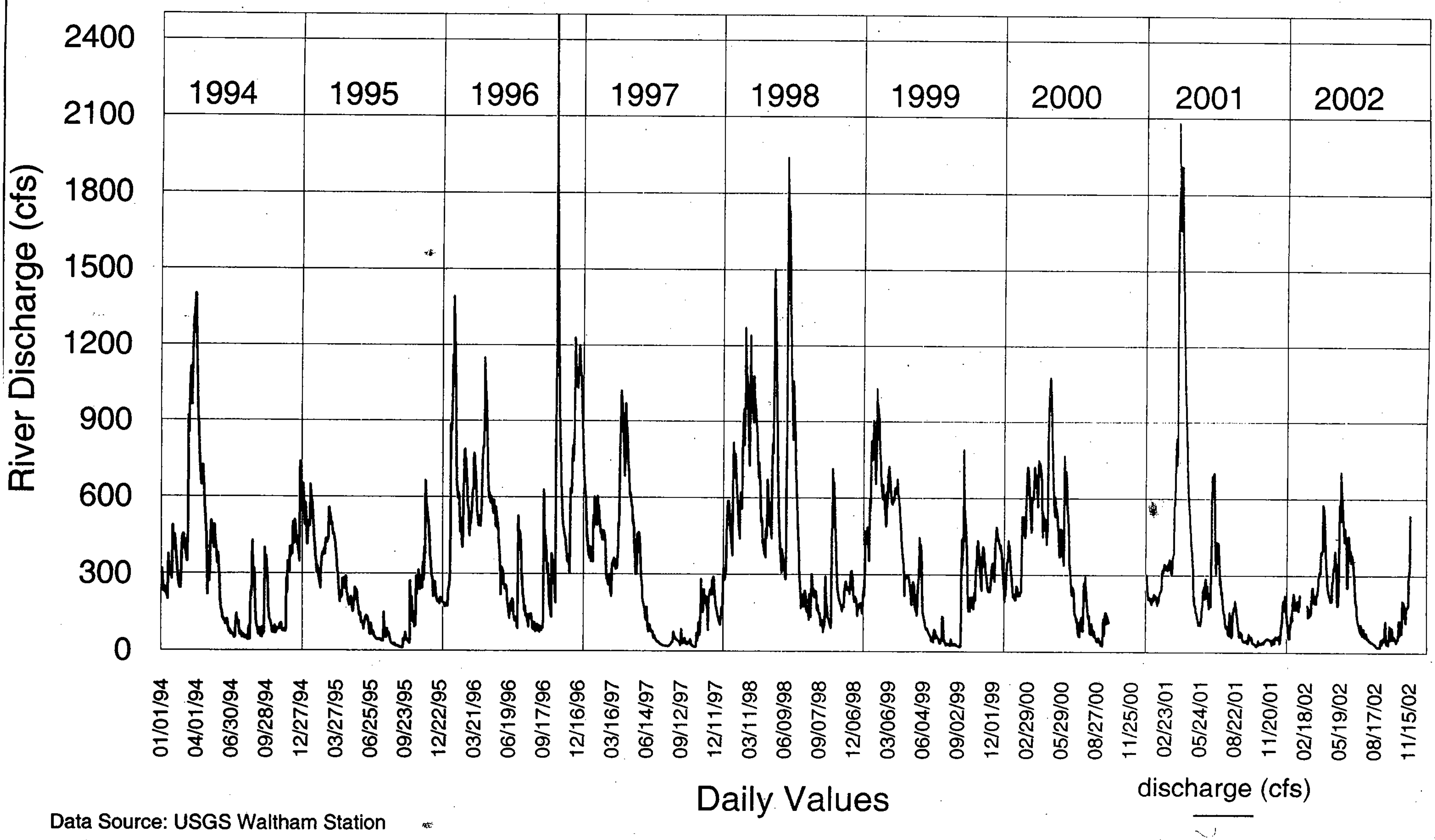
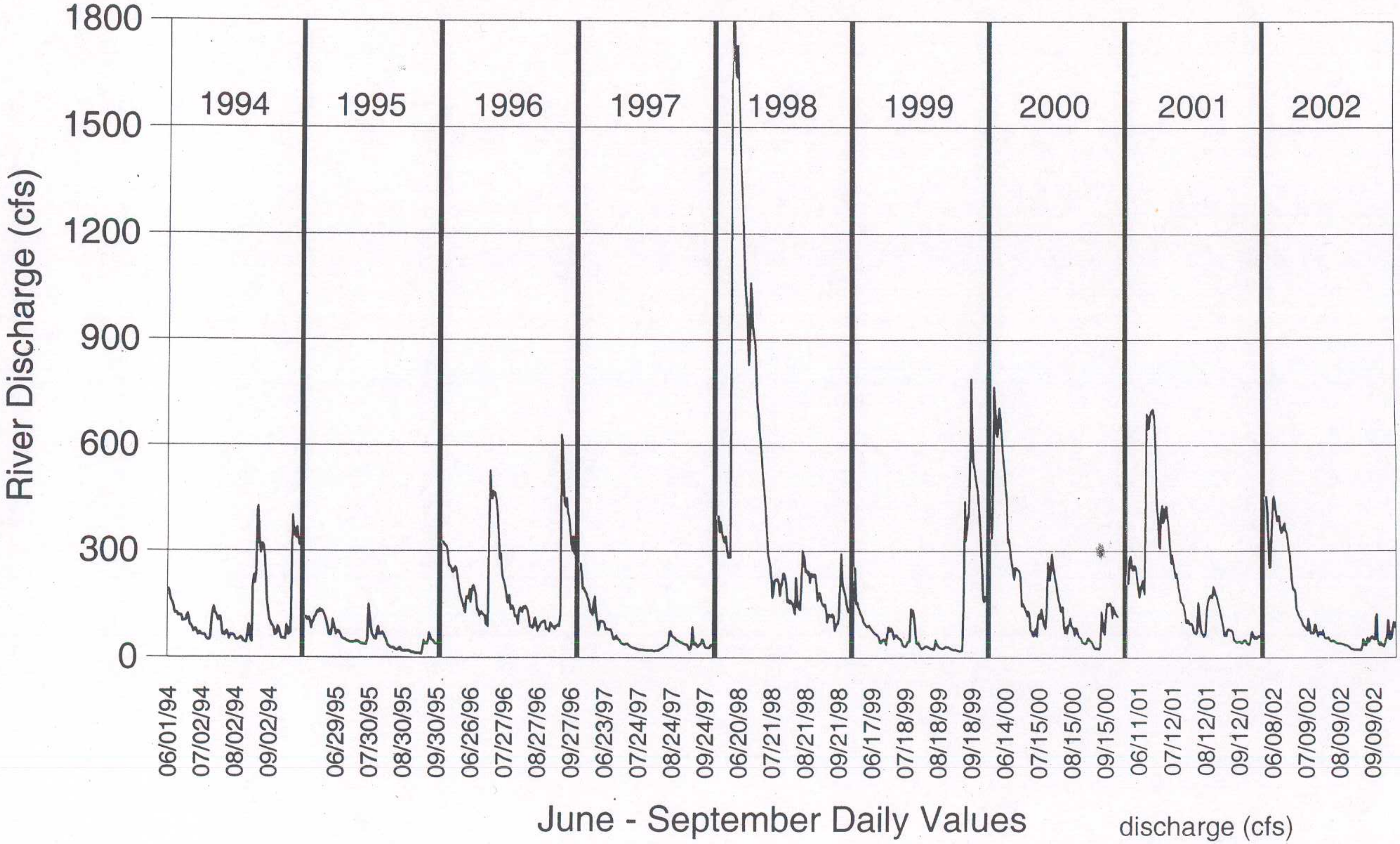
Figure 2.4-1 Daily average values for Charles River discharge, measured in cubic feet per second (cfs), as recorded by the USGS Gauging Station at Waltham, Massachusetts. (January 1994 - November 2002)



Data Source: USGS Waltham Station

Figure 2.4-2 Daily average values for Charles River discharge, measured in cubic feet per second (cfs), for the months of June through September only, as recorded by the USGS Gauging Station at Waltham, Massachusetts. (January 1994 - November 2002)



Source Data: USGS Waltham Station

Figure 3.1.1-1 Mirant Kendall Station existing and future cooling water discharge parameters. Taken from Figure 2-7 of Mirant Kendall's Supplemental Volume I Application of February, 2001. (September 1988- August 1999)

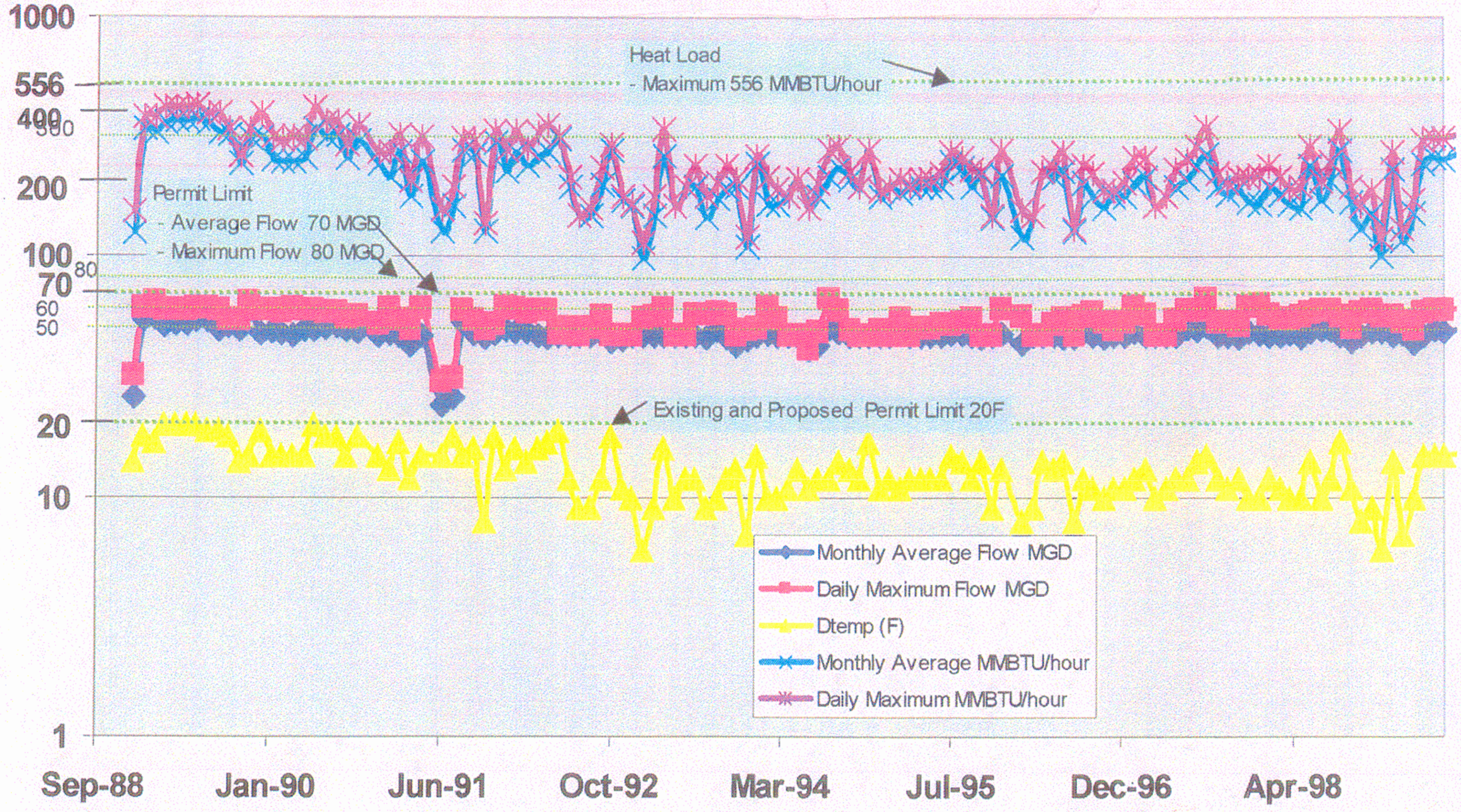


Figure 5.1-1 Temperature-growth curves for major algal groups (From Canale and Vogel, 1974).

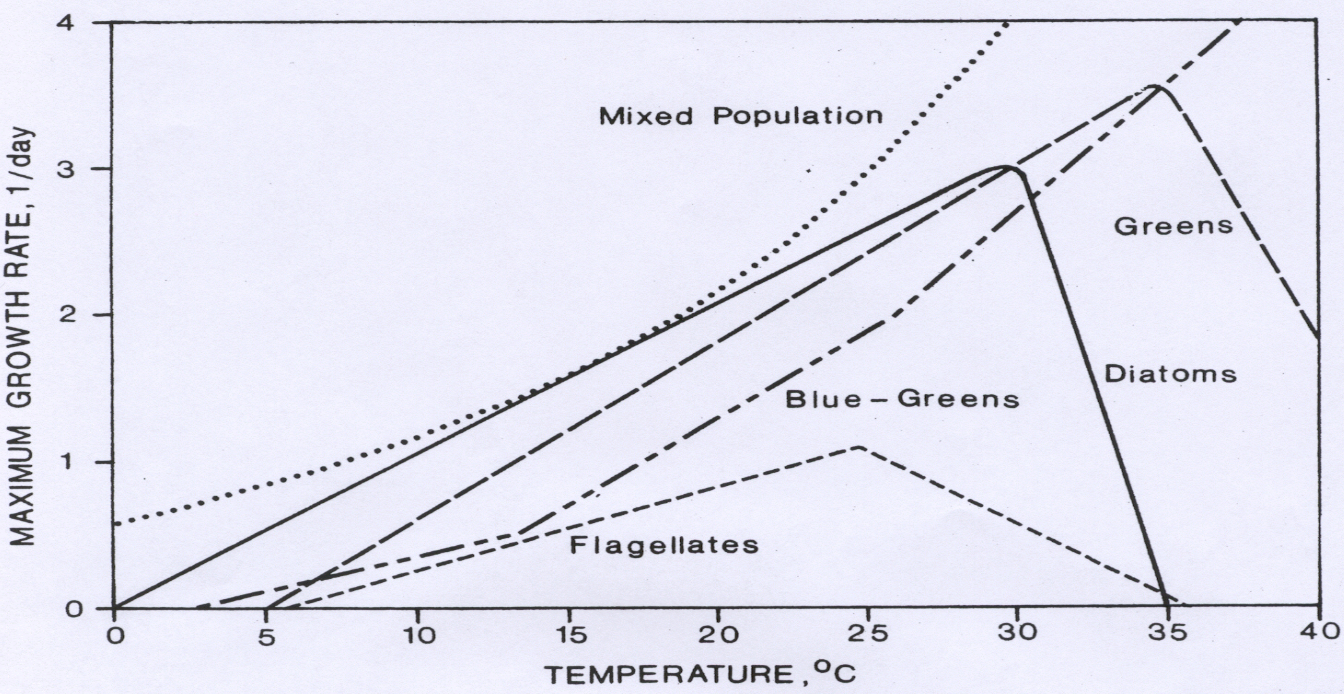


Figure 6-3. Temperature-growth curves for major algal groups (from Canale and Vogel, 1974).

Figure 5.3-1 Kendall Station average monthly heat load calculated from hourly values of delta T and cooling water usage for the months of June through September. The maximum monthly heatload allowed from historical permit limits as well as revised limits are also included. September 2003 data was not available. Information supplied by Mirant Kendall Station (June - September, 1998 - 2003).

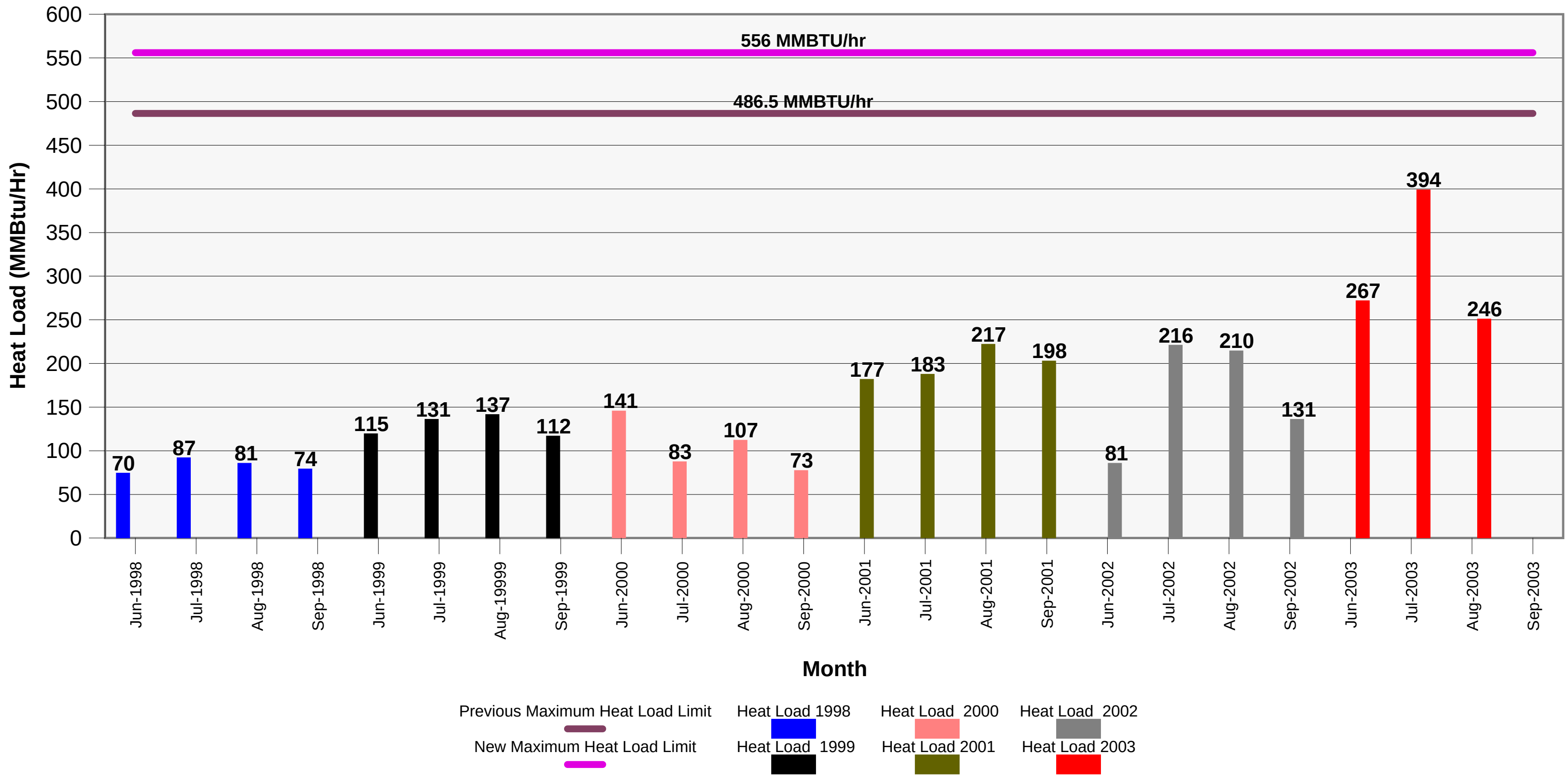


Figure 5.3-2 Mirant Kendall Station cooling water discharge temperature monitoring record. Reproduced without modification from a figure submitted by the permittee as part of the permitting process. (January 1989 - July 1999)

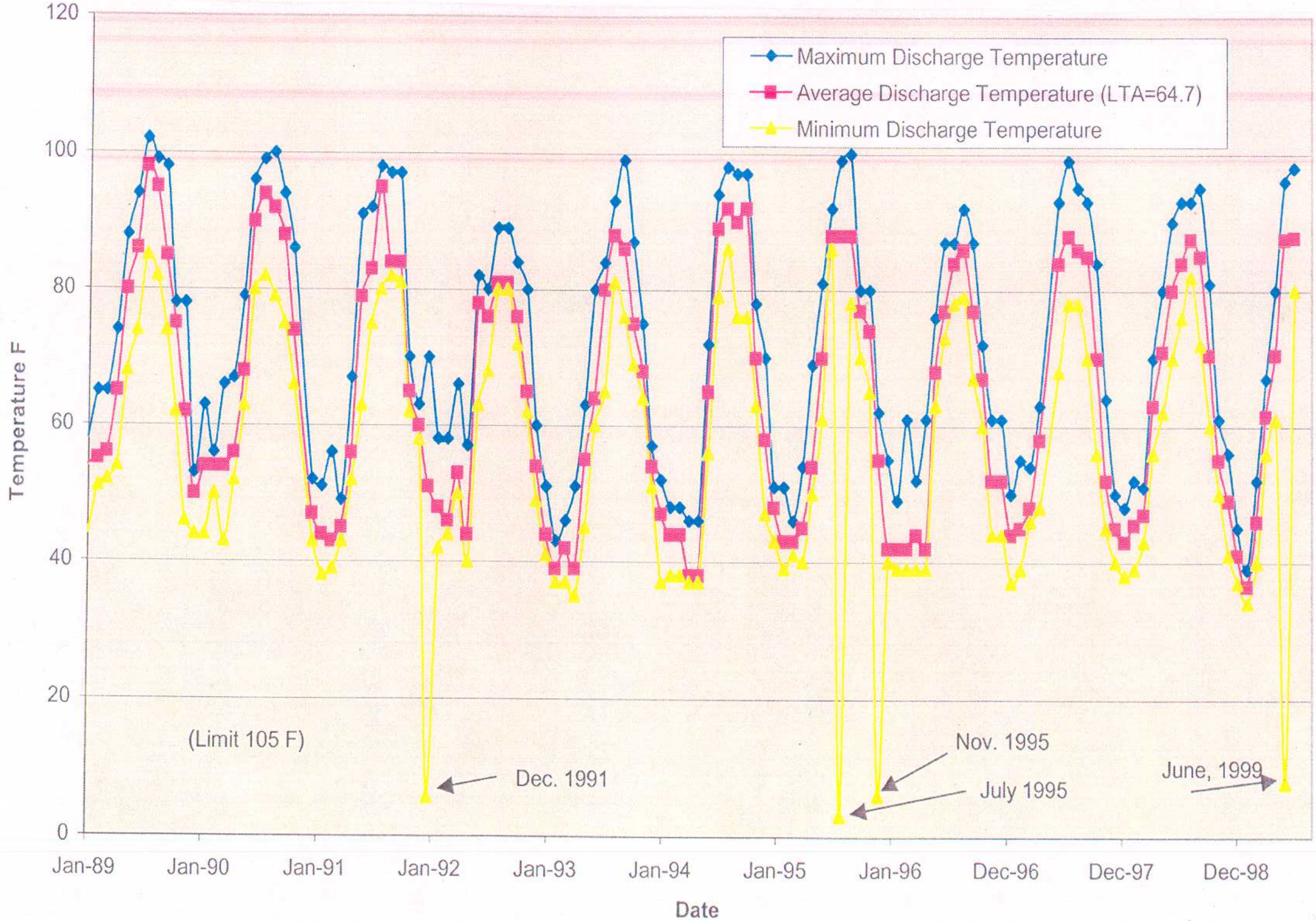


Figure 5.6-1 Maximum temperature limits in the Zone of Passage and Habitat for life stages of the most sensitive resident species in the lower Charles River Basin. For all life stages, the species used was yellow perch.

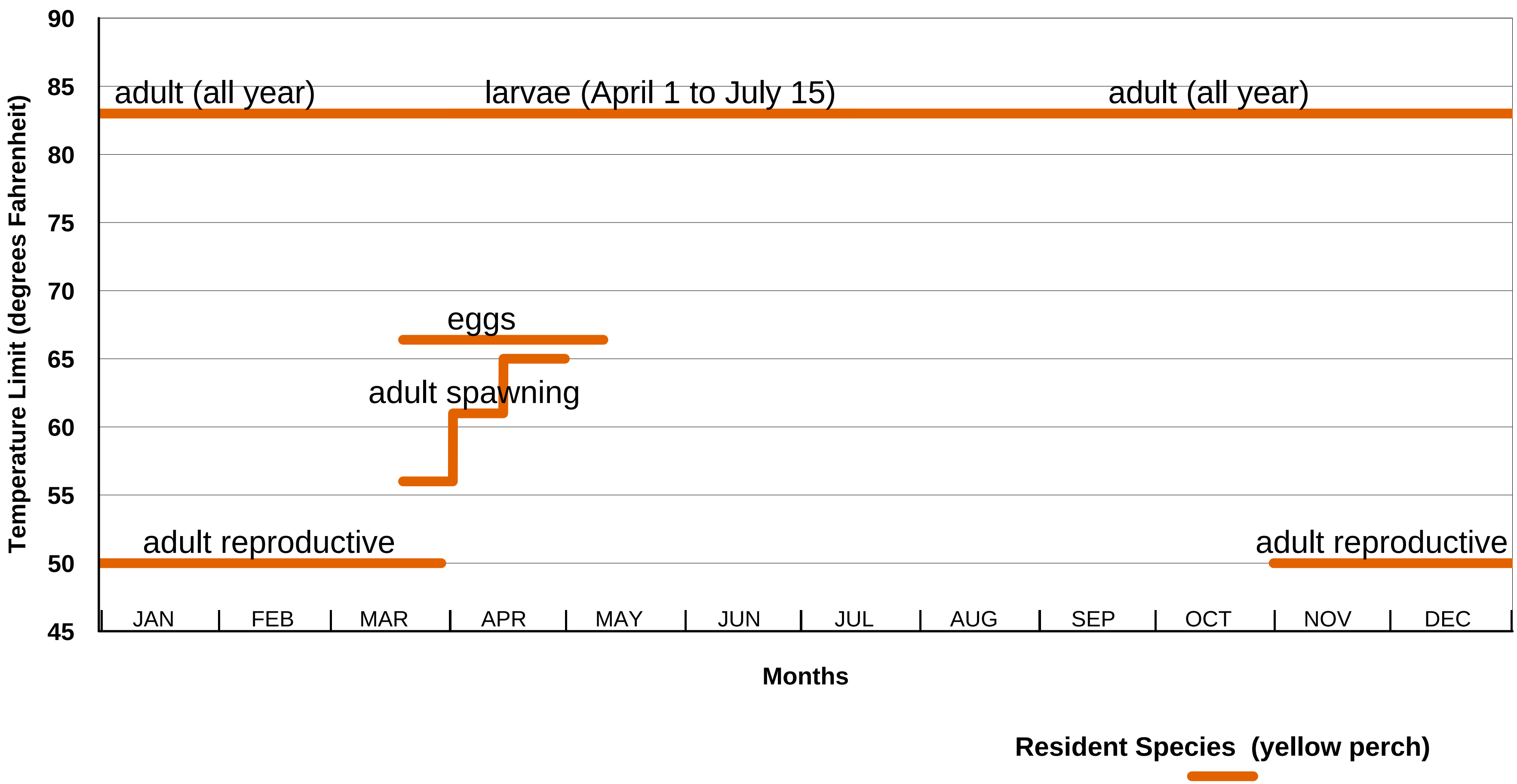


Figure 5.7-1 Maximum temperature limits in the Zone of Passage and Habitat for life stages of the most sensitive anadromous species in the lower Charles River Basin. For all life stages, the species used was alewife.

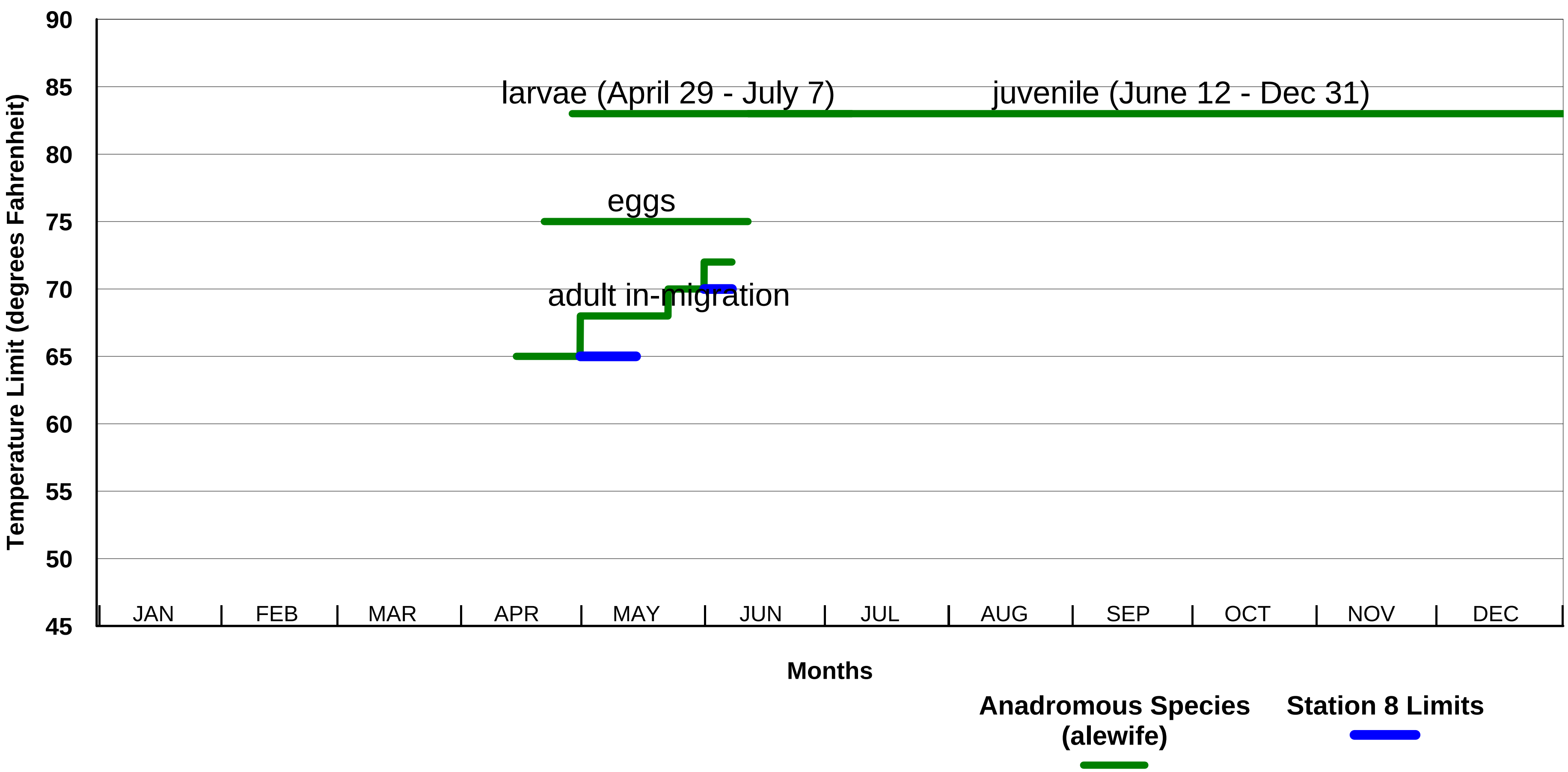
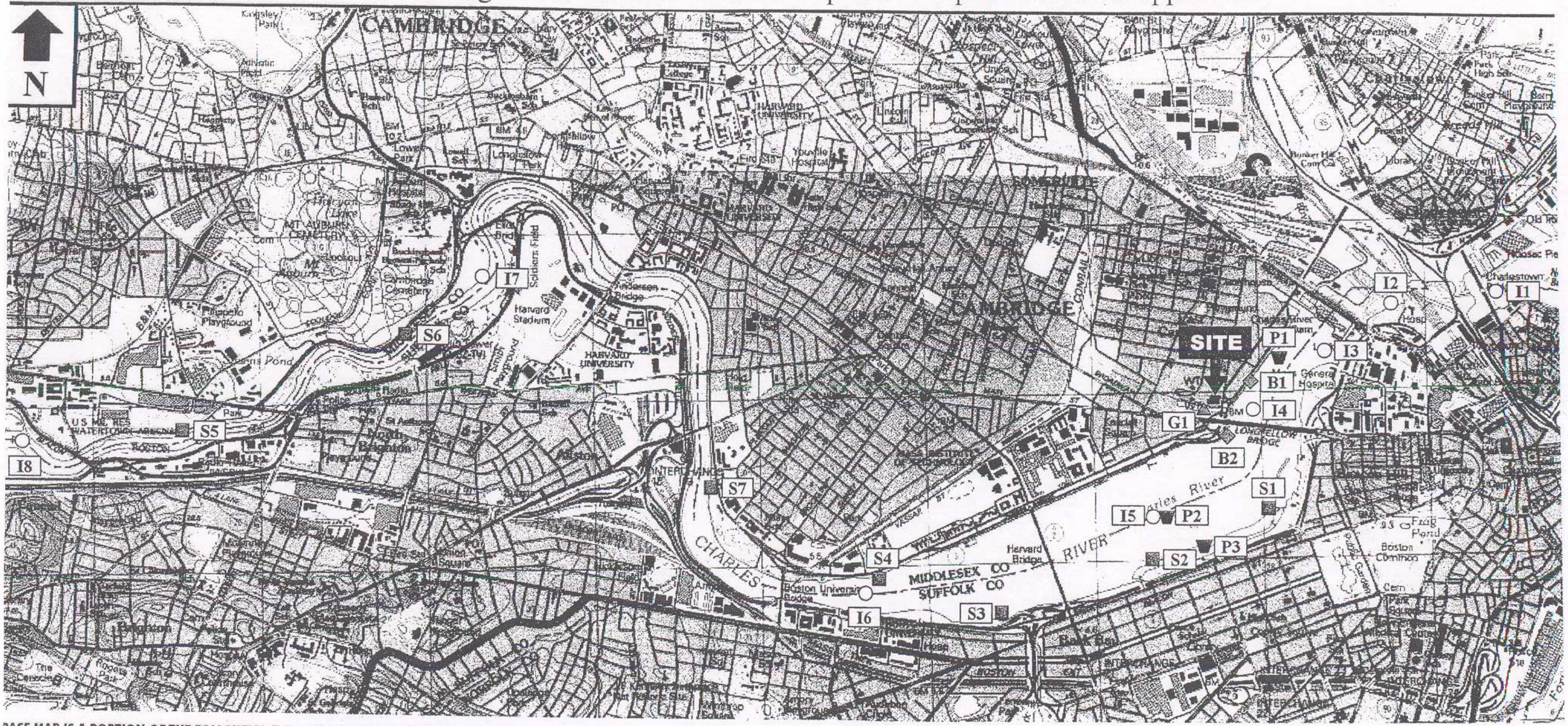


Figure 5.7.3b-1 Expanded map of lower Charles River Basin, with Mirant Kendall Environmental Sampling sites identified. Used without modification from Mirant Kendall Figure 1, labeled Kendall Biological Monitoring Locations and submitted as part of the permit renewal application.



BASE MAP IS A PORTION OF THE FOLLOWING 7.5' x 15' USGS TOPOGRAPHIC QUADRANGLES: BOSTON NORTH, MA 1987, BOSTON SOUTH, MA, 1985

LEGEND

○ **ICHTHYOPLANKTON STATION**
- I1 Below Locks
- I2 Museum
- I3 Old Channel
- I4 River
- I5 MIT
- I6 Hyatt
- I7 Soldiers Field
- I8 Marina

BEACH SEINE SITE
- S1 Fiedler
- S2 Lagoon
- S3 Storrow
- S4 Hyatt
- S5 UPN38
- S6 Greenough
- S7 Magazine

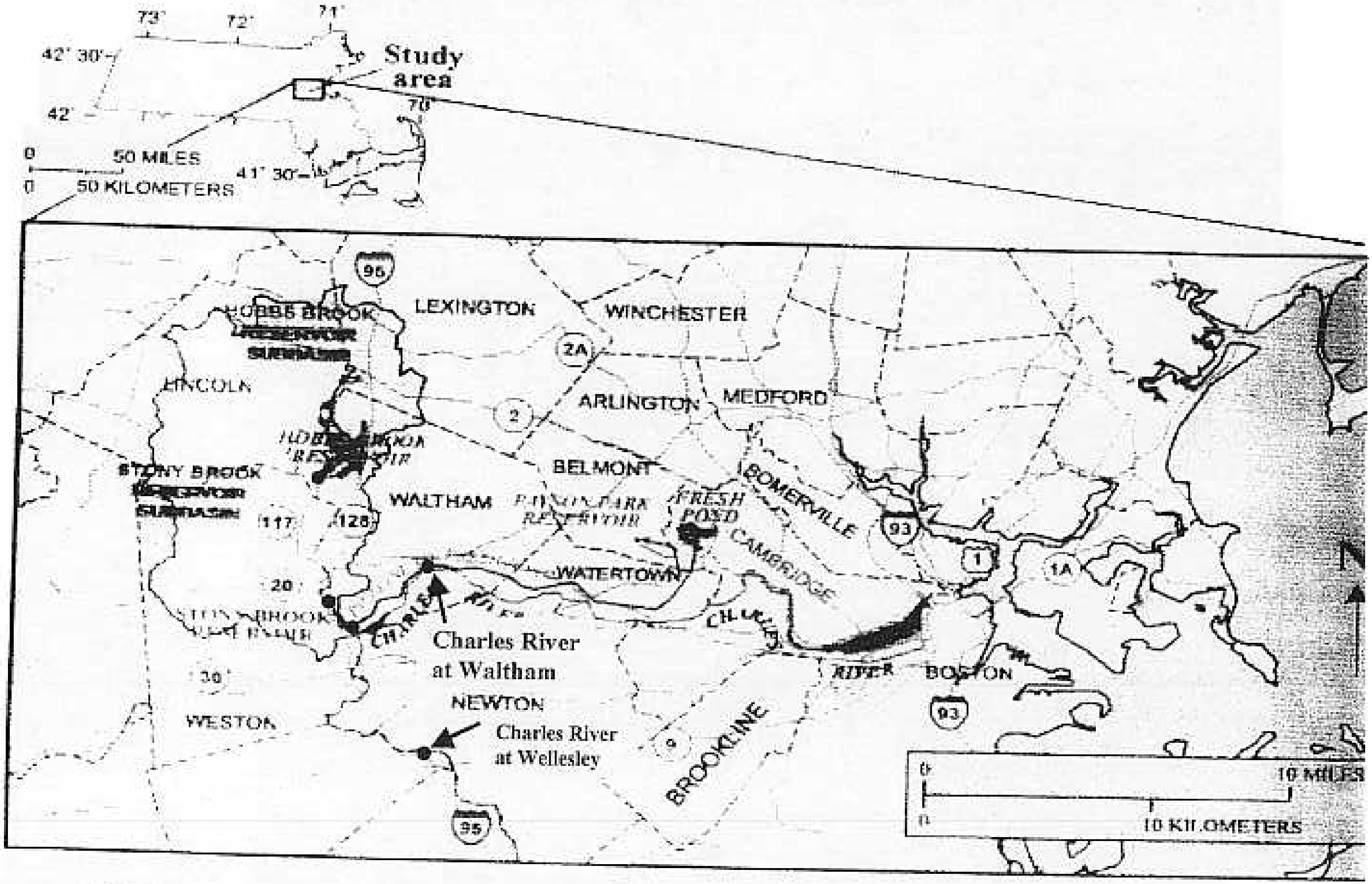
◈ **BENTHIC TRANSECT**
- B1 Diffuser
- B2 Longfellow Bridge

△ **GILLNET SAMPLE STATION**
- G1 Intake Gillnet

▼ **PHYTOPLANKTON STATION**
- P1 Discharge Area
- P2 MIT
- P3 Storrow

0 1000 2000
scale in feet

Expanded map of the Charles River, showing areas as far upstream as the Charles River at Waltham. Taken from USGS Fact Sheet 101-98 (September, 1998).



Source: USGS Fact Sheet 101-98, September, 1998

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- USGS Gauging Stations

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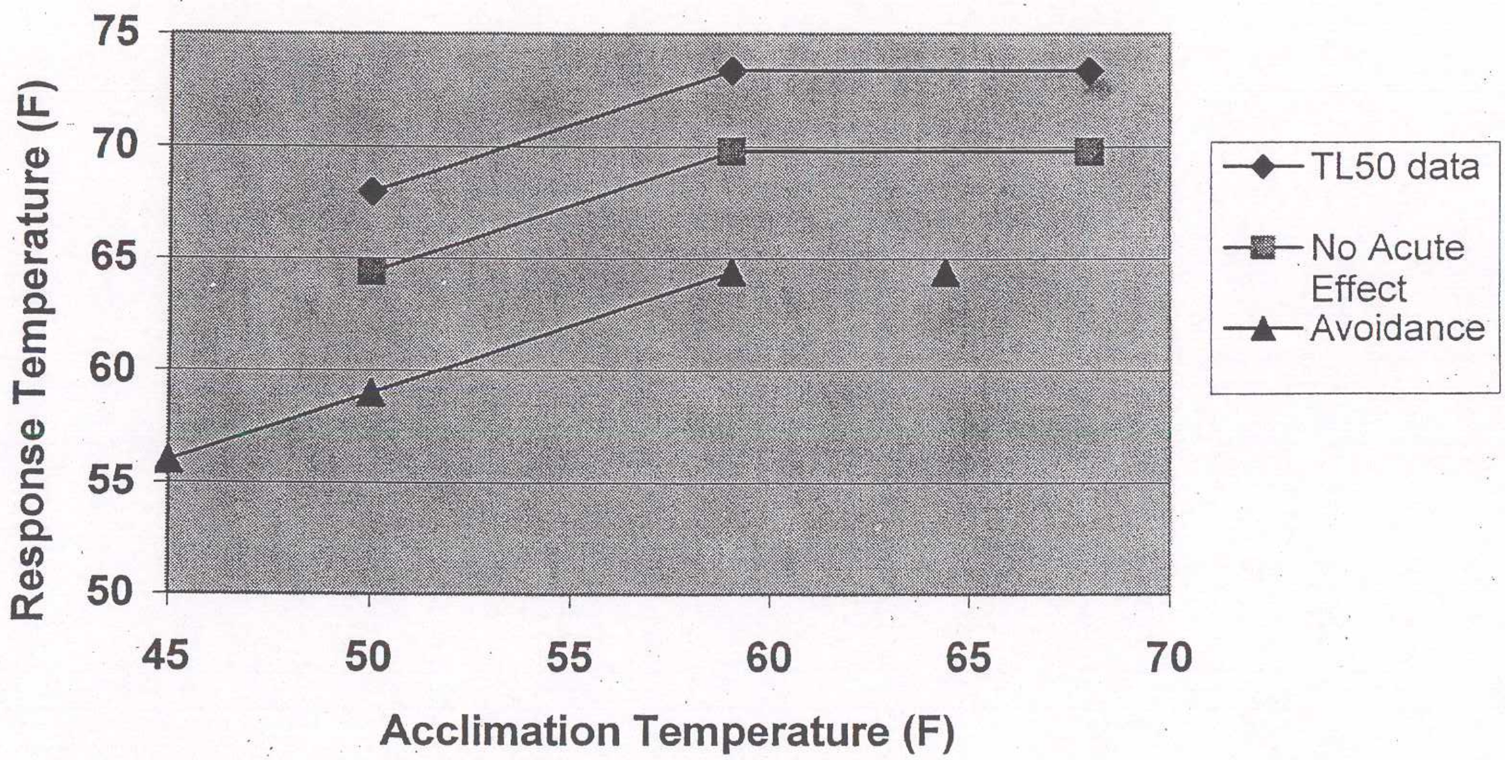
tl
10'1

Figure 5.7.3c-1 **Actual and predicted tolerance responses for adult alewives at entry to spawning. TL50 data from Graham, 1956; NOAEL values predicted from Coutant; avoidance value at acclimation of 64.4F from Richkus; other avoidance values estimated.**



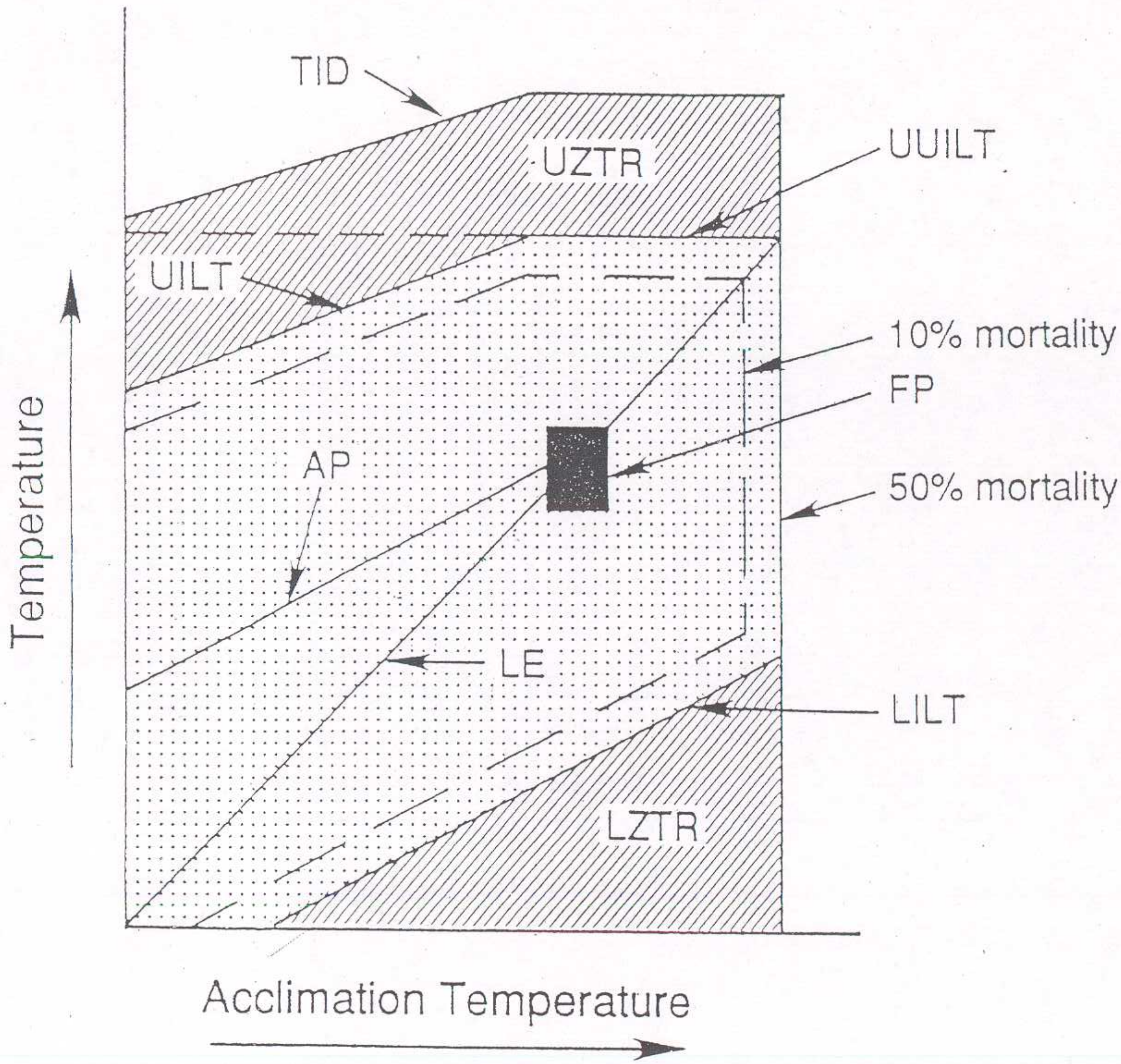
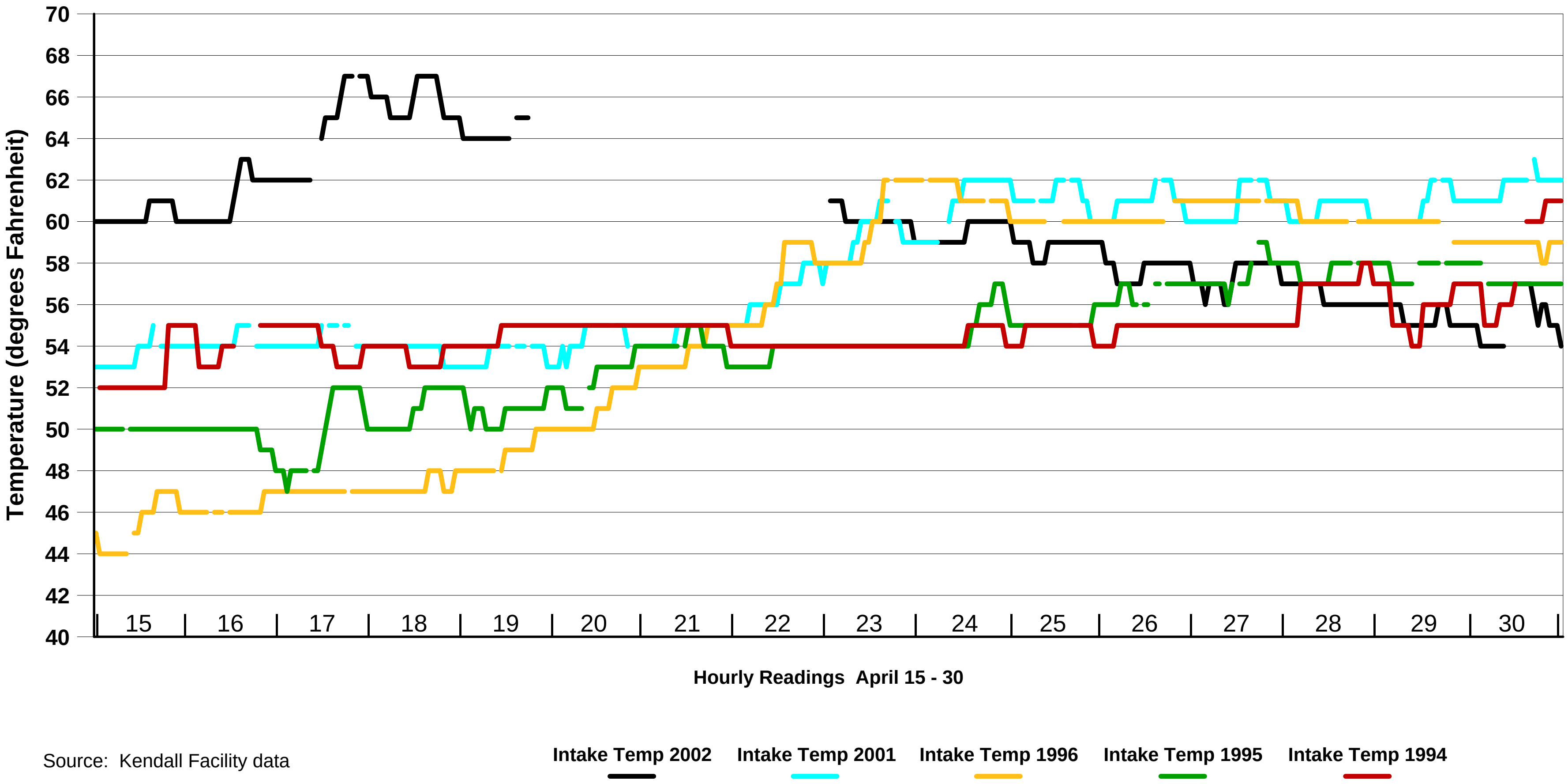


Figure 5.7.3c-2

Temperature tolerance responses for a hypothetical fish. The *dotted* area represents the zone of thermal tolerance (Brett 1960; Coutant 1970; Jobling 1981). AP = acute thermal preferendum, LE = line of equality, LILT = lower incipient lethal temperature, FP = final preferendum, UUILT = upper ultimate incipient lethal temperature, TID = temperature of instantaneous death, LZTR = lower zone of thermal resistance, and UZTR = upper zone of thermal resistance. The responses can vary within and between species because of genetic differences, environmental influences, and other factors, including the life stage. The area bounded by the 50% mortality line is the zone of thermal tolerance.

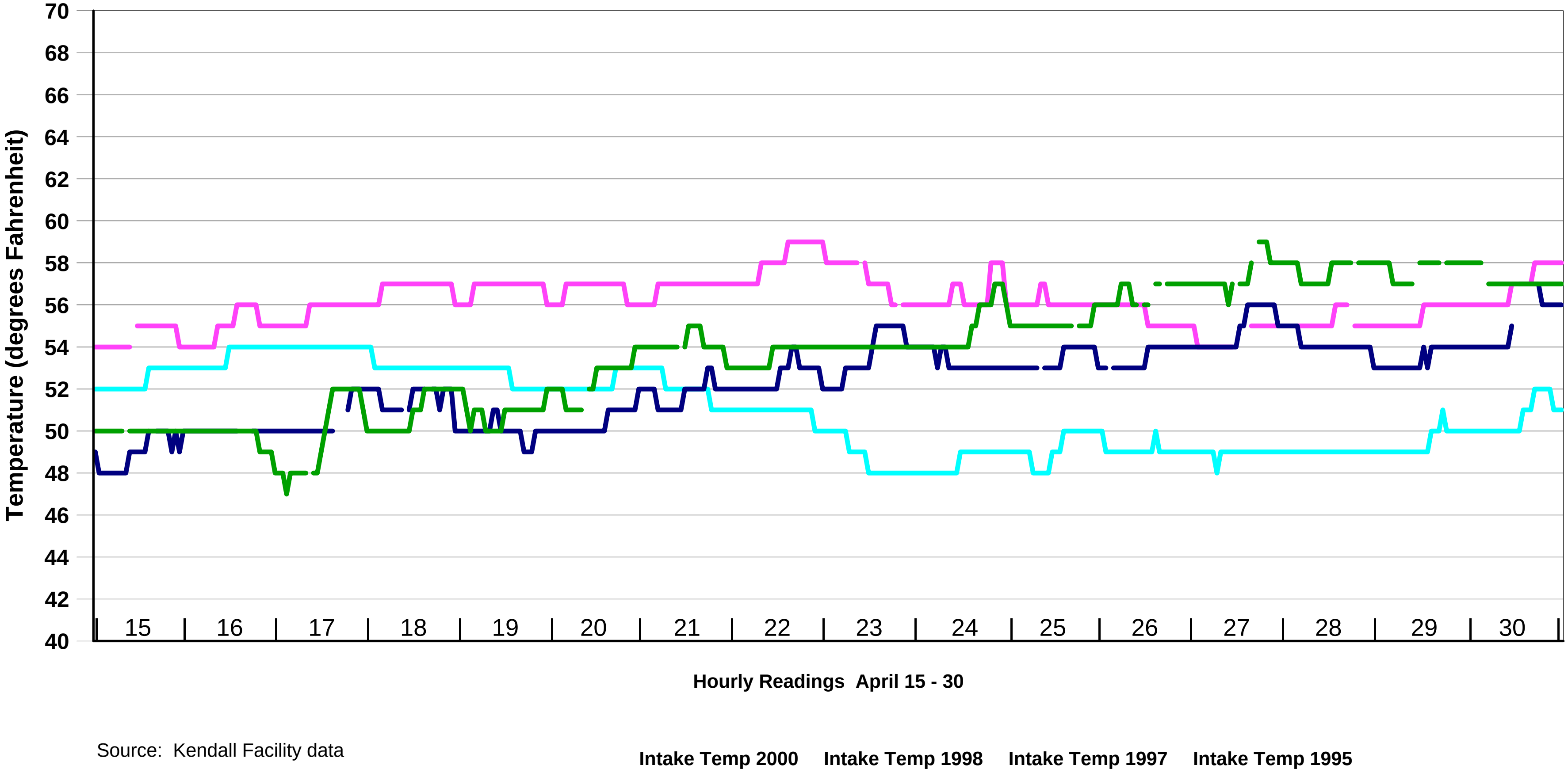
Figure 5.7.3c - 3.

Kendall Station intake continuous temperatures from April 15 - 30, for the years 1994, 1995, 1996, 2001 and 2002. Presented as ambient temperatures to evaluate a protective in-migration temperature of 15.6 C (60 F) for alewife.



Source: Kendall Facility data

Figure 5.7.3c - 4.
Kendall Station intake continuous temperatures from April 15 - 30, for the years 1995, 1997, 1998 and 2000. Presented as ambient temperatures to evaluate a protective in-migration temperature of 15.6 C (60 F) for alewife.



Source: Kendall Facility data

Figure 5.8.1-1 Protective temperature limits and time periods for the most sensitive resident species and the most sensitive anadromous species, organized by month. When two different temperature limits were identified for the same time period, the lowest protective temperature was used as the limit, for as long as it applied. The life stages being protected are also identified. Additional protective temperatures in effect at Station 8 are included. American shad protective temperature values are included for information only at this time.

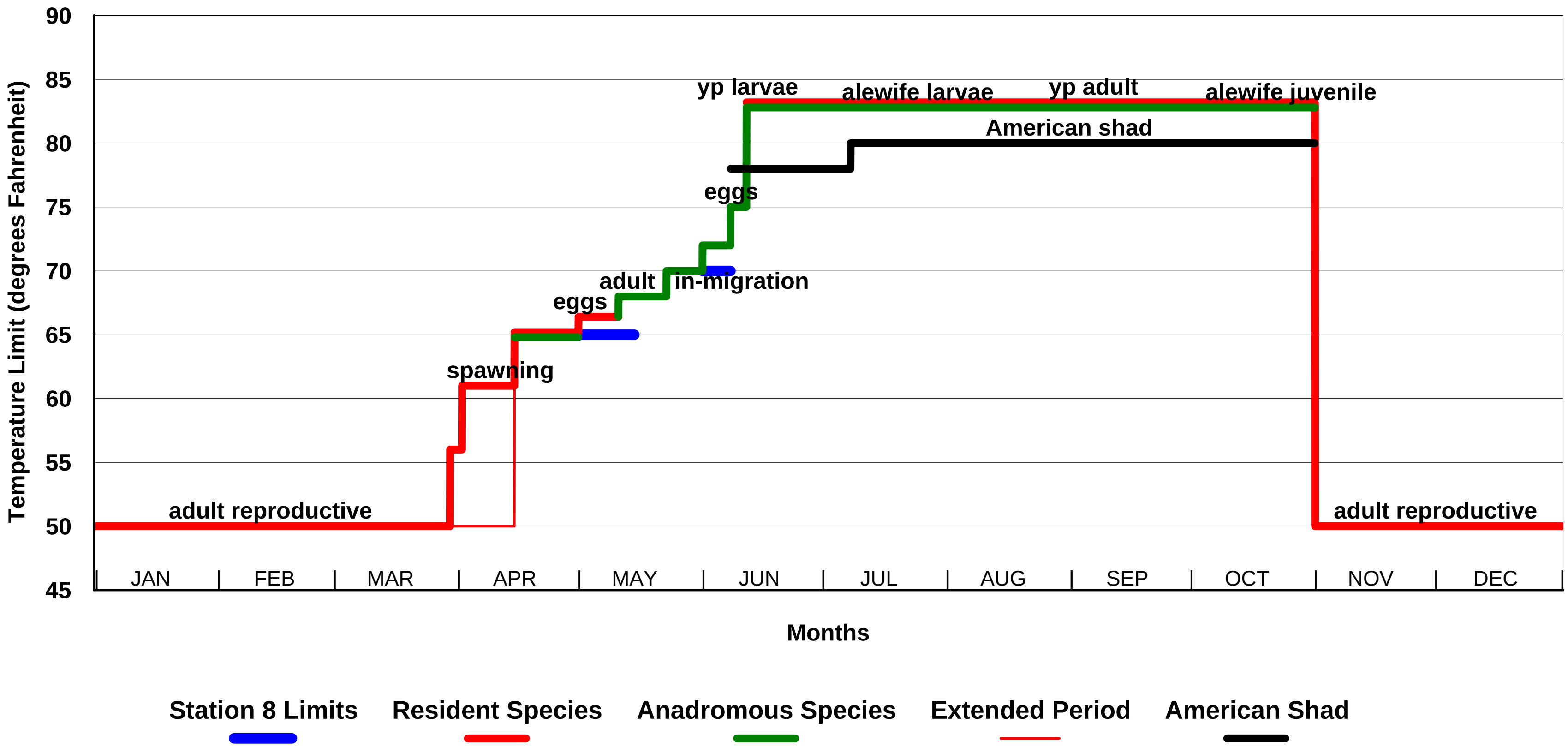


Figure 5.8.2b-1 Information submitted by Mirant Kendall showing the percent (%) of the lower Charles River Basin between the Boston University Bridge and the New Charles River Dam and Locks simulated to have an ambient temperature rise greater than specified temperatures in August, under future facility operating conditions. The information is derived from a predictive model designed by the permittee.

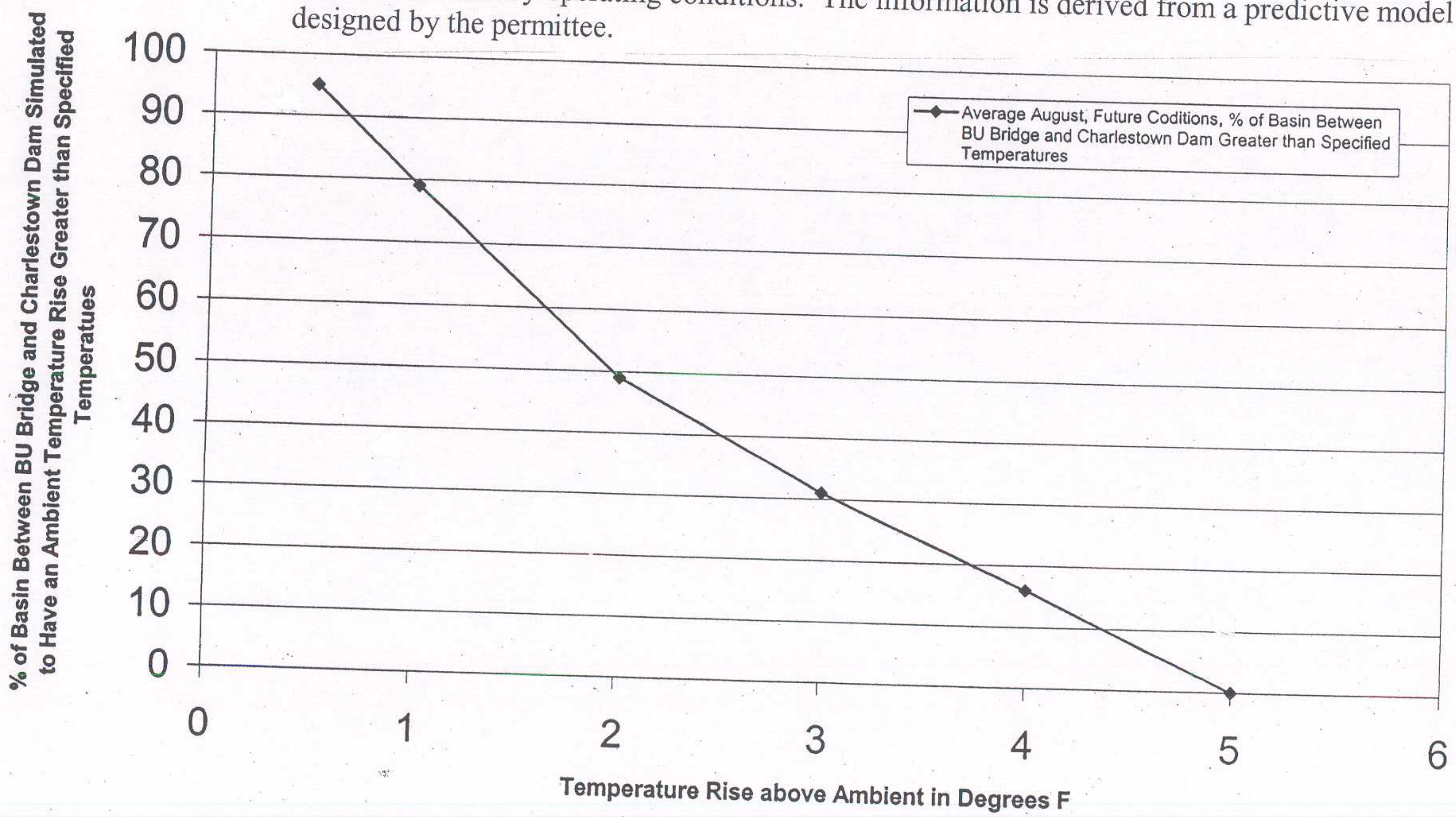
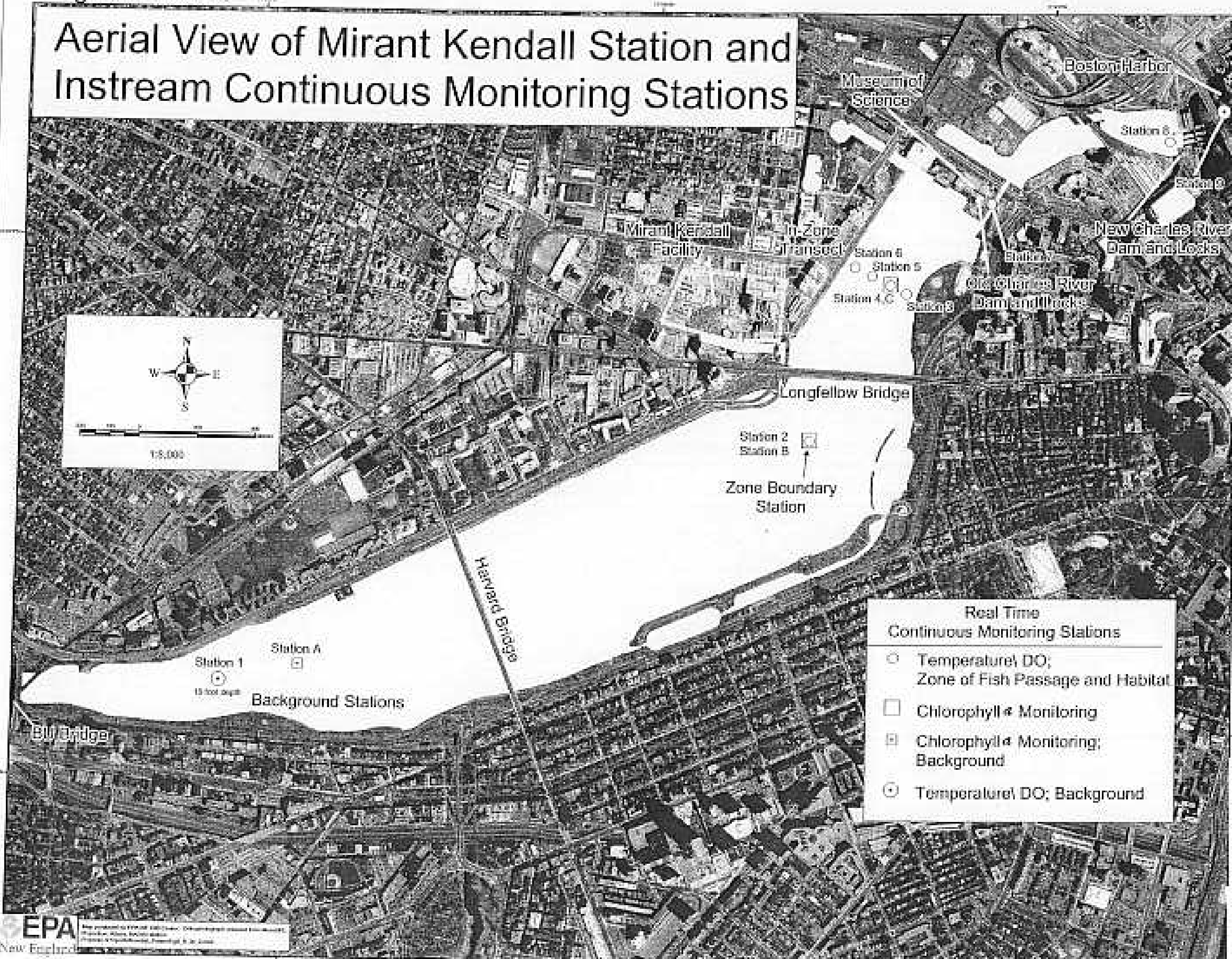
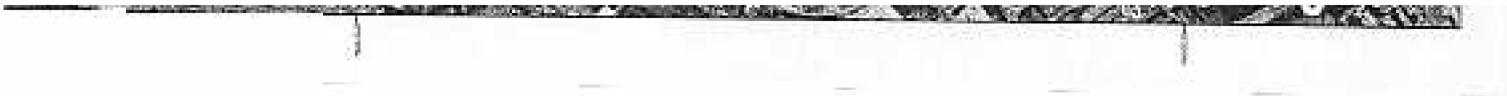


Figure 5.8.2b-2





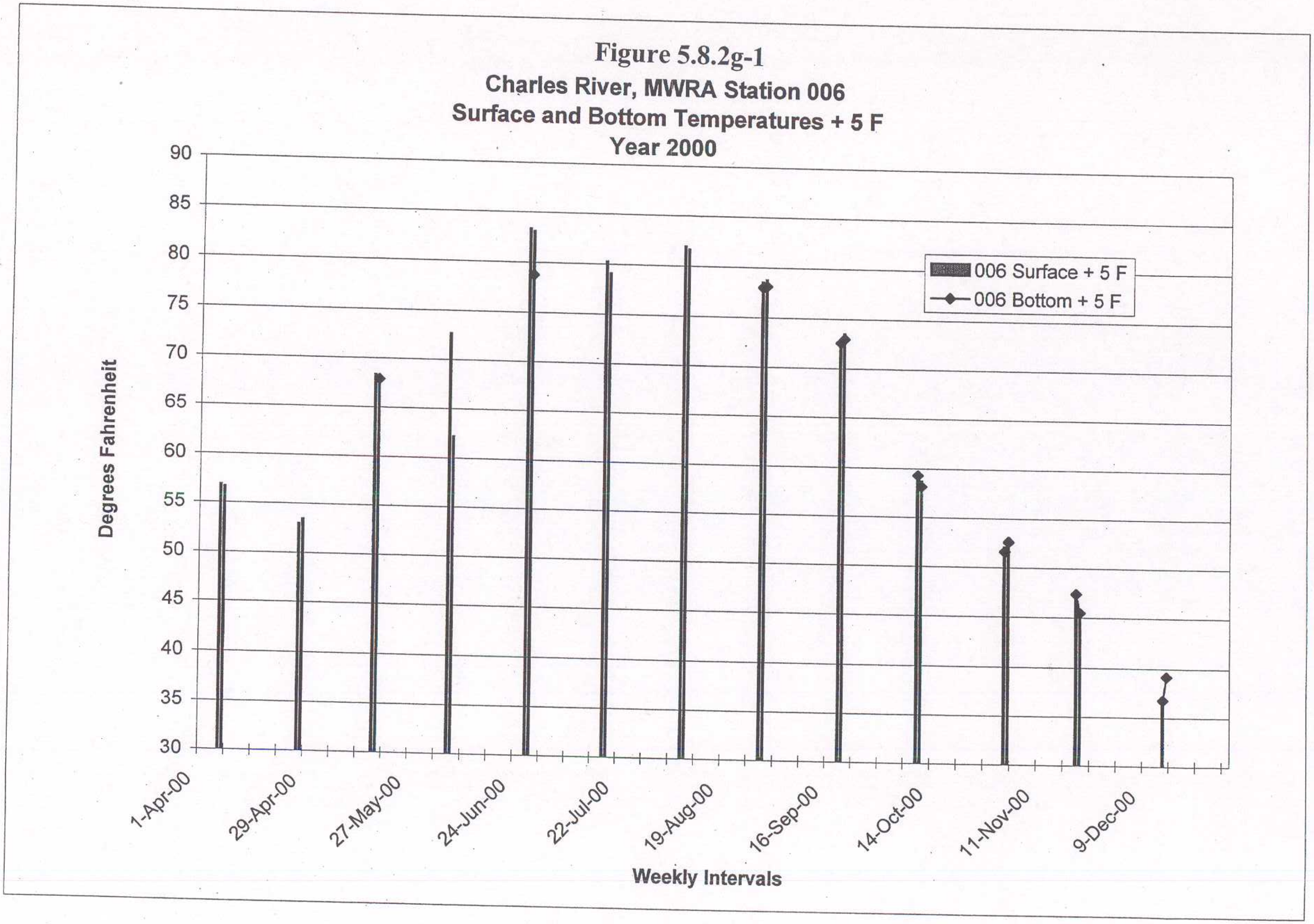


Figure 5.8.2g-1
Charles River, MWRA Station 006
Surface and Bottom Temperatures + 5 F
Year 2000
006 Surface + 5 F
006 Bottom + 5 F
Degrees Fahrenheit
90
85
80
75
70
65
60
55
50
45
40
35
30
1-Apr-00
29-Apr-00
27-May-00
24-Jun-00
22-Jul-00
19-Aug-00
16-Sep-00
14-Oct-00
11-Nov-00
9-Dec-00
Weekly Intervals

Figure 5.8.2g-2

Charles River, MWRA Station 006

Surface and Bottom Temperatures + 5 F

Year 2001

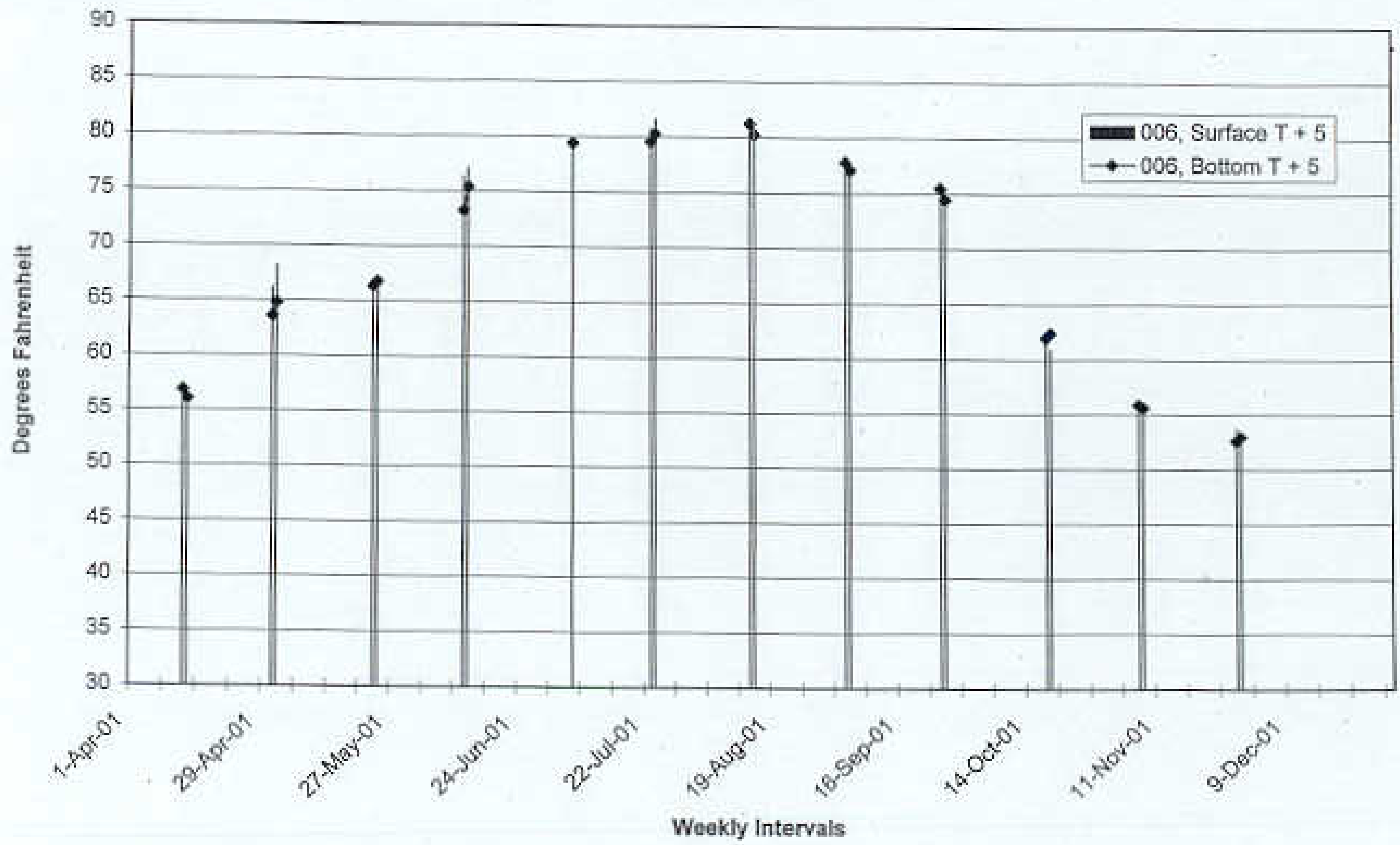


Figure 5.8.2g-3

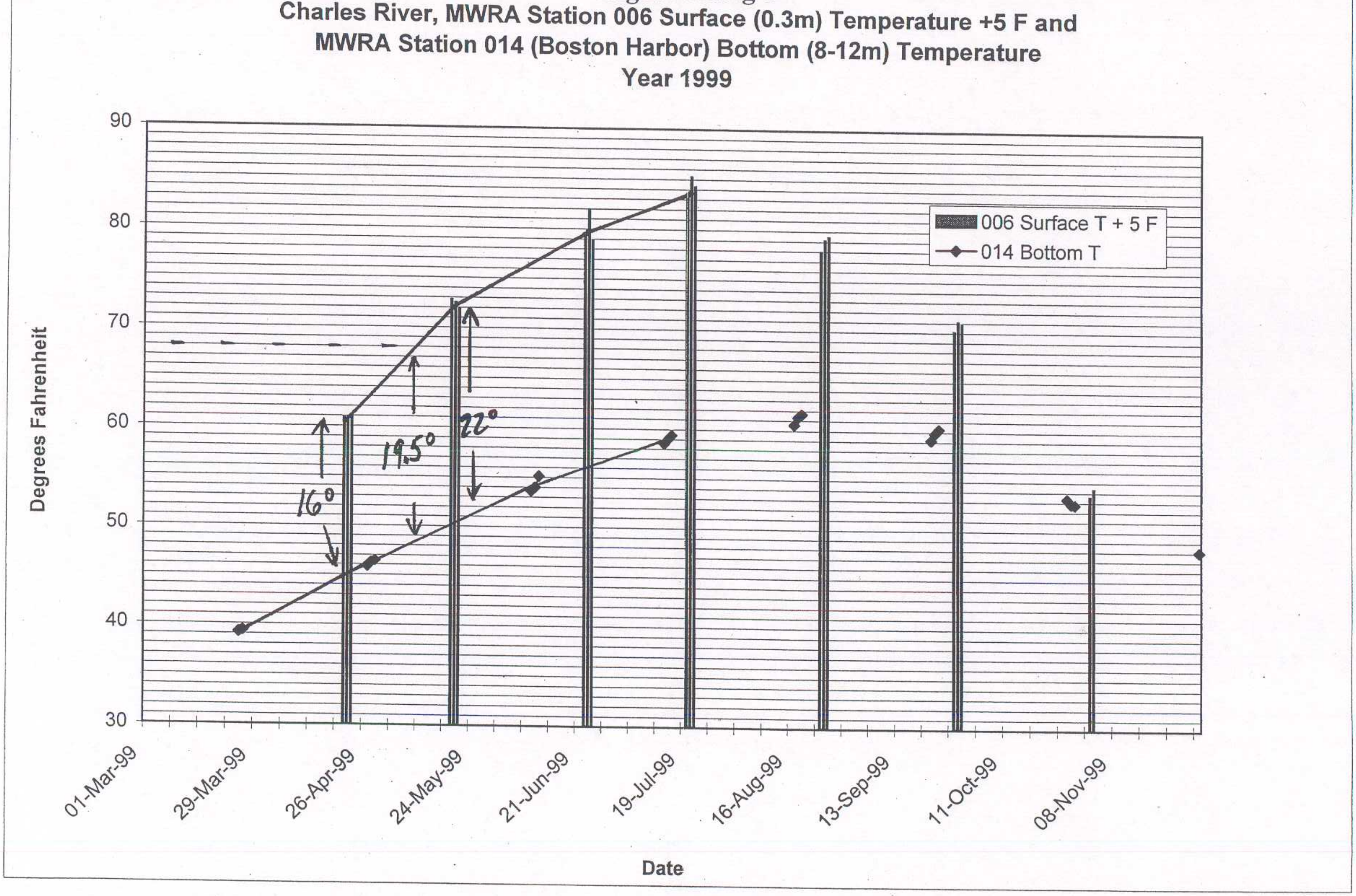


Figure 5.8.2g-4

Charles River, MWRA Station 006, Surface Temperature + 5 F and MWRA Station 014, Bottom Temperature Year 2000

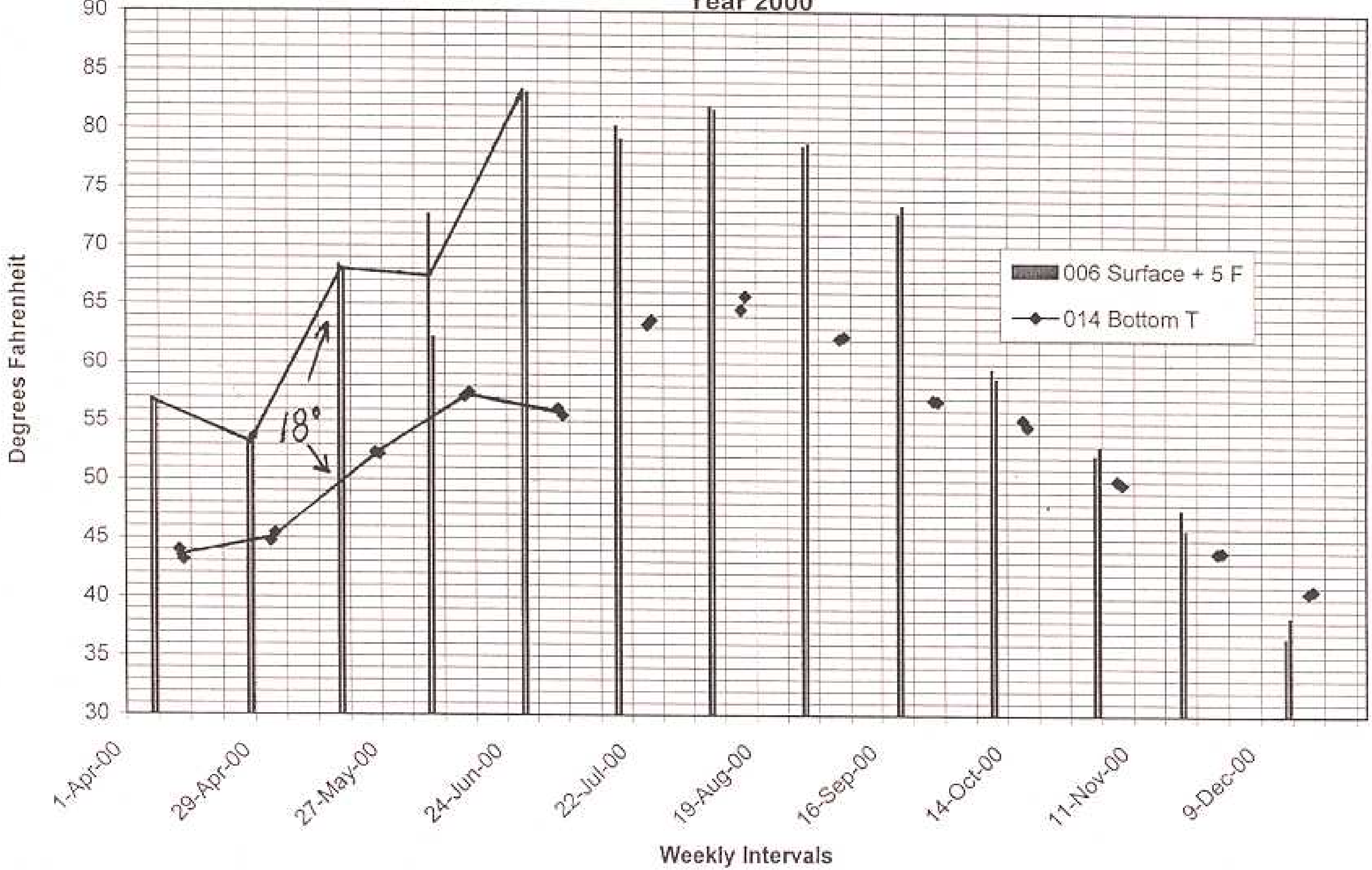


Figure 5.8.2g-5

Charles River, MWRA Station 006 Surface Temperature + 5 F and MWRA Station 014 Bottom Temperature Year 2001

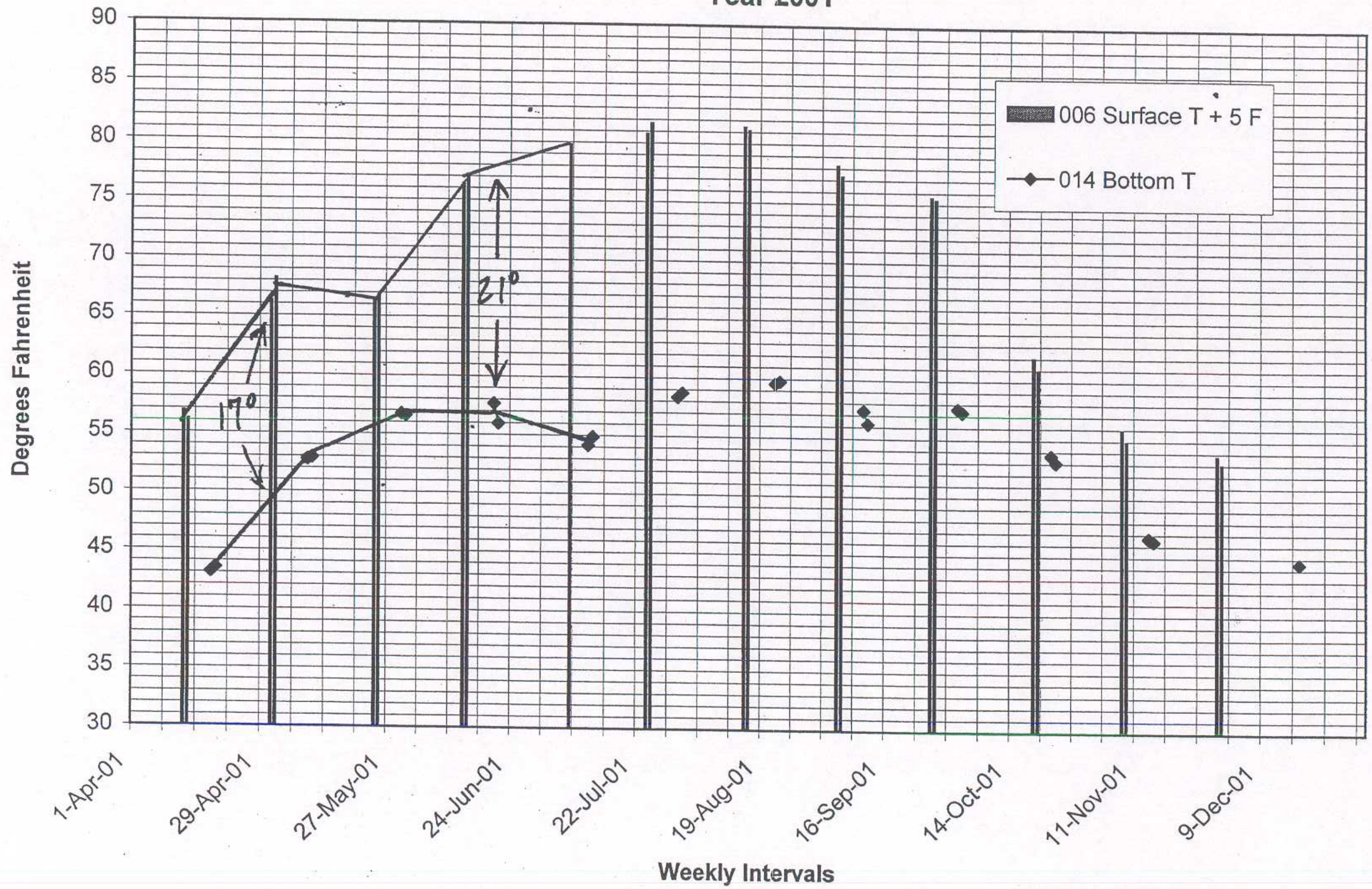


Figure 5.8.2g-6

Charles River, MWRA Station 006 Surface (0.3m) Temperature + 5F and MWRA Station 014 (Boston Harbor) Surface (0.3m) Temperature Year 1999

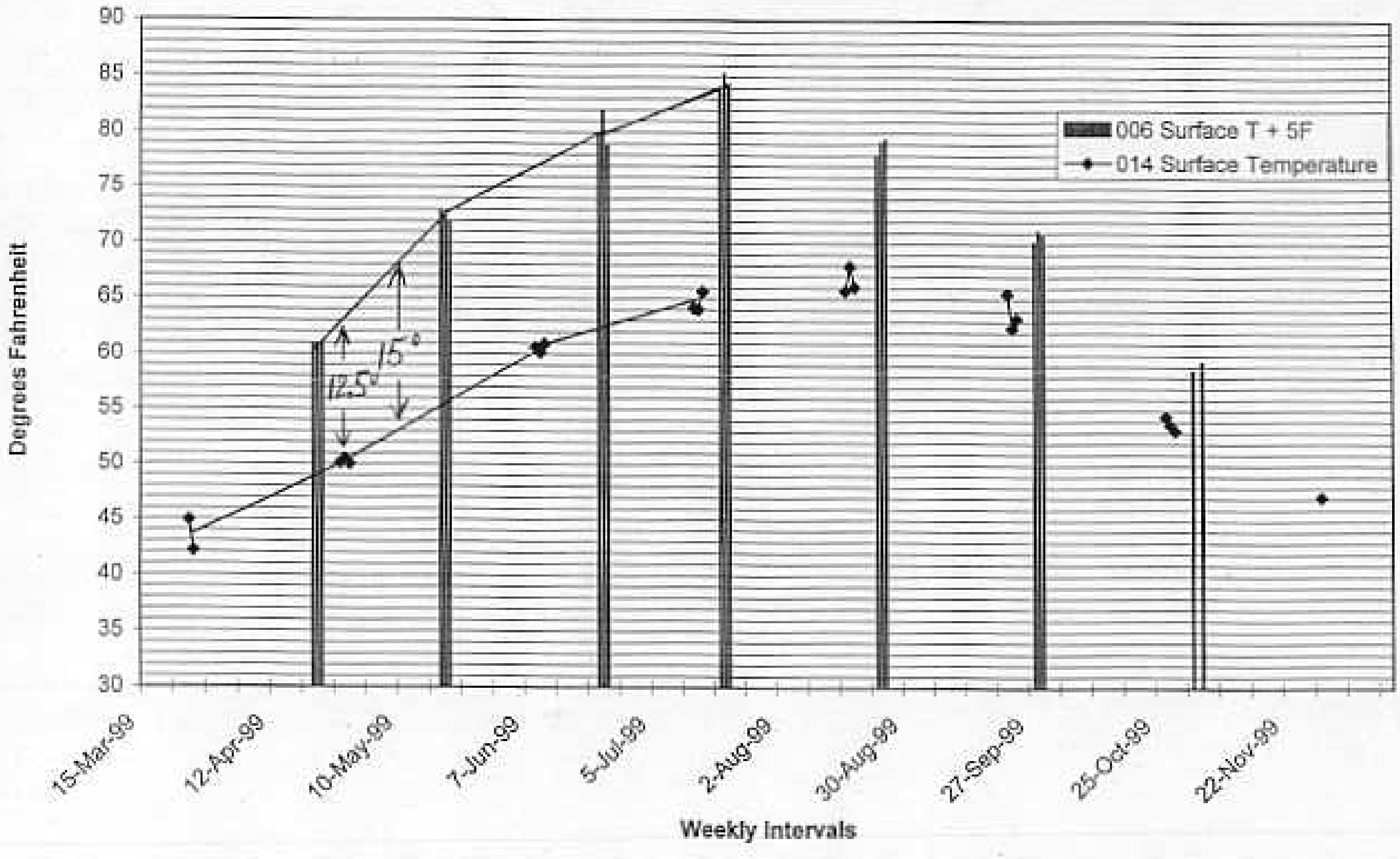


Figure 5.8.2g-7

Charles River, MWRA Station 006 Surface (0.3m) Temperature +5F and MWRA Station 014 (Boston Harbor) Surface (0.3m) Temperature Year 2000

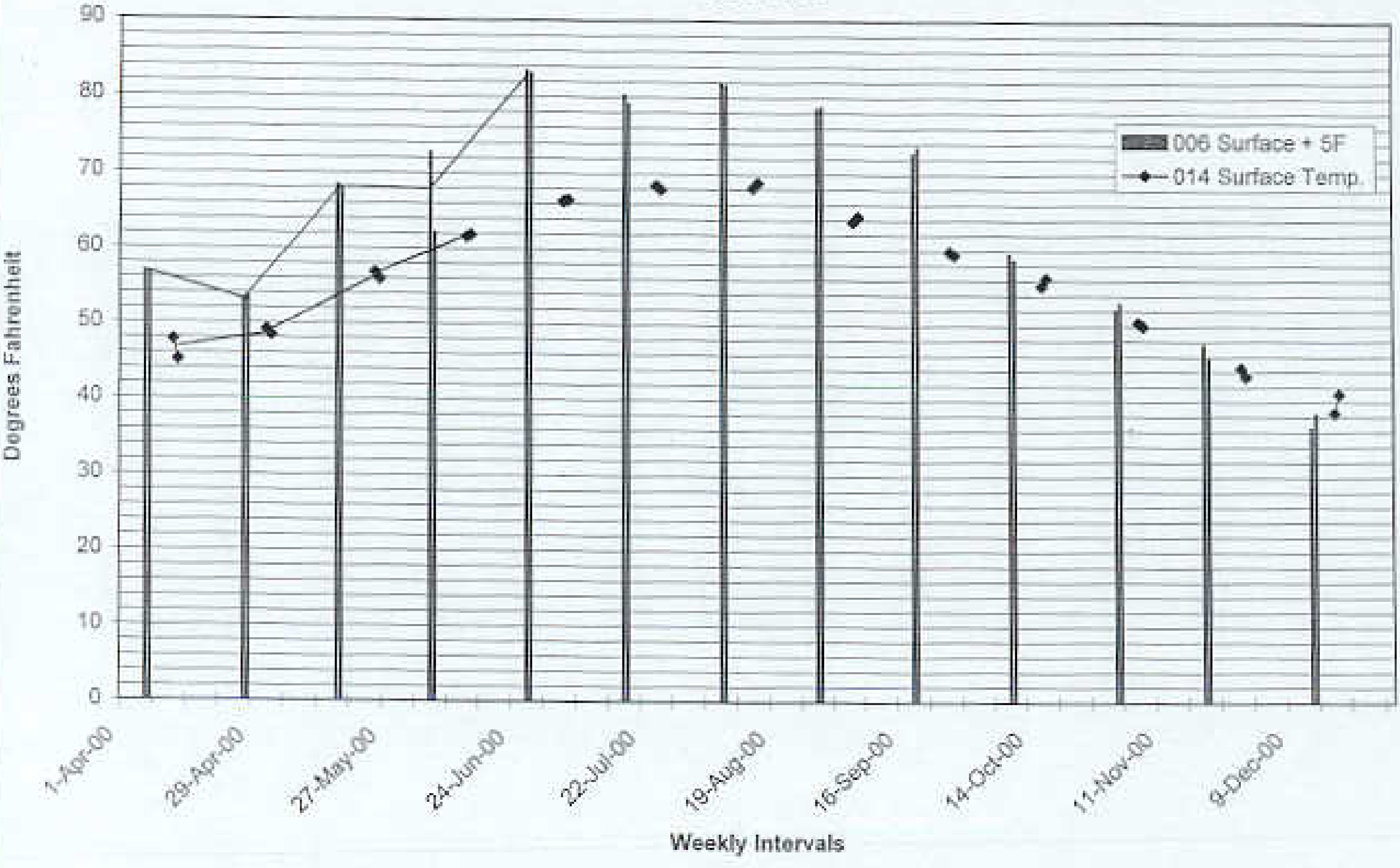


Figure 5.8.2g-8

Charles River, MWRA Station 006 Surface (0.3m) Temperature + 5f and MWRA Station 014 (Boston Harbor) Surface (0.3m) Temperature Year 2001

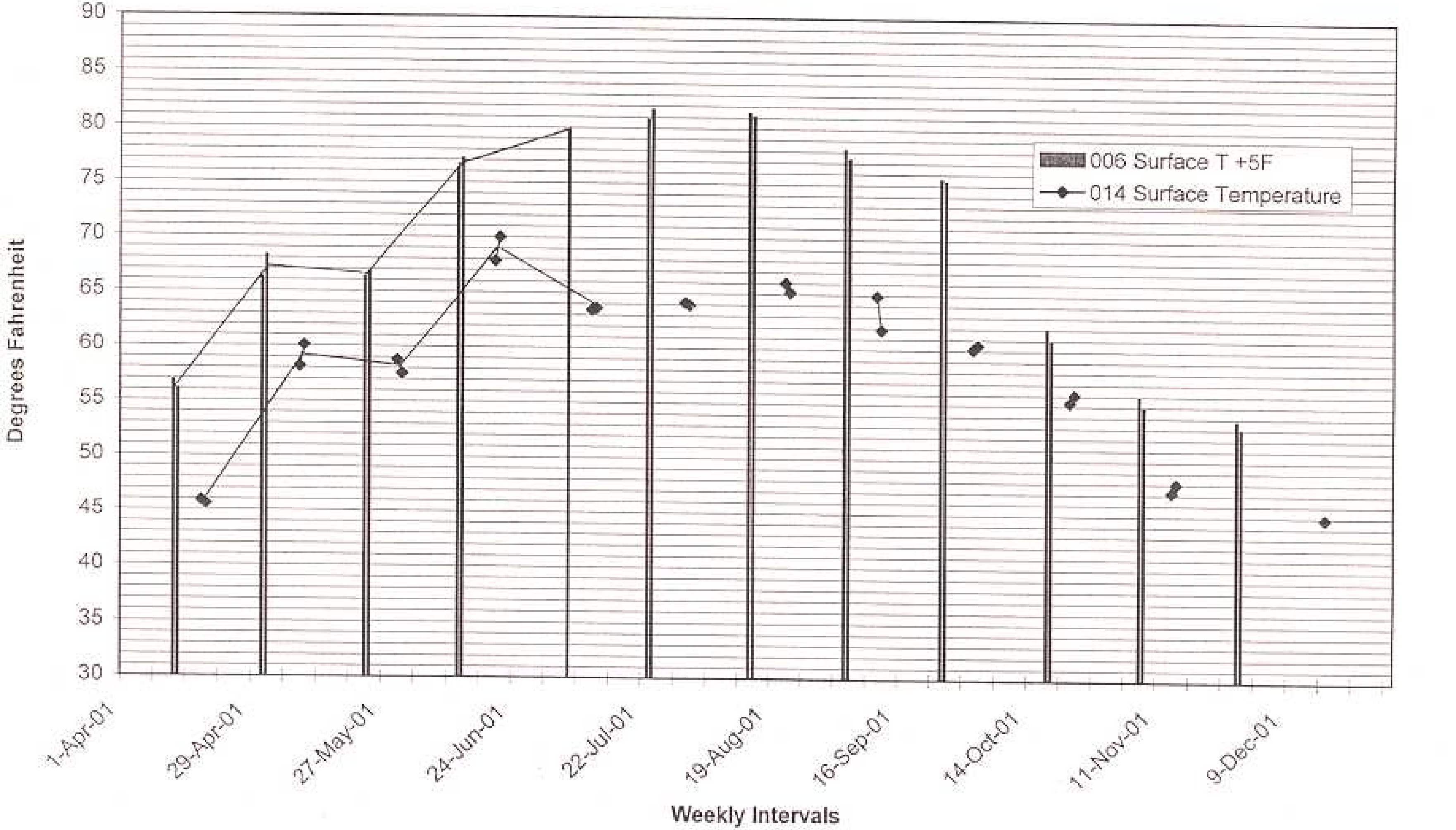


Figure 5.8.2l-1

Charles River, MWRA Station 006 Surface Temperatures with and without Delta T of 5 F Year 1999

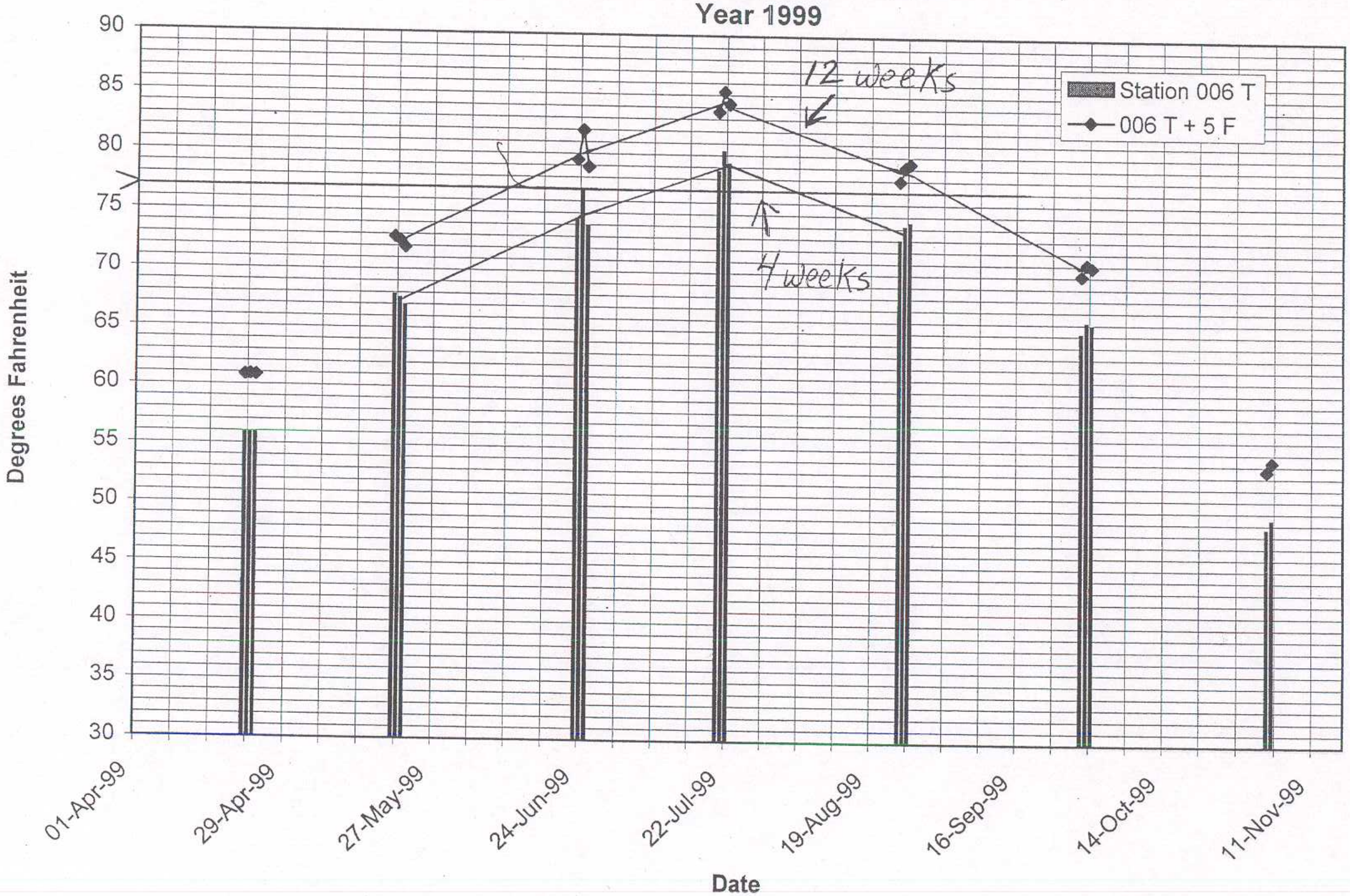


Figure 5.8.21-2

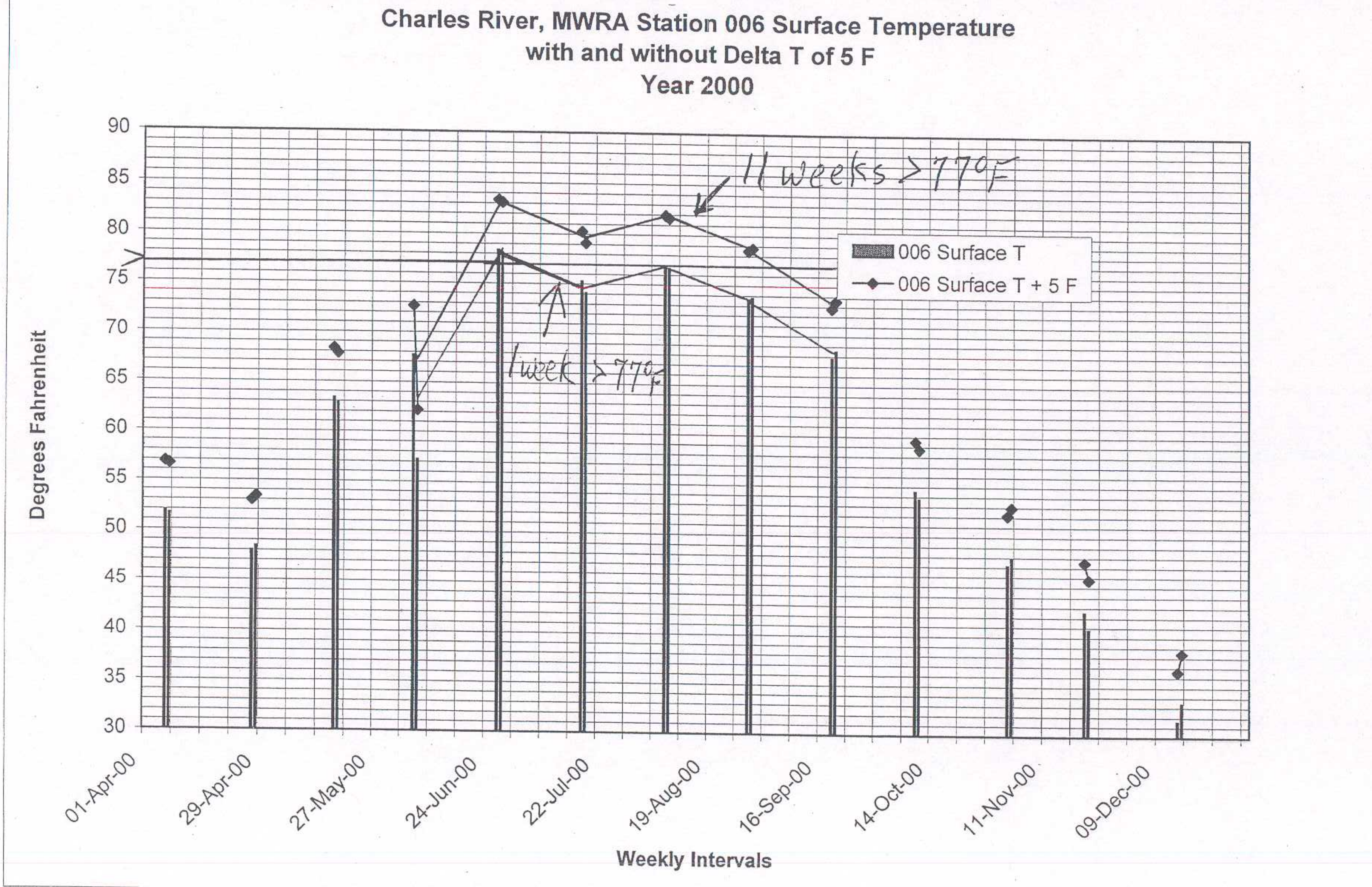


Figure 5.8.21-3

Charles River, MWRA Station 006 Surface Temperatures with and without Delta T of 5 F Year 2001

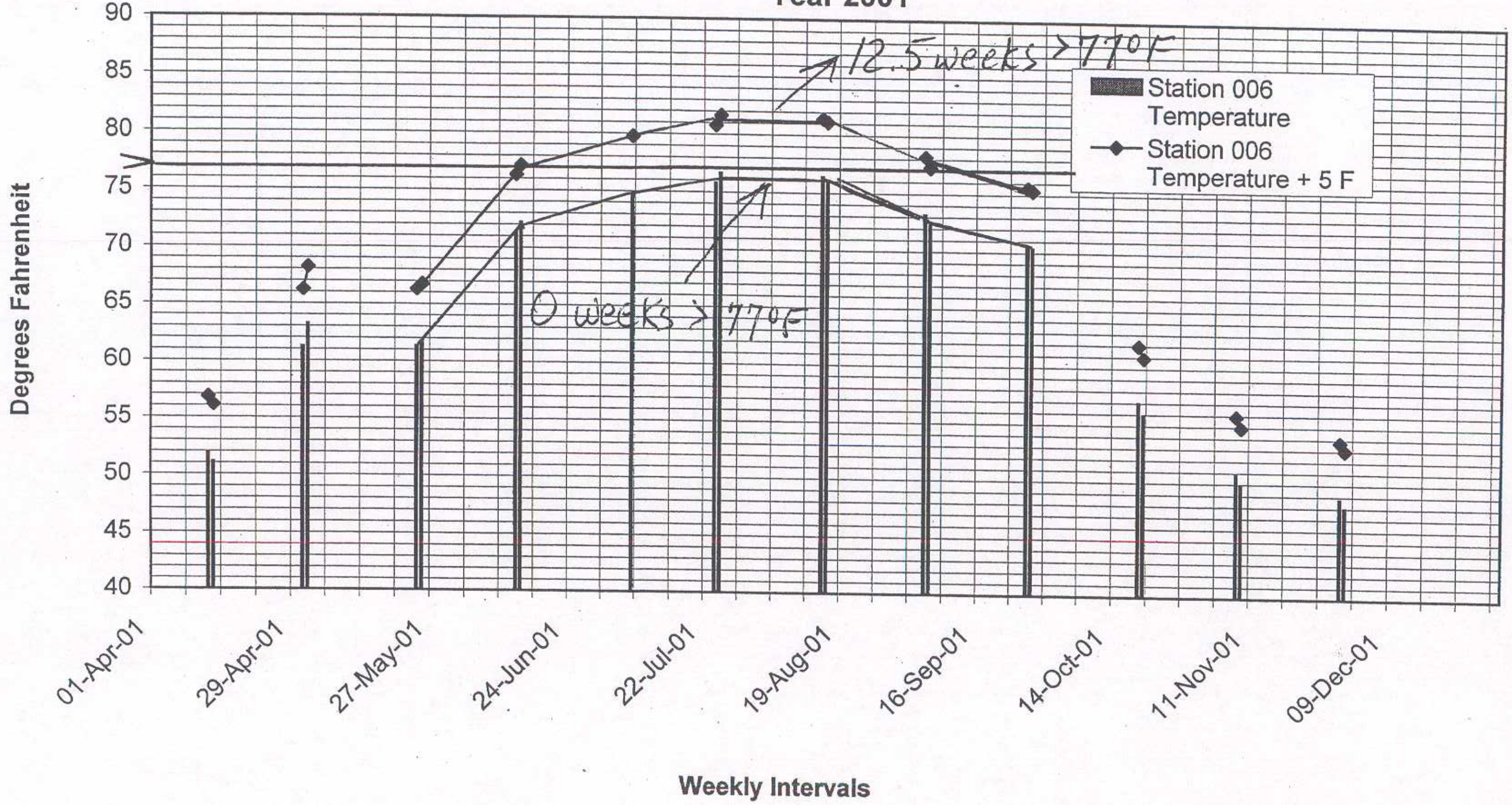
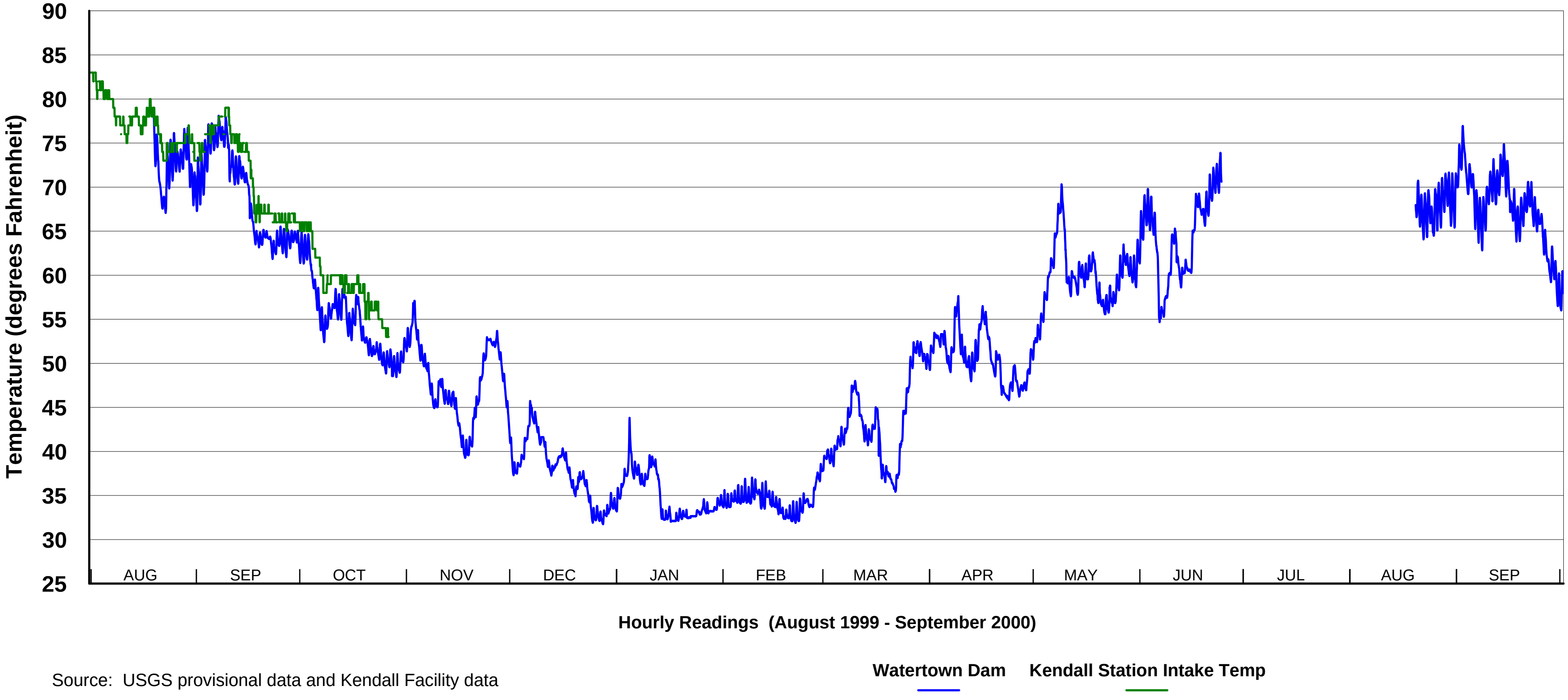
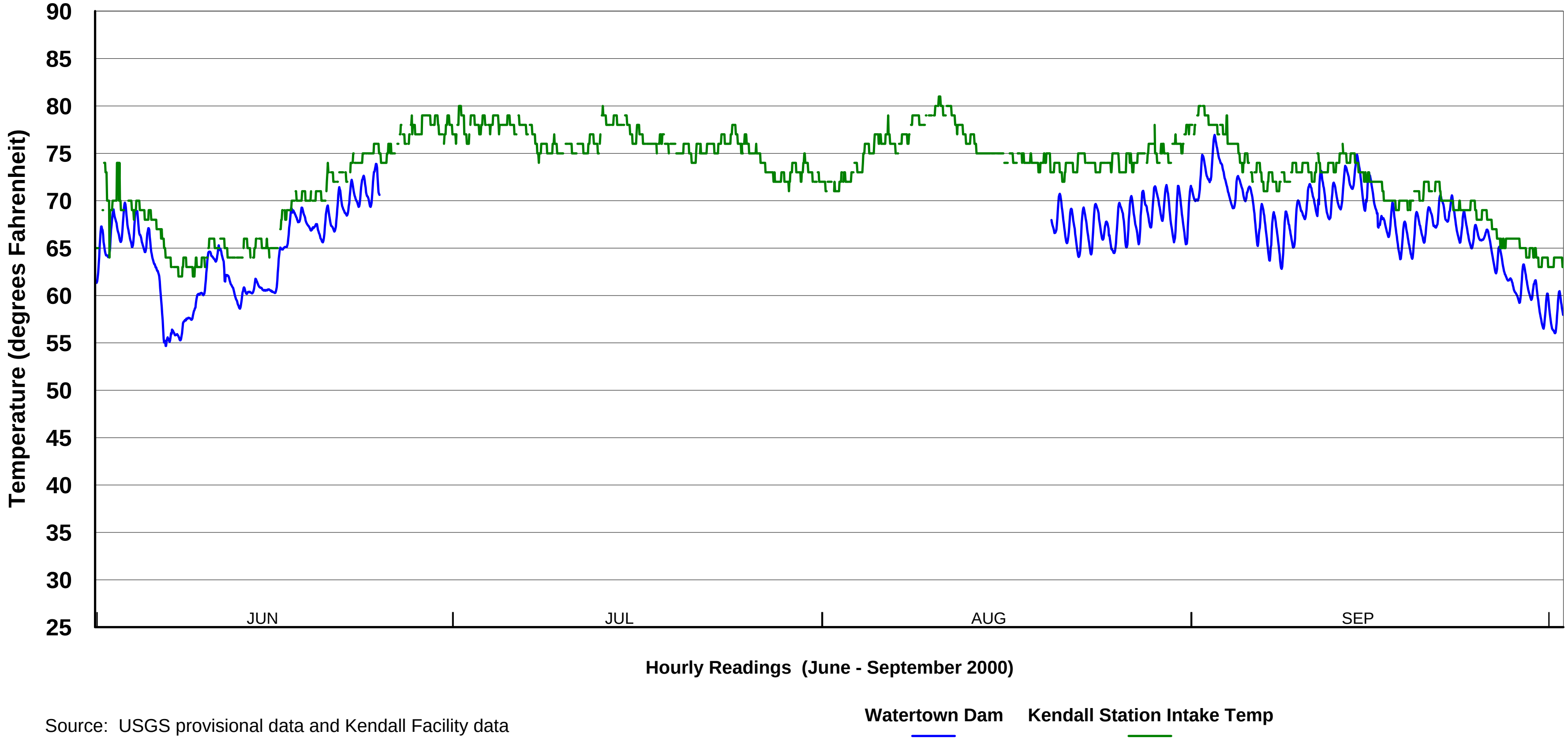


Figure 5.9.2-1 Charles River continuous temperature data from a discrete depth at the Watertown Dam compared with Kendall Station Intake temperatures for the same time period. Watertown Dam temperatures are USGS provisional data and Kendall Intake temperatures are from Mirant Kendall (August 1999 - September 2000).



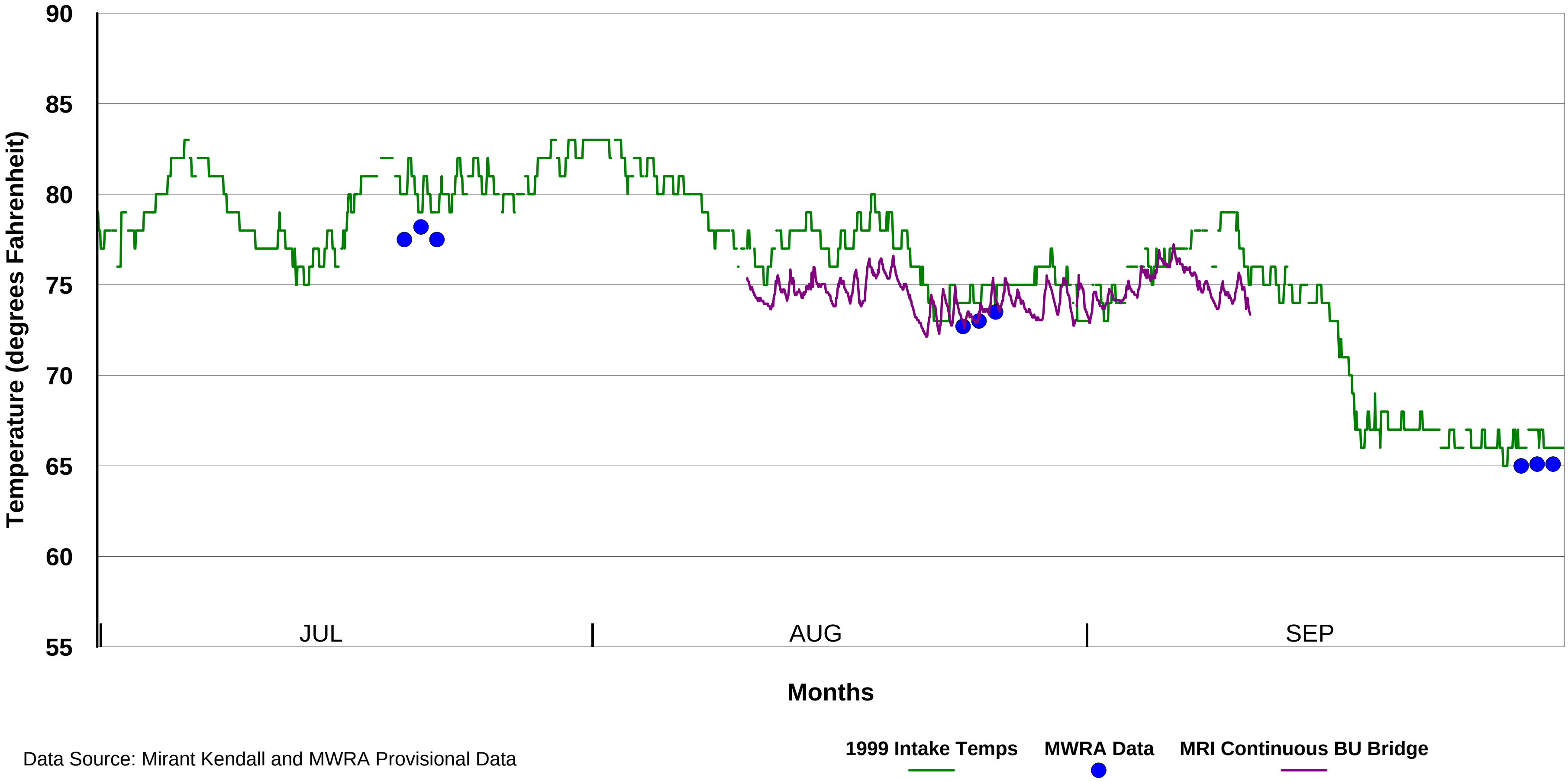
Source: USGS provisional data and Kendall Facility data

Figure 5.9.2-2 Charles River continuous temperature data from a discrete depth at the Watertown Dam compared with Kendall Station Intake temperatures for the same time period. Watertown Dam temperatures are USGS provisional data and Kendall Intake temperatures are from Mirant Kendall (June - September 2000).



Source: USGS provisional data and Kendall Facility data

Figure 5.9.2-3 Kendall Station intake continuous temperatures compared with continuous temperatures measured near the Boston University Bridge. Temperatures taken once a day in the same location by the Massachusetts Water Resources Authority (MWRA) were also included (July - September, 1999).



Data Source: Mirant Kendall and MWRA Provisional Data

Figure 5.9.2-4 Kendall Station intake continuous temperatures compared with continuous temperatures measured near the Boston University Bridge and the Harvard Bridge. Mirant Kendall data (May 15 - August 23, 2002).

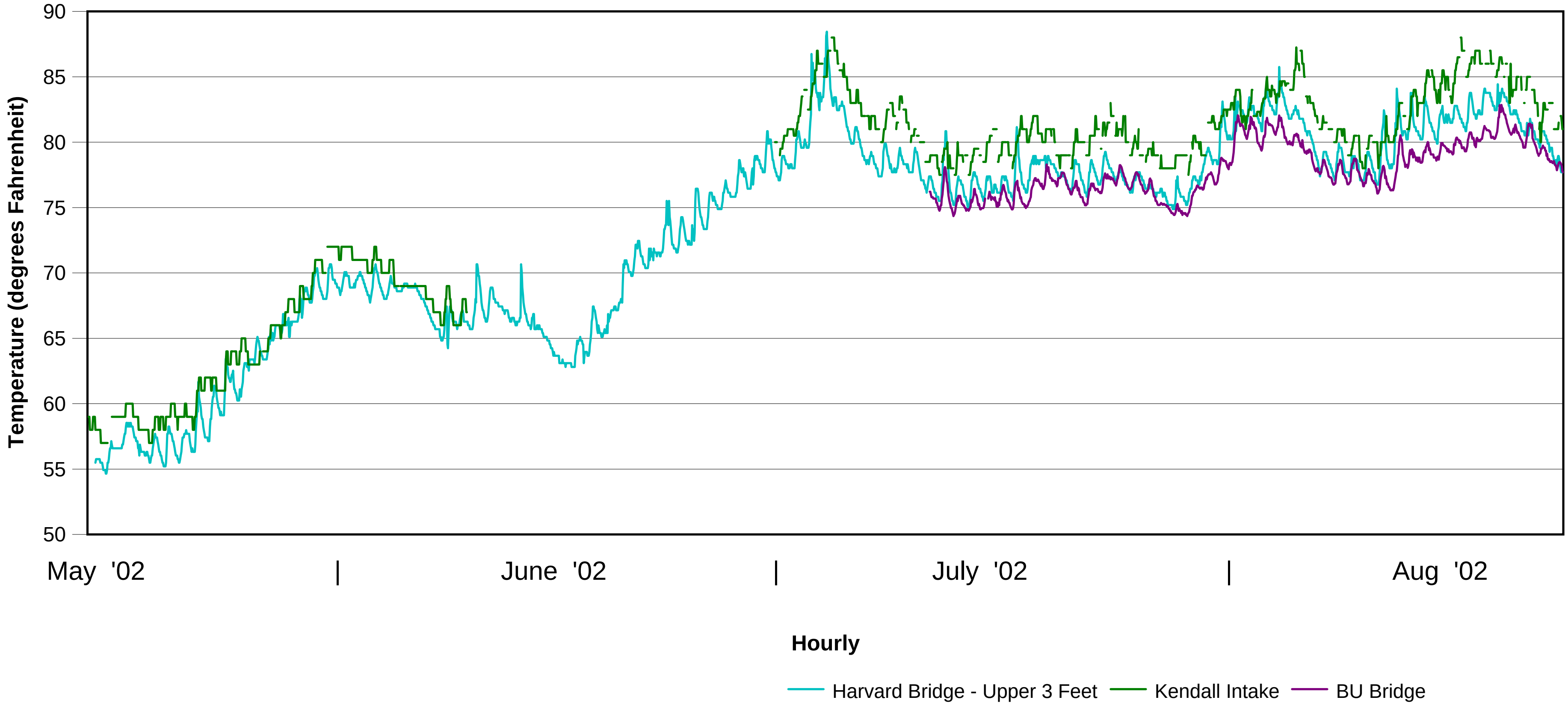


Figure 5.9.2-5 Kendall Station cooling water intake continuous temperatures compared with discrete temperatures collected by the Massachusetts Water Resources Authority (MWRA). MWRA value was averaged from a near surface and a near bottom temperature taken near the BU Bridge. The same calculation was performed on Hyatt Station data collected further downstream in the Basin (January - December 1997).

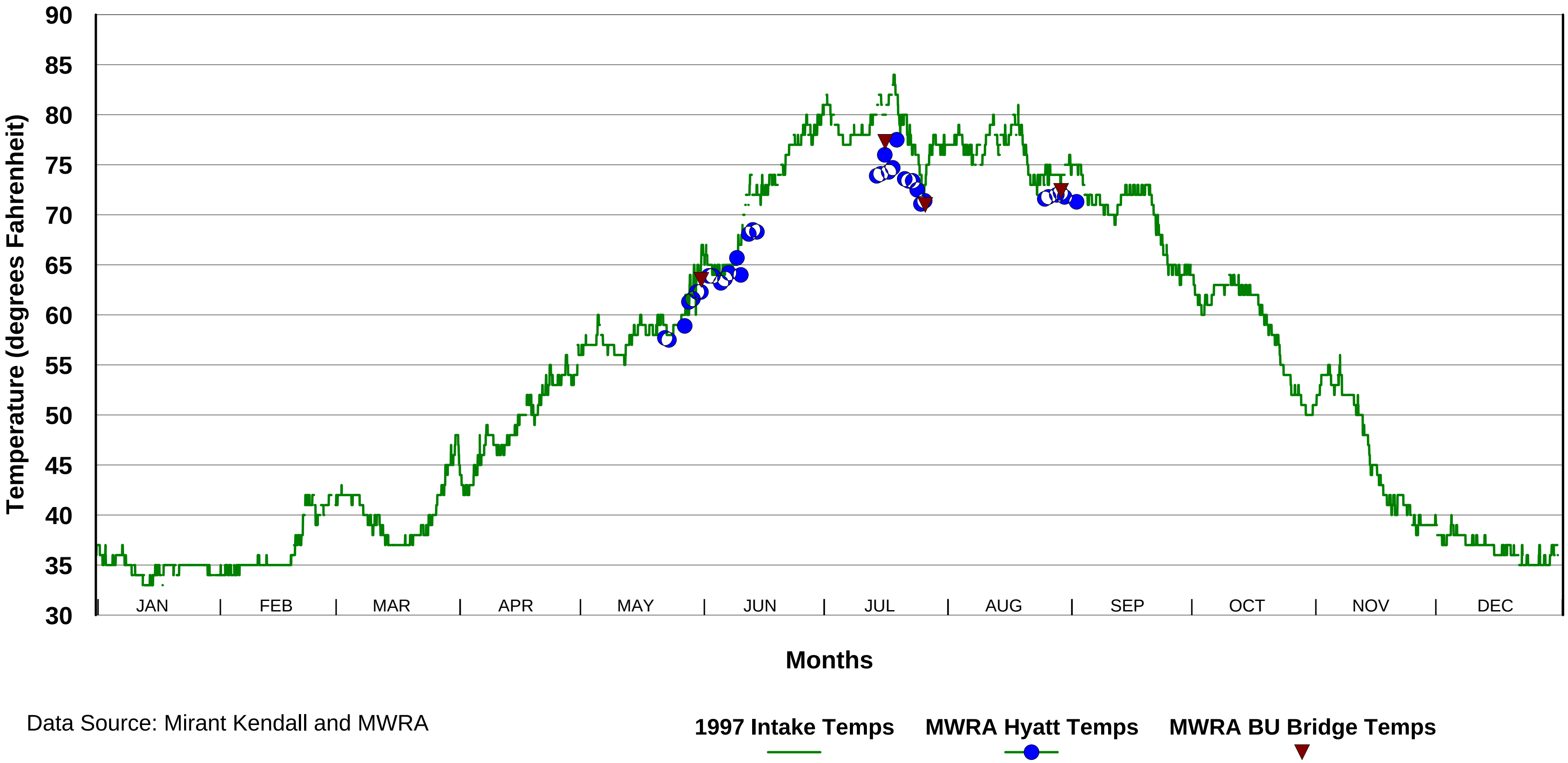


Figure 5.9.2-6 Kendall Station cooling water intake continuous temperatures compared with discrete temperatures collected by the Massachusetts Water Resources Authority (MWRA). MWRA value was averaged from a near surface and a near bottom temperature taken near the BU Bridge. The same calculation was performed on Hyatt Station data collected further downstream in the Basin (January - December 1998). data collected further downstream in the Basin (January - December 1997).

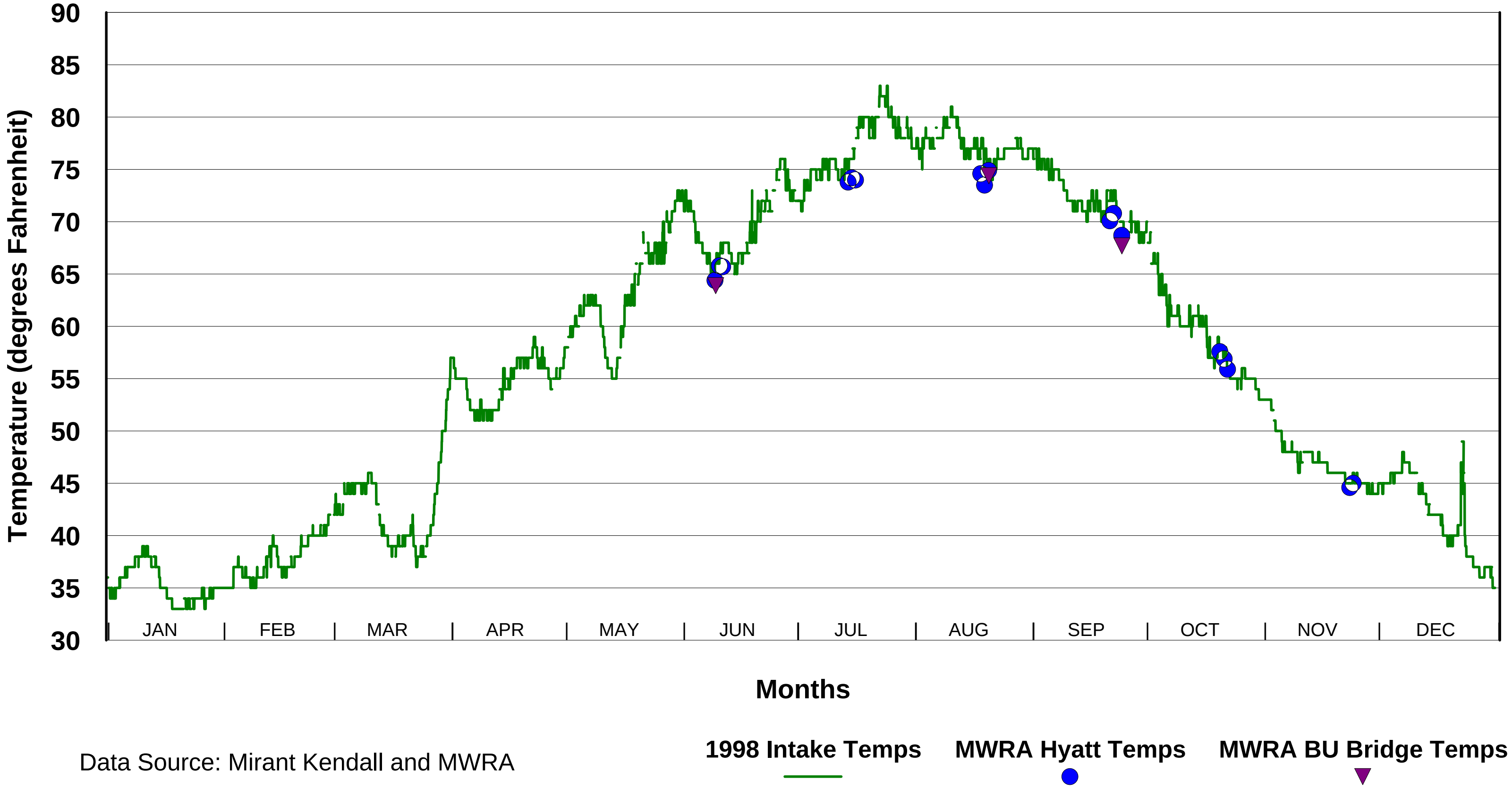
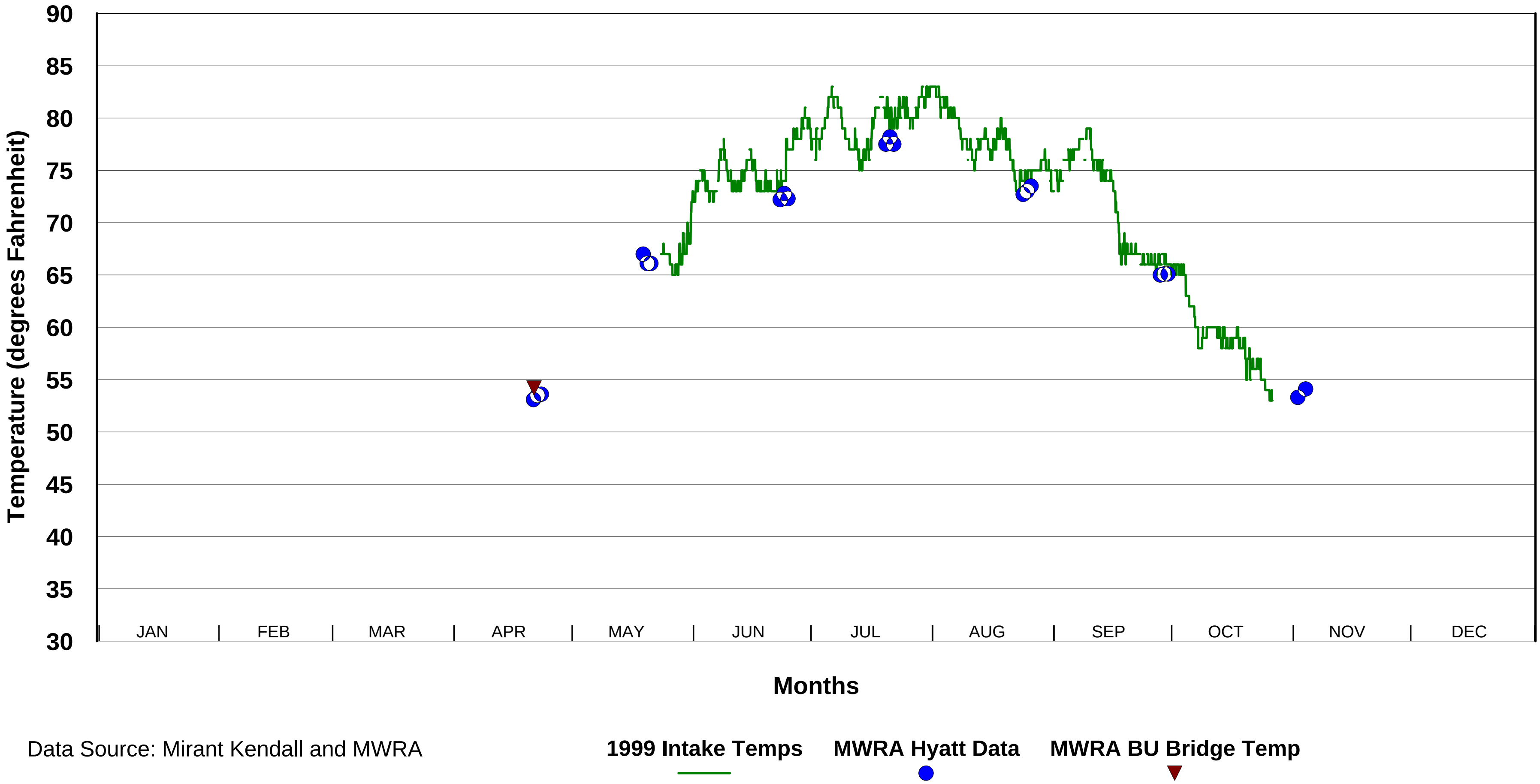
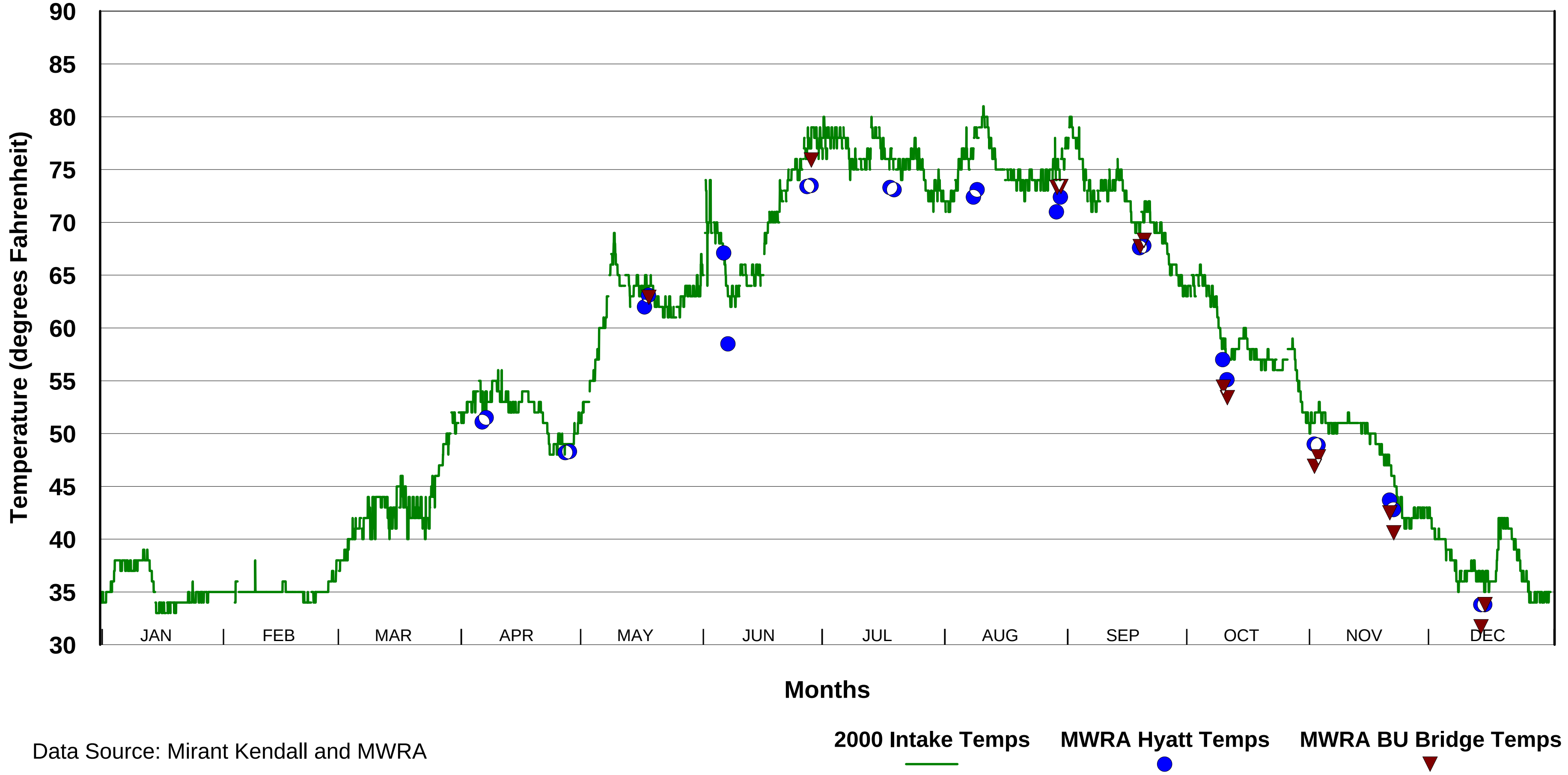


Figure 5.9.2-7 Kendall Station cooling water intake continuous temperatures compared with discrete temperatures collected by the Massachusetts Water Resources Authority (MWRA). MWRA value was averaged from a near surface and a near bottom temperature taken near the BU Bridge. The same calculation was performed on Hyatt Station data collected further downstream in the Basin (January - December 1999).



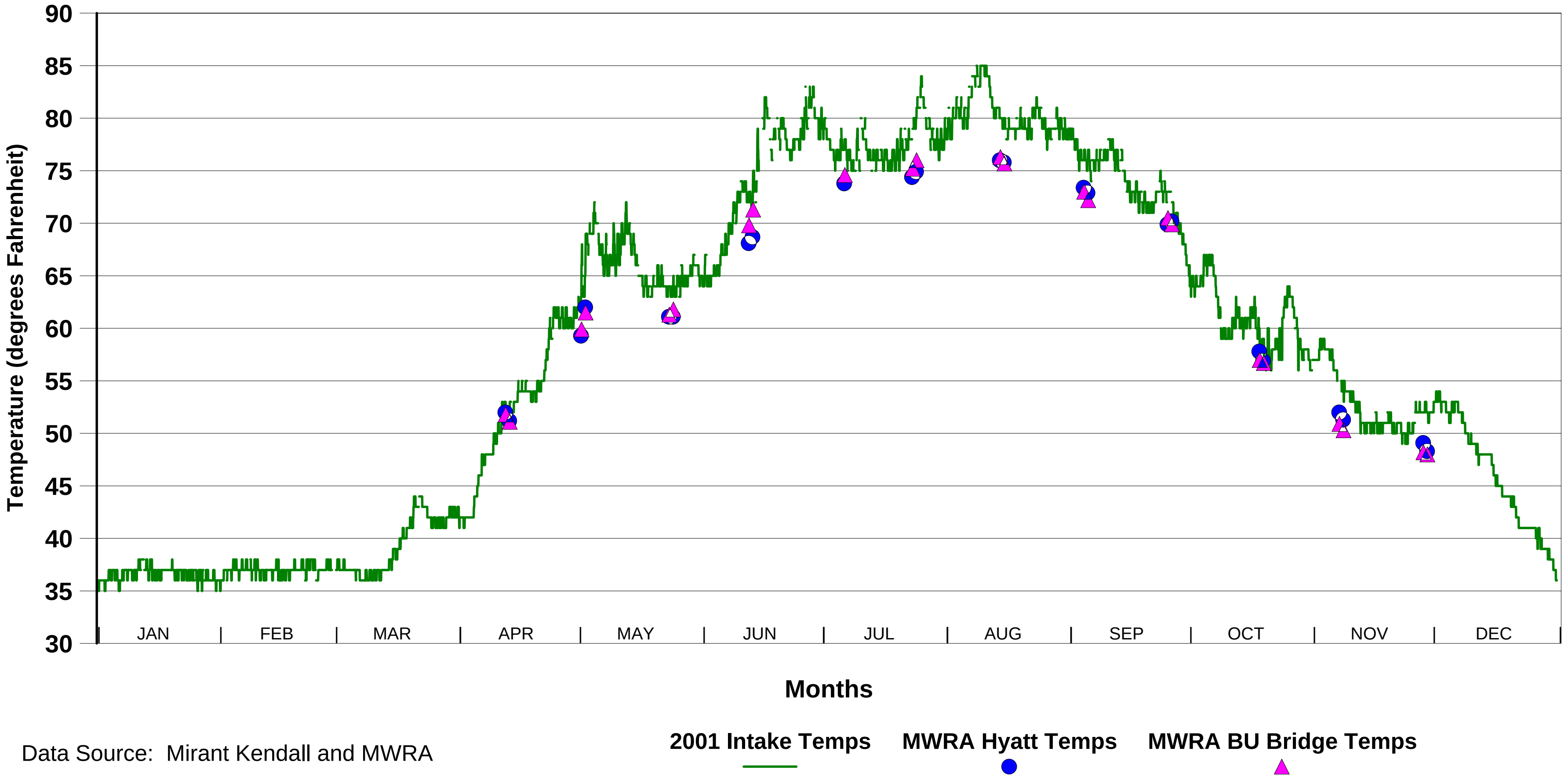
Data Source: Mirant Kendall and MWRA

Figure 5.9.2-8 Kendall Station cooling water intake continuous temperatures compared with discrete temperatures collected by the Massachusetts Water Resources Authority (MWRA). MWRA value was averaged from a near surface and a near bottom temperature taken near the BU Bridge. The same calculation was performed on Hyatt Station data collected further downstream in the Basin (January - December 2000).



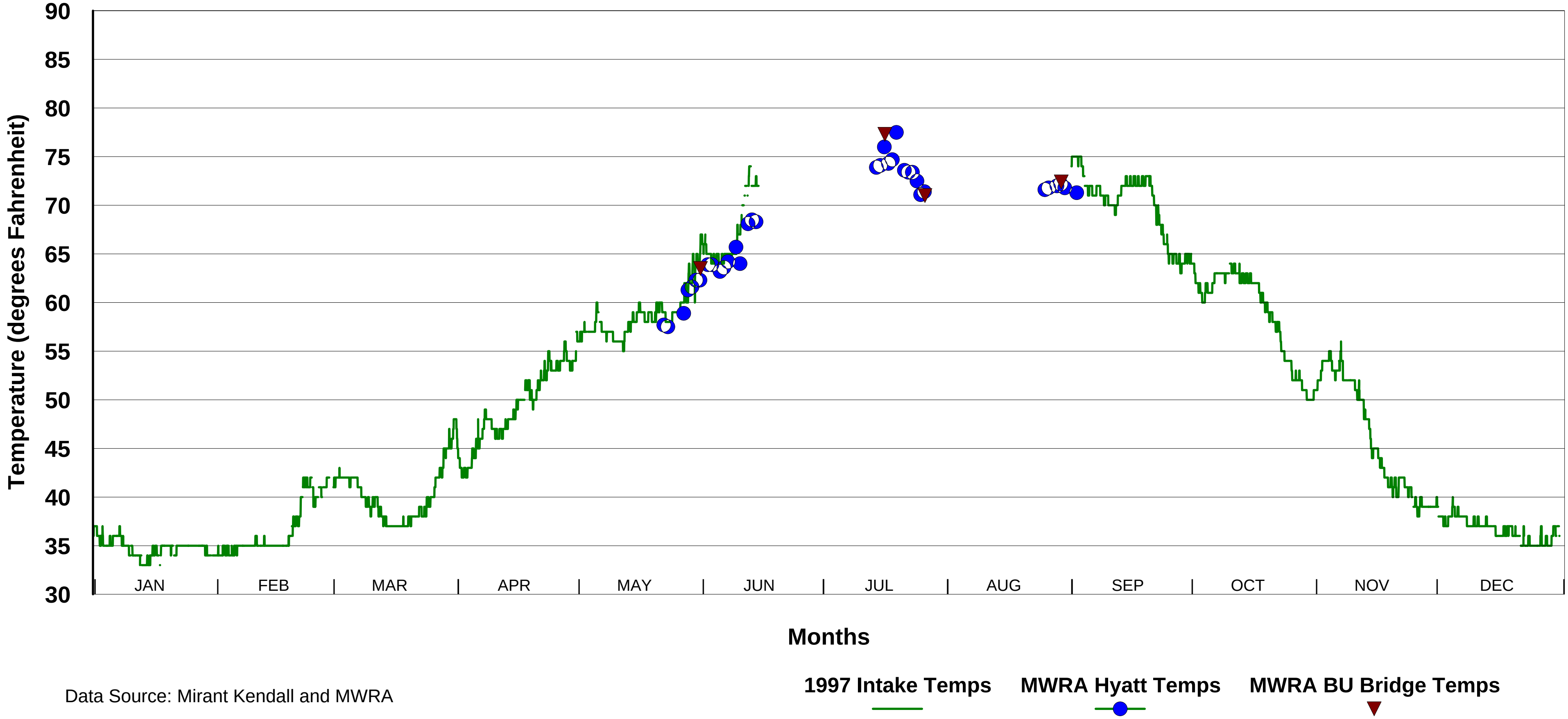
Data Source: Mirant Kendall and MWRA

Figure 5.9.2-9 Kendall Station cooling water intake continuous temperatures compared with discrete temperatures collected by the Massachusetts Water Resources Authority (MWRA). MWRA value was averaged from a near surface and a near bottom temperature taken near the BU Bridge. The same calculation was performed on Hyatt Station data collected further downstream in the Basin (January - December 2001).



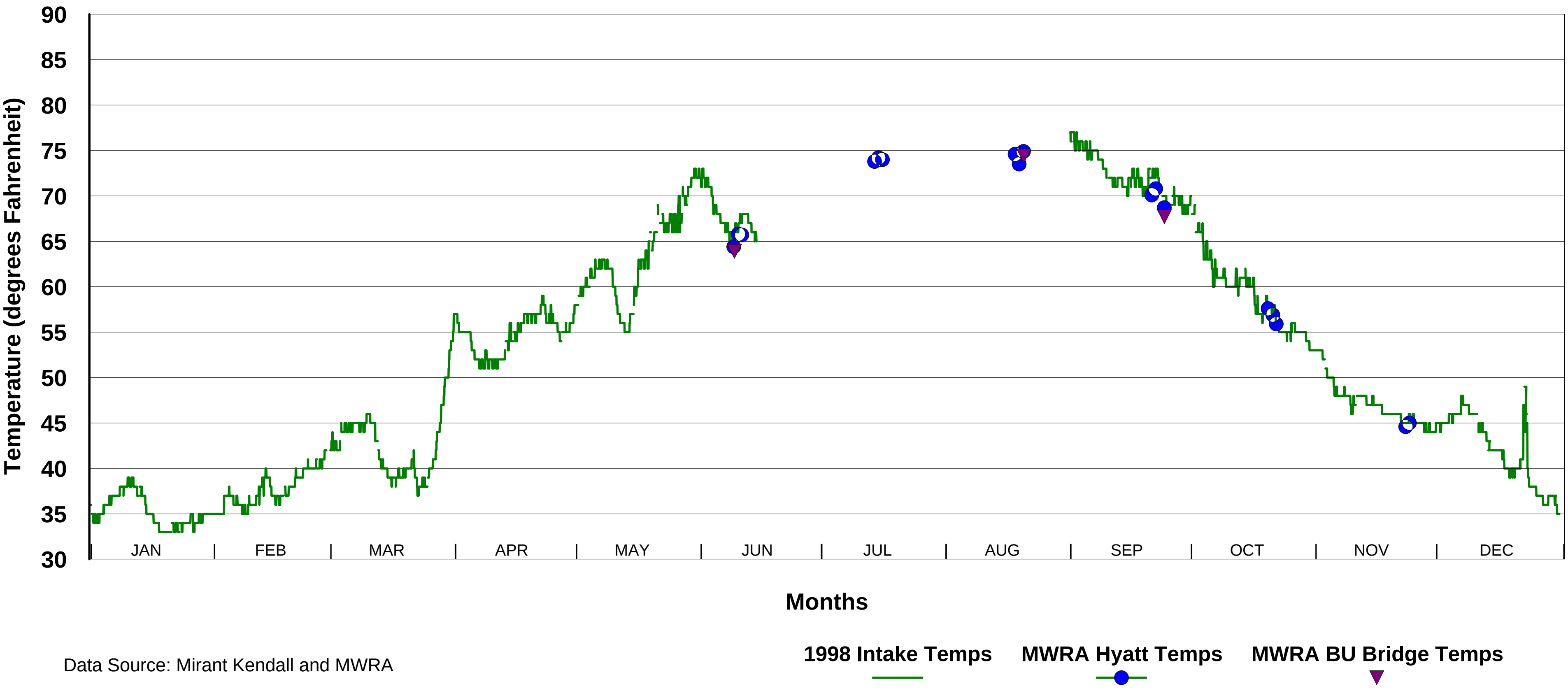
Data Source: Mirant Kendall and MWRA

Figure 5.9.2-10 Kendall Station cooling water intake continuous temperatures compared with discrete temperatures collected by the Massachusetts Water Resources Authority (MWRA). MWRA value was averaged from a near surface and a near bottom temperature taken near the BU Bridge. The same calculation was performed on Hyatt Station data collected further downstream in the basin. Intake temperatures from June 15 through August 31 were not judged to generally reflect ambient basin temperatures and were removed from the figure (January-December 1997)



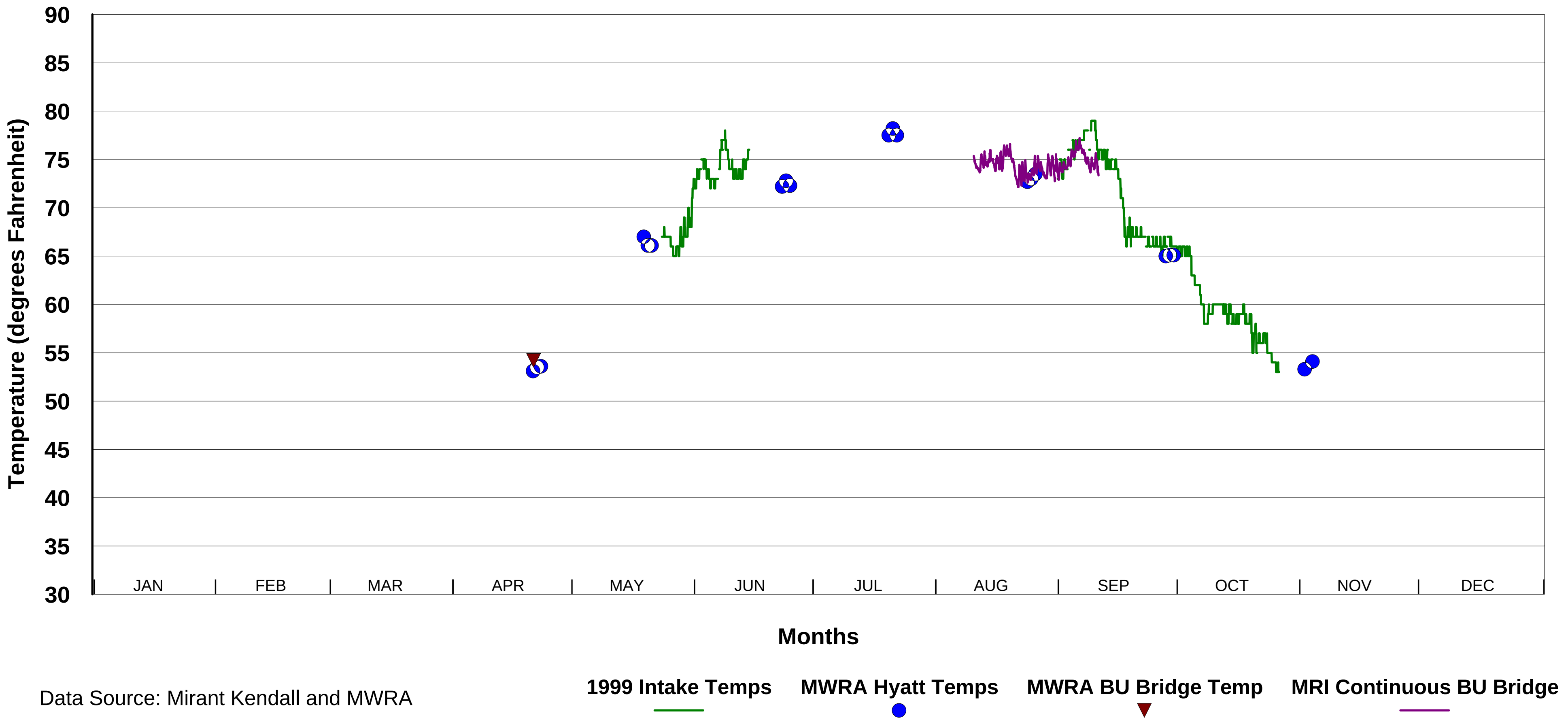
Data Source: Mirant Kendall and MWRA

Figure 5.9.2-11 Kendall Station cooling water intake continuous temperatures compared with discrete temperatures collected by the Massachusetts Water Resources Authority (MWRA). MWRA value was averaged from a near surface and a near bottom temperature taken near the BU Bridge. The same calculation was performed on Hyatt Station data collected further downstream in the basin. Intake temperatures from June 15 through August 31 were not judged to generally reflect ambient basin temperatures and were removed from the figure



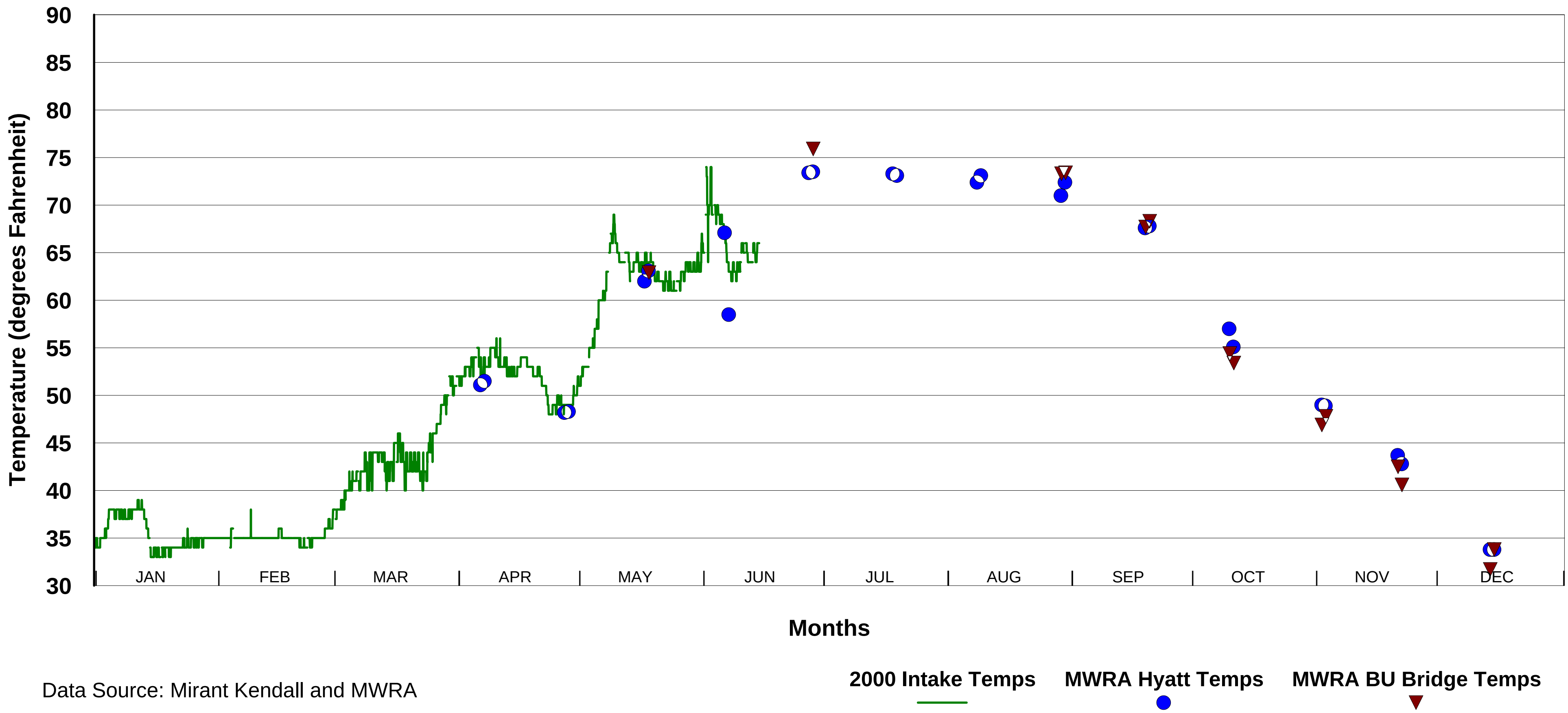
Data Source: Mirant Kendall and MWRA

Figure 5.9.2-12 Kendall Station cooling water intake continuous temperatures compared with discrete temperatures collected by the Massachusetts Water Resources Authority (MWRA). MWRA value was averaged from a near surface and a near bottom temperature taken near the BU Bridge. The same calculation was performed on Hyatt Station data collected further downstream in the basin. Intake temperatures from June 15 through August 31 were not judged to generally reflect ambient basin temperatures and were removed from the figure. Available continuous temperature data recorded by Mirant (MRI) at the BU Bridge were also included (January - December 1999).



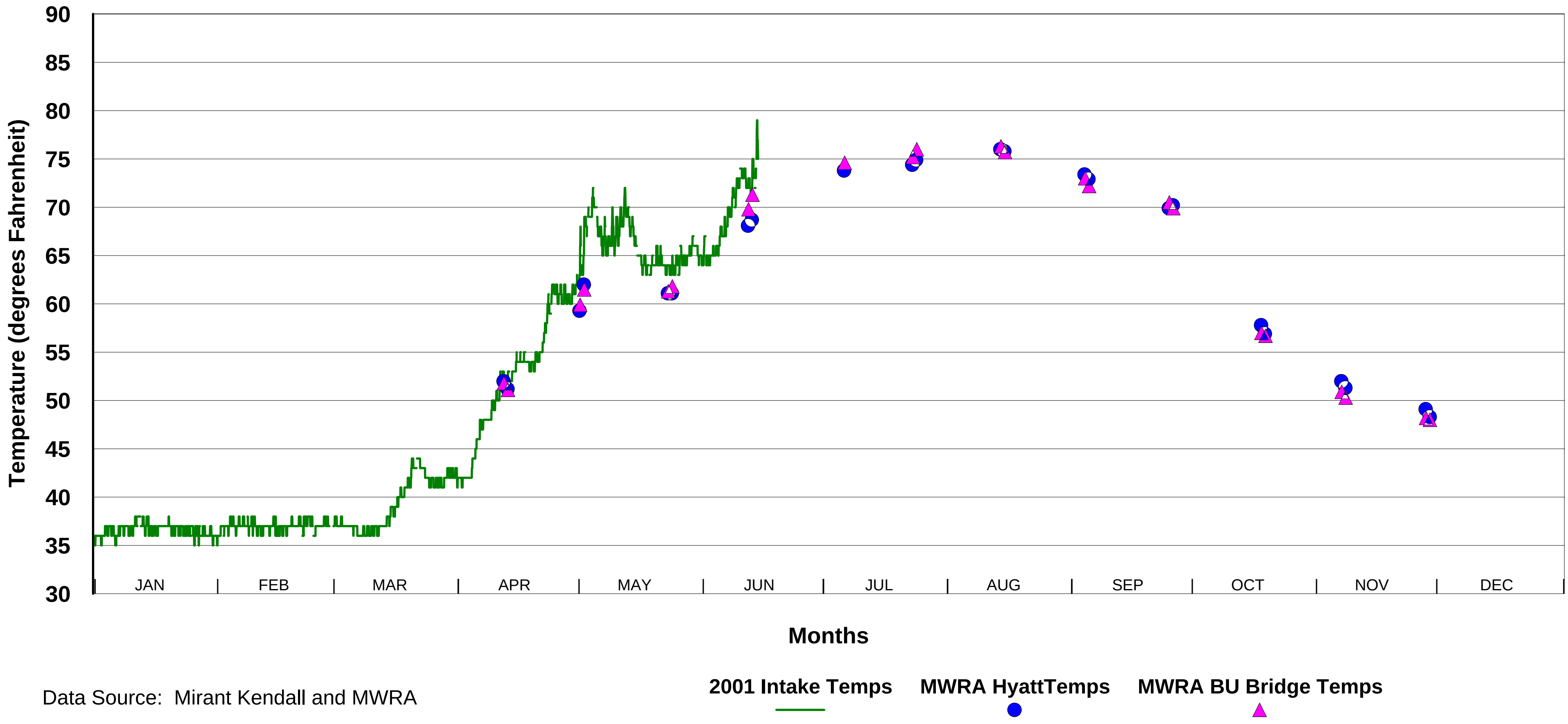
Data Source: Mirant Kendall and MWRA

Figure 5.9.2-13 Kendall Station cooling water intake continuous temperatures compared with discrete temperatures collected by the Massachusetts Water Resources Authority (MWRA). MWRA value was averaged from a near surface and a near bottom temperature taken near the BU Bridge. The same calculation was performed on Hyatt Station data collected further downstream in the basin. Intake temperatures from June 15 through August 31 were not judged to generally reflect ambient basin temperatures and were removed from the figure (January-December 2000).



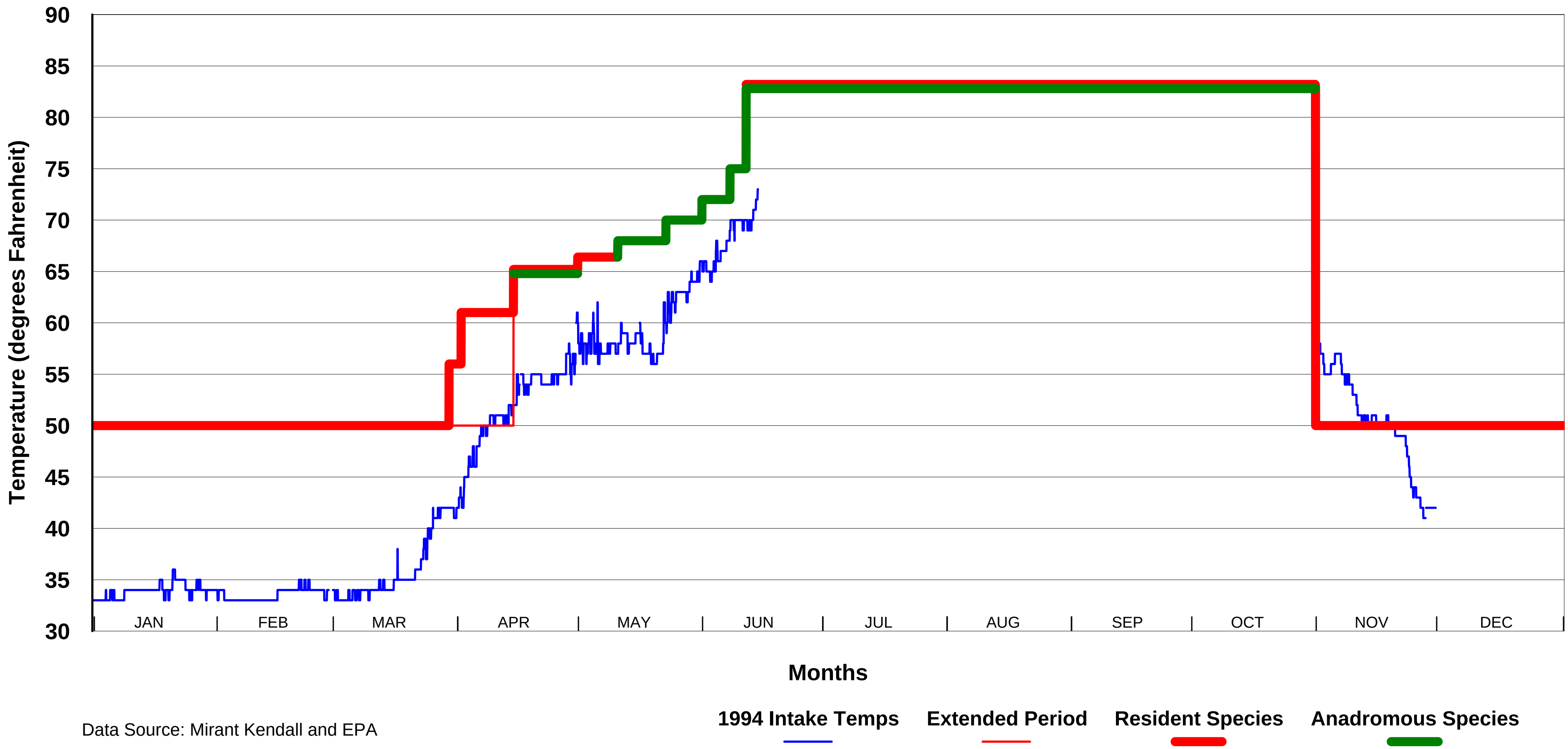
Data Source: Mirant Kendall and MWRA

Figure 5.9.2-14 Kendall Station cooling water intake continuous temperatures compared with discrete temperatures collected by the Massachusetts Water Resources Authority (MWRA). MWRA value was averaged from a near surface and a near bottom temperature taken near the BU Bridge. The same calculation was performed on Hyatt Station data collected further downstream in the basin. Intake temperatures from June 15 through August 31 were not judged to generally reflect ambient basin temperatures and were removed from the figure (January - December 2001)



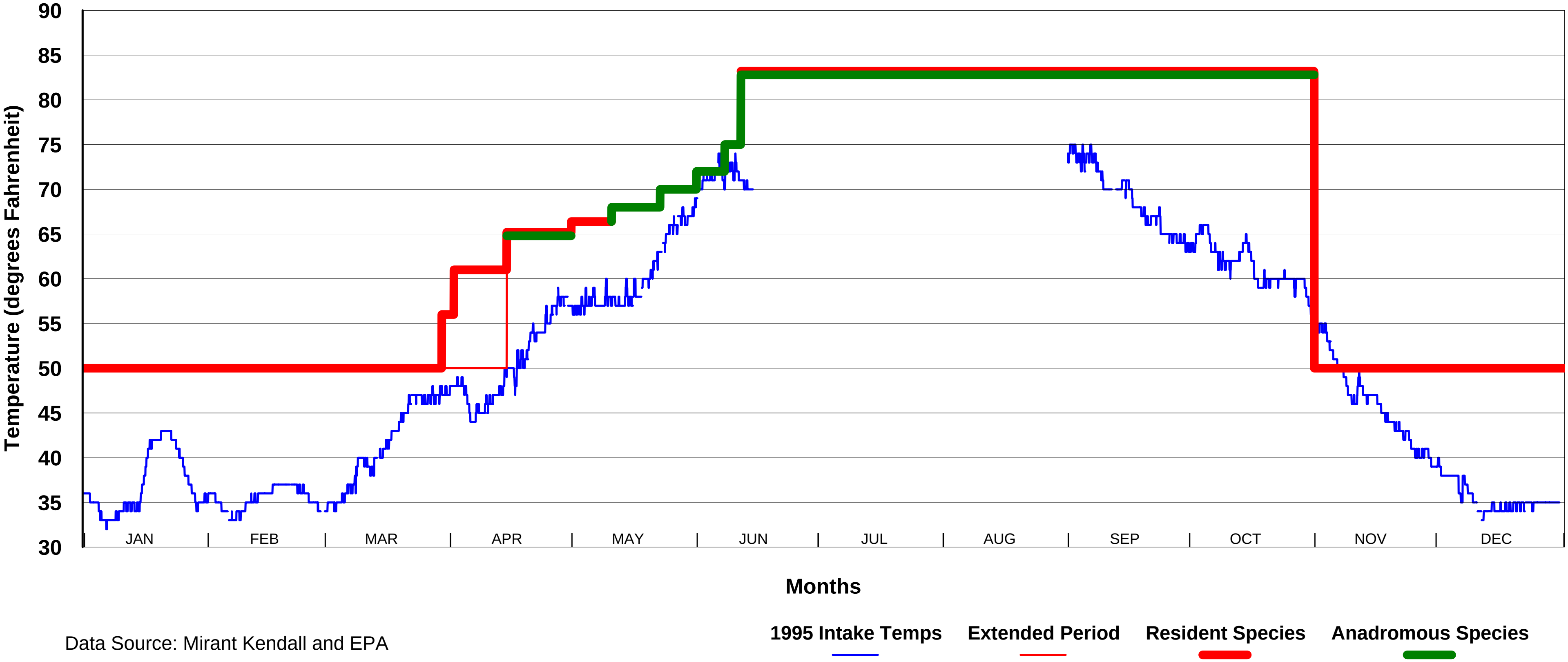
Data Source: Mirant Kendall and MWRA

Figure 5.9.2-15 Kendall Station cooling water intake continuous temperatures, judged to approximate ambient lower Charles River Basin conditions, compared with temperature limits established for the Zone of Passage and Habitat (January - December 1994).



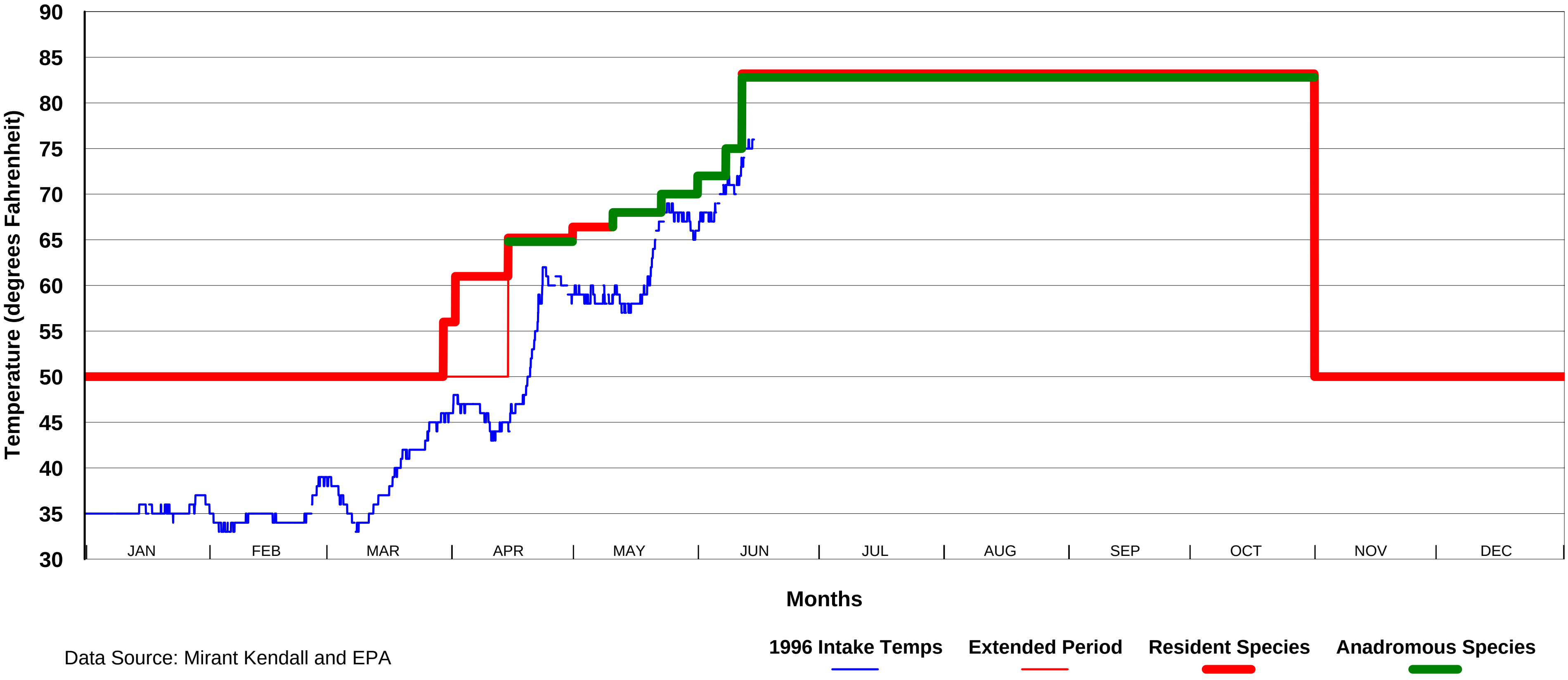
Data Source: Mirant Kendall and EPA

Figure 5.9.2-16 Kendall Station cooling water intake continuous temperatures, judged to approximate ambient lower Charles River Basin conditions, compared with temperature limits established for the Zone of Passage and Habitat (January - December 1995).



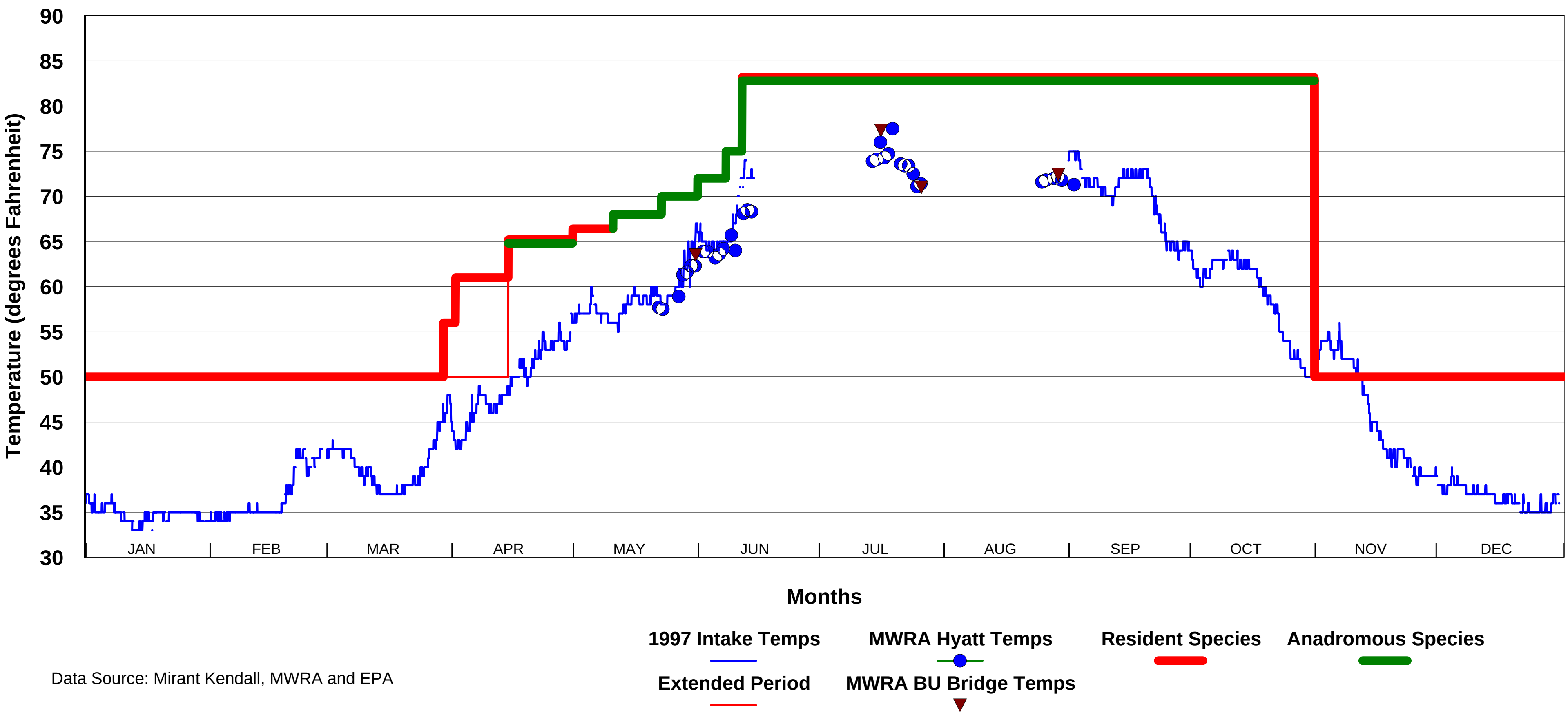
Data Source: Mirant Kendall and EPA

Figure 5.9.2-17 Kendall Station cooling water intake continuous temperatures, judged to approximate ambient lower Charles River Basin conditions, compared with temperature limits established for the Zone of Passage and Habitat (January - December 1996).



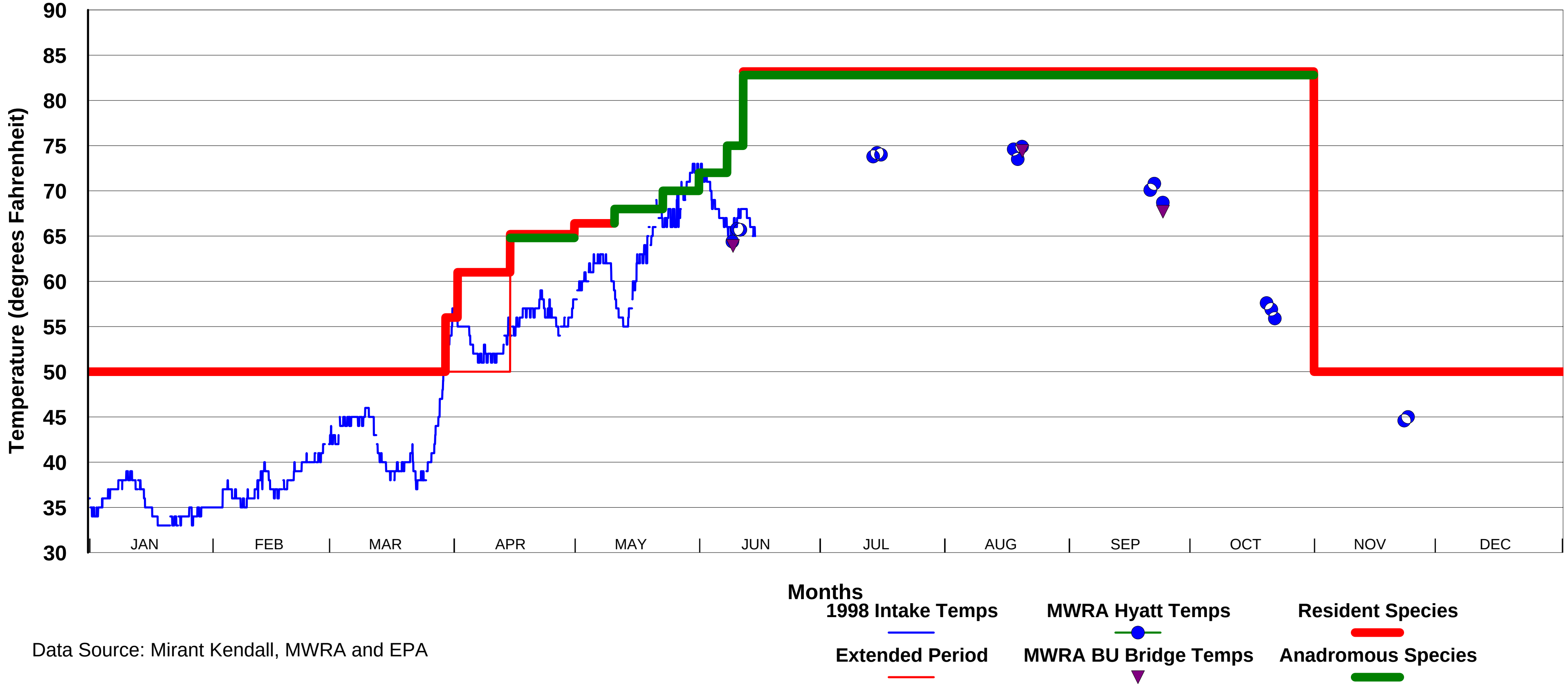
Data Source: Mirant Kendall and EPA

Figure 5.9.2-18 Kendall Station cooling water intake continuous temperatures and discrete MWRA temperature data, judged to approximate ambient lower Charles River Basin conditions, compared with temperature limits established for the Zone of Passage and Habitat (January - December 1997).



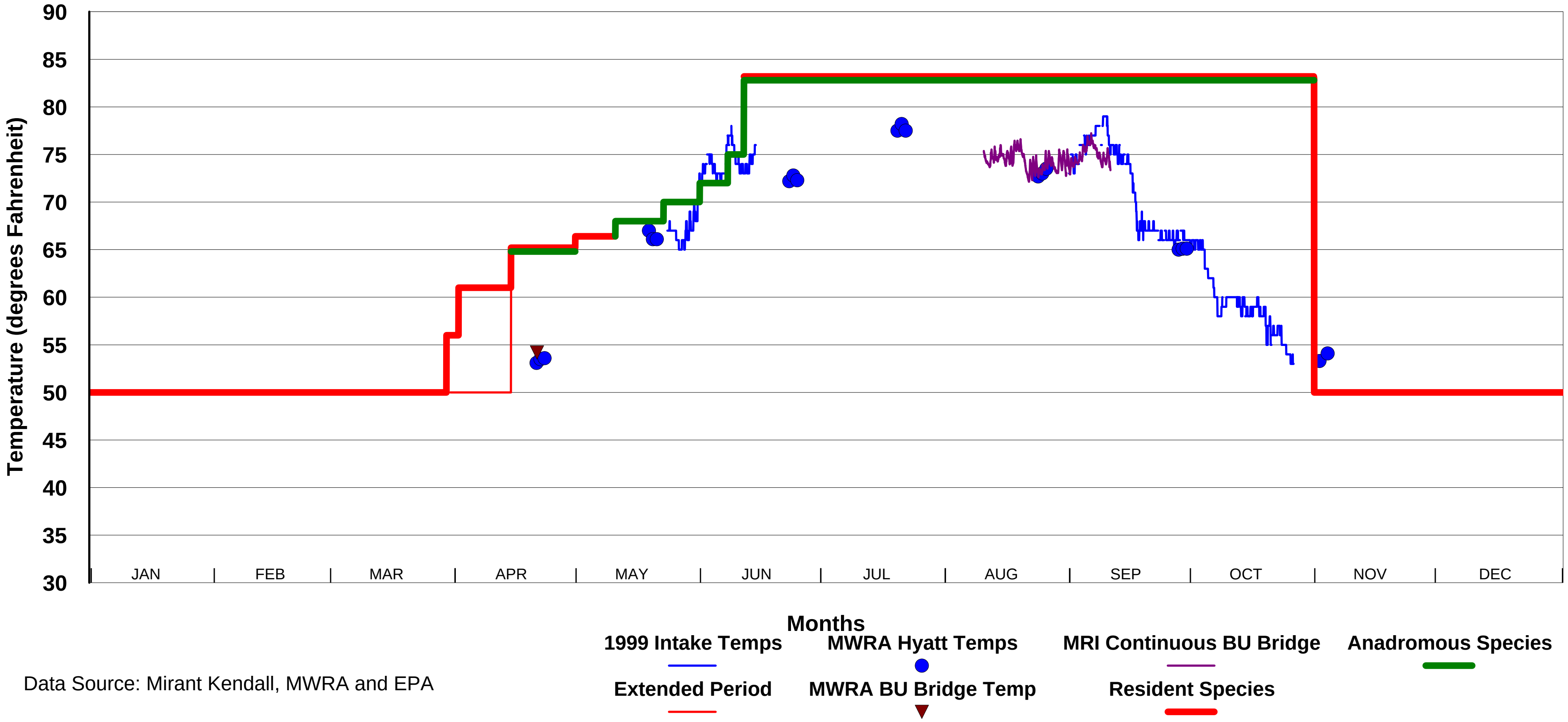
Data Source: Mirant Kendall, MWRA and EPA

Figure 5.9.2-19 Kendall Station cooling water intake continuous temperatures and discrete MWRA temperature data, judged to approximate ambient lower Charles River Basin conditions, compared with temperature limits established for the Zone of Passage and Habitat (January - December 1998).



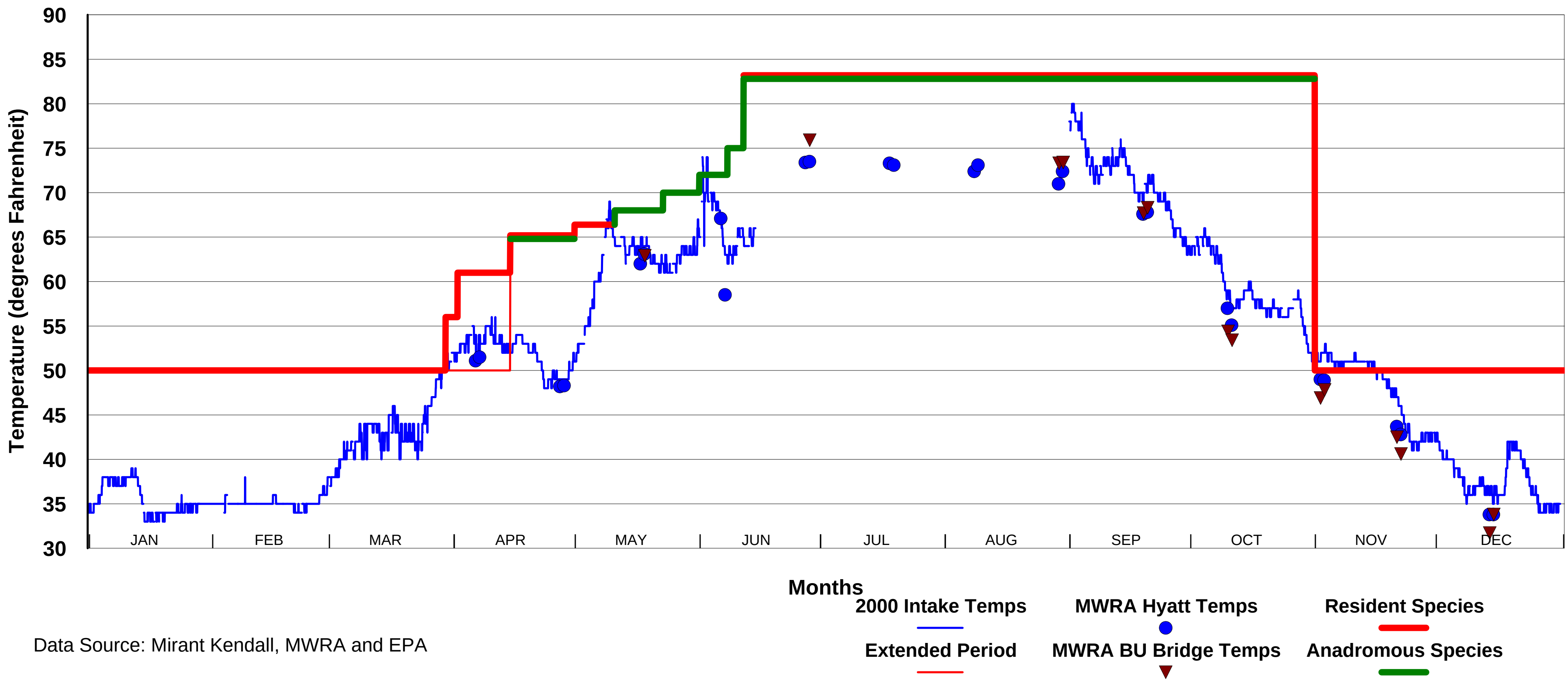
Data Source: Mirant Kendall, MWRA and EPA

Figure 5.9.2-20 Kendall Station cooling water intake continuous temperatures, continuous temperatures recorded near the BU Bridge, and discrete MWRA temperature data, judged to approximate ambient lower Charles River Basin conditions, compared with temperature limits established for the Zone of Passage and Habitat (January - December 1999).



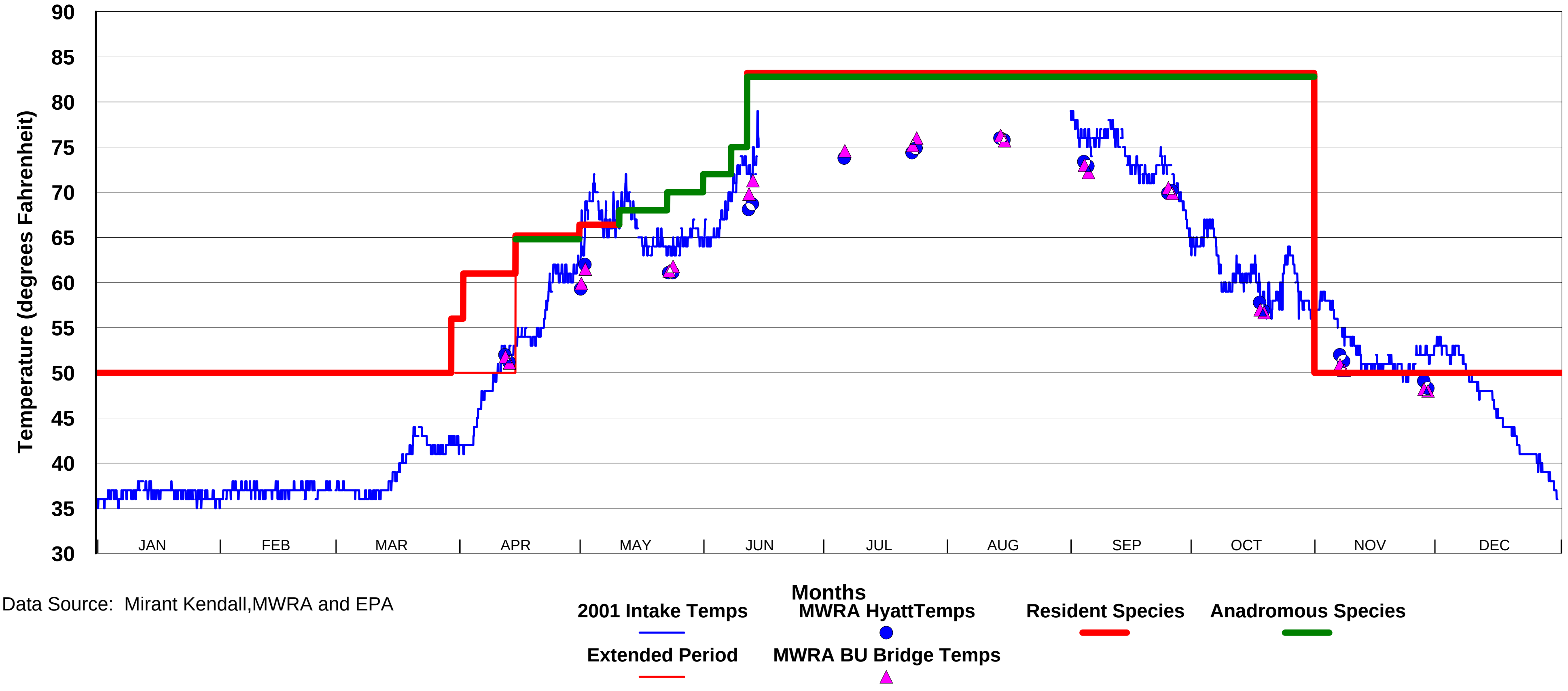
Data Source: Mirant Kendall, MWRA and EPA

Figure 5.9.2-21 Kendall Station cooling water intake continuous temperatures and discrete MWRA temperature data, judged to approximate ambient lower Charles River Basin conditions, compared with temperature limits established for the Zone of Passage and Habitat (January - December 2000).



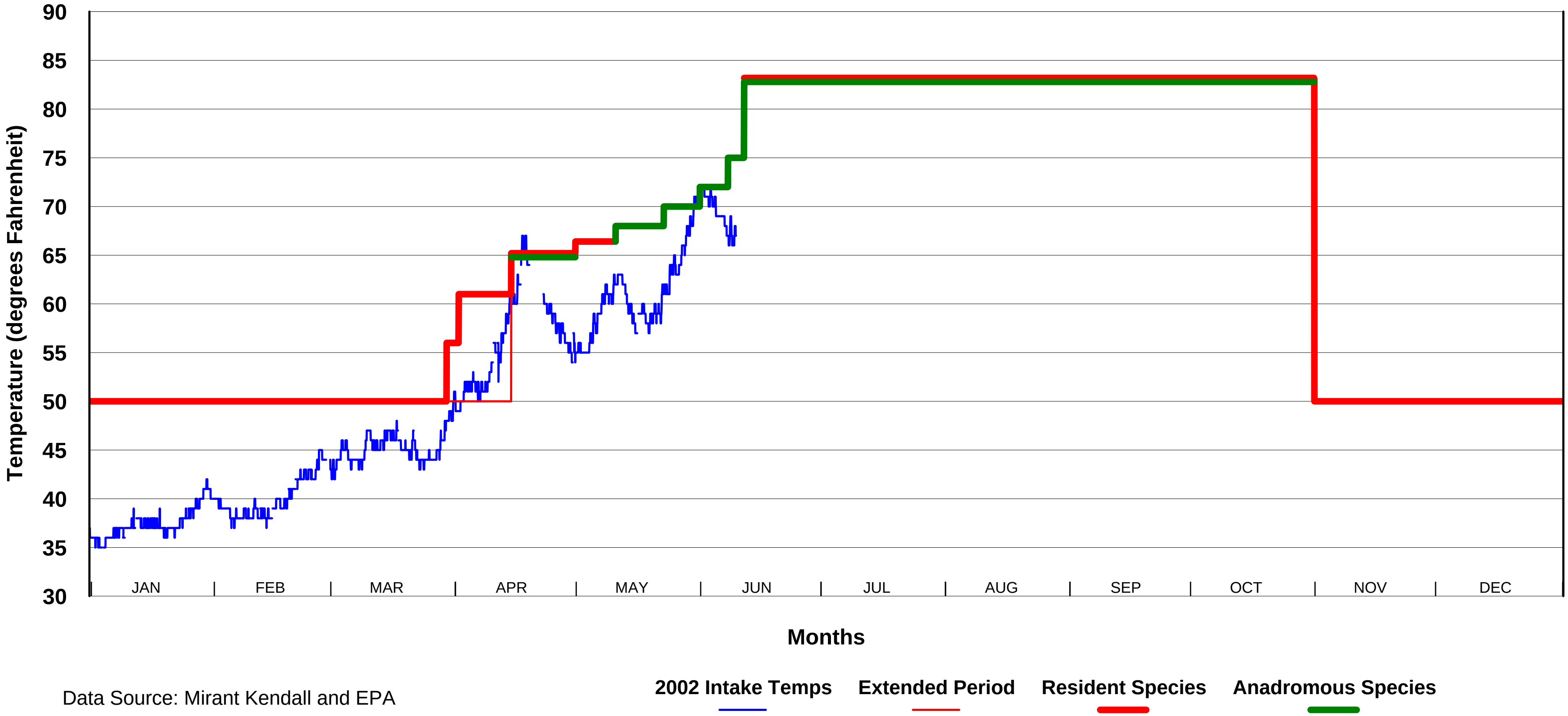
Data Source: Mirant Kendall, MWRA and EPA

Figure 5.9.2-22 Kendall Station cooling water intake continuous temperatures and discrete MWRA temperature data, judged to approximate ambient lower Charles River Basin conditions, compared with temperature limits established for the Zone of Passage and Habitat (January - December 2001).



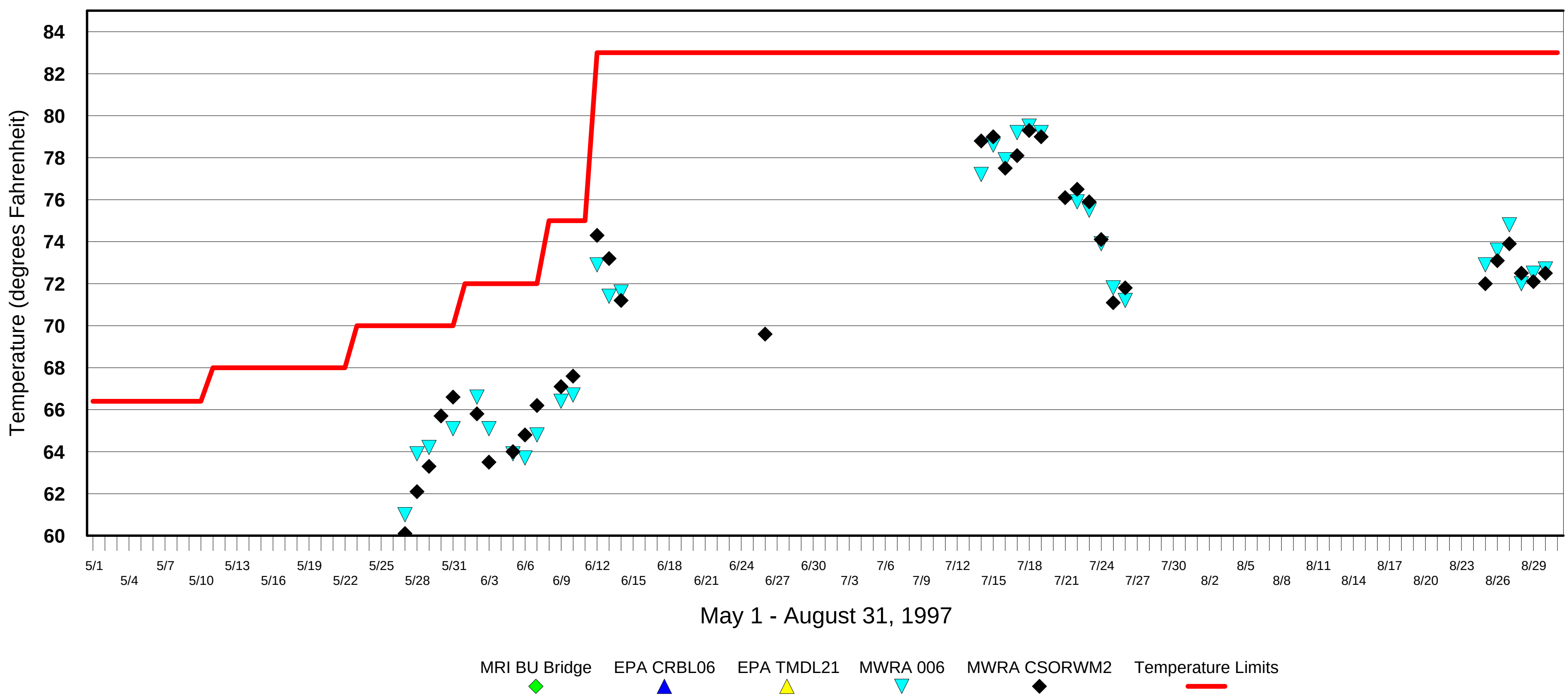
Data Source: Mirant Kendall,MWRA and EPA

Figure 5.9.2-23 Kendall Station cooling water intake continuous temperatures judged to approximate ambient lower Charles River Basin conditions, compared with temperature limits established for the Zone of Passage and Habitat Data from June 15 through August 31 not used and data after August 31 not available (January - June 2002).



Data Source: Mirant Kendall and EPA

Figure 5.9.2-24 Charles River ambient temperatures recorded near the Boston University Bridge (background station) at a single, near surface depth, compared with temperature limits established for the Zone of Passage and Habitat (May 1 - August 31, 1997)



Data Source: Mirant Kendall (MRI), MWRA and EPA

Figure 5.9.2-25 Charles River ambient temperatures recorded near the Boston University Bridge (background station) at a single, near surface depth, compared with temperature limits established for the Zone of Passage and Habitat. Data Source: Mirant Kendall (MRI), MWRA, and EPA (May 1 - August 31, 1998).

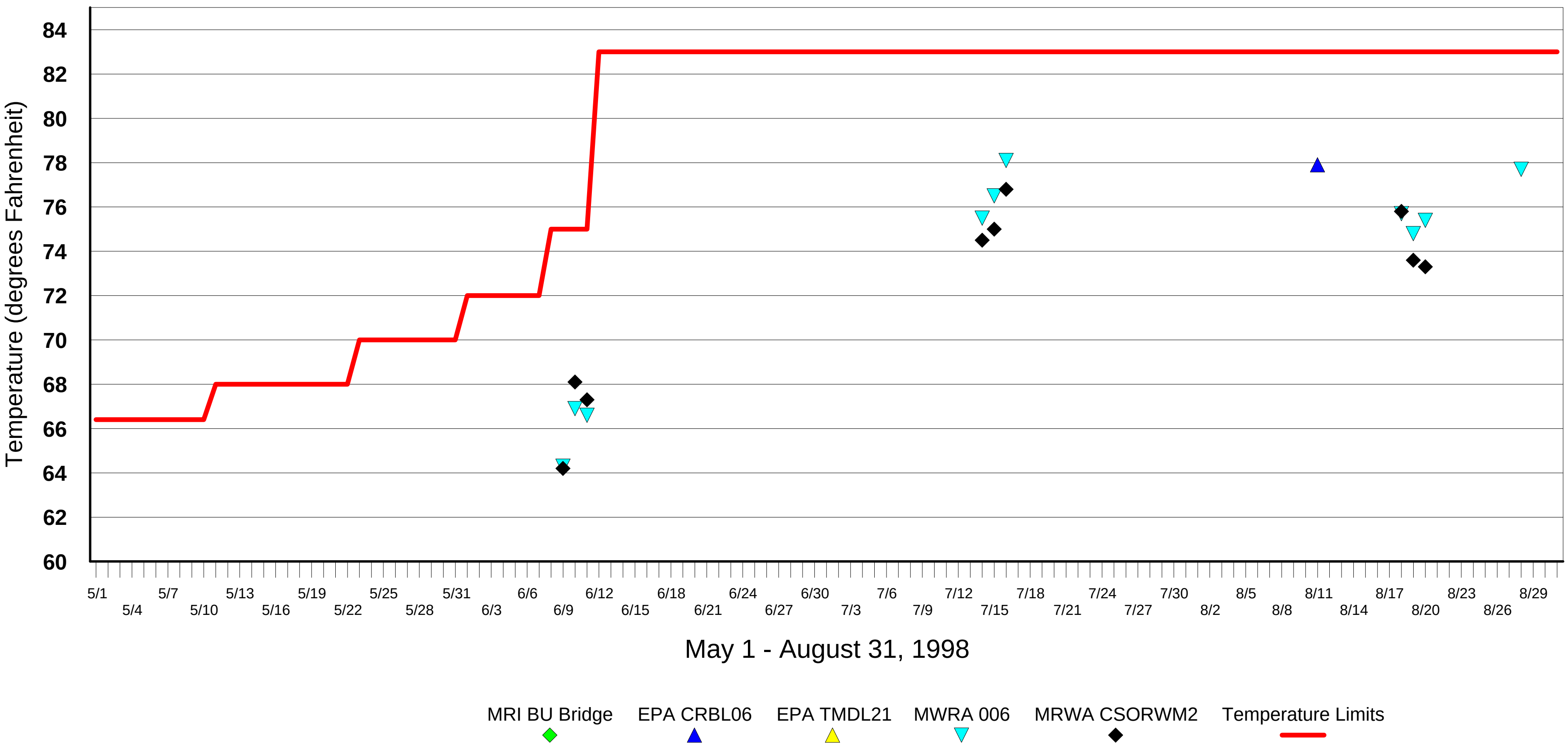


Figure 5.9.2-26 Charles River ambient temperatures recorded near the Boston University Bridge (background station) at a single, near surface depth, compared with temperature limits established for the Zone of Passage and Habitat. The number of hours Blackstone Station operated and discharged thermal effluent in the vicinity of the bridge is also included. Mirant Kendall (MRI), MWRA, Blackstone Station and EPA (May 1 - Aug 31, 1999).

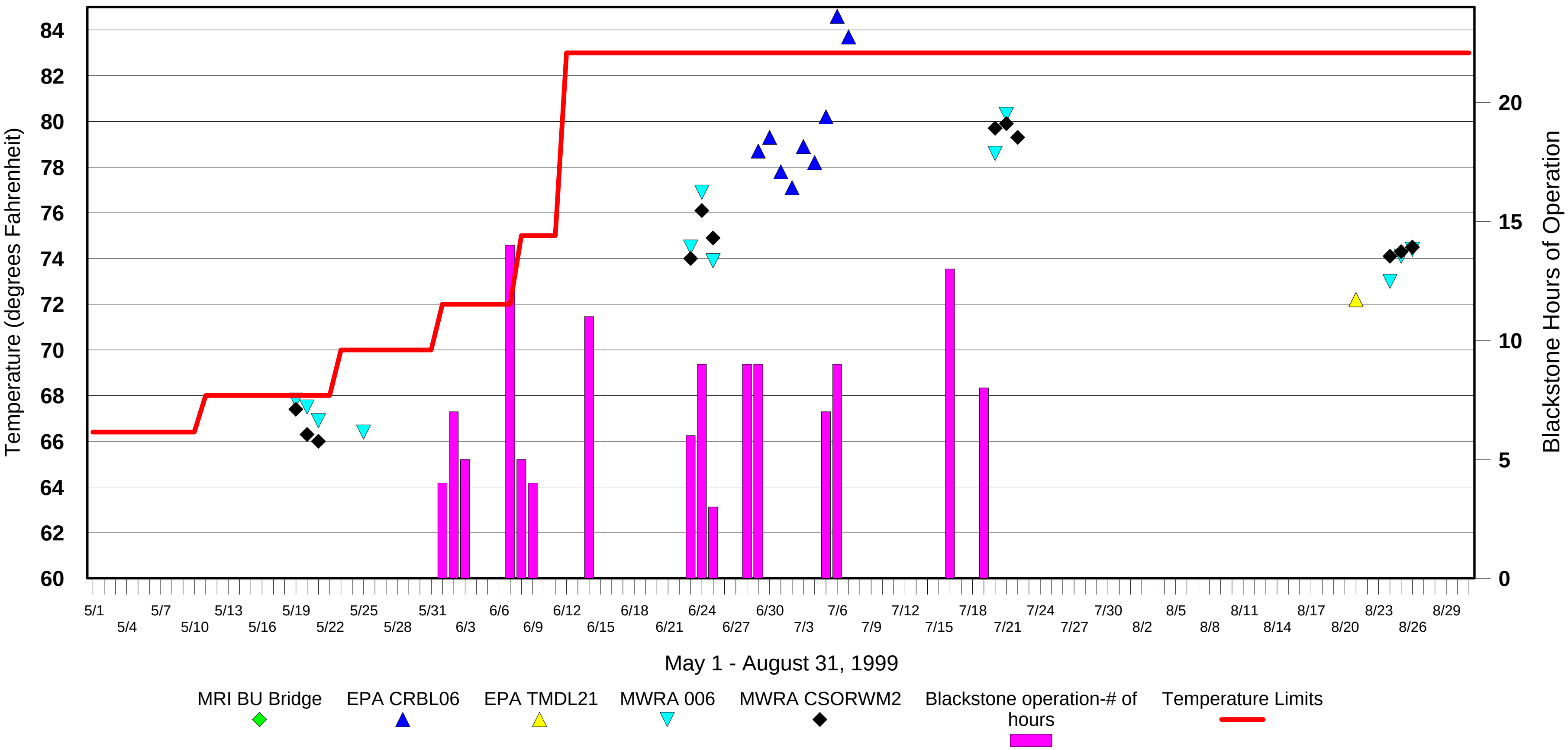


Figure 5.9.2-27 Charles River ambient temperatures recorded near the Boston University Bridge (background station) at a single, near surface depth, compared with temperature limits established for the Zone of Passage and Habitat. Data Source: Mirant Kendall (MRI), MWRA, and EPA (May 1 - August 31, 2000).

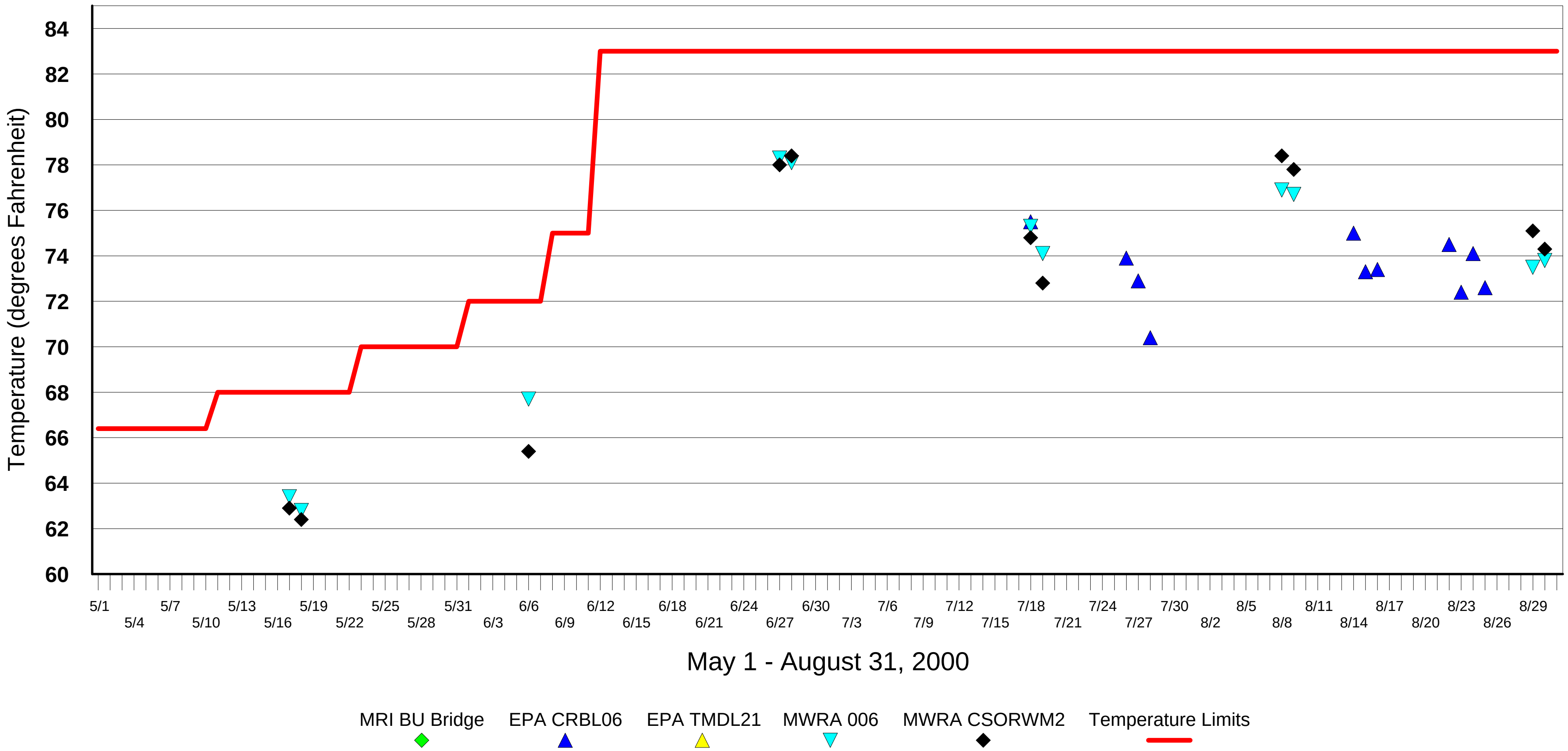


Figure 5.9.2-28 Charles River ambient temperatures recorded near the Boston University Bridge (background station) at a single, near surface depth, compared with temperature limits established for the Zone of Passage and Habitat. Data Source: Mirant Kendall (MRI), MWRA, and EPA (May 1 - August 31, 2001).

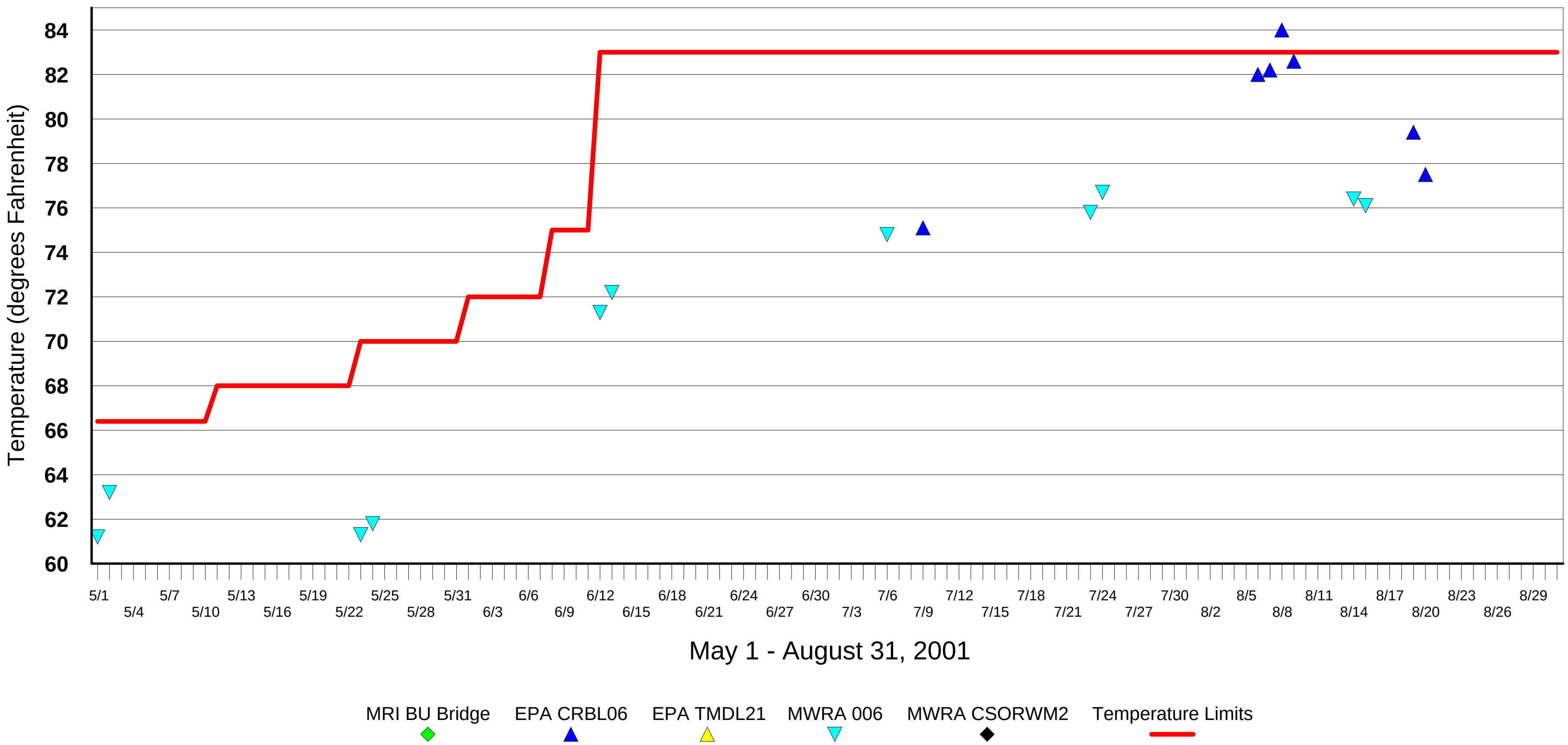


Figure 5.9.2-29 Charles River ambient temperatures recorded near the Boston University Bridge (background station) at a single, near surface depth, compared with temperature limits established for the Zone of Passage and Habitat. Data Source: Mirant Kendall (MRI), MWRA, and EPA (May 1 - August 31, 2002).

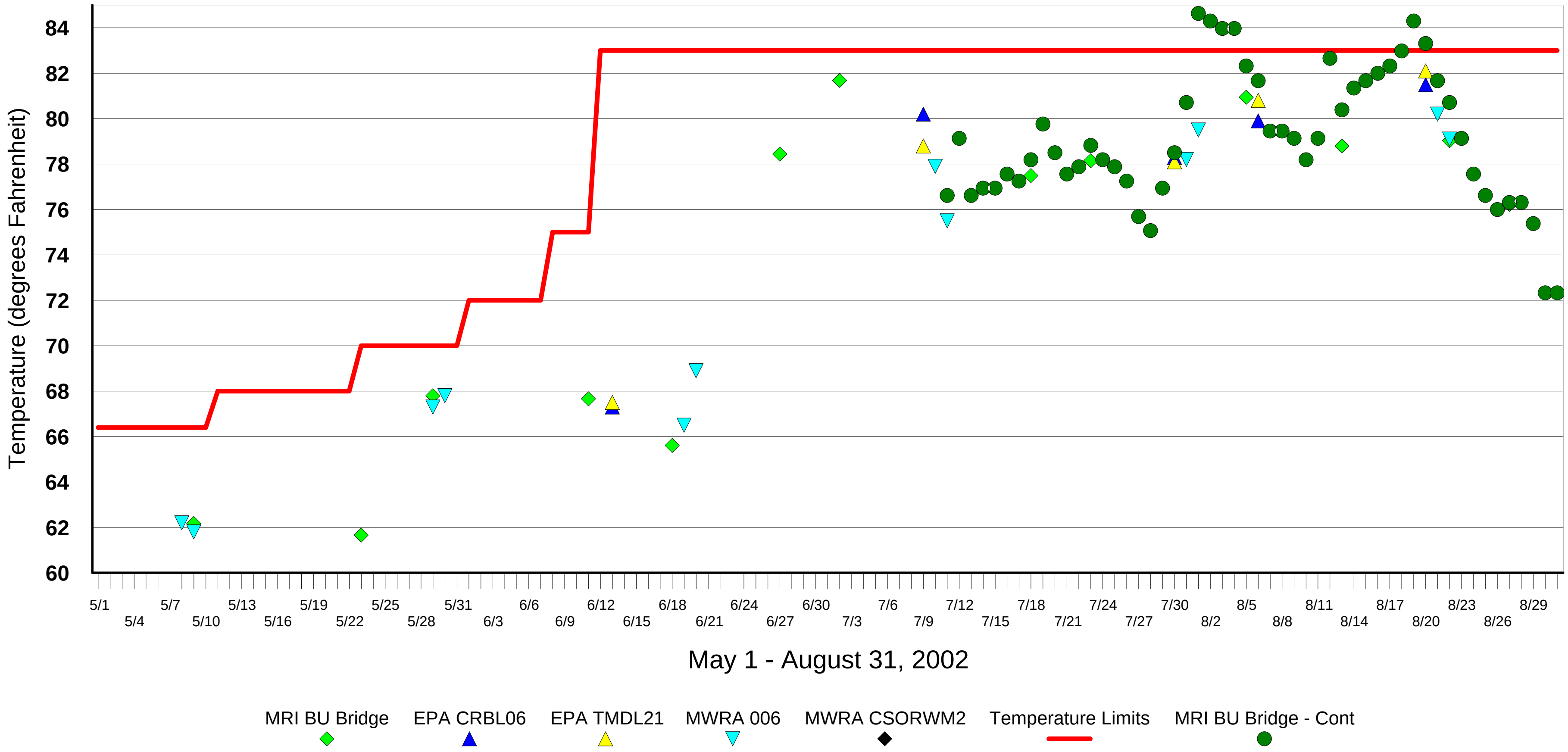


Figure 5.9.2-30 Charles River ambient temperatures recorded near the Boston University Bridge (background station) at a single, near surface depth, compared with temperature limits established for the Zone of Passage and Habitat. Data Source: Mirant Kendall (MRI), MWRA, and EPA (May 1 - August 31, 2003).

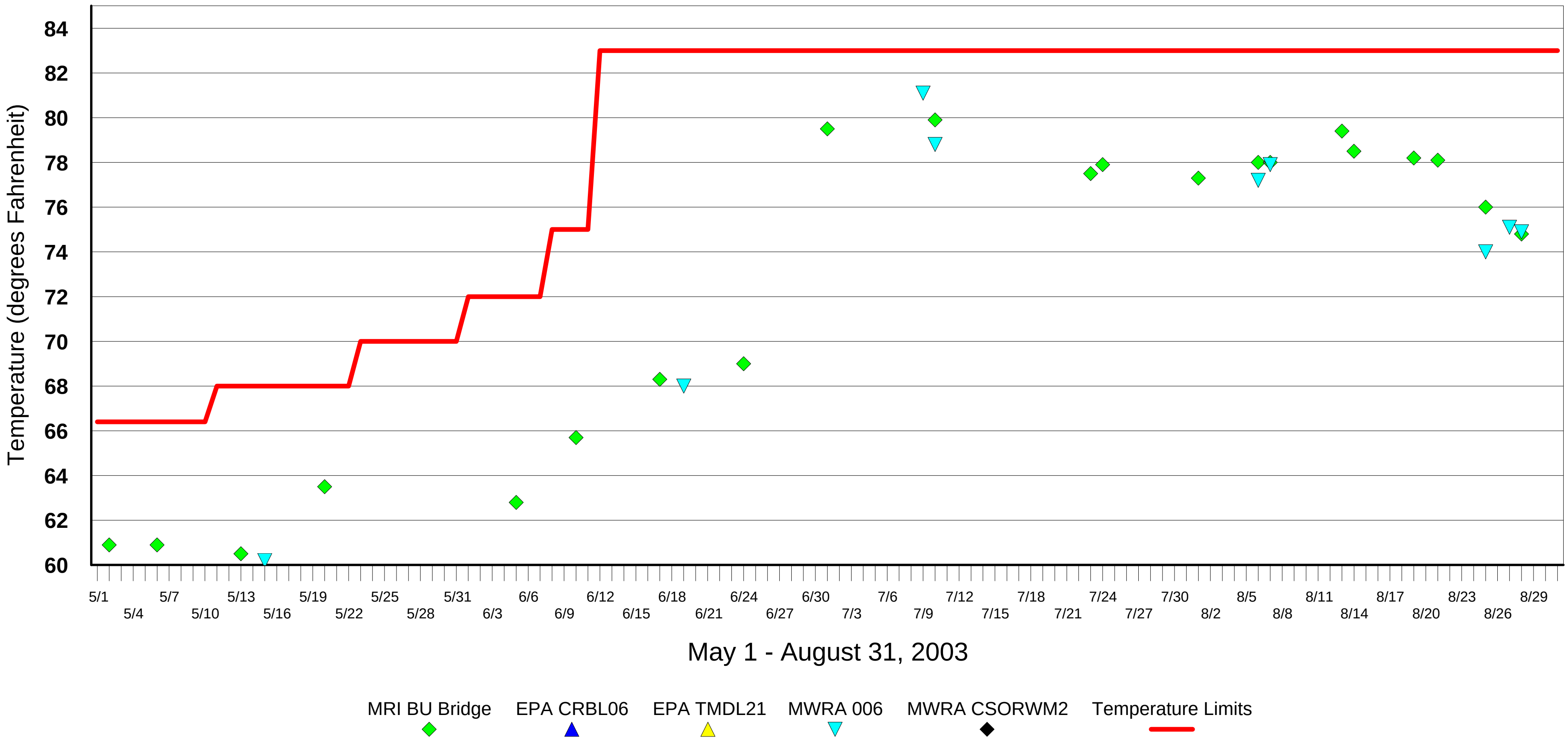
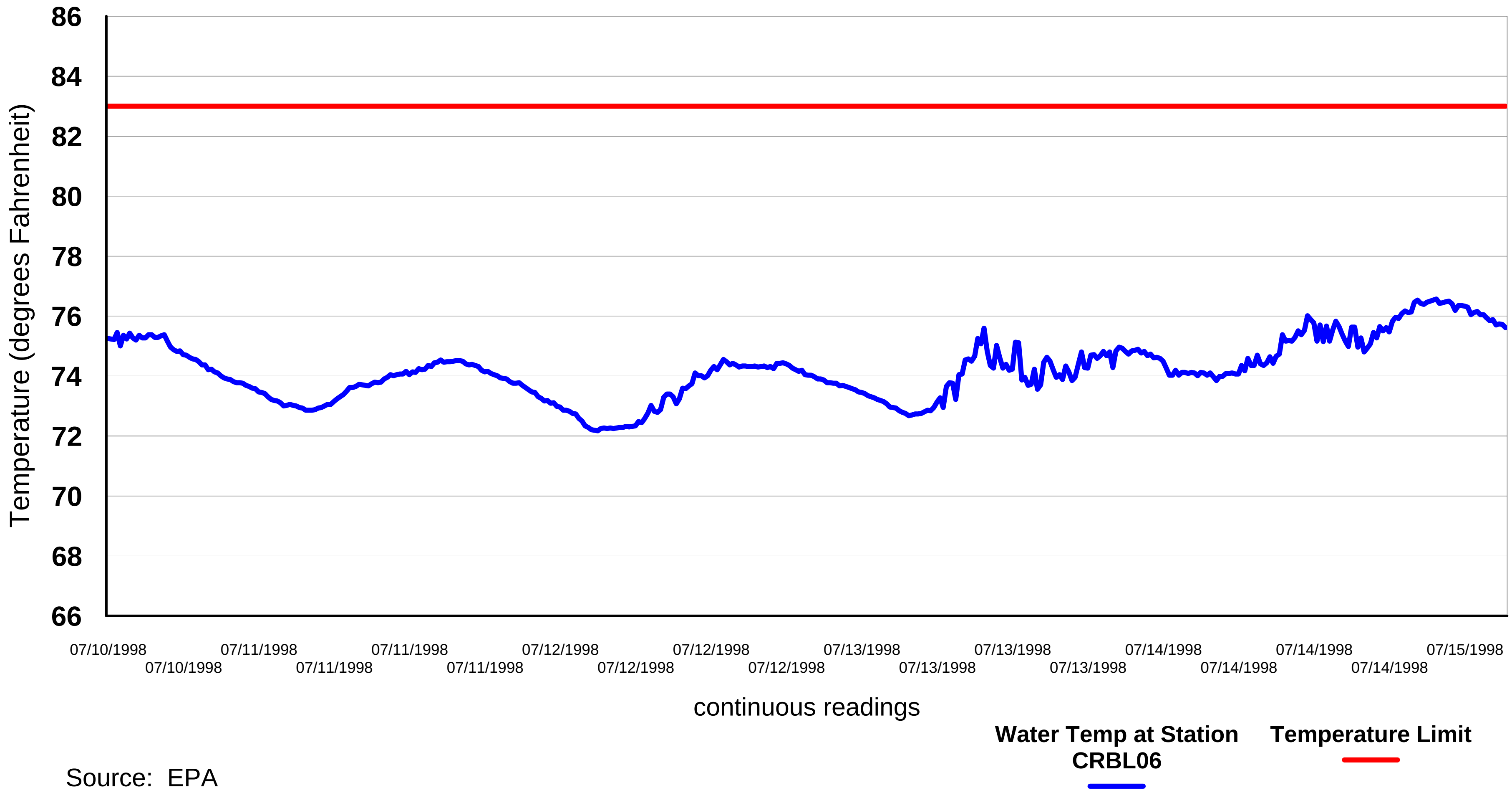
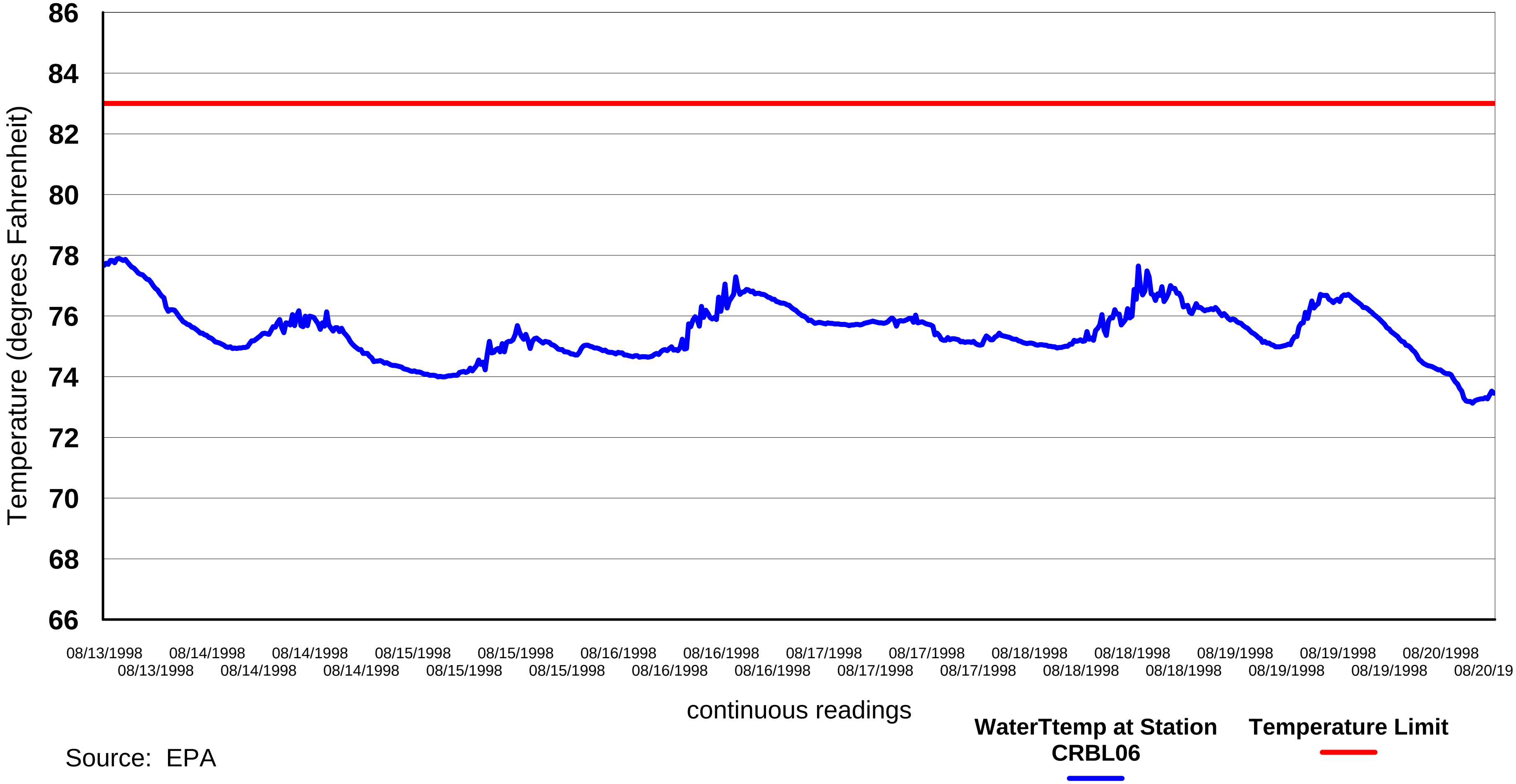


Figure 5.9.2-31 Charles River ambient river temperatures, recorded continuously at a depth of 0.75 meters, in the vicinity of the Boston University Bridge (background monitoring station), compared with the established temperature limit for the Zone of Passage and Habitat (July 10 - 15, 1998).



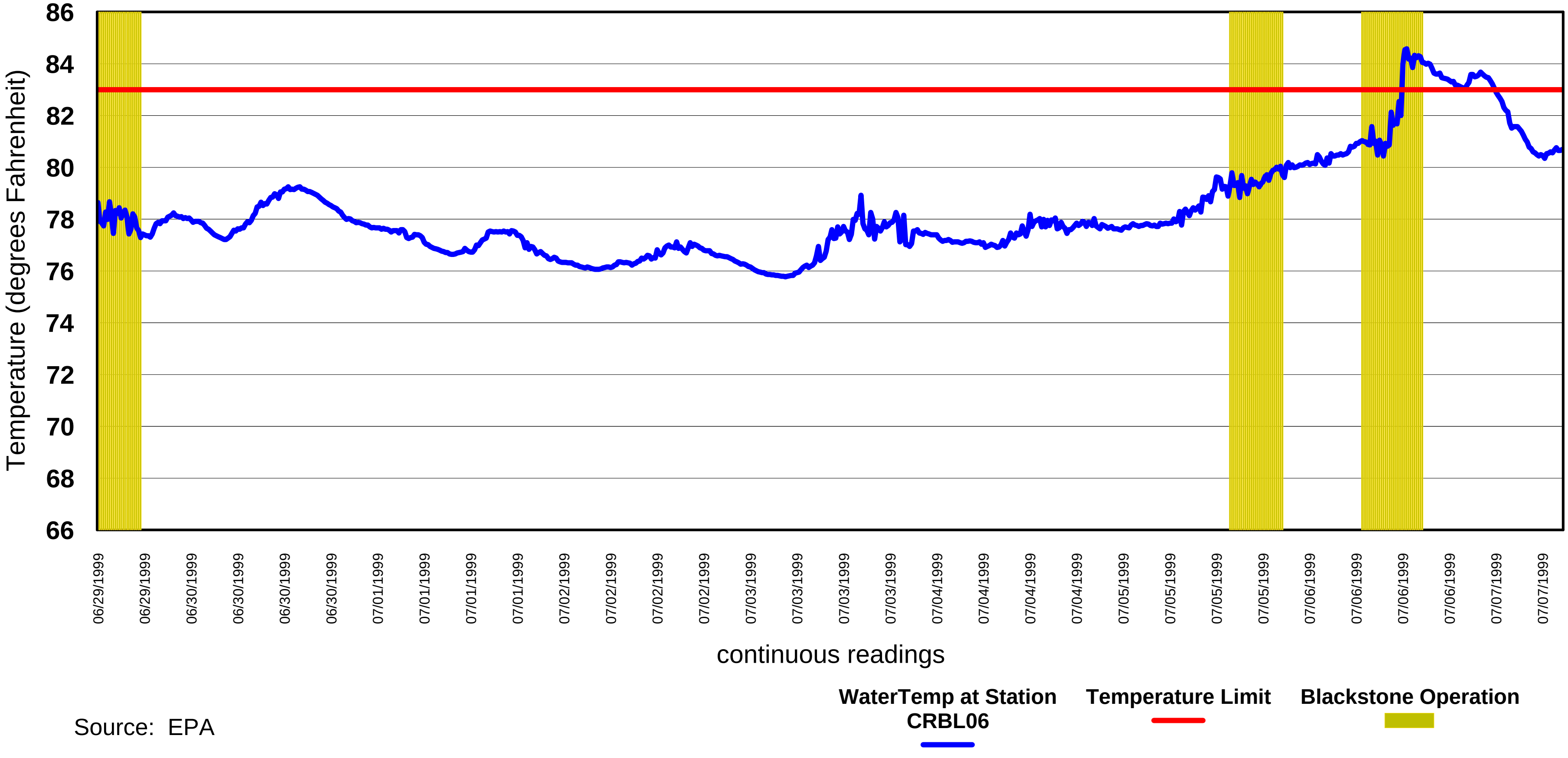
Source: EPA

Figure 5.9.2-32 Charles River ambient river temperatures, recorded continuously at a depth of 0.75 meters, in the vicinity of the Boston University Bridge (background monitoring station), compared with the established temperature limit for the Zone of Passage and Habitat (August 13 - 20, 1998).



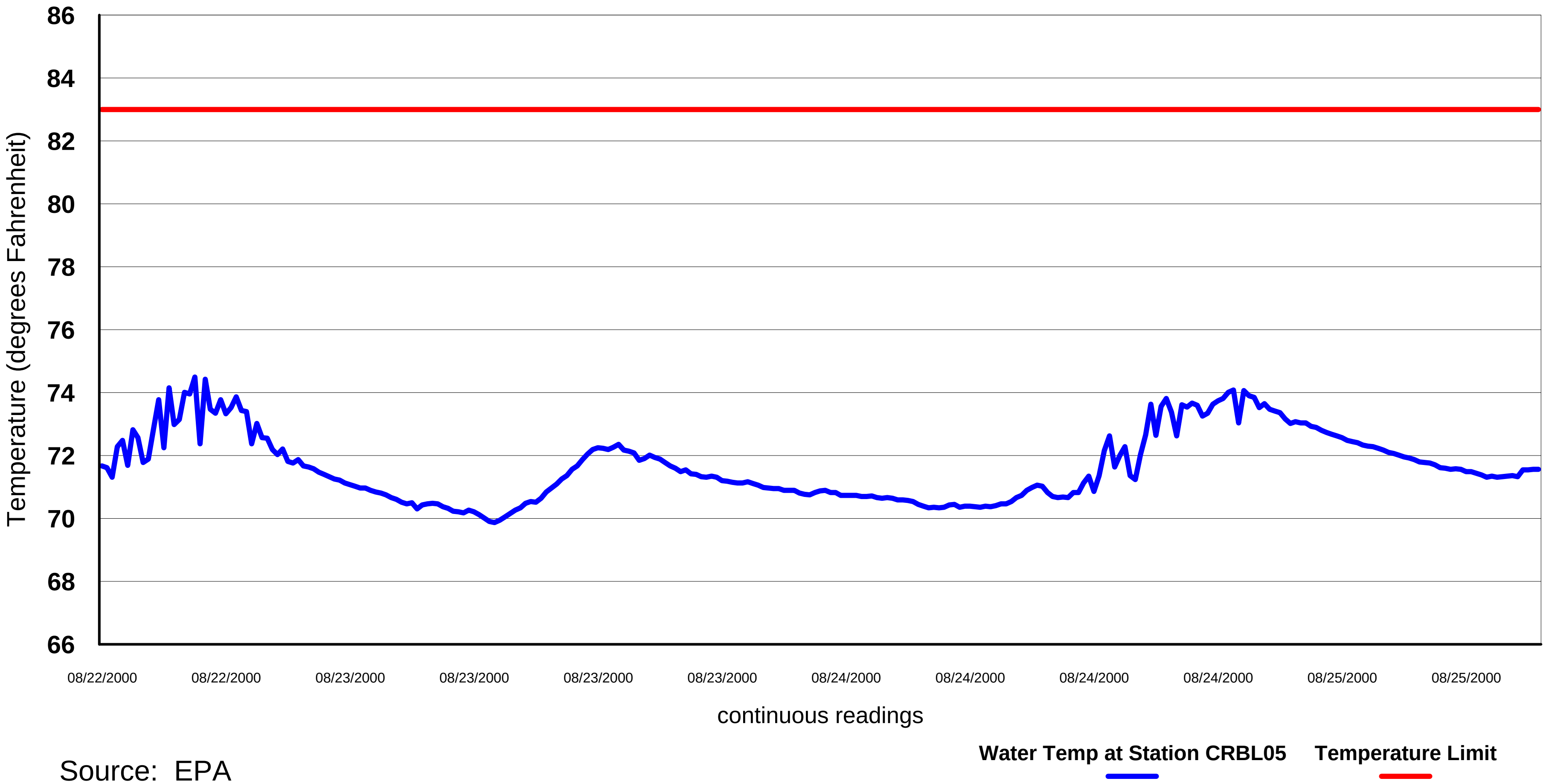
Source: EPA

Figure 5.9.2-33 Charles River ambient river temperatures, recorded continuously at a depth of 0.75 meters, in the vicinity of the Boston University Bridge (background monitoring station), compared with the established temperature limit for the Zone of Passage and Habitat. The time periods when Blackstone Station discharged heated effluent to the river are also identified in the figure (June 29 - July 7, 1999).



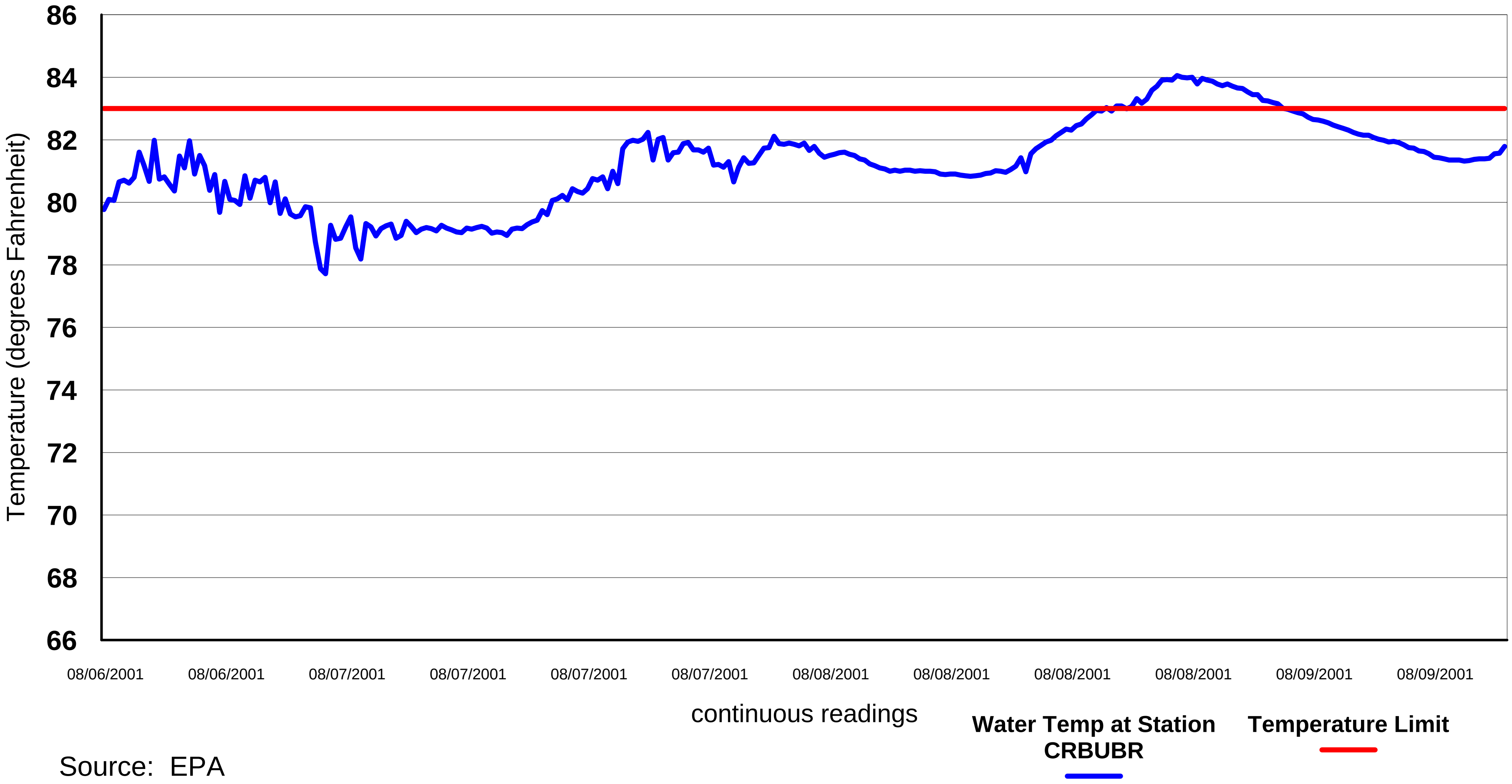
Source: EPA

Figure 5.9.2-34 Charles River ambient river temperatures, recorded continuously at a depth of 0.75 meters, in the vicinity of the Boston University Bridge (background monitoring station), compared with the established temperature limit for the Zone of Passage and Habitat (August 22 - 25, 2000).



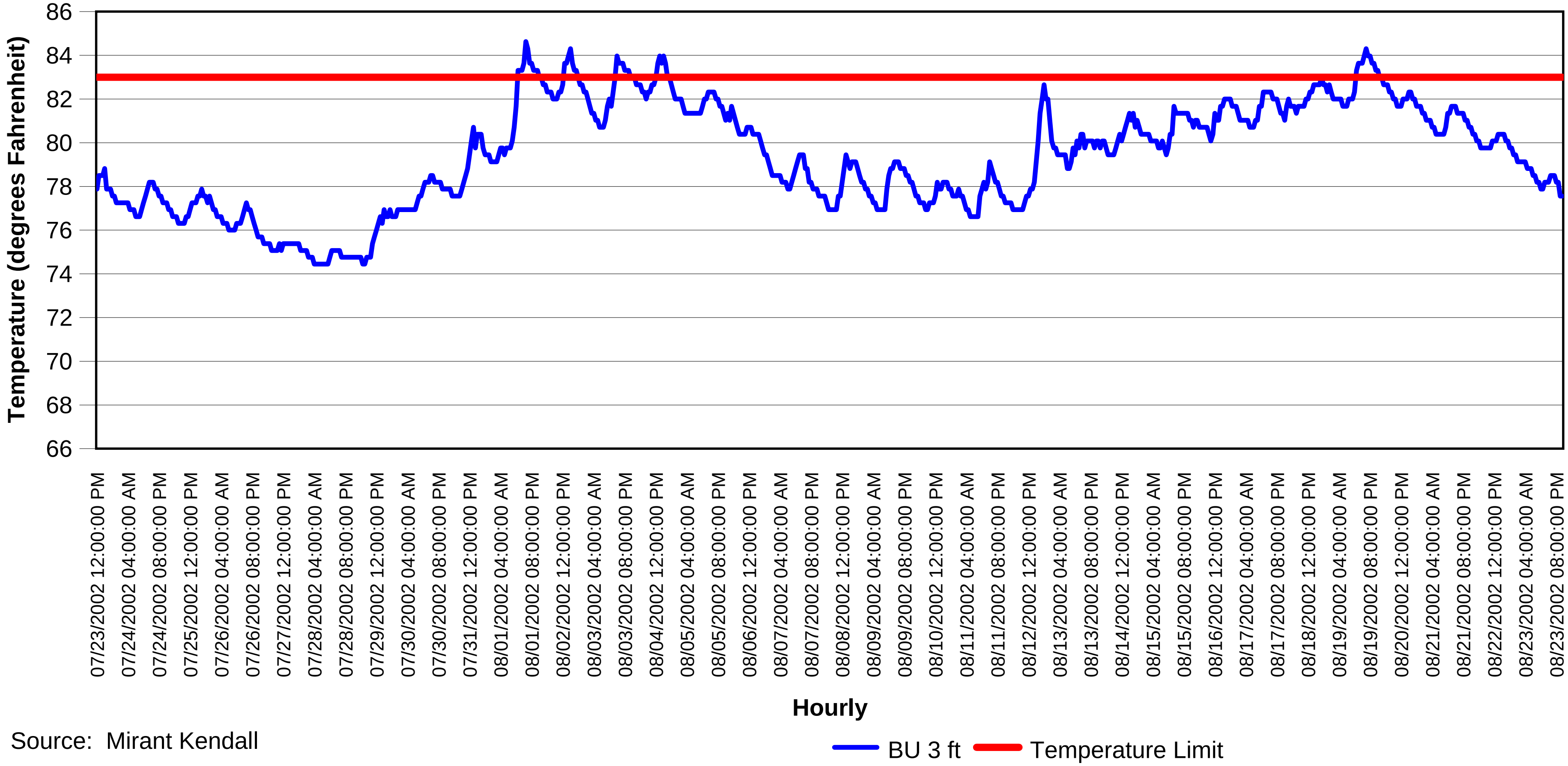
Source: EPA

Figure 5.9.2-35 Charles River ambient river temperatures, recorded continuously at a depth of 0.75 meters, in the vicinity of the Boston University Bridge (background monitoring station), compared with the established temperature limit for the Zone of Passage and Habitat (August 6 - 9, 2001).



Source: EPA

Figure 5.9.2-36 Charles River ambient temperatures, recorded continuously at a depth of 3 feet, in the vicinity of the Boston University Bridge (background monitoring station), compared with the established temperature limit for the Zone of Passage and Habitat (July 23 - August 23, 2002).



Source: Mirant Kendall

Figure 5.10.5c-1 Continuous temperature data from the Boston University Bridge (close to Monitoring Station 1, Background) and a location near Monitoring Stations 3 (Boston Shore ZPH) and 4 (Mid-Channel ZPH). Presented to show daily fluctuation in water temperature and the time lag between the Boston University Bridge area and the downstream areas (Mirant Kendall Data, July 23 to Aug 23, 2002).

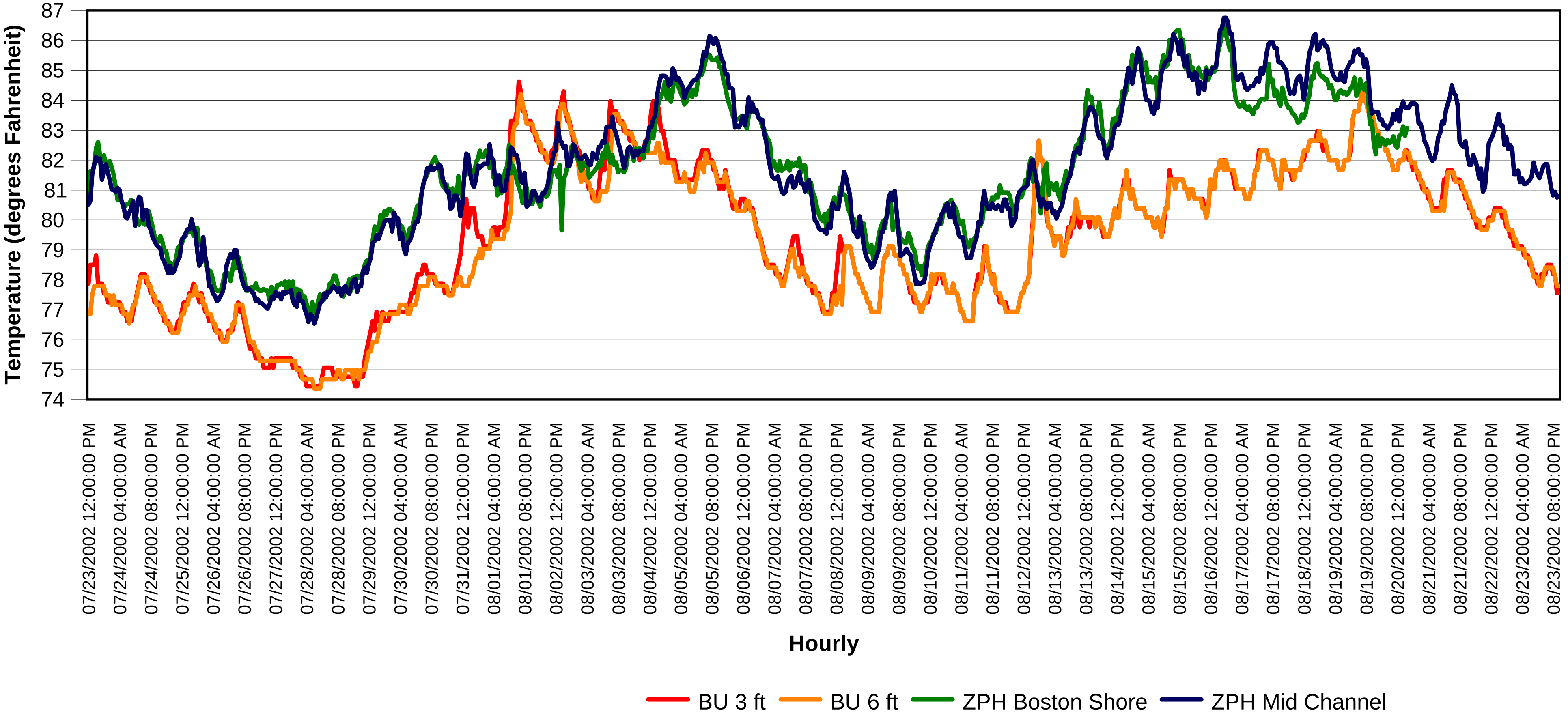


Figure 5.10.5c-2 Continuous temperature data from the Boston University Bridge (close to Monitoring Station 1, Background) and a location near Monitoring Stations 3 (Boston Shore ZPH) and 4 (Mid-Channel ZPH). Presented to show daily fluctuation in water temperature and the time lag between the Boston University Bridge area and the downstream areas. A subset of the timeframe shown in Figure 5.10.5c-1 to better illustrate time lags between data peaks (Mirant Kendall Data, July 23 to 31, 2002).

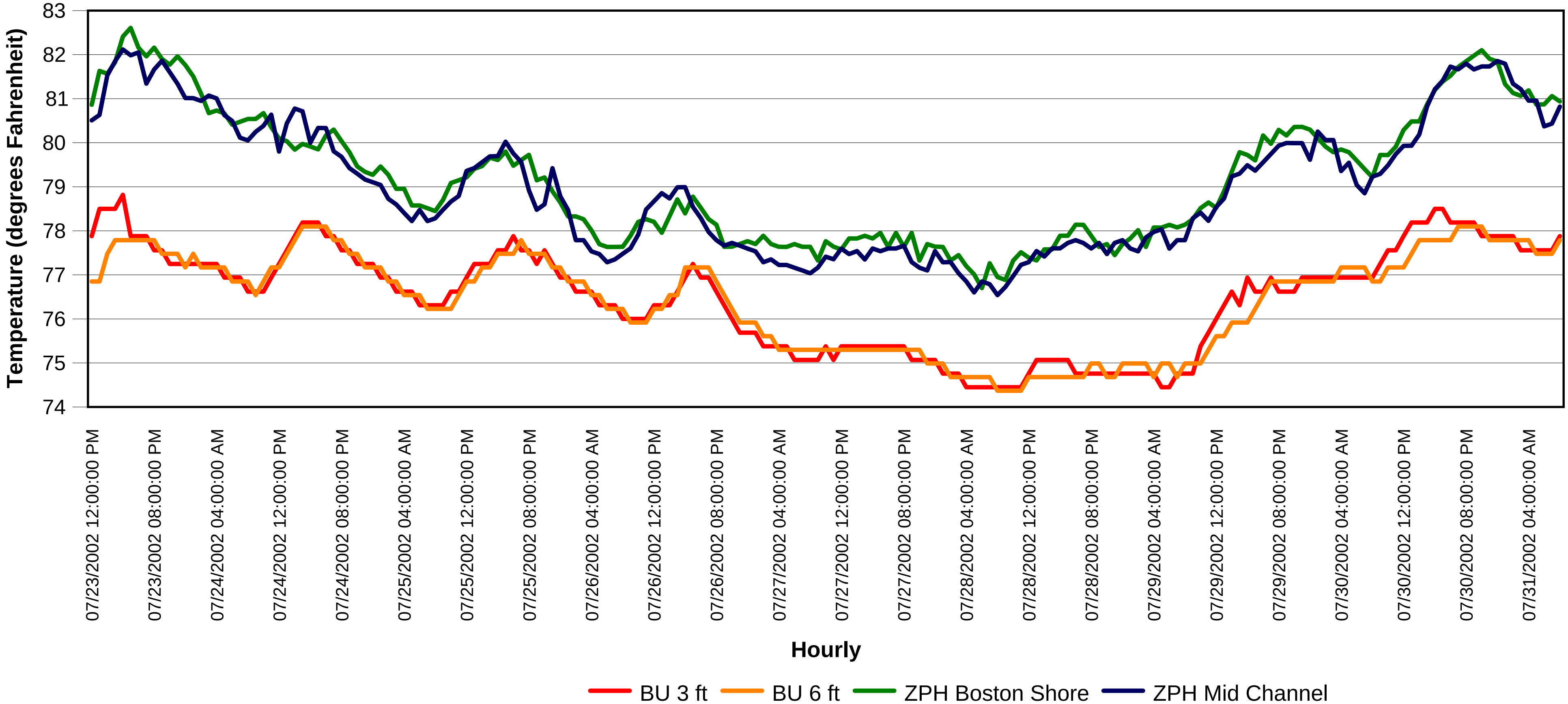


Figure 5.10.5c-3 Continuous temperature data from the Boston University Bridge (close to Monitoring Station 1, Background) and a location near Monitoring Stations 3 (Boston Shore ZPH) and 4 (Mid-Channel ZPH). Presented to show daily fluctuation in water temperature and the time lag between the Boston University Bridge area and the downstream areas. A subset of the timeframe shown in Figure 5.10.5c-1 to better illustrate time lags between data peaks (Mirant Kendall, July 31 to Aug 8, 2002).

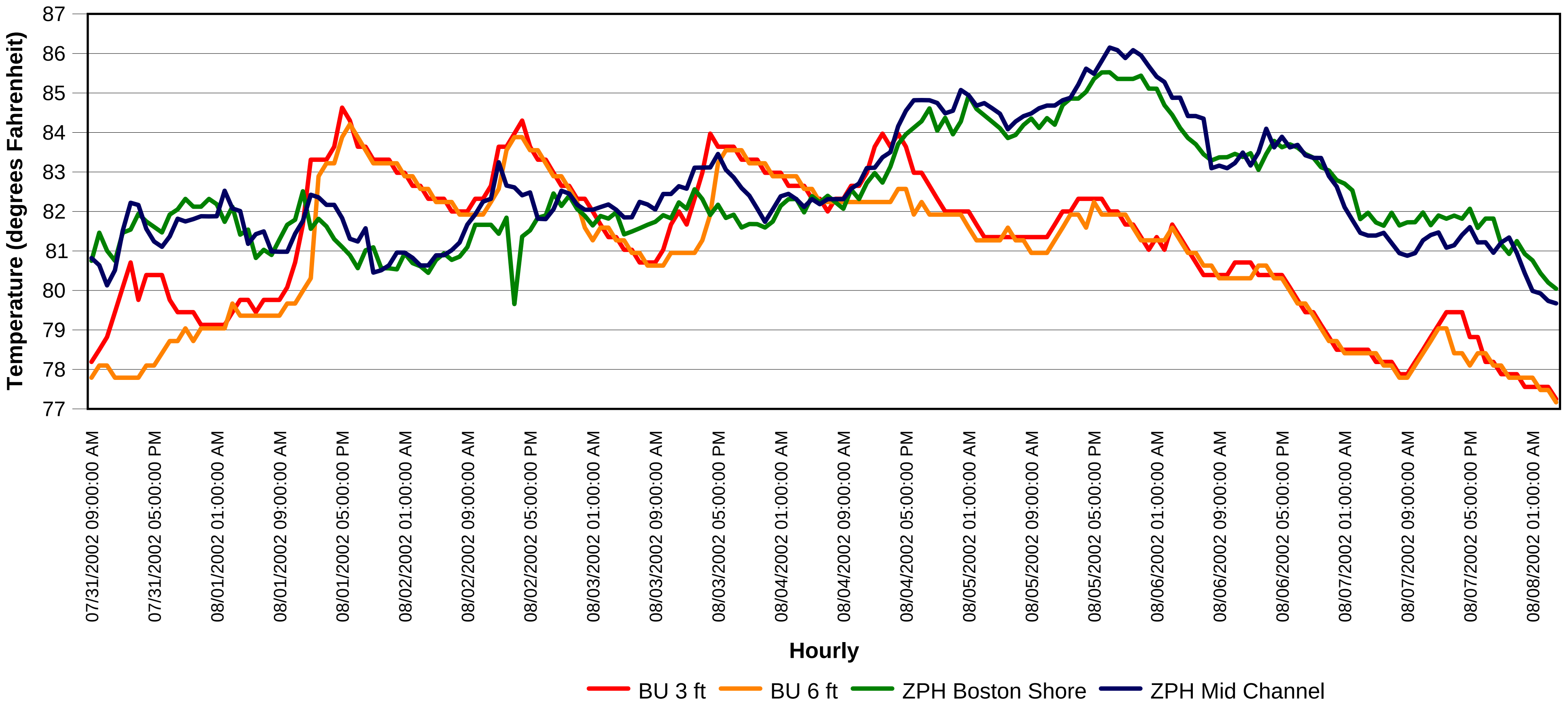


Figure 5.10.5c-4 Continuous temperature data from the Boston University Bridge (close to Monitoring Station 1, Background) and a location near Monitoring Stations 3 (Boston Shore ZPH) and 4 (Mid-Channel ZPH). Presented to show daily fluctuation in water temperature and the time lag between the Boston University Bridge area and the downstream areas. A subset of the timeframe shown in Figure 5.10.5c-1 to better illustrate time lags between data peaks (Mirant Kendall Data, Aug 8 to 15, 2002).

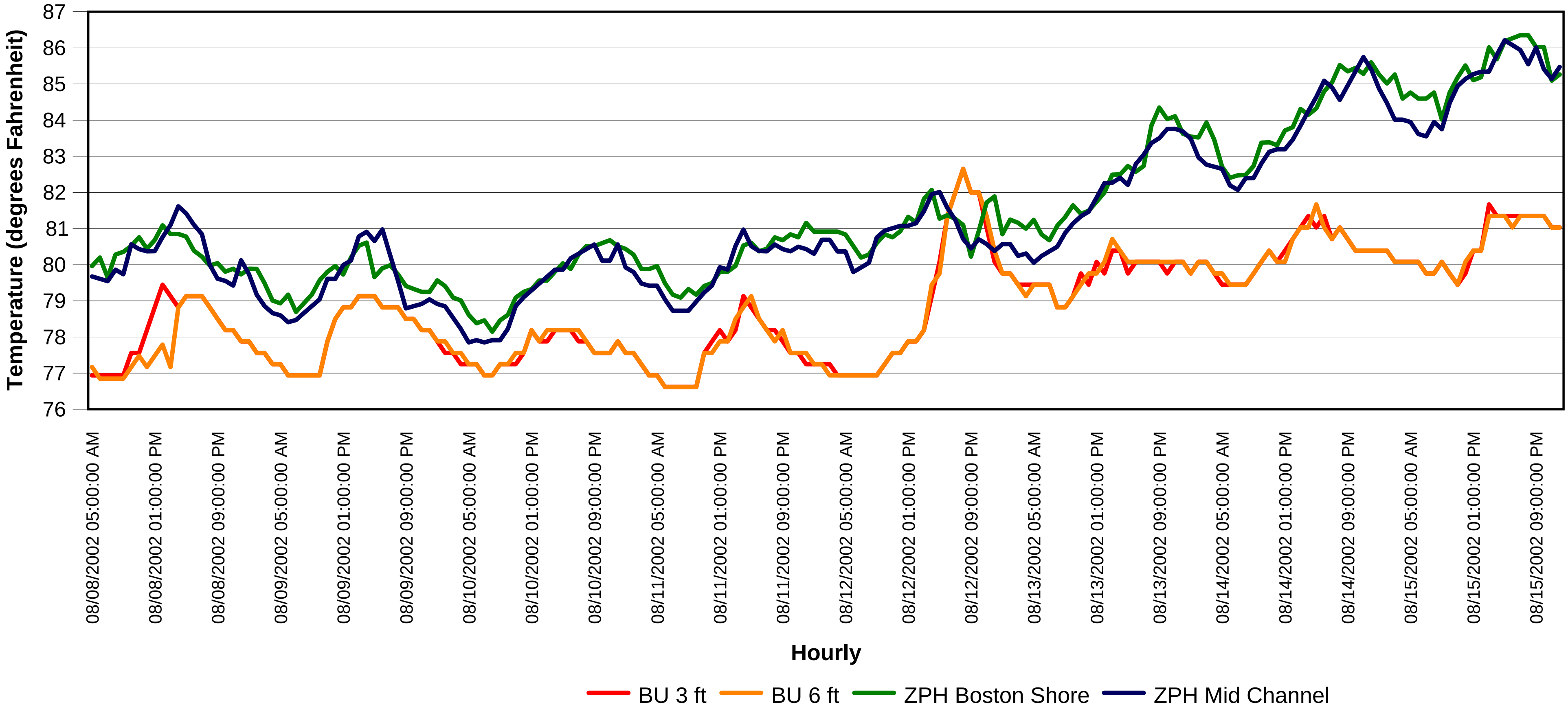
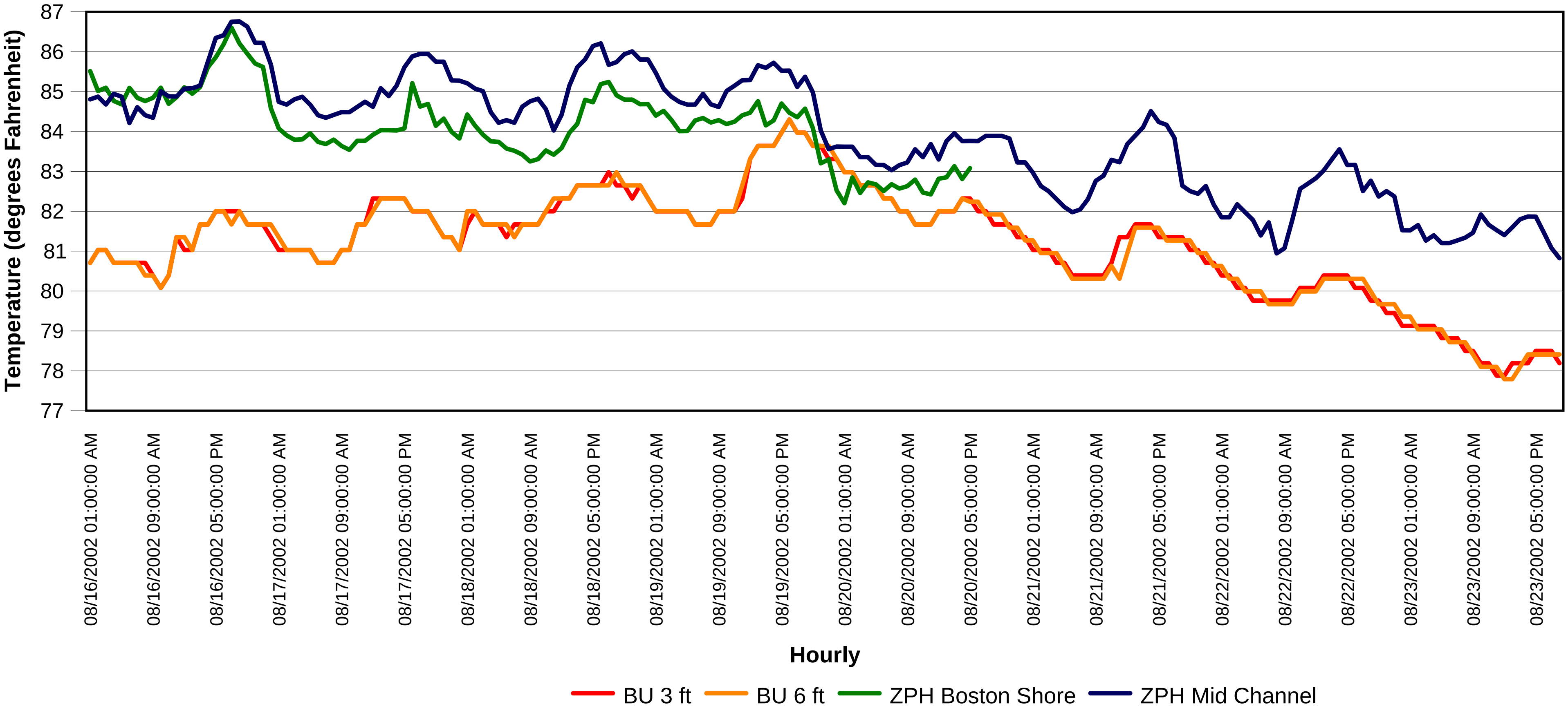
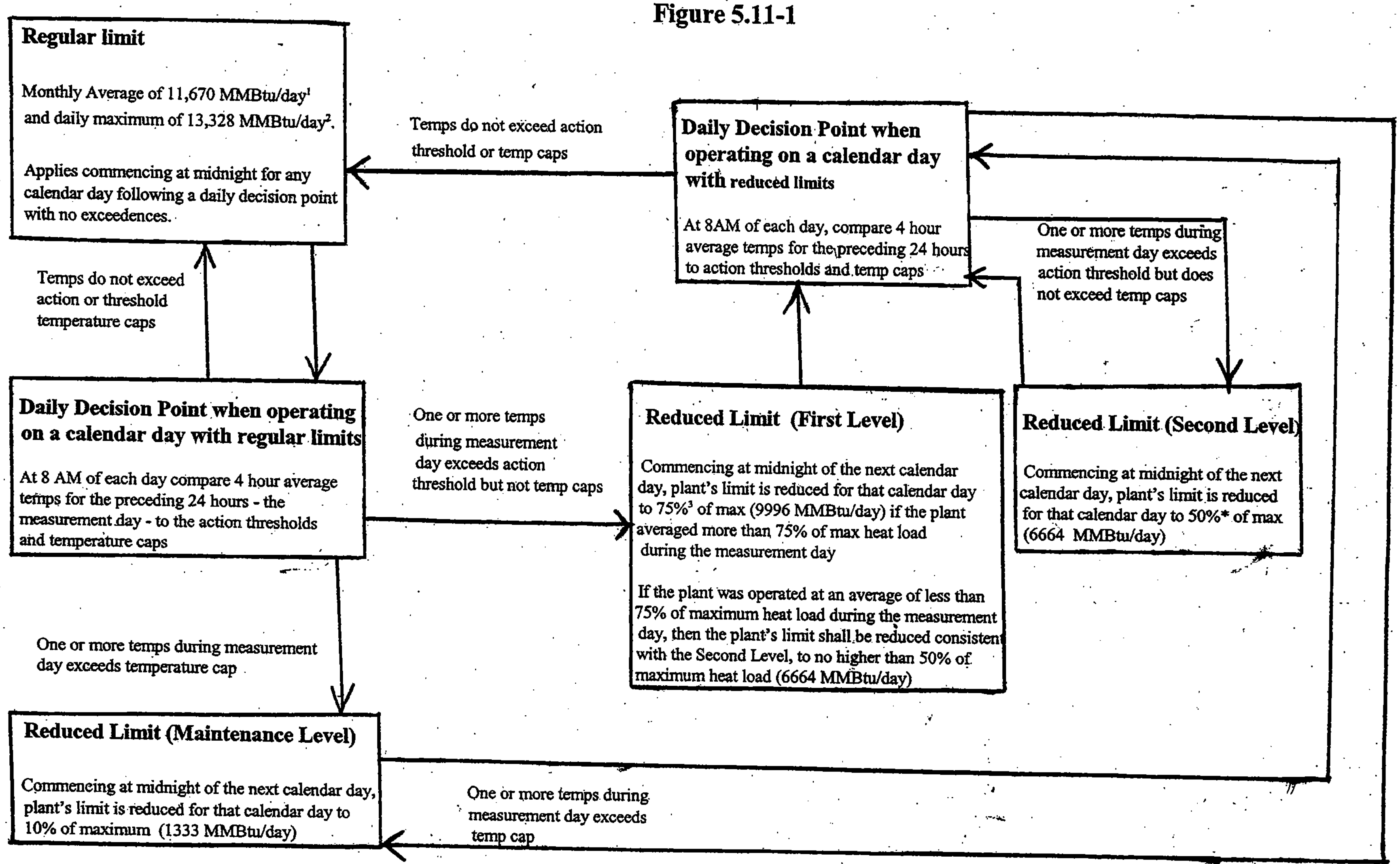


Figure 5.10.5c-5 Continuous temperature data from the Boston University Bridge (close to Monitoring Station 1, Background) and a location near Monitoring Stations 3 (Boston Shore ZPH) and 4 (Mid-Channel ZPH). Presented to show daily fluctuation in water temperature and the time lag between the Boston University Bridge area and the downstream areas. A subset of the timeframe shown in Figure 5.10.5c-1 to better illustrate time lags between data peaks (Mirant Kendall Data, Aug 16 to 23, 2002).



BTU Loading Approach - Flow Chart
Figure 5.11-1



1. Based on 70 MGD effluent flow; 2. Based on 80 MGD effluent flow

3. 75% and 50% levels are maximum levels for the entire day, not to be exceeded at any time during that particular calendar day

Table 2.6-1 KENDALL STATION LIST OF FINFISH PRIORITY SPECIES	
Common Name	**Scientific Name**
River Herring (Alewife & Blueback Herring)	*Alosa pseudoharengus* and *A. aestivalis*
White Perch	*Morone americana*
Sunfish (Pumpkinseed & Bluegill)	*Lepomis gibbosus* and *L. macrochirus*
Yellow Perch	*Perca flavescens*
American Shad	*Alosa sapidissima*
Black Crappie	*Pomoxis nigromaculatus*
Brown Bullhead	*Ictalurus nebulosus*
Chain Pickerel	*Esox niger*
Channel Catfish	*Ictalurus punctatus*
Common Carp	*Cyprinus carpio*
Golden Shiner	*Notemigonus crysoleucas*
Largemouth Bass	*Micropterus salmoides*
Northern Pike	*Esox lucius*
Rainbow Smelt	*Osmerus mordax*
Spottail Shiner	*Notropis hudsonius*
Striped Bass	*Morone saxatilis*
White Catfish	*Ictalurus catus*
American Eel	*Anguilla rostrata*

Table 5-1 of Mirant Kendall Permit Application

Table 5.3-1 Kendall Station historic heat load, compared with projected future maximum heat load, and calculated percent (%) increase. Based on hourly heat load values, except for daily heat load values in 1998. Information from Mirant Kendall (June through September, 1998, 1999 and 2000).

Projected Future Heat Load value calculated as follows: (Delta T (20 F) x Water Use (80 MGD) x 8.34) /24 hours/day

Month	Year 1998 (MMBTU/hr)	Year 1999 (MMBTU/hr)	Year 2000 (MMBTU/hr)	Average Heat Load	Projected Future Heat Load	Percent Increase
June	69.5	114.6	140.6	108.2 MMBTU/hr	556 MMBTU/hr	413.7 %
July	87.1	131.1	82.6	100.3 MMBTU/hr	556 MMBTU/hr	454.5 %
August	80.7	136.6	107.2	108.2 MMBTU/hr	556 MMBTU/hr	414.0 %
September	74.3	111.9	72.5	86.2 MMBTU/hr	556 MMBTU/hr	544.8 %

Table 5.6-1. Species identified as among the most sensitive to elevated temperatures for at least part of their life cycle. It must be stressed that temperatures and time periods listed in this table came from a preliminary "first draft" of threshold parameters for these species. The temperature values and time periods identified were used for comparison between the species of interest to determine which resident and anadromous species appeared to have the lowest thresholds. The protective temperature limits and time periods ultimately developed were based on a number of sources and discussed fully in Sections 5.6.3 and 5.7.3 of the Determination Document (page 1 of 5).

Blueback Herring

Life Stage	Time of Year	Temp. of Interest	Reference	Comments
Adults (Spawning)	April 15 - June 30	27.0^{o}C (80.6^{o}F)	Loesch, J.G., and W.A. Lund, Jr.,1977, A Contribution to the Life History of the Blueback Herring, <u>Alosa aestivalis</u>, Trans. Am., Fish Soc., 106(6):583-589.	
Eggs	May 1 - June 30	28.4^{o}C (83.1^{o} F)	[Lawler, Matusky & Skelly Engineers, 1998] Koo, et al., 1979 (as cited in Tab 14[1])	
Larvae	May 1 - July 15	27.9^{o}C (82.2^{o}F)	Ecological Analysts, Inc., 1978 (Tab 5)	Substituting Alewife for this life stage
Juveniles	June 1 - Sept. 30	29.3^{o}C (84.7^{o}F)	Ecological Analysts, Inc., 1978 (Tab 5)	Substituting Alewife for this life stage
Adults	June 30 - July 30	29.0^{o}C (84.2^{o}F)	Meldrim, J.W, J.J. Gift, and B.R. Petrosky, 1974 (Tab 8)	

Table 5.6-1. Species identified as among the most sensitive to elevated temperatures for at least part

[1] The "Tab" number refers to tabs 3-25 containing the references in the document titled "Charles River Tolerance Information provided to the Agencies on April 26, 2001 by Marine Research, Inc.

of their life cycle. It must be stressed that temperatures and time periods listed in this table came from a preliminary "first draft" of threshold parameters for these species. The temperature values and time periods identified were used for comparison between the species of interest to determine which resident and anadromous species appeared to have the lowest thresholds. The protective temperature limits and time periods ultimately developed were based on a number of sources and discussed fully in Sections 5.6.3 and 5.7.3 of the Determination Document (page 2 of 5).

Alewife

Life Stage	Time of Year	Temp. of Interest	Reference	Comments
Adults (Spawning)	April 15 - June 15	21.1ºC (70ºF)	[Edsall, T.A.,1970]; Cooper, 1961 (as cited in Tab 3)	migration ceases (unpublished field data may indicate higher limit)
Eggs	May 1 - June 30	26.7ºC (80ºF)	Kellogg, R.L.,1982 (Tab 4)	
Larvae	May 1 - July 15	27.9ºC (82.2ºF)	Ecological Analysts, Inc., 1978 (Tab 5)	
Juveniles	June 1 - Sept. 30	29.3ºC (84.7ºF)	Ecological Analysts, Inc., 1978 (Tab 5)	
Adults	June 15 - July 30	26.7ºC (80.1ºF)	Ecological Analysts, Inc., 1978 (Tab 5)	

Table 5.6-1. Species identified as among the most sensitive to elevated temperatures for at least part

of their life cycle. It must be stressed that temperatures and time periods listed in this table came from a preliminary "first draft" of threshold parameters for these species. The temperature values and time periods identified were used for comparison between the species of interest to determine which resident and anadromous species appeared to have the lowest thresholds. The protective temperature limits and time periods ultimately developed were based on a number of sources and discussed fully in Sections 5.6.3 and 5.7.3 of the Determination Document (page 3 of 5).

White Perch

Life Stage	Time of Year	Temp. of Interest	Reference	Comments
Adults (Spawning)	April 1 - June 15	27.0ºC (80.6ºF)	U.S. Fish and Wildlife Survey, 1983; Jackson et al., 1995	Range from 8 to 27ºC
Eggs	April 15 - June 30	27.0ºC (80.6ºF)	Ecological Analysts, 1983; Morgan and Rasin, 1982	12-14 ºC optimal
Larvae	May 1 - July 15	31.6ºC (88.9ºF)	Ecological Analysts, 1983	
Juveniles	March 1 - Dec. 30	29.6ºC (85.3ºF)	Ecological Analysts, 1983; Meldrim and Gift, 1971	Upper Limit of optimum growth; 30.6ºC – 96% lethality for 24 hours after 3 days acclimated at 20ºC
Adults	March 1 - Dec. 30	32.0ºC (89.6ºF)	Gift and Westman, 1971	Avoidance Temp. in lab experiment

Table 5.6-1. Species identified as among the most sensitive to elevated temperatures for at least part

of their life cycle. It must be stressed that temperatures and time periods listed in this table came from a preliminary "first draft" of threshold parameters for these species. The temperature values and time periods identified were used for comparison between the species of interest to determine which resident and anadromous species appeared to have the lowest thresholds. The protective temperature limits and time periods ultimately developed were based on a number of sources and discussed fully in Sections 5.6.3 and 5.7.3 of the Determination Document (page 4 of 5).

Yellow Perch

Life Stage	Time of Year	Temp. of Interest	Reference	Comments
Adults (Spawning)	March 20 - April 30	18.3ºC (65.0ºF)	R. Keller, Mass. Div. Of Fisheries & Wildlife, Personal Communication, 2001; Koonce, J.F., B.F. Bagenal, R.F. Carline,, K.E.F. Hokanson, and M. Naiec, 1977 (Tab 17)	Lower limit of temp. that inhibits egg cleavage
Eggs	April 1 - May 15	21.1ºC (70.0ºF)	R. Keller, Mass. Div. Of Fisheries & Wildlife, Personal Communication, 2001; Koonce, et al., 1977 (Tab 17)	Upper limit of temp. that inhibits egg cleavage
Larvae	April 1 - June 30	28.1ºC (82.5ºF)	Krieger, D.A., J.W. Terrell, and P.C. Nelson, 1983, Habitat Suitability Information: Yellow Perch, U.S. Fish Wildl. Serv. FWS/OBS-83/10.55, 37pp.; NWRC website	
Juveniles	All Year	29.2ºC (84.5ºF)	Krieger, et al., 1983; NWRC website	Lower limit of incipient lethal
Adults	Nov 1 - March 30	10.0ºC (50.0ºF)	Krieger, et al., 1983; NWRC website	Adults must be exposed to 5-6 months of cold water temps. to ensure "ripening" of eggs
Adults	March 2 - Oct. 31	25.0ºC (77.0ºF)	Krieger, et al., 1983; NWRC website	Avoidance temp.

Table 5.6-1. Species identified as among the most sensitive to elevated temperatures for at least part of their life cycle. It must be stressed that temperatures and time periods listed in this table came

from a preliminary "first draft" of threshold parameters for these species. The temperature values and time periods identified were used for comparison between the species of interest to determine which resident and anadromous species appeared to have the lowest thresholds. The protective temperature limits and time periods ultimately developed were based on a number of sources and discussed fully in Sections 5.6.3 and 5.7.3 of the Determination Document (page 5 of 5).

White Sucker

Life Stage	Time of Year	Temp. of Interest	Reference	Comments
Adults (Spawning)	April 1 - May 30	----------		Move upstream to fast moving shallow water
Eggs	April 1 - May 30	----------		Move upstream to fast moving shallow water
Larvae	April 1 - May 30	26.7°C (80.0°F)	McCormick, J.H., B.R. Jones, and K.E.F. Hokanson, 1977 (Tab 21)	
Juveniles	May 30 - June 30	29.7°C (85.5°F)	McCormick, et al., 1977 (Tab 21)	
Adults	All Year	28.9°C (84°F)	Stauffer, J.R., K.L. Dickson, J. Cairns, Jr., D.S. Cherry, 1976 (Tab 23)	Avoidance temperature

Table 5.7.3c-1 Data from rivers north and south of the Charles River, with well documented alewife and river herring spawning monitoring programs in Rhode Island, Massachusetts and New Hampshire. Assembled by G. Szal, MA DEP, October, 2001 (Page 1 of 3).

Alewife Data

Monument River, Bourndale, Massachusetts

•**Alewife Data Only**

Monument River, Bourndale, Massachusetts

Year	Highest River Temperature Reached by end of Run		Day of Year at end of Run	Calendar Dates
	°C	°F		
1990	17.8	64	155	June 4
1991	18.9	66	147	May 27
1992	18.3	65	152	June 1
1993	18.5	65	144	May 24
1994	18	64	144	May 24
1995	20	68	155	June 4
1996	21	70	147	May 27
1997	14	57	148	May 28
1998	21	70	146	May 26
2000	20.5	69	139	May 19
2001	20	68	137	May 17
2002	17.8	64	141	May 21

Parker River, Massachusetts 1997 – 2001

• **Alewife Run:** 99% of Fish Passed by 65°F; data from all years combined
Range of dates for end of run: May 9-May 19

Lamprey River, New Hampshire

•**Alewife Run**

Year	Max. Temperature when 95% of Run is Complete		Max. Temperature when 99% of Run is Complete		Date when 99% of Run is Complete
	°C	°F	°C	°F	
2000	19	66	19	66	May 31
1999	20	68	19.5	67	May 28

Table 5.7.3c-1 Data from rivers north and south of the Charles River, with well documented alewife and river herring spawning monitoring programs in Rhode Island, Massachusetts and New Hampshire. Assembled by G. Szal, MA DEP, 2001 (Page 2 of 3).

Blueback Data

Taylor River, New Hampshire

Year	Max Temp, 95% Run Completed		Max. Temp. 99% Run Completed	
	°C	°F	°C	°F
1999	22.5	73	26	79

Oyster River, New Hampshire

Blueback Run

Year	Max Temp, 95% Run Completed		Max. Temp. 99% Run Completed	
	°C	°F	°C	°F
1999	20	68	22.5	73

Mixed Species (Blueback and Alewife) Data

Cocheco River, New Hampshire

Year	Max Temp, 95% Run Completed		Max. Temp. 99% Run Completed	
	°C	°F	°C	°F
2000	18	64	19	66
1999	23	73	24.5	76
1998	21.5	71	22	72
1997	22	72	23.5	74

Exeter River, New Hampshire

Year	Max Temp, 95% Run Completed		Max. Temp. 99% Completed Run	
	°C	°F	°C	°F
2000	19	66	19	66
1999	20.5	69	23.5	74
1998	22	72	23.5	74
1997	22.5	73	24	75

Table 5.7.3c-1 Data from rivers north and south of the Charles River, with well documented alewife and river herring spawning monitoring programs in Rhode Island, Massachusetts and New Hampshire. Assembled by G. Szal, MA DEP, 2001 (Page 3 of 3).

Merrimack River, Massachusetts

Year	Max. Temp @ Bulk of Run Complete and %	Max Temp. 95% Completed Run	Max. Temp 99% Completed Run
1983	64°F (85%)	78°F	79°F
1984		71°F	71°F
1985		73.5°F	73.5°F
1986	58°F	72°F	72°F
1987		69°F	74°F

Merrimack River, Massachusetts (continued)

Year	Max. Temp Reached when Bulk of of Run Complete	Max Temp. reached 95% Run Completed	Max. Temp. reached 99% Run Completed
1988	64°F	62°F	66°F
1989	66°F	66°F	69°F
1990		66°F	68°F
1991		74°F	75°F
1992		66°F	68°F
1993	65°F	65°F	65°F
1994	64°F	64°F	64°F
1995	64°F	64°F	64°F
1996	64°F	64°F	64°F
1997	56°F	56°F	70°F
1998	59°F	64°F	70°F
1999	65°F	65°F	67°F
2000	64°F	64°F	64°F

Other information on Merrimack Data:

During the 1991 migration, alewives were reported to have come up the fish lift at the Essex dam at temperatures up to 75°F. As the dam is 26 miles upstream of the mouth of the Merrimack, the river temperature at which alewives enter the system is unknown. We also have no data regarding how long it took the fish to travel this distance.

Table 5.8.1-1 - Kendall Station 316 (a) and (b) Determination Document

Charles River Temperature Limits by Time of Year in the Zone of Passage and Habitat (ZPH)[1]

Time of Year	Max. Temperature [2]	Dissolved Oxygen	Location
March 30 - April 1*	Not to exceed 4 hour average[3] of 13.3ºC (56.0ºF) at each Monitoring Point[4] in the ZPH.	Not less than 5.0 mg/l [5,6] for a 4 hour average at each Monitoring Point in the ZPH.	Monitoring Stations[7] 2, 3, 4, 5, 6, 7 and 8. Each Monitoring Point in the ZPH must meet this temperature limit.
April 2 - April 14*	Not to exceed a 4 hour average of 16.1ºC (61.0ºF) at each Monitoring Point.	Not less than 5.0 mg/l for a 4 hour average at each Monitoring Point in the ZPH.	Monitoring Stations 2, 3, 4, 5, 6, 7 and 8. Each Monitoring Point in the ZPH must meet this temperature limit.
April 15 - April 30**	Not to exceed 4 hour average of 18.3ºC (65.0ºF) at each Monitoring Point in the ZPH.	Not less than 5.0 mg/l for a 4 hour average at each Monitoring Point in the ZPH.	Monitoring Stations 2, 3, 4, 5, 6, 7 and 8. Each Monitoring Point in the ZPH must meet this temperature limit.
May 1 - May 10**	Not to exceed 4 hour average of 19.1ºC (66.4.0ºF) at each Monitoring Point in the ZPH.	Not less than 5.0 mg/l for a 4 hour average at each Monitoring Point in the ZPH	Monitoring Stations 2, 3, 4, 5, 6, 7 and 8. Each Monitoring Point in the ZPH must meet this temperature limit.
May 1 - May 14**	Not to exceed a 4 hour average of 18.3ºC (65.0ºF) at each Monitoring Point.	Not less than 5.0 mg/l for a 4 hour average at each Monitoring Point in the ZPH.	Monitoring Station 8. Each Monitoring Points located at 2.0 ft. and 6.0 ft. must meet this temperature limit.
May 11 - May 14**	Not to exceed a 4 hour average of 20.0ºC (68.0ºF) at each Monitoring Point in the ZPH.	Not less than 5.0 mg/l for a 4 hour average at each Monitoring Point in the ZPH.	Monitoring Stations 2, 3, 4, 5, 6, and 7. Each Monitoring Point in the ZPH must meet this temperature limit.
May 15 - May 22**	Not to exceed a 4 hour average of 20.0ºC (68.0ºF) at each Monitoring Point in the ZPH.	Not less than 5.0 mg/l for a 4 hour average at each Monitoring Point in the ZPH.	Monitoring Stations 2, 3, 4, 5, 6, 7 and 8. Each Monitoring Point in the ZPH must meet this temperature limit.
May 23 - May 31**	Not to exceed a 4 hour average of 21.1ºC (70.0ºF) at each Monitoring Point in the ZPH.	Not less than 5.0 mg/l for a 4 hour average at each Monitoring Point in the ZPH.	Monitoring Stations 2, 3, 4, 5, 6, 7 and 8. Each Monitoring Point in the ZPH must meet this temperature limit.

Time of Year	Max. Temperature [2]	Dissolved Oxygen	Location
June 1 to June 7**	Not to exceed a 4 hour average of 21.1ºC (70.0ºF) at each Monitoring Point.	Not less than 5.0 mg/l for a 4 hour average at each Monitoring Point in the ZPH.	Monitoring Station 8. Each Monitoring Point, located at 2.0 ft. and 6.0 ft., must meet this temperature limit.
June 1 - June 7**	Not to exceed a 4 hour average of 22.2ºC (72.0ºF) at each Monitoring Point in the ZPH..	Not less than 5.0 mg/l for a 4 hour average at each Monitoring Point in the ZPH.	Monitoring Stations 2, 3, 4, 5, 6, and 7. Each Monitoring Point in the ZPH must meet this temperature limit.
June 8 - June 11	Not to exceed a 4 hour average of 23.9ºC (75.0ºF) at each Monitoring Point in the ZPH.	Not less than 5.0 mg/l for a 4 hour average at each Monitoring Point in the ZPH.	Monitoring Stations 2, 3, 4, 5, 6, 7 and 8. Each Monitoring Point in the ZPH must meet this temperature limit.
June 12 - Oct. 31	Not to exceed a 4 hour average of 28ºC (83.0ºF) at each Monitoring Point in the ZPH.	Not less than 5.0 mg/l for a 4 hour average at each Monitoring Point in the ZPH.	Monitoring Stations 2, 3, 4, 5, 6, 7 and 8.
November 1 to March 29 (chill period")* * *	Not to exceed a 4 hour average of 10.0ºC (50.0ºF) at each Monitoring Point in the ZPH.	Not less than 5.0 mg/l for a 4 hour average at each Monitoring Point in the ZPH.	Monitoring Stations 2, 3, 4, 5, and 6

Time of Year	Max. Temperature ^{2}	Dissolved Oxygen	Location
The Chill Period Shall Begin on: 1) Nov. 1, providing that 1) Max. Temperature provisions are met (see next column) 2) if not begun under condition 1) above, then between November 1 and November 14, when 2) Max Temperature provisions are met (see next column) 3) if not begun under conditions 1) or 2) above, then beginning on November 15, provided that 3) Max Temp. provisions are met (see next column)	(The numbered items below correspond to the same numbered items in the "Time of Year" column) 1) Maintain water temperatures in the In-Zone transect ZPH, based on a temperature average of the 2.0 ft. and 6.0 ft .Monitoring Points over a four hour period, at or below 10.0ºC (50.0ºF) for three consecutive days. 2) Condition 1 (see Time of Year column) has been met, or when Monitoring Station 1 temperature averaged from the 2.0 ft. and 6.0 ft. Monitoring Points over a four hour period, is at or below 10.0ºC (50.0ºF) for three consecutive days. 3) if conditions 1) and 2) have not been met, maintain the river temperatures in the ZPH at no more than 10.0ºC (50.0ºF). If background temperature exceeds 10.0ºC (50.0ºF), ZPH may rise to 1.1ºC (2.0ºF) above background temperature. Background temperature, **for this purpose only**, is defined as the warmer of the 2.0 ft. or 6.0 ft. Monitoring Points located at Monitoring Station 1. Once Max Temperature conditions 1) or 2) are met, this condition no longer applies.	Not less than 5.0 mg/l for a 4 hour average at each Monitoring Point in the ZPH.	Monitoring Stations 2, 3, (4, 5 and 6, if in the ZPH) based on a temperature average of Monitoring Points at 2.0 ft. and 6.0 ft.

Time of Year	Max. Temperature [2]	Dissolved Oxygen	Location
The Chill Period will end on March 29th , when 149 days have met the Max. Temperature provisions: 1) if by March 29th the temperatures have not met Max Temperature provisions for 149 days, then the Facility will operate in accordance with 1) Max. Temperature provisions (see next column) until 149 days are met 2) The chill period will end after being in effect for 149 days or on April 13th, whichever comes first	1) maintain the river temperatures in the ZPH at no more than 10.0ºC (50.0ºF). If background temperature exceeds 10.0ºC (50.0ºF), ZPH may rise to 1.1ºC (2.0ºF) above background temperature. Background temperature, **for this purpose only**, is defined as the warmer of the 2.0 ft. or 6.0 ft. Monitoring Points located at Monitoring Station 1.	Not less than 5.0 mg/l for a 4 hour average at each Monitoring Point in the ZPH.	Monitoring Stations 2, 3, (4, 5 and 6, if in the ZPH) based on a temperature average of Monitoring Points at 2.0 ft. and 6.0 ft.

Time of Year	Max. Temperature [2]	Dissolved Oxygen	Location
All Year	1) The maximum temperature differential limit of 2.8ºC (5ºF) or "Delta T of 2.8 ºC (5ºF)" will be determined by comparing a) the 24 hour block time average (00:00 [midnight]-23:59) of temperatures recorded at Monitoring Points at 2.0 ft and 6.0 ft. (averaged together) at Station 1 with b) the 24 hour block average (00:00 [midnight]-23:59) of the temperatures recorded at Monitoring Points at 2.0 ft. and 6.0 ft. (averaged together) at each of the Monitoring Stations in the ZPH.	Not less than 5.0 mg/l for a 4 hour average at each Monitoring Point in the ZPH.	Compare the average of the 2.0 ft. and 6.0 ft. Monitoring Points at Monitoring Station 1, with the the 2.0 ft and 6.0 ft average at each of Monitoring Stations 2. 3, 4 and 8 in the ZPH. At Station 7 only, the average of the 6.0 ft and 12.0 ft Monitoring Points (instead of the 2.0 ft and 6.0 ft average) may be compared with the Monitoring Station 1 average, if this will result in compliance with the Delta T limit.

* The Start Date of this temperature limit will be the day after the yellow perch chill period ends, if later than March 29.

** If the Monitoring Station 1 (background station) temperature, averaged from the 2.0 ft and 6.0 ft Monitoring Points over a four hour period, exceeds the established limits identified for a given time period, then the Station 1 average temperature becomes the applicable temperature limit. Exception: For <u>six</u> non-consecutive 24 hour periods only during the time-frame from April 15 to June 7, if the Monitoring Station 1 average temperature is at or above the prescribed limit, the Facility will be allowed to operate such that the river temperatures downstream of Monitoring Station 1 in the ZPH are 1.1ºC (2.0ºF) above background up to a maximum temperature of 22.2ºC (72.0ºF); except for the June 1 to June 7 time period, where the temperature may be 1.1ºC (2.0ºF) above the Monitoring Station 1average temperature up to a maximum temperature of 23.3ºC (74.0ºF). To ensure that all six (6) 24 hour periods are not used within a brief time frame, only three (3) exceedances will be allowed in any four week period. Unused days will not be carried over to future years.

*** If "Chill Period" temperature has not been met by November 1, then Chill Period Limits will be in effect when the Monitoring Station 1 (background station) temperature averaged from the 2.0 ft. and 6.0 ft. Monitoring Points over a four hour period, reach 10.0ºC (50.0ºF) or below for three consecutive days.

Footnotes:

1. The "Zone of Passage and Habitat" (ZPH) is the area of the lower Charles River Basin that is viable habitat (temperature and dissolved oxygen levels causing no acute or chronic effects), spanning from the upstream location of the Zone Boundary Transect to the downstream location of the New Charles River Dam and Locks (Attachment B). The ZPH is defined by compliance with temperature and dissolved oxygen limits at the following Monitoring Points: All Monitoring Points at Station 2 must be met at all times. This station is located upstream of the Longfellow Bridge, approximately half the distance between the Boston and Cambridge shores of the Charles River. The ZPH also includes, at all times, all Monitoring Points at Station 3 (Boston side). The ZPH includes, at all times, all Monitoring Points at Station 4, with the exception of the 2 foot monitoring point. The ZPH includes, at all times, a sufficient number of Monitoring Points at Stations 5 and 6 such that at least ½ of the total number of Monitoring Points that meet the dissolved oxygen limit of 5.0 mg/l in the In-Zone Transect (Stations 3, 4, 5 and 6) meet the temperature limit in effect. These Monitoring Points must be contiguous with Monitoring Points at Station 4. In addition, the ZPH includes, at all times that Monitoring Station 7 (located at the Science Museum lock) is required, at least two contiguous Monitoring Points (2.0 ft. and 6.0 ft., or 6.0 ft and 12.0 ft.). The ZPH also includes, at all times that Monitoring Station 8 (upstream of the New Charles River Dam and Locks) is required, the 2.0 ft. and 6.0 ft. Monitoring Point.

2. Should the 4 hour average temperature of the average of the 2.0 ft. and 6.0 ft. Monitoring Points of Monitoring Station 1 near the Boston University Bridge (Background Station) exceed any of the applicable temperature limits specified in this table for the corresponding time period, the temperature at Monitoring Station 1 will become the maximum temperature limit until the average temperature at 2.0 ft. and 6.0 ft. of the Monitoring Points at Monitoring Station 1 fall below the applicable maximum temperatures herein.

3. The 4 hour average consists of a minimum of one instantaneous measurement, at evenly spaced time intervals and taken within each of the four discrete one hour time periods (minimum of four total readings). If more than one reading is used within a discrete hour, the readings must be taken at evenly spaced time intervals within the hour (e.g. every 15 minutes) and the same number of readings, at the same temporal spacing, must be used for all hours within the four hour average block for the calculation of the four hour average temperature. Four hour averages shall be reported daily for the following four hour time blocks: 0:00 - 3:59, 4:00 - 7:59, 8:00 - 11:59, 12:00 - 15:59, 16:00 - 19:59 and 20:00 - 23:59.

4. A Monitoring Point is an underwater probe at a discrete depth which records temperature and other water quality parameters when specified.

5. Dissolved oxygen concentrations are for all depths except where indicated.

6. A dissolved oxygen concentration below 5 mg/l, when measured at a Monitoring Point required to be in the ZPH, is not a violation of the permit limit. If the dissolved oxygen concentration is less than 5 mg/l at any Monitoring Point, then that Monitoring Point is not considered to be located in suitable habitat. Therefore, that Monitoring Point will no longer be a temperature compliance point. In the case of the In-Zone Transect (Monitoring Stations 3, 4 ,5 and 6) a Monitoring Point with a dissolved oxygen level below 5 mg/l will not be used in the calculation to verify that at least ½ of the Monitoring Points of the In-Zone Transect meet the temperature limit in effect for a corresponding time period.

7. A Monitoring Station is a vertical array of temperature and other sensors suspended by a buoy or attached to a permanent structure in the Charles River.