (BL)	----->	+10 °C
Dresden Narrows (DN)	-->	+12 °C
Whitehall (WH)	----->	+14 °C



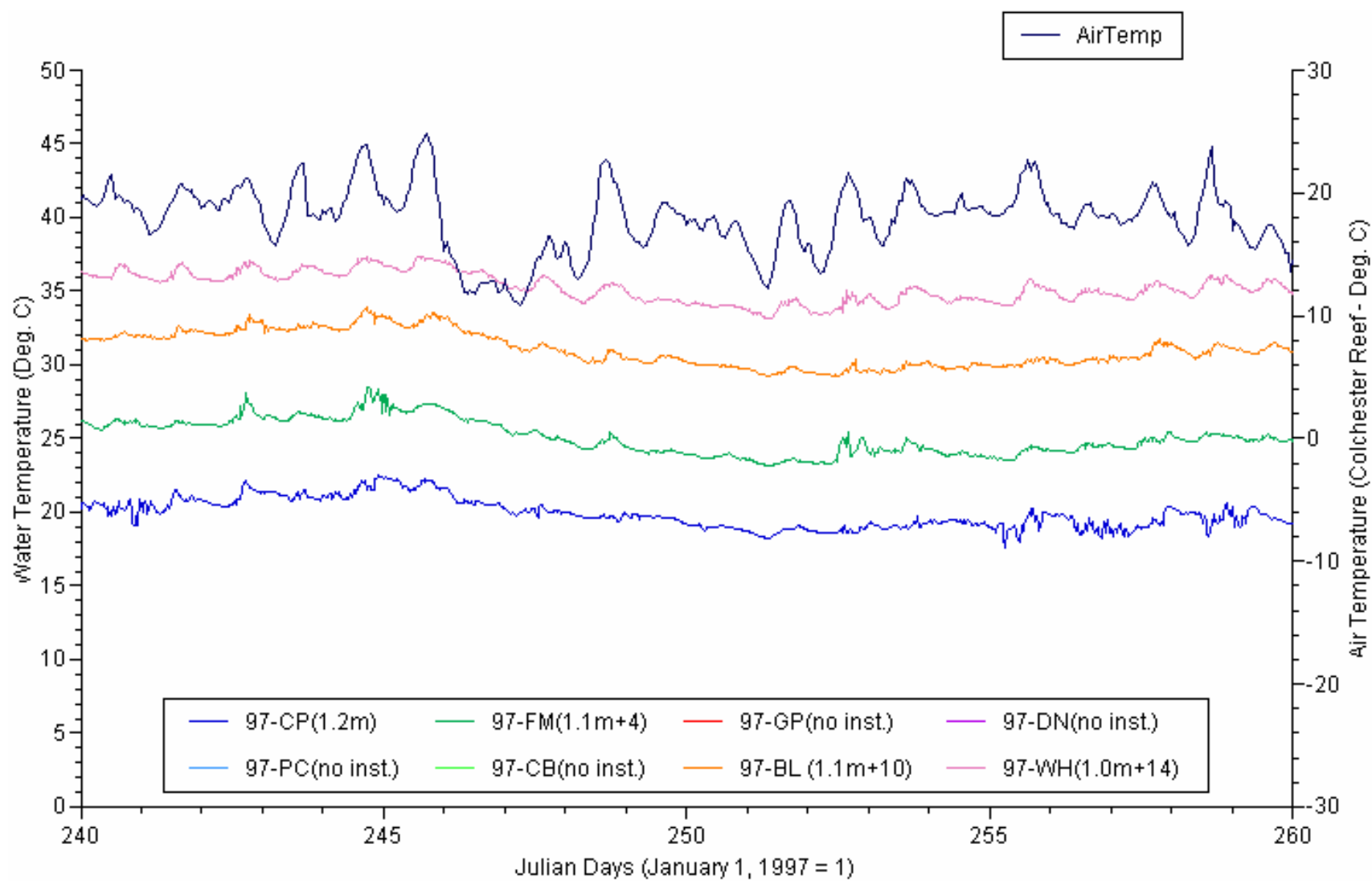
Appendix 7-97a. All 1997 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



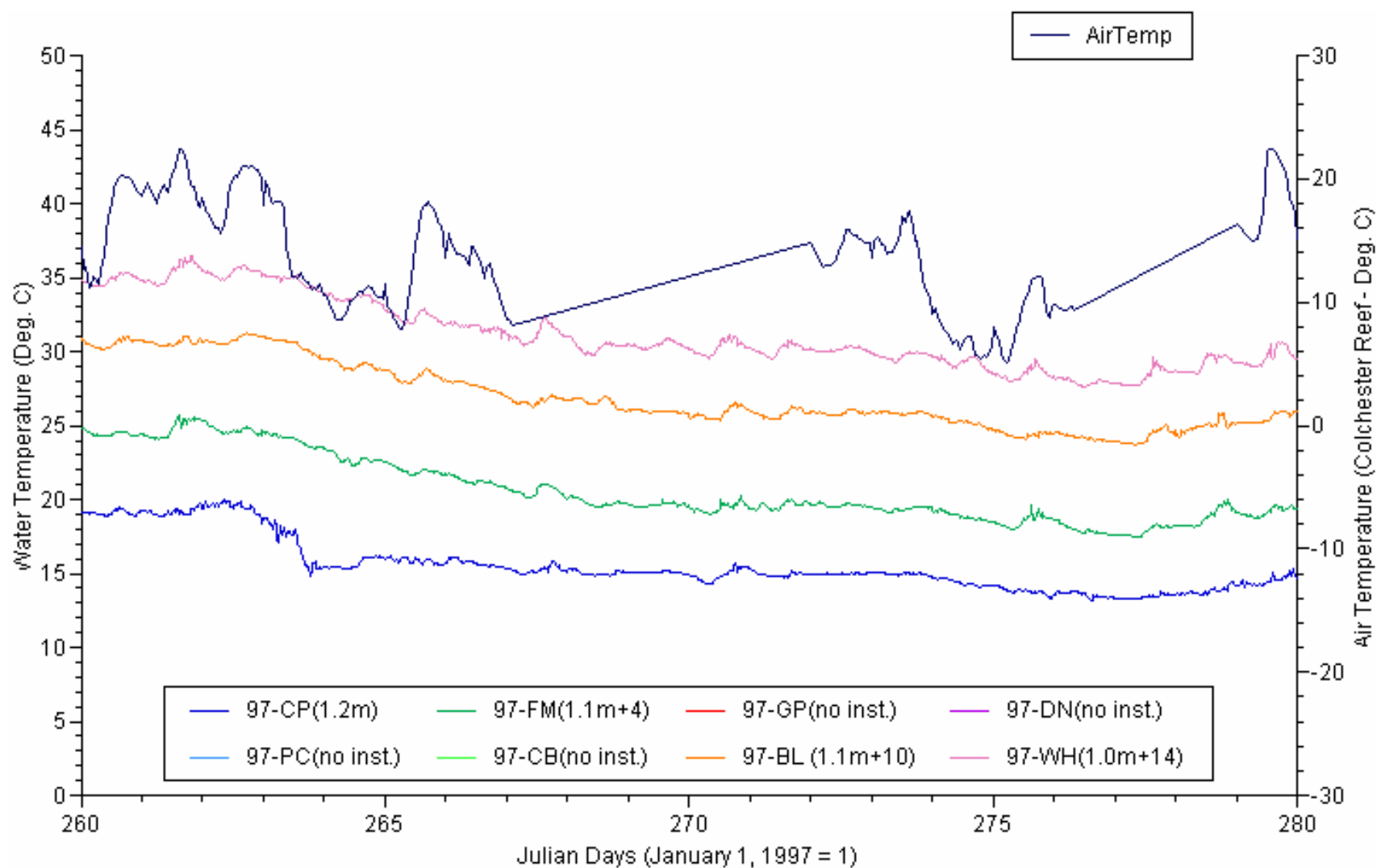
Appendix 7-97b. All 1997 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



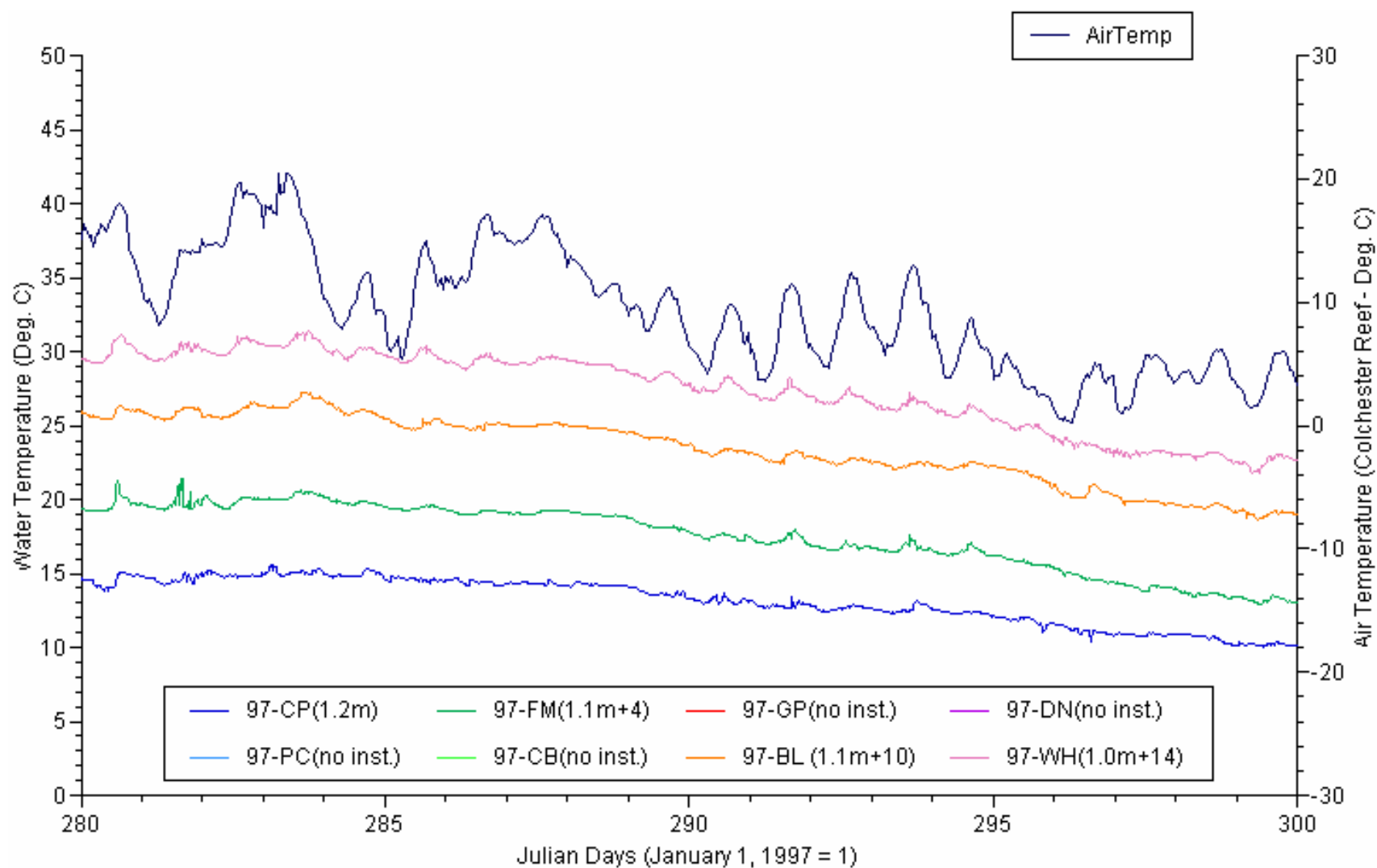
Appendix 7-97c. All 1997 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



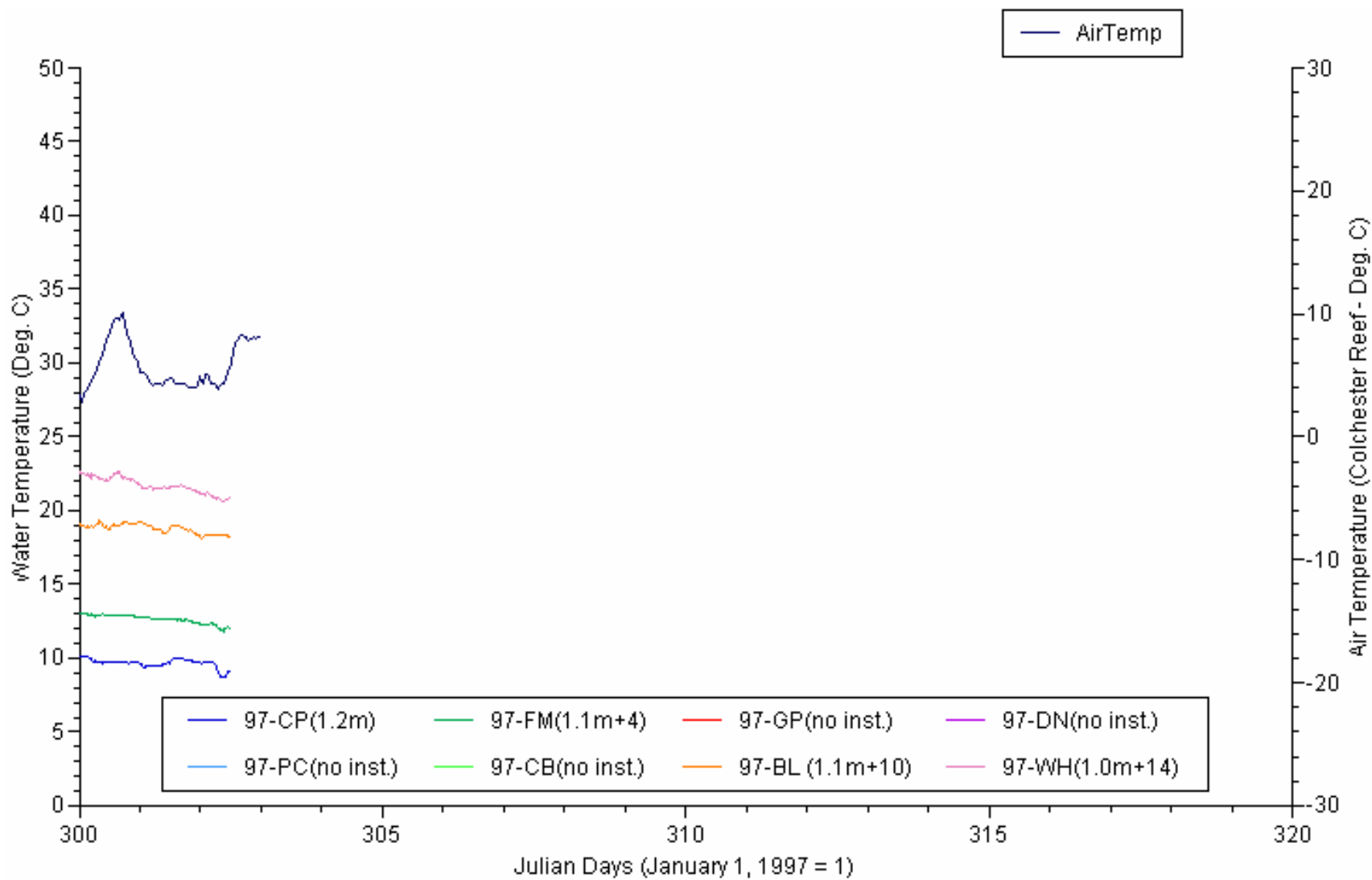
Appendix 7-97d. All 1997 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



Appendix 7-97e. All 1997 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



Appendix 7-97f. All 1997 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



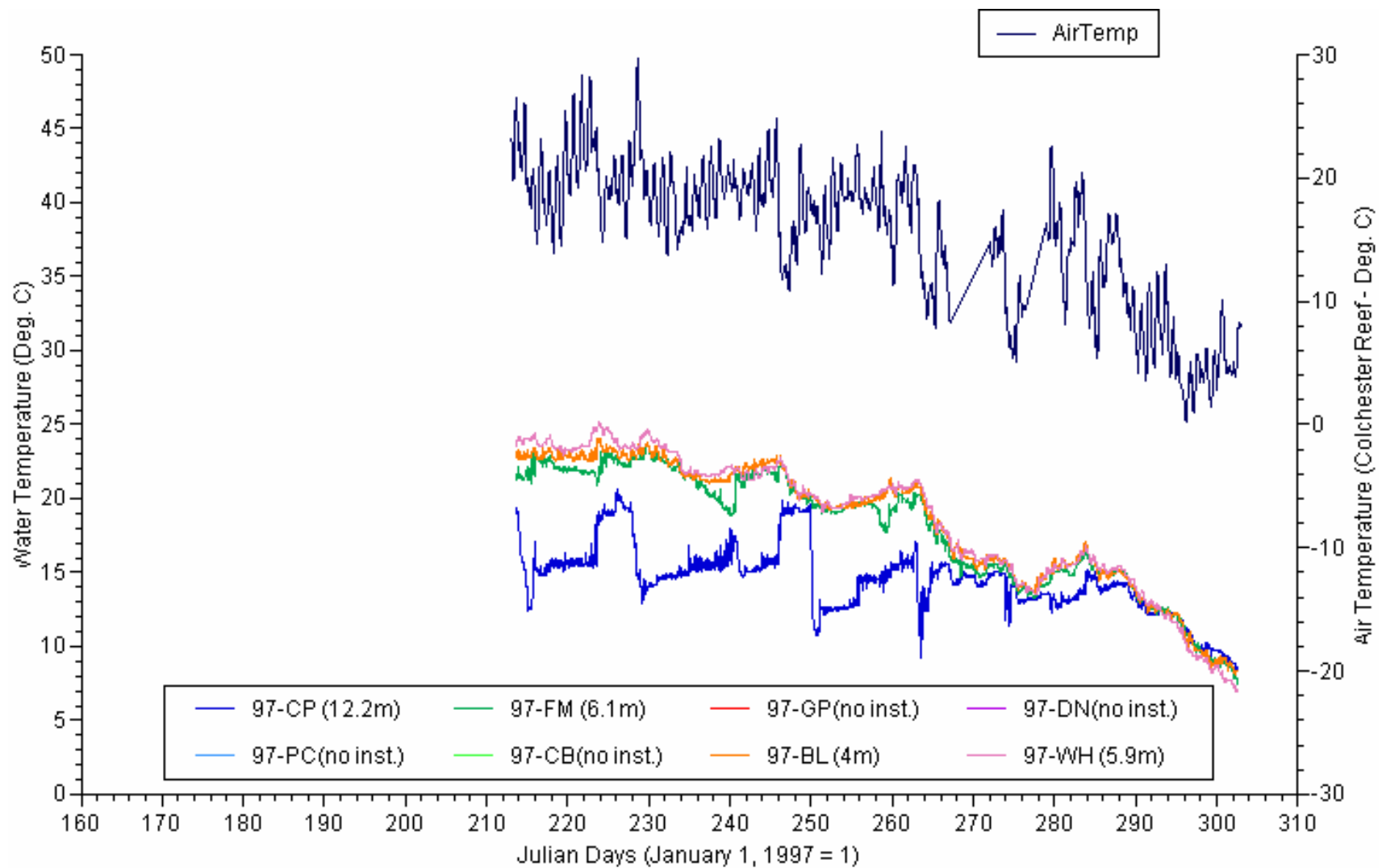
Appendix 7-97g. All 1997 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.

Appendix 8

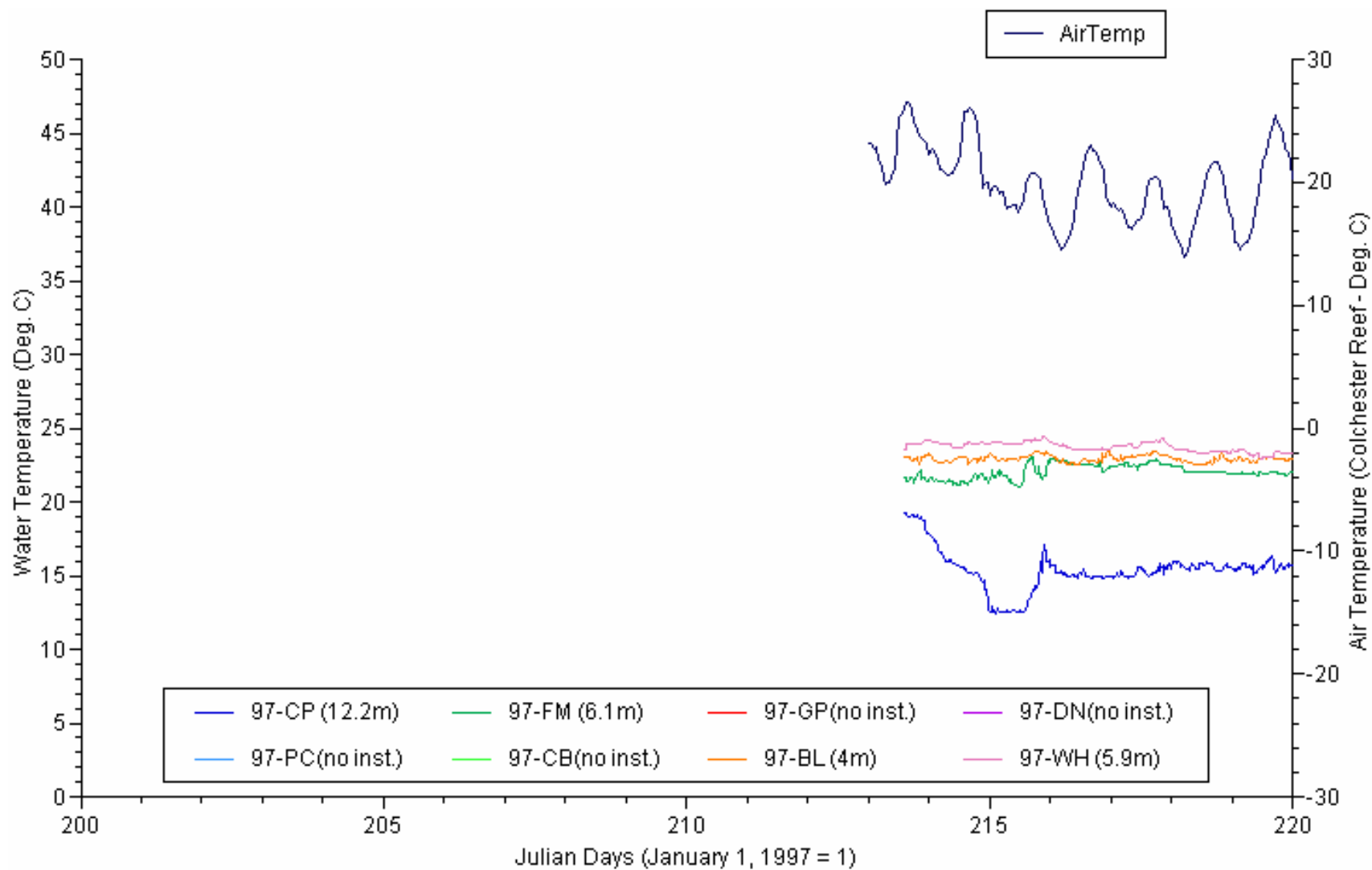
1997 - All Sites

Deep Temperature Data (Non-Offset)
&
Colchester Reef Meteorological Air Temperatures

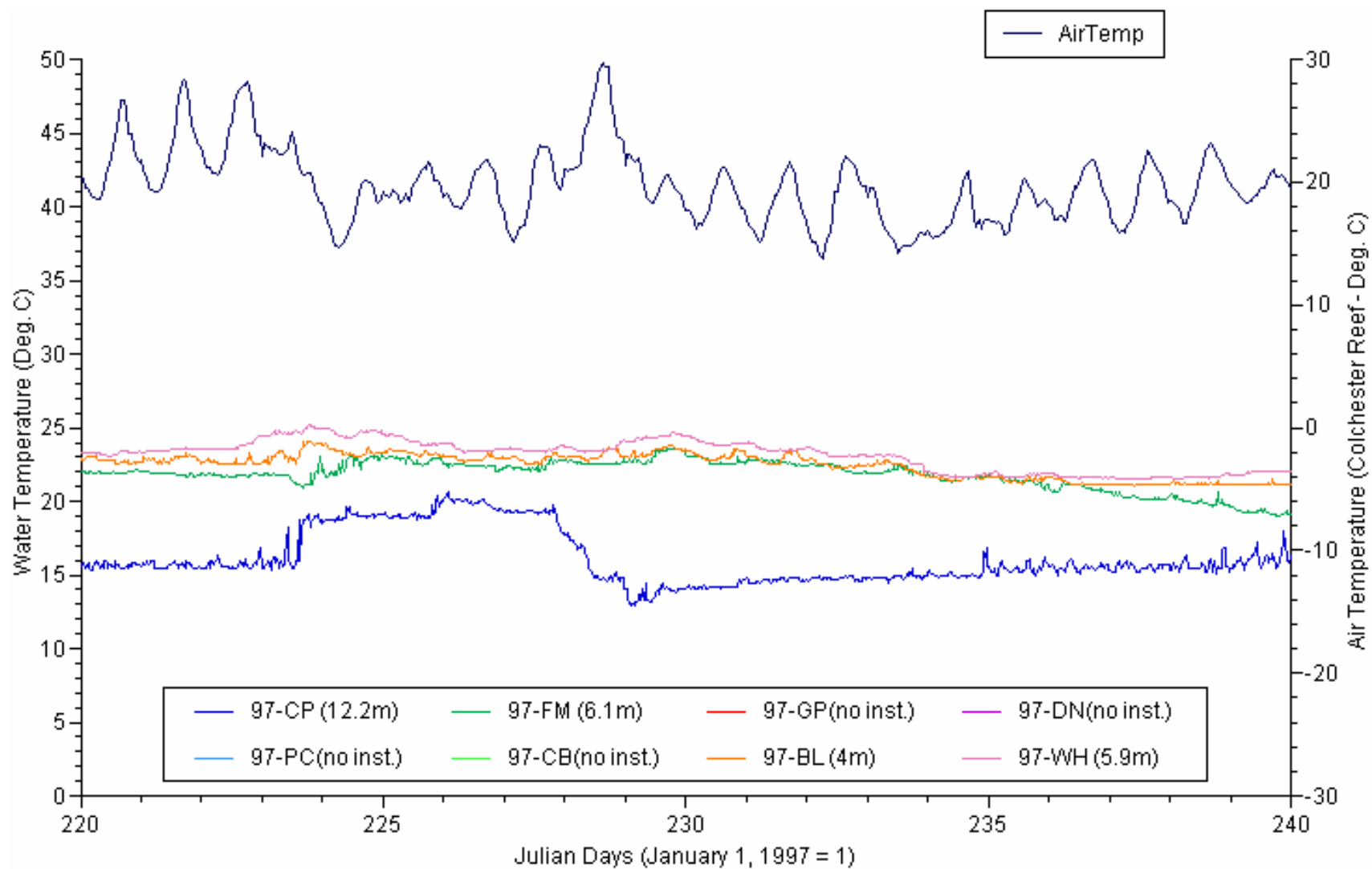
Total Duration
&
20-Day Expanded Plots



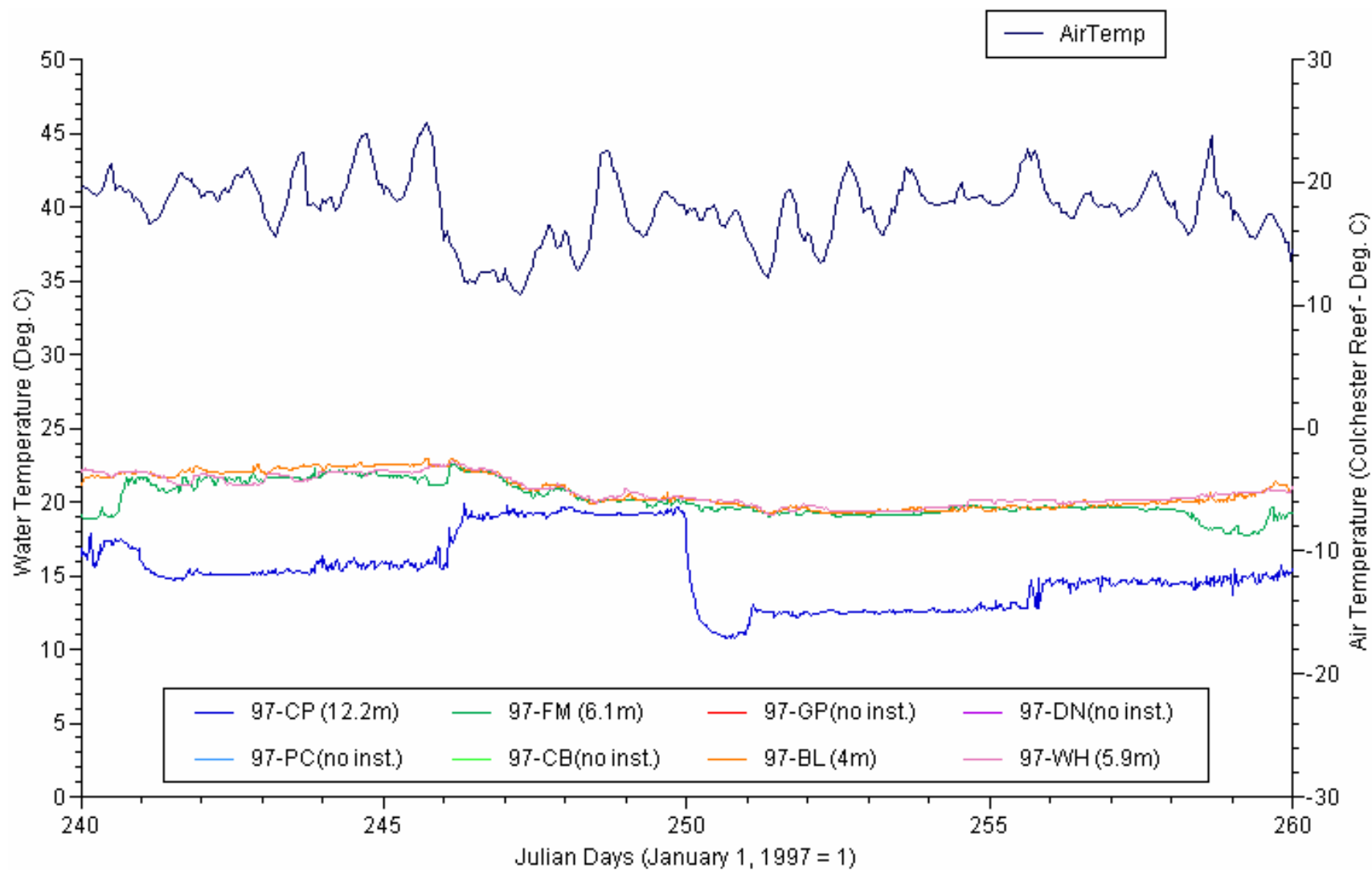
Appendix 8-97a. All 1997 surface tempertaure logger data along with air temperatures at Colchester Reef.



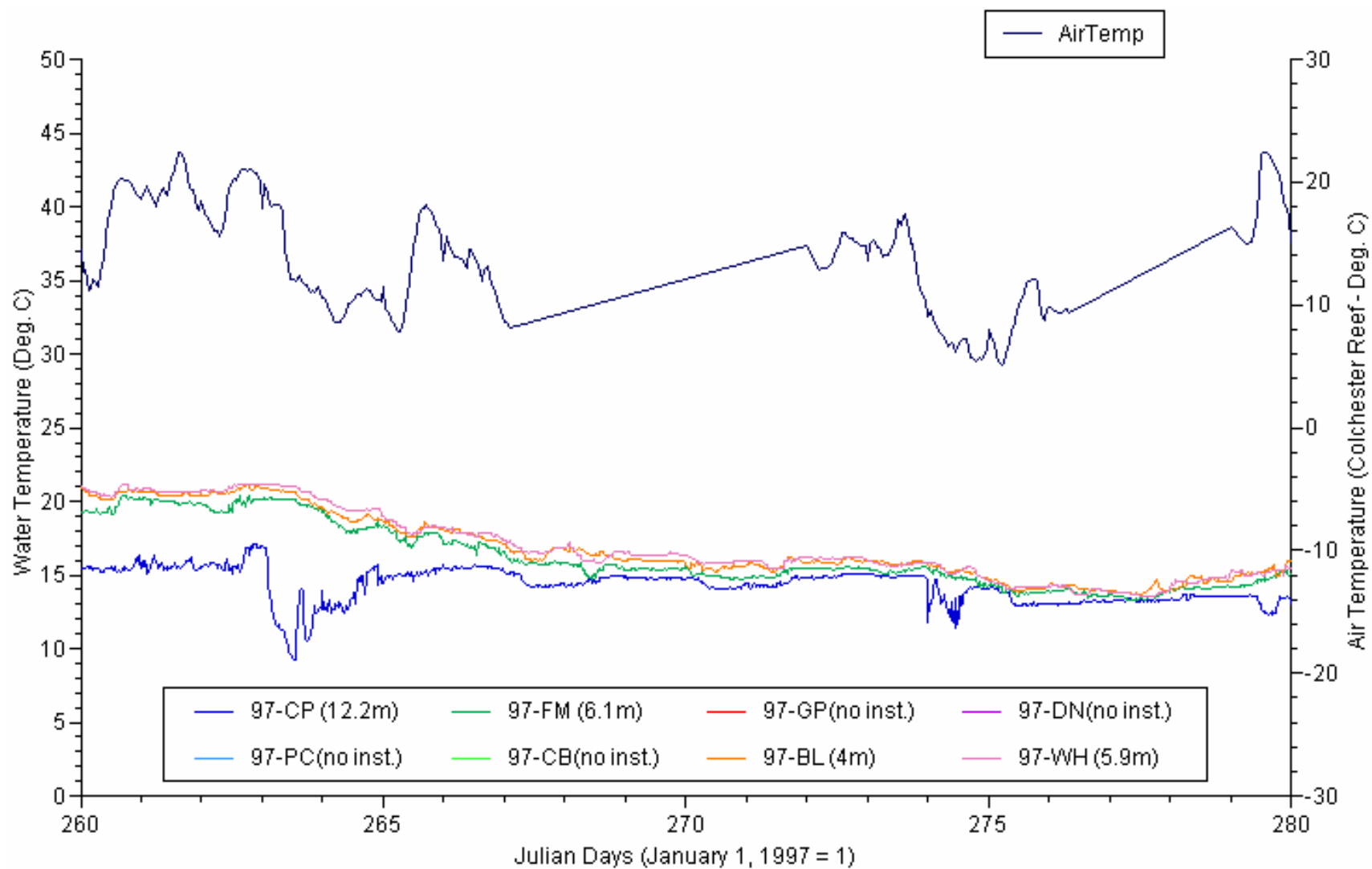
Appendix 8-97b. All 1997 surface temperature logger data along with air temperatures at Colchester Reef.



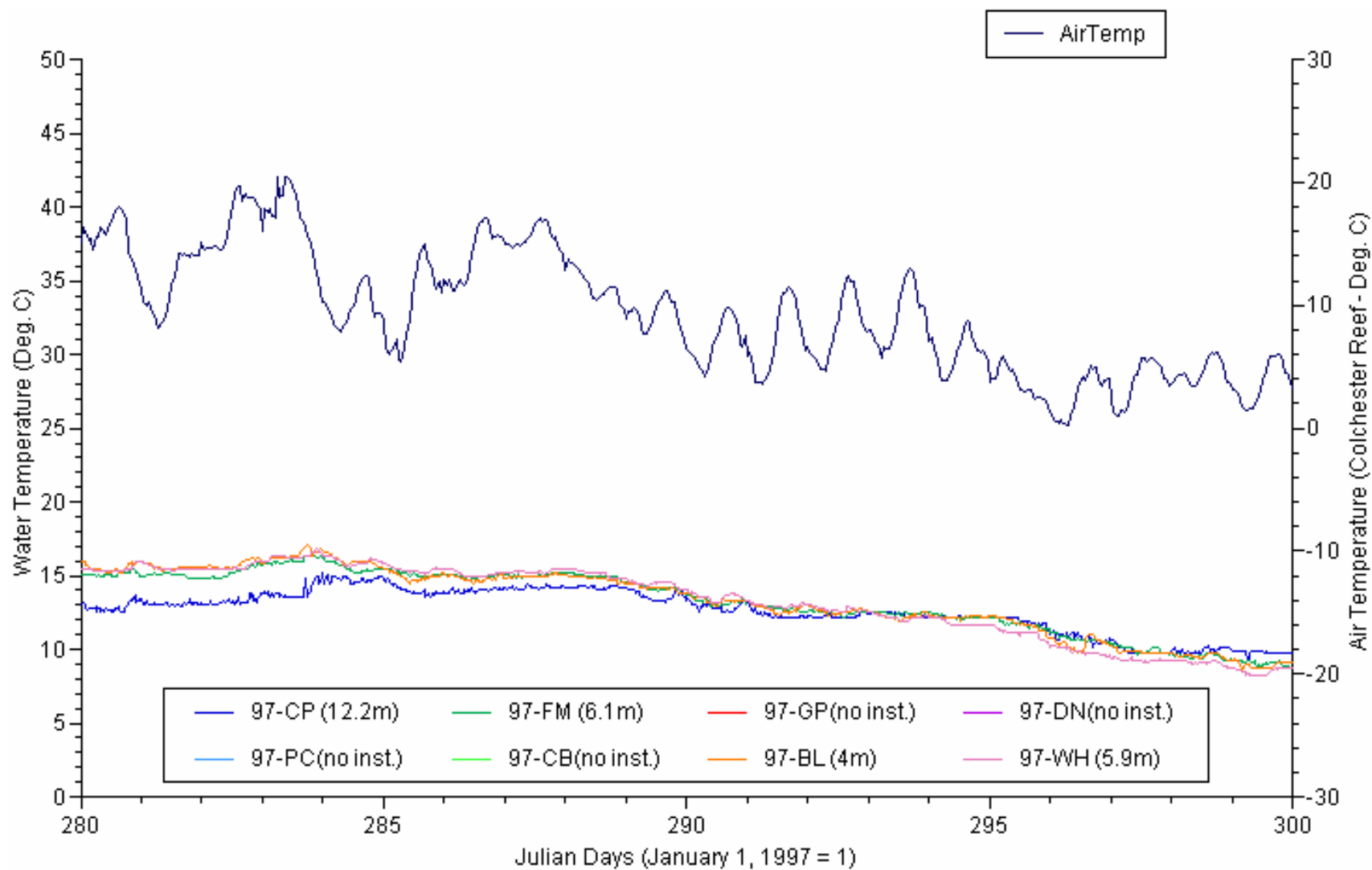
Appendix 8-97c. All 1997 surface tempertaure logger data along with air temperatures at Colchester Reef.



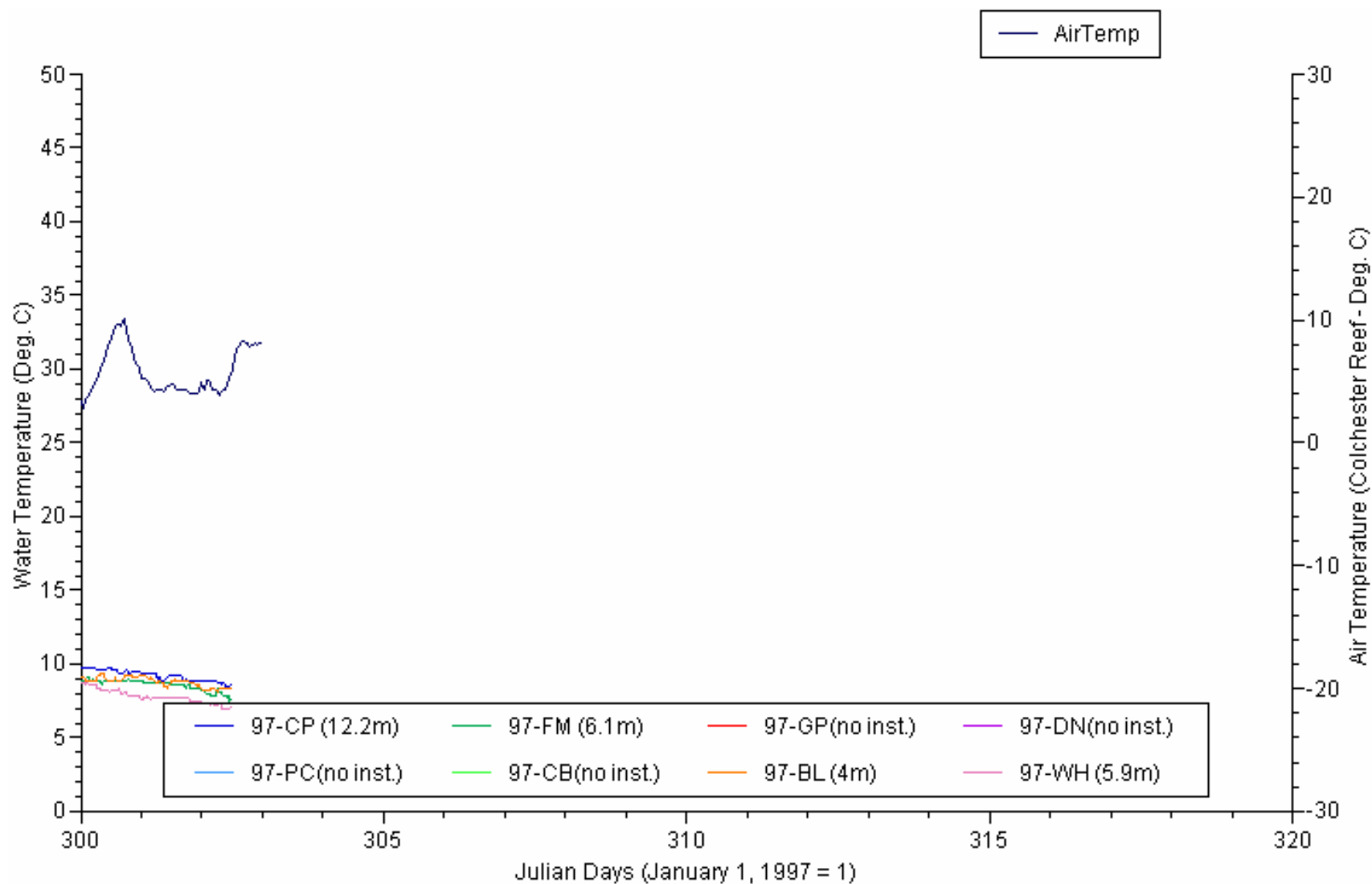
Appendix 8-97d. All 1997 surface temperature logger data along with air temperatures at Colchester Reef.



Appendix 8-97e. All 1997 surface temperature logger data along with air temperatures at Colchester Reef.



Appendix 8-97f. All 1997 surface tempertaure logger data along with air temperatures at Colchester Reef.



Appendix 8-97g. All 1997 surface tempertaure logger data along with air temperatures at Colchester Reef.

Appendix 9

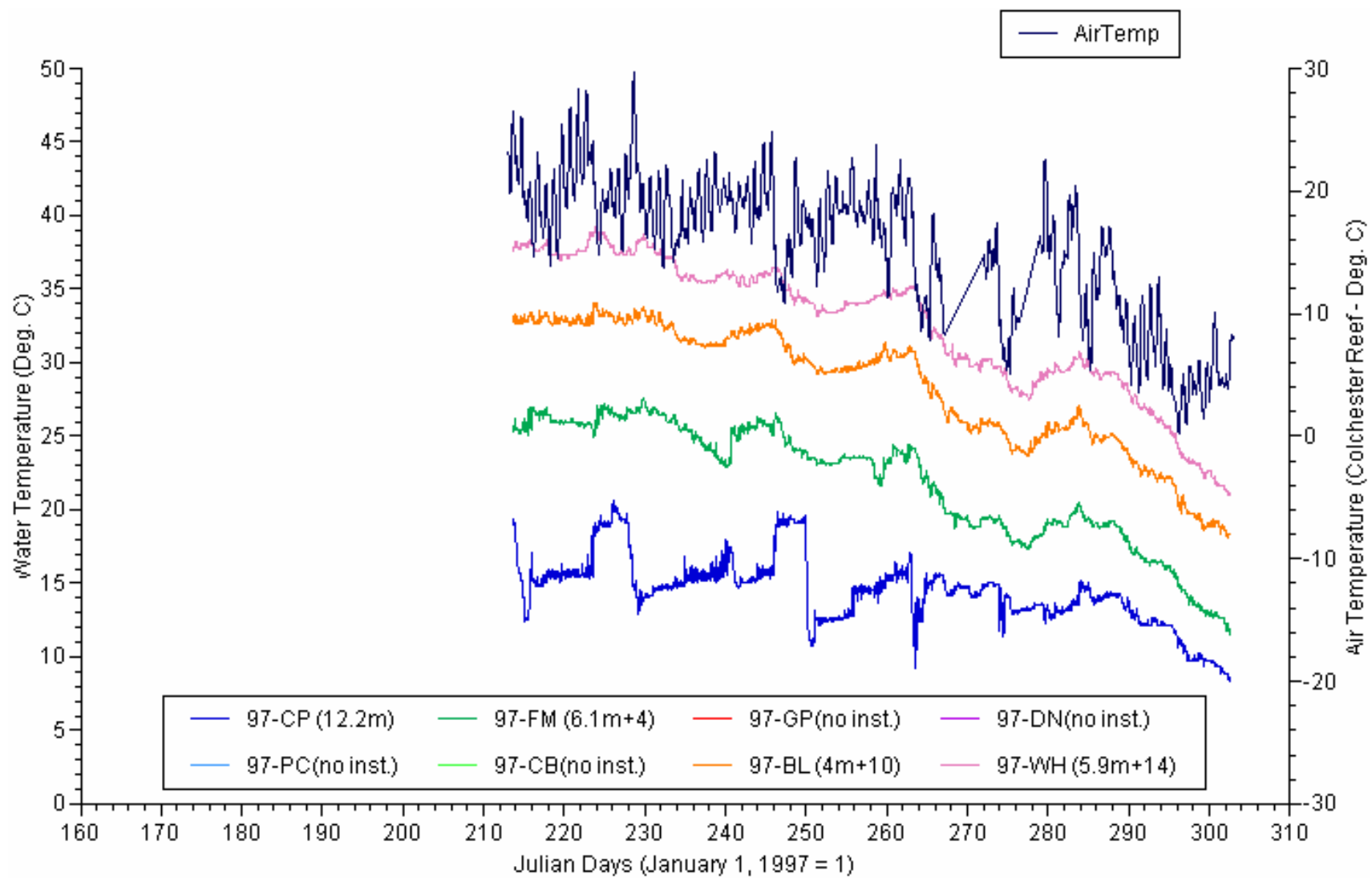
1997 - All Sites

Deep Temperature Data (2 °C Offset)
&
Colchester Reef Meteorological Air Temperatures

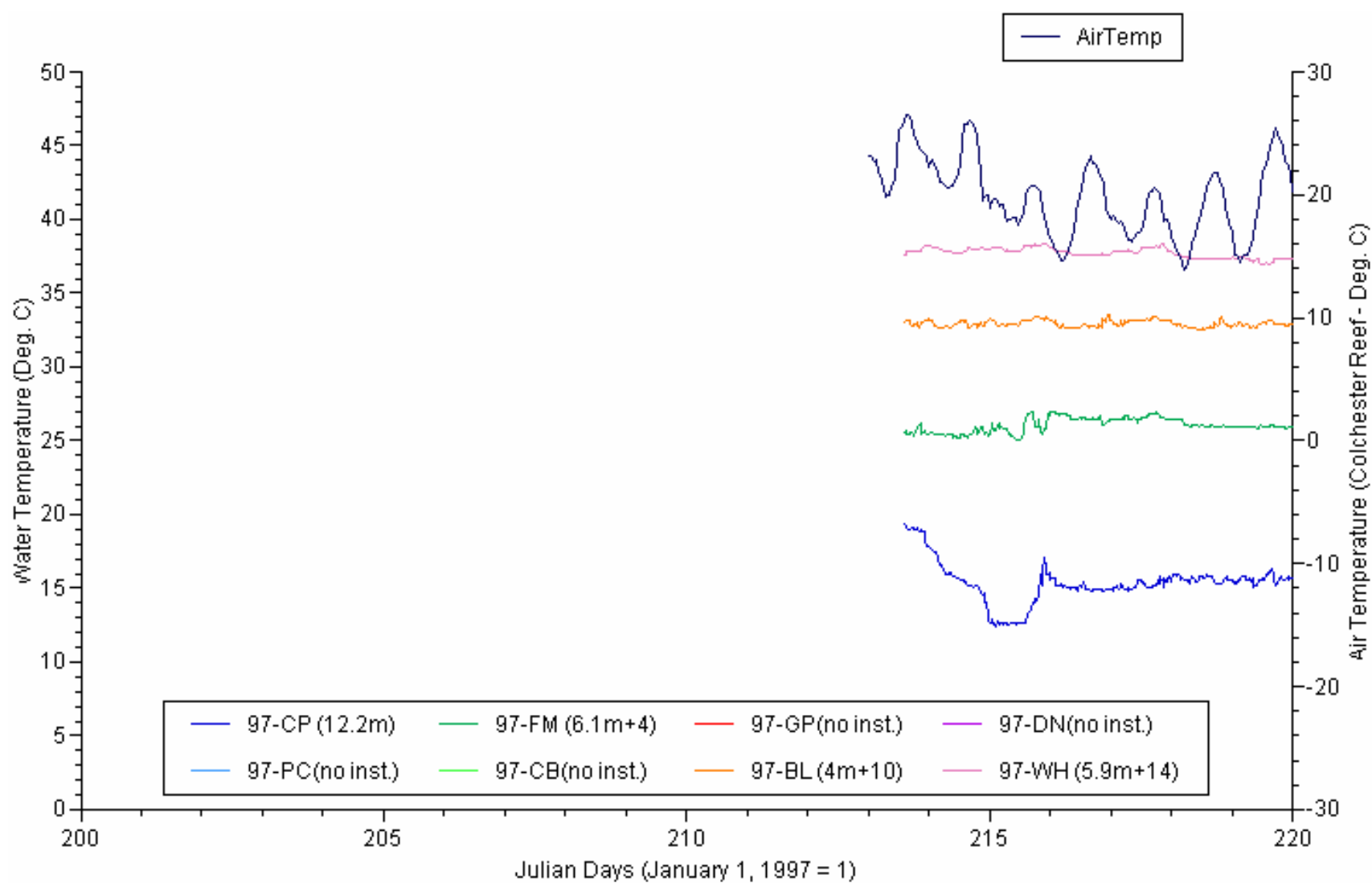
Total Duration
&
20-Day Expanded Plots

Note: Temperature offsets were applied to all sites except Crown Point in order to separate the data. The following temperature offsets were added to the sites on all subsequent plots:

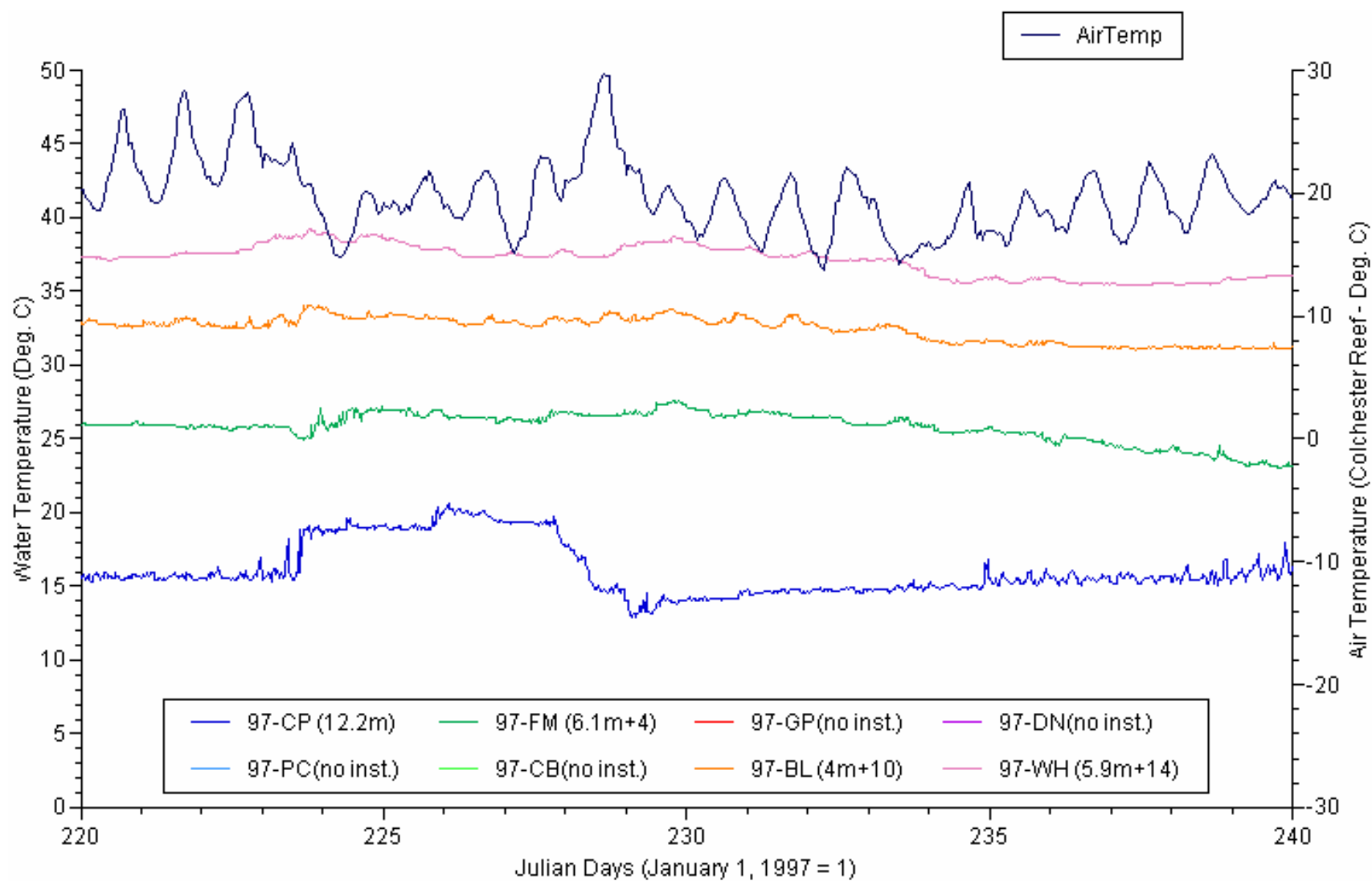
Putnam Creek (PC)	----->	+2 °C
File Mile Point (FM)	----->	+4 °C
Catfish Bay (CB)	----->	+6 °C
Gourlie Point (GP)	----->	+8 °C
Benson Landing (BL)	----->	+10 °C
Dresden Narrows (DN)	-->	+12 °C
Whitehall (WH)	----->	+14 °C



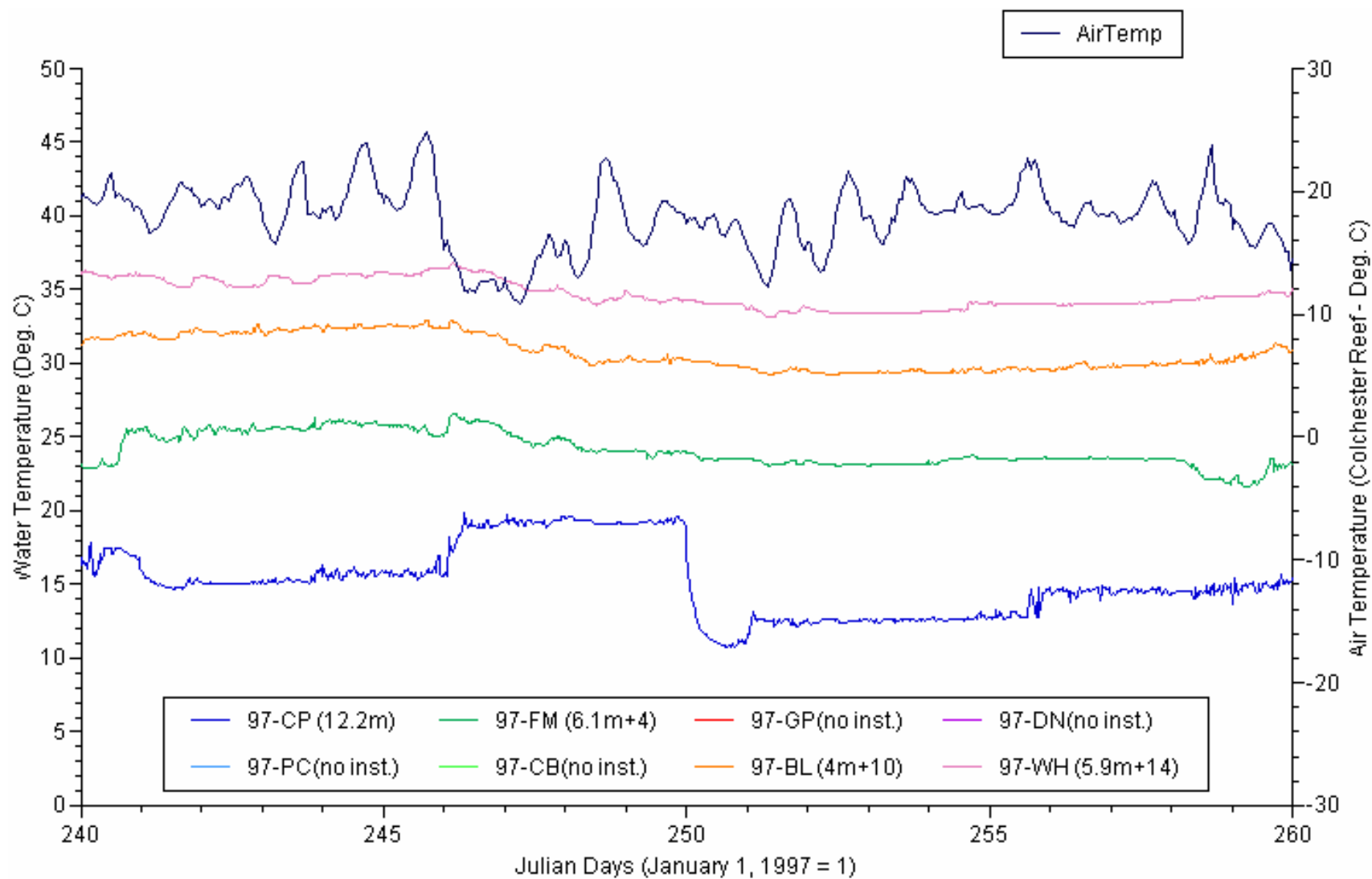
Appendix 9-97a. All 1997 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



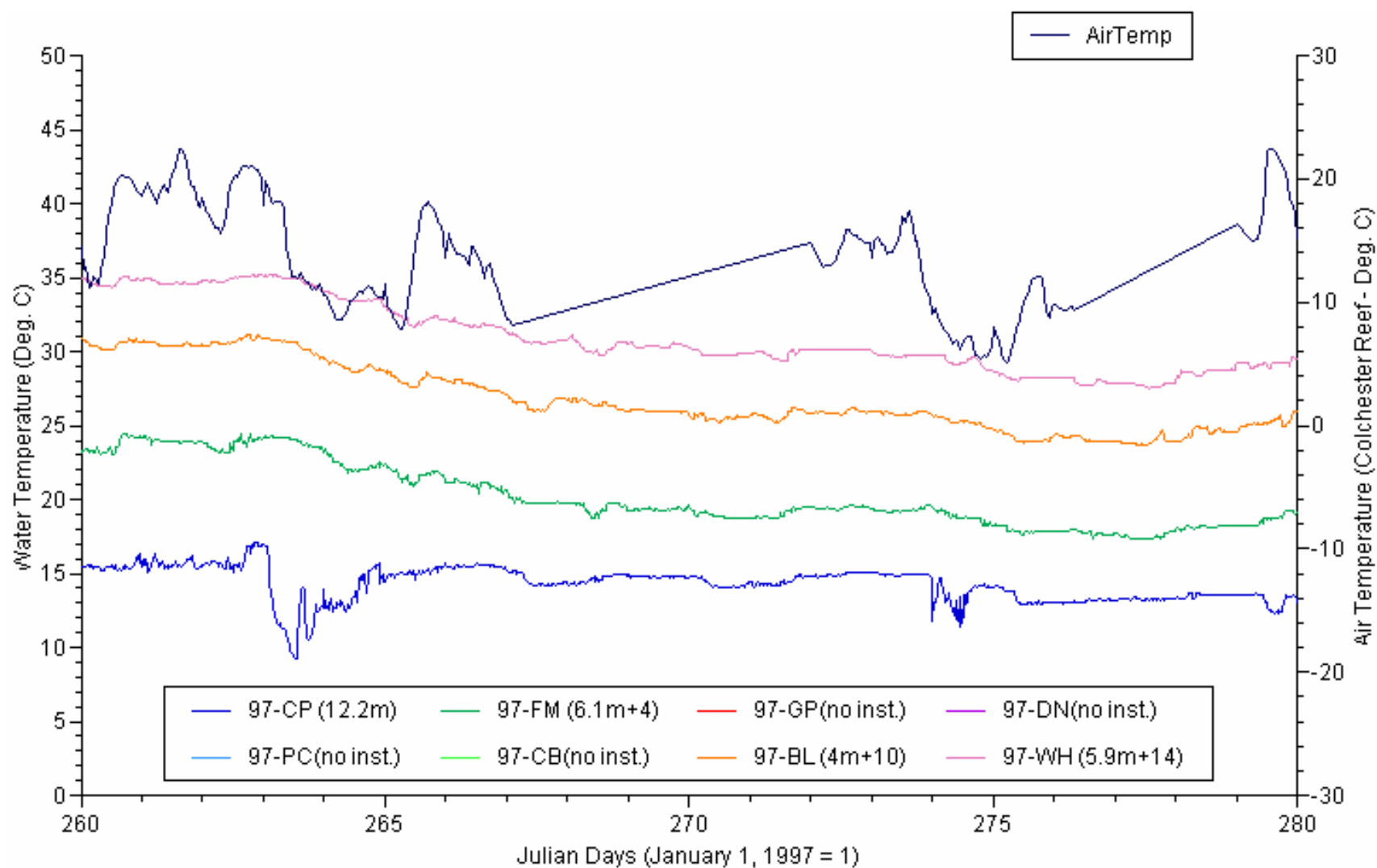
Appendix 9-97b. All 1997 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



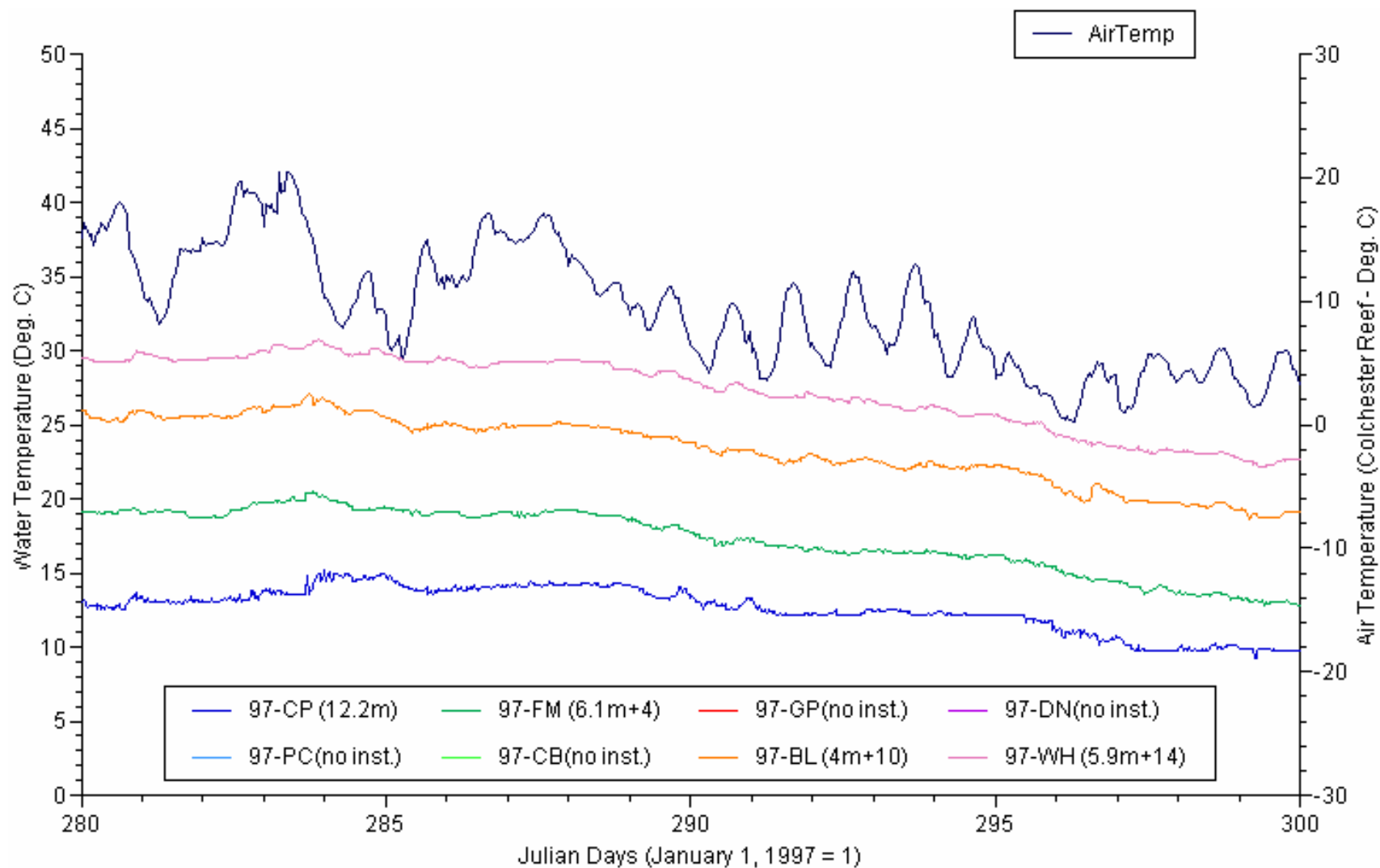
Appendix 9-97c. All 1997 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



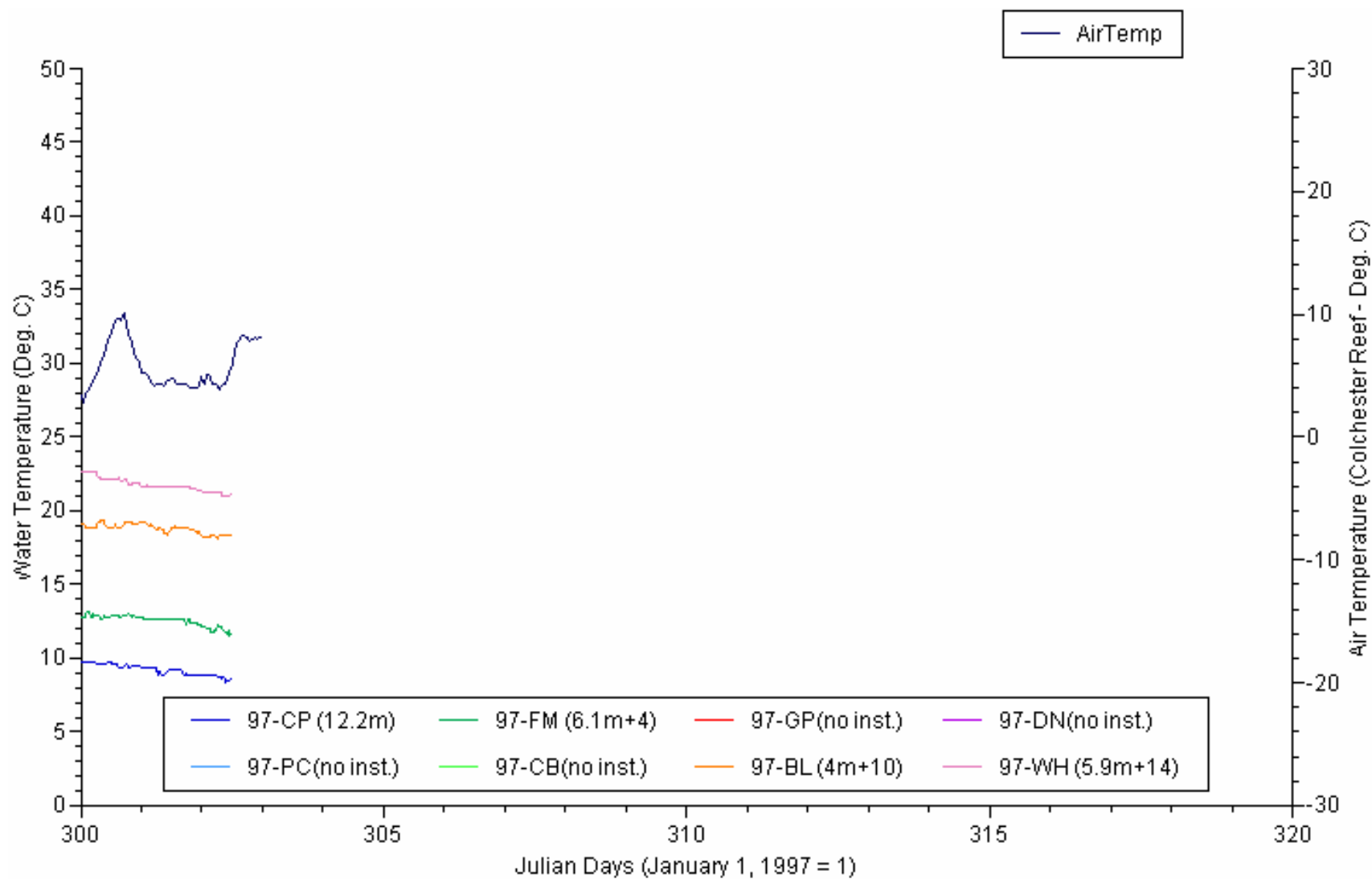
Appendix 9-97d. All 1997 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



Appendix 9-97e. All 1997 surface temperature logger data (offset plotted) along with air temperatures at Colchester Reef.



Appendix 9-97f. All 1997 surface temperature logger data (offset plotted) along with air temperatures at Colchester Reef.



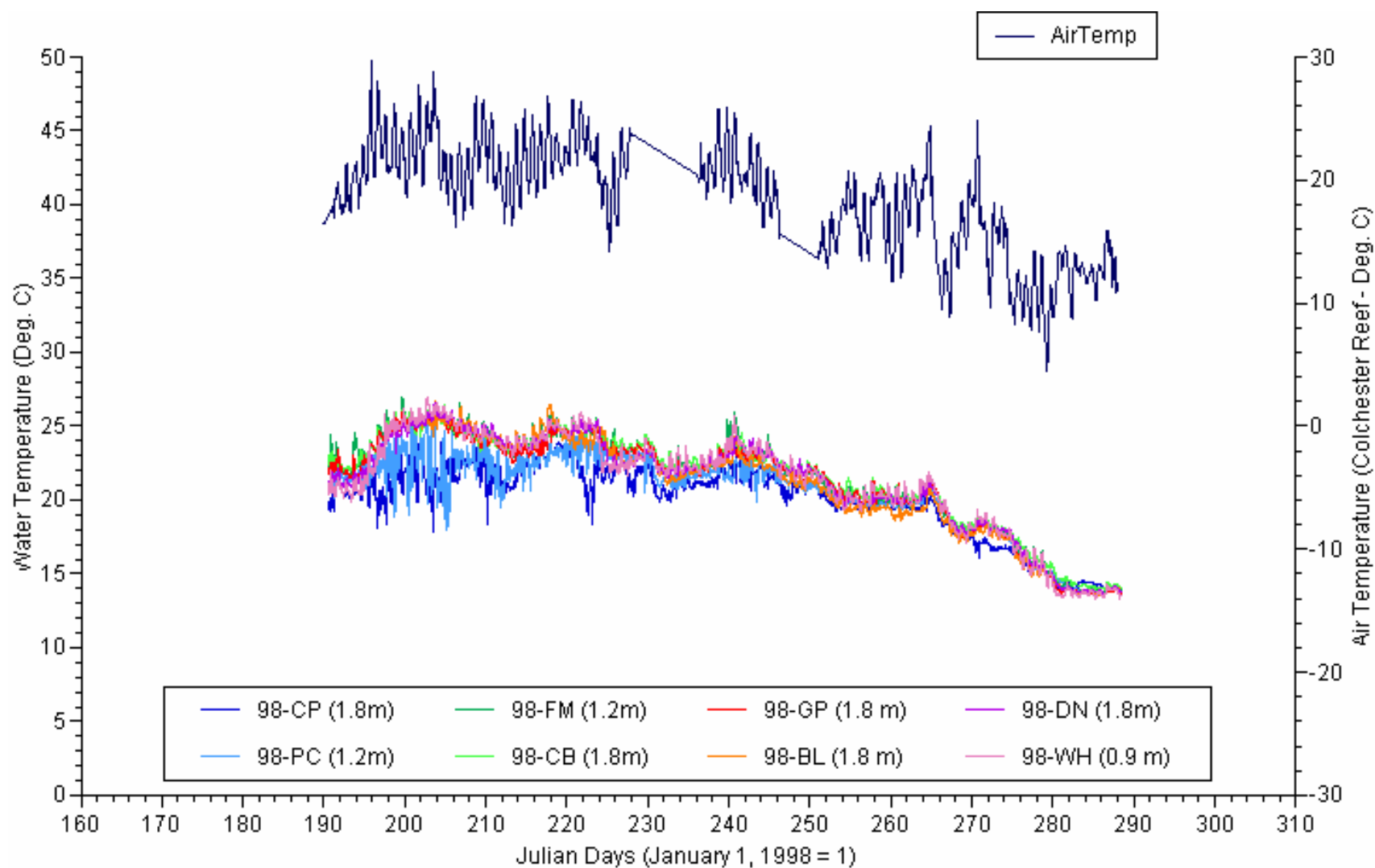
Appendix 9-97g. All 1997 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.

Appendix 10

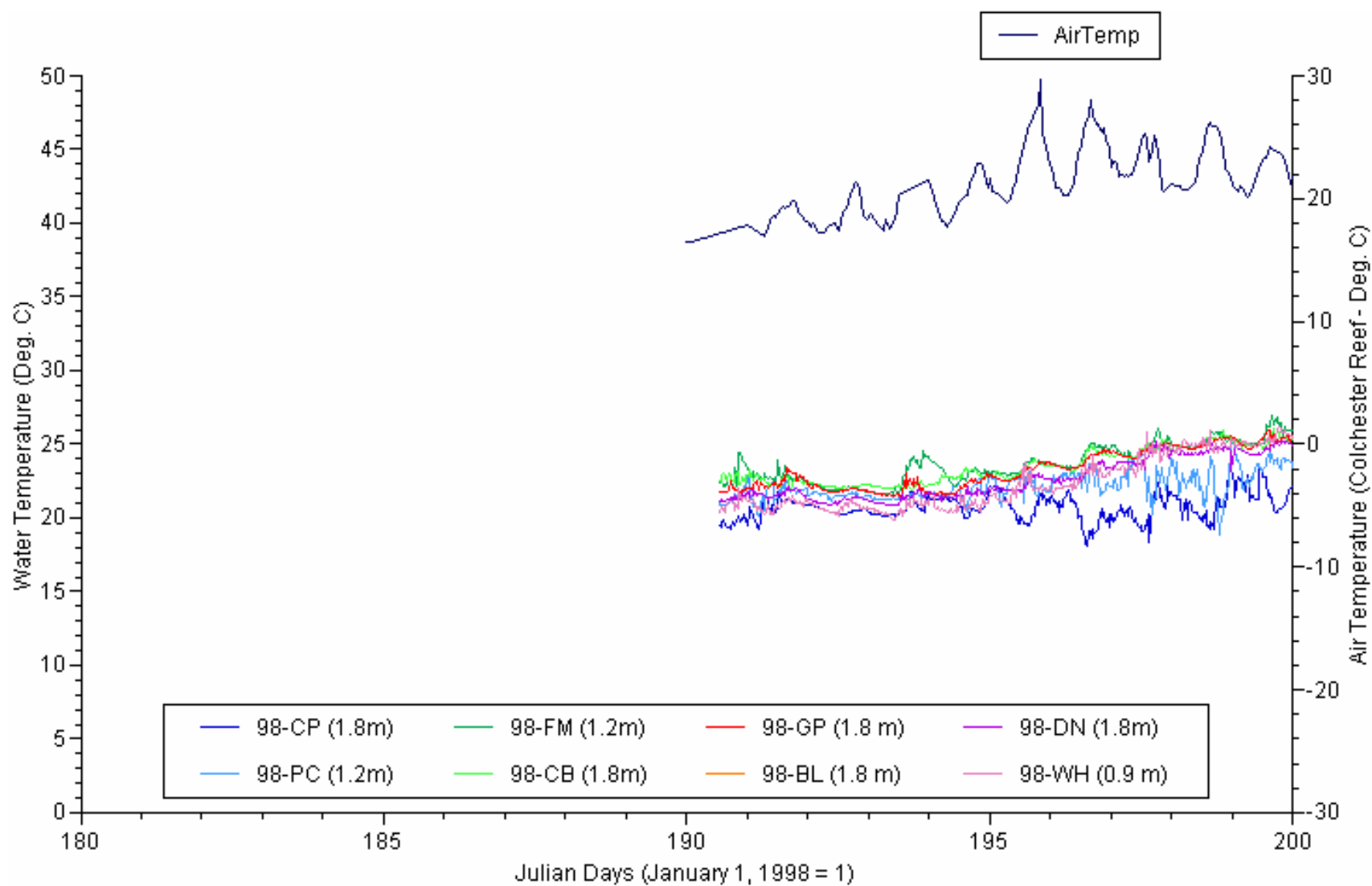
1998 - All Sites

Shallow Temperature Data (Non-Offset)
&
Colchester Reef Meteorological Air Temperatures

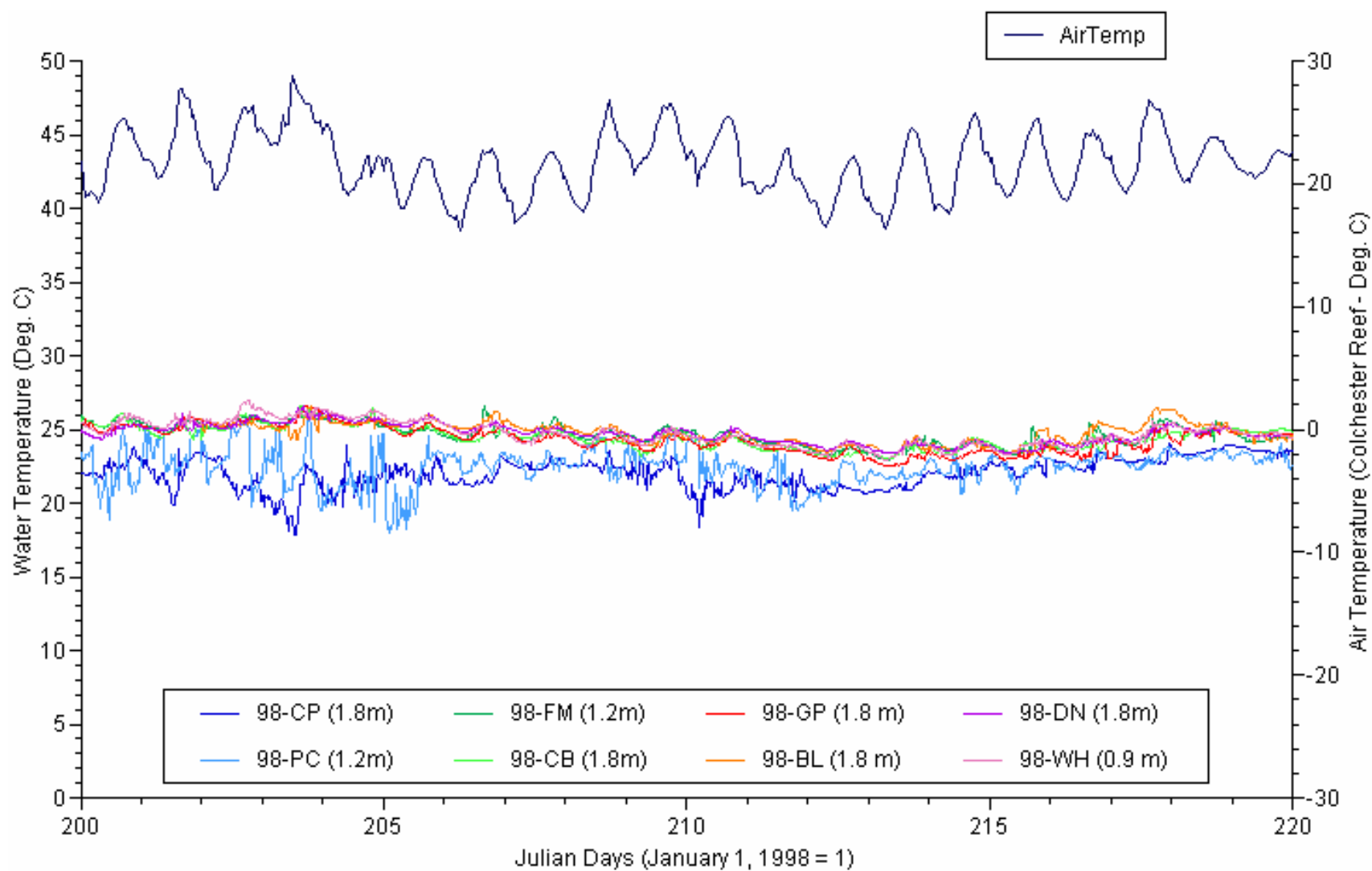
Total Duration
&
20-Day Expanded Plots



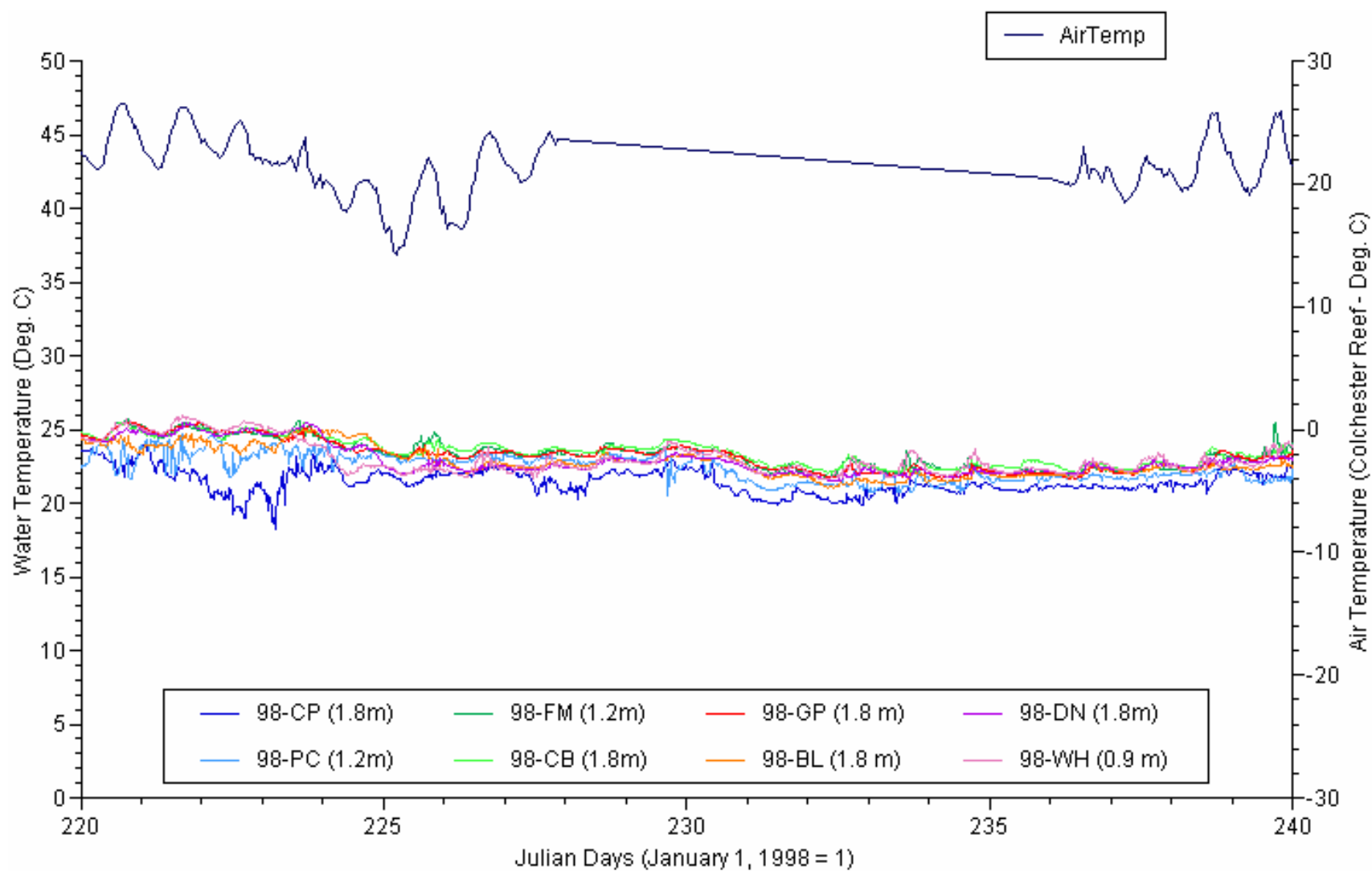
Appendix 10-98a. All 1998 surface tempertaure logger data along with air temperatures at Colchester Reef.



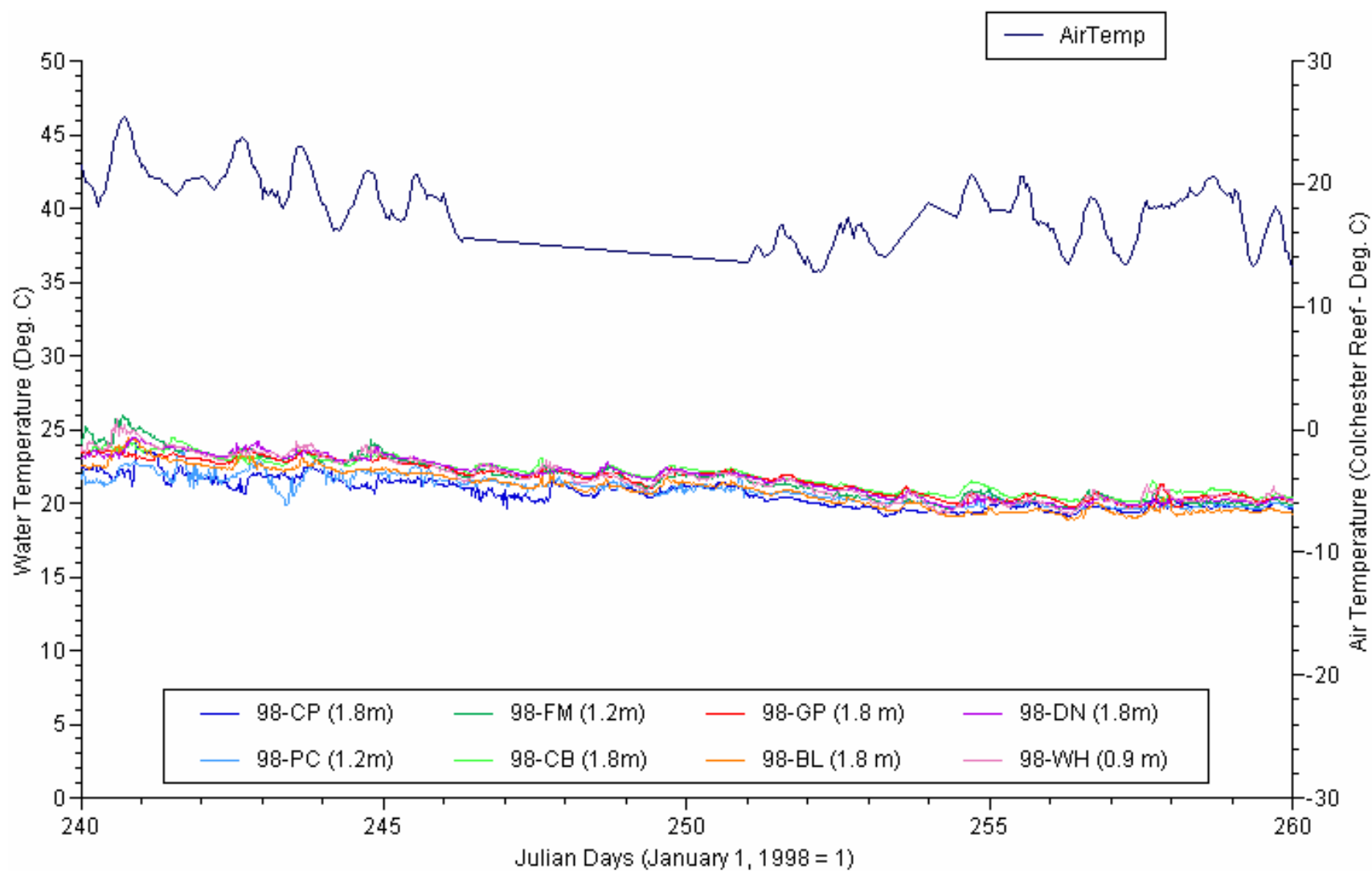
Appendix 10-98b. All 1998 surface tempertaure logger data along with air temperatures at Colchester Reef.



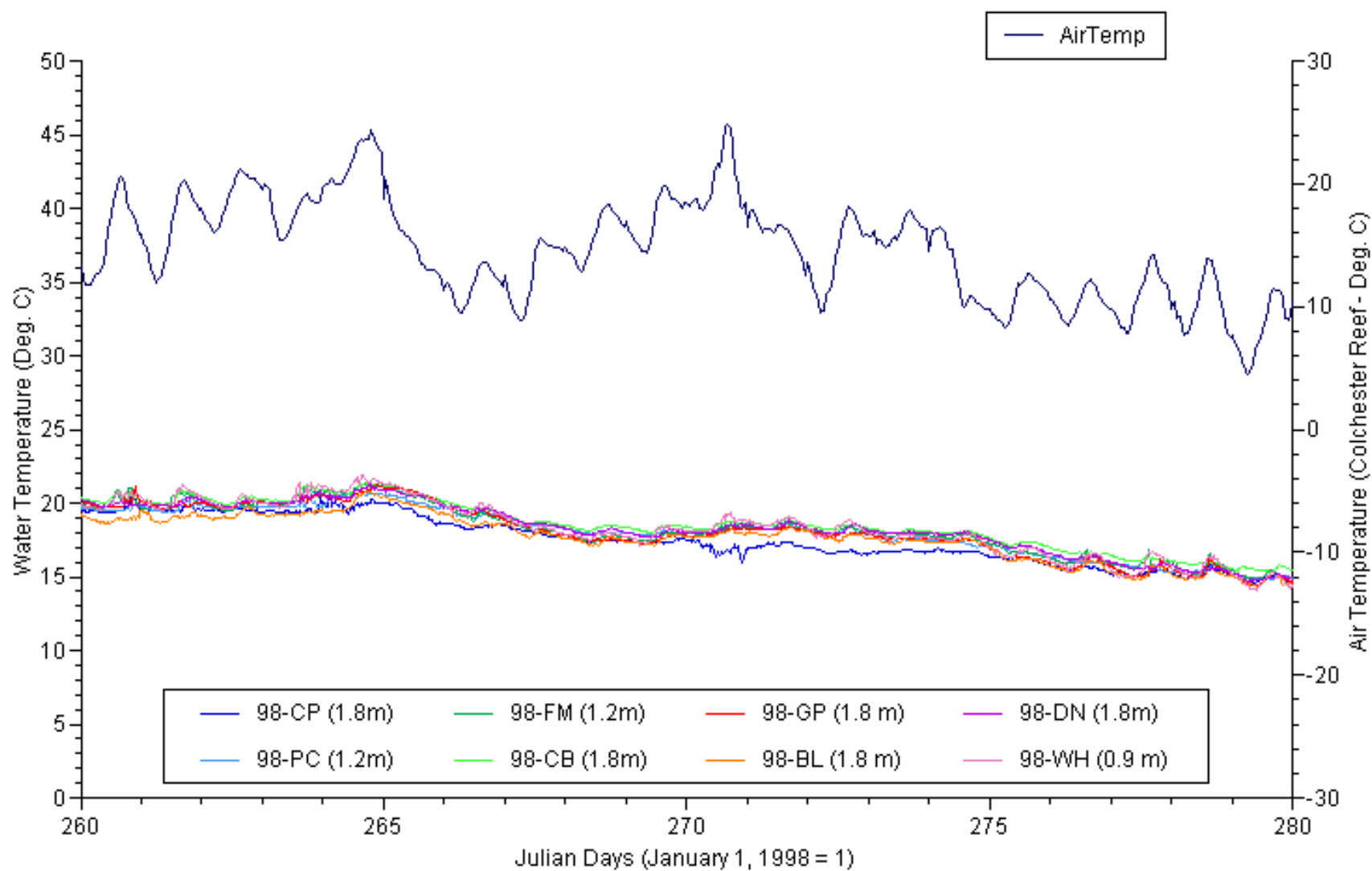
Appendix 10-98c. All 1998 surface tempertaure logger data along with air temperatures at Colchester Reef.



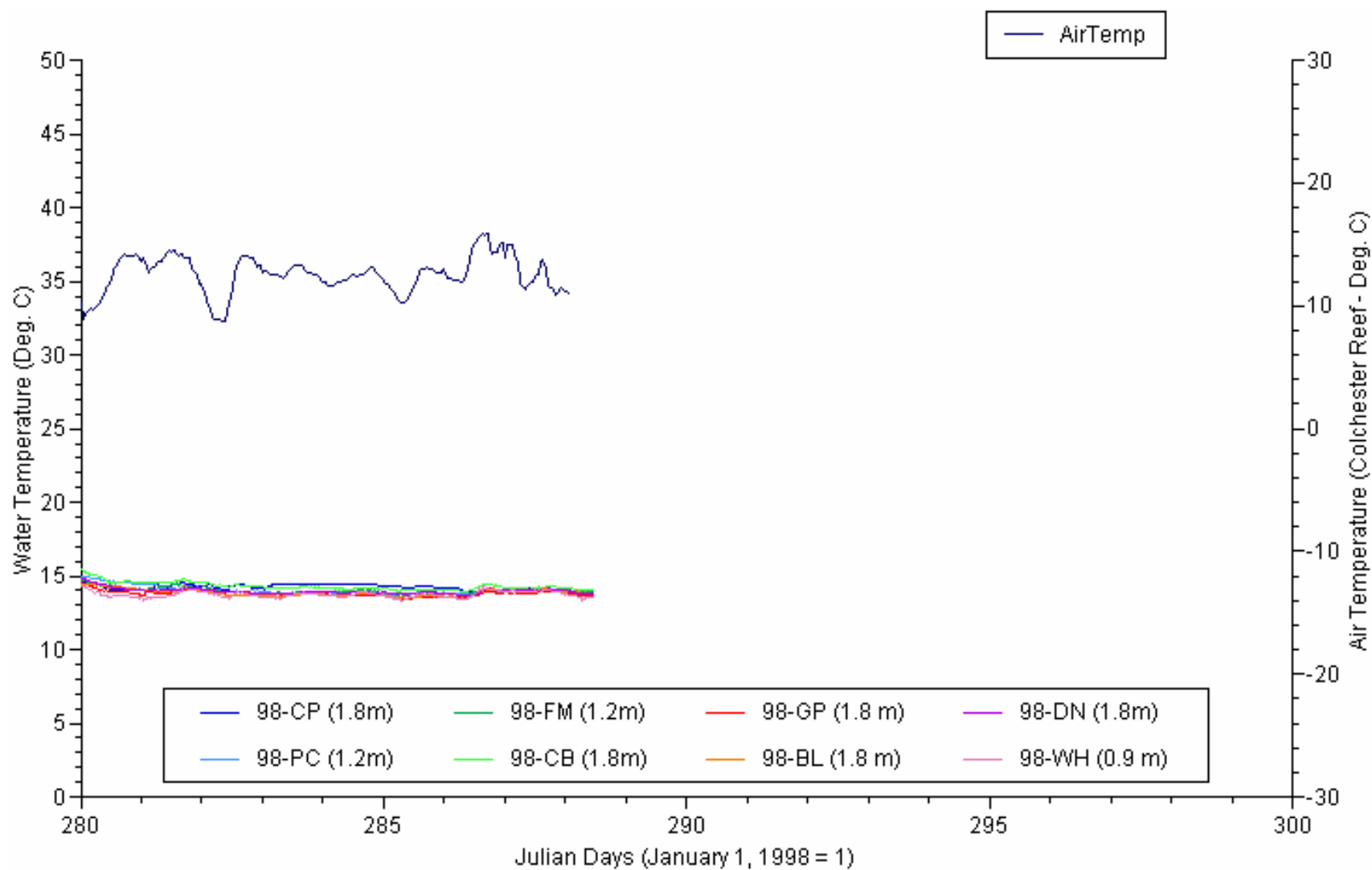
Appendix 10-98d. All 1998 surface tempertaure logger data along with air temperatures at Colchester Reef.



Appendix 10-98e. All 1998 surface tempertaure logger data along with air temperatures at Colchester Reef.



Appendix 10-98f. All 1998 surface tempertaure logger data along with air temperatures at Colchester Reef.



Appendix 10-98g. All 1998 surface tempertaure logger data along with air temperatures at Colchester Reef.

Appendix 11

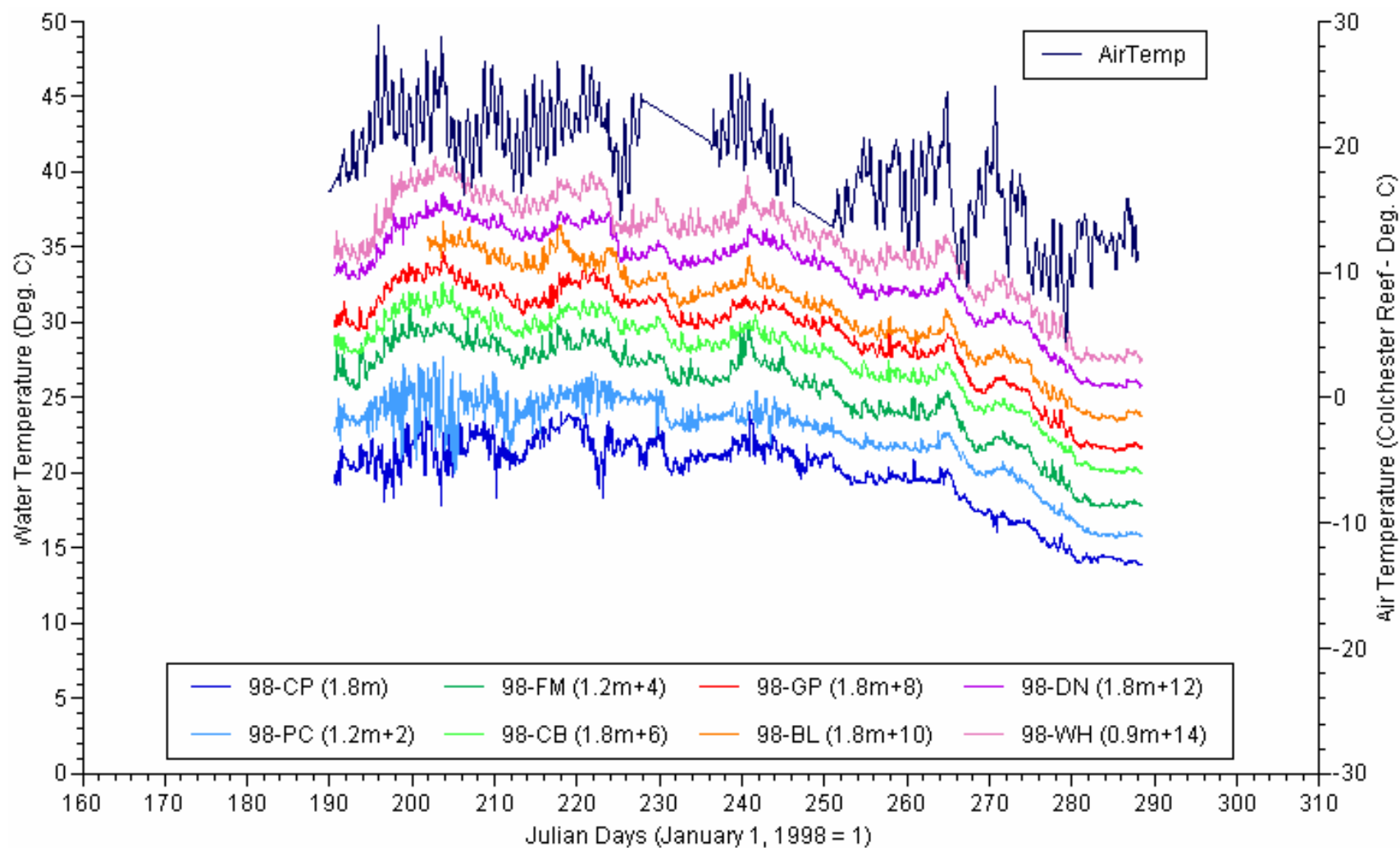
1998 - All Sites

Shallow Temperature Data (2 °C Offset) & Colchester Reef Meteorological Air Temperatures

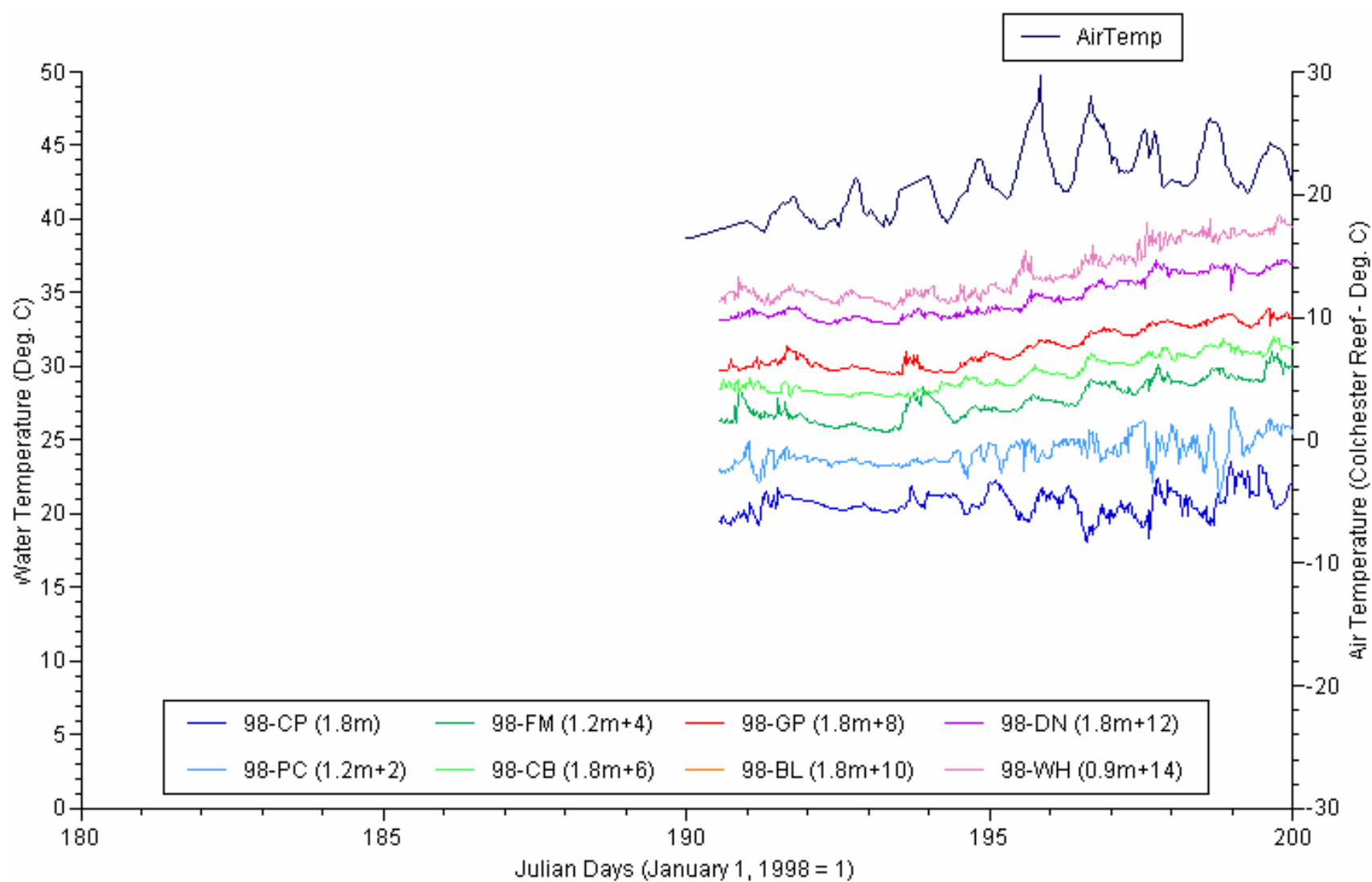
Total Duration
&
20-Day Expanded Plots

Note: Temperature offsets were applied to all sites except Crown Point in order to separate the data. The following temperature offsets were added to the sites on all subsequent plots:

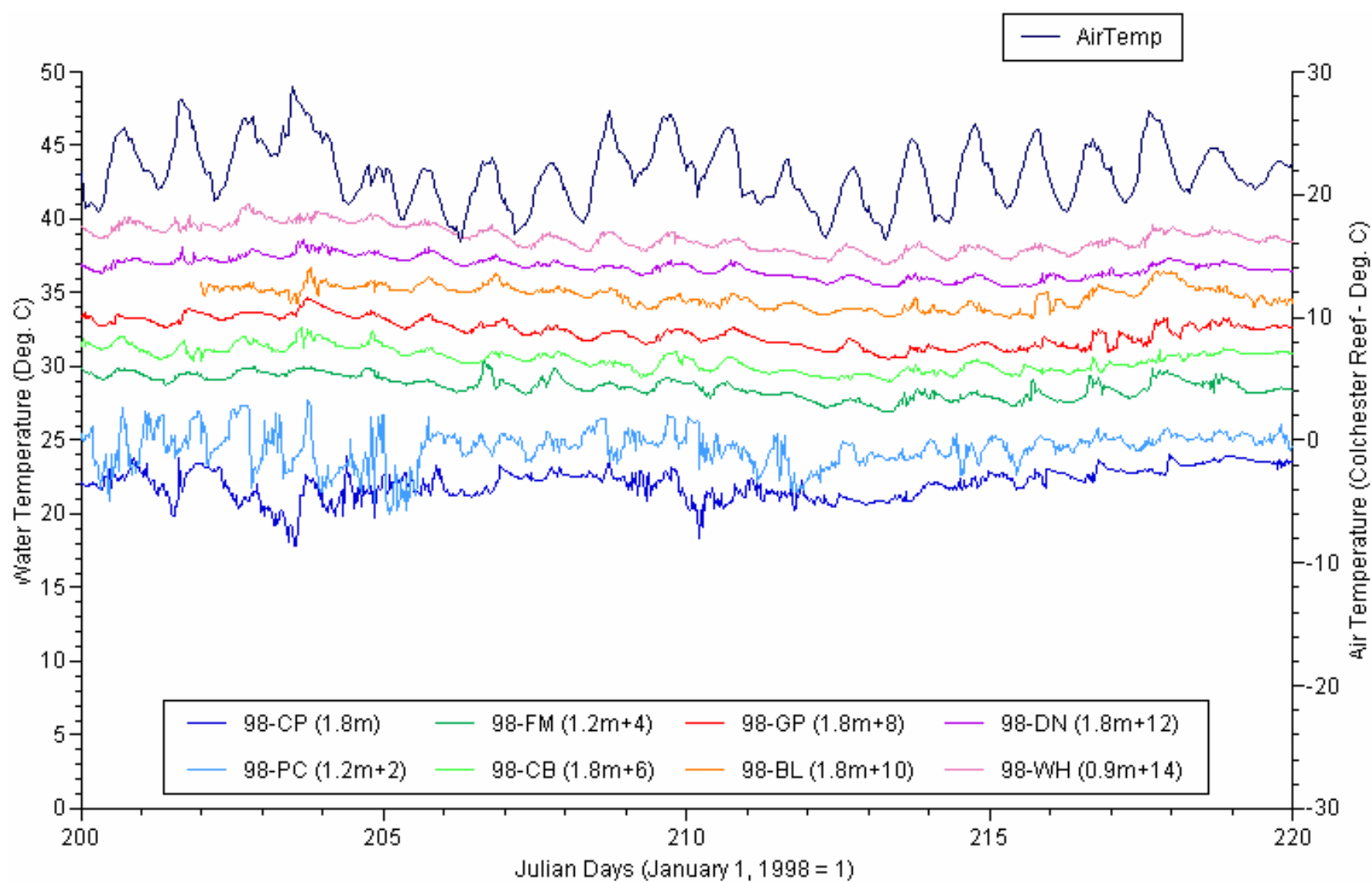
Putnam Creek (PC)	----->	+2 °C
File Mile Point (FM)	----->	+4 °C
Catfish Bay (CB)	----->	+6 °C
Gourlie Point (GP)	----->	+8 °C
Benson Landing (BL)	----->	+10 °C
Dresden Narrows (DN)	-->	+12 °C
Whitehall (WH)	----->	+14 °C



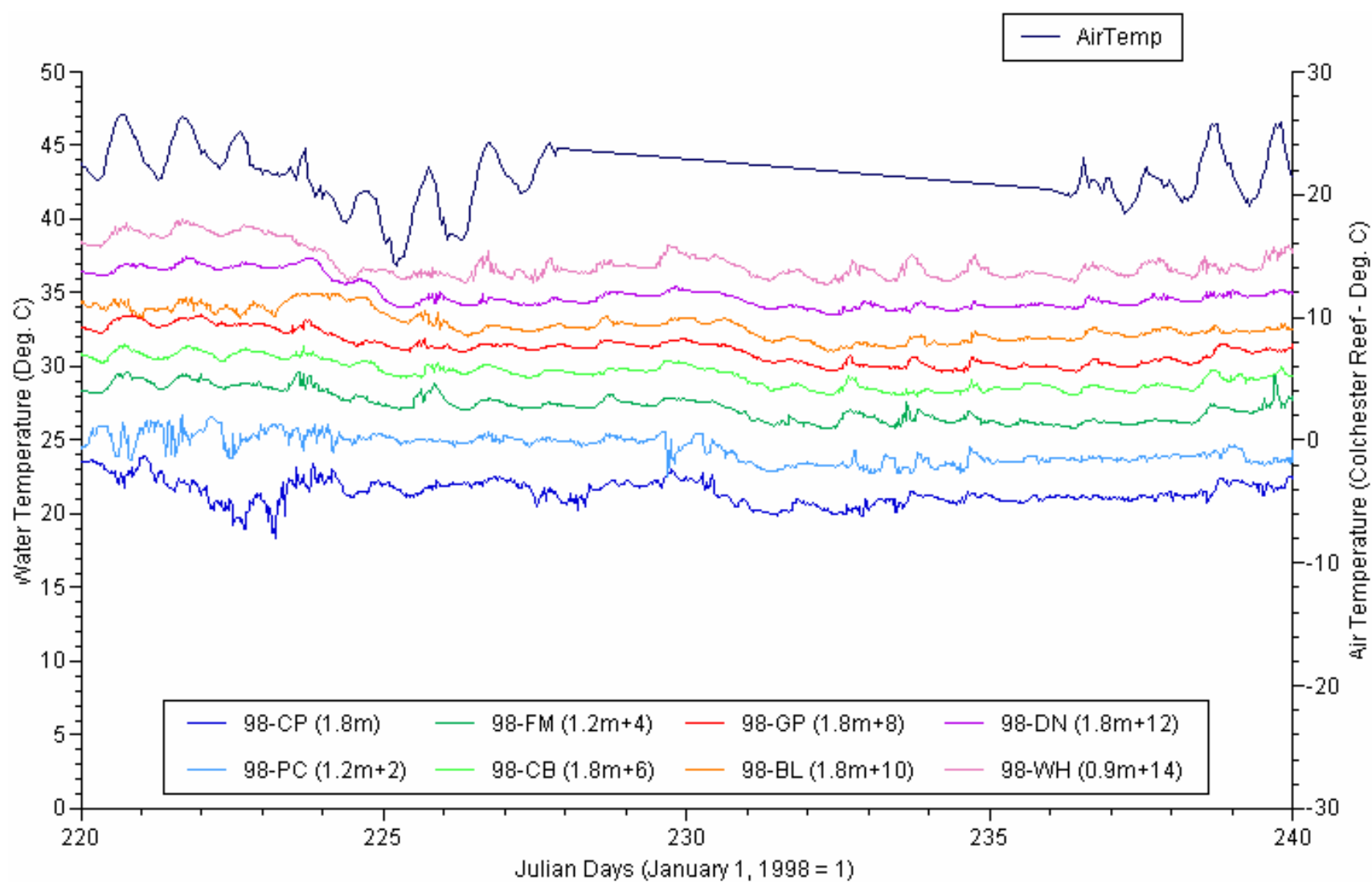
Appendix 11-98a. All 1998 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



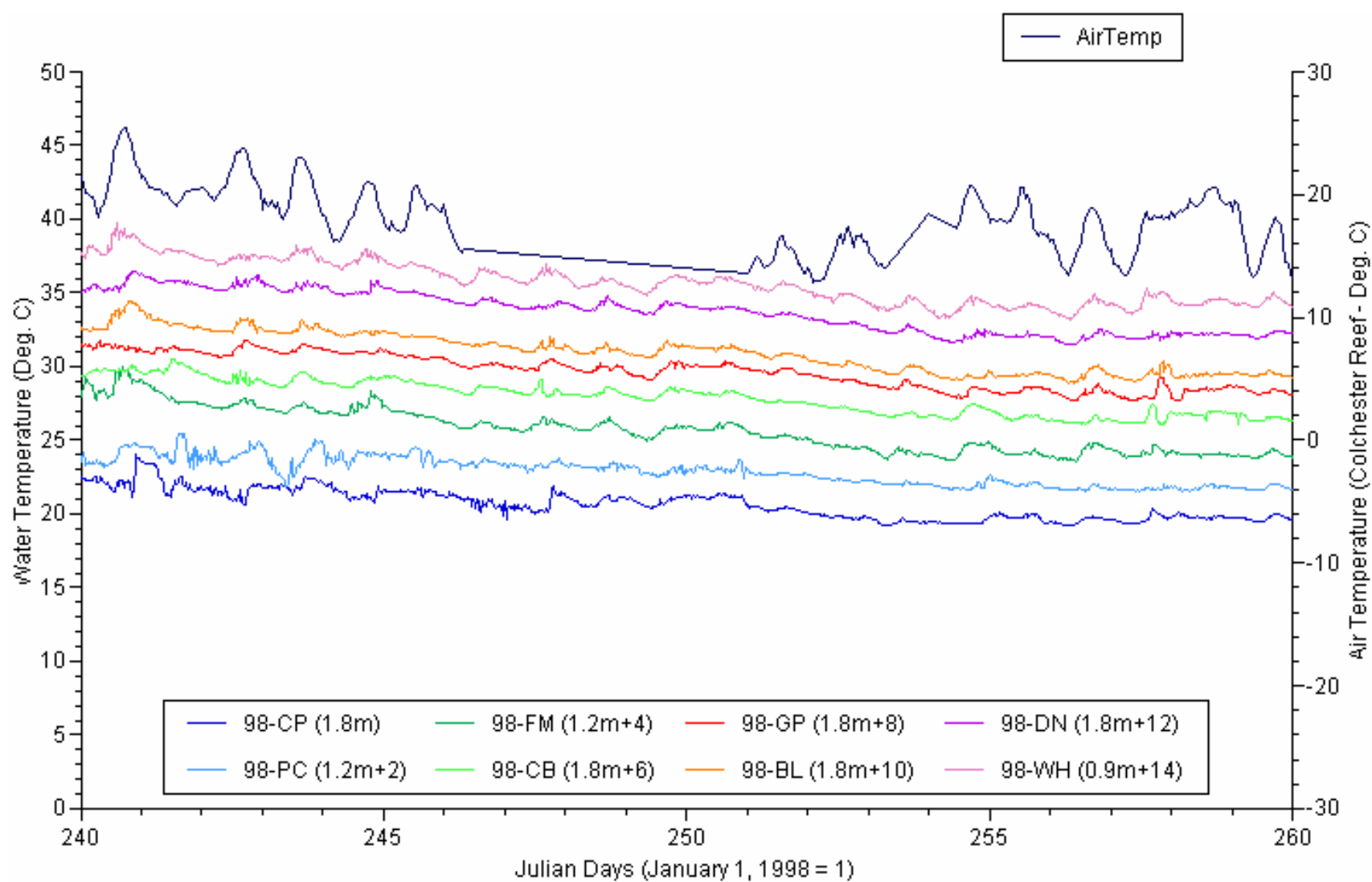
Appendix 11-98b. All 1998 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



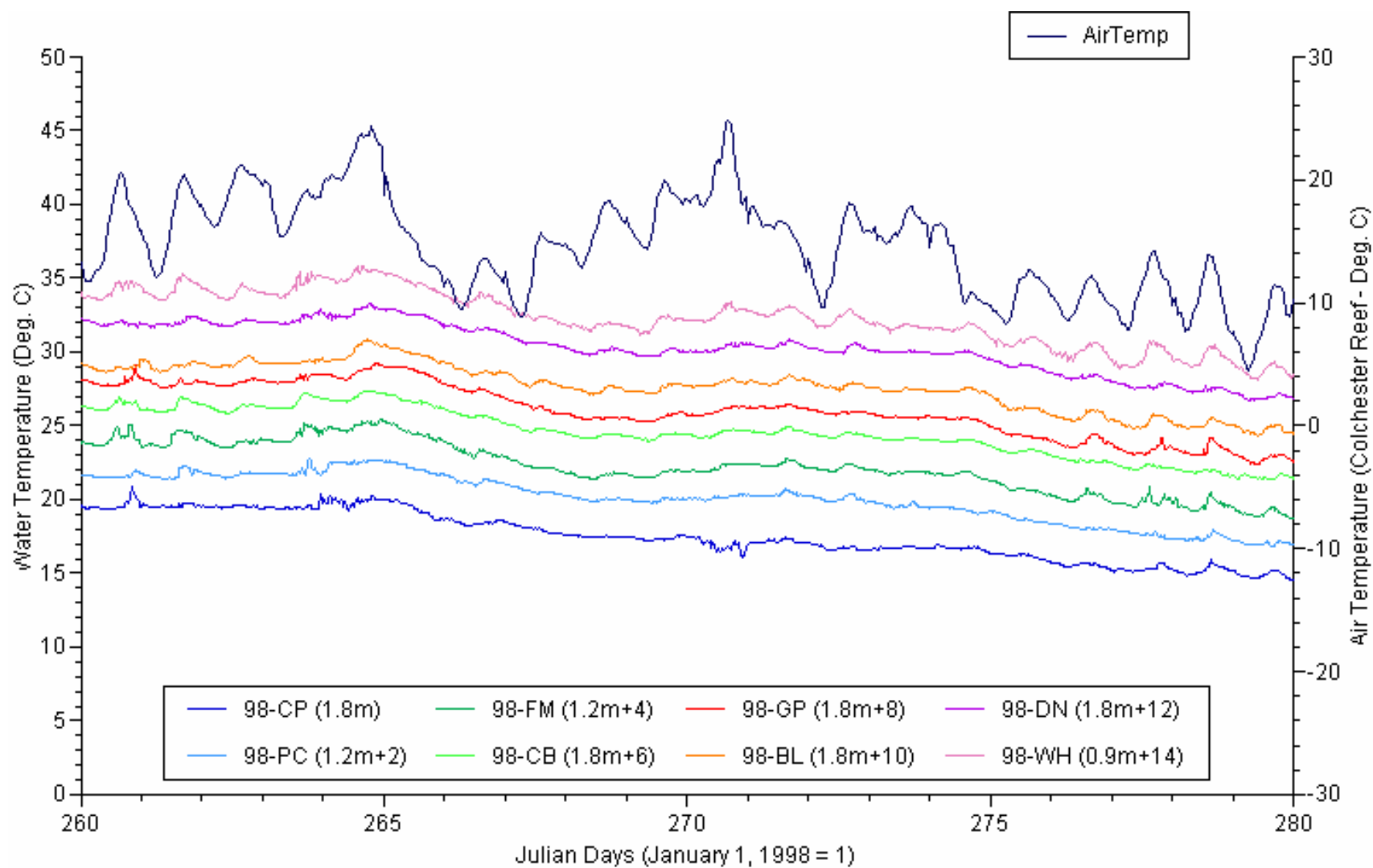
Appendix 11-98c. All 1998 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



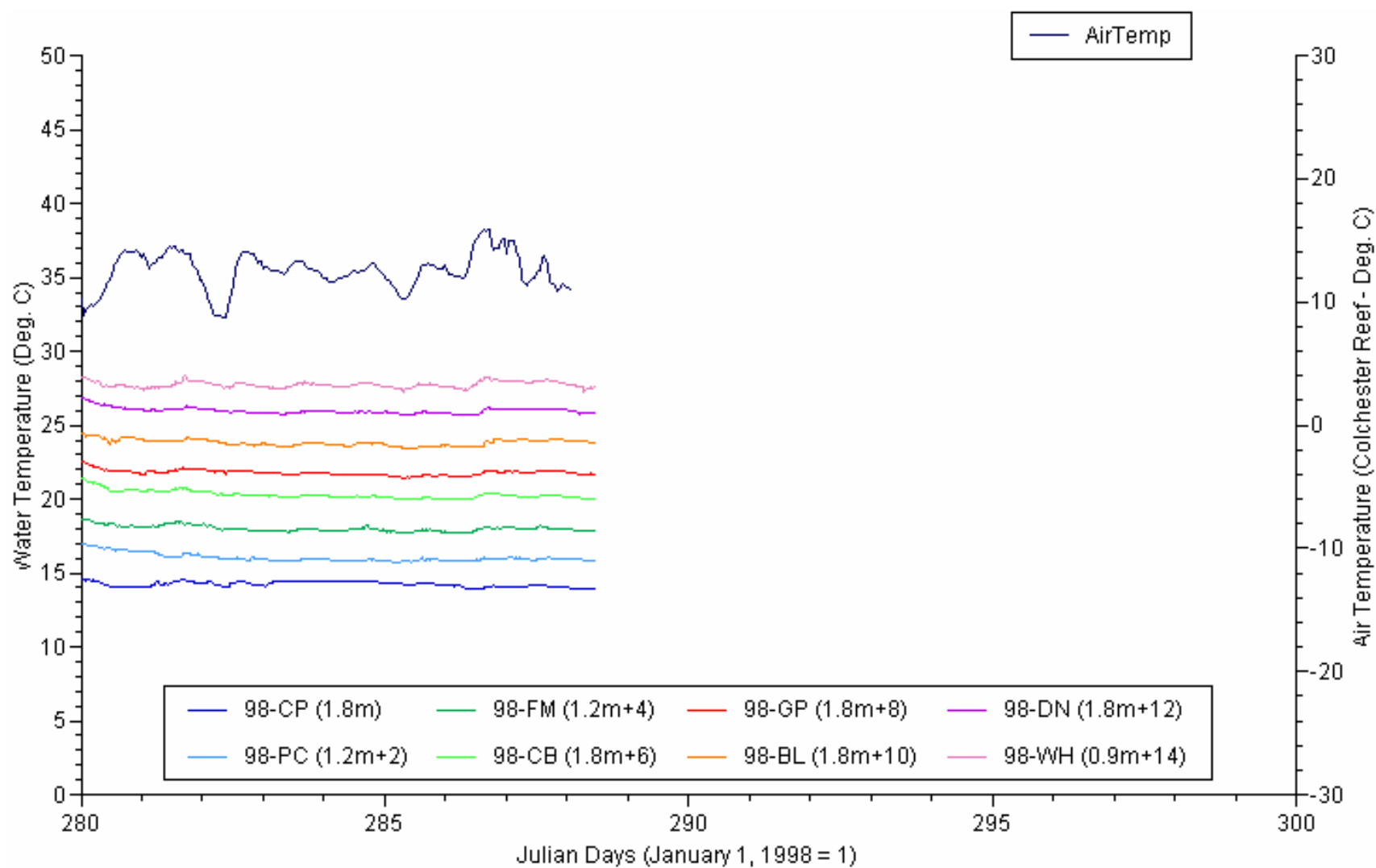
Appendix 11-98d. All 1998 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



Appendix 11-98e. All 1998 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



Appendix 11-98f. All 1998 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



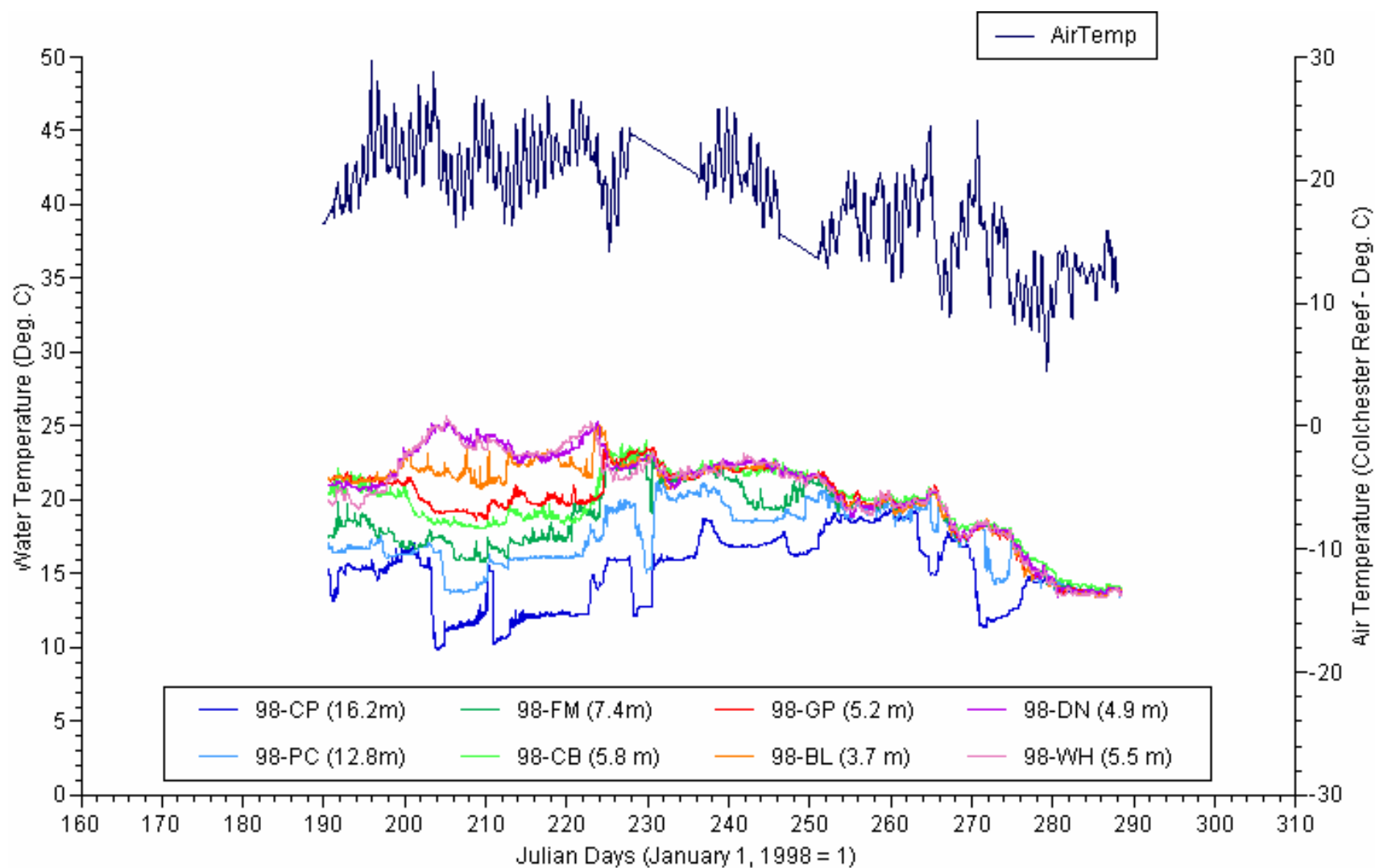
Appendix 11-98g. All 1998 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.

Appendix 12

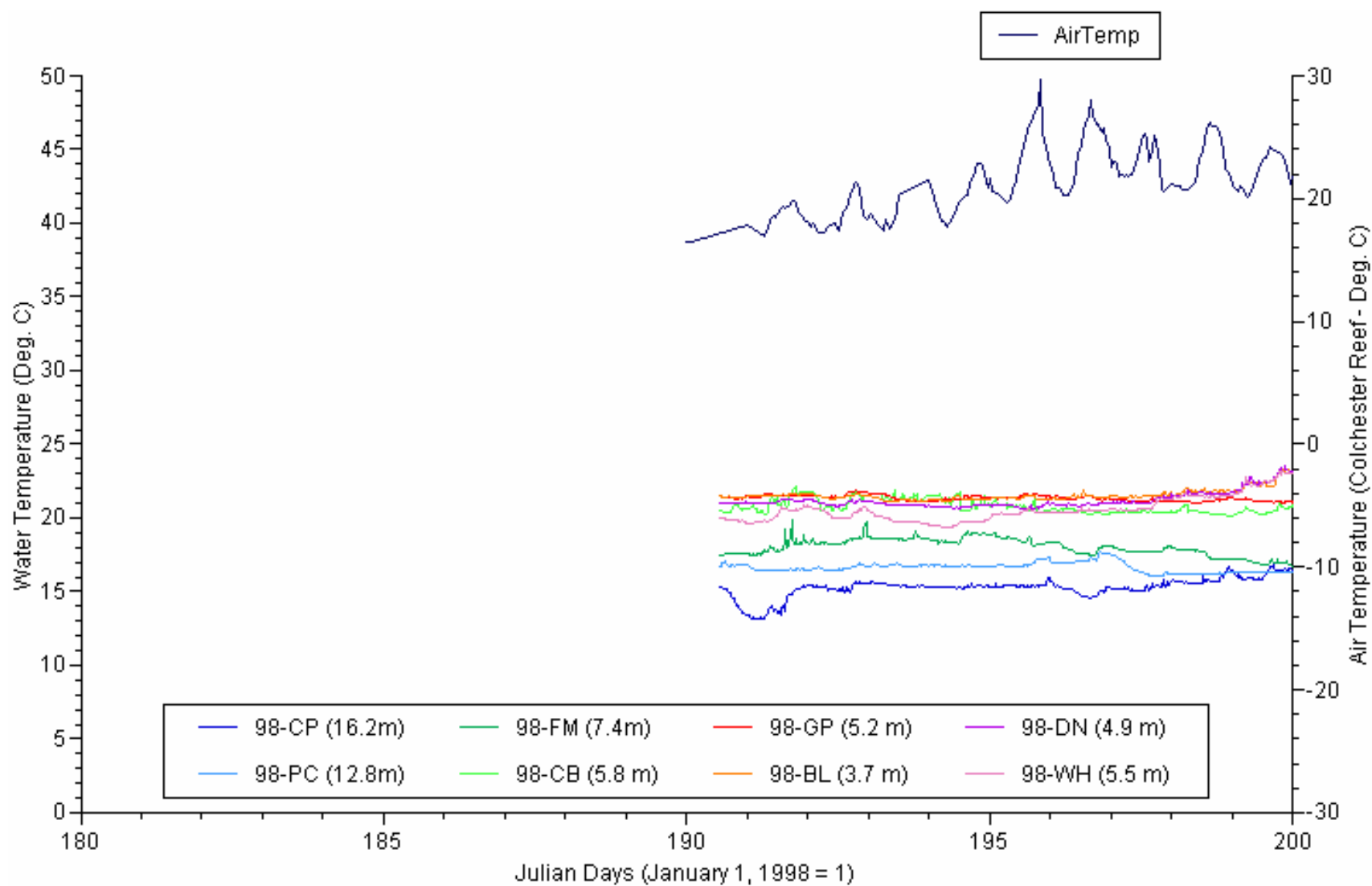
1998 - All Sites

Deep Temperature Data (Non-Offset)
&
Colchester Reef Meteorological Air Temperatures

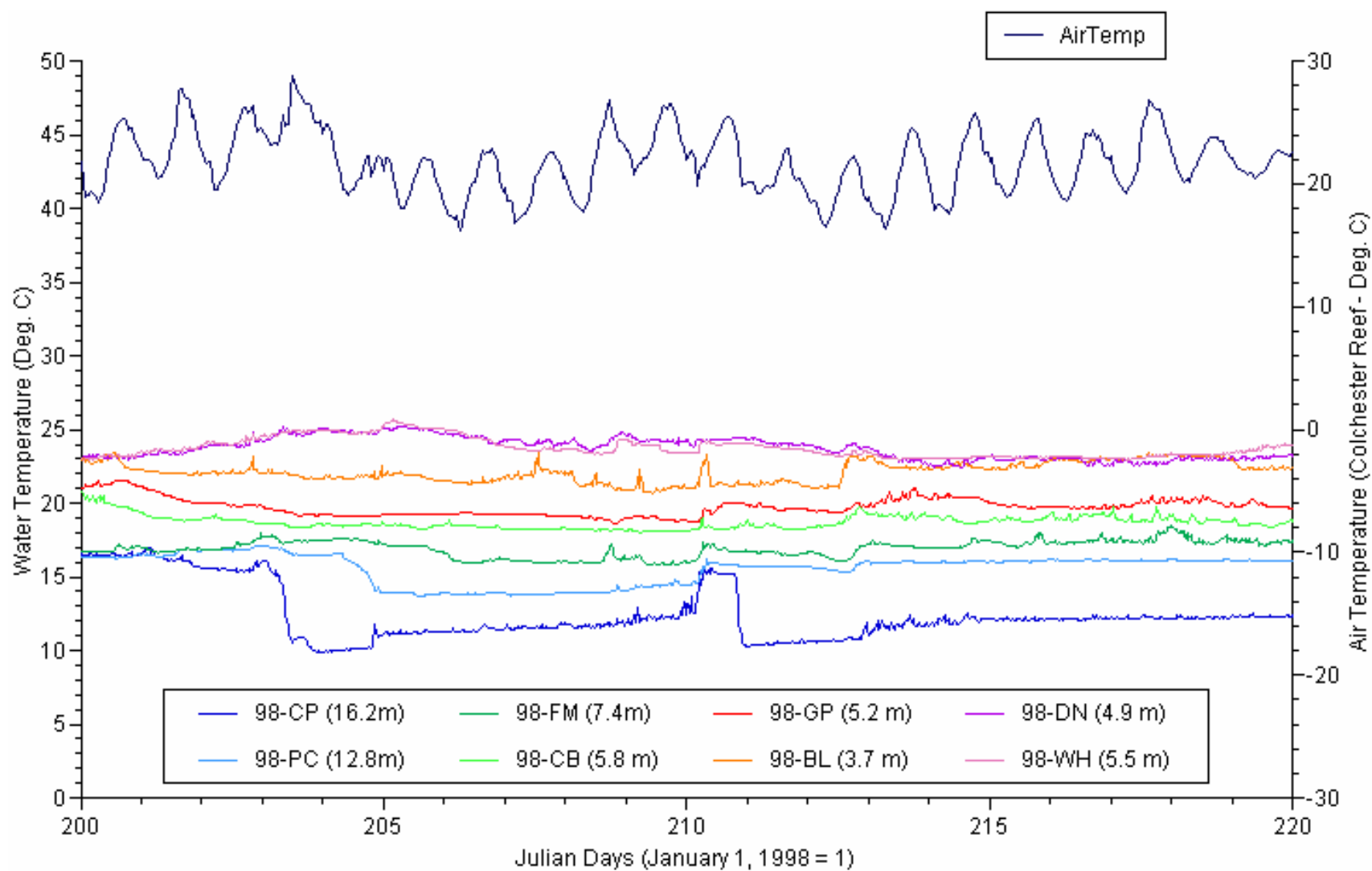
Total Duration
&
20-Day Expanded Plots



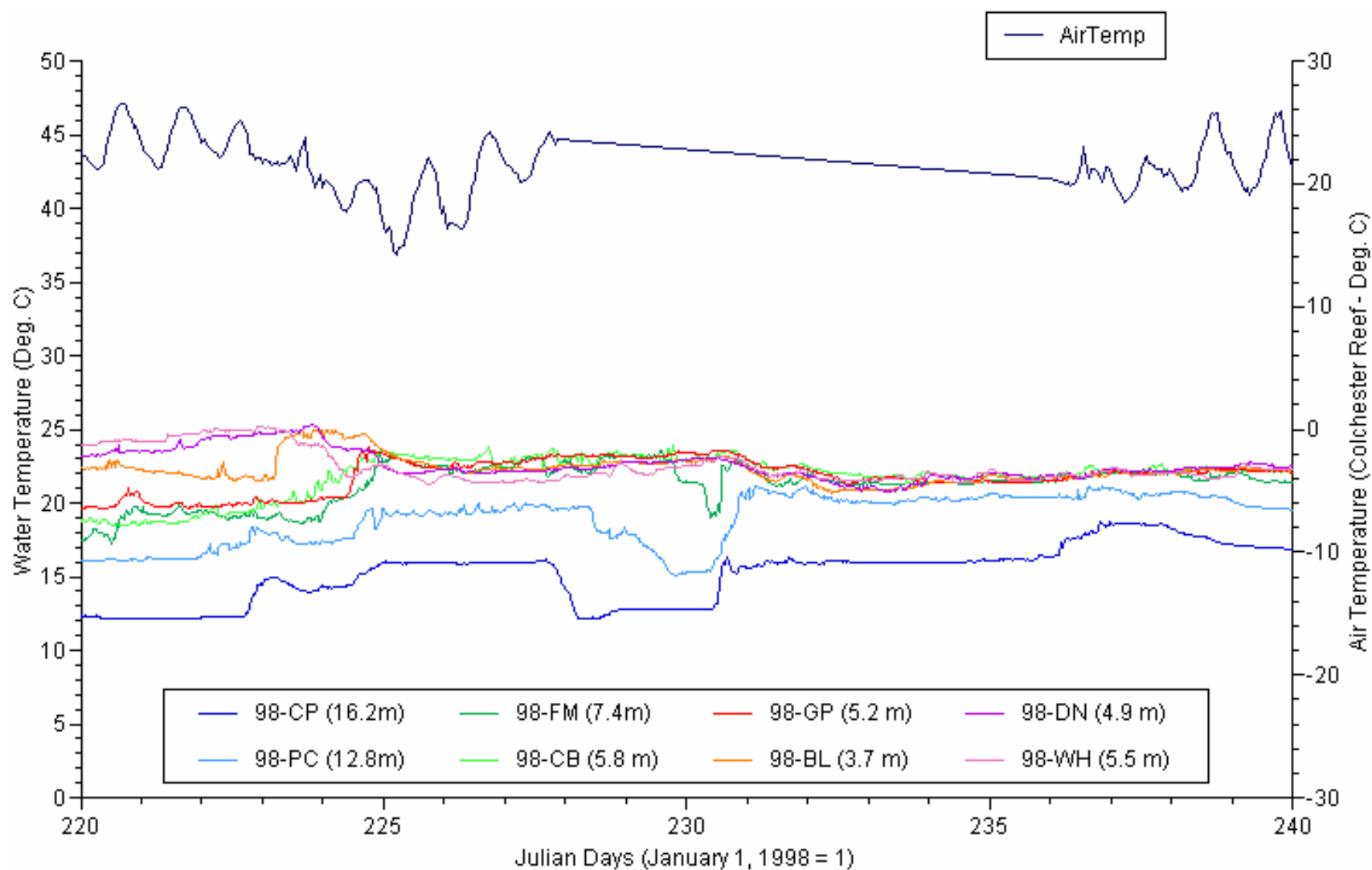
Appendix 12-98a. All 1998 surface temperature logger data along with air temperatures at Colchester Reef.



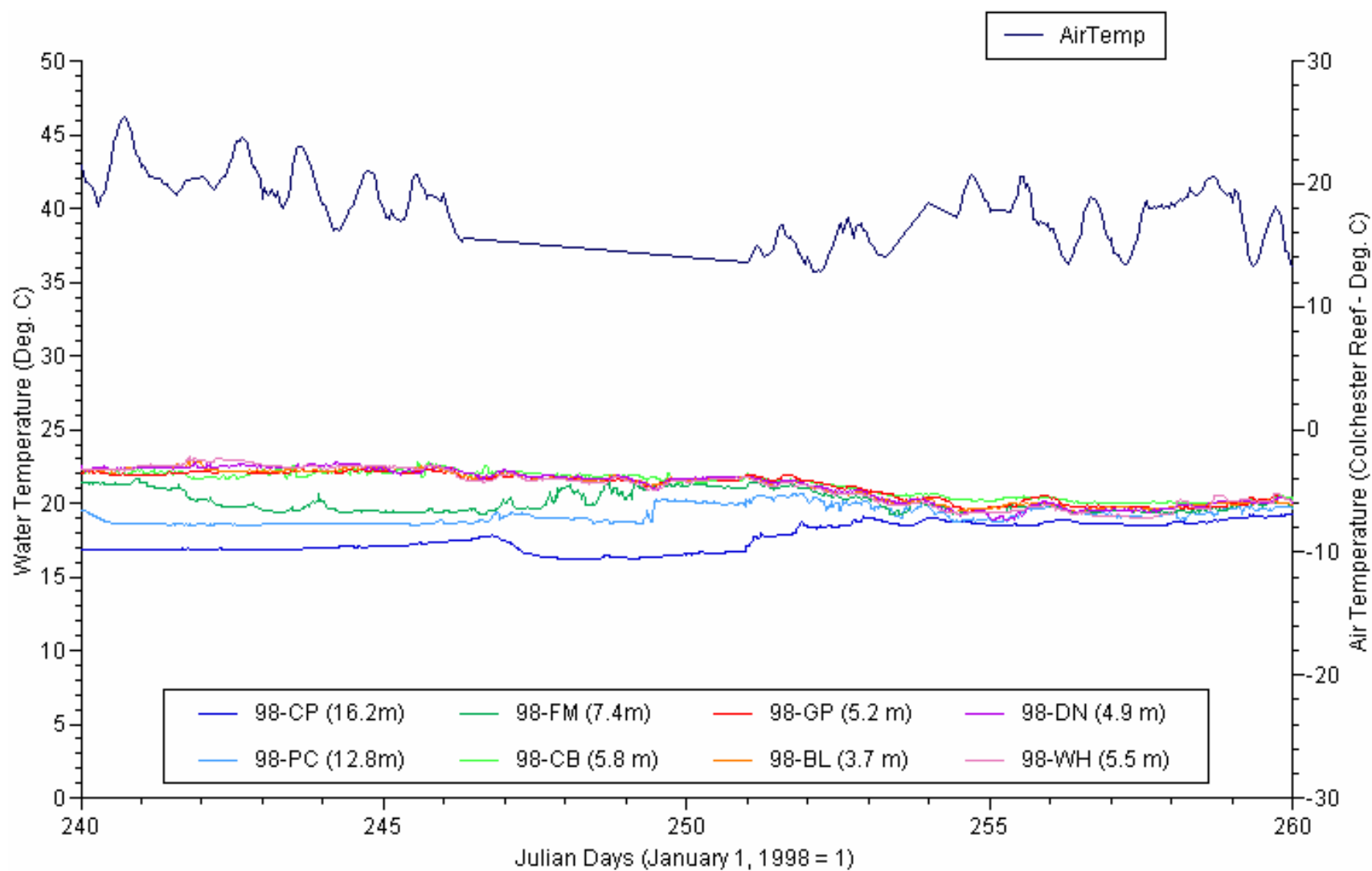
Appendix 12-98b. All 1998 surface tempertaure logger data along with air temperatures at Colchester Reef.



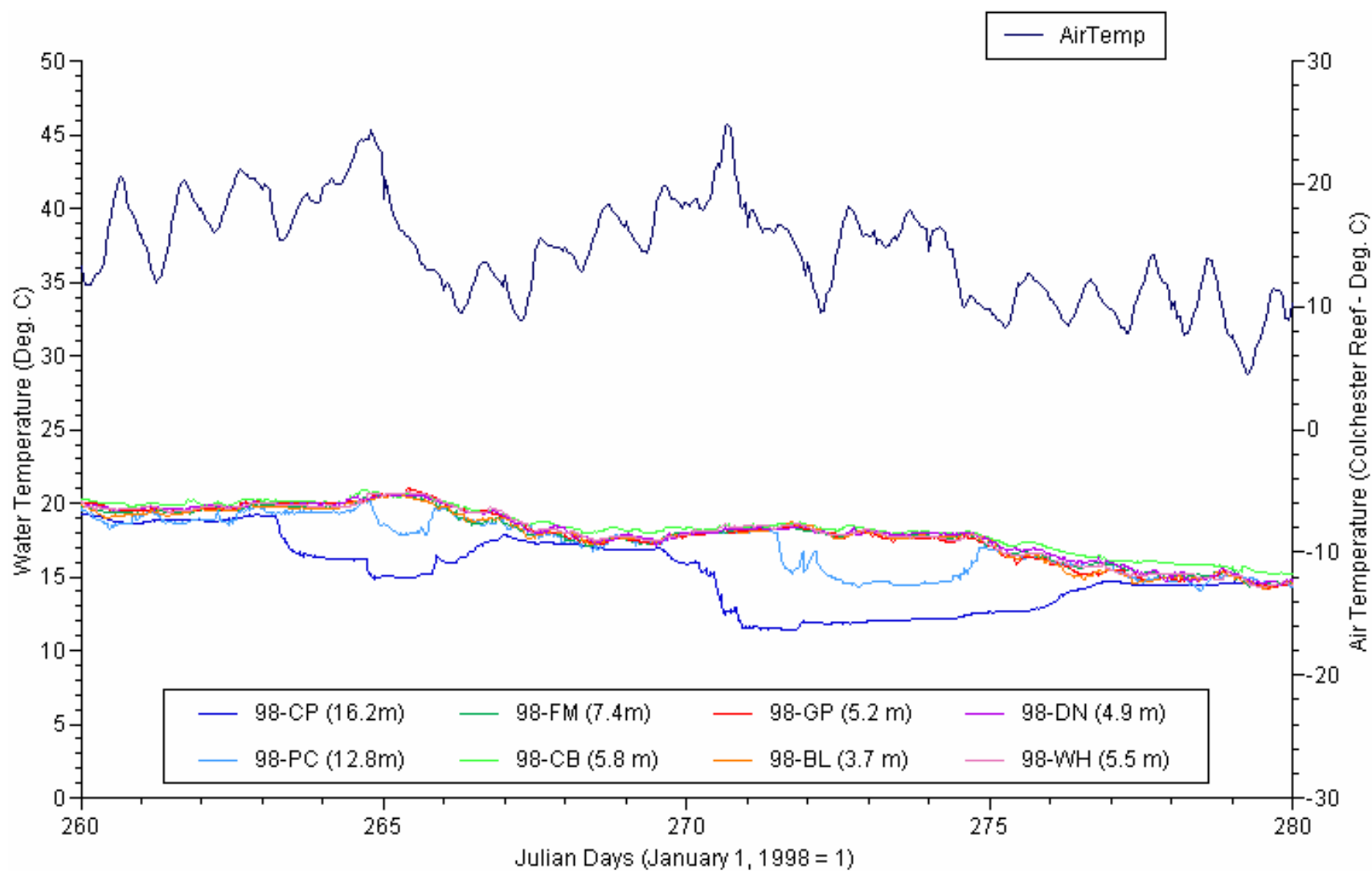
Appendix 12-98c. All 1998 surface tempertaure logger data along with air temperatures at Colchester Reef.



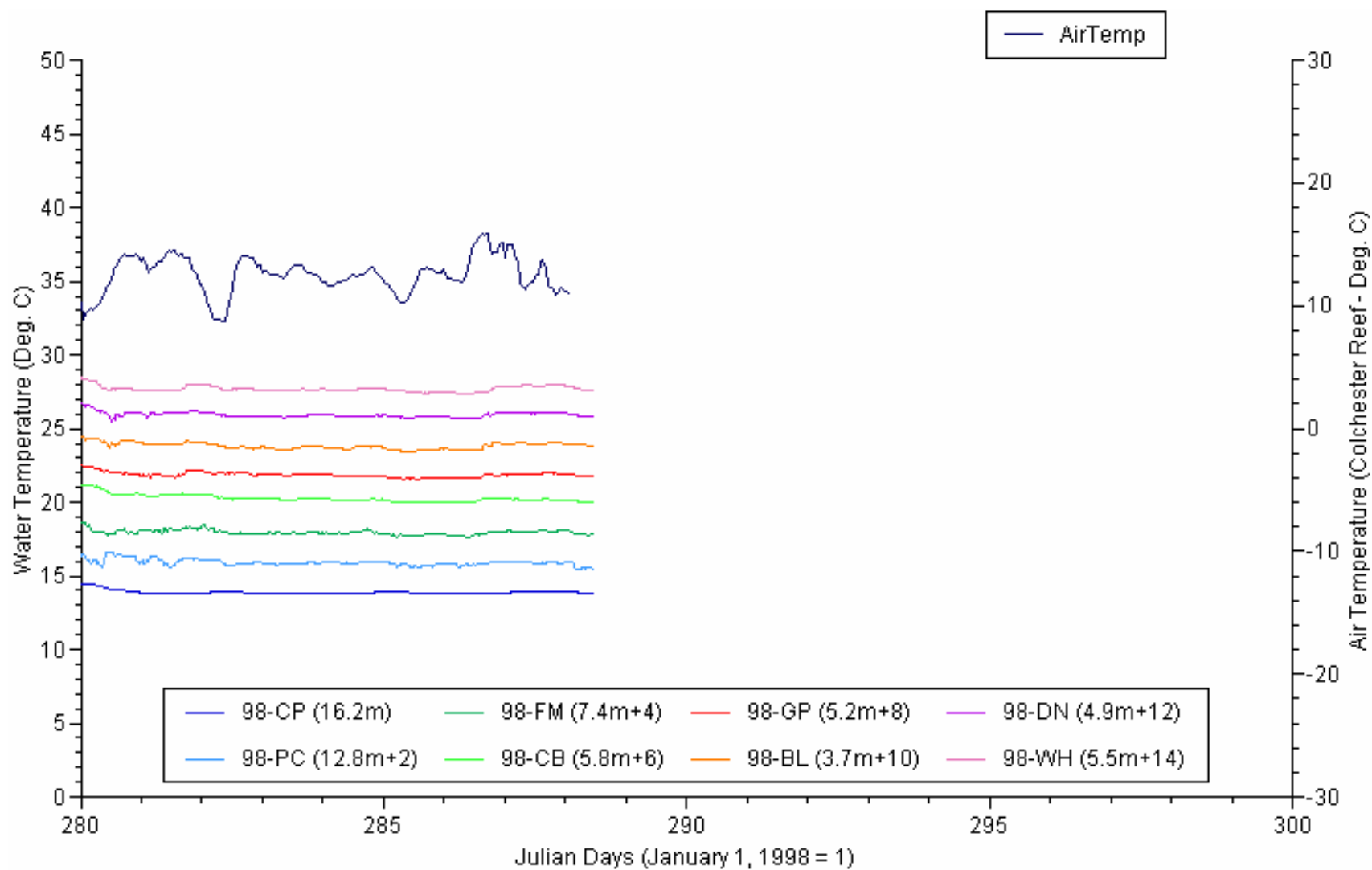
Appendix 12-98d. All 1998 surface tempertaure logger data along with air temperatures at Colchester Reef.



Appendix 12-98e. All 1998 surface tempertaure logger data along with air temperatures at Colchester Reef.



Appendix 12-98f. All 1998 surface tempertaure logger data along with air temperatures at Colchester Reef.



Appendix 12-98g. All 1998 surface tempertaure logger data along with air temperatures at Colchester Reef.

Appendix 13

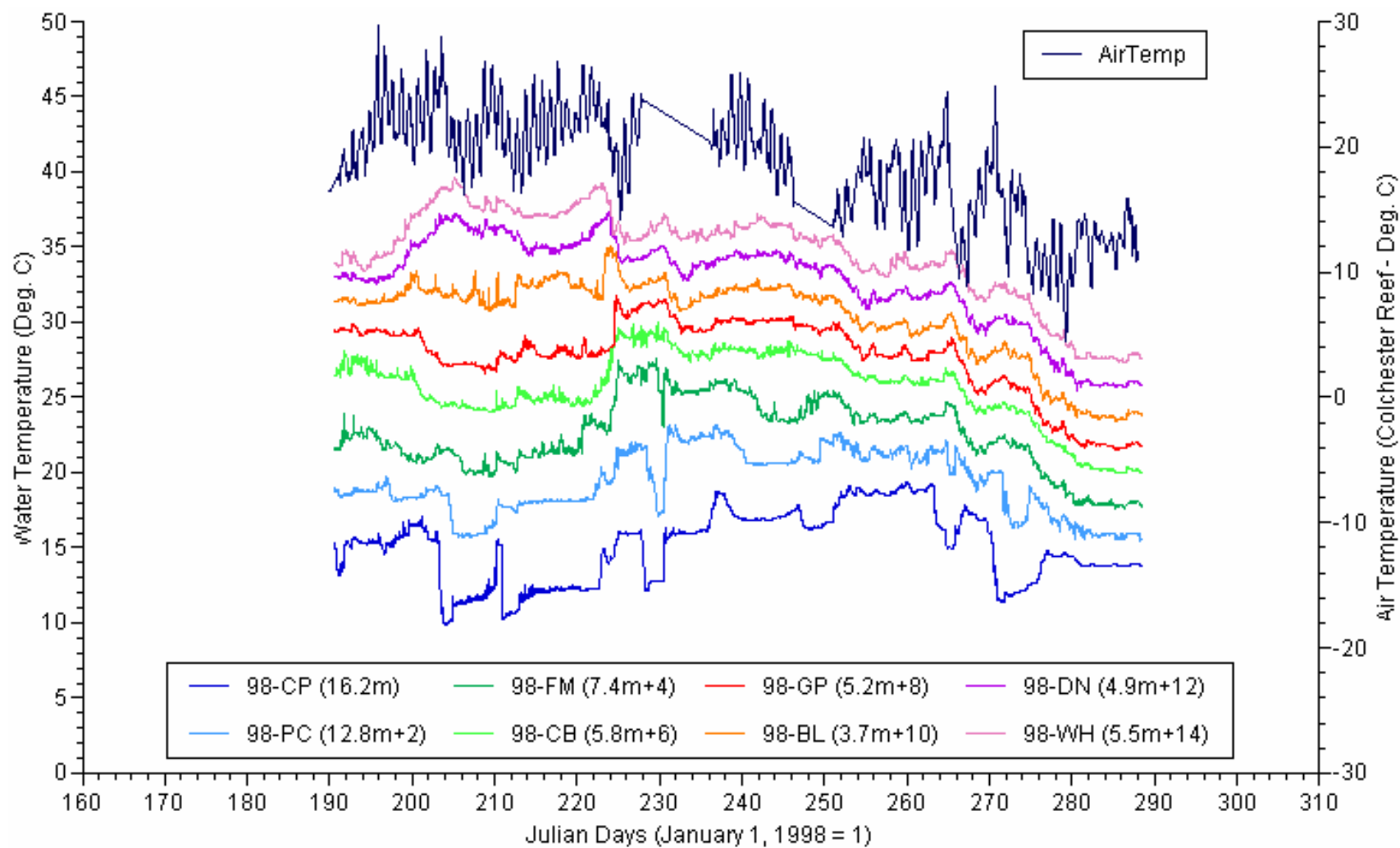
1998 - All Sites

Deep Temperature Data (2 °C Offset)
&
Colchester Reef Meteorological Air Temperatures

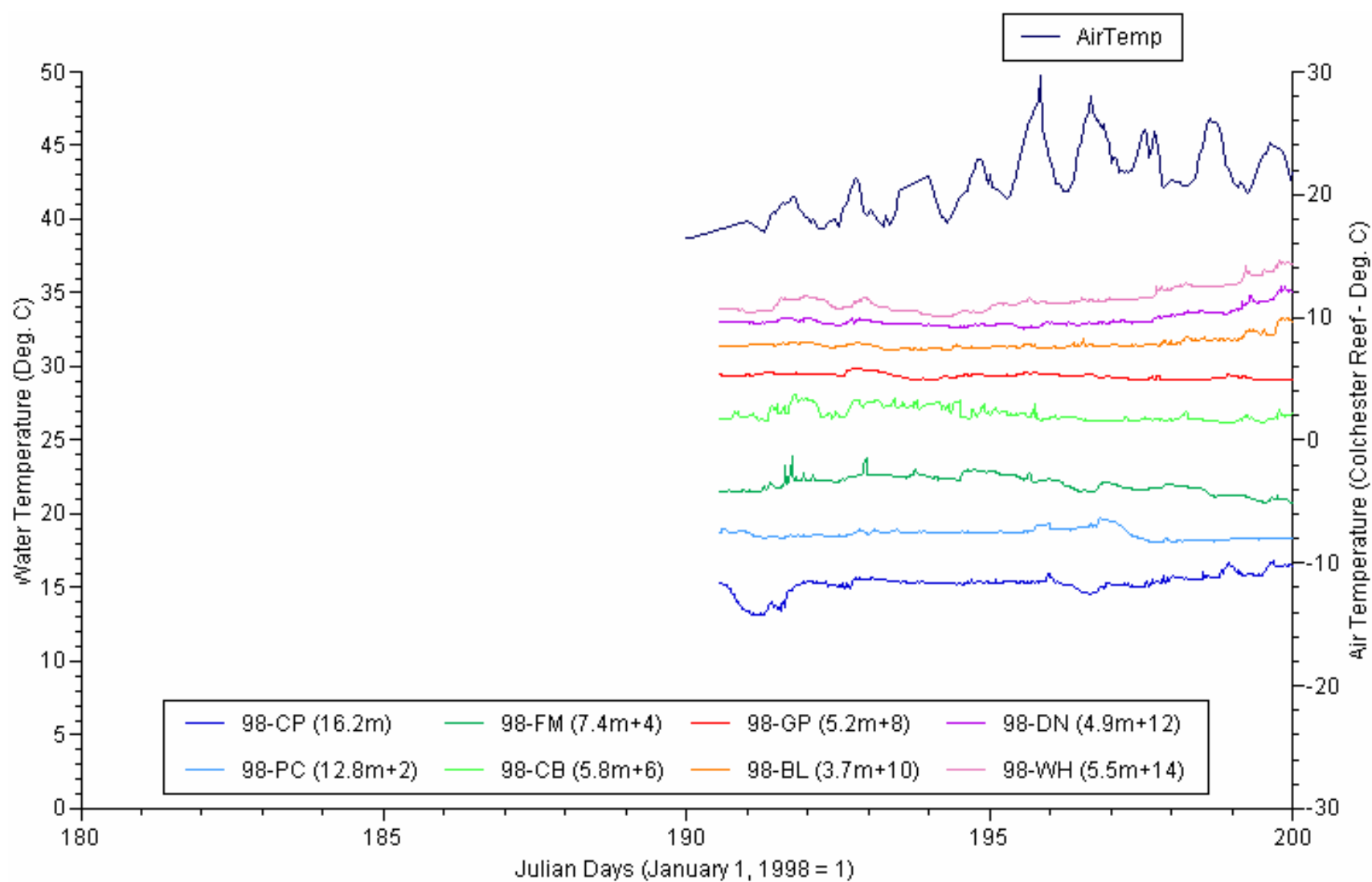
Total Duration
&
20-Day Expanded Plots

Note: Temperature offsets were applied to all sites except Crown Point in order to separate the data. The following temperature offsets were added to the sites on all subsequent plots:

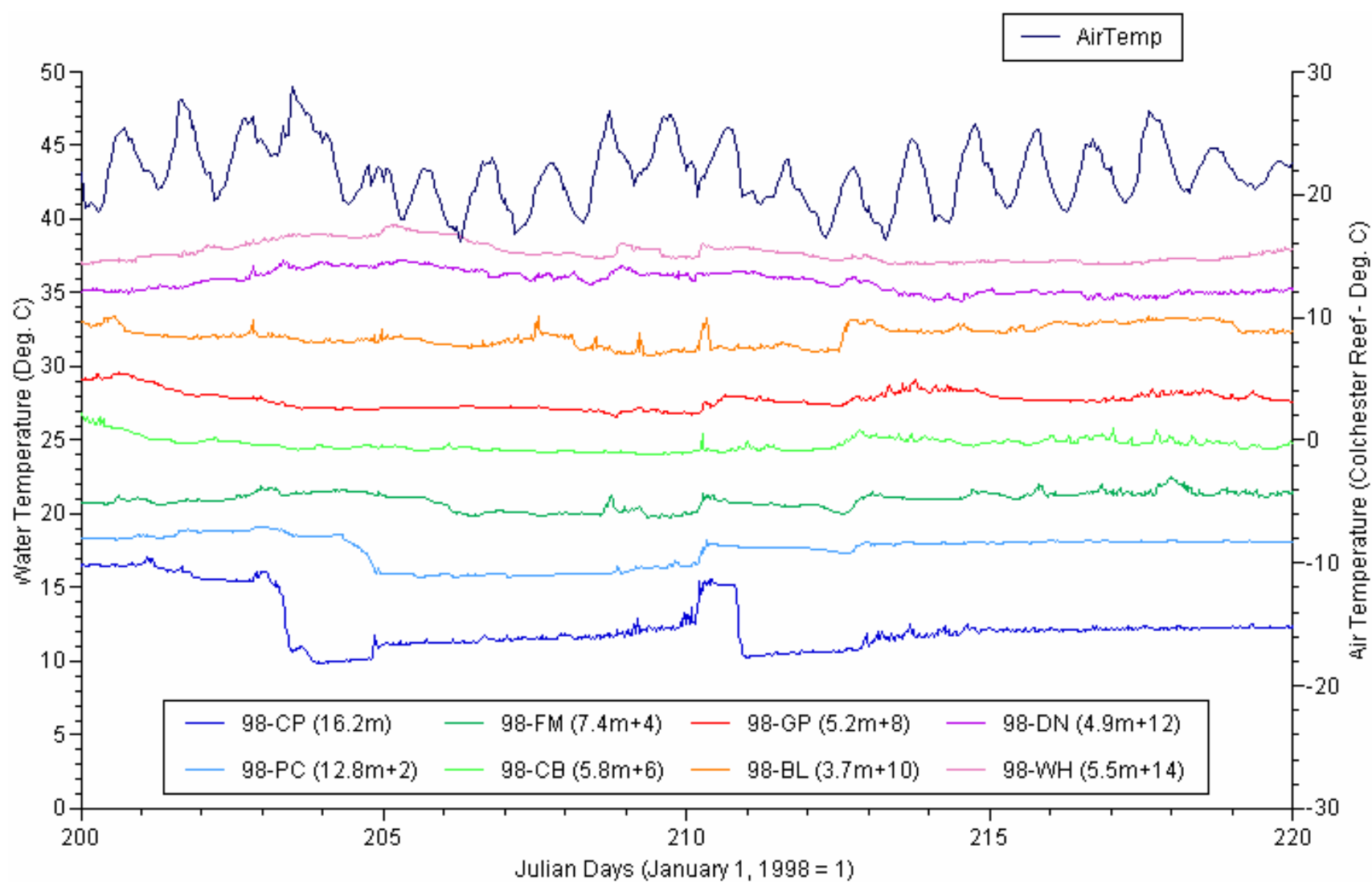
Putnam Creek (PC)	----->	+2 °C
File Mile Point (FM)	----->	+4 °C
Catfish Bay (CB)	----->	+6 °C
Gourlie Point (GP)	----->	+8 °C
Benson Landing (BL)	----->	+10 °C
Dresden Narrows (DN)	-->	+12 °C
Whitehall (WH)	----->	+14 °C



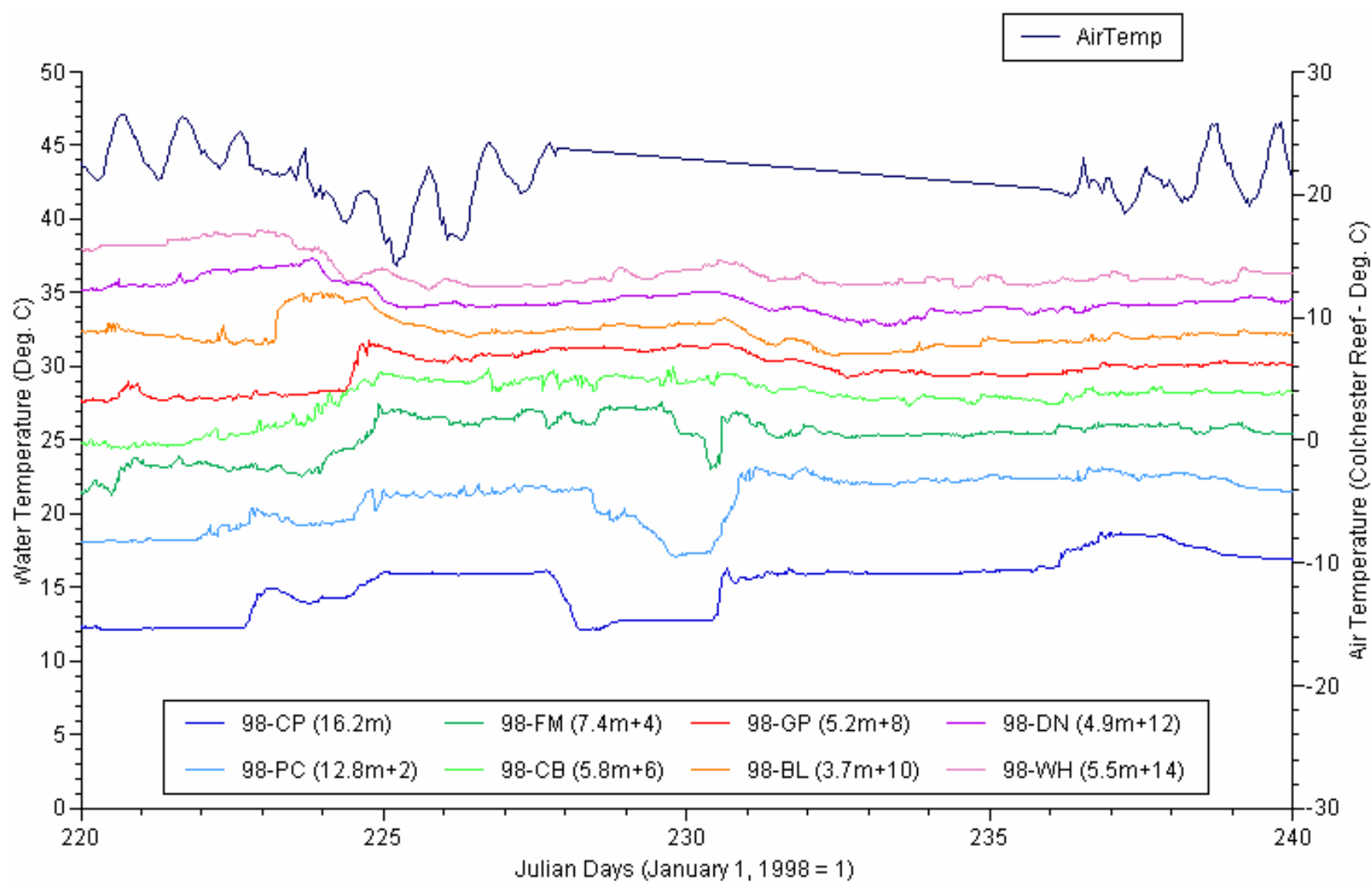
Appendix 13-98a. All 1998 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



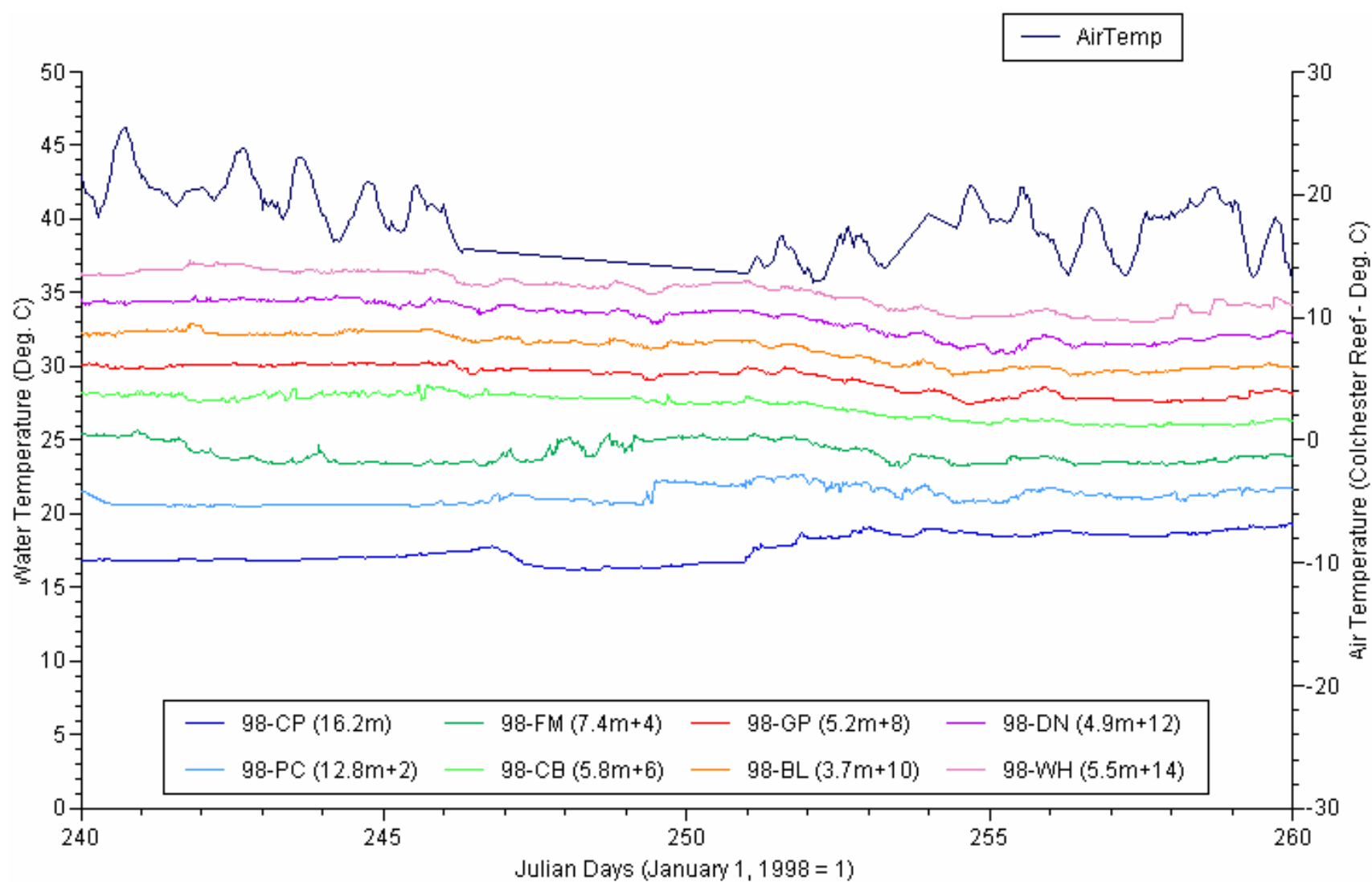
Appendix 13-98b. All 1998 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



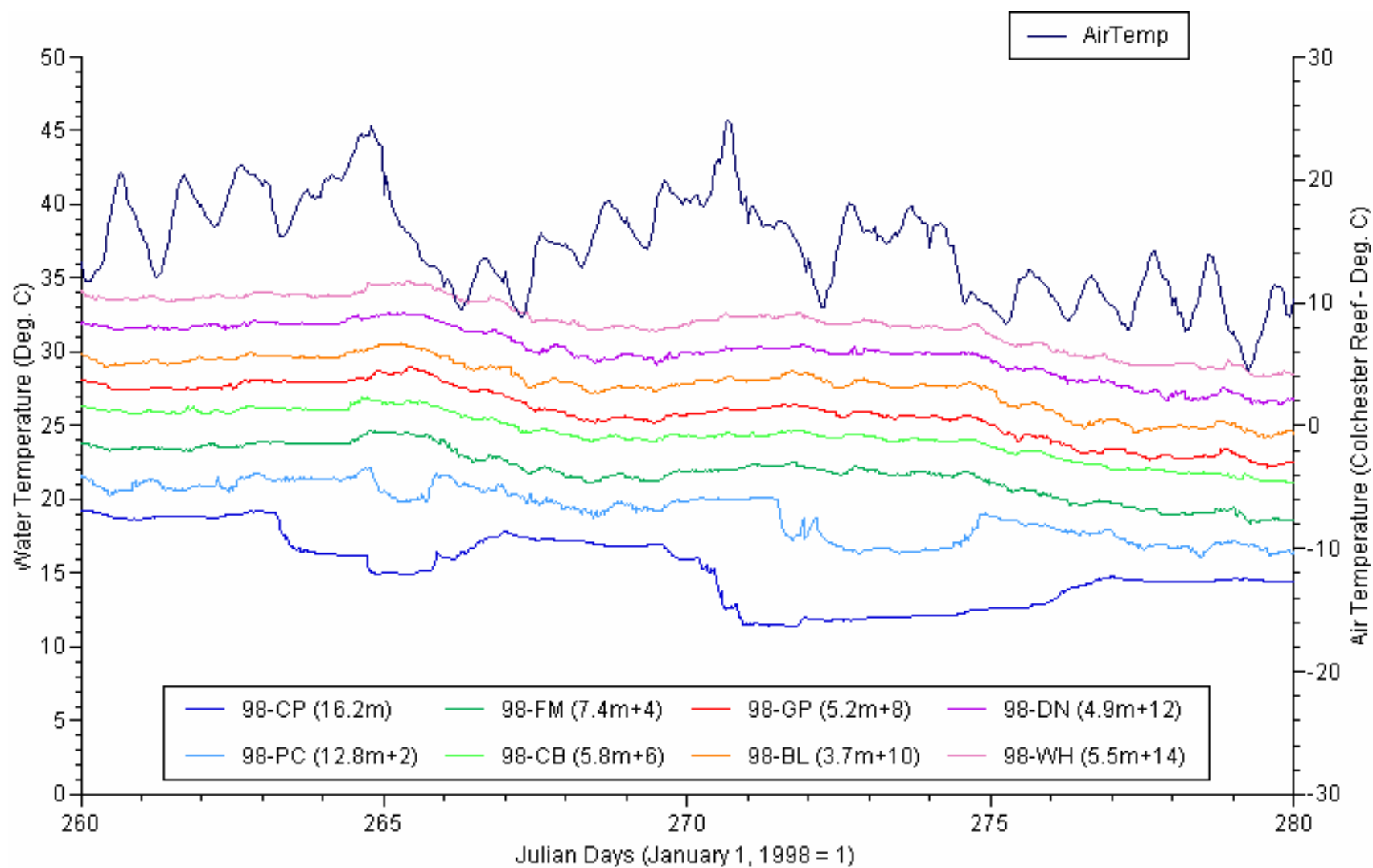
Appendix 13-98c. All 1998 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



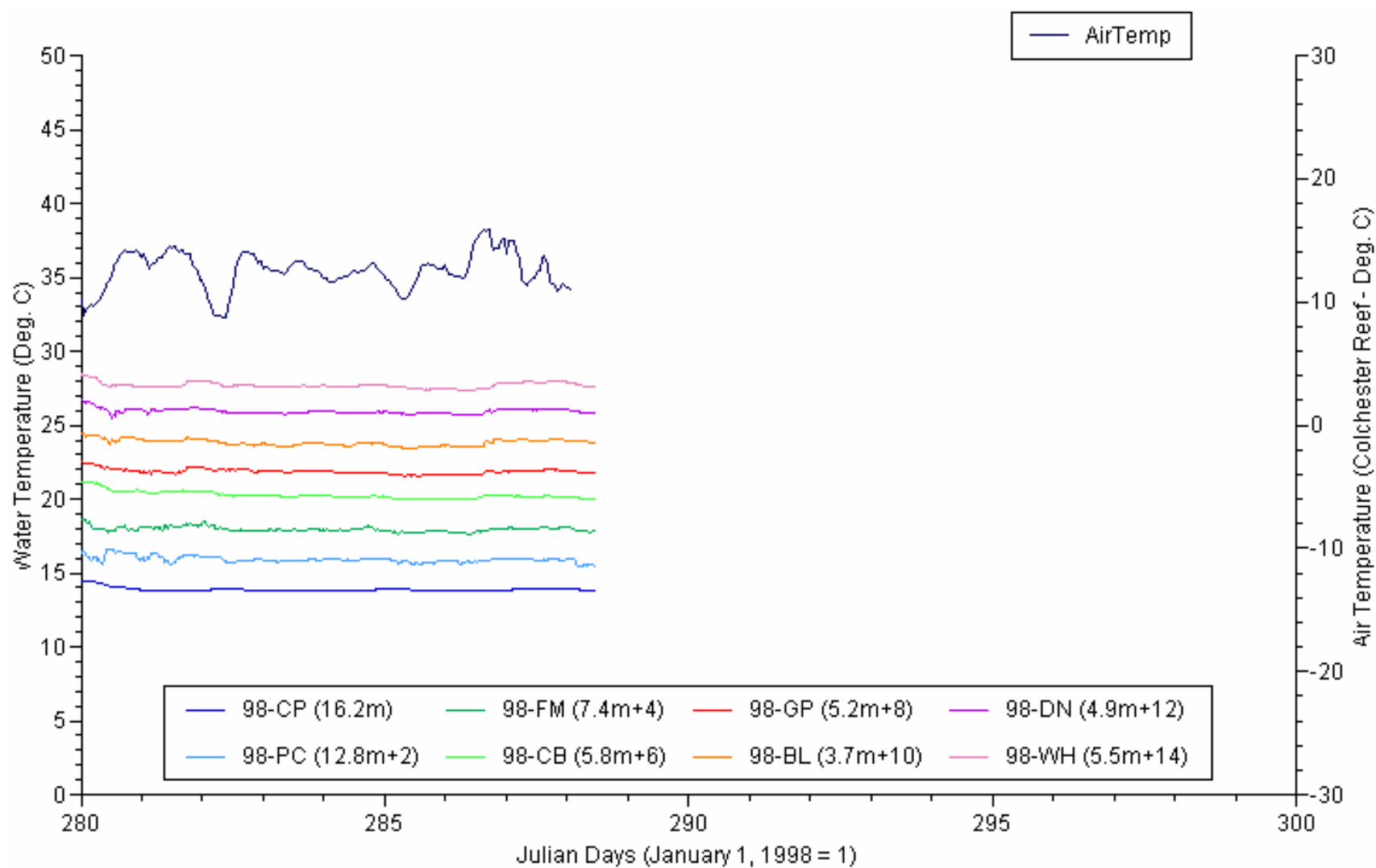
Appendix 13-98d. All 1998 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



Appendix 13-98e. All 1998 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



Appendix 13-98f. All 1998 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.



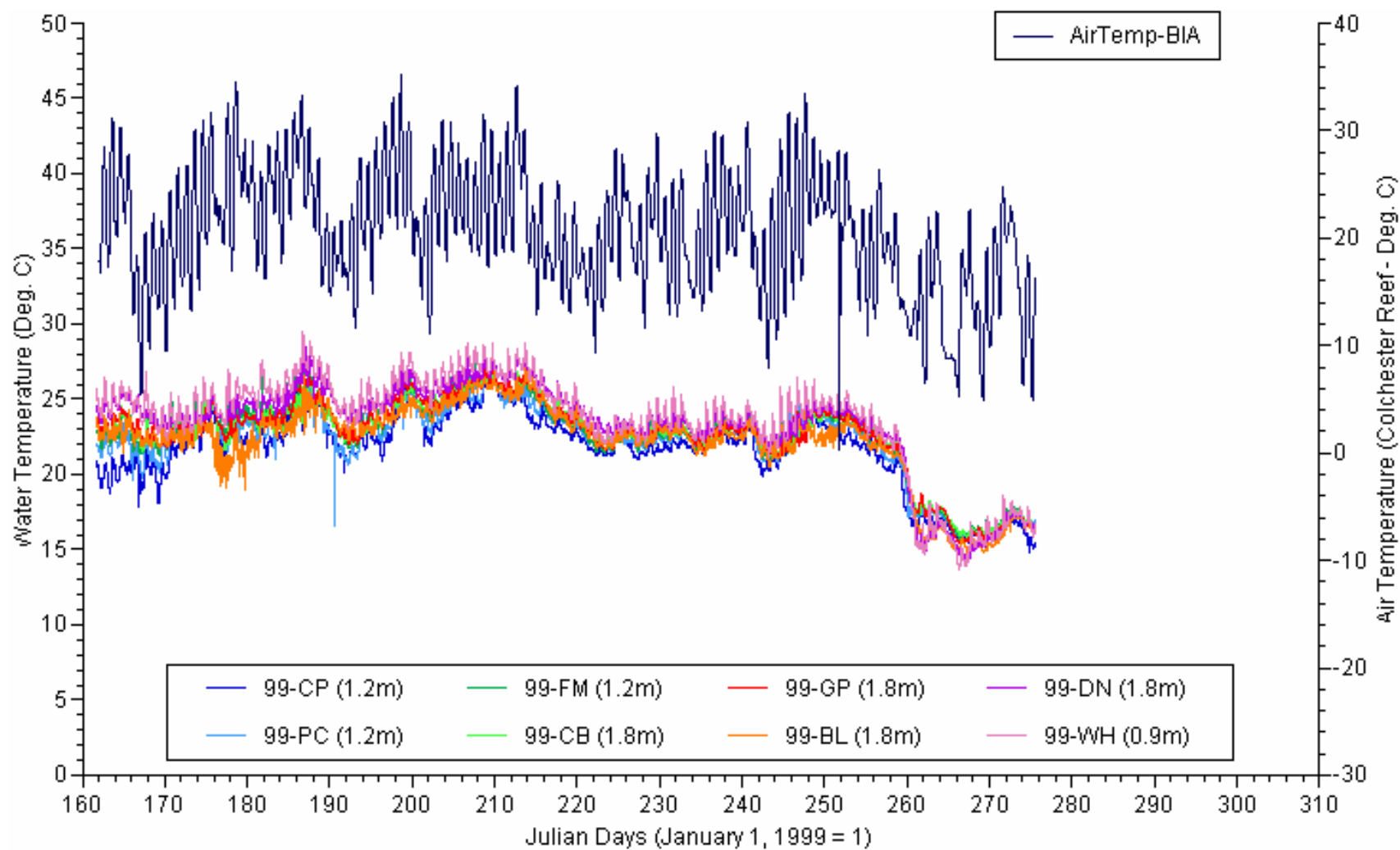
Appendix 13-98g. All 1998 surface tempertaure logger data (offset plotted) along with air temperatures at Colchester Reef.

Appendix 14

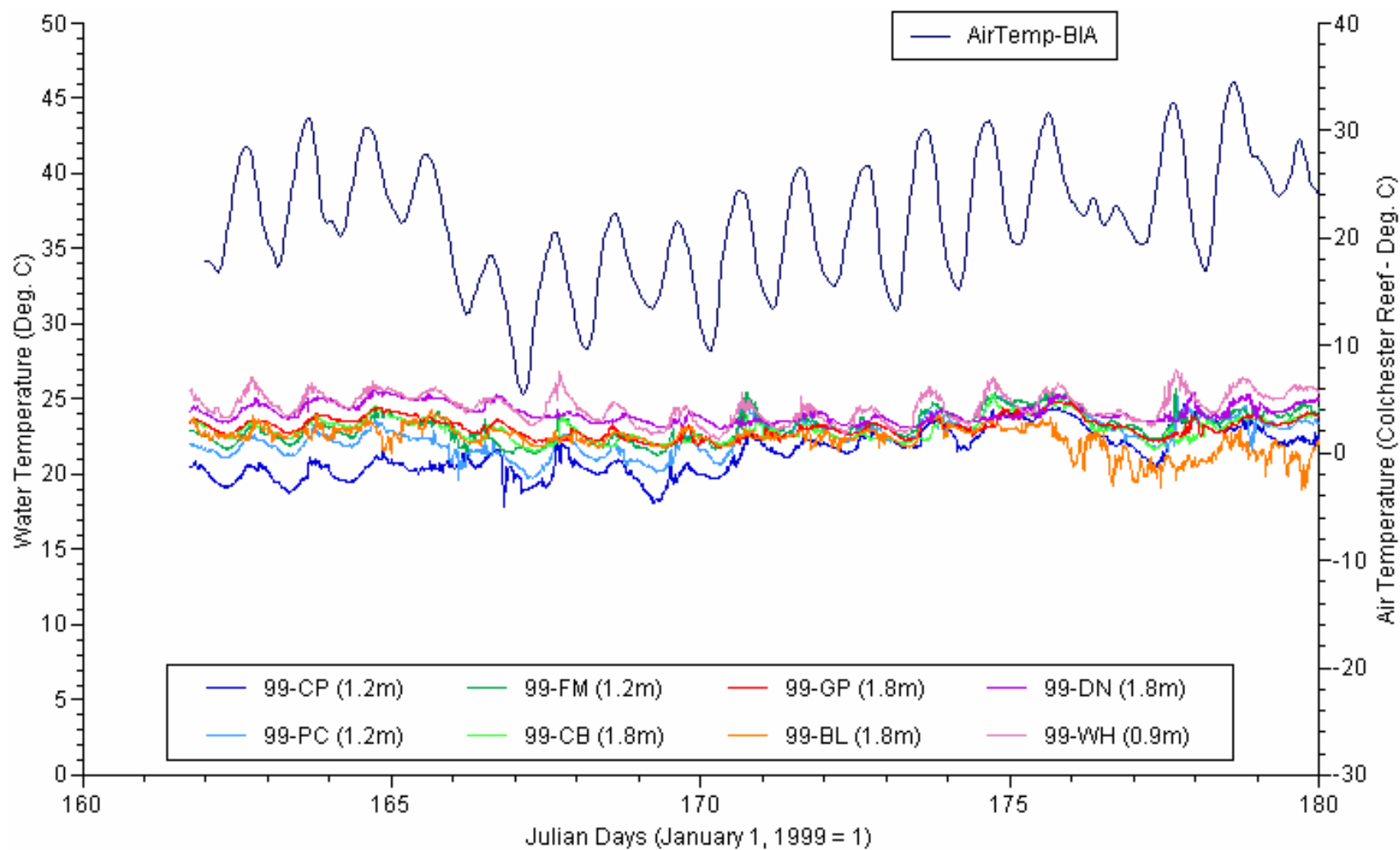
1999 - All Sites

Shallow Temperature Data (Non-Offset)
&
Colchester Reef Meteorological Air Temperatures

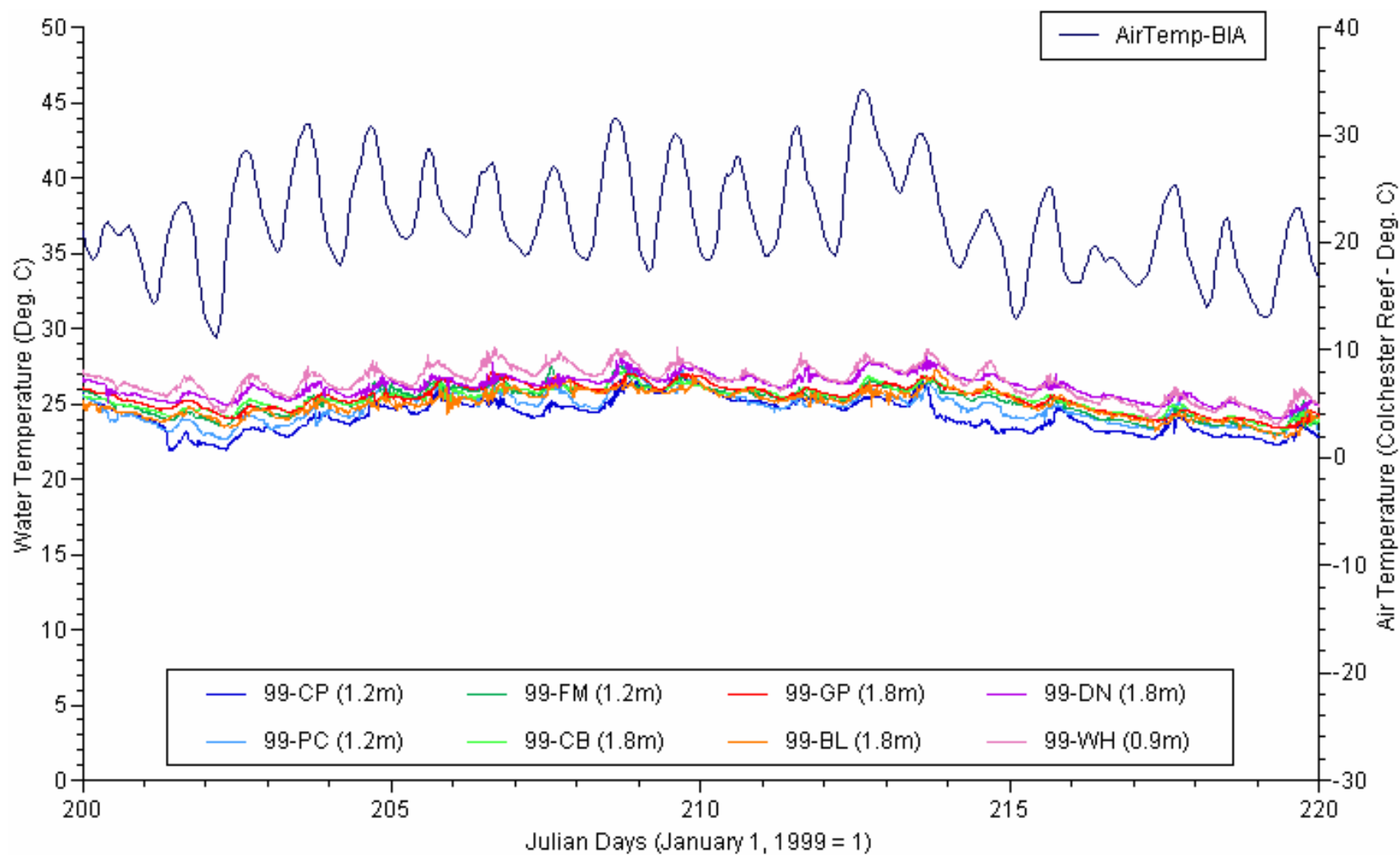
Total Duration
&
20-Day Expanded Plots



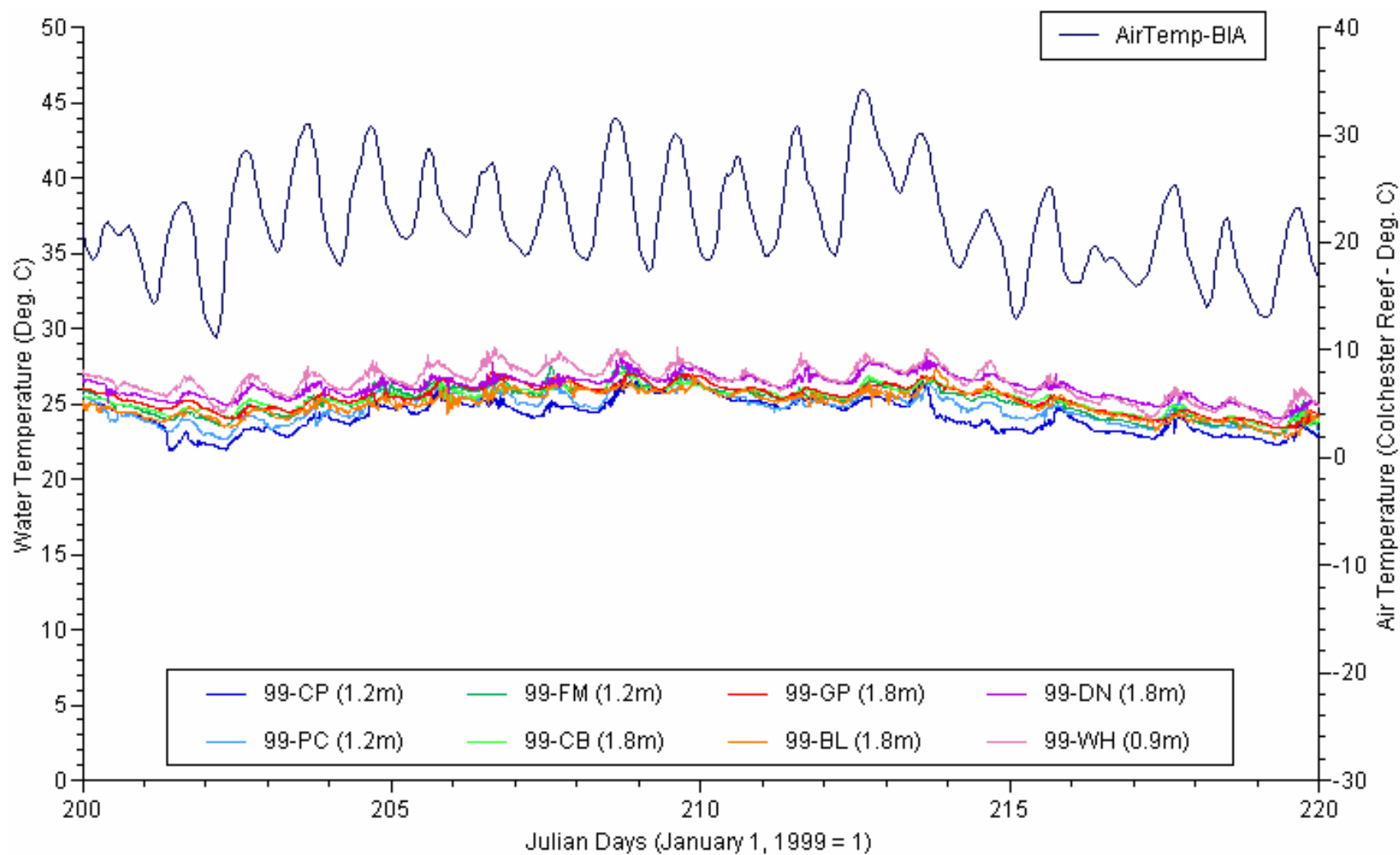
Appendix 14-99a. All 1999 surface tempertaure logger data along with air temperatures at Burlington International Airport.



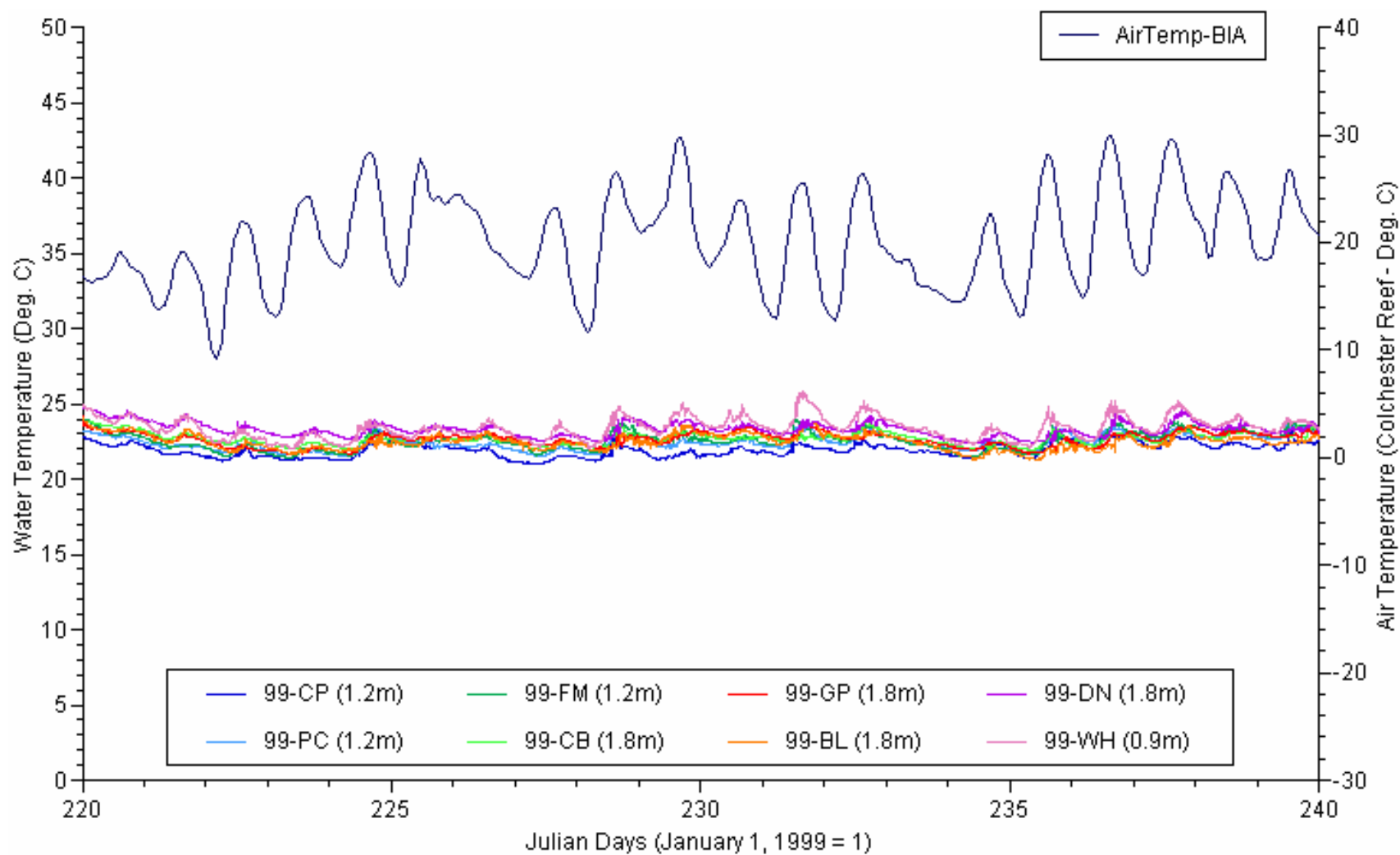
Appendix 14-99b. All 1999 surface tempertaure logger data along with air temperatures at Burlington International Airport.



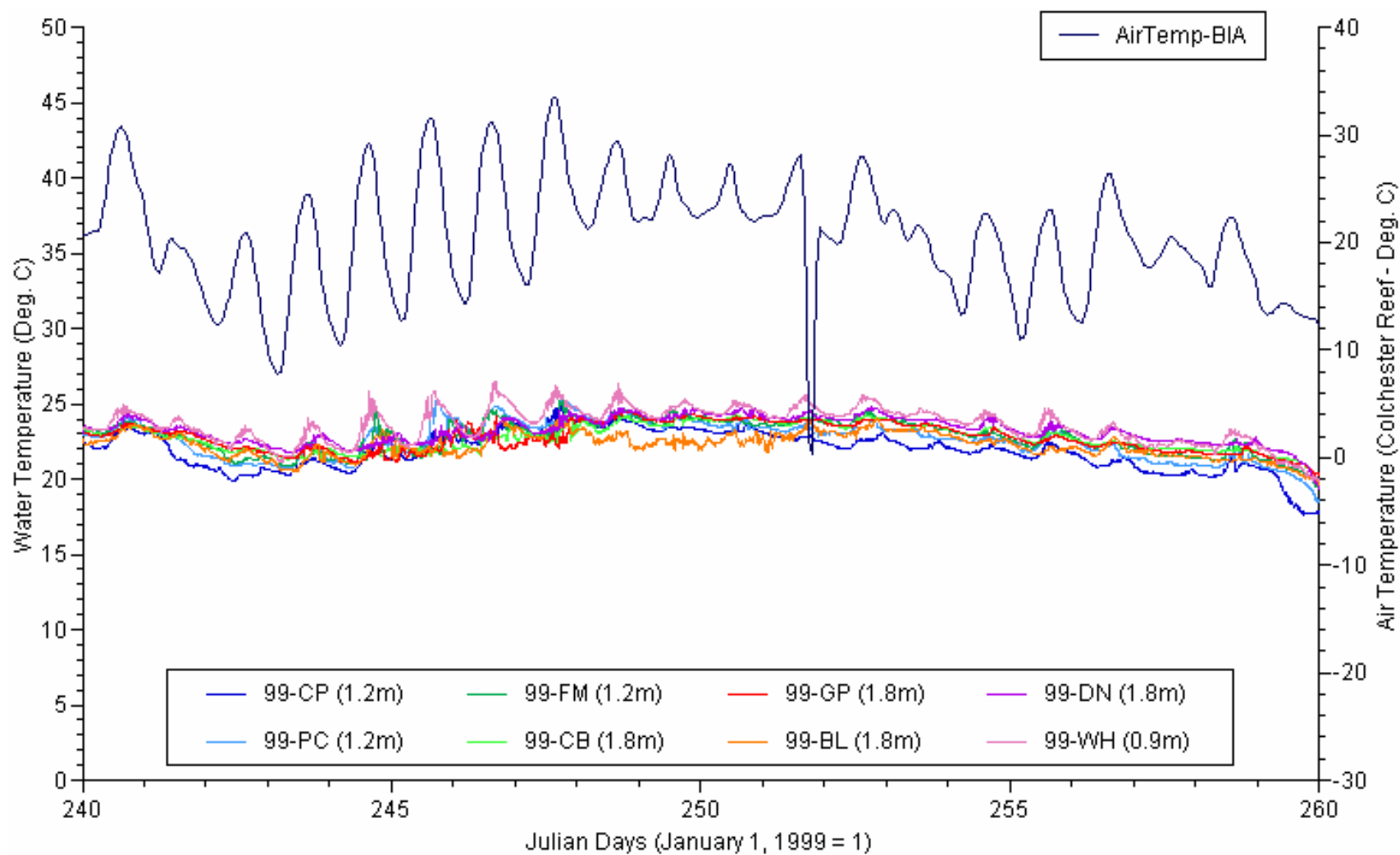
Appendix 14-99c. All 1999 surface tempertaure logger data along with air temperatures at Burlington International Airport.



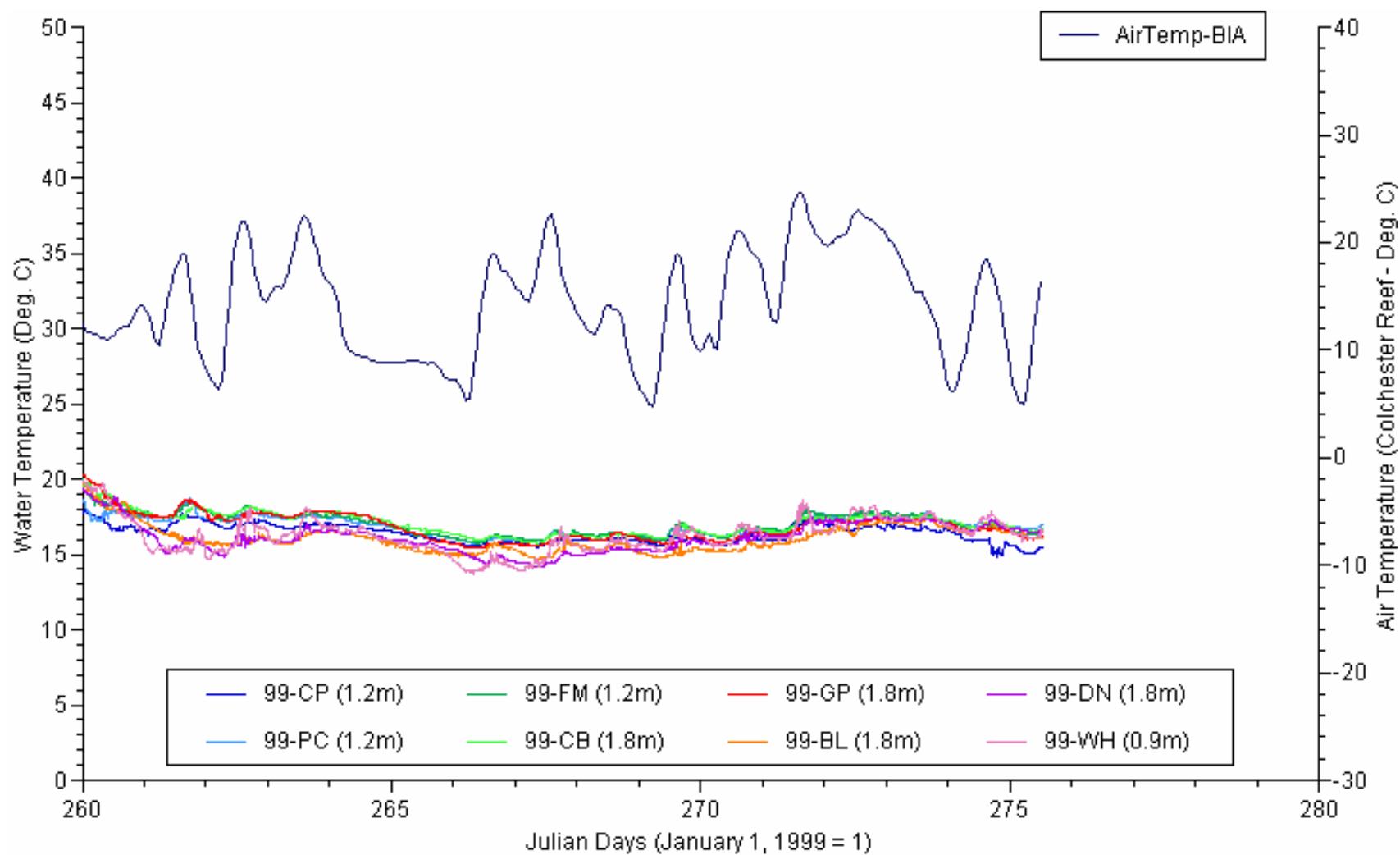
Appendix 14-99d. All 1999 surface tempertaure logger data along with air temperatures at Burlington International Airport.



Appendix 14-99e. All 1999 surface tempertaure logger data along with air temperatures at Burlington International Airport.



Appendix 14-99f. All 1999 surface tempertaure logger data along with air temperatures at Burlington International Airport.



Appendix 14-99g. All 1999 surface tempertaure logger data along with air temperatures at Burlington International Airport.

Appendix 15

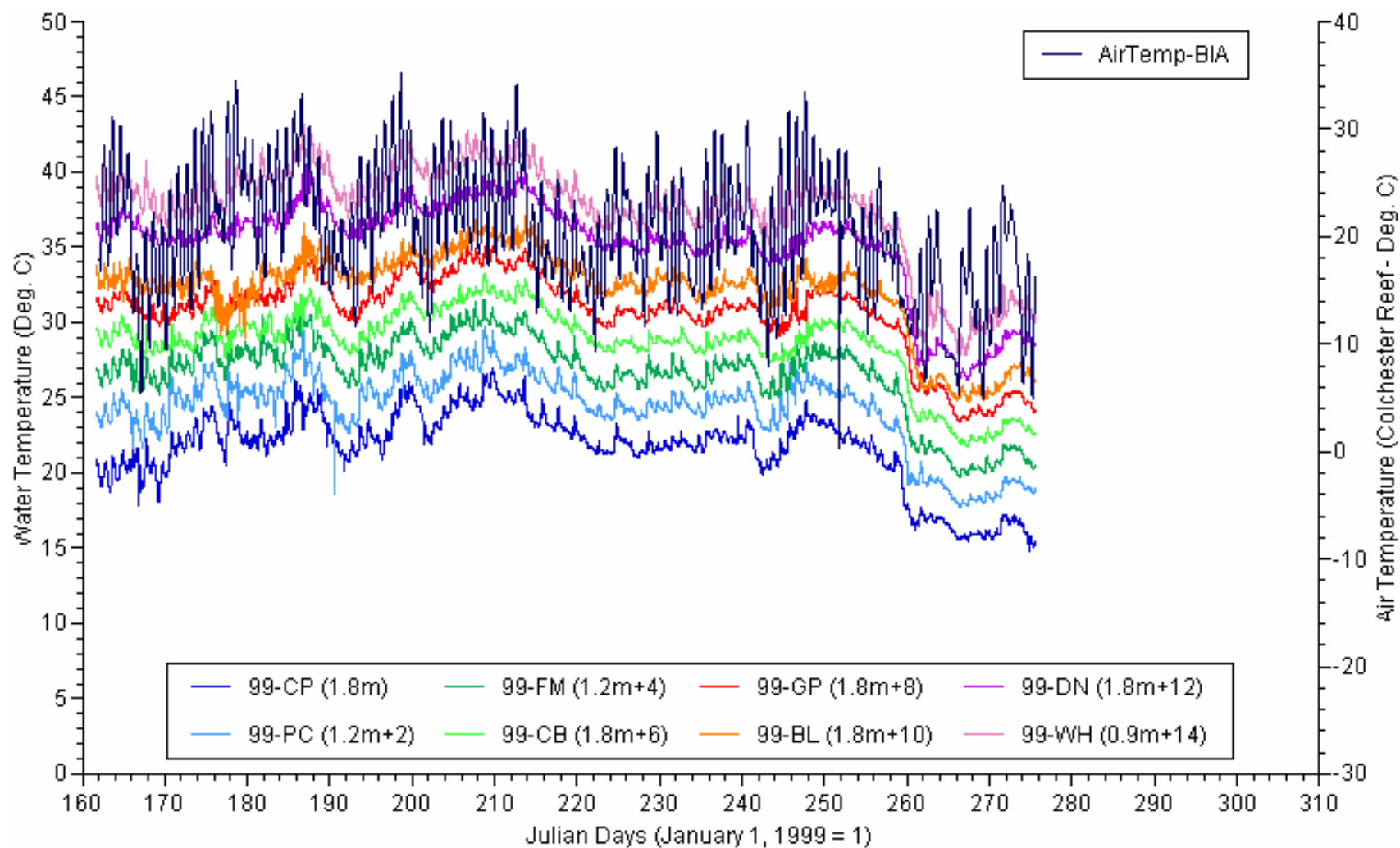
1999 - All Sites

Shallow Temperature Data (2 °C Offset) & Colchester Reef Meteorological Air Temperatures

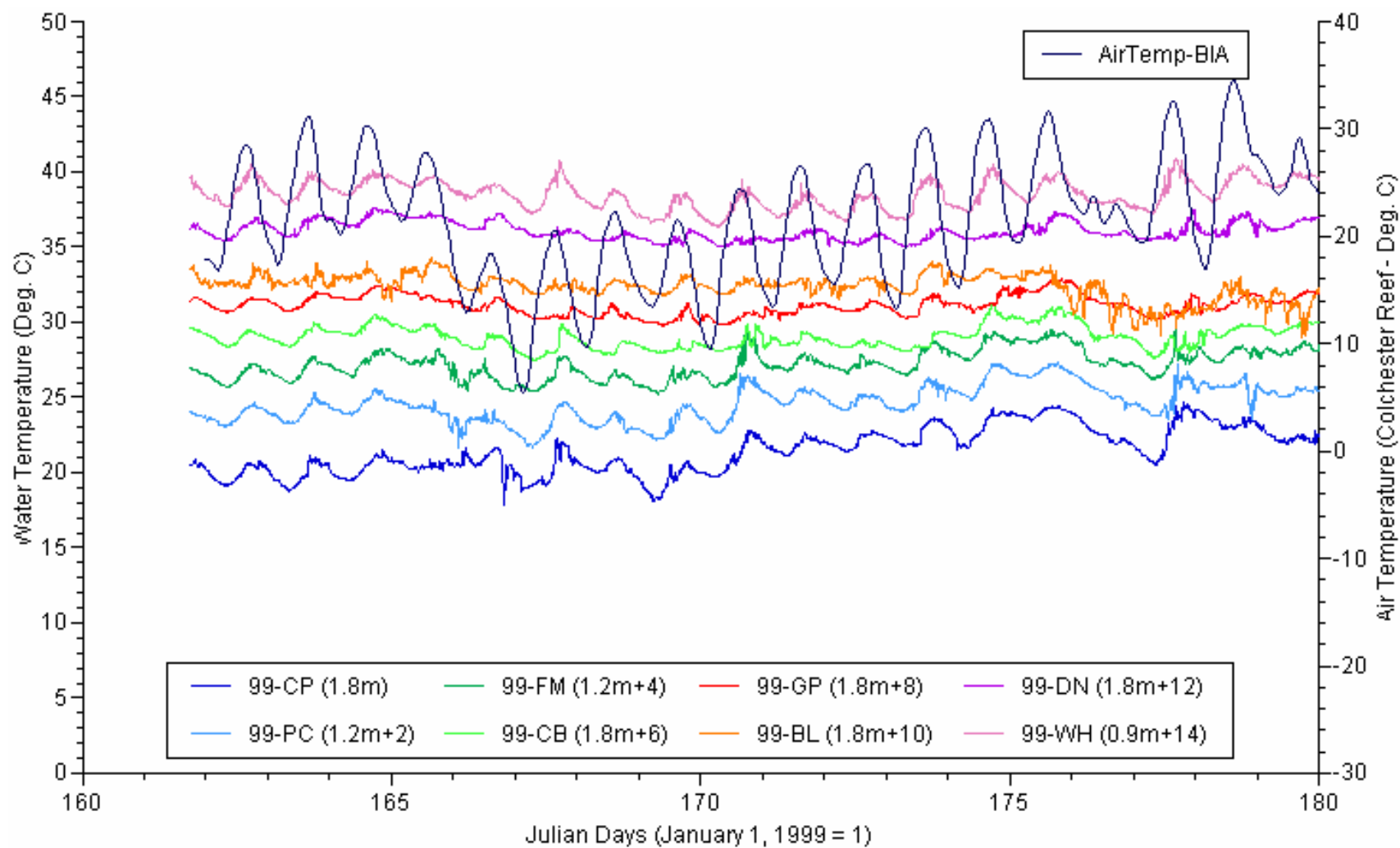
Total Duration
&
20-Day Expanded Plots

Note: Temperature offsets were applied to all sites except Crown Point in order to separate the data. The following temperature offsets were added to the sites on all subsequent plots:

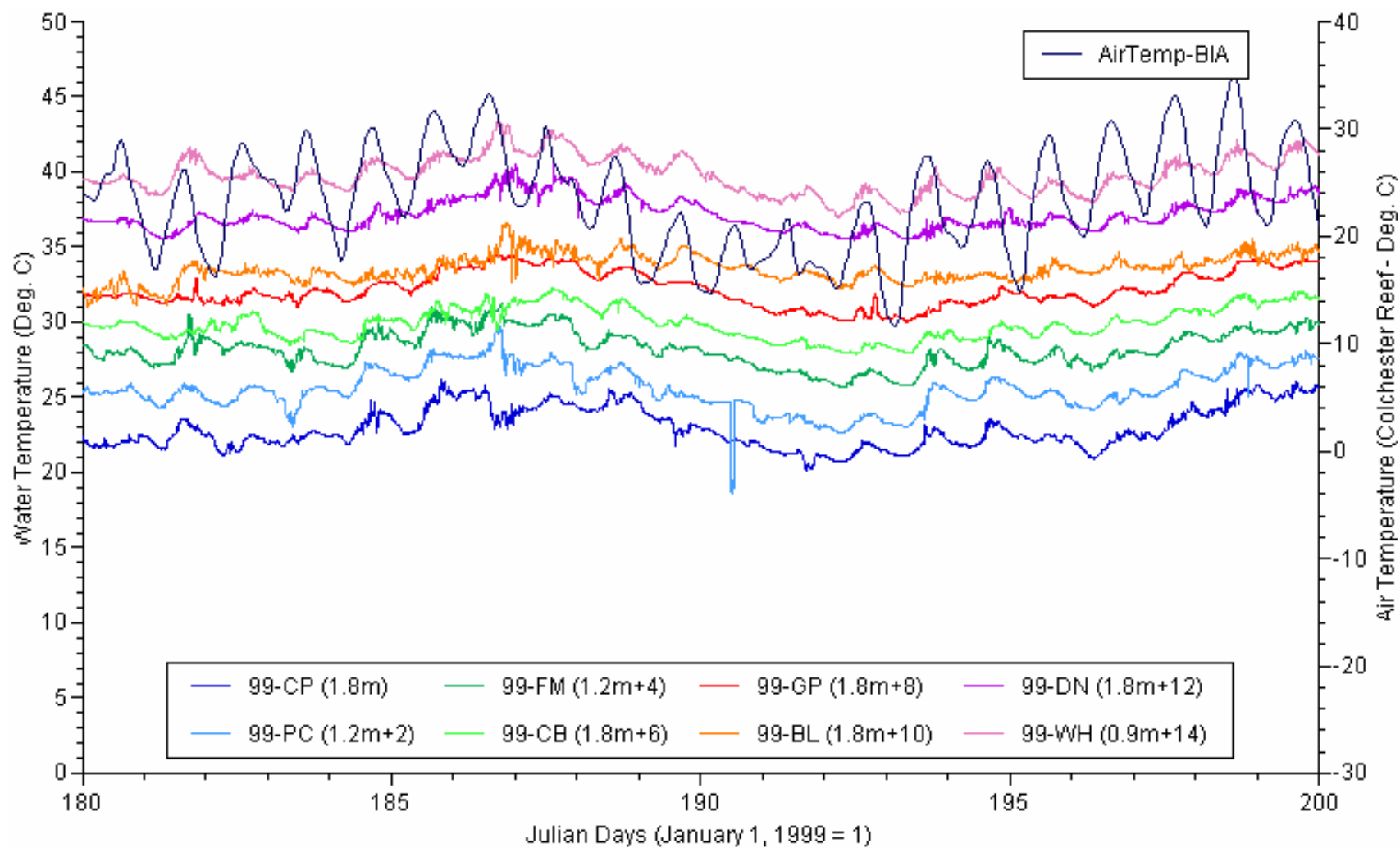
Putnam Creek (PC)	----->	+2 °C
File Mile Point (FM)	----->	+4 °C
Catfish Bay (CB)	----->	+6 °C
Gourlie Point (GP)	----->	+8 °C
Benson Landing (BL)	----->	+10 °C
Dresden Narrows (DN)	-->	+12 °C
Whitehall (WH)	----->	+14 °C



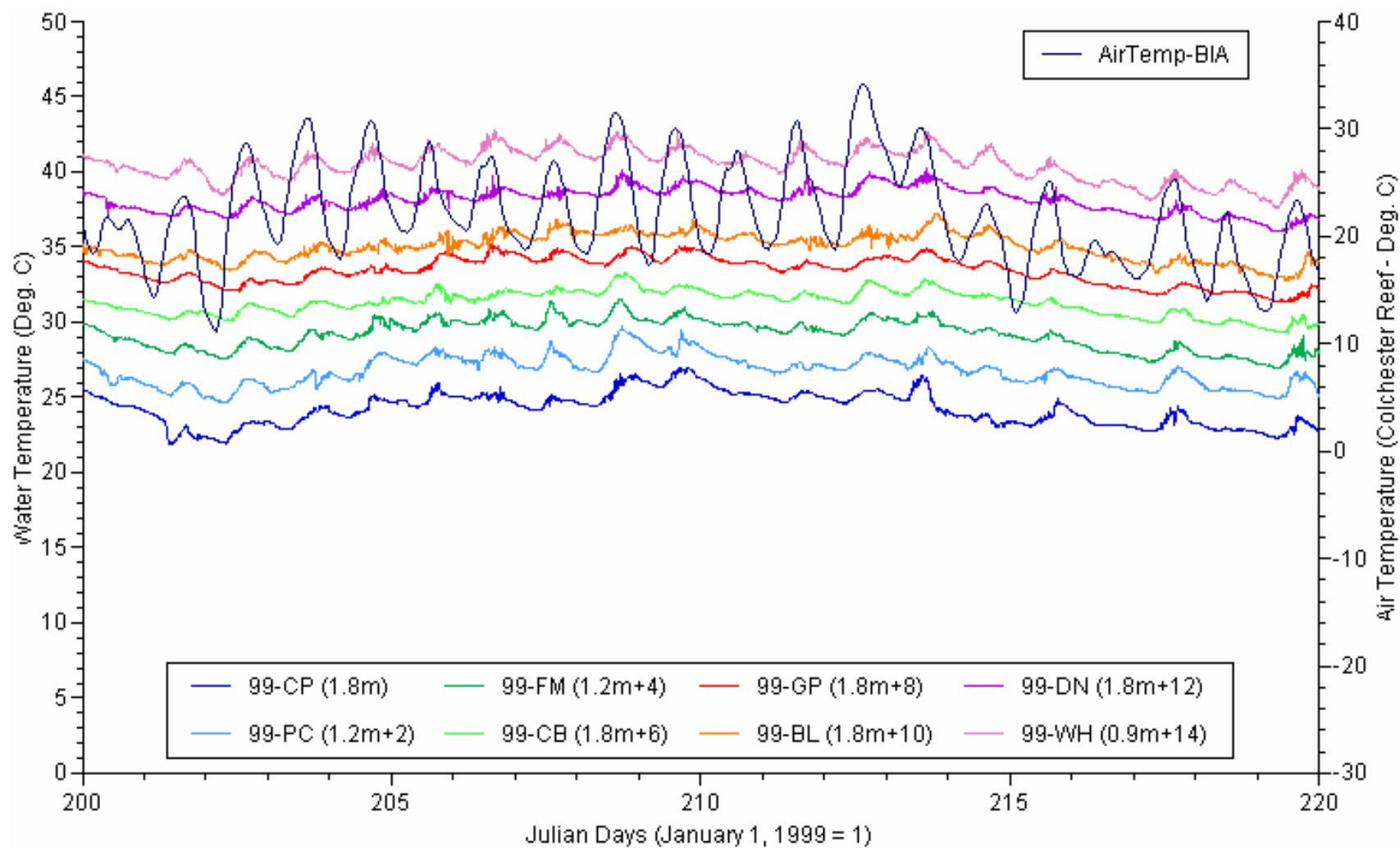
Appendix 15-99a. All 1999 surface tempertaure logger data (offset plotted) along with air temperatures at Burlington International Airport.



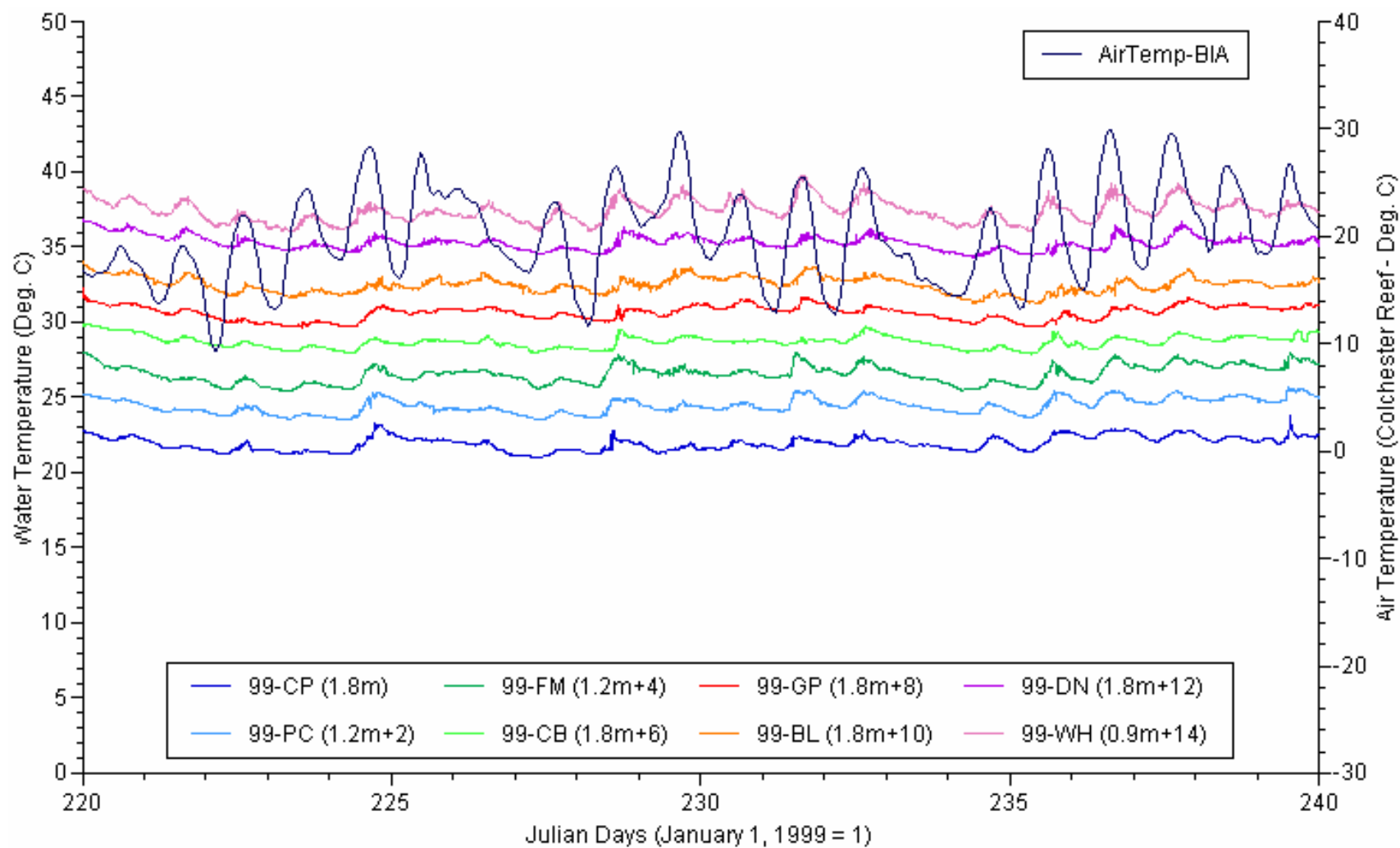
Appendix 15-99b. All 1999 surface tempertaure logger data (offset plotted) along with air temperatures at Burlington International Airport.



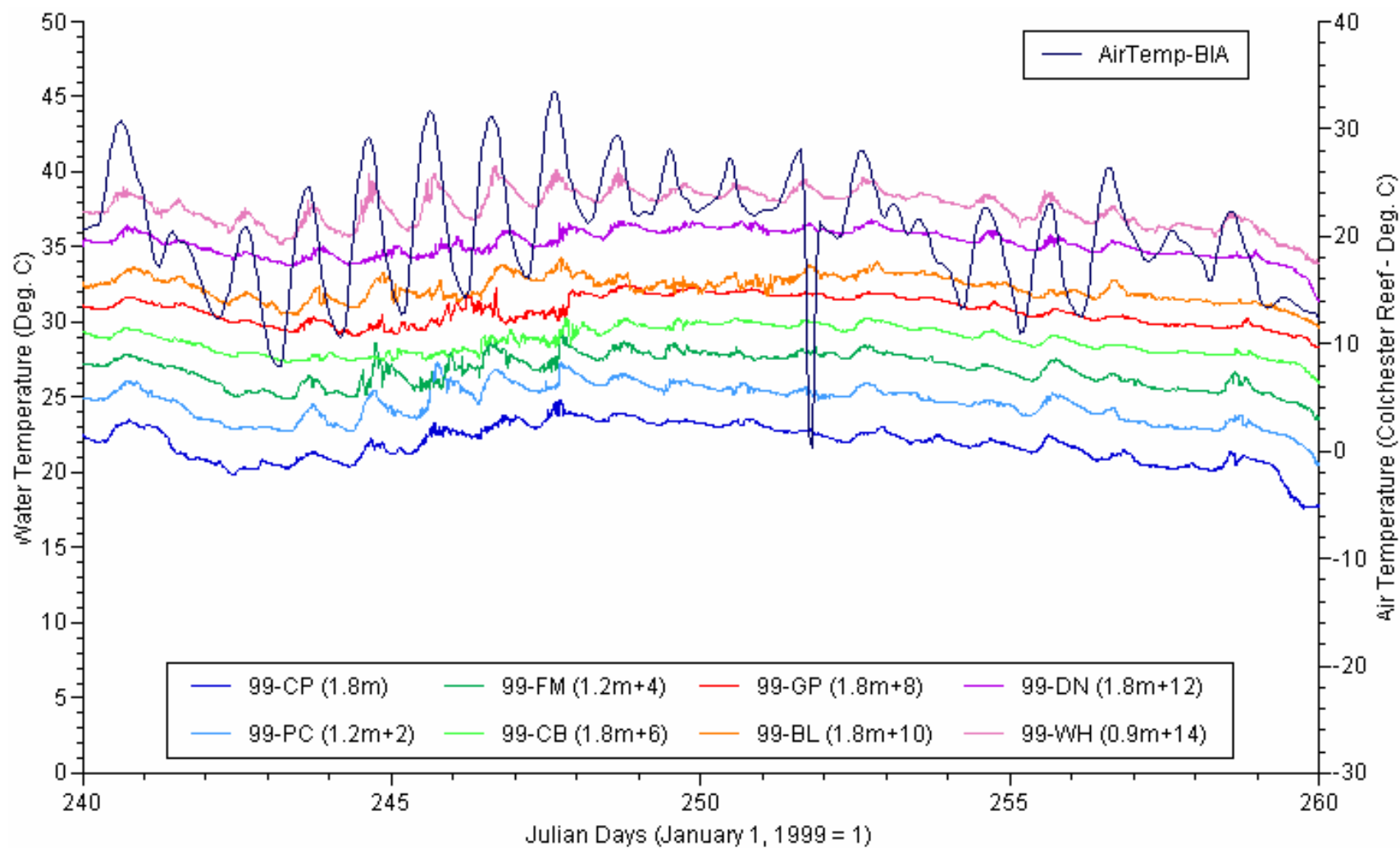
Appendix 15-99c. All 1999 surface tempertaure logger data (offset plotted) along with air temperatures at Burlington International Airport.



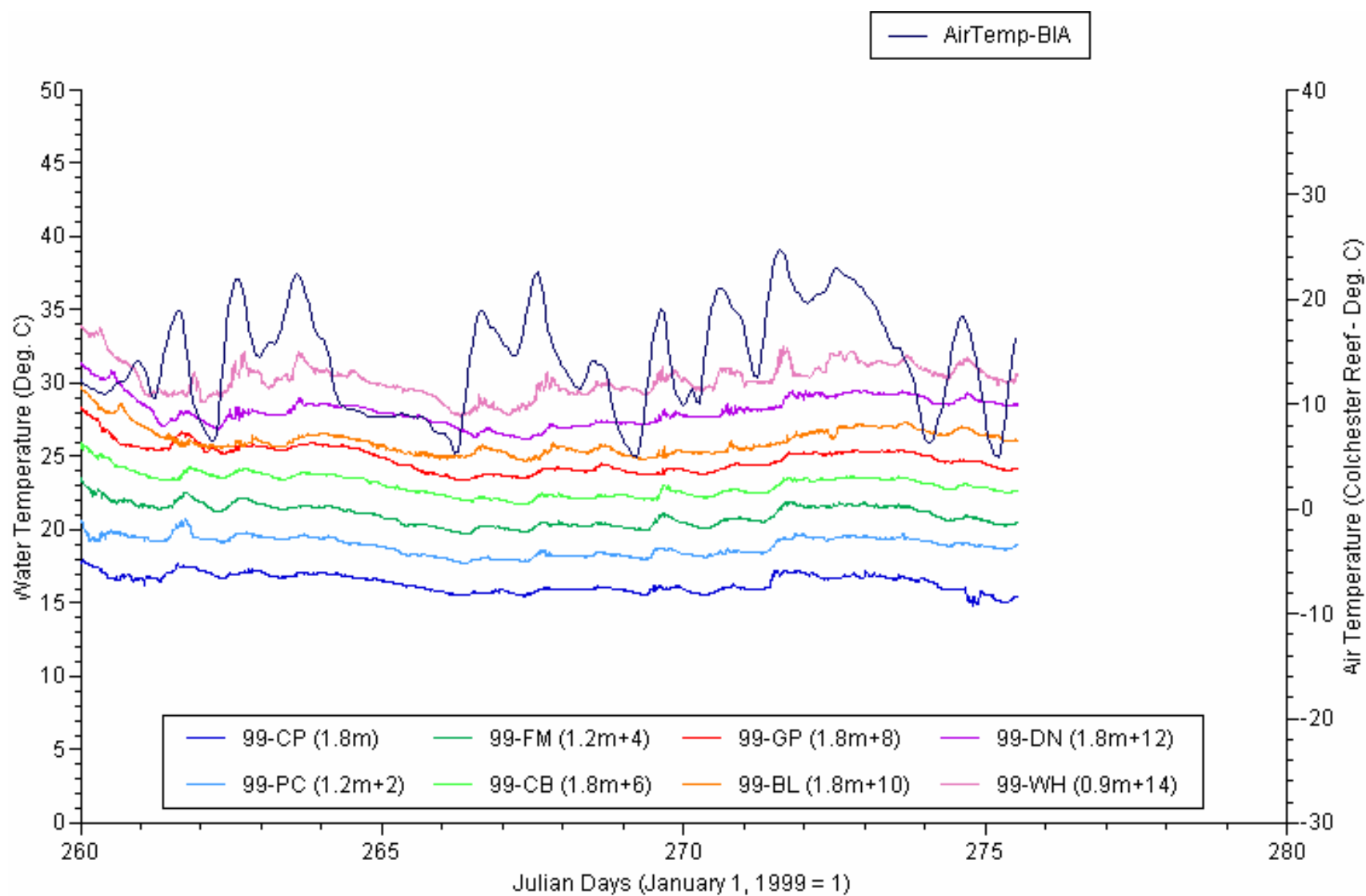
Appendix 15-99d. All 1999 surface tempertaure logger data (offset plotted) along with air temperatures at Burlington International Airport.



Appendix 15-99e. All 1999 surface tempertaure logger data (offset plotted) along with air temperatures at Burlington International Airport.



Appendix 15-99f. All 1999 surface tempertaure logger data (offset plotted) along with air temperatures at Burlington International Airport.



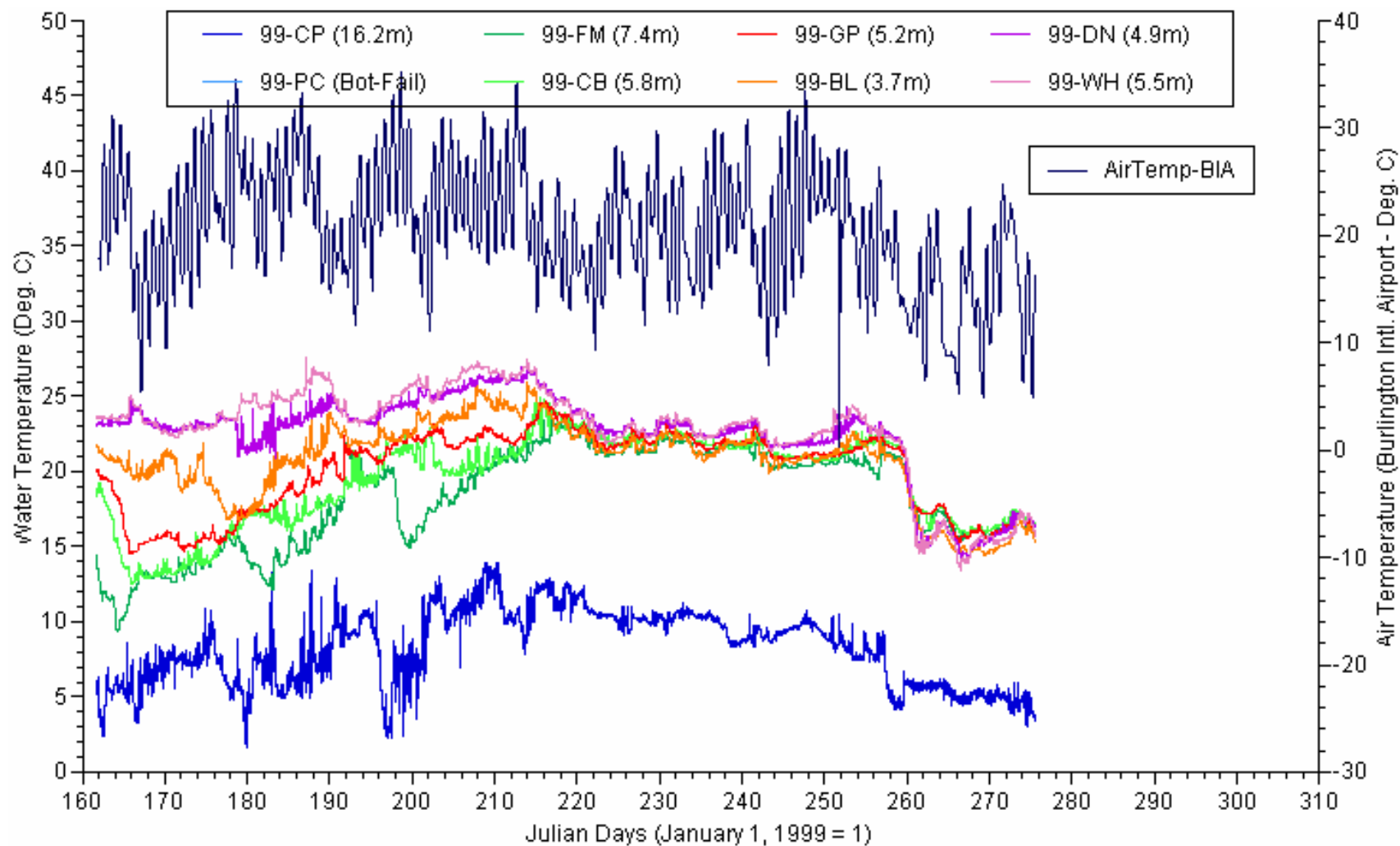
Appendix 15-99g. All 1999 surface tempertaure logger data (offset plotted) along with air temperatures at Burlington International Airport.

Appendix 16

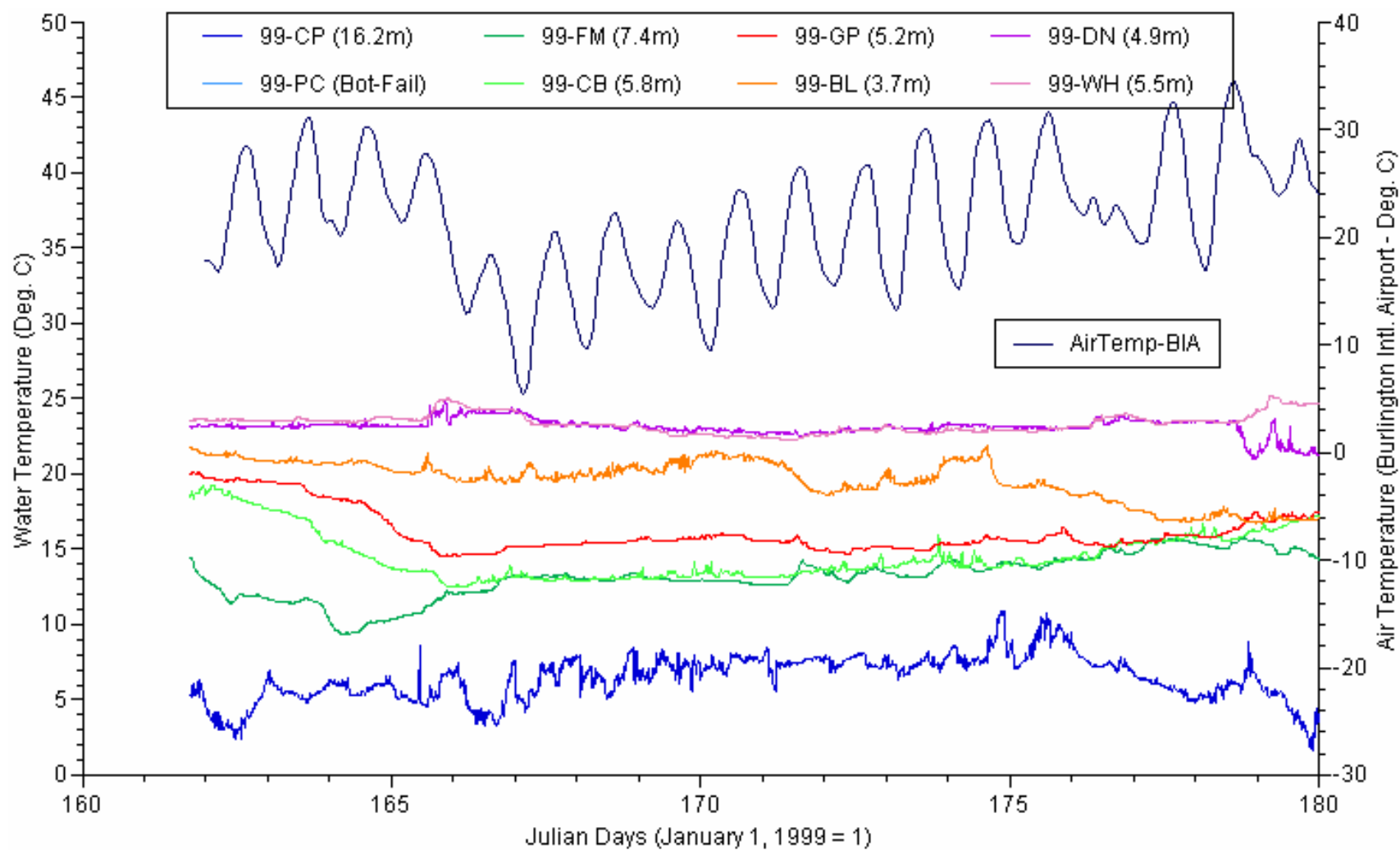
1999 - All Sites

Deep Temperature Data (Non-Offset)
&
Colchester Reef Meteorological Air Temperatures

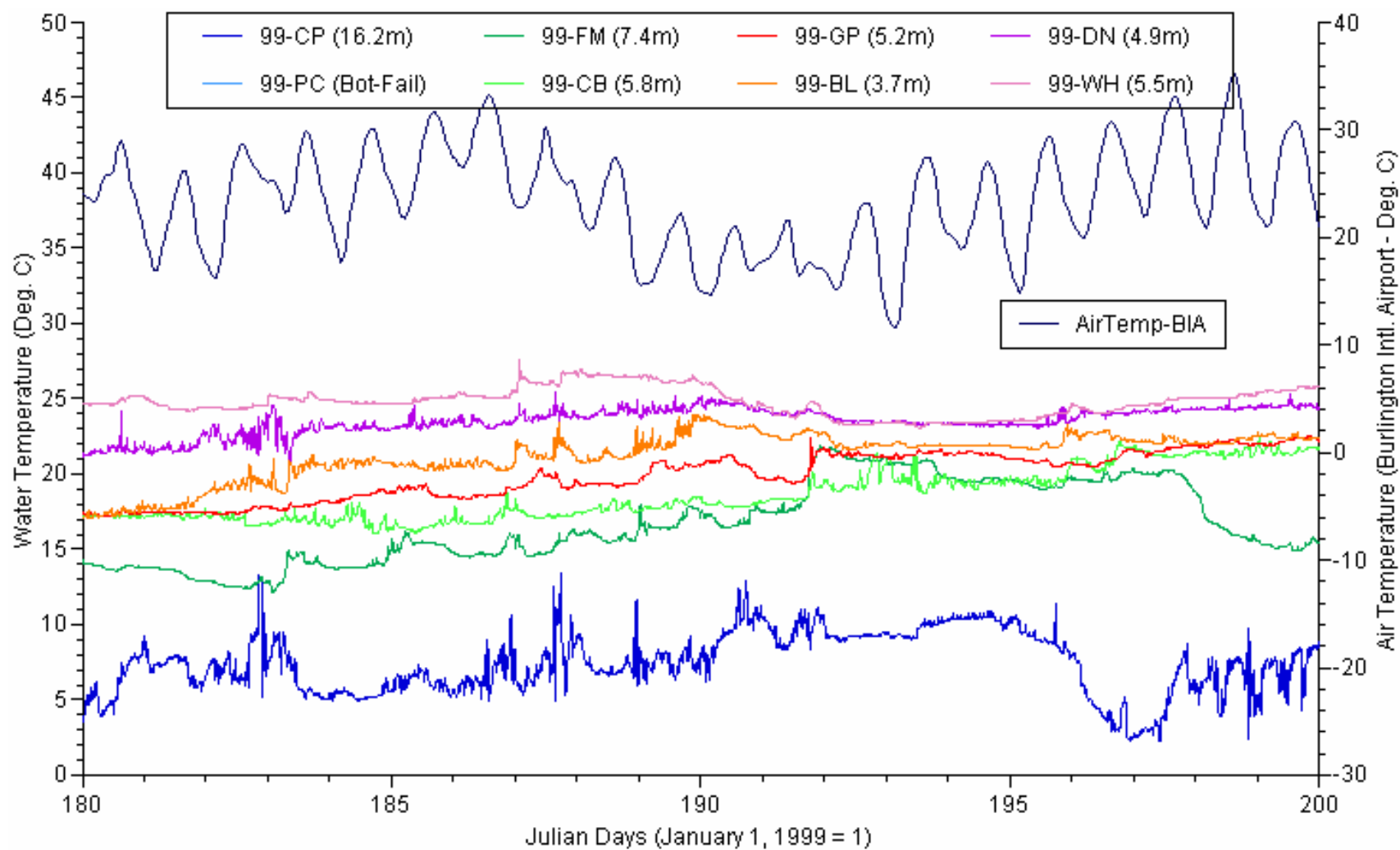
Total Duration
&
20-Day Expanded Plots



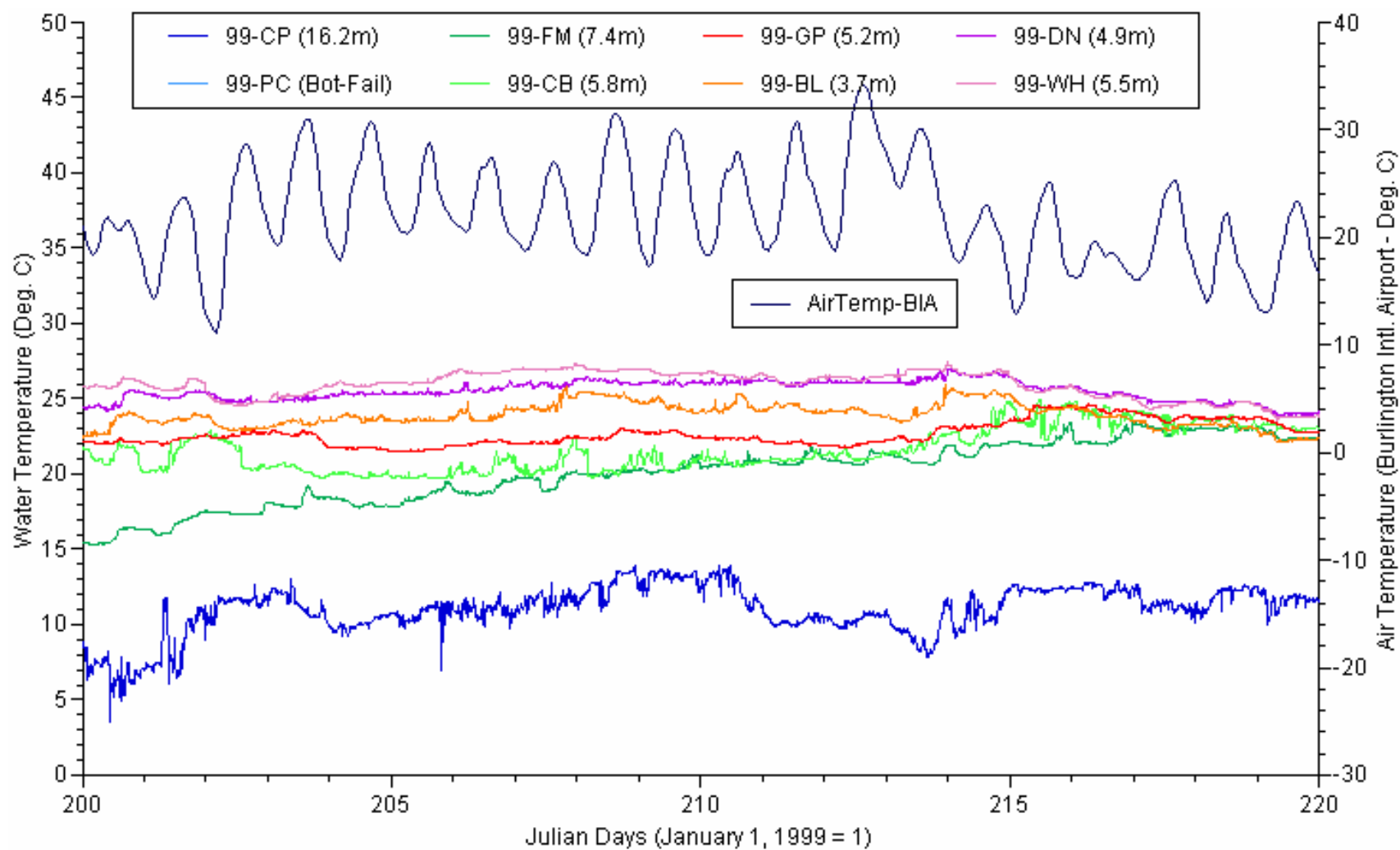
Appendix 16-99a. All 1999 surface temperature logger data along with air temperatures at Burlington International Airport.



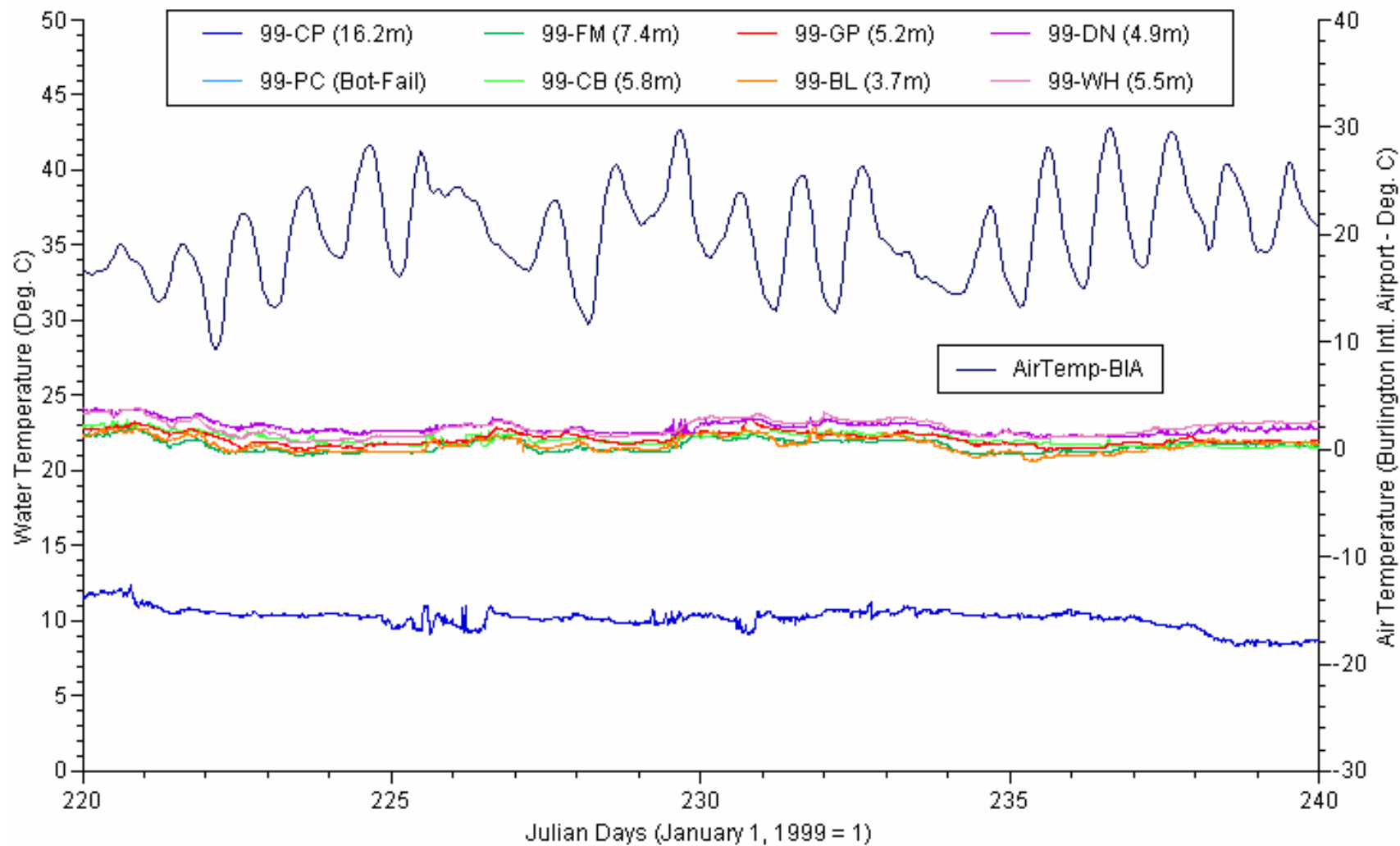
Appendix 16-99b. All 1999 surface tempertaure logger data along with air temperatures at Burlington International Airport.



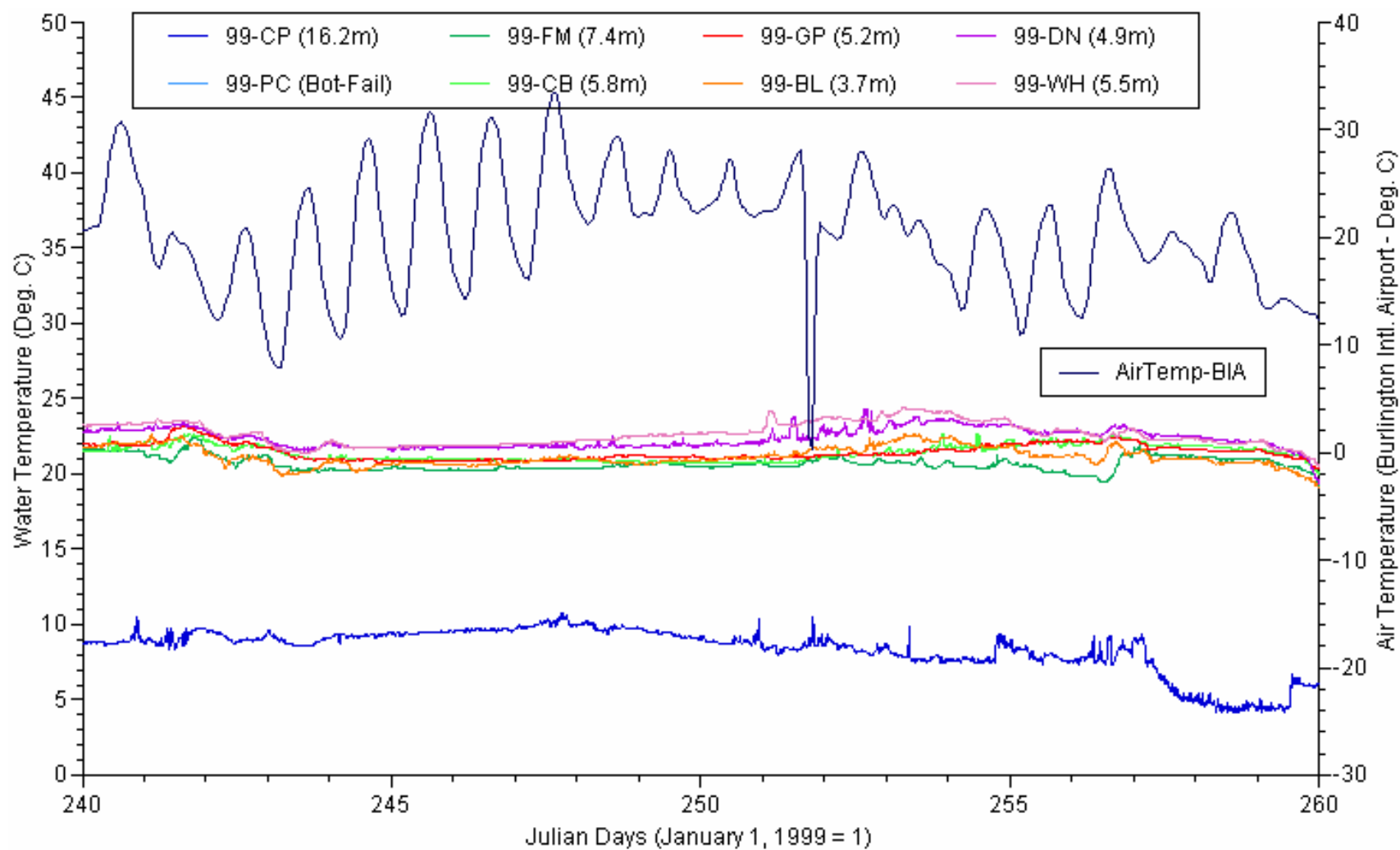
Appendix 16-99c. All 1999 surface tempertaure logger data along with air temperatures at Burlington International Airport.



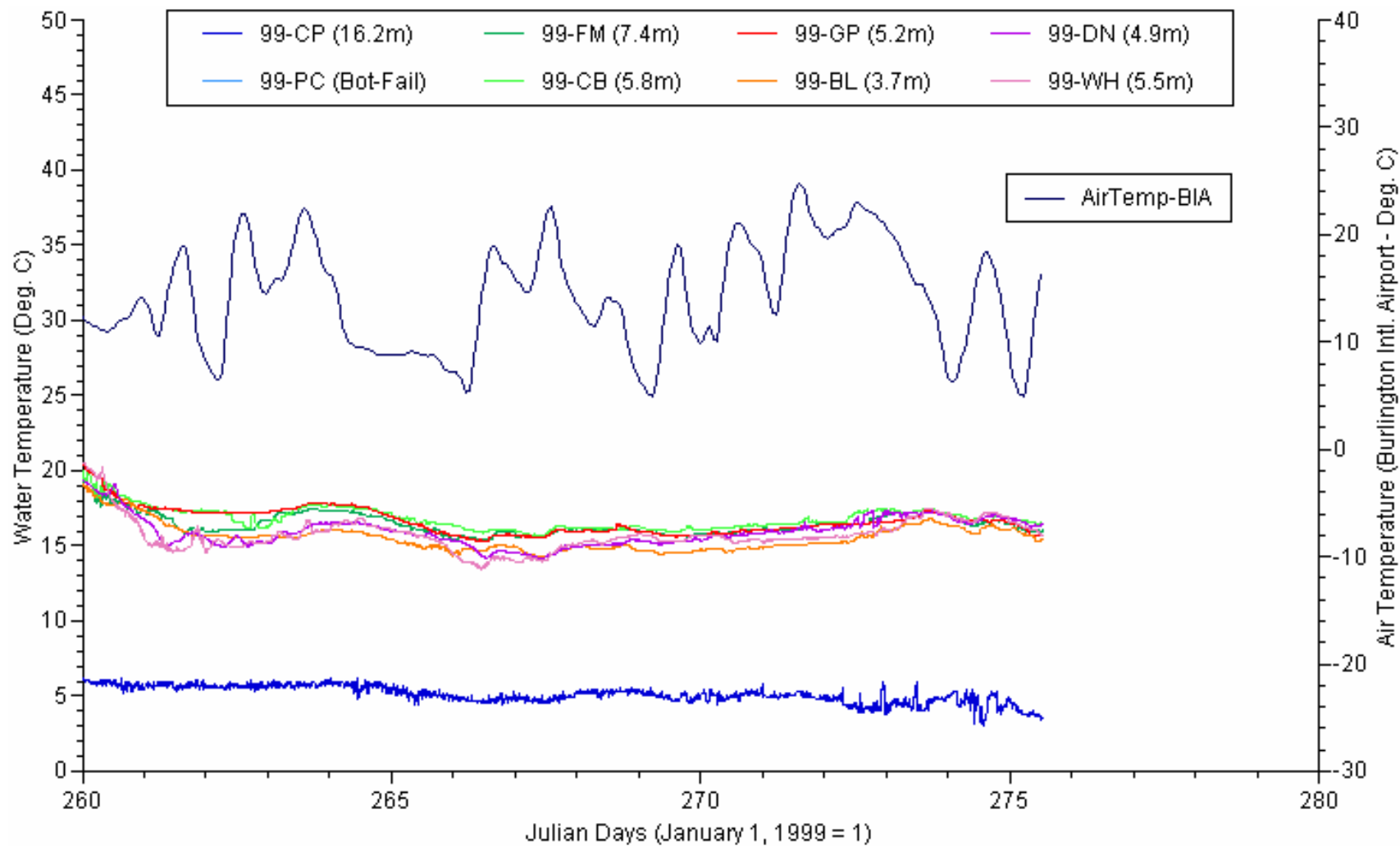
Appendix 16-99d. All 1999 surface tempertaure logger data along with air temperatures at Burlington International Airport.



Appendix 16-99e. All 1999 surface tempertaure logger data along with air temperatures at Burlington International Airport.



Appendix 16-99f. All 1999 surface tempertaure logger data along with air temperatures at Burlington International Airport.



Appendix 16-99g. All 1999 surface tempertaure logger data along with air temperatures at Burlington International Airport.

Appendix 17

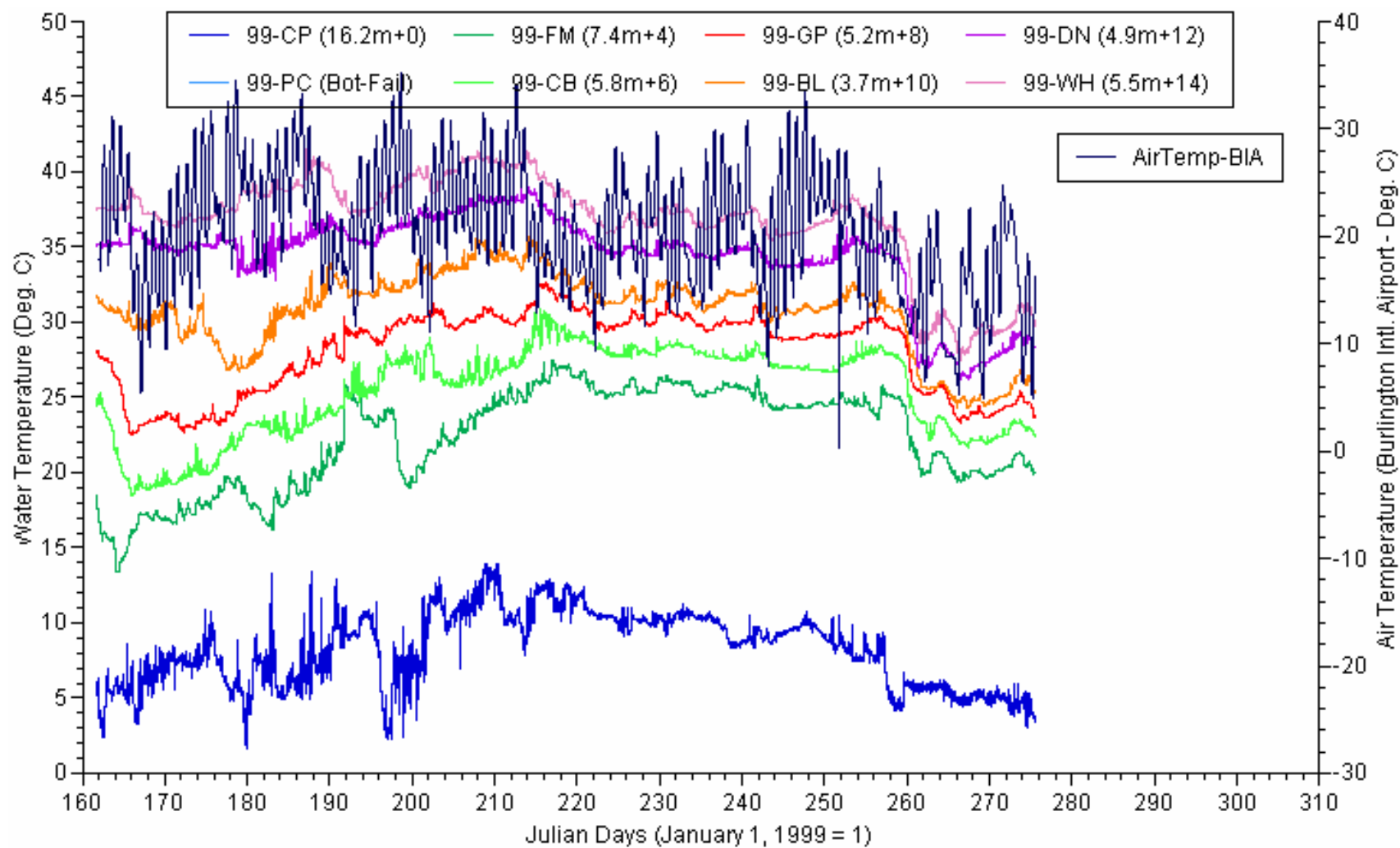
1999 - All Sites

Deep Temperature Data (2 °C Offset)
&
Colchester Reef Meteorological Air Temperatures

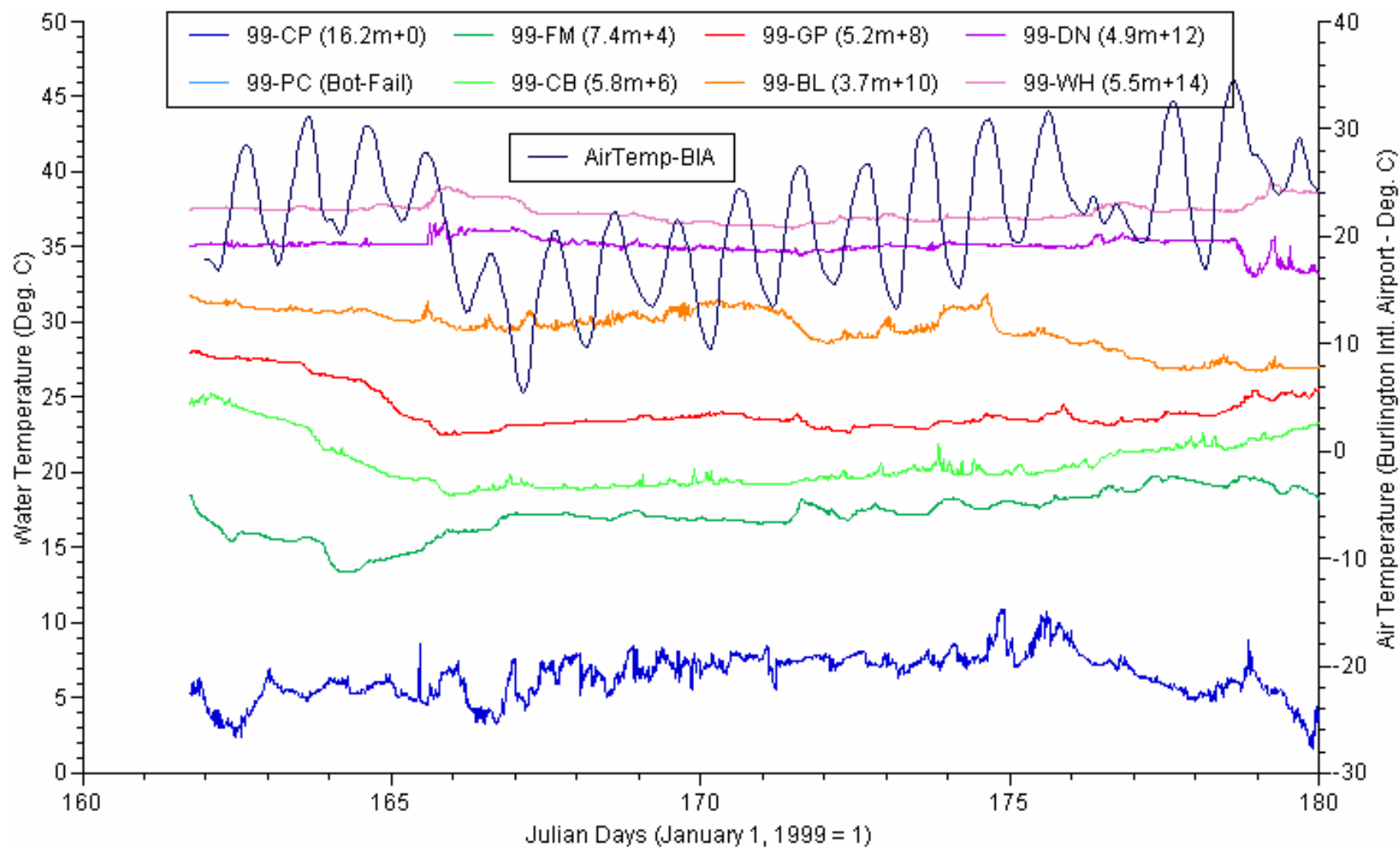
Total Duration
&
20-Day Expanded Plots

Note: Temperature offsets were applied to all sites except Crown Point in order to separate the data. The following temperature offsets were added to the sites on all subsequent plots:

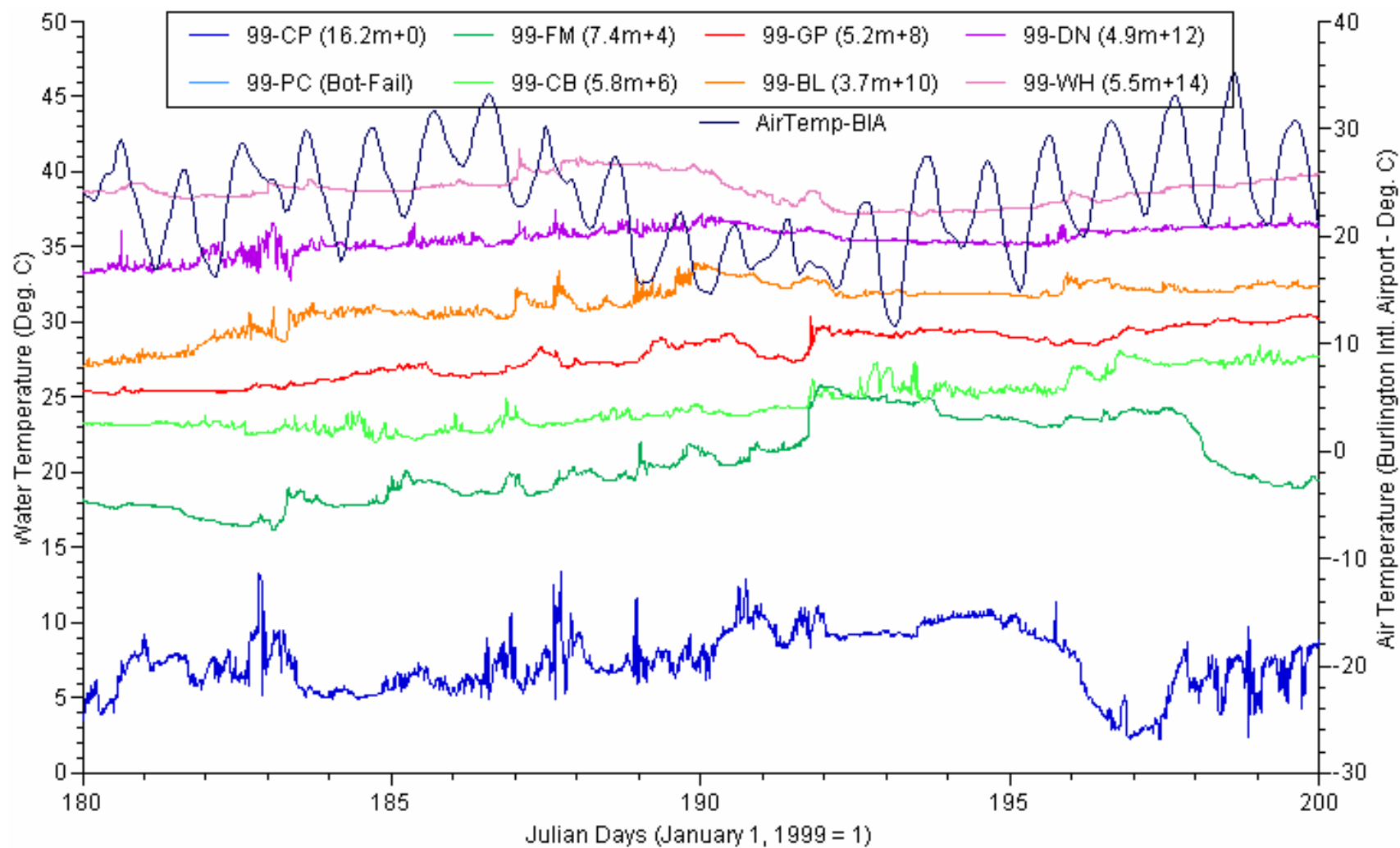
Putnam Creek (PC)	----->	+2 °C
File Mile Point (FM)	----->	+4 °C
Catfish Bay (CB)	----->	+6 °C
Gourlie Point (GP)	----->	+8 °C
Benson Landing (BL)	----->	+10 °C
Dresden Narrows (DN)	-->	+12 °C
Whitehall (WH)	----->	+14 °C



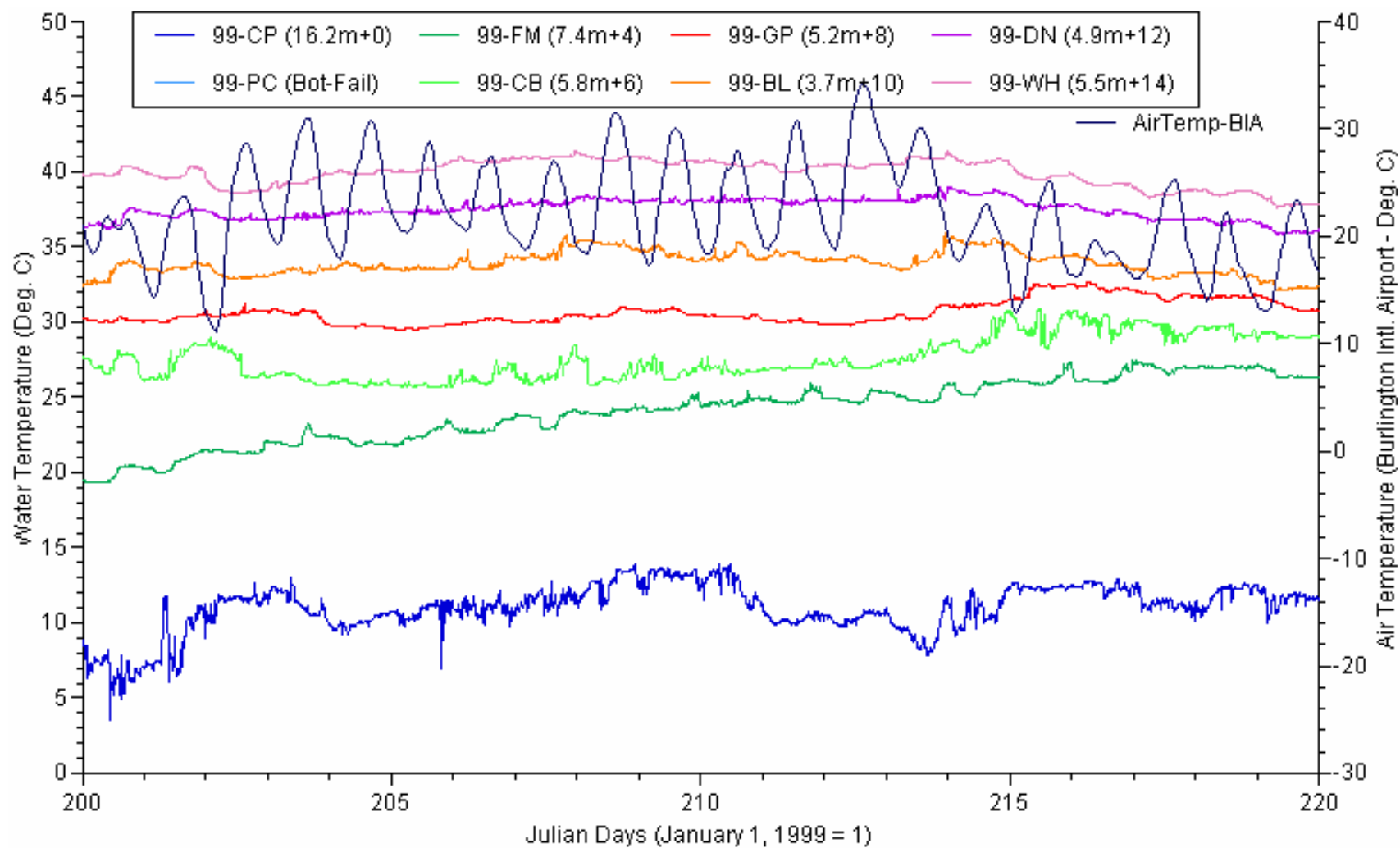
Appendix 17-99a. All 1999 surface tempertaure logger data (offset plotted) along with air temperatures at Burlington International Airport.



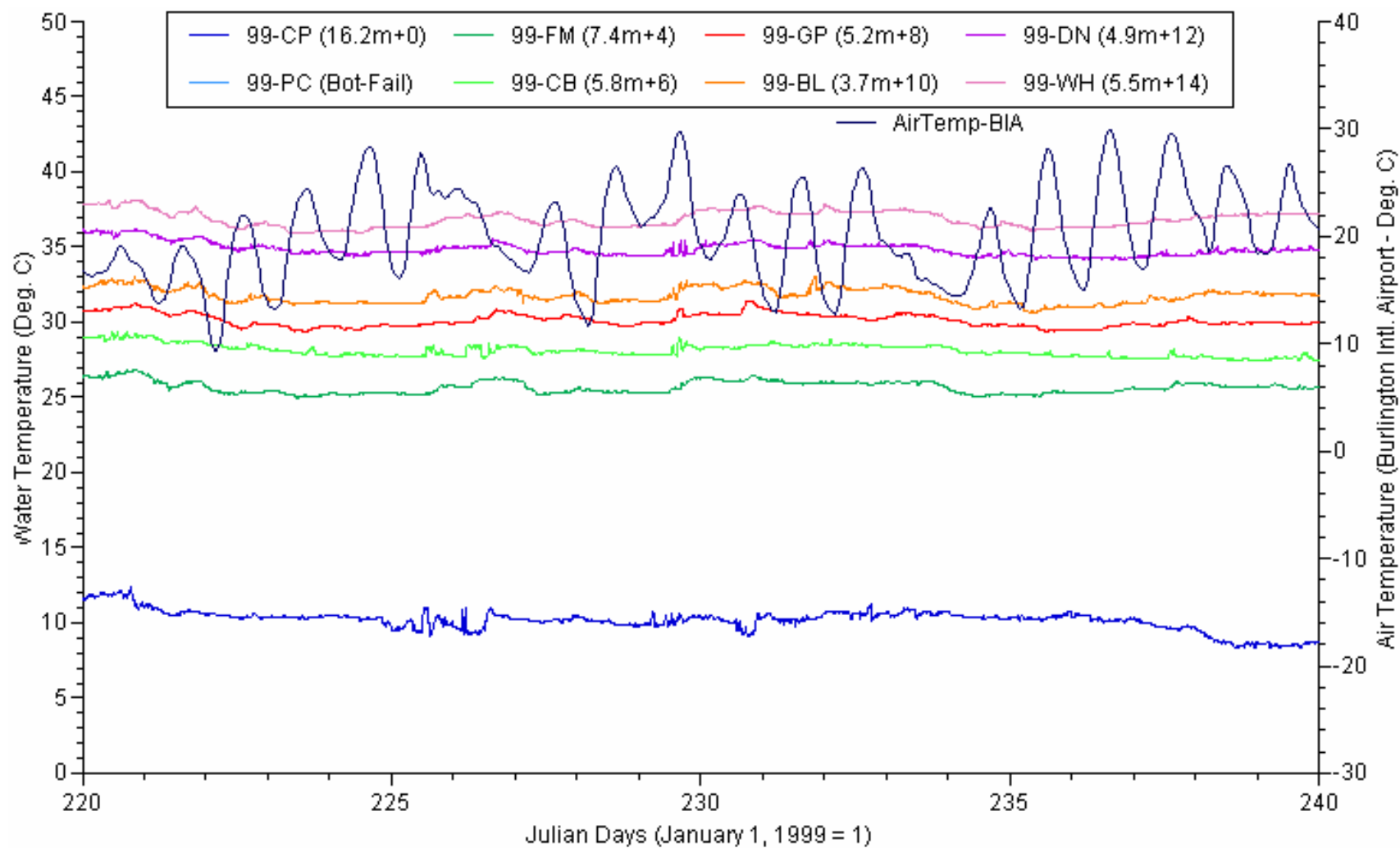
Appendix 17-99b. All 1999 surface tempertaure logger data (offset plotted) along with air temperatures at Burlington International Airport.



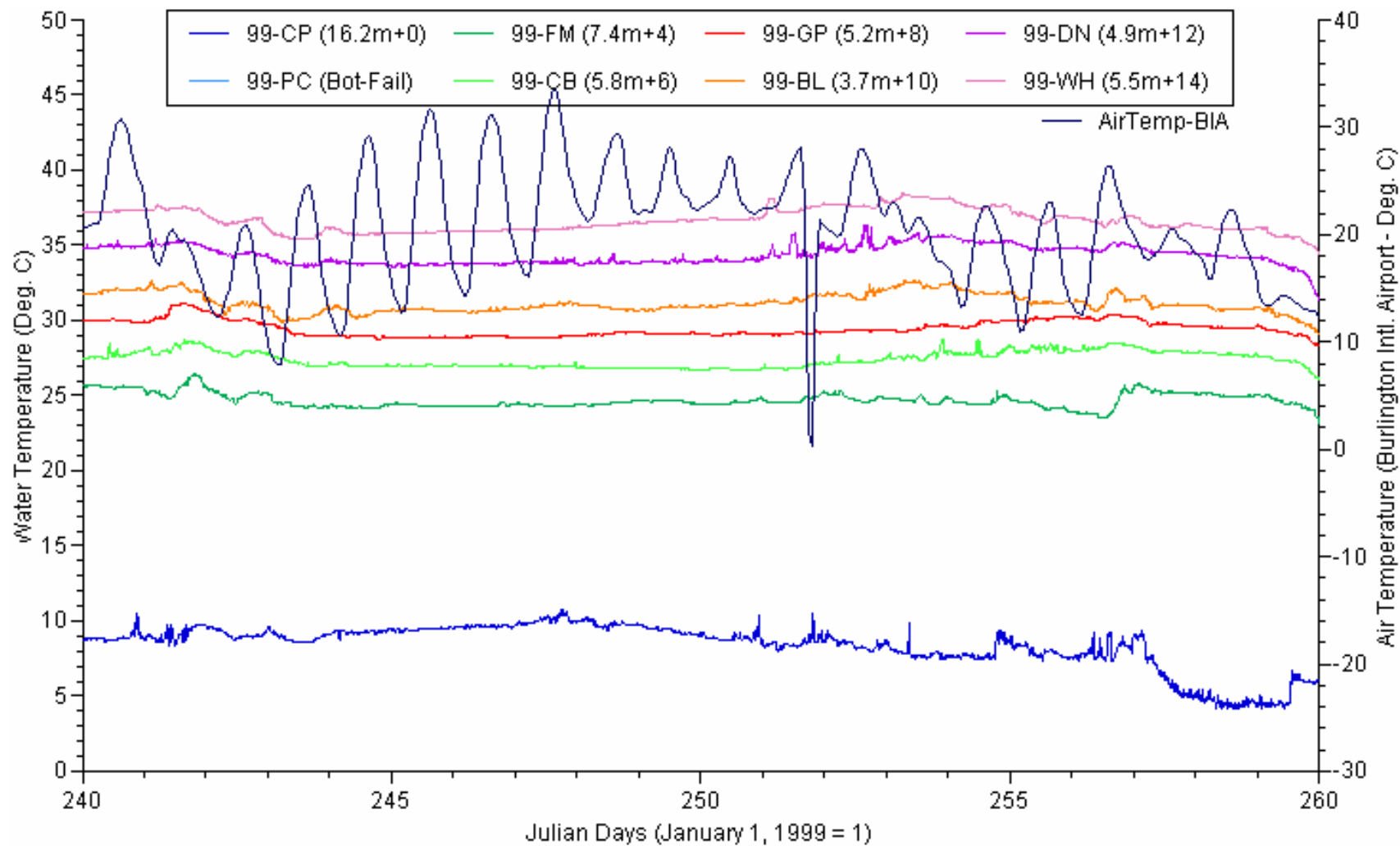
Appendix 17-99c. All 1999 surface tempertaure logger data (offset plotted) along with air temperatures at Burlington International Airport.



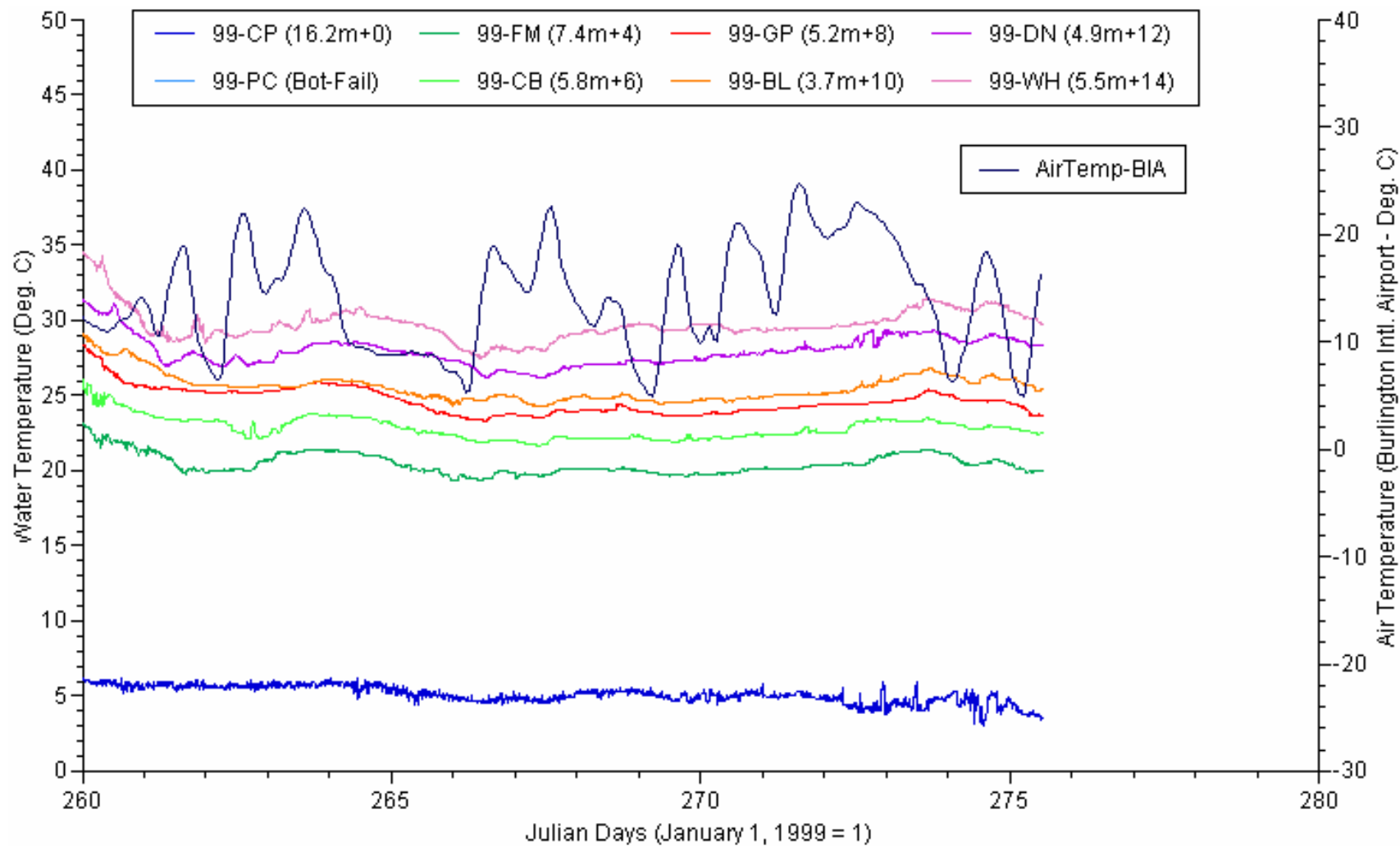
Appendix 17-99d. All 1999 surface tempertaure logger data (offset plotted) along with air temperatures at Burlington International Airport.



Appendix 17-99e. All 1999 surface tempertaure logger data (offset plotted) along with air temperatures at Burlington International Airport.



Appendix 17-99f. All 1999 surface tempertaure logger data (offset plotted) along with air temperatures at Burlington International Airport.



Appendix 17-99g. All 1999 surface tempertaure logger data (offset plotted) along with air temperatures at Burlington International Airport.