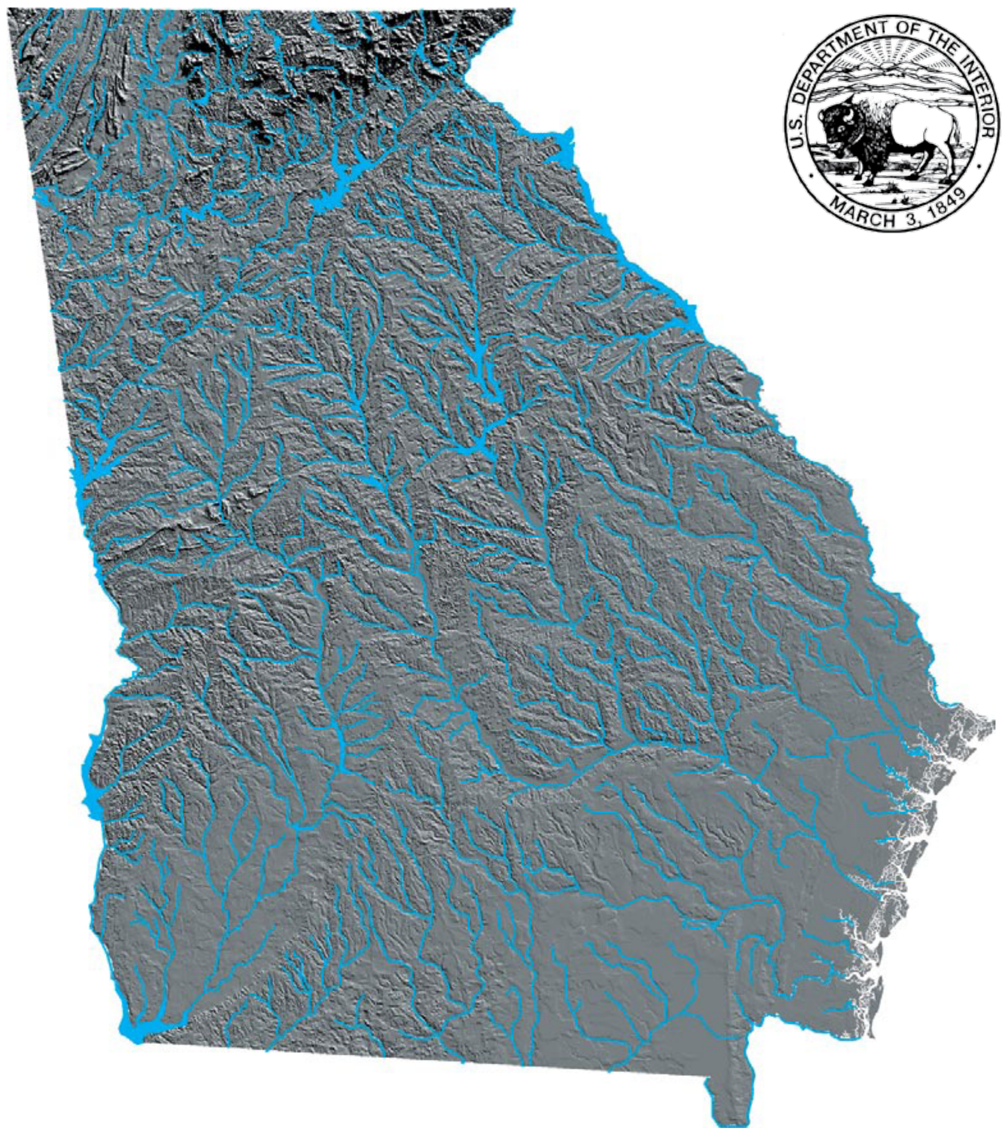
STREAM-TEMPERATURE CHARACTERISTICS IN GEORGIA

U.S. GEOLOGICAL SURVEY



Prepared in cooperation with the

GEORGIA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Water-Resources Investigations Report 96-4203

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By T.R. Dyar and S.J. Alhadeff

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U.S. DEPARTMENT OF THE INTERIOR

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ABSTRACT

Stream-temperature measurements for 198 periodic and 22 daily record stations were analyzed using a harmonic curve-fitting procedure. Statistics of data from 78 selected stations were used to compute a statewide stream-temperature harmonic equation, derived using latitude, drainage area, and altitude for natural streams having drainage areas greater than about 40 square miles. Based on the 1955–84 reference period, the equation may be used to compute long-term natural harmonic stream-temperature coefficients to within an on average of about 0.4 ° C.

Basin-by-basin summaries of observed long-term stream-temperature characteristics are included for selected stations and river reaches, particularly along Georgia's mainstem streams. Changes in the stream-temperature regimen caused by the effects of development, principally impoundments and thermal power plants, are shown by comparing harmonic curves and coefficients from the estimated natural values to the observed modified-condition values.

INTRODUCTION

Stream-temperature characteristics are used to assess, manage, and protect the water resources of Georgia. As body temperature is an indicator of human health, water temperature is an indicator of the ability of a stream to sustain aquatic life and assimilate wastes.

Stream-temperature data are important inputs for stream water-quality models. In 1974, the Georgia Department of Natural Resources, Environmental Protection Division (EPD), with assistance from the U.S. Geological Survey (USGS), designed and constructed a seasonal stream assimilative capacity (SAC) model as an aid to stream assessments in Georgia. The SAC model has been used to provide statistics for the design and operation of waste-treatment facilities to help ensure compliance with various water-quality standards and to quantify stream assimilative capacity.

Stream-temperature data along with curves determined by least-squares simple harmonic fitting of the data were presented for 146 stream-temperature stations in Georgia by Dyar and Stokes (1973). The stream-temperature information for these 146 stations is suitable for input to the SAC model or other such water-quality models. However, stream-temperature characteristics have not been estimated for many streams in Georgia for which no data or insufficient data exist. Thus, a simple, reliable method is needed to estimate stream-temperature characteristics for sites where little or no data exist.

This study was conducted by the USGS, in cooperation with the EPD. The stream-temperature data used in this study were collected in cooperation with EPD and other Federal, State, and local agencies.

Purpose and Scope

This report summarizes the water-temperature characteristics of selected stream stations in Georgia, and provides a harmonic equation suitable for estimating natural seasonal water-temperature characteristics of most Georgia streams. The harmonic equation described in this report is based on estimates of natural seasonal stream-temperature characteristics for non-tidal streams in Georgia having drainage basins greater than 40 square miles (mi^2). Stream-temperature characteristics computed by the harmonic equation presented in this report may be compared to observed stream-temperature data to evaluate how seasonal stream-temperature characteristics of a particular stream may be deviating from estimated natural characteristics.

This report builds upon the Statewide summary report of stream-temperature data presented by Dyar and Stokes (1973). Seasonal stream-temperature characteristics are computed and analyzed from data collected by USGS at 198 periodic and 22 continuous record stream-temperature stations through 1984, including most of the 146 stations reported by Dyar and Stokes (1973).

The harmonic equations for computing natural seasonal stream-temperature characteristics presented in this report are based on analyses of 78 stream-temperature stations having records from about 1955–84. Analyses of records collected subsequent to 1984 could cause changes in these equations. However, based on comparisons of the analyses in this report and Dyar and Stokes (1973), changes likely will occur slowly.

Throughout this report, the term “natural” is intended to describe stream temperatures that are relatively unaffected by human activities, including such practices as waste-water return, reservoir operation, diversions, or proximity to urban areas. The term “natural” is subjective and rigorous evaluative procedures are not applied to prove the validity of its use. Similarly, the term “modified” connotes that observed stream temperatures likely are affected by human activities. The terms “stream temperature,” “water temperature,” and “temperature” are synonymous throughout this report. Finally, the terms “station” and “stream station” refers to locations where systematic stream-temperature data are available; whereas, the term “site” and “stream site” refers to locations where little or no data are available.

Previous Investigations

Numerous previous stream-temperature studies were referred to during the compilation and analysis of the information contained in this report. Statewide inventories of continuous or periodic records of stream temperatures collected primarily by the USGS were presented for California in a series of reports by Blodgett (1970–72) and for North Carolina by Woodard (1970). More descriptive, graphic summaries on regional-basin, statewide, or national scales have taken several forms. Maps depicting gross areal variability of selected stream-temperature characteristics have been prepared for Florida (Anderson, 1971), for Washington (Collings and Higgins, 1973), and for the Nation as a whole (Blakely, 1966; Steele and others; 1974, Hawkinson and others, 1977). Plots of annual stream-temperature variations have been reported for numerous stations in Montana (Aagaard, 1969), for selected sites in Georgia (Lamar, 1944), for the upper Delaware River basin in New York (Williams, 1971), and for the Delaware River at Trenton, N.J. (McCarthy and Keighton, 1964).

Annual seasonal temperature variations were distinguished from shorter-term daily variations in stream temperature in reports by Calandro (1969) and Williams (1971). Studies correlating air and water temperatures on an annual or seasonal basis include studies by Kothandaraman and Evans (1972), Anderson and Faust (1973), Williams (1971), and Steele (1974).

Based on seasonal cyclical patterns of stream-temperature records commonly observed at numerous measuring stations, a least-squares, harmonic-analysis regression fit of annual variability was proposed by Ward (1963). An evaluation of incremental benefits obtained by imposing higher-order harmonics in the analysis (Thomann, 1967; Kothandaraman, 1971) concluded that a single-harmonic analytical depiction of seasonal variations in stream temperatures explains 85–95 percent of the observed variability in annual records. A modification of the basic single-harmonic approach was reported by Tasker and Burns (1974) for specific application to regions where streams are affected by ice cover for prolonged periods.

In addition to the above reports on graphical or analytical representations of seasonal variations in stream temperature, several other investigations warrant mentioning. Detailed studies, generally on small streams, have described and evaluated various environmental factors affecting stream temperatures

(Pluhowski, 1970; Moore, 1967). Collings and Higgins (1973) related stream-temperature harmonic coefficients to selected characteristics of a basin using a multiple-regression approach and found the most frequently occurring, statistically significant variables were drainage area, channel slope, mean basin altitude, and mean annual streamflow. Gilroy and Steele (1972) evaluated the effects of reduced sampling frequencies of stream-temperature measurements as depicted by harmonic coefficients for selected long-term daily records.

Station-Identification System

The stream-temperature station numbers are based upon a numbering system which has been used for USGS surface-water stations since October 1, 1950. In this system, the station-identification number is assigned according to downstream order and gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete number of each station, such as 02331655, includes the two-digit part number “02” plus the downstream-order number “331655,” which can be from 6 to 12 digits (Stokes and McFarlane, 1995). The tables and most figures in this report adhere to this system.

In figures 1 and 2 of this report, the USGS stream-station numbers are shortened by omitting the first two digits. Similarly, in the text of this report, all stream-temperature station names that are referenced to Georgia cities are shortened to omit the “Ga.” part. For example, the complete station number and name for the abbreviated “392500, Little River near Roswell,” is “02392500, Little River near Roswell, Ga.” Other abbreviated station numbers can be completed similarly with the exception of stations having abbreviated numbers greater than 5000—these stations require a leading “03” rather than a leading “02.” For example, the complete station number for station 545000 is 03545000. The number and name abbreviations are intended to improve the readability of the report. The tables and most figures in this report contain complete station numbers and names.

Stream-Temperature Data

Periodic and daily stream-temperature data for streams in Georgia stored in the USGS database through 1984 were compiled for evaluation and possible further analyses. The compilation yielded 333 periodic stations having 8 or more temperature measurements and 61 stations with daily temperature records. Of the 333 periodic stations, 198 had five or more years of well-distributed data suitable to determine long-term stream-temperature characteristics (table 1, in back of report). Similar criteria were used to screen the 61 daily record stations; 22 of these stations were selected as suitable for harmonic analyses (table 2, in back of report). All but four of the daily record stations (02208450, 02231000, 02338660, and 02382720, respectively) also are periodic stations. The 198 periodic stream-temperature stations selected for analysis are listed in table 1 with their locations shown in figure 1. The 22 selected daily stream-temperature record stations are listed in table 2 and shown in figure 1. The figure also shows major river basins and physiographic provinces discussed in this report.

Periodic stream temperatures for stations listed in table 1 were measured by holding a thermometer in flowing water and, in most instances, reading the thermometer while the bulb was immersed. Accuracies of periodic temperature measuring techniques used by the USGS are within about 0.8 ° C (Moore, 1967, p. 8–14; Rawson, 1970, p. 2–4; Blodgett, 1970, p. 2–3). Because most periodic-temperature measurements are made during daylight hours, observed stream temperatures generally are higher than daily mean stream temperatures.

Daily record stream temperatures were collected by automatic recording equipment or by local observers. A variety of automatic recorders have been used to collect data over the years. Generally, accuracies of water temperatures collected by automatic recording equipment are within ± 1 ° C (Moore, 1967, p. 8–14; Rawson, 1970, p. 2–4; Blodgett, 1970, p. 2–3). Data collected by local observers also are believed to be within ± 1 ° C.

Figure 1. Locations of 198 periodic and 22 daily stream-temperature stations, major river basins, and physiographic provinces in Georgia.

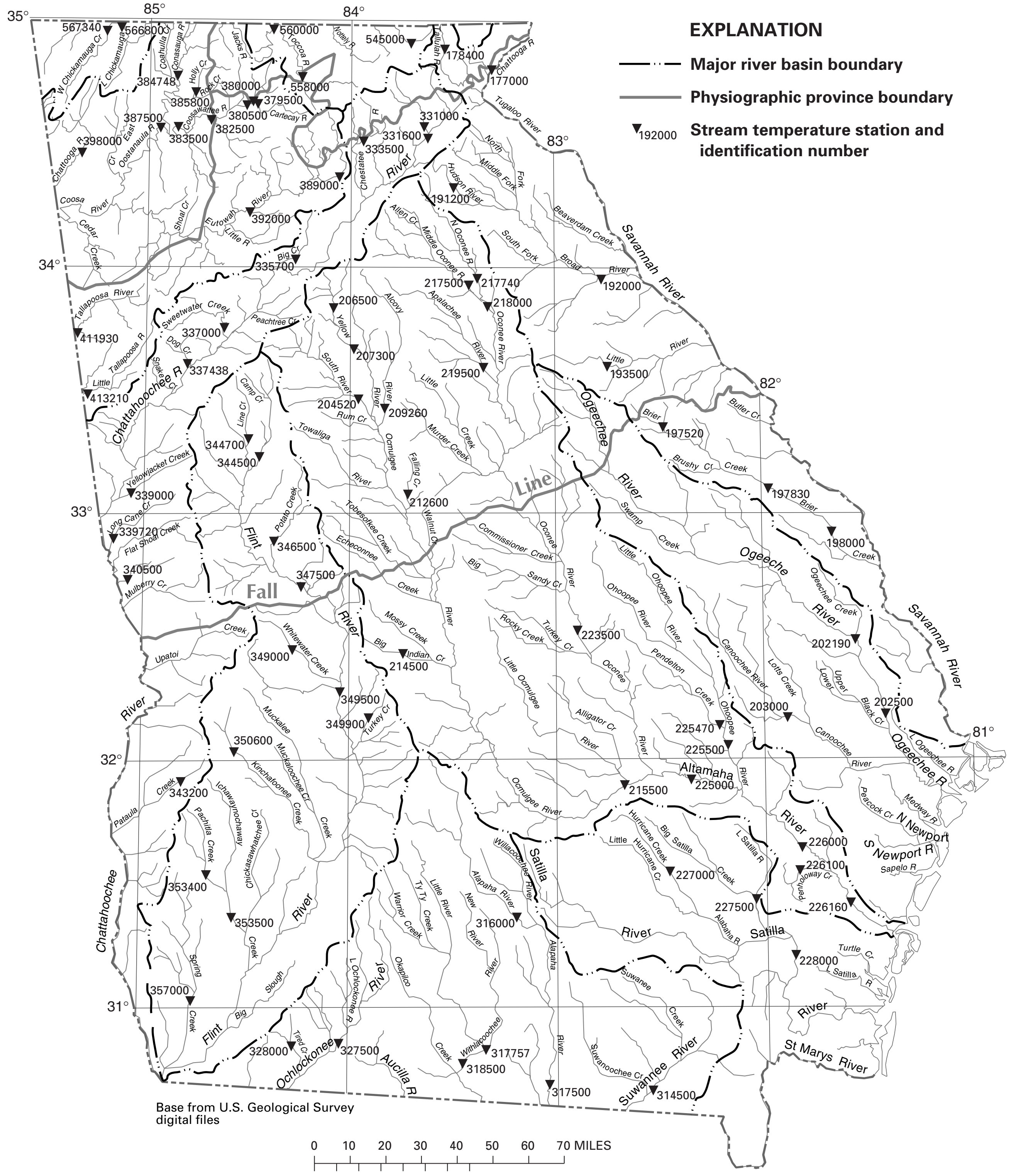

Figure 2. Names of major streams and locations of 78 stream-temperature stations used to compute harmonic stream-temperature regression equations.

LONG-TERM STREAM-TEMPERATURE CHARACTERISTICS

Dyar and Stokes (1973) demonstrated that annual seasonal or long-term stream-temperature characteristics may be represented by a harmonic (sinusoidal) function of the following form (Ward, 1963; Collings, 1969; and Steele and Gilroy, 1972):

$$T = M + A\,[\sin (b\,t + c)] \qquad (1)$$

where

- T is the harmonic-mean stream temperature on day "t";
- M is the harmonic-mean coefficient or the long-term mean stream temperature for the period of record used in the analysis;
- A is the amplitude coefficient or annual range in temperature of the harmonic function (or one-half the estimated annual variation in stream temperature for the period of record);
- b is a constant to convert time of year "t" to degrees of arc;
- t is the time of year expressed as a day number, where t = 1 for October 1; and
- c is the phase coefficient of the harmonic function.

A generalized example of a harmonic temperature curve computed from equation (1) is shown in figure 3. Harmonic coefficients for equation (1) (M, A, and c) may be determined by plotting stream-temperature station data for the selected period of analysis on a single annual time segment, without regard to year, and computing the least-square harmonic fit from the data points. The selected annual time segment is a standard "water year" used by the USGS, which represents a period of October 1 to September 30 of the following calendar year.

Stream-temperature data for each station listed in tables 1 and 2 were plotted and harmonic-function coefficients were computed from a least-squares sinusoidal fit of the data. The computed coefficients, standard errors, and variances are listed in tables 1 and 2. Multiple analyses were performed for six periodic

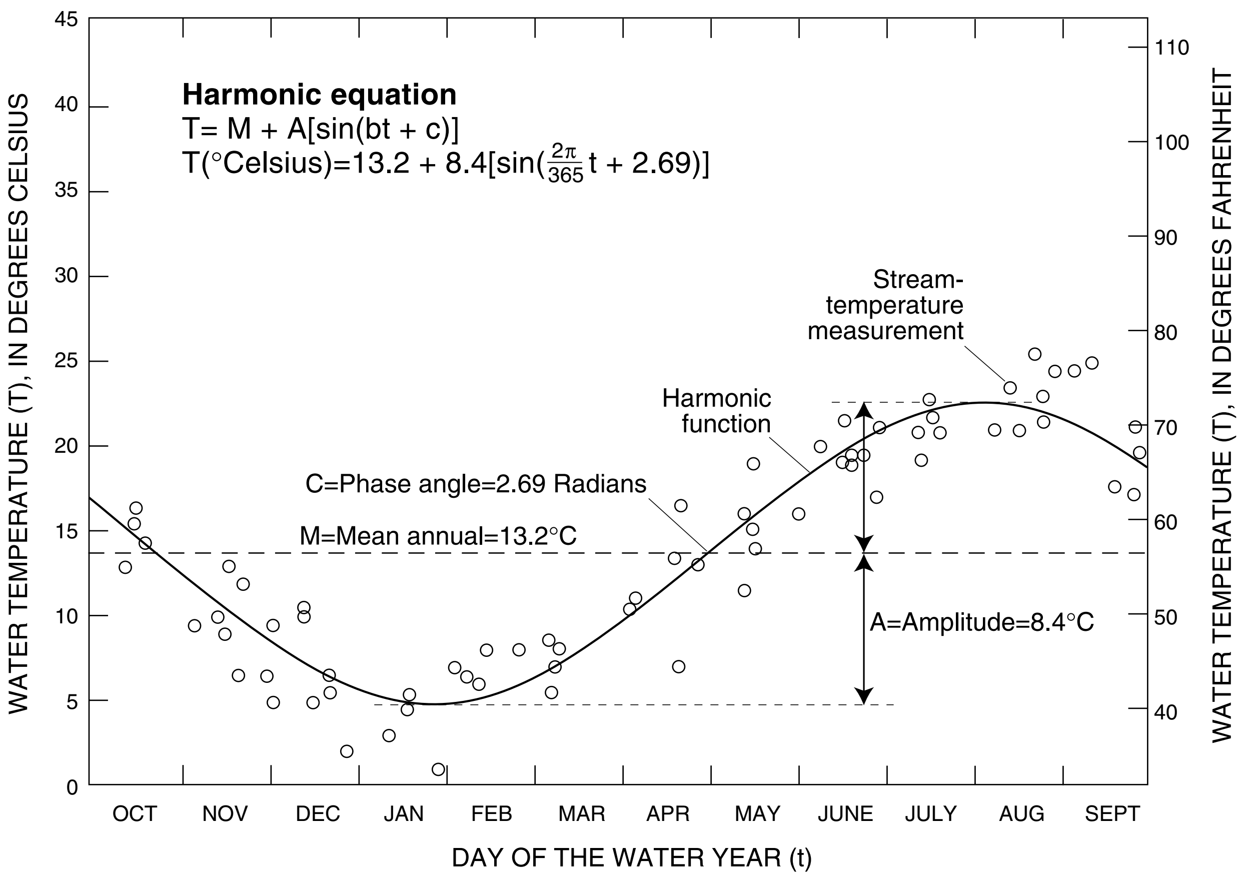

Figure 3. Generalized harmonic stream-temperature curve showing harmonic equation coefficients.

stations (02213500, 02318000, 02336000, 02339500, 02392500, and 02394000) because reservoirs constructed upstream from the stations during the period of record interrupted the homogeneity of the temperature data. Graphs of the annualized stream-temperature data and harmonic-function curves for selected periodic stations listed in table 1 are shown in back of this report.

Natural Stream-Temperature Characteristics

To estimate natural stream-temperature characteristics at ungaged locations, 78 of the 198 periodic stream-temperature stations were selected for regression analysis. No continuous-record stations were selected for analysis because most were located on modified streams or were already represented by periodic stations at the same locations. Stations with stream temperatures substantially affected by human activities and stations having drainage areas less than 40 square miles (mi^2) were excluded from analysis. To help ensure statistical independence, most mainstem stations were excluded. However, 16 stations with drainage areas greater than 1,000 mi^2 were included to provide sufficient drainage area variability for the regional analysis. The 78 stations selected for analysis are listed in table 3 (in back of report) and their locations and stream names are shown in figure 2.

Several limitations of the data used to compute natural temperature characteristics should be noted. First, for the analysis to be rigorous, only stations having completely natural conditions upstream should be used. Because some modifications have occurred on most major streams, computation of completely natural temperature characteristics was not possible. However, natural stream-temperatures should predominate at each of the 78 stations used for analysis (table 3). Second, most periodic data collection occurs in daylight hours, causing a slight temperature bias. This bias typically is from about 0.5 to 1 ° C or less; most bias occurs on smaller streams during the warmer seasons.

Regression Analysis

To develop regional relations, the harmonic mean (M), amplitude (A), and phase coefficients (c) listed in table 3 were each analyzed by regression analyses; the following multiple-regression function was defined:

$$y = b_0 + b_1 * x_1 + b_2 * x_2 + b_3 * x_3 + \ldots + b_n * x_n \qquad (2)$$

where

- y is one of the harmonic-analysis coefficients (M, A, or c as defined in equation 1);
- $b_{0 \cdots n}$ are terms of regression coefficients; and
- $x_{1 \ldots n}$ are variables of selected basin characteristics considered in the regional analysis.

Independent variables used for the regression included the station latitude, drainage area, and altitude (table 1).

Harmonic Mean Coefficient

The empirical equation resulting from the regression analysis to estimate the natural long-term harmonic mean stream-temperature coefficient applicable throughout the State of Georgia is:

$$M = 42.68 - 0.833 * L + 0.743 * \log D - 0.00133 * E \qquad (3)$$

where

- M is the long-term mean stream temperature or the harmonic mean temperature coefficient, in ° C;
- L is the station or stream location latitude, in decimal degrees;
- D is the station or stream location drainage area, in square miles; and
- E is the station or stream location altitude, in feet above sea level.

Harmonic mean stream-temperature and independent variable data used in this regression equation are listed in table 3. The regression yields a standard error of about 0.4 ° C for the harmonic mean stream-temperature coefficient. Equation (3) accounts for 95 percent of the variance, with the latitude component accounting for about 49 percent; altitude for about 27 percent; and drainage area for about 19 percent. Harmonic mean temperatures tend to increase southward and with lower basin altitude.

Residuals obtained by subtracting harmonic mean temperatures determined by regression equation (3) from the values calculated by harmonic analyses of station data are shown in figure 5. Negative values indicate harmonic mean temperatures computed from station data are less than those determined by equation (3). Clusters of both negative and positive residuals are apparent in figure 5; at least one of the larger departures shown in figure 5 is relatively easy to explain. West Chickamauga Creek near Lakeview (station 03567340) has a residual value of + 1.0 ° C as would be expected for any stream in Georgia that flows opposite to the primary north-to-south direction. However, for the most part, the map of residuals (fig. 5) shows random and small numerical departures from equation (3).

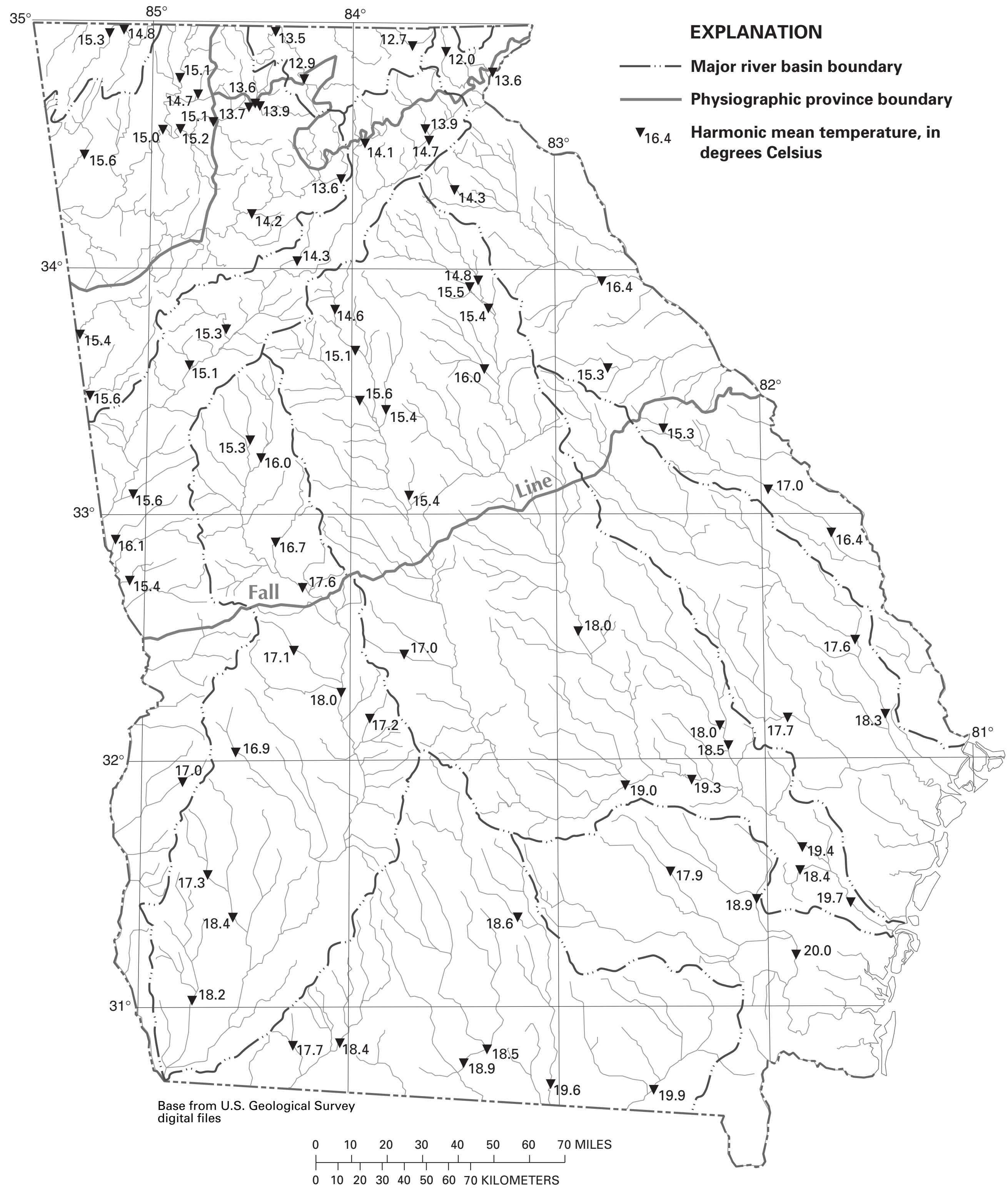

Figure 4. Harmonic mean stream temperatures for 78 natural-condition stations.

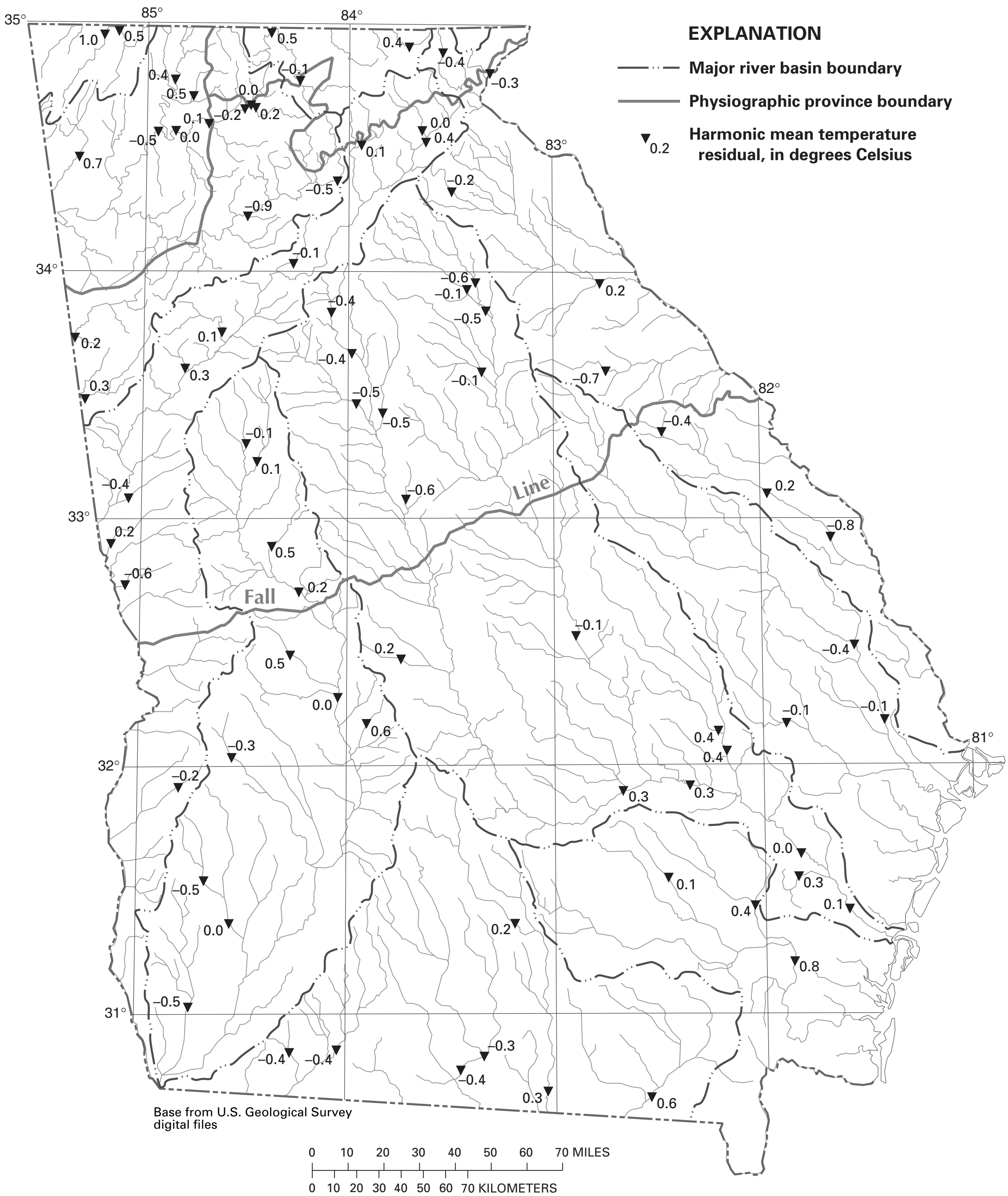

Figure 5. Residuals of harmonic mean stream temperatures for 78 natural-condition stations.

Natural long-term temperature anomalies can be expected in some locations in Georgia. For example, stream temperatures in and around Warm Springs, likely would be higher than values predicted by equation (3). Along the coast and in tidal streams (such as stations 02203559, 02203566, 02203570, 02203574, 02203578, 02203585, and 02203596), data are scarce. Because stations having sea affects are not included, equation (3) should not be applied to tidally affected stream sites. Stream locations having drainage areas smaller than about 40 mi^2 or having a very high proportion of streamflow derived from ground-water inflow upstream may show deviations of 1 ° C or more from values estimated by equation (3).

The empirical equation used to estimate natural long-term harmonic-mean temperatures in Georgia streams predict a maximum high value of about 20.5 ° C; such values occur at lower latitudes, lower altitudes, and in larger drainage basins. The minimum predicted low value is about 12.3 ° C; values in this range occur at higher latitudes, higher altitudes, and in smaller drainage basins. Generally, the harmonic mean temperatures computed from data for the 78 stations analyzed (table 3) agree well with those estimated by equation (3).

Amplitude Coefficient

The empirical equation resulting from the regression analysis to estimate the natural long-term amplitude stream-temperature coefficient applicable throughout the State of Georgia is:

$$A = -7.40 + 0.947 * \log D + 0.426 * L - 0.00075 * E \quad (4)$$

where

A is the amplitude coefficient in ° C;

D is the station or stream location drainage area, in square miles;

L is the station or stream location latitude, in decimal degrees; and

E is the station or stream location altitude, in feet.

Amplitude and independent variable data used in equation (4) are identified in table 3. An areal plot of the amplitude coefficients is shown in figure 6. The regression yields a standard error of about 0.7 ° C. Equation (4) accounts for about 48 percent of the variance, with the drainage area component accounting for about 18 percent; latitude for about 18 percent; and altitude for about 12 percent.

Residuals computed by subtracting amplitude coefficients computed by equation (4) from the values computed from station data are shown in figure 7. The residuals in figure 7 range from an average of about +0.6 ° C in the Piedmont Province to an average of about -0.3 ° C for much of the remaining provinces in the State; this indicates that equation (4) tends to underestimate the harmonic amplitude coefficient in much of the Piedmont, and to overestimate it throughout most of the remainder of the State. Much of the difference in the amplitude coefficients in the two areas may be attributable to natural causes. Many of the negative residuals occur on streams having large components of ground-water inflow. For example, a relatively large proportion of streamflow at Whitewater Creek near Butler (station 02349000), having one of the largest negative residuals of -1.8 ° C, comes from ground-water inflow. The large ground-water component also applies to the Chattooga River at Summerville (station 02398000).

Many streams immediately south of the Fall Line also have relatively large components of ground-water inflow, as do those in the southern parts of the Chattahoochee and Flint River basins in southwestern Georgia, and in some of the Valley and Ridge Province within the Coosa River basin. Conversely, the high positive residuals seen at stations in the southern Piedmont Province may be attributable to relatively small ground-water inflow to these streams. Also, the band of positive residuals within the Piedmont is coincident with high population densities and may be partially attributable to affects of human development.

Estimates of long-term natural harmonic amplitude coefficients from equation (4) can yield a range of amplitude from a high value of about 11.2 ° C to a low value of about 5.0 ° C for normal variations of the independent variables. High values typically occur with larger drainage areas, higher latitudes, and lower altitudes. Low values tend to occur with smaller drainage areas, lower latitudes, and higher altitudes. However, higher altitudes do not occur with lower latitudes in the State. From table 3, the maximum long-term natural harmonic-amplitude coefficient is about 10.2 ° C for the Flint River near Culloden (station 02347500). The minimum amplitude coefficient observed from the 78 stations analyzed is about 6.2 ° C for Whitewater Creek near Butler (station 02349000) (table 3).

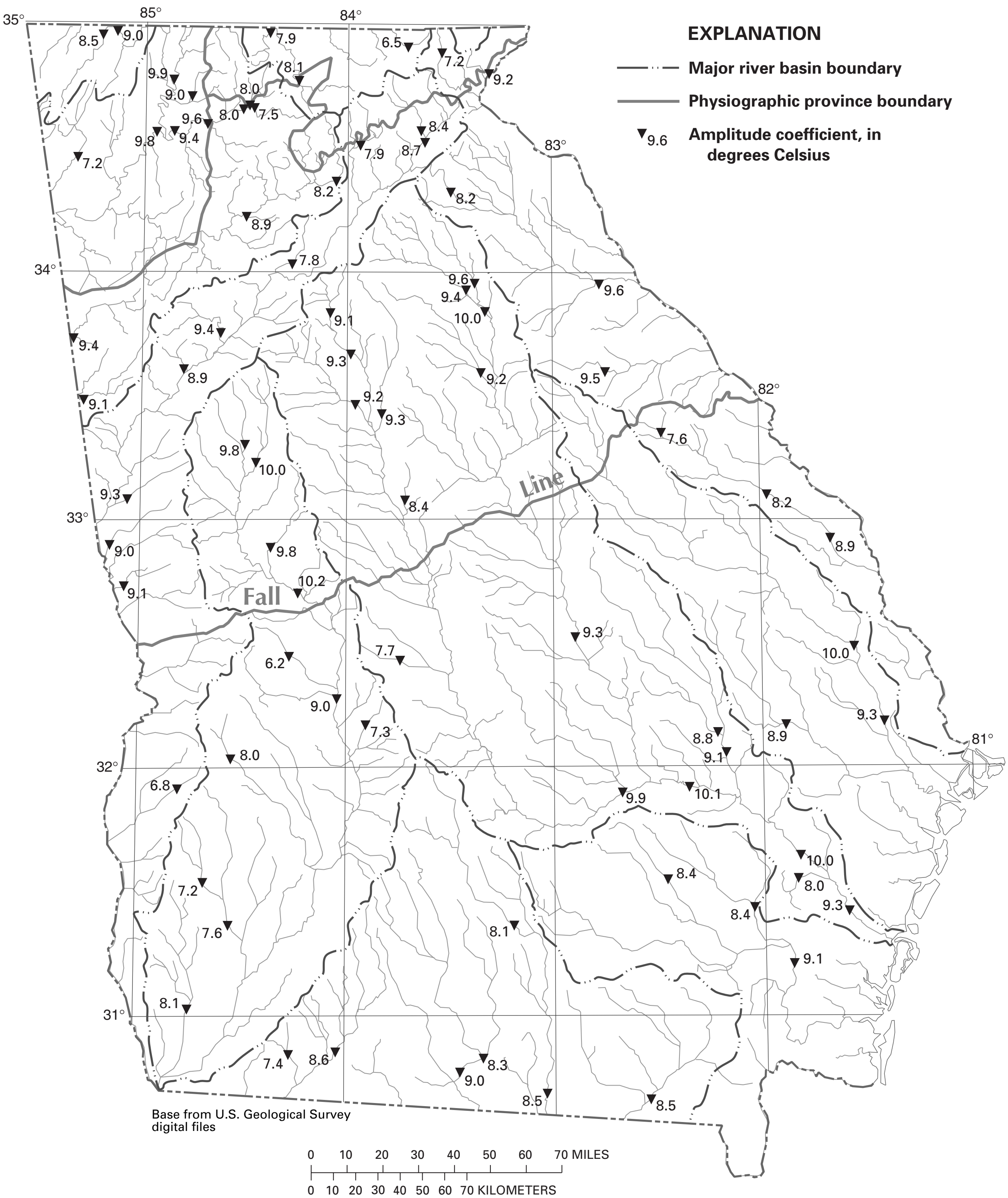

Figure 6. Amplitude coefficients for 78 natural-condition stations.

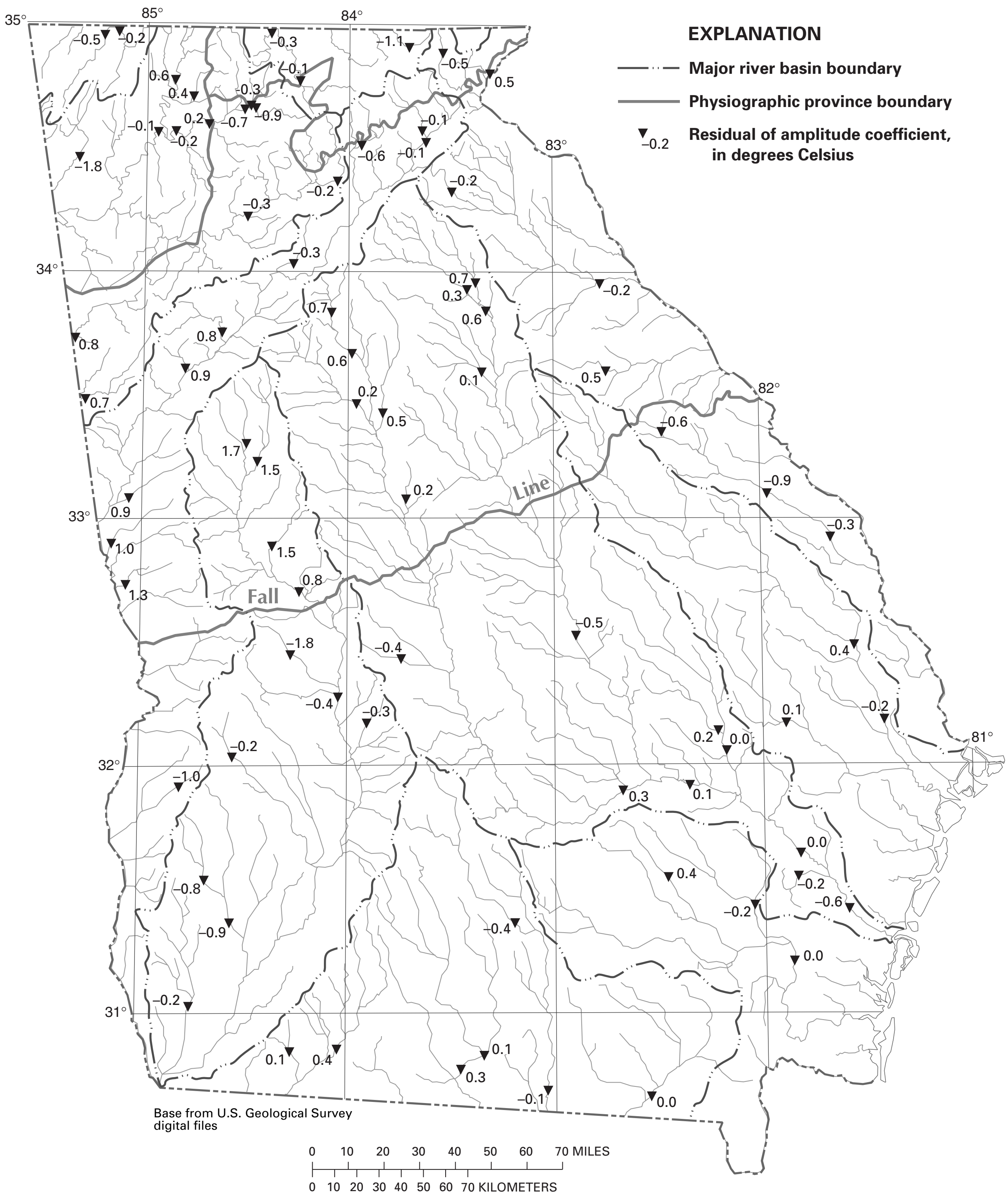

Figure 7. Residuals of amplitude coefficients for 78 natural-condition stations.

The amplitude coefficient of the harmonic function is useful to determine the high and low stream-temperature regimens, as illustrated by figure 3. Graphs and data included in this report show that the addition of the amplitude to the harmonic mean temperature provides estimates of average annual maximum stream temperatures. Similarly, subtraction of the amplitude from the harmonic mean yields estimates of average annual minimum temperatures.

Phase Coefficient

Regression analyses were applied to phase-coefficient data in table 3. No basin or hydrologic parameters were found to be helpful in determining the value of the phase coefficient. The natural long-term phase coefficient is a constant of about 2.81 radians. The standard error of the phase coefficient is about 0.04 radians, amounting to about two days. Long-term mean-temperature values are most likely to occur in natural streams in Georgia on about October 19 and April 20. Minimum and maximum long-term natural temperatures are likely to occur on about January 19 and July 20, respectively. Temperatures near the annual maximum and minimum are likely to persist for several weeks. For example, temperatures within 1 ° C of the maximum temperature are likely to occur from about the end of June through mid-August. Similarly, temperatures within 1 ° C of the minimum value are likely to occur from about the end of December through mid-February. The individual phase-coefficient values for each of the selected 78 stations are plotted on figure 8, indicating that the phase-coefficient data are adequately described by the constant of 2.81 radians.

Statewide Harmonic Equation

Long-term stream-temperature characteristics commonly are estimated for sites when stream-temperature data are not available or are not practical to obtain. The harmonic equation to estimate long-term natural stream-temperature characteristics in Georgia is derived by substituting equations (3) and (4) and the constant of 2.81 radians into equation (1). The resulting equation to estimate long-term natural stream-temperature characteristics is:

$$T = 42.68 - 0.833 * L + 0.743 * \log D - 0.00133 * E + (0.947 * \log D + 0.426 * L - 0.00075 * E - 7.40) * (\sin (2 * \pi * t/365 + 2.81)) \quad (5)$$

where

T is the estimated long-term mean-daily stream temperature in ° C for the selected day of the year;

L is the station or stream location latitude, in decimal degrees—values ranging from about 30.5 degrees to 35 degrees;

D is the station or stream location drainage area, in square miles—values ranging from about 40 to 14,000 mi^2,

E is the station or stream location altitude, in feet—values ranging from about 0 to 2,000 feet; and

t is incremented day-by-day beginning with "1" for October 1 to "365" or "366" for September 30 of a given or leap year, respectively.

The insertion of latitude, drainage area, and altitude values into equation (5) while incrementing "t" day-by-day throughout a year generates a harmonic curve which tends to provide a good description of stream-temperature response to solar radiation, season by season, throughout the State.

The harmonic mean and amplitude coefficients that are generated by equation (5), hereinafter termed the "statewide harmonic equation," match the individual harmonic stream-temperature coefficients for the 78 natural-condition stations to within an average of about 0.4 ° C. When equation (5) is applied to the stream-temperature measurements of the 78 regression-analysis stations shown in table 3, the data mostly appear as normally distributed about each curve. The standard error or natural temperature scatter averages about 2.2 ° C (table 3) throughout the State. Likewise, the 95 percent probability averages about 1.2 ° C above or below the applied statewide harmonic curve. Because of the uniform scatter of data about the applied harmonic curve and the large number of data measurements used in the computation, upper and lower bounds in these ranges should give the data user an estimate of natural statistical temperature ranges.

The statewide harmonic equation was derived from 78 stations having drainage areas greater than about 40 mi^2, using temperature data collected from about 1955–84 (table 3). Derivations using other periods of analysis, subsequent data, or different stations could cause somewhat different results.

To evaluate the suitability of the statewide harmonic equation for drainage areas less than 40 mi^2, 13 stations having drainage areas ranging from 15 to 37 mi^2 and having mostly natural stream-temperature characteristics were selected from table 1. For the 13 selected stations, the statewide harmonic equation yielded average harmonic temperature coefficients

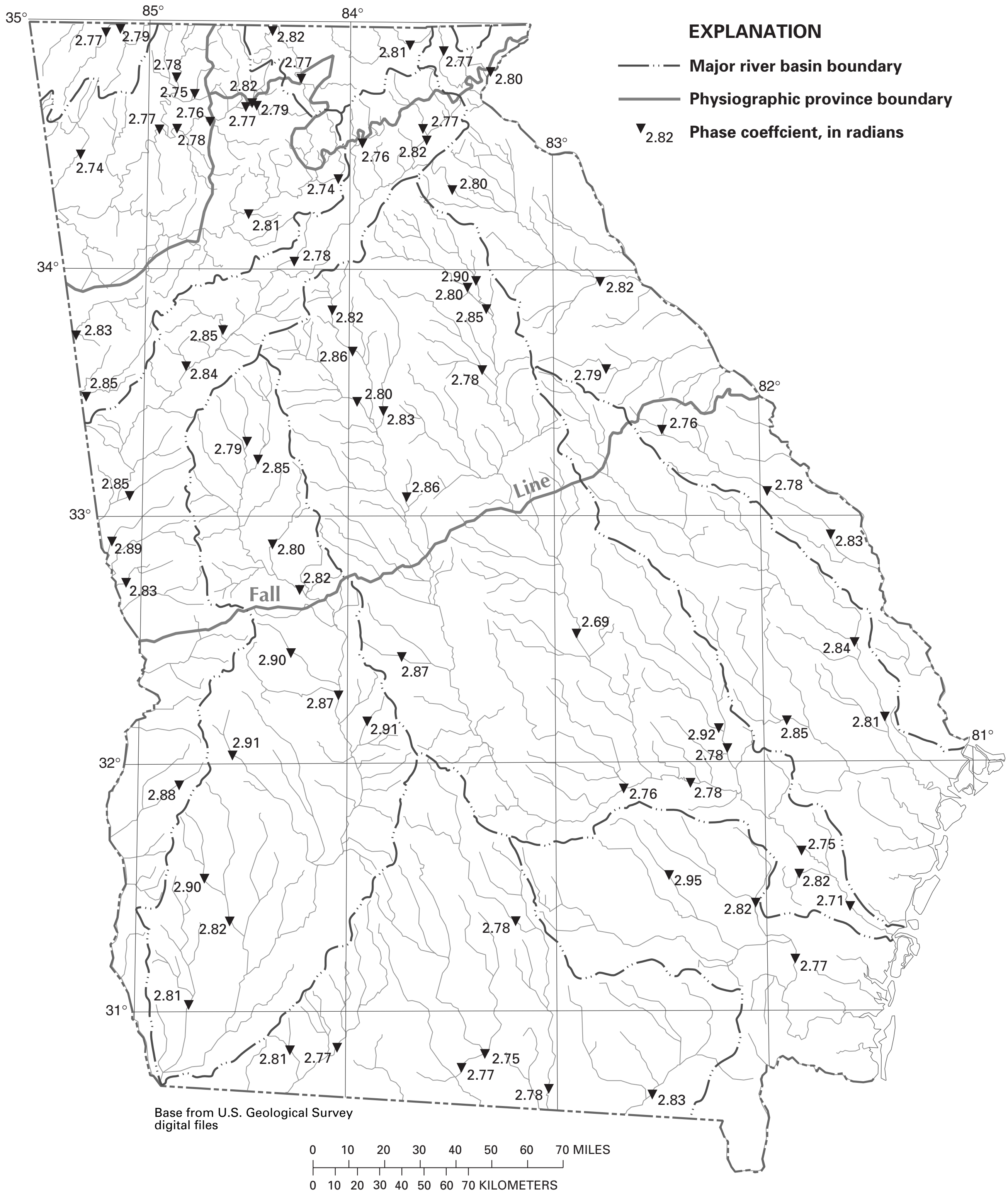

Figure 8. Phase coefficients for 78 natural-condition stations.

within about 0.7 ° C of the coefficients computed from observed data. This error of prediction for harmonic temperature coefficients is higher than the 0.4 ° C average error computed using the 78 larger drainage area stations from table 3. Though the statistical sample of 13 stations is small and confined to central and northern Georgia streams, the statewide harmonic equation is expected to generate progressively larger errors of prediction for drainage areas less than about 15 mi^2. More discussion of applications and limitations of the statewide harmonic equation is presented in following sections of this report.

Harmonic statistics of the daily stream-temperature records (table 2) show that long-term harmonic curves of daily maximum and minimum stream temperatures, typically range from about 1.0 to 1.5 ° C above and below, respectively, the long-term harmonic mean curve for stations having drainage areas of about 100 mi^2, and about 0.5 ° C above and below the long-term mean curve for stations having drainage areas of about 10,000 mi^2. Addition (or substraction) of these values to equation (5) and the analysis of maximum or minimum monthly observed values from nearby data can produce good estimates of expected maximum or minimum stream-temperature values for any month of the year.

There are some asymmetrical properties of annual stream-temperature characteristics which the sinusoidal fitting process tends to obscure, such as when minimum temperatures approach freezing. Stream temperatures that approach 0 ° C do not fit a sinusoidal distribution.

Perhaps a more important asymmetrical stream-temperature consideration at a station comes from heat flux proportional to streamflow. The annual heat-flux distribution is skewed because runoff typically increases, particularly in natural streams, during the colder December-April period. Examples of this phenomenon can be observed in stream reaches below some reservoirs. The reservoirs act as heat sinks that tend to moderate and lag downstream temperatures. When reservoir storage is large compared to average annual stream runoff, downstream stream-temperature characteristics may be markedly changed from natural temperature characteristics. For example, the annual mean harmonic-stream temperature downstream of Lake Sidney Lanier (Chattahoochee River near Buford, station 02334500) currently is about 9.2 ° C, which is about 6 ° C below the natural annual harmonic-mean temperature—calculated from equation (5) for the station—of about 15.3 ° C. Because near-bottom water is released from Lake Sidney Lanier, the Chattahoochee River downstream from the lake has temperature characteristics of the cool season throughout the year.

Examples of Estimating Natural Stream-Temperature Characteristics

Four examples illustrating uses of stream-temperature data and regression equations presented in this report are described below. The stations selected for discussion range widely in size and geographic location and include (1) Panther Creek, a small stream in the upper reaches of the Savannah River basin in the Blue Ridge Province; (2) West Armuchee Creek in the Coosa River basin in the Valley and Ridge Province; (3) Alcovy River in the Altamaha River basin in the Piedmont Province; and (4) Altamaha River about 60 miles upstream from its mouth and in the Coastal Plain Province. Each example depicts how a user might choose to analyze and estimate natural stream-temperature characteristics at the site of interest. Although each example of estimating natural long-term stream-temperature characteristics described below was selected for a stream having available stream-temperature data, similar procedures could be used to estimate temperature characteristics at ungaged sites. Also, it is important to note that each example relies on historical data through no later than 1984 that may or may not accurately reflect current or future stream-temperature conditions.

Panther Creek

The first example illustrates how a user can compare station data with the statewide harmonic equation. Panther Creek near Toccoa (station 02182000) has 75 temperature measurements made between 1959-74 (table 1). Harmonic coefficients and curves computed from station data and from equations (3), (4), and (5) appear in figure 9. The drainage area of this station is 33 mi^2, somewhat less than the 40 mi^2 regression equation criteria. Nonetheless, coefficients derived from observed data are very similar to coefficients computed from the statewide harmonic equation (fig. 9). The two curves in figure 9 show that natural temperatures for 1959-74 averaged about 1 to 2 ° C higher than temperatures computed by the statewide harmonic equation.

West Armuchee Creek

This example illustrates the use of nearby data to improve temperature-characteristic estimates. West Armuchee Creek near Subligna (station 02388000) appears in table 1 with harmonic coefficients and a drainage area of about 36 mi^2. The comparison of the harmonic coefficients from actual data and the statewide harmonic equation is shown in figure 10. The harmonic stream-temperature characteristics curves are about the same, except for the period October through March

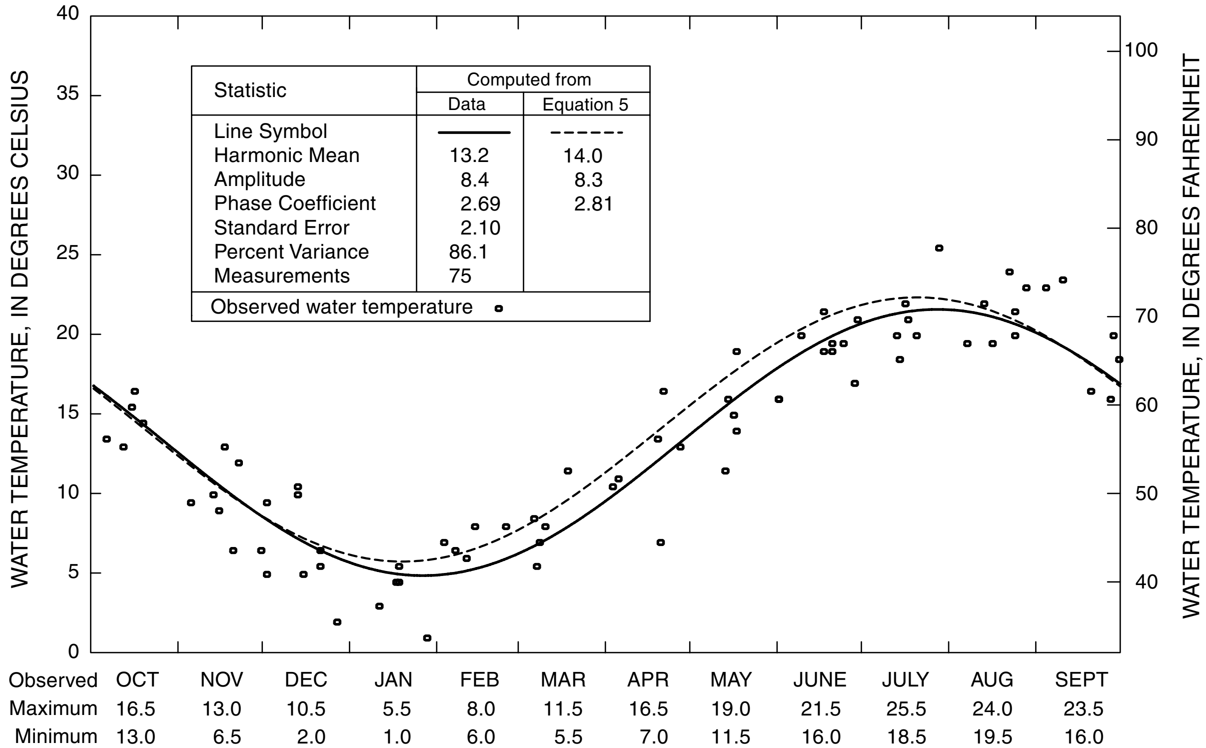

Figure 9. Harmonic stream-temperature curves of observed data and statewide harmonic equation for Panther Creek near Toccoa, Georgia (station 02182000), September 1959 to June 1974.

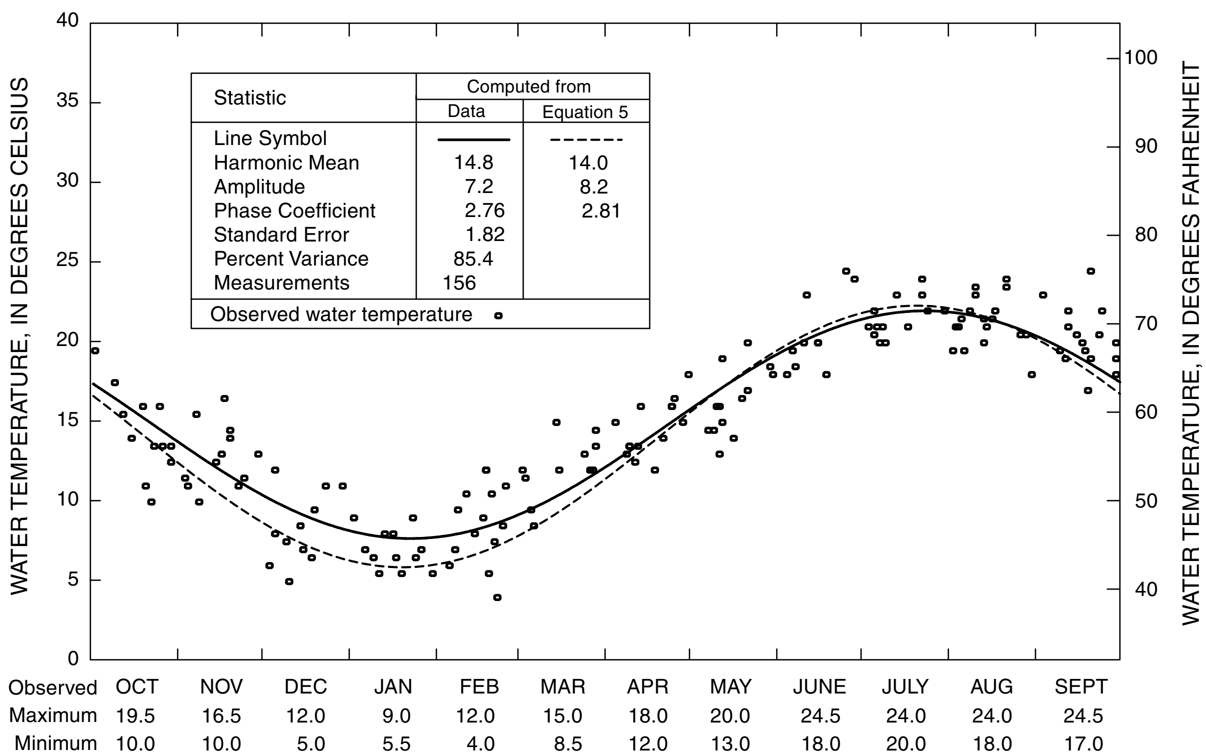

Figure 10. Harmonic stream-temperature curves of observed data and statewide harmonic equation for West Armuchee Creek near Subligna, Georgia (station 02388000), May 1960 to April 1982.

when the statewide harmonic equation yields about 1 to 2 ° C lower values. Because of differences of several degrees in the two characteristic curves during the cold weather months, it is helpful to examine temperature characteristics at other nearby stations. Stations 02397500, 02398000, 03566800, and 03567340 are nearby stations within the same Valley and Ridge Province (figs. 197, 199, 210, and 211), and all show a similar deviation from the statewide harmonic equation during the cooler months. Therefore, the data user may consider this characteristic to be a local anomaly for stations in nearby streams in the Valley and Ridge Province. Better estimation of stream-temperature characteristics may require adjusting the coefficients from the statewide harmonic equation to more closely reflect local conditions.

In general, when using data from nearby stations to improve estimates of natural stream-temperature characteristics, streams having similar flow characteristics should be selected. For example, within the Coosa River basin, stations from the Valley and Ridge Province in the western part of the basin show differing low-flow characteristics than stations typically representative of the Piedmont Province to the east. Therefore, some local variations in long-term stream-temperature characteristics within the Coosa River basin can be expected.

Alcovy River

This example determines the long-term natural stream-temperature characteristics for a site in the Piedmont Province—Alcovy River above Covington (station 02208450). A search of the USGS database yielded 27 stream-temperature measurements for Alcovy River above Covington from 1972–75. However, because of the short period of record, harmonic computations are not shown in table 1. (A daily record station was maintained here for about 7 years; the information is summarized in table 2.) For this station, the input variables for the statewide harmonic equation are as follows—latitude of about 33.64 degrees (decimal notation); drainage area of about 185 mi^2; and altitude of about 650 ft. Figure 11 shows the 27 temperature measurements observed from 1972–75, plotted on the annual cycle with the statewide harmonic equation superimposed. The data fit the equation well; and therefore, the data user may be reasonably confident that the data from the short period of record—about four years—is indicative of long-term natural stream-temperature characteristics at the station.

Altamaha River

The Altamaha River near Gardi (station 02226010) in the Coastal Plain Province also was selected as an example to estimate long-term natural stream-temperature characteristics. Following the procedures outlined above, the data user will recognize that the site has 113 recorded temperature measurements (table 1). To independently estimate the long-term natural stream-temperature characteristics at this station, an interpolation of harmonic characteristics from a nearby upstream station, Altamaha River at Doctortown (station 02226000) and a nearby downstream station, Altamaha River at Everett City (station 02226160) is performed and shown in table 4.

The reach of the Altamaha River from Doctortown to Everett City does not have substantial tributary inflow or modifications that would significantly alter long-term thermal characteristics during the period selected for analysis. Interpolated and observed values compare well with the harmonic mean coefficient, showing the largest difference of 0.3 ° C between interpolated data (19.6 ° C) and computed from observed data (19.9 ° C) (table 4). The 1970–84 temperature data at the downstream station, Altamaha River at Everett City (station 02226160), generates a slightly higher harmonic mean temperature than either the statewide harmonic equation for the Gardi station or the observed record at Doctortown. The interpolated harmonic mean coefficients (table 4) were averaged from the upstream and downstream stations, rather than to more heavily weight the coefficients from the closer upstream station.

Using the coefficients computed from observed data as a basis, it appears that the interpolated example furnishes better estimates than those obtained from the statewide harmonic equation. Comments concerning tributary inflow, analysis of the stream reach, and weighing effects of modification were included in the example because each can be important to stream-temperature estimation within a stream reach.

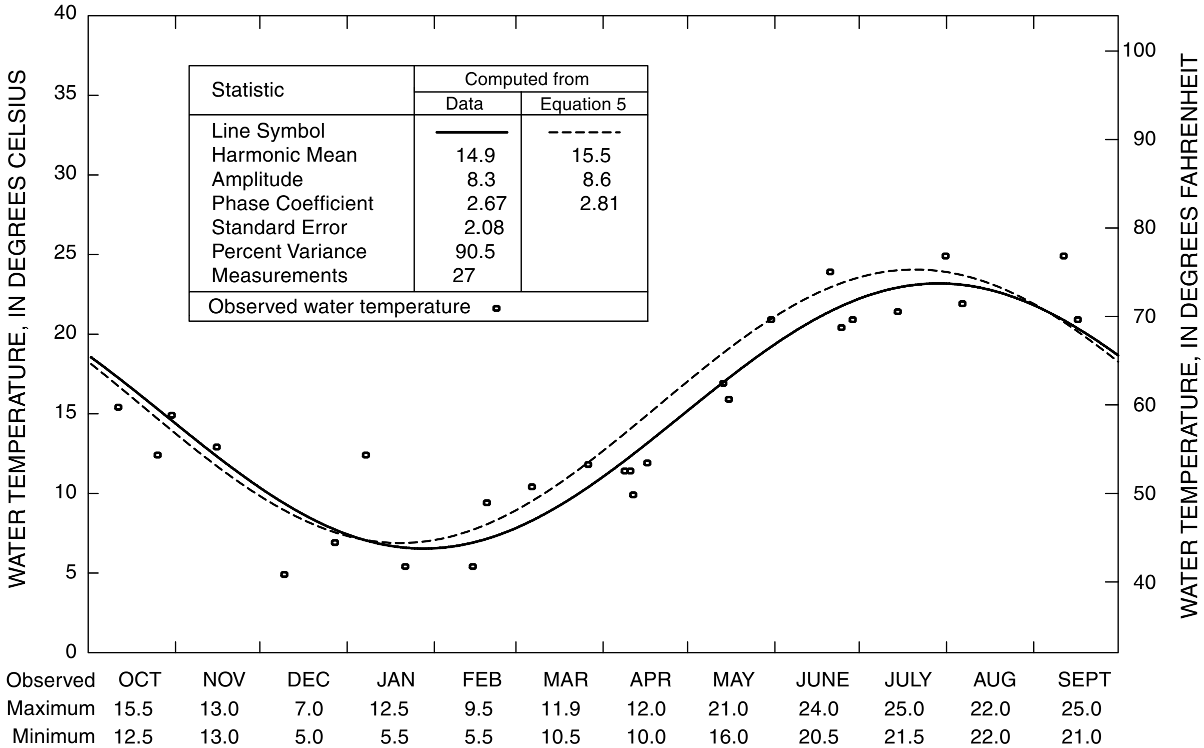

Figure 11. Harmonic stream-temperature curves of observed data and statewide harmonic equation for Alcovy River above Covington, Georgia (station 02208450), October 1972 to July 1975.

Table 4. Estimates of harmonic coefficients for Altamaha River near Gardi using interpolation and observed data compared with estimates from the statewide harmonic equation

[mi^2, square miles; ° C, degrees Celsius]

Station number	Station name	Period of record	Drainage area (mi^2)	Type of data analysis	Harmonic mean (° C)	Amplitude (° C)	Phase coefficient (radians)
02226000	Altamaha River at Doctortown	1937–79	13,600	observed	19.4	10.0	2.75
02226010	Altamaha River near Gardi	1974–84	13,600	observed	19.9	9.6	2.74
				interpolated	19.6	9.6	2.73
				statewide harmonic equation	19.4	10.0	2.81
02226160	Altamaha River at Everett City	1970–84	14,000	observed	19.7	9.3	2.71

SUMMARY OF STREAM-TEMPERATURE CHARACTERISTICS BY RIVER BASIN

Many Georgia streams have reaches where stream-temperature characteristics are modified by human activities. For example, streams immediately downstream from reservoirs or outflows from power-generating facilities typically exhibit modified stream-temperature characteristics. Principal hydro-power and thermoelectric-generating facilities in Georgia are shown in figure 12 and listed in table 5. Similarly, stream reaches often are affected by urban runoff, waste water, and other discharges from large municipalities and industries. Cities and towns having populations greater than 10,000 population according to the 1980 census (U.S. Department of Commerce, Bureau of Census, 1982) are shown in figure 13. Stream reaches receiving such discharges or runoff will exhibit modified stream-temperature characteristics, depending upon the distance downstream and relative amount of discharge to the flow of the receiving stream.

Selected stations in Georgia having natural and modified stream-temperature characteristics are summarized by river basin and discussed in the following sections. Graphical illustrations of harmonic-temperature characteristics computed from the statewide harmonic equation for stations listed in table 1 are shown in figures 14 through 211. Stream-temperature characteristics in modified streams are more difficult to estimate than natural streams because streamflow, chemical, and thermal characteristics are undergoing changes from human-induced activities. The following sections describing streams by river basin are intended as an aid in estimating stream-temperature characteristics in natural and modified reaches, emphasizing modified larger stream reaches.

Savannah River Basin

The Savannah River and its tributaries, the Tugaloo and Chattooga Rivers, form the northeastern boundaries of the State of Georgia (fig. 1). The basin drains about 10,580 mi^2 of Georgia, South Carolina, and North Carolina. Headwaters are in the mountainous Blue Ridge Province and the principal flow is southeastward through the Piedmont and Coastal Plain Provinces.

Stream-temperature characteristics computed from observed data and from the statewide harmonic equation for estimating natural characteristics for 26 stream-temperature stations within the basin are shown in figures 14–39. Stream-temperature characteristics for five mainstem Savannah River stations are listed in table 2 and individual annual harmonic graphs are included in figures 17, 19, 33, 34, and 39.

Hartwell Lake accounts for most of the modified stream-temperature characteristics observed at Savannah River near Iva, S.C. (station 02187500) (fig. 17). Compared to natural stream-temperature characteristics computed from the statewide harmonic equation, the harmonic mean temperature is lowered by about 2.8 ° C, the amplitude by about 4.9 ° C, the harmonic maximum temperature by about 7.7 ° C, the phase coefficient by about 0.64 radians (resulting in a stream-temperature season lag of about one month), and the harmonic minimum temperature raised by about 2.1 ° C. The downstream Savannah River station near Calhoun Falls, S.C. (station 02189000) (fig. 19), shows some recovery toward natural characteristics. Stream-temperature records of both mainstem stations—Savannah River at Iva, S.C. (station 02187500) and Savannah River near Calhoun Falls, S.C. (station 02189000)—have historic value since both now are inundated by Lake Richard B. Russell Reservoir.

The next mainstem station downstream from Calhoun Falls is Savannah River at Augusta (station 02197000). The Savannah River at Augusta station is about 50.3 river miles downstream of Thurmond Lake and its record (1958-73) is indicative of the pre-Richard B. Russell Reservoir period through 1984. After completion of Richard B. Russell Reservoir in 1983, some changes in downstream temperature characteristics are expected.

Several other stations in the Savannah River basin show modified long-term stream-temperature characteristics. Six upper Broad River tributary stations and three mainstream Broad River stations—North Fork Broad River above Toccoa (station 02189050); Denmans Creek near Toccoa (station 02189100); North Fork Broad River near Toccoa (station 02189500); Bear Creek near Mize (station 02189600); North Fork Broad River near Lavonia (station 02190000) Toms Creek near Eastonollee (station 02190100); Toms Creek near Avalon (station 02190200); Toms Creek near Martin (station 02190500); and North Fork Broad River near Carnesville (station 02191000) show characteristics

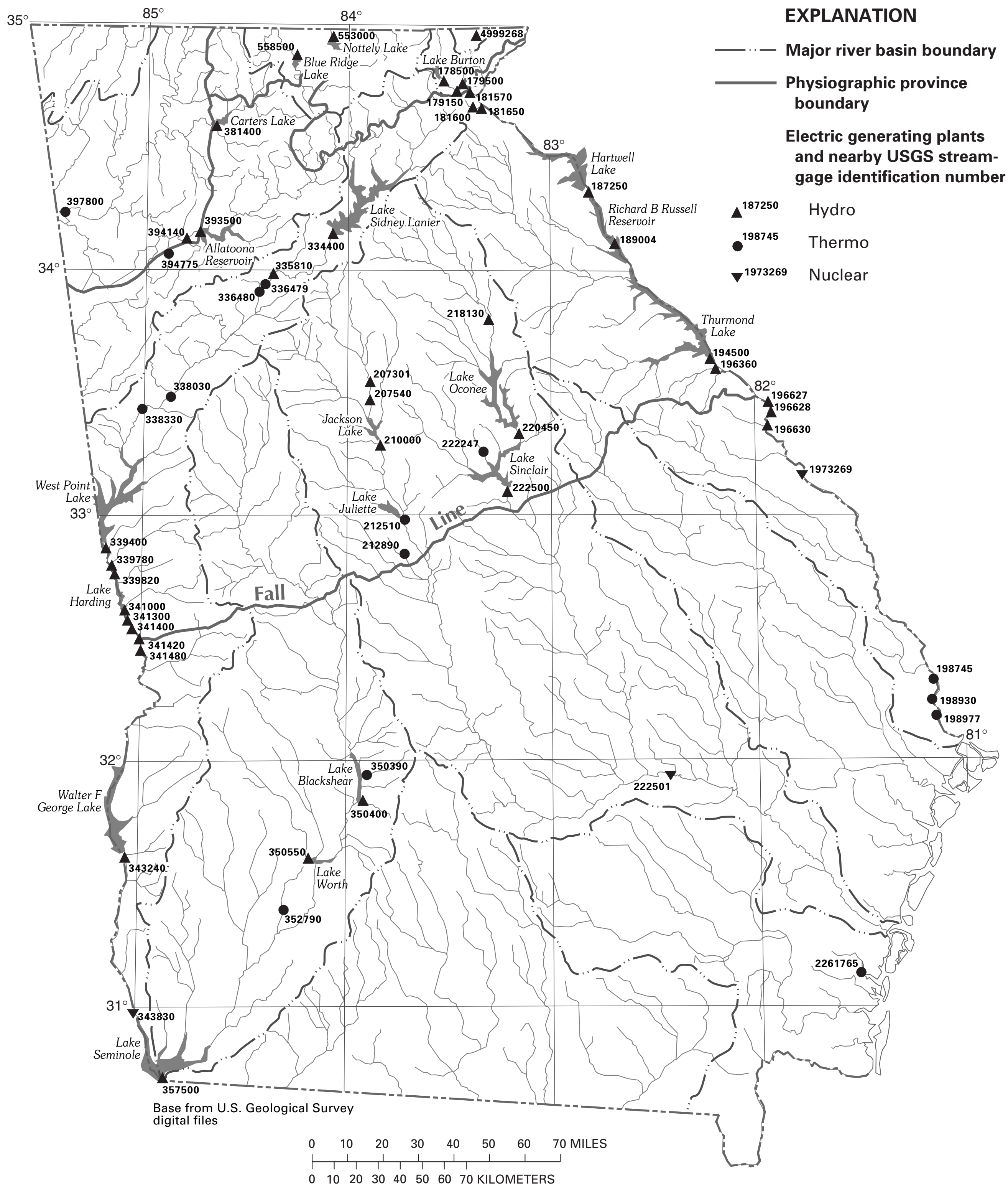

Figure 12. Locations of principal power-generating facilities and major reservoirs in Georgia.

Table 5. Power-generating plants in Georgia

[Modified from Fanning and others, 1991]

Station number	Plant name Owner	Type/ Fuel source	Water source/ Reservoir	Year in service	Capacity (kilowatts)
		SAVANNAH RIVER BASIN			
02178500	Burton Georgia Power Company	Hydroelectric/ storage	Tallulah River/ Lake Burton	1927	6,120
02179150	Nacoochee Georgia Power Company	Hydroelectric/ storage	Tallulah River/ Lake Seed	1926	4,800
02179500	Terrora Georgia Power Company	Hydroelectric/ storage	Tallulah River/ Mathis Reservoir	1925	16,000
02181570	Tallulah Georgia Power Company	Hydroelectric/ storage	Tallulah River/ Tallulah Falls Lake	1913	72,000
02181600	Tugalo Georgia Power Company	Hydroelectric/ storage	Tugalo River/ Tugalo Lake	1923	45,000
02181650	Yonah Georgia Power Company	Hydroelectric/ storage	Tugalo River/ Lake Yonah	1925	22,500
02187250	Hartwell U.S. Army Corps of Engineers	Hydroelectric/ storage	Savannah River/ Hartwell Lake	1962	344,000
02189004	Russell U.S. Army Corps of Engineers	Hydroelectric/ storage	Savannah River/ Richard B. Russell Reservoir	1984	300,000
02194500	Thurmond U.S. Army Corps of Engineers	Hydroelectric/ storage	Savannah River/ Thurmond Lake (formerly Clarks Hill Lake)	1953	280,000
02196360	Stevens Creek South Carolina Electric and Gas Company	Hydroelectric/ run-of-river	Savannah River/ power pool	1914	18,900
02196627	Sibley Graniteville Company	Hydroelectric/ run-of-river	Savannah River by Augusta Canal/none	1920	2,100
02196628	King Mills Division of Spartan Mills	Hydroelectric/ run-of-river	Savannah River by Augusta Canal/none	1943	2,250
02196630	Enterprise Graniteville Company	Hydroelectric/ run-of-river	Savannah River by Augusta Canal/none	1920	1,200
021973269	Vogtle Georgia Power Company	Thermoelectric/ nuclear	Savannah River/ none	1987	2,320,000
02198745	McIntosh Savannah Electric and Power Company	Thermoelectric/ fossil fuel	Savannah River/ none	1979	178,000
02198930	Port Wentworth Savannah Electric and Power Company	Thermoelectric/ fossil fuel	Savannah River/ none	1958	334,000
02198977	Riverside Savannah Electric and Power Company	Thermoelectric/ fossil fuel	Savannah River/ none	1949	80,000
		ALTAMAHA RIVER BASIN			
02207301	Milstead McRay Energy Inc.	Hydroelectric/ run-of-river	Yellow River/ power pool	1924	800
02207540	Porterdale Porterdale Associates	Hydroelectric/ run-of-river	Yellow River/ power pool	1927	1,600

Table 5. Power-generating plants in Georgia—Continued

[Modified from Fanning and others, 1991]

Station number	Plant name Owner	Type/ Fuel source	Water source/ Reservoir	Year in service	Capacity (kilowatts)
02210000	Lloyd Shoals Georgia Power Company	Hydroelectric/ storage	Ocmulgee River/ Lloyd Shoals Reservoir	1911	14,400
			ALTAMAHA RIVER BASIN—Continued		
02212510	Scherer Georgia Power Company	Thermoelectric/ fossil fuel	Ocmulgee River and Rum Creek Lake Juliette	1982	3,270,000
02212890	Arkwright Georgia Power Company	Thermoelectric/ fossil fuel	Ocmulgee River/ none	1941	160,000
02218130	Barnett Shoals Georgia Power Company	Hydroelectric/ run-of-river	Oconee River/ power pool	1910	2,800
02220450	Wallace Georgia Power Company	Hydroelectric/ storage	Oconee River/ Lake Oconee	1980	321,000
02222247	Harlee Branch Georgia Power Company	Thermoelectric/ fossil fuel	Oconee River/ Sinclair Reservoir	1965	1,540,000
02222500	Sinclair Georgia Power Company	Hydroelectric/ storage	Oconee River/ Sinclair Reservoir	1953	45,000
02225001	Edwin I. Hatch Georgia Power Company	Thermoelectric/ nuclear	Altamaha River/ none	1975	1,163,000
			SATILLA–ST MARYS RIVER BASINS		
022261765	McManus Georgia Power Company	Thermoelectric/ fossil fuel	Turtle Creek/ none	1952	115,000
			CHATTAHOOCHEE RIVER BASIN		
02334400	Buford U.S. Army Corps of Engineers	Hydroelectric/ storage	Chattahoochee River/ Lake Sidney Lanier	1957	86,000
02335810	Morgan Falls Georgia Power Company	Hydroelectric/ storage	Chattahoochee River/ Blue Sluice Lake	1904	16,800
02336479	Atkinson Georgia Power Company	Thermoelectric/ fossil fuel	Chattahoochee River/ none	1930	240,000
02336480	McDonough Georgia Power Company	Thermoelectric/ fossil fuel	Chattahoochee River/ none	1963	490,000
02338030	Yates Georgia Power Company	Thermoelectric/ fossil fuel	Chattahoochee River/ none	1950	1,250,000
02338330	Wansley Georgia Power Company	Thermoelectric/ fossil fuel	Chattahoochee River and Yellow Dirt Creek/none	1976	1,730,000
02339400	West Point U.S. Army Corps of Engineers	Hydroelectric/ storage	Chattahoochee River/ West Point Lake	1975	73,400
02339780	Langdale Georgia Power Company	Hydroelectric/ run-of-river	Chattahoochee River/ power pool	1924	1,040
02339820	Riverview Georgia Power Company	Hydroelectric/ run-of-river	Chattahoochee River/ power pool	1918	480
02341000	Bartletts Ferry Georgia Power Company	Hydroelectric/ storage	Chattahoochee River/ Lake Harding	1926	173,000
02341300	Goat Rock Georgia Power Company	Hydroelectric/ run-of-river	Chattahoochee River/ power pool	1912	26,000
02341400	Oliver Georgia Power Company	Hydroelectric/ storage	Chattahoochee River/ Lake Oliver	1959	60,000

Table 5. Power-generating plants in Georgia—Continued

[Modified from Fanning and others, 1991]

Station number	Plant name Owner	Type/ Fuel source	Water source/ Reservoir	Year in service	Capacity (kilowatts)
		CHATTAHOOCHEE RIVER BASIN—Continued			
02341420	North Highlands Georgia Power Company	Hydroelectric/ run-of-river	Chattahoochee River/ power pool	1963	29,600
02341480	Eagle and Phenix #1 and #2 Fieldcrest Cannon Inc.	Hydroelectric/ run-of-river	Chattahoochee River/ power pool	1915	31,800
02343240	Walter F. George U.S. Army Corps of Engineers	Hydroelectric/ storage	Chattahoochee River/ Walter F. George Lake	1963	130,000
02343830	Joseph M. Farley Alabama Power Company	Thermoelectric/ nuclear	Chattahoochee River/ none	1977	1,720,000
		FLINT RIVER BASIN			
02350390	Crisp Crisp County Power Commission	Thermoelectric/ fossil fuel	Flint River/ Lake Blackshear	1958	12,500
02350400	Warwick Crisp County Power Commission	Hydroelectric/ storage	Flint River/ Lake Blackshear	1930	16,400
02350550	Flint River Georgia Power Company	Hydroelectric/ storage	Flint River/ Lake Worth	1921	5,400
02352790	Mitchell Georgia Power Company	Thermoelectric/ fossil fuel	Flint River/ none	1948	170,000
02357500	Jim Woodruff U.S. Army Corps of Engineers	Hydroelectric/ storage	Apalachicola River/ Lake Seminole	1957	49,800
		COOSA RIVER BASIN			
02381400	Carters U.S. Army Corps of Engineers	Hydroelectric/ storage	Coosawattee River/ Carters Lake	1976	500,000
02393500	Allatoona U.S. Army Corps of Engineers	Hydroelectric/ storage	Etowah River/ Allatoona Reservoir	1950	74,000
02394140	Cartersville ECC American International	Hydroelectric/ run-of-river	Etowah River/ power pool	1927	625
02394775	Bowen Georgia Power Company	Thermoelectric/ fossil fuel	Etowah River/ none	1971	3,160,000
02397800	Hammond Georgia Power Company	Thermoelectric/ fossil fuel	Coosa River/ none	1954	800,000
		TENNESSEE RIVER BASIN			
034999268	Estatoah Georgia Power Company	Hydroelectric/ run-of-river	Mud Creek/ power pool	1928	240
03553000	Nottely Tennessee Valley Authority	Hydroelectric/ storage	Nottely River/ Nottely Lake	1956	15,000
03558500	Blue Ridge Tennessee Valley Authority	Hydroelectric/ storage	Toccoa River/ Blue Ridge Lake	1931	20,000

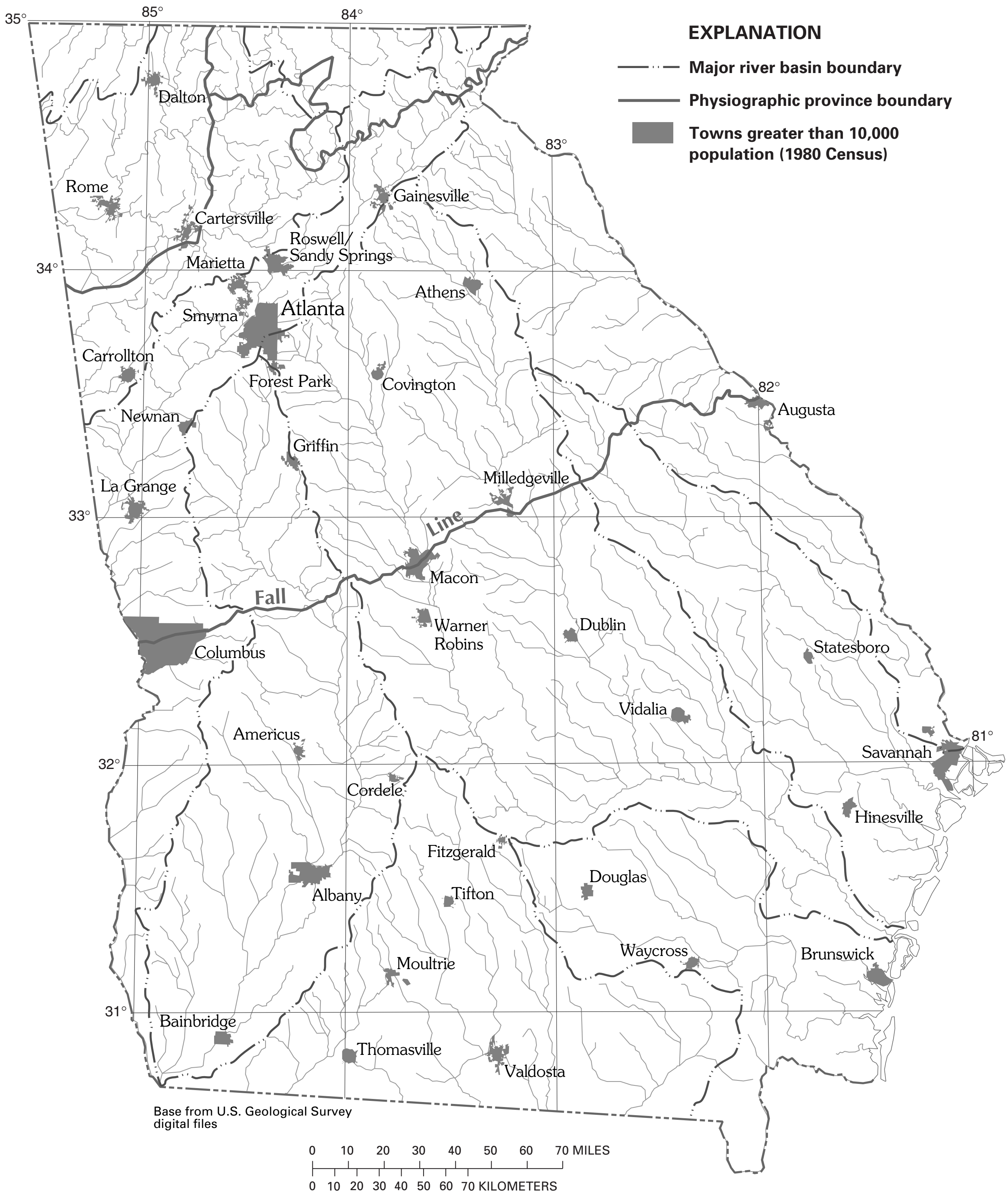

Figure 13. Locations of cities in Georgia having populations greater than 10,000 (data from U.S. Department of Commerce, U.S. Bureau of Census, 1982).

typical of stations below small dams or systems of small dams. For each station, the data tend to show higher stream temperatures, particularly in the warmer months, than would be expected from the statewide harmonic equation (figs. 20–28). This primarily is caused by the discharge of warm water from the surface of small impoundments. Similar effects on long-term stream-temperature characteristics may result from farm ponds or small recreational lakes. The magnitude of the effects will depend primarily on storage, stream discharge, nature of the system of impoundments, thermal stratification, location of impoundment discharge, and the distance of the site below the dam or dams.

Ogeechee River Basin

The Ogeechee River basin has a drainage area of about 4,690 mi^2 and lies mostly within the Coastal Plain Province, with relatively small headwaters in the Piedmont Province (fig. 1). The Ogeechee River basin lies south of the Savannah River basin and does not contain either large reservoirs or urban areas.

The first station for which stream-temperature characteristics are illustrated is the Ogeechee River at Scarboro (station 02202000). This station is about mid-basin without nearby stations to compare observed stream-temperature data. Figure 40 shows that observed stream temperatures of Ogeechee River at Scarboro plot about 1 to 2 ° C lower than those estimated by the statewide harmonic equation.

Annual long-term stream-temperature characteristics for Ogeechee River at Oliver (station 02202190) are shown in figure 41. Harmonic stream-temperature characteristics generated from observed data agree with values from the statewide harmonic equation, except for the period October through March, where values are about 0.5 to 1.0 ° C lower.

Stream-temperature characteristics for the next downstream mainstem station, Ogeechee River near Eden (station 02202500), are shown in figure 42. Stream-temperature characteristics generated by the observed data agree with values from the statewide harmonic equation.

The Canoochee River is a major tributary to the Ogeechee River and drains about 1,400 mi^2. Natural stream-temperature characteristics computed from the statewide harmonic equation and characteristics computed from observed data for Canoochee River near Claxton (station 02203000) and Canoochee River at Fort Stewart (station 02203519 are shown in figures 43 and 44).

South of the Ogeechee River basin, near the Georgia coast and downstream of several small inland streams, lies the Newport River tidal estuaries. Long-term observed stream-temperature characteristics for Peacock Creek at McIntosh (station 02203559) are shown in figure 45. This station and six other nearby tidal stations—(02203566, 02203570, 02203574, 02203578, 02203585, and 02203596), not shown in illustrations of this report—have substantially warmer stream temperatures year round than temperatures computed from the statewide harmonic equation. Observed harmonic-mean temperatures range from about 1.6 ° C warmer than computed data at Peacock Creek at McIntosh (station 02203559) to about 2.5 ° C warmer seaward at North Newport River at Halfmoon Landing (station 02203578). In the tidal reaches of nearby estuaries, stream-temperature characteristics, as depicted by the observed data, show an amplitude about 1.1 to 1.9 ° C higher than values generated by the statewide harmonic equation. The statewide harmonic equation was derived from inland stream-temperature data and should not be used to estimate temperature characteristics of tidal waters.

Altamaha River Basin

Rapidly developing basins, such as those around the Atlanta Metropolitan area, are likely to have long-term stream-temperature characteristics that vary from those estimated by the statewide harmonic equation. Within such a basin, the data user may need to consider effects of basin modifications to better estimate current, or future, stream-temperature characteristics.

The Altamaha River originates in the Piedmont Province of northern Georgia (fig. 1). The Oconee and Ocmulgee Rivers account for about 5,250 and 6,080 mi^2, respectively, of the Altamaha River's total 14,480 mi^2 drainage area. The Ocmulgee River headwaters include the Atlanta Metropolitan area and less densely populated areas to the east. Stream-temperature-characteristic curves for the upper Ocmulgee River basin, including the South River basin, are shown in figures 46 through 51. Stream temperatures of the upper reaches of the South River are higher than predicted by the statewide harmonic equation, probably because of discharge from nearby Atlanta and DeKalb County, Ga., waste-water treatment facilities and other municipal and industrial basin modifications that usually accompany development. The 1985 completion of the city of Atlanta's “Three Rivers Project” rerouted waste water from the Chattahoochee River basin away from the upper reaches of the South River, and back into the Chattahoochee River. Therefore, stream-temperature characteristics subsequent to 1985 likely will change.

The Yellow and Alcovy River basins, in the eastern part of the upper Ocmulgee River basin are experiencing more rapid development as the Atlanta Metropolitan area continues to grow. Pre-1985 annual observed temperatures match the statewide harmonic equation values well for the Yellow River near Snellville (station 02206500), Yellow River at Conyers (station 02207300), Yellow River near Covington (station 02207500), Yellow River at Porterdale (station 02207540), Yellow River near Stewart (station 02208005), and Alcovy River at Newton Factory Bridge Road near Stewart (station 02209260) (figs. 52–57) except during cooler months from about November through February, when plots show about 1 ° C lower temperatures.

The confluence of the South and Yellow Rivers form the Ocmulgee River that is joined by the Alcovy River in the upper part of Lloyd Shoals Reservoir (Jackson Lake). The stream-temperature characteristics of the Ocmulgee River near Jackson (station 02210500), about 1 mile downstream from Lake Jackson, are shown in figure 58. Annual harmonic characteristics are shown for the Towaliga River near Jackson (station 02211300) (fig. 59), where stream temperatures are about 3 ° C lower than estimates from the statewide harmonic equation throughout the winter months. Downstream, the Ocmulgee River in the vicinity of Macon (stations 02212950 and 02213000) (figs. 61 and 62) reflects the usual municipal and industrial modifications associated with a developed area. Upstream fossil-fuel plants likely also contribute to the modified temperature characteristics of these two Ocmulgee River stations. Observed data for the Ocmulgee River at Lumber City (02215500) (fig. 71) agrees with the estimated long-term natural stream-temperature characteristics derived by the statewide harmonic equation.

Stream-temperature characteristics for four stations in the upper Oconee River basin—Allen Creek at Talmo (station 02217000); Middle Oconee River near Athens (station 02217500); North Oconee River at Athens (station 02217740); and Oconee River at Barnett Shoals near Watkinsville (station 02218000)—are shown in figures 72, 73, 74, and 75, respectively. Observed data from all of these stations agree reasonably well with long-term natural stream-temperature characteristics estimated by the statewide harmonic equation.

Stream-temperature data shown for Oconee River near Greensboro (station 02218500) primarily have historic utility because the stream reach now lies within Lake Oconee, where storage began in 1979 (fig. 76). Sinclair Reservoir is downstream from Lake Oconee. Oconee River at Milledgeville (station 02223000) (fig. 80) depicts annual temperature characteristics about 3.8 river miles downstream of Sinclair Dam. The effects of the newer Lake Oconee upon the stream-temperature characteristics of this station and the downstream stations, Oconee River near Hardwick (station 02223040) (fig. 81); Oconee River near Toomsboro (station 02223250) (fig. 82); Oconee River at Dublin (station 02223500) (fig. 84); and Oconee River near Dublin (station 02223600) (fig. 85) are unknown. However, the latter two stations in the vicinity of Dublin show little effect because of the distance downstream and the increased streamflow from the larger drainage area.

Stream-temperature characteristics of the mainstem Altamaha River are regarded mostly as natural. The records for the Altamaha River stations at Baxley (station 02225000) (fig. 87), Jesup (station 02225990) (fig. 90), Doctortown (station 02226000) (fig. 91), Gardi (station 02226010) (fig. 92), and Everett City (station 02226160) (fig. 94) show that temperatures for June through September have maximums in the 29 to 32 ° C range. Seasonal natural maximum temperatures in these temperature ranges are corroborated by the statewide harmonic equation.

Satilla River–St Marys River Basins

The Satilla and St Marys River basins (fig. 1) lie in the Coastal Plain Province and drain about 4,380 mi^2 in southern Georgia and about 1,150 mi^2 in northeastern Florida. The Satilla River basin covers most of the area, encompassing about 3,530 mi^2. Both basins have very low relief, with headwater altitudes for the Satilla River at about 350 feet and St Marys River at about 120 feet. The Satilla River basin, like the nearby Altamaha River basin, is characterized by high summer temperatures having observed maximum temperatures in the 29 ° to 34 ° C range.

Long-term stream-temperature characteristics of six stations in the Satilla River basin are shown in figures 95-100. Two of the six stations, Satilla River near Waycross (station 02226500) (fig. 96) and Satilla River at Atkinson (station 02228000) (fig. 100), show deviation of observed data from the statewide harmonic equation. The estimated natural harmonic-mean temperatures for both stations are about 0.9 ° C lower than the harmonic mean indicated by observed data.

Suwannee-Ochlockonee River Basins

Principal streams in the Suwannee River and Ochlockonee River basins in Georgia are the Withlacoochee, Alapaha, Suwannee and Ochlockonee Rivers (fig. 1). The Suwannee and Ochlockonee River basins cover south-central Georgia and north-central Florida and are about equally divided between the two States. The Okefenokee Swamp is in the headwaters of the Suwannee River and covers about 1,100 mi^2 of the eastern end of the basin at an altitude of about 120 feet. The Suwannee River flows southward and then westward into the Gulf of Mexico. The headwaters of both the Withlacoochee and Alapaha Rivers are in the northern end of the basin with altitudes at about 450 ft.

Long-term harmonic characteristics are shown for 12 stations in the Suwannee River basin (figs. 101–112). The harmonic-mean stream temperature computed from observed data for Suwannee River at Fargo (station 02314500) (fig. 101) is about 0.6 ° C higher than the value computed from the statewide harmonic equation. This station includes the drainage of much of the Okefenokee Swamp which may account for the slightly higher stream-temperature characteristics. As in the adjacent Satilla River basin, summer temperatures are high, with observed temperatures as high as 31 ° C, and winter temperatures vary widely from 4 to 21 ° C.

Four Ochlockonee River basin stations—Ochlockonee River near Moultrie (station 02327205); Ochlockonee River near Thomasville (station 02327500); Tired Creek near Cairo (station 02328000); and Ochlockonee River near Calvary (station 02328200)—are shown in figures 113–116. The harmonic stream-temperature coefficients computed from observed data closely match those from the statewide harmonic equation except for Ochlockonee River near Calvary (station 02328200) (fig. 116), which plots about 1.4 ° C lower than the curve formed by the statewide equation. However, the Ochlockonee River near Calvary station data spans only the 1974–84 period. Values computed from the statewide harmonic equation agree well with those values computed from observations for Ochlockonee River near Thomasville (station 02327500) (fig. 114) with data spanning the years 1954–84. A reexamination of harmonic coefficients for the Ochlockonee River near Thomasville station for the 1974–84 period (as was used for the Ochlockonee River near Calvary station) indicates that the harmonic mean for the Thomasville station also was about 0.9 ° C below the values computed by the statewide harmonic equation. Therefore, observed temperature data for the 1974–84 period plotted below the statewide harmonic equation in both instances.

Chattahoochee River Basin

The Chattahoochee River basin extends from the Blue Ridge Province in northern Georgia to the southwestern tip of the State at the confluence with the Flint River (fig. 1). The basin drains about 8,770 mi^2, mostly in Georgia. The maximum width of the basin is about 55 miles.

The Chattahoochee River system is the principal water supply for about one half of Georgia's population (Marella and others, 1993). In addition, the river system serves industry; provides recreation and fishing; generates power; assimilates wastes; and in the southern reaches of the river, supports shipping. Population projections for the upper Chattahoochee River basin, within the Piedmont Province, predict continuing growth (Brown, 1981).

Long-term observed stream-temperature characteristics for stations within the Chattahoochee River basin are shown in figures 117–145. Figures 117 through 119 show temperature-characteristic curves for three stations—Chattahoochee River near Leaf (station 02331000); Chattahoochee River near Cornelia (station 02331600); and Chestatee River at State Highway 52 near Dahlonega (station 02333500)—in the upper part of the basin. Each of these three stations compare well with curves computed from the statewide harmonic equation and shows mostly natural stream-temperature characteristics.

Stream-temperature characteristics for Chattahoochee River near Buford (station 02334500), about 2.3 miles downstream from Lake Sidney Lanier are shown in figure 120. A harmonic-mean observed stream temperature of about 9.2 ° C is 6.1 ° C lower than the mean estimated by the statewide harmonic equation. In this reach of the Chattahoochee River, observed year-round temperatures are about the same as minimum winter temperatures estimated by the statewide harmonic equation. These lower temperatures occur because of the dominant impact of storage of large volumes of winter-season water in the large reservoir, Lake Sidney Lanier near Gainesville, Ga., formed by Buford Dam. Water from Lake Sidney Lanier is discharged from depth, unlike surface-outlet structures characteristic of smaller ponds mentioned earlier. A phase coefficient lag of 0.64 radians effectively shifts the stream-temperature season by about 37 days. Cooler than natural stream temperatures also were observed at Chattahoochee River near Norcross (station 02335000) (fig. 121), about 18 miles downstream from Lake Sidney

Lanier. Thirty-five stream-temperature measurements during May 1937 to December 1938 for the Chattahoochee River at Atlanta (station 02336000) prior to the construction of Lake Sidney Lanier are shown in figure 123. Long-term stream-temperature characteristic curves for Chattahoochee River at Atlanta (station 02336000) for the period after Lake Sidney Lanier (1957-79) are shown in figure 124. At Chattahoochee River at Atlanta, summer temperatures average about 6.0 ° C lower than computed natural values. The station is located about 9.5 river miles downstream from Morgan Falls Dam, a small 16.8 kilowatt power-generation and river-regulation facility.

Harmonic stream-temperature characteristic curves for Peachtree Creek at Atlanta (station 02336300), are shown in figure 125. The Peachtree Creek basin is totally within the Atlanta Metropolitan area. Stream-temperature measurements at this station show summer maximum temperatures in the 28 to 31 ° C range. The harmonic maximum for the observed temperature data is about 26 ° C—about 3 ° C higher than statewide harmonic equation values. Harmonic maximum stream temperatures of this magnitude would normally be expected to occur much farther south, indicating the effects of urban development.

Stream-temperature characteristics at Chattahoochee River at Interstate Highway 285 near Atlanta (station 02336502) are shown in figure 126. Temperatures show a marked increase over values from Chattahoochee River at Atlanta (station 02336000) which is about 5.3 river miles upstream. The harmonic-mean temperature increase of about 2.6 ° C is caused, in part, by the return of cooling water from electric-generating plants and from wastewater returns. Summer temperatures show more variability than natural, with some measured values near 30.0 ° C, which is more typical of a south Georgia stream. Also, as mentioned earlier, differing analysis periods (1957–79 for Chattahoochee River at Atlanta) also could account for some of the differences between the two stations.

Long-term stream temperatures for four tributary streams—Sweetwater Creek near Austell (station 02337000); North Fork Camp Creek at Atlanta (station 02337100); Dog River near Fairplay (station 02337438); and Snake Creek near Whitesburg (station 02337500)—are shown in figures 127, 128, 130, and 131. Amplitude coefficients determined by observed data for Sweetwater Creek near Austell (02337000) (fig. 127) and Dog River near Fairplay (02337438) (fig. 130) are about 0.8 ° C above values predicted by the statewide harmonic equation. Stream-temperature characteristics from observed data for North Fork Camp Creek at Atlanta (02337100) (fig. 128) show substantial departure from values calculated by the statewide harmonic equation. However, the drainage area of North Fork Camp Creek at Atlanta is only 5.3 mi^2; well below the 20 mi^2 minimum drainage area recommended for use with the statewide harmonic equation.

Stream-temperature characteristics for Chattahoochee River mainstem stations, Chattahoochee River near Fairburn (station 02337170), Chattahoochee near Whitesburg (station 02338000), and Chattahoochee River at U.S. Highway 27 at Franklin (station 02338500) are shown in figures 129, 132, and 133, respectively. Stream-temperature characteristics for Chattahoochee River at West Point (station 02339500) are shown in figures 136 and 137. The station is about 3 miles downstream from West Point Lake. Figure 136 depicts pre-West Point Lake conditions and figure 137 represents post-West Point Lake conditions. Stream-temperature characteristics show only a slight damping of post-Lake harmonic natural amplitude from 9.2 to about 9.1 ° C. The most apparent post-Lake difference is in the phase coefficient which changed from about 2.8 to about 2.6 radians or a seasonal lag of about 12 days.

Flint River Basin

The headwaters of the Flint River are located in the Piedmont Province of Georgia in the highly developed area south of Atlanta (fig. 1). The basin has a drainage area of about 8,460 mi^2 and an average width of about 40 miles.

Long-term annual harmonic stream-temperature characteristics for stations in the Flint River basin are shown in figures 146–167. Harmonic mean and amplitude coefficients from the upper reaches of the basin typically are about 1 to 2 ° C above values computed from the statewide harmonic equation. This may be attributable to natural causes and effects of development near the stations. Long-term stream-temperature characteristics for Flint River near Culloden (station 02347500) are shown in figure 154. At this station, the computed harmonic mean coefficient is about 0.2 ° C higher and the amplitude coefficient is about 0.8 ° C higher than values computed from the statewide harmonic equation. Flint River near Culloden was among stations selected as mostly natural and it was used to compute the statewide harmonic equation.

Downstream, Whitewater Creek below Rambulette Creek near Butler (station 02349000) (fig. 155) was selected as a natural stream-temperature characteristics site. However, characteristics for this station generated by the statewide harmonic equation differ substantially from values shown by the more damped actual-data curve. This damping primarily is due to the large ground-water discharge to streams within the Whitewater Creek basin. For example, during extended low-flow periods, streamflows of Whitewater Creek below Rambulette Creek near Butler (drainage area of 94 mi^2) approach streamflows of the much larger drainage area of the Flint River near Culloden (1,850 mi^2). The data-derived harmonic-mean coefficient of 17.1 ° C is greater than the regionally computed harmonic mean of 16.6 ° C. A similar affect, but not as pronounced, of ground-water discharge to streams also is seen in figure 157 for Turkey Creek at Byromville (station 02349900).

Long-term annual harmonic stream-temperature characteristics for the lower Flint River basin tributary stations are shown in figures 159, 163, 164, and 167. Data-derived harmonic curves agree well with the statewide harmonic equation curves, except for Pachitla Creek near Edison (station 02353400) (fig. 163) and Ichawaynochaway Creek at Milford (station 02353500) (fig. 164), where amplitude coefficients are damped by about 0.9 ° C, possibly because of ground-water inflow.

Figures 162, 165, and 166 show annual harmonic characteristics of three lower mainstem Flint River stations: Flint River at Newton (station 02353000), Flint River at Bainbridge (station 02356000), and Flint River below State Docks at Bainbridge (station 02336015). The temperature characteristics of the latter two of these stations may be somewhat affected by backwaters of Lake Seminole.

Coosa River Basin

The Coosa River basin covers about 4,360 mi^2 of Valley and Ridge, Blue Ridge, and Piedmont Provinces in northwest Georgia (including a small part of southern Tennessee) (fig. 1). The Coosa River is formed by the confluence of the Oostanaula and Etowah Rivers (fig. 2). Streams in this basin serve many small towns; several hydropower and steam-power facilities; large industrial centers, such as the carpet industry at Dalton; and several medium-size towns, such as Rome.

Long-term annual stream-temperature characteristics of headwater streams are shown in figures 168–170. For these stations, the statewide harmonic equation yields amplitudes from about 0.3 to 0.9 ° C greater than those derived from data. Further downstream, the records for the period 1965–72 for Coosawattee River at Carters (station 02382500) (fig. 172) and 1957-72 for Coosawattee River near Pine Chapel (station 02383500) (fig. 174) are prior to the impoundment of Carters Lake; and therefore, primarily have historic utility. Modified stream-temperature characteristics for Coosawattee River near Calhoun (station 02383540) for the post-Carters Lake period of 1974-84 are shown in figure 175. Carters Lake and its re-regulation dam cause a shift in the natural phase coefficient that amounts to a seasonal lag of about 15 days. Also, the observed-data amplitude value of 8.8 ° C is lower than the estimated natural value of about 9.6 ° C.

Stream-temperature characteristics for two small Coosa River basin tributary streams—Scarecorn Creek at Hinton (station 02382000) and Rock Creek near Fairmont (station 02383000)—are shown in figures 171 and 173, respectively. The harmonic-characteristic curves for both stations average 1.0 to 1.5 ° C above the statewide harmonic equation.

Annual temperature-characteristic curves for Conasauga River near Dalton (station 02384748) and Holly Creek near Chatsworth (station 02385800) are shown in figures 176 and 177. Both stations are considered representative of mostly natural conditions and are included in the stations used for the statewide regression analyses (table 3). The harmonic mean and amplitude coefficients are about 0.5 ° C higher than values computed from the statewide harmonic equation.

Annual stream-temperature characteristic curves for Conasauga River at Tilton (station 02387000) and Conasauga River near Resaca (station 02387050) are shown in figures 178 and 179. Temperatures recorded at the Tilton station likely are affected by industrial and land-use activities in the Dalton area. Natural temperatures for stations having similar basin characteristics as the Tilton station typically occur further south. Downstream, at Conasauga River near Resaca (station 02387050) (fig. 179), harmonic-mean and amplitude coefficients from observed data are about 0.6 and 0.8 ° C higher than respective values generated by the statewide harmonic equation.

In the vicinity of Resaca, Ga., the Conasauga and Coosawattee Rivers combine to form the Oostanaula River. The first Oostanaula River temperature station downstream of this confluence is the Oostanaula River at Resaca (station 02387500). The data and characteristic curves for this station are shown in figure 180. The period of observed temperature data analysis (1957-72) preceded the construction of Carters Lake and was included as one of the 78 statewide harmonic analysis stations (table 3).

Harmonic curves for Oostanaula River at I-75 at Resaca (station 02387502) for the post-Carters Lake period of 1974–84 are shown in figure 181. This station is only a few miles downstream from the confluence of the Conasauga and Coosawattee Rivers. Stream temperatures at Oostanaula River at I-75 at Resaca more closely resemble the post-Carters Lake temperatures of the higher yielding Coosawattee River near Calhoun (fig. 175), with damped harmonic mean and amplitude, than those of the Conasauga River near Resaca (fig. 179).

Harmonic temperature curves computed from observed data and the statewide harmonic equation for West Armuchee Creek near Subligna (station 02388000) are shown in figure 182. West Armuchee Creek near Subligna has a small 36 mi^2 drainage area. During winter months, the observed-data curve is several degrees higher than the statewide harmonic equation curve. This difference likely is attributable to substantial ground-water discharge, characteristic of many small streams within the Valley and Ridge Province.

Figure 183 shows pre-Carters Lake data (1957–73) for Oostanaula River at Rome (station 02388500). Harmonic curves from the statewide harmonic equation and from the observed data are in close agreement with harmonic mean, amplitude, and phase coefficients, differing only by 0.3 ° C, 0.4 ° C, and 0.07 radians, respectively. The harmonic curve from the post-Carters Lake period is shown for Oostanaula River (Rome Intake) at Rome (station 02388520) in figure 184. The only harmonic coefficient that shows a noticeable difference from the statewide harmonic equation for the period 1974-84 is the phase coefficient, with a lag of about 0.13 radians or about eight days.

Annual harmonic stream-temperature characteristics for Etowah River near Dawsonville (station 02389000) are shown in figure 185. The harmonic curve from the statewide harmonic equation plots about 1 ° C above the curve derived from observed data for January through July. This is consistent with Etowah River near Canton (station 02392000) shown in figure 187. For the Canton station, the 1 ° C cooler temperature is evident year round. Both the Dawsonville and Canton stations are among those selected to compute the statewide harmonic equation. Figure 186 shows stream-temperature data and characteristics for Shoal Creek near Dawsonville (station 02389300). The observed data for the Shoal Creek station shows a harmonic amplitude coefficient about 0.8 ° C lower than the amplitude from the statewide harmonic equation. Figures 188 and 189 show the temperature characteristics at Little River near Roswell (station 02392500) for periods 1959–64 and 1964–75, respectively. The harmonic mean and amplitude coefficients computed from the 1964–75 data are about 1.5 ° C above respective values from 1959–64 and from the statewide harmonic equation. These differences likely are due to urban development, stream channelization, and pond construction within the Little River basin.

Computed annual stream-temperature characteristics for Etowah River at Allatoona Dam above Cartersville (station 02394000) for a short pre-Allatoona Reservoir period are shown in figure 190. Allatoona Reservoir was completed in 1949 and is located about 0.8 miles upstream from station 02394000. Because the pre-Allatoona Reservoir record, shown in figure 190, continued only about one year (1938–39), no harmonic curve is shown for the data. Annual stream-temperature characteristics for the post-Allatoona Reservoir period (1958-84) are shown in figure 191. The more current record shows harmonic mean and amplitude coefficients both about 0.4 ° C lower and the phase coefficient about 0.42 radians lower than respective values of the statewide harmonic equation. The shift in phase coefficient amounts to a seasonal lag of about 24 days.

Harmonic characteristics for Etowah River above Kingston (station 02394980), Etowah River near Kingston (station 02395000), and Etowah River at Rome (station 02396000) are shown in figures 193, 194, and 195. Harmonic characteristics computed from measurements for these reaches of the Etowah River reflect the effects of reservoir, industrial, municipal, and fossil-fuel power-generation activities.

The Coosa River is formed by the confluence of the Oostanaula and Etowah Rivers in Rome, Ga. Figure 196 shows stream-temperature characteristics for Coosa River near Rome (station 02397000) for the period 1957-84. Harmonic coefficients computed from the periodic stream-temperature measurements show about a 0.6 ° C compression and a 0.16 radian (about 10 days) lag for the amplitude and phase coefficients, respectively, when compared with coefficients from the statewide harmonic equation. Allatoona Dam on the Etowah River may be the principal cause of most of these differences.

Harmonic coefficients for tributary Cedar Creek near Cedartown (station 02397500), Chattooga River at Summerville (station 02398000), and Chattooga River at Chattoogaville (02398037) are shown in figures 197, 199, and 200, respectively. The Cedartown, Summerville, and Chattoogaville stations all show higher harmonic mean and lower amplitude coefficients than values estimated from the statewide harmonic equation. This may be caused by larger ground-water discharge to these streams.

Annual harmonic stream-temperature characteristics for Coosa River (at the Georgia–Alabama State line) near Coosa (station 02397530) for the period 1974-84 are shown in figure 198. The harmonic curve, generated by the measured data, plots about 2 to 3 ° C higher than the curve derived from the statewide harmonic equation throughout most of the year. Observed summer stream-temperature maximum and average values (harmonic mean values) at Coosa River near Coosa are typical of streams much farther south. Elevated stream temperatures may be attributable to return flow from power generation at Plant Hammond and other industrial and municipal activities in the vicinity of Rome, Ga.

Tennessee River Basin

The Tennessee River basin (fig. 1) covers only a few square miles in northern Georgia. In general, the Tennessee River basin streams in Georgia flow northward to Tennessee; whereas, most other streams in the State flow southward. Harmonic coefficients computed from periodic stream-temperature measurements from the Tennessee River basin (fig. 1) are shown in figures 204-211. Tennessee River basin stations used to compute the statewide harmonic equation include Hiawassee River at Presley (station 03545000) (fig. 204); Toccoa River near Dial (station 03558000) (fig. 207); Fightingtown Creek at McCaysville (station 0356000) (fig. 209); South Chickamauga Creek at Graysville (station 03566800) (fig. 210); and West Chickamauga Creek near Lakeview (station 03567340) (fig. 211). Each of these curves except Toccoa River near Dial have harmonic mean temperatures about 0.1 to 1.0 ° C higher and amplitudes about 0.1 to 1.1 ° C lower than those computed by the statewide harmonic equation.

Nottely River at Nottely Dam near Ivylog (station 03553500) (fig. 206) and Toccoa River near Blue Ridge (03559000) (fig. 208) are immediately downstream from impoundments and stream-temperature data indicate modified characteristics. Both stations have annual harmonic mean and amplitude coefficients about 1 ° C lower than values computed from the statewide harmonic equation. Phase coefficients for both stations are about 2.1 radians, lagging the natural season by about 41 days.

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TABULAR DATA

Table 1. Periodic stream-temperature stations, periods of analyses, selected station information, and harmonic properties

[mi^2, square miles; ft, feet; ° C, degrees Celsius]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record analyzed	Number of observations	Observed stream temperature: Minimum (° C)	Observed stream temperature: Maximum (° C)	Harmonic properties computed from observed data: Mean (° C)	Amplitude (° C)	Phase coefficient (radians)	Standard error (° C)	Variance (percent)
	SAVANNAH RIVER BASIN													
02177000	Chattooga River near Clayton, Ga.	34°48'50"	83°18'22"	207	1,166	09/57-12/84	260	1.0	29.0	13.6	9.2	2.80	2.22	88.1
02178400	Tallulah River near Clayton, Ga.	34°53'25"	83°31'50"	57	1,869	07/64-08/84	174	2.0	24.0	12.0	7.2	2.77	2.00	84.5
02182000	Panther Creek near Toccoa, Ga.	34°40'40"	83°20'43"	33	674	09/59-06/74	75	1.0	25.5	13.2	8.4	2.69	2.10	86.1
02187500	Savannah River near Iva, S.C.	34°15'20"	82°44'42"	2,231	432	05/58-11/84	93	4.0	24.0	13.3	5.1	2.17	2.12	64.0
02188500	Beaverdam Creek at Dewy Rose, Ga.	34°10'52"	82°56'38"	38	581	02/58-07/75	101	3.0	27.0	15.5	8.9	2.82	2.26	89.1
02189000	Savannah River near Calhoun Falls, S.C.	34°04'15"	82°38'30"	2,876	364	09/57-07/74	34	6.0	25.0	16.6	6.7	2.56	2.20	75.3
02189050	North Fork Broad River (SWS no. 1) above Toccoa, Ga.	34°34'25"	83°22'00"	3.7	894	10/58-08/68	53	1.5	27.0	14.7	9.4	2.71	1.82	85.1
02189100	Denmans Creek (SWS no. 2) near Toccoa, Ga.	34°34'22"	83°22'00"	0.7	870	10/58-10/69	53	3.0	29.5	15.5	11.3	2.79	1.93	89.4
02189500	North Fork Broad River near Toccoa, Ga.	34°30'49"	83°19'19"	19	750	10/58-08/68	52	4.0	25.0	14.4	7.9	2.66	1.78	93.3
02189600	Bear Creek (SWS no. 6) near Mize, Ga.	34°29'07"	83°18'38"	4.0	743	10/58-07/68	50	4.5	31.5	17.0	11.6	2.82	2.04	90.3
02190000	North Fork Broad River near Lavonia, Ga.	34°27'10"	83°14'23"	42	680	07/58-08/68	60	1.5	26.0	15.0	9.2	2.68	1.97	93.3
02190100	Toms Creek (SWS no. 11) near Eastanollee, Ga.	34°29'01"	83°14'02"	3.8	731	07/62-08/68	46	4.5	29.0	16.5	10.9	2.79	1.99	89.4
02190200	Toms Creek Tributary (SWS no. 14) near Avalon, Ga.	34°29'35"	83°13'23"	1.2	735	07/62-08/68	51	4.0	29.0	16.0	10.5	2.87	1.87	84.9
02190500	Toms Creek near Martin, Ga.	34°27'47"	83°13'19"	10.3	682	10/62-09/68	61	4.0	25.5	15.7	9.0	2.85	1.88	99.9
02191000	North Fork Broad River near Carnesville, Ga.	34°19'25"	83°11'10"	119	600	10/62-09/70	56	4.5	28.5	15.4	9.7	2.78	2.30	99.7
02191200	Hudson River at Homer, Ga.	34°20'15"	83°29'17"	61	695	08/62-07/75	100	2.0	25.0	14.3	8.2	2.80	2.00	85.9
02192000	Broad River near Bell, Ga.	33°58'27"	82°46'12"	1,430	357	10/56-10/79	147	1.5	27.0	16.4	9.6	2.82	2.43	90.2
02193500	Little River near Washington, Ga.	33°36'46"	82°44'33"	291	354	10/54-06/74	83	1.0	26.5	15.3	9.5	2.79	2.43	82.2
02196820	Butler Creek at Fort. Gordon, Ga.	33°26'36"	82°07'45"	7.5	271	03/68-07/76	56	4.0	26.5	16.9	8.9	2.71	2.88	78.1
02197000	Savannah River at Augusta, Ga.	33°22'25"	81°56'35"	7,508	97	02/58-07/73	53	6.0	26.0	16.6	6.9	2.42	1.98	82.9

Table 1. Periodic stream-temperature stations, periods of analyses, selected station information, and harmonic properties—Continued

[mi^2, square miles; ft, feet; ° C, degrees Celsius]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record analyzed	Number of observations	Observed stream temperature		Harmonic properties computed from observed data				
								Minimum (° C)	Maximum (° C)	Mean (° C)	Amplitude (° C)	Phase coefficient (radians)	Standard error (° C)	Variance (percent)
02197500	Savannah River at Burtons Ferry near Millhaven, Ga.	32°56'20"	81°30'10"	8,650	52	08/57-06/79	81	4.0	27.0	16.8	8.2	2.64	1.82	87.4
	SAVANNAH RIVER BASIN—Continued													
02197520	Brier Creek near Thomson, Ga.	33°22'06"	82°28'06"	55	330	11/58-07/76	68	4.0	24.0	15.3	7.6	2.76	2.35	75.1
02197600	Brushy Creek near Wrens, Ga.	33°10'37"	82°18'21"	28	283	05/58-07/76	146	5.0	25.0	16.5	6.8	2.79	1.88	88.8
02197830	Brier Creek near Waynesboro, Ga.	33°07'05"	81°57'50"	473	174	10/54-09/83	80	2.0	28.5	17.0	8.2	2.78	2.54	81.2
02198000	Brier Creek at Millhaven, Ga.	32°56'00"	81°39'05"	646	96	07/54-06/79	155	0.0	28.5	16.4	8.9	2.83	2.62	84.1
02198500	Savannah River near Clyo, Ga.	32°31'30"	81°15'45"	9,850	13	05/38-12/84	331	4.5	30.0	18.0	8.7	2.70	1.82	88.8
	OGEECHEE-NEWPORT RIVER BASINS													
02202000	Ogeechee River at Scarboro, Ga.	32°42'38"	81°52'46"	1,940	112	10/54-06/79	107	2.0	30.0	16.6	10.0	2.77	2.42	93.8
02202190	Ogeechee River at Oliver, Ga.	32°29'40"	81°33'21"	2,370	60	08/74-12/84	121	2.5	30.0	17.6	10.0	2.84	2.29	89.0
02202500	Ogeechee River near Eden, Ga.	32°11'29"	81°24'58"	2,650	20	05/37-10/84	293	3.0	31.5	18.3	9.3	2.81	2.23	86.0
02203000	Canoochee River near Claxton, Ga.	32°11'05"	81°53'20"	555	80	09/54-12/84	255	3.0	30.0	17.7	8.9	2.85	2.23	86.7
02203519	Canoochee River at Fort Stewart, Ga.	31°58'59"	81°23'07"	970	60	02/58-12/84	78	3.0	31.0	18.5	9.4	2.83	2.28	87.6
02203559	Peacock Creek at McIntosh, Ga.	31°48'49"	81°31'13"	33	0.4	09/66-11/77	101	5.5	31.0	18.9	7.7	2.85	2.39	82.1
02203566	Riceboro Creek near Riceboro, Ga.	31°45'16"	81°27'38"	29.2	0.1	09/66-11/77	93	5.0	29.0	18.9	8.2	2.86	2.51	84.2
02203570	Riceboro Creek at Riceboro, Ga.	31°44'43"	81°25'37"	31.7	0.1	09/66-11/77	98	8.0	29.6	19.9	8.6	2.82	2.02	92.6
02203574	North Newport River near Seabrook, Ga.	31°42'10"	81°19'54"	144	0.1	10/66-11/77	95	8.0	30.0	20.4	9.0	2.75	1.74	98.0
02203578	North Newport River at Halfmoon Landing, Ga.	31°41'43"	81°16'18"	157	0.1	10/66-12/84	221	6.0	30.5	20.5	9.3	2.73	1.86	96.2
02203585	Timmons River near Yellow Bluff, Ga.	31°40'37"	81°13'09"	161	0.1	10/66-07/70	61	8.0	29.8	19.8	9.5	2.68	1.84	93.1
02203596	South Newport River near Harris Neck, Ga.	31°39'05"	81°17'21"	126	0.1	09/66-07/70	52	8.0	30.5	20.0	9.5	2.73	1.62	97.6
	ALTAMAHA RIVER BASIN													
02203800	South River at Bouldercrest Road at Atlanta, Ga.	33°40'46"	84°18'30"	41.5	759	08/70-12/84	119	3.5	28.5	17.1	7.8	2.71	1.97	86.6
02203965	South River at State Highway 155 near Atlanta, Ga.	33°39'14"	84°11'12"	147	660	10/70-12/84	111	2.0	26.0	16.2	8.3	2.75	1.83	90.2
02204285	Pates Creek at Buster Lewis Road near Flippen, Ga.	33°29'34"	84°14'44"	11.9	720	02/78-08/83	32	4.0	24.0	15.7	8.3	2.95	1.96	93.9

Table 1. Periodic stream-temperature stations, periods of analyses, selected station information, and harmonic properties—Continued

[mi^2, square miles; ft, feet; ° C, degrees Celsius]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record analyzed	Number of observations	Observed stream temperature		Harmonic properties computed from observed data				
								Minimum (° C)	Maximum (° C)	Mean (° C)	Amplitude (° C)	Phase coefficient (radians)	Standard error (° C)	Variance (percent)
	ALTAMAHA RIVER BASIN—-Continued													
02204500	South River near McDonough, Ga.	33°29'48"	84°00'53"	456	565	12/57-09/82	32	4.0	26.0	16.1	9.2	2.89	2.10	95.3
02204520	South River at State Highway 81 at Snapping Shoals, Ga.	33°29'04"	83°57'29"	465	540	08/70-12/84	123	3.0	27.5	15.6	9.2	2.80	2.24	84.5
02205000	Wildcat Creek near Lawrenceville, Ga.	34°00'08"	84°00'18"	1.6	968	10/56-09/76	152	2.0	24.0	14.4	6.9	2.80	2.18	78.2
02206500	Yellow River near Snellville, Ga.	33°51'11"	84°04'45"	134	806	08/56-11/84	183	1.5	28.5	14.6	9.1	2.82	2.18	87.7
02207300	Yellow River (Conyers Intake) at Conyers, Ga.	33°41'23"	83°58'43"	236	660	07/74-12/84	119	0.5	26.0	15.1	9.3	2.86	2.24	86.6
02207500	Yellow River near Covington, Ga.	33°36'52"	83°54'54"	378	617	12/57-09/82	30	2.5	27.0	16.0	9.5	2.80	2.48	86.5
02207540	Yellow River at Porterdale, Ga.	33°34'12"	83°53'51"	401	600	07/74-06/79	56	2.0	27.0	14.8	9.4	2.86	2.18	86.7
02208005	Yellow River at State Highway 212 near Stewart, Ga.	33°26'26"	83°52'43"	440	560	07/74-12/84	121	2.5	26.5	15.4	9.4	2.84	2.14	86.6
02209260	Alcovy River Newton Factory Bridge Road near Stewart, Ga.	33°26'58"	83°49'42"	291	560	05/72-12/84	122	2.0	27.5	15.4	9.3	2.83	2.25	85.9
02210500	Ocmulgee River near Jackson, Ga.	33°18'28"	83°50'18"	1,420	419	12/57-12/84	127	2.0	27.5	17.2	9.3	2.64	1.93	89.9
02211300	Towaliga River near Jackson, Ga.	33°15'50"	84°04'17"	105	596	06/60-12/73	97	0.5	26.0	14.7	9.5	2.77	2.08	94.0
02212600	Falling Creek near Juliette, Ga.	33°05'59"	83°43'25"	72	368	07/64-01/85	278	1.5	28.0	15.4	8.4	2.86	2.22	86.5
02212950	Ocmulgee River (Macon Intake) at Macon, Ga.	32°52'11"	83°39'15"	2,230	270	07/74-12/84	113	3.2	34.0	18.4	10.4	2.69	2.23	91.3
02213000	Ocmulgee River at Macon, Ga.	32°50'19"	83°37'14"	2,240	270	05/37-12/75	202	5.0	33.0	18.4	9.8	2.72	2.10	89.5
02213050	Walnut Creek near Gray, Ga.	32°58'20"	83°37'08"	29	380	08/62-07/76	119	4.0	28.5	16.8	8.1	2.92	2.50	79.9
02213470	Tobesofkee Creek above Macon, Ga.	32°52'02"	83°50'24"	156	365	05/67-12/73	31	7.0	26.5	16.7	8.6	2.63	1.27	89.3
02213500	Tobesofkee Creek near Macon, Ga.	32°48'32"	83°45'30"	182	310	10/55-10/66	67	4.0	27.0	16.8	9.0	2.86	2.28	83.7
						11/66-09/74	76	6.0	27.0	17.0	8.4	2.63	1.05	87.7
02213700	Ocmulgee River near Warner Robins, Ga.	32°40'17"	83°36'11"	2,690	250	11/70-12/84	133	3.5	32.5	18.9	10.3	2.72	2.13	92.8
02214265	Ocmulgee River near Bonaire, Ga.	32°32'33"	83°32'13"	3,350	200	08/74-12/84	115	3.0	29.0	17.7	10.2	2.82	2.35	87.8
02214500	Big Indian Creek at Perry, Ga.	32°27'20"	83°44'21"	108	279	04/54-01/74	134	4.5	28.5	17.0	7.7	2.87	1.93	87.5
02215260	Ocmulgee River at Abbeville, Ga.	31°59'47"	83°16'43"	4,460	162	02/58-06/79	42	3.5	28.0	17.1	9.9	2.76	2.43	83.2

Table 1. Periodic stream-temperature stations, periods of analyses, selected station information, and harmonic properties—Continued

[mi^2, square miles; ft, feet; ° C, degrees Celsius]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record analyzed	Number of observations	Observed stream temperature		Harmonic properties computed from observed data				
								Minimum (° C)	Maximum (° C)	Mean (° C)	Amplitude (° C)	Phase coefficient (radians)	Standard error (° C)	Variance (percent)
	ALTAMAHA RIVER BASIN—-Continued													
02215500	Ocmulgee River at Lumber City, Ga.	31°55'06"	82°40'26"	5,180	87	06/54-12/84	250	3.0	31.0	19.0	9.9	2.76	2.01	88.5
02217000	Allen Creek at Talmo, Ga.	34°11'34"	83°43'11"	18.2	784	10/56-06/74	112	3.0	24.0	13.9	8.0	2.71	2.10	89.4
02217500	Middle Oconee River near Athens, Ga.	33°56'48"	83°25'22"	398	556	08/56-10/77	158	3.0	27.0	15.5	9.4	2.80	2.38	87.7
02217740	North Oconee River (Athens Intake) at Athens, Ga.	33°58'28"	83°22'56"	270	580	07/74-12/84	116	1.0	26.0	14.8	9.6	2.90	2.19	90.5
02218000	Oconee River at Barnett Shoals near Watkinsville, Ga.	33°51'21"	83°19'36"	783	530	07/74-12/84	120	1.0	29.5	15.4	10.0	2.85	2.26	88.8
02218500	Oconee River near Greensboro, Ga.	33°34'52"	83°16'22"	1,090	410	07/56-12/84	219	2.5	30.0	16.5	9.8	2.79	2.28	89.5
02219500	Apalachee River near Buckhead, Ga.	33°36'31"	83°20'58"	436	424	07/56-07/76	149	0.5	26.5	16.0	9.2	2.78	2.20	85.6
02220550	Whitten Creek near Sparta, Ga.	33°23'12"	83°01'34"	16.6	395	12/60-08/76	143	3.5	25.0	15.2	7.2	2.83	2.51	75.3
02221000	Murder Creek near Monticello, Ga.	33°24'56"	83°39'43"	24	498	08/56-12/73	117	3.0	23.5	14.6	7.5	2.87	2.14	83.8
02223000	Oconee River at Milledgeville, Ga.	33°04'58"	83°12'51"	2,950	231	05/37-12/84	273	3.0	30.0	17.8	8.9	2.62	1.95	89.0
02223040	Oconee River near Hardwick, Ga.	33°01'45"	83°11'24"	3,200	200	07/74-12/84	117	3.0	29.5	18.1	9.4	2.58	1.9	91.5
02223250	Oconee River at State Highway 57 near Toombsboro, Ga.	32°46'54"	82°57'30"	3,770	170	02/79-12/84	69	5.0	31.0	18.5	9.8	2.72	1.97	87.3
02223300	Big Sandy Creek near Jeffersonville, Ga.	32°48'15"	83°25'04"	31	324	08/58-12/73	82	5.0	27.0	16.7	8.2	2.92	1.92	86.2
02223500	Oconee River at Dublin, Ga.	32°32'40"	82°53'41"	4,400	149	11/54-11/76	126	5.5	29.0	18.0	9.3	2.69	2.16	92.1
02223600	Oconee River at Interstate Highway 16 near Dublin, Ga.	32°29'05"	82°51'45"	4,440	148	10/73-12/84	102	3.0	31.0	18.2	10.4	2.72	1.98	92.0
02224000	Rocky Creek near Dudley, Ga.	32°29'38"	83°08'49"	62.9	262	08/54-03/84	152	4.5	28.0	17.2	7.5	2.85	2.27	80.4
02225000	Altamaha River near Baxley, Ga.	31°56'20"	82°21'13"	11,600	62	12/57-12/84	146	4.0	31.0	19.3	10.1	2.78	2.18	87.5
02225470	Pendelton Creek at State Highway 86 below Ohoopee, Ga.	32°09'36"	82°12'43"	300	90	07/79-12/84	64	5.0	28.0	18.0	8.8	2.92	2.15	89.1
02225500	Ohoopee River near Reidsville, Ga.	32°04'42"	82°10'39"	1,110	74	07/54-10/82	212	3.0	31.0	18.5	9.1	2.78	2.53	84.0
02225990	Altamaha River near Jesup, Ga.	31°39'59"	81°50'19"	13,600	40	08/74-12/84	117	5.0	32.0	19.7	9.5	2.76	1.24	93.5

Table 1. Periodic stream-temperature stations, periods of analyses, selected station information, and harmonic properties—Continued

[mi^2, square miles; ft, feet; ° C, degrees Celsius]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record analyzed	Number of observations	Observed stream temperature: Minimum (° C)	Observed stream temperature: Maximum (° C)	Harmonic properties computed from observed data: Mean (° C)	Amplitude (° C)	Phase coefficient (radians)	Standard error (° C)	Variance (percent)
	ALTAMAHA RIVER BASIN—Continued													
02226000	Altamaha River at Doctortown, Ga.	31°39'16"	81°49'41"	13,600	25	05/37-10/79	215	3.3	31.0	19.4	10.0	2.75	2.09	92.7
02226010	Altamaha River near Gardi, Ga.	31°37'24"	81°45'55"	13,600	40	11/74-12/84	113	5.0	32.0	19.9	9.6	2.74	1.94	93.9
02226100	Penholoway Creek near Jesup, Ga.	31°34'00"	81°50'18"	210	19	12/58-07/84	182	6.0	29.5	18.4	8.0	2.82	2.10	85.9
02226160	Altamaha River at Everett City, Ga.	31°25'37"	81°36'20"	14,000	5.0	12/70-12/84	166	5.0	31.5	19.7	9.3	2.71	1.86	91.2
	SATILLA–ST MARY'S RIVER BASINS													
02226475	Satilla River at Waltertown, Ga.	31°18'17"	82°23'33"	1,160	70	08/74-12/84	116	4.0	31.0	18.6	9.5	2.87	2.43	86.8
02226500	Satilla River near Waycross, Ga.	31°14'17"	82°19'29"	1,200	66	05/37-08/74	188	5.0	31.0	19.8	8.9	2.86	2.41	84.3
02226582	Satilla River at State Highways 15 and 121 near Hoboken, Ga.	31°13'00"	82°09'45"	1,350	52	08/74-12/84	120	4.0	31.5	18.9	9.5	2.86	2.44	86.9
02227000	Hurricane Creek near Alma, Ga.	31°34'00"	82°27'50"	139	136	01/55-06/82	103	4.5	30.5	17.9	8.4	2.95	2.33	81.9
02227500	Little Satilla River near Offerman, Ga.	31°27'04"	82°03'17"	646	58	01/55-09/83	163	6.0	32.0	18.9	8.4	2.82	2.23	88.2
02228000	Satilla River at Atkinson, Ga.	31°13'16"	81°52'03"	2,790	15	05/54-10/84	258	5.0	34.0	20.0	9.1	2.77	2.36	90.3
	SUWANNEE–OCHLOCKONEE–AUCILLA RIVER BASINS													
02314500	Suwannee River at Fargo, Ga.	30°40'50"	82°33'38"	1,260	92	08/57-11/84	258	4.0	31.0	19.9	8.5	2.83	2.27	88.2
02316000	Alapaha River near Alapaha, Ga.	31°23'03"	83°11'33"	663	208	03/53-07/84	171	5.5	29.5	18.6	8.1	2.78	2.22	87.7
02317500	Alapaha River at Statenville, Ga.	30°42'14"	83°02'00"	1,400	77	01/54-08/74	164	4.0	31.5	19.6	8.5	2.78	2.33	84.2
02317718	New River at U.S. Highway 82 near Tifton, Ga.	31°26'33"	83°28'33"	10	200	07/79-12/84	65	4.0	29.0	19.4	7.8	2.69	2.34	81.6
02317749	Withlacoochee River near Valdosta, Ga.	30°55'57"	83°17'22"	520	190	11/74-12/84	121	4.0	29.5	18.1	8.7	2.77	2.27	86.4
02317757	Withlacoochee River at State Highway 94 near Valdosta, Ga.	30°51'00"	83°20'23"	552	170	11/74-12/84	115	4.5	29.0	18.5	8.3	2.75	2.24	84.7
02317800	Little River at U.S. Highway 82 near Tifton, Ga.	31°26'21"	83°33'38"	145	252	08/77-06/82	34	2.0	28.0	17.7	8.3	2.75	2.59	79.5
02318000	Little River near Adel, Ga.	31°09'18"	83°32'38"	577	171	10/55-03/61	25	8.0	29.0	18.8	8.7	2.76	1.90	99.9
						04/61-07/74	95	6.0	31.0	19.4	8.9	2.81	2.37	88.9

Table 1. Periodic stream-temperature stations, periods of analyses, selected station information, and harmonic properties—Continued

[mi^2, square miles; ft, feet; ° C, degrees Celsius]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record analyzed	Number of observations	Observed stream temperature		Harmonic properties computed from observed data				
								Minimum (° C)	Maximum (° C)	Mean (° C)	Amplitude (° C)	Phase coefficient (radians)	Standard error (° C)	Variance (percent)
	SUWANNEE-OCHLOCKONEE-AUCILLA RIVER BASINS—Continued													
02318500	Withlacoochee River near Quitman, Ga.	30°47'33"	83°27'06"	1,480	84	08/57-12/84	93	4.0	29.0	18.9	9.0	2.77	2.01	89.2
02318725	Okapilco Creek at U.S. Highway 84 at Quitman, Ga.	30°47'10"	83°31'33"	278	94	11/74-12/84	115	4.5	29.5	18.1	8.6	2.76	2.24	86.1
02318960	Withlacoochee River near Clyattsville, Ga.	30°38'07"	83°18'41"	1,490	50	11/74-12/84	118	3.0	29.0	18.5	8.1	2.74	2.26	83.2
02327205	Ochlockonee River near Moultrie, Ga.	31°08'31"	83°48'13"	104	150	07/79-12/84	65	3.0	29.5	17.6	8.2	2.74	2.48	79.3
02327500	Ochlockonee River near Thomasville, Ga.	30°52'32"	84°02'44"	550	134	04/54-12/84	231	2.5	30.5	18.4	8.6	2.77	2.31	89.4
02328000	Tired Creek near Cairo, Ga.	30°51'54"	84°15'46"	60	159	05/54-07/74	110	3.0	27.0	17.7	7.4	2.81	2.00	81.4
02328200	Ochlockonee River near Calvary, Ga.	30°43'53"	84°14'12"	930	100	08/74-12/84	115	2.0	29.0	17.8	8.5	2.81	2.20	85.8
	CHATTAHOOCHEE RIVER BASIN													
02331000	Chattahoochee River near Leaf, Ga.	34°34'37"	83°38'09"	150	1,220	09/57-08/76	123	2.0	25.0	13.9	8.4	2.77	1.93	99.7
02331600	Chattahoochee River near Cornelia, Ga.	34°32'27"	83°37'14"	315	1,129	02/68-11/84	139	0.5	26.0	14.7	8.7	2.82	2.18	86.3
02333500	Chestatee River at State Highway 52 near Dahlonega, Ga.	34°31'41"	83°56'23"	153	1,129	10/56-9/76	167	1.0	25.0	14.1	7.9	2.76	2.33	84.5
02334500	Chattahoochee River near Buford, Ga.	34°07'34"	84°05'37"	1,060	905	05/57-08/77	123	5.0	14.5	9.2	1.8	2.17	0.95	41.9
02335000	Chattahoochee River near Norcross, Ga.	33°59'50"	84°12'07"	1,170	878	10/57-09/76	86	2.0	18.0	11.6	3.6	2.53	1.31	58.1
02335700	Big Creek near Alpharetta, Ga.	34°03'02"	84°16'10"	72	961	05/60-09/76	150	1.0	24.0	14.3	7.8	2.78	2.23	82.3
02336000	Chattahoochee River at Atlanta, Ga.	33°51'33"	84°27'16"	1450	750	11/57-09/79	360	2.0	28.5	13.1	6.1	2.69	1.81	79.3
02336300	Peachtree Creek at Atlanta, Ga.	33°49'10"	84°24'28"	86.8	764	07/59-12/84	306	0.0	31.0	16.0	9.7	2.80	2.44	89.0
02336502	Chattahoochee River at Interstate Highway 285 near Atlanta, Ga.	33°48'32"	84°29'43"	1,600	745	07/75-12/84	123	5.0	30.2	15.7	6.6	2.69	2.62	68.3
02337000	Sweetwater Creek near Austell, Ga.	33°46'22"	84°36'53"	246	857	05/57-12/84	339	0.5	27.0	15.3	9.4	2.85	2.17	92.1
02337100	North Fork Camp Creek at Atlanta, Ga.	33°39'40"	84°30'40"	5.3	812	10/63-07/70	64	3.5	30.0	16.4	9.4	2.72	2.41	83.4
02337170	Chattahoochee River near Fairburn, Ga.	33°39'24"	84°40'25"	2,060	719	07/65-12/84	380	4.0	28.0	16.4	7.6	2.69	2.10	86.2
02337438	Dog River at State Highway 166 near Fairplay, Ga.	33°37'20"	84°47'35"	70	940	07/74-05/79	55	0.5	27.0	15.1	8.9	2.84	2.80	79.4

Table 1. Periodic stream-temperature stations, periods of analyses, selected station information, and harmonic properties—Continued

[mi^2, square miles; ft, feet; ° C, degrees Celsius]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record analyzed	Number of observations	Observed stream temperature		Harmonic properties computed from observed data				
								Minimum (° C)	Maximum (° C)	Mean (° C)	Amplitude (° C)	Phase coefficient (radians)	Standard error (° C)	Variance (percent)
	CHATTAHOOCHEE RIVER BASIN—Continued													
02337500	Snake Creek near Whitesburg, Ga.	33°31'46"	84°55'42"	36	833	10/59-07/84	184	3.5	26.0	15.1	7.9	2.78	1.60	92.7
02338000	Chattahoochee River near Whitesburg, Ga.	33°28'37"	84°54'04"	2,430	682	02/58-12/84	311	1.5	30.0	16.9	7.9	2.73	2.18	89.5
02338500	Chattahoochee River at U.S. Highway 27 at Franklin, Ga.	33°16'45"	85°06'00"	2,680	624	02/58-12/84	170	2.0	28.9	17.8	8.8	2.72	2.34	87.7
02338720	Chattahoochee River (LaGrange Intake) near LaGrange, Ga.	33°04'42"	85°06'39"	2,700	600	07/74-12/84	273	2.5	33.0	18.7	10.4	2.75	2.11	92.6
02339000	Yellowjacket Creek near LaGrange, Ga.	33°05'27"	85°03'40"	182	601	08/56-09/70	104	1.0	27.0	15.6	9.3	2.85	2.31	88.6
02339500	Chattahoochee River at West Point, Ga.	32°53'10"	85°10'56"	3,550	552	09/57-09/74	163	4.0	31.0	17.2	9.2	2.81	2.37	88.5
						10/74-12/84	166	1.0	28.0	17.2	9.1	2.62	1.70	98.6
02339720	Long Cane Creek near West Point, Ga.	32°54'37"	85°08'43"	75	580	07/74-12/84	117	0.0	27.5	16.1	9.0	2.89	2.31	86.4
02340500	Mountain Oak Creek near Hamilton, Ga.	32°44'28"	85°04'08"	62	550	08/56-06/74	103	2.0	26.5	15.4	9.1	2.83	1.96	92.3
02341500	Chattahoochee River at Columbus, Ga.	32°27'45"	84°59'52"	4,670	183	10/40-09/74	173	6.0	30.0	18.5	9.5	2.68	1.64	96.0
02341800	Upatoi Creek near Columbus, Ga.	32°24'48"	84°49'12"	342	230	04/65-09/83	127	0.0	30.5	18.2	8.3	2.82	2.23	92.9
02343200	Pataula Creek near Lumpkin, Ga.	31°56'03"	84°48'12"	70	224	08/62-11/73	69	8.0	25.0	17.0	6.8	2.88	2.04	85.1
02343500	Chattahoochee River at Columbia, Ala.	31°17'02"	85°05'59"	8,040	72	11/40-04/58	38	7.8	29.0	18.9	10.3	2.80	1.31	88.6
02344000	Chattahoochee River at Alaga Ala.	31°06'59"	85°02'50"	8,340	63	01/64-07/74	48	8.0	30.0	18.9	9.0	2.66	2.40	78.4
02344040	Chattahoochee River near Steam Mill, Ga.	30°58'39"	85°00'19"	8,510	60	10/74-12/84	120	5.5	31.5	19.5	10.0	2.67	1.82	90.7
	FLINT RIVER BASIN													
02344180	Flint River at State Highway 138 near Jonesboro, Ga.	33°32'14"	84°22'35"	39.3	780	05/58-12/84	113	1.5	27.0	15.9	9.3	2.84	2.23	88.0
02344190	Flint River at State Highway 54 near Fayetteville, Ga.	33°29'13"	84°23'44"	60	760	07/75-12/84	111	0.5	27.0	15.8	9.2	2.80	2.08	88.2
02344300	Camp Creek near Fayetteville, Ga.	33°31'00"	84°25'39"	17	800	07/60-09/70	93	3.0	25.0	14.2	9.0	2.82	2.00	89.8
02344380	Flint River at Ackert Road near Inman, Ga.	33°23'08"	84°23'24"	100	740	07/75-12/84	111	1.0	27.5	15.7	9.5	2.86	2.15	88.8
02344400	Flint River at State Highway 92 above Griffin, Ga.	33°18'33"	84°23'36"	194	720	07/75-12/84	111	1.0	27.0	15.8	9.5	2.87	2.12	91.1

Table 1. Periodic stream-temperature stations, periods of analyses, selected station information, and harmonic properties—Continued

[mi^2, square miles; ft, feet; ° C, degrees Celsius]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record analyzed	Number of observations	Observed stream temperature		Harmonic properties computed from observed data				
								Minimum (° C)	Maximum (° C)	Mean (° C)	Amplitude (° C)	Phase coefficient (radians)	Standard error (° C)	Variance (percent)
	FLINT RIVER BASIN—Continued													
02344500	Flint River near Griffin, Ga.	33°14'39"	84°25'45"	272	711	08/56-07/76	157	1.5	28.0	16.0	10.0	2.85	2.06	91.8
02344700	Line Creek near Senoia, Ga.	33°19'10"	84°31'25"	101	729	09/64-07/76	98	2.0	26.5	15.3	9.8	2.79	2.25	87.2
02346500	Potato Creek near Thomaston, Ga.	32°54'15"	84°21'45"	186	605	07/56-06/74	103	3.0	28.5	16.7	9.8	2.80	2.20	89.4
02347500	Flint River near Culloden, Ga.	32°43'17"	84°13'57"	1,850	335	04/54-06/79	189	3.0	30.0	17.6	10.2	2.82	2.48	87.8
02349000	Whitewater Creek below Rambulette Creek near Butler, Ga.	32°28'00"	84°15'58"	93	366	04/54-11/73	103	8.0	25.0	17.1	6.2	2.90	1.65	87.2
02349500	Flint River at Montezuma, Ga.	32°17'53"	84°02'38"	2,900	256	05/54-12/84	245	4.0	30.0	18.0	9.0	2.87	2.16	87.5
02349900	Turkey Creek at Byromville, Ga.	32°11'44"	83°54'03"	45	286	07/54-06/82	124	3.5	28.0	17.2	7.3	2.91	2.17	83.8
02350001	Flint River at State Highway 27 near Vienna, Ga.	32°03'31"	83°58'39"	3,390	220	07/79-12/84	55	3.0	28.5	18.1	9.9	2.90	2.15	87.3
02350600	Kinchafoonee Creek at Preston, Ga.	32°03'09"	84°32'53"	197	338	05/54-07/84	169	3.0	27.0	16.9	8.0	2.91	2.52	81.2
02352500	Flint River at Albany, Ga.	31°35'39"	84°08'39"	5,310	150	05/54-12/84	171	5.5	31.5	19.4	9.3	2.77	2.18	92.4
02352790	Flint River (Putney Intake) near Putney, Ga.	31°26'39"	84°08'16"	5,340	140	08/74-12/84	120	5.0	31.0	19.6	9.8	2.72	1.82	89.9
02353000	Flint River at Newton, Ga.	31°18'34"	84°20'06"	5,740	110	08/56-10/84	205	6.0	29.0	19.3	8.9	2.71	1.83	94.5
02353400	Pachitla Creek near Edison, Ga.	31°33'17"	84°40'43"	188	213	10/54-11/73	68	6.5	26.0	17.3	7.2	2.90	1.96	83.0
02353500	Ichawaynochaway Ceekr at Milford, Ga.	31°22'58"	84°32'52"	620	150	04/54-07/84	152	4.0	28.5	18.4	7.6	2.82	2.22	86.9
02356000	Flint River at Bainbridge, Ga.	30°54'41"	84°34'48"	7,570	58	04/54-07/73	95	6.0	30.0	19.9	8.7	2.74	2.02	91.7
02356015	Flint River 0.8 mile below State Docks at Bainbridge, Ga.	30°53'34"	84°36'38"	7,570	57	07/74-12/84	120	5.5	30.0	19.5	8.9	2.73	1.98	86.8
02357000	Spring Creek near Iron City, Ga.	31°02'23"	84°44'18"	485	86	08/57-07/78	128	6.0	28.0	18.2	8.1	2.81	2.07	93.7
	COOSA RIVER BASIN													
02379500	Cartecay River near Ellijay, Ga.	34°40'53"	84°27'20"	134	1,255	06/57-08/75	154	0.0	24.0	13.9	7.5	2.79	1.90	92.5
02380000	Ellijay River at Ellijay, Ga.	34°41'06"	84°28'40"	88	1,242	06/57-07/74	121	2.0	24.0	13.6	8.0	2.82	2.04	89.1
02380500	Coosawattee River near Ellijay, Ga.	34°40'18"	84°30'31"	236	1,216	05/63-08/83	175	0.5	25.0	13.7	8.0	2.77	1.88	88.4

Table 1. Periodic stream-temperature stations, periods of analyses, selected station information, and harmonic properties—Continued

[mi^2, square miles; ft, feet; ° C, degrees Celsius]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record analyzed	Number of observations	Observed stream temperature		Harmonic properties computed from observed data				
								Minimum (° C)	Maximum (° C)	Mean (° C)	Amplitude (° C)	Phase coefficient (radians)	Standard error (° C)	Variance (percent)
	COOSA RIVER BASIN—Continued													
02382000	Scarecorn Creek at Hinton, Ga.	34°28'04"	84°35'30"	21	1,051	05/59-07/74	132	1.5	25.5	14.5	7.9	2.82	2.09	85.4
02382500	Coosawattee River at Carters, Ga.	34°36'13"	84°41'44"	521	651	07/65-12/72	32	5.0	26.5	15.1	9.6	2.76	1.48	93.7
02383000	Rock Creek near Fairmount, Ga.	34°21'32"	84°46'46"	6.2	759	07/57-09/72	109	3.0	24.5	15.0	7.9	2.82	2.22	81.5
02383500	Coosawattee River near Pine Chapel, Ga.	34°34'35"	84°51'37"	831	616	06/57-12/72	92	1.5	27.0	15.2	9.4	2.78	2.30	85.9
02383540	Coosawattee River near Calhoun, Ga.	34°32'28"	84°54'03"	861	610	08/74-12/84	114	2.5	29.5	14.9	8.8	2.56	1.78	94.4
02384748	Conasauga River (Dalton Intake) near Dalton, Ga.	34°47'20"	84°52'30"	308	650	07/74-12/84	119	1.5	27.0	15.1	9.9	2.78	1.96	92.5
02385800	Holly Creek near Chatsworth, Ga.	34°43'00"	84°46'12"	64	689	07/60-06/83	202	1.5	26.0	14.7	9.0	2.75	2.27	84.4
02387000	Conasauga River at Tilton, Ga.	34°40'00"	84°55'42"	687	622	06/57-12/84	279	0.5	30.5	16.1	9.9	2.82	2.30	90.2
02387050	Conasauga River near Resaca, Ga.	34°35'36"	84°56'02"	706	610	08/74-12/84	117	1.0	28.0	15.8	10.4	2.76	2.00	95.1
02387500	Oostanaula River at Resaca, Ga.	34°34'42"	84°56'29"	1,602	604	09/57-12/72	111	2.0	27.0	15.0	9.8	2.77	2.12	89.1
02387502	Oostanaula River at Interstate Highway 75 at Resaca, Ga.	34°34'17"	84°56'49"	1,620	602	08/74-12/84	113	2.5	27.0	15.3	9.3	2.66	1.89	92.6
02388000	West Armuchee Creek nearr Subligna, Ga.	34°34'04"	85°09'16"	36	710	05/60-04/82	156	4.0	24.5	14.8	7.2	2.76	1.82	85.4
02388500	Oostanaula River at Rome, Ga.	34°18'02"	85°08'30"	2,115	562	09/57-12/73	128	2.0	30.0	16.1	10.3	2.74	2.01	97.3
02388520	Oostanaula River (Rome Intake) at Rome, Ga.	34°16'13"	85°10'24"	2,145	562	08/74-12/84	119	2.0	28.5	16.0	10.0	2.68	2.06	96.0
02389000	Etowah River near Dawsonville, Ga.	34°22'57"	84°03'21"	107	1,050	09/56-08/84	163	1.5	24.5	13.6	8.2	2.74	1.90	90.2
02389300	Shoal Creek near Dawsonville, Ga.	34°25'13"	84°08'47"	22	1,150	06/58-06/74	90	3.5	22.0	13.3	6.8	2.75	1.85	84.3
02392000	Etowah River at Canton, Ga.	34°14'23"	84°29'47"	605	845	06/57-10/84	212	1.5	27.0	14.2	8.9	2.81	1.97	92.1
02392500	Little River near Roswell, Ga.	34°07'09"	84°23'18"	60	898	08/59-09/64 08/56-06/75	46, 91	4.0, 1.5	25.0 28.5	14.4 15.9	8.3 9.7	2.79 2.78	2.35 2.54	92.9 89.0
02394000	Etowah River at Allatoona Dam above Cartersville, Ga.	34°09'47"	84°44'28"	1,119	687	01/58-11/84	120	3.0	26.0	15.1	9.1	2.39	1.57	94.2
02394950	Hills Creek near Taylorsville, Ga.	34°04'27"	84°57'02"	25	690	06/59-07/74	118	0.0	25.0	14.2	8.6	2.78	2.13	87.3
02394980	Etowah River above Kingston, Ga.	34°11'28"	84°55'44"	1,612	650	08/74-12/84	117	3.0	26.5	15.7	8.7	2.54	1.57	95.1

Table 1. Periodic stream-temperature stations, periods of analyses, selected station information, and harmonic properties—Continued

[mi^2, square miles; ft, feet; ° C, degrees Celsius]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record analyzed	Number of observations	Observed stream temperature		Harmonic properties computed from observed data				
								Minimum (° C)	Maximum (° C)	Mean (° C)	Amplitude (° C)	Phase coefficient (radians)	Standard error (° C)	Variance (percent)
						COOSA RIVER BASIN—Continued								
02395000	Etowah River near Kingston, Ga.	34°12'24"	84°58'44"	1,634	610	10/69-09/84	51	4.0	26.0	16.7	8.4	2.68	2.00	88.3
02396000	Etowah River at Rome, Ga.	34°15'26"	85°09'30"	1,819	562	09/57-12/84	236	3.0	28.0	15.9	8.9	2.61	1.81	91.0
02397000	Coosa River near Rome, Ga.	34°12'01"	85°15'24"	4,040	553	07/57-12/84	267	2.5	28.0	16.2	9.6	2.65	1.73	93.5
02397500	Cedar Creek near Cedartown, Ga.	34°03'38"	85°18'41"	115	725	06/57-12/84	278	3.5	25.5	15.9	7.0	2.79	1.45	88.0
02397530	Coosa River at State Line, Ala.-Ga.	34°11'54"	85°26'46"	4,362	550	08/74-12/84	116	5.0	31.0	18.3	10.4	2.65	1.74	95.2
02398000	Chattooga River at Summerville, Ga.	34°28'03"	85°20'19"	192	613	07/57-12/84	290	1.5	26.0	15.6	7.2	2.74	1.83	85.2
02398037	Chattooga River at Chattoogaville, Ga.	34°20'08"	85°26'43"	281	605	08/74-12/84	119	2.0	26.5	15.7	8.3	2.79	2.01	89.0
02411800	Little River near Buchanan, Ga.	33°47'51"	85°07'03"	20	1,110	05/59-08/75	138	2.0	25.0	14.5	8.5	2.80	1.97	88.6
02411930	Tallapoosa River below Tallapoosa, Ga.	33°44'27"	85°20'11"	272	920	07/74-11/84	80	0.0	29.0	15.4	9.4	2.83	2.33	88.3
02413210	Little Tallapoosa River below Bowdon, Ga.	33°29'34"	85°16'45"	245	919	07/74-12/84	117	1.0	26.5	15.6	9.1	2.85	2.09	89.9
						TENNESSEE RIVER BASIN								
03545000	Hiwassee River at Presley, Ga.	34°54'17"	83°43'01"	46	1,933	08/51-06/82	270	0.0	24.0	12.7	6.5	2.81	2.13	79.0
03550500	Nottely River near Blairsville, Ga.	34°50'28"	83°56'10"	75	1,812	08/51-06/82	244	0.0	24.0	13.2	7.3	2.81	2.09	83.8
03553500	Nottely River at Nottely Dam near Ivylog, Ga.	34°57'55"	84°05'25"	215	1,599	09/51-07/74	158	3.5	25.0	12.4	6.7	2.12	2.44	73.2
03558000	Toccoa River near Dial, Ga.	34°47'24"	84°14'24"	177	1,782	01/51-06/84	297	0.5	25.0	12.9	8.1	2.77	2.04	89.6
03559000	Toccoa River near Blue Ridge, Ga.	34°53'14"	84°17'07"	233	1,539	01/51-07/74	125	3.5	23.0	12.4	5.6	2.12	2.37	64.0
03560000	Fightingtown Creek at McCaysville, Ga.	34°58'53"	84°23'12"	71	1,450	01/51-06/74	218	0.5	26.0	13.5	7.9	2.82	2.21	85.5
03566800	South Chickamauga Creek at Graysville, Ga.	34°58'39"	85°08'42"	198	680	08/74-11/84	80	1.0	26.0	14.8	9.0	2.79	2.03	90.0
03567340	West Chickamauga Creek near Lakeview, Ga.	34°57'26"	85°12'20"	148	679	08/74-12/84	119	1.0	26.0	15.3	8.5	2.77	1.76	92.6

Table 2. Stream-temperature daily record stations, periods of analyses, selected station information, and harmonic properties

[mi^2, square miles; ° C, degrees Celsius; ft, feet; —, no data]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record analyzed	Statistic	Days	Harmonic properties computed from observed data				
									Mean (° C)	Amplitude (° C)	Phase coefficient (radians)	Standard error (° C)	Variance (percent)
02178400	Tallulah River near Clayton, Ga.	34°53'25"	83°31'50"	56.5	1,869	1964-79	maximum	5,167	13.9	8.2	2.80	.62	98.1
						1964-79	minimum	5,164	11.0	7.3	2.72	.67	97.9
02197000	Savannah River at Augusta, Ga.	33°22'25"	81°56'35"	7,508	97	1973-80	maximum	2,335	17.1	7.3	2.43	.64	97.0
						1973-80	minimum	2,332	16.0	7.0	2.37	.75	96.4
						1973-80	mean	2,324	16.6	7.1	2.40	.70	96.7
02197500	Savannah River at Burtons Ferry near Millhaven, Ga.	32°56'20"	81°30'10"	8,650	54	1960-74	maximum	4,073	17.8	7.9	2.6	.58	98.2
						1960-74	minimum	4,083	17.4	7.9	2.6	.63	98.0
02202500	Ogeechee River near Eden, Ga.	32°11'29"	81°24'58"	2,650	20	1972-81	maximum	3,154	18.2	8.9	2.75	.68	97.3
						1972-81	minimum	3,154	17.4	8.7	2.75	.69	97.4
						1975-81	mean	2,06	18.5	10.1	2.80	1.03	96.7
02203578	North Newport River at Halfmoon Landing, Ga.	31°41'43"	81°16'18"	157	0.1	1970-76	maximum	1,965	22.2	8.7	2.74	.56	96.9
						1970-76	minimum	1,965	21.0	8.8	2.72	.61	97.2
						1970-76	mean	1,964	21.6	8.7	2.73	.59	97.1
02208450	Alcovy River above Covington, Ga.	33°38'24"	83°46'45"	185	646	1972-78	maximum	2,110	16.5	8.4	2.89	1.11	94.7
						1972-78	minimum	2,099	14.3	8.6	2.83	1.09	95.8
						1972-79	mean	2,099	15.4	8.6	2.86	1.08	95.5
02212600	Falling Creek near Juliette, Ga.	33°05'59"	83°43'25"	72.2	368	1965-79	maximum	4,599	17.0	8.6	2.85	.82	96.7
						1965-79	minimum	4,598	15.0	8.5	2.83	.73	97.4
02213700	Ocmulgee River near Warner Robins, Ga.	32°40'17"	83°36'11"	2,690	250	1970-85	maximum	4,969	19.7	10.5	2.71	.45	98.6
						1970-85	minimum	4,963	18.5	10.4	2.71	.53	98.6
						1970-85	mean	4,961	19.1	10.5	2.71	.48	98.6
02225000	Altamaha River near Baxley, Ga.	31°56'20"	82°21'13"	11,600	62	1970-76	maximum	1,802	20.9	9.0	2.72	.74	96.9
						1970-76	minimum	1,801	19.6	8.9	2.73	.78	96.9
						1970-76	mean	1,799	20.2	9.0	2.72	.75	96.9
02226160	Altamaha River at Everett City, Ga.	31°25'37"	81°36'20"	14,000	0.1	1969-85	maximum	4,993	20.7	9.5	2.73	.54	97.9
						1969-85	minimum	4,980	19.6	9.4	2.73	.61	98.0
						1969-85	mean	4,975	20.1	9.4	2.73	.56	98.0

Table 2. Stream-temperature daily record stations, periods of analyses, selected station information, and harmonic properties—Continued

[mi^2, square miles; ° C, degrees Celsius; ft, feet; —, no data]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record analyzed	Statistic	Days	Harmonic properties computed from observed data: Mean (° C)	Amplitude (° C)	Phase coefficient (radians)	Standard error (° C)	Variance (percent)
02228000	Satilla River at Atkinson, Ga.	31°13'16"	81°52'03"	2,790	15	1974-81	maximum	2,426	20.7	9.4	2.83	.61	97.5
						1974-81	minimum	2,426	19.6	9.2	2.82	.71	97.3
						1974-81	mean	2,425	20.1	9.3	2.83	.67	97.4
02231000	St Marys River near MacClenny, Fla.	30°21'13"	80°04'54"	700	40	1965-77	random	3,016	20.1	6.5	2.65	.85	94.2
02337170	Chattahoochee River near Fairburn, Ga.	33°39'24"	84°40'25"	2,060	719	1975-85	maximum	3,249	17.4	7.5	2.67	.64	97.1
						1975-85	minimum	3,248	15.3	6.7	2.68	.74	96.2
						1975-85	mean	3,248	16.3	7.1	2.68	.67	96.8
02338000	Chattahoochee River near Whitesburg, Ga.	33°28'37"	84°54'04"	2,430	682	1975-84	maximum	2,073	17.0	8.0	2.71	.73	97.2
						1975-84	minimum	2,071	15.6	7.5	2.70	.80	96.6
						1975-84	mean	2,071	16.2	7.7	2.70	.75	97.0
02338660	New River near Corinth, Ga.	33°14'07"	84°59'16"	127	635	1978-84	maximum	1,895	17.5	9.8	2.82	1.16	96.2
						1978-84	minimum	1,892	14.9	9.1	2.85	0.97	96.8
						1978-84	mean	1,894	16.1	9.3	2.84	1.01	96.7
02382720	Coosawattee River near Nickelsville, Ga.	34°36'03"	84°46'42"	556	630	1974-81	maximum	2,428	15.5	8.0	2.55	.77	97.2
						1974-81	minimum	2,428	13.7	7.6	2.50	.96	96.1
						1974-81	mean	2,428	14.6	7.8	2.52	.86	96.7
02383500	Coosawattee River near Pine Chapel, Ga	34°34'35"	84°51'37"	831	616	1974-81	maximum	2,351	15.4	7.9	2.58	.91	96.3
						1974-81	minimum	2,351	14.3	7.8	2.56	.98	96.1
						1974-81	mean	2,351	14.8	7.9	2.56	.94	96.2
02387000	Conasauga River at Tilton, Ga.	34°40'00"	84°55'42"	687	622	1975-85	maximum	2,843	17.3	10.5	2.77	.86	97.7
						1975-85	minimum	2,835	15.7	10.3	2.77	.88	97.7
						1975-85	mean	2,834	16.5	10.4	2.77	.84	97.8
02387500	Oostanaula River at Resaca, Ga.	34°34'42"	84°56'29"	1,602	604	1967-84	maximum	5,439	16.1	8.8	2.70	.61	98.0
						1967-84	minimum	5,439	15.2	8.7	2.70	.68	97.9
						1976-84	mean	2,371	15.7	9.5	2.66	.83	97.8
02392000	Etowah River at Canton, Ga.	34°14'23"	84°29'47"	613	845	1971-76	maximum	1,751	15.7	7.5	2.76	1.07	94.6
						1971-76	minimum	1,751	14.6	7.5	2.77	1.12	94.6
						1971-76	mean	1,751	15.1	7.5	2.76	1.08	94.6

Table 2. Stream-temperature daily record stations, periods of analyses, selected station information, and harmonic properties—Continued

[mi^2, square miles; ° C, degrees Celsius; ft, feet; —, no data]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record analyzed	Statistic	Days	Harmonic properties computed from observed data				
									Mean (° C)	Amplitude (° C)	Phase coefficient (radians)	Standard error (° C)	Variance (percent)
02392500	Little River near Roswell, Ga.	34°07'09"	84°23'18"	60	898	1971-76	maximum	1,910	17.9	9.1	2.81	.89	96.6
						1971-76	minimum	1,925	13.8	7.9	2.76	.92	96.5
02397530	Coosa River at State Line, Ala.-Ga.	34°11'54"	85°26'46"	4,362	550	1975-85	maximum	2,906	19.5	10.7	2.60	.80	98.3
						1975-85	minimum	2,905	17.7	10.6	2.61	.75	98.5
						1975-85	mean	2,906	18.5	10.6	2.61	.75	98.5

Table 3. Periodic stream-temperature stations used for regression analyses, periods of analysis, selected station information, and harmonic properties
[mi^2, square miles; ft, feet; ° C, degrees Celsius]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record	Number of observations	Harmonic properties computed from observed data: Mean (° C)	Amplitude (° C)	Phase (radians)	Standard error (° C)	Variance (percent)
	SAVANNAH RIVER BASIN											
02177000	Chattooga River near Clayton, Ga.	34°48'50"	83°18'22"	207	1,166	09/57–12/84	260	13.6	9.2	2.80	2.22	88.1
02178400	Tallulah River near Clayton, Ga.	34°53'25"	83°31'50"	57	1,869	07/64–08/84	174	12.0	7.2	2.77	2.0	84.5
02191200	Hudson River at Homer, Ga.	34°30'15"	83°29'17"	61	695	08/62–07/75	100	14.3	8.2	2.80	2.0	85.9
02192000	Broad River near Bell, Ga.	33°58'27"	82°46'12"	1,430	357	10/56–10/79	147	16.4	9.6	2.82	2.43	90.2
02193500	Little River near Washington, Ga.	33°36'46"	82°44'33"	291	354	10/54–06/74	83	15.3	9.5	2.79	2.43	82.2
02197520	Brier Creek near Thomson, Ga.	33°22'06"	82°28'06"	55	330	11/58–07/76	68	15.3	7.6	2.76	2.35	75.1
02197830	Brier Creek near Waynesboro, Ga.	33°07'05"	81°57'50"	473	174	10/54–09/83	80	17.0	8.2	2.78	2.54	81.2
02198000	Brier Creek at Millhaven, Ga.	32°56'00"	81°39'05"	646	96	07/54–06/79	156	16.5	8.6	2.83	2.82	79.5
02202190	Ogeechee River at Oliver, Ga.	32°29'40"	81°33'21"	2,370	60	08/74–12/84	121	17.6	10.0	2.84	2.29	89.0
02202500	Ogeechee River near Eden, Ga.	32°11'29"	81°24'58"	2,650	20	05/37–10/84	293	18.3	9.3	2.81	2.23	86.0
02203000	Canoochee River near Claxton, Ga.	32°11'05"	81°53'20"	555	80	09/54–12/84	255	17.7	8.9	2.85	2.23	86.7
	ALTAMAHA RIVER BASIN											
02204520	South River at State Route 81 at Snapping Shoals, Ga.	33°29'04"	83°57'29"	465	540	08/70–12/84	123	15.6	9.2	2.80	2.24	84.5
02206500	Yellow River near Snellville, Ga.	33°51'11"	84°04'45"	134	806	08/56–11/84	183	14.6	9.1	2.82	2.18	87.7
02207300	Yellow River (Conyers Intake) at Conyers, Ga.	33°41'23"	83°58'43"	236	660	07/74–12/84	119	15.1	9.3	2.86	2.24	86.6
02209260	Alcovy River Newton Factory Bridge Road near Stewart, Ga.	33°26'58"	83°49'42"	291	560	05/72–12/84	122	15.4	9.3	2.83	2.25	85.9
02212600	Falling Creek near Juliette, Ga.	33°05'59"	83°43'25"	72	368	07/64–01/85	278	15.4	8.4	2.86	2.22	86.5
02214500	Big Indian Creek at Perry, Ga.	32°27'20"	83°44'21"	108	279	04/54–01/74	134	17.0	7.7	2.87	1.93	87.5
02215500	Ocmulgee River at Lumber City, Ga.	31°55'06"	82°40'26"	5,180	87	06/54–12/84	250	19.0	9.9	2.76	2.01	88.5
02217500	Middle Oconee River near Athens, Ga.	33°56'48"	83°25'22"	398	556	08/56–10/77	158	15.5	9.4	2.80	2.38	87.7
02217740	North Oconee River (Athens Intake) at Athens, Ga.	33°58'28"	83°22'56"	270	580	07/74–12/84	116	14.8	9.6	2.90	2.19	90.5
02218000	Oconee River at Barnett Shoals near Watkinsville, Ga.	33°51'21"	83°19'36"	783	530	07/74–12/84	120	15.4	10.0	2.85	2.26	88.8

Table 3. Periodic stream-temperature stations used for regression analyses, periods of analysis, selected station information, and harmonic properties—Continued

[mi^2, square miles; ft, feet; ° C, degrees Celsius]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record	Number of observations	Harmonic properties computed from observed data: Mean (° C)	Amplitude (° C)	Phase (radians)	Standard error (° C)	Variance (percent)
	ALTAMAHA RIVER BASIN—Continued											
02219500	Apalachee River near Buckhead, Ga.	33°36'31"	83°20'58"	436	424	07/56–07/76	149	16.0	9.2	2.78	2.20	85.6
02223500	Oconee River at Dublin, Ga.	32°32'40"	82°53'41"	4,400	149	11/54–11/76	126	18.0	9.3	2.69	2.16	92.1
02225000	Altamaha River near Baxley, Ga.	31°56'20"	82°21'13"	11,600	62	12/57–12/84	146	19.3	10.1	2.78	2.18	87.5
02225470	Pendelton Creek at State Route 86 below Ohoopee, Ga.	32°09'36"	82°12'43"	300	90	07/79–12/84	64	18.0	8.8	2.92	2.15	89.1
02225500	Ohoopee River near Reidsville, Ga.	32°04'42"	82°10'39"	1,110	74	07/54–10/82	212	18.5	9.1	2.78	2.53	84.0
02226000	Altamaha River at Doctortown, Ga.	31°39'16"	81°49'41"	13,600	25	05/37–10/79	215	19.4	10.0	2.75	2.09	92.7
02226100	Penholoway Creek near Jesup, Ga.	31°34'00"	81°50'18"	210	19	12/58–07/84	182	18.4	8.0	2.82	2.10	85.9
02226160	Altamaha River at Everett City, Ga.	31°25'37"	81°36'20"	14,000	0.1	12/70–12/84	166	19.7	9.3	2.71	1.86	91.2
	SATILLA–ST. MARY'S RIVER BASINS											
02227000	Hurricane Creek near Alma, Ga.	31°34'00"	82°27'50"	139	136	01/55–06/82	103	17.9	8.4	2.95	2.33	81.9
02227500	Little Satilla River near Offerman, Ga.	31°27'04"	82°03'17"	646	58	01/55–09/83	163	18.9	8.4	2.82	2.23	88.2
02228000	Satilla River at Atkinson, Ga.	31°13'16"	81°52'03"	2,790	15	05/54–10/84	258	20.0	9.1	2.77	2.36	90.3
	SUWANNEE–OCHLOCKONEE RIVER BASINS											
02314500	Suwannee River at Fargo, Ga.	82°40'50"	82°33'38"	1,260	92	08/57–11/84	258	19.9	8.5	2.83	2.27	88.2
02316000	Alapaha River near Alapaha, Ga.	31°23'03"	83°11'33"	663	208	03/53–07/84	171	18.6	8.1	2.78	2.22	87.7
02317500	Alapaha River at Statenville, Ga.	30°42'14"	83°02'00"	1,400	77	01/54–08/74	164	19.6	8.5	2.78	2.33	84.2
02317757	Withlacoochee River at State Route 94 near Valdosta, Ga.	30°51'00"	83°20'23"	552	170	11/74–12/84	115	18.5	8.3	2.75	2.24	84.7
02318500	Withlacoochee River near Quitman, Ga.	30°47'22"	83°27'06"	1,480	84	08/57–12/84	93	18.9	9.0	2.77	2.01	89.2
02327500	Ochlockonee River near Thomasville, Ga.	30°52'32"	84°02'44"	550	134	04/54–12/84	231	18.4	8.6	2.77	2.31	89.4
02328000	Tired Creek near Cairo, Ga.	30°51'54"	84°15'46"	60	159	05/54–07/74	110	17.7	7.4	2.81	2.00	81.4
	CHATTAHOOCHEE RIVER BASIN											
02331000	Chattahoochee River near Leaf, Ga.	34°34'37"	83°38'09"	150	1,220	09/57–08/76	123	13.9	8.4	2.77	1.93	99.7

Table 3. Periodic stream-temperature stations used for regression analyses, periods of analysis, selected station information, and harmonic properties—Continued

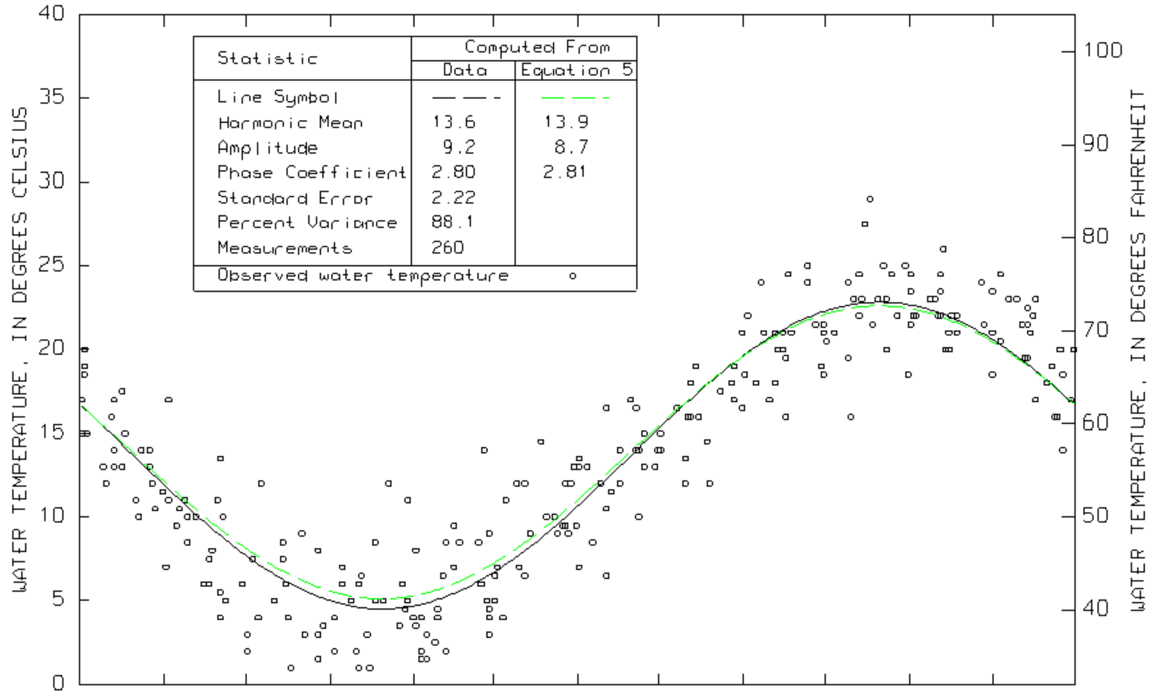
[mi^2, square miles; ft, feet; ° C, degrees Celsius]

Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record	Number of observations	Harmonic properties computed from observed data				
								Mean (° C)	Amplitude (° C)	Phase (radians)	Standard error (° C)	Variance (percent)
	CHATTAHOOCHEE RIVER BASIN—Continued											
02331600	Chattahoochee River near Cornelia, Ga.	34°32'27"	83°37'14"	315	1,129	02/68–11/84	139	14.7	8.7	2.82	2.18	86.3
02333500	Chestatee River at State Route 52 near Dahlonega, Ga.	34°31'41"	83°56'23"	153	1,129	10/56–09/76	167	14.1	7.9	2.76	2.33	84.5
02335700	Big Creek near Alpharetta, Ga.	34°03'02"	84°16'10"	72	961	05/60–09/76	150	14.3	7.8	2.78	2.23	82.3
02337000	Sweetwater Creek near Austell, Ga.	33°46'22"	84°36'53"	246	857	05/57–12/84	339	15.3	9.4	2.85	2.17	92.1
02337438	Dog River at State Route 166 near Fairplay, Ga.	33°37'20"	84°47'35"	70	940	07/74–05/79	55	15.1	8.9	2.84	2.80	79.4
02339000	Yellowjacket Creek near LaGrange, Ga.	33°05'27"	85°03'40"	182	601	08/56–09/70	104	15.6	9.3	2.85	2.31	88.6
02339720	Long Cane Creek near West Point, Ga.	32°54'37"	85°08'43"	75	580	07/74–12/84	117	16.1	9.0	2.89	2.31	86.4
02340500	Mountain Oak Creek near Hamilton, Ga.	32°44'28"	85°04'08"	62	550	08/56–06/74	103	15.4	9.1	2.83	1.96	92.3
	FLINT RIVER BASIN											
02343200	Pataula Creek near Lumpkin, Ga.	31°56'03"	84°48'12"	70	286	08/62–11/73	69	17.0	6.8	2.88	2.04	85.1
02344500	Flint River near Griffin, Ga.	33°14'39"	84°25'45"	272	711	08/56–07/76	157	16.0	10.0	2.85	2.06	91.8
02344700	Line Creek near Senoia, Ga.	33°19'10"	84°31'25"	101	729	09/64–07/76	98	15.3	9.8	2.79	2.25	87.2
02346500	Potato Creek near Thomaston, Ga.	32°54'15"	84°21'45"	186	605	07/56–06/74	103	16.7	9.8	2.80	2.20	89.4
02347500	Flint River near Culloden, Ga.	32°43'17"	84°13'57"	1,850	335	04/54–06/79	189	17.6	10.2	2.82	2.48	87.8
02349000	Whitewater Creek below Rambulette Creek near Butler, Ga.	32°28'00"	84°15'58"	93	366	04/54–11/73	103	17.1	6.2	2.90	1.65	87.2
02349500	Flint River at Montezuma, Ga.	32°17'53"	84°02'38"	2,900	256	05/54–12/84	245	18.0	9.0	2.87	2.16	87.5
02349900	Turkey Creek at Byromville, Ga.	32°11'44"	83°54'03"	45	386	07/54–06/82	124	17.2	7.3	2.91	2.17	83.8
02350600	Kinchafoonee Creek at Preston, Ga.	32°03'09"	84°32'53"	197	338	05/54–07/84	169	16.9	8.0	2.91	2.52	81.2
02353400	Pachitla Creek near Edison, Ga.	31°33'17"	84°40'43"	188	213	10/54–11/73	68	17.3	7.2	2.90	1.96	83.0
02353500	Ichawaynochaway Creek at Milford, Ga.	31°22'58"	84°32'52"	620	150	04/54–07/84	152	18.4	7.6	2.82	2.22	86.9
02357000	Spring Creek near Iron City, Ga.	31°02'23"	84°44'18"	485	86	08/57–07/78	128	18.2	8.1	2.81	2.07	93.7
	COOSA RIVER BASIN											
02379500	Cartecay River near Ellijay, Ga.	34°40'53"	84°27'20"	134	1,255	06/57–08/75	154	13.9	7.5	2.79	1.90	92.5

Table 3. Periodic stream-temperature stations used for regression analyses, periods of analysis, selected station information, and harmonic properties—Continued
[mi^2, square miles; ft, feet; ° C, degrees Celsius]

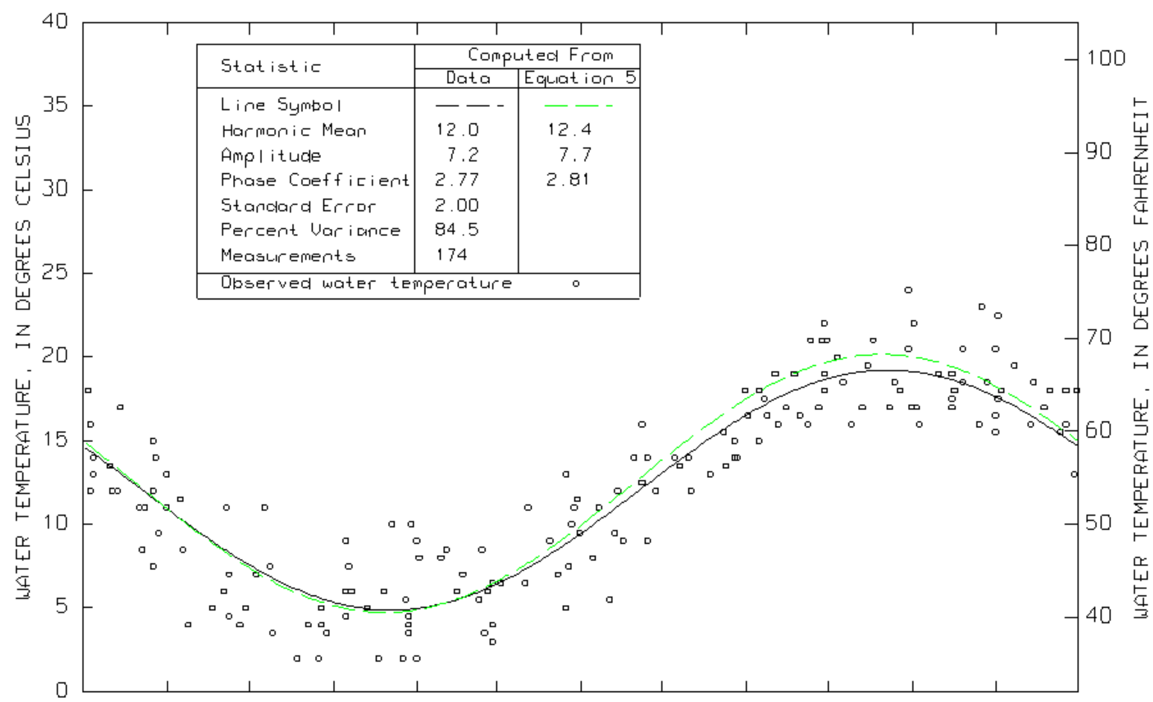
Station number	Station name	Latitude	Longitude	Drainage area (mi^2)	Altitude (ft)	Period of record	Number of observations	Harmonic properties computed from observed data: Mean (° C)	Amplitude (° C)	Phase (radians)	Standard error (° C)	Variance (percent)
	COOSA RIVER BASIN—Continued											
02380000	Ellijay River at Ellijay, Ga.	34°41'06"	84°28'40"	88	1,242	06/57–07/74	121	13.6	8.0	2.82	2.04	89.1
02380500	Coosawattee River near Ellijay, Ga.	34°40'18"	84°30'31"	236	1,216	05/63–08/83	175	13.7	8.0	2.77	1.88	88.4
02382500	Coosawattee River at Carters, Ga.	34°36'13"	84°41'44"	521	651	07/65–12/72	32	15.1	9.6	2.76	1.48	93.7
02383500	Coosawattee River near Pine Chapel, Ga.	34°34'35"	84°51'37"	831	616	06/57–12/72	92	15.2	9.4	2.78	2.30	85.9
02384748	Conasauga River (Dalton Intake) near Dalton, Ga.	34°47'20"	84°52'30"	308	650	07/74–12/84	119	15.1	9.9	2.78	1.96	92.5
02385800	Holly Creek near Chatsworth, Ga.	34°43'00"	84°46'12"	64	689	07/60–06/83	202	14.7	9.0	2.75	2.27	84.4
02387500	Oostanaula River at Resaca, Ga.	34°34'42"	84°56'29"	1,602	604	09/57–12/72	111	15.0	9.8	2.77	2.12	89.1
02389000	Etowah River near Dawsonville, Ga.	34°22'57"	84°03'21"	103	1,050	09/56–08/84	163	13.6	8.2	2.74	1.90	90.2
02392000	Etowah River at Canton, Ga.	34°14'23"	84°29'47"	613	845	06/57–10/84	212	14.2	8.9	2.81	1.97	92.1
02398000	Chattooga River at Summerville, Ga.	34°28'03"	85°20'19"	192	613	07/57–12/84	290	15.6	7.2	2.74	1.83	85.2
02411930	Tallapoosa River below Tallapoosa, Ga.	33°44'27"	85°20'11"	272	920	07/74–11/84	80	15.4	9.4	2.83	2.33	88.3
02413210	Little Tallapoosa River below Bowdon, Ga.	33°29'34"	85°16'45"	245	919	07/74–12/84	117	15.6	9.1	2.85	2.09	89.9
	TENNESSEE RIVER BASIN											
03545000	Hiwassee River at Presley, Ga.	34°54'17"	83°43'01"	46	1,933	08/51–06/82	270	12.7	6.5	2.81	2.13	79.0
03558000	Toccoa River near Dial, Ga.	34°47'24"	84°14'24"	177	1,782	01/51–06/84	297	12.9	8.1	2.77	2.04	89.6
03560000	Fightingtown Creek at McCaysville, Ga.	34°58'53"	84°23'12"	71	1,450	01/51–06/74	218	13.5	7.9	2.82	2.21	85.5
03566800	South Chickamauga Creek at Graysville, Ga.	34°58'39"	85°08'42"	198	680	08/74–11/84	80	14.8	9.0	2.79	2.03	90.0
03567340	West Chickamauga Creek near Lakeview, Ga.	34°57'26"	85°12'20"	148	679	08/74–12/84	119	15.3	8.5	2.77	1.76	92.6

GRAPHS SHOWING HARMONIC STREAM TEMPERATURE CURVES OF OBSERVED DATA AND STATEWIDE HARMONIC EQUATION FOR SELECTED STATIONS, FIGURES 14–211



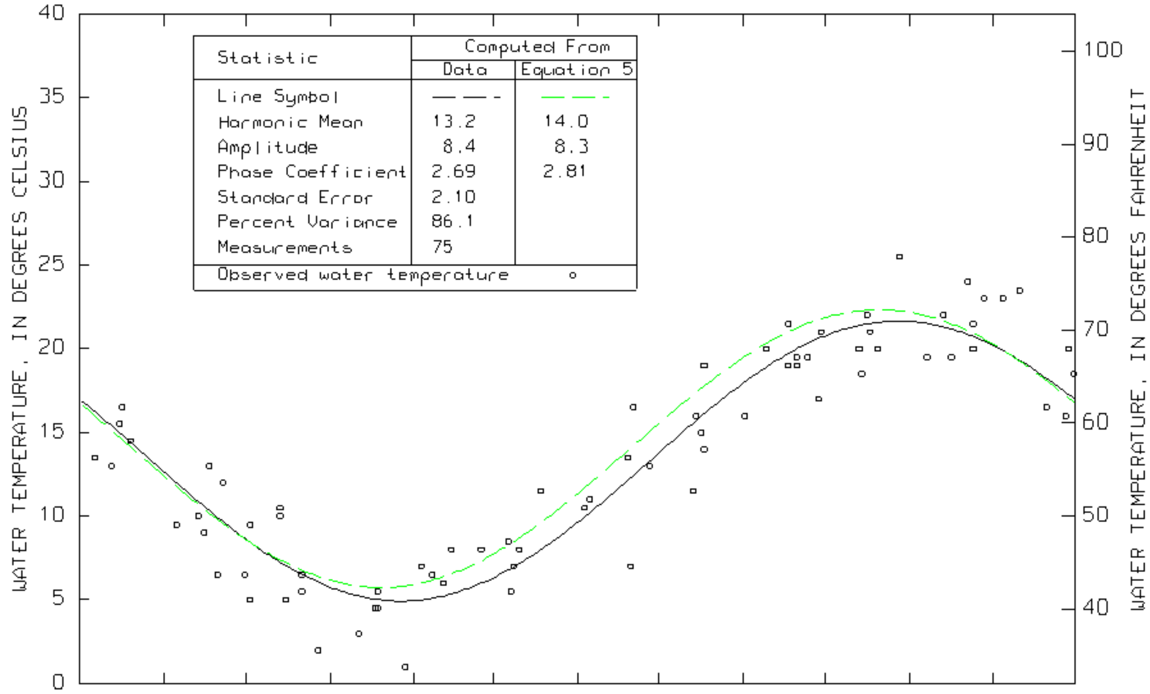
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	17.0	12.0	12.0	14.0	14.5	17.0	21.0	25.0	29.0	26.0	24.5
Minimum	10.0	4.0	1.0	1.0	1.5	4.0	6.5	12.0	16.0	16.0	18.5	14.0

Figure 14. Chattooga River near Clayton, Georgia, Station 02177000, September 1957 to December 1984.



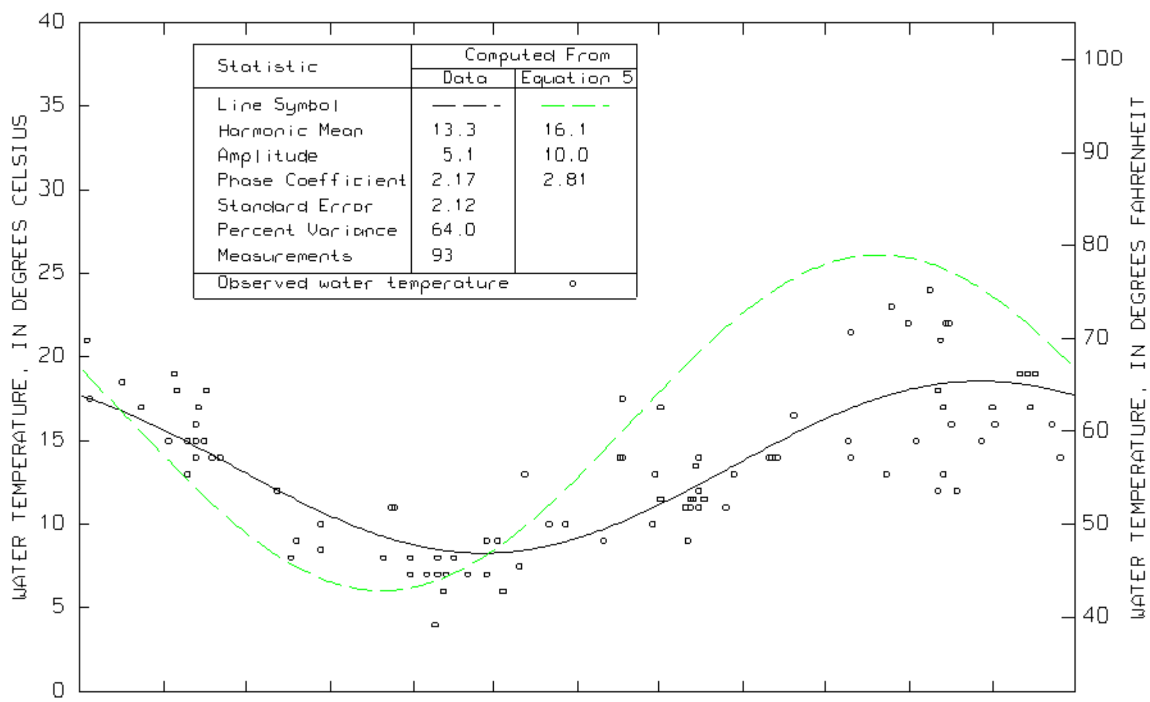
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	18.0	11.5	11.0	10.0	8.5	13.0	16.0	18.0	22.0	24.0	23.0	22.5
Minimum	7.5	4.0	2.0	2.0	3.0	5.0	5.5	12.0	15.0	16.0	15.5	13.0

Figure 15. Tallulah River near Clayton, Georgia, Station 02178400, July 1964 to August 1984.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	16.5	13.0	10.5	5.5	8.0	11.5	16.5	19.0	21.5	25.5	24.0	23.5
Minimum	13.0	6.5	2.0	1.0	6.0	5.5	7.0	11.5	16.0	18.5	19.5	16.0

Figure 16. Panther Creek near Toccoa, Georgia,
Station 02182000, September 1959 to June 1974.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	19.0	12.0	11.0	9.0	13.0	17.5	17.0	16.5	23.0	24.0	19.0
Minimum	17.0	13.0	8.0	7.0	4.0	6.0	9.0	9.0	14.0	13.0	12.0	14.0

Figure 17. Savannah River near Iva, South Carolina
Station 02187500, May 1958 to November 1984.

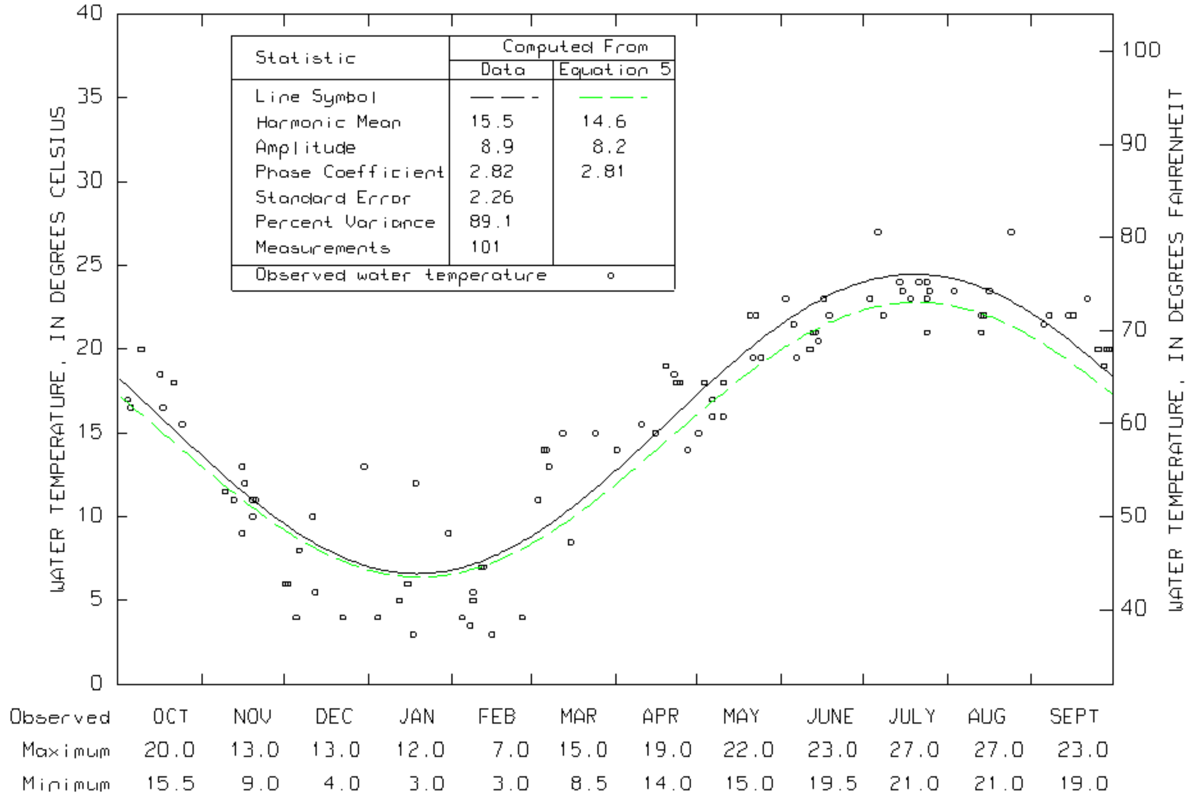


Figure 18. Beaverdam Creek at Dewy Rose, Georgia,
Station 02188500, February 1958 to July 1975.

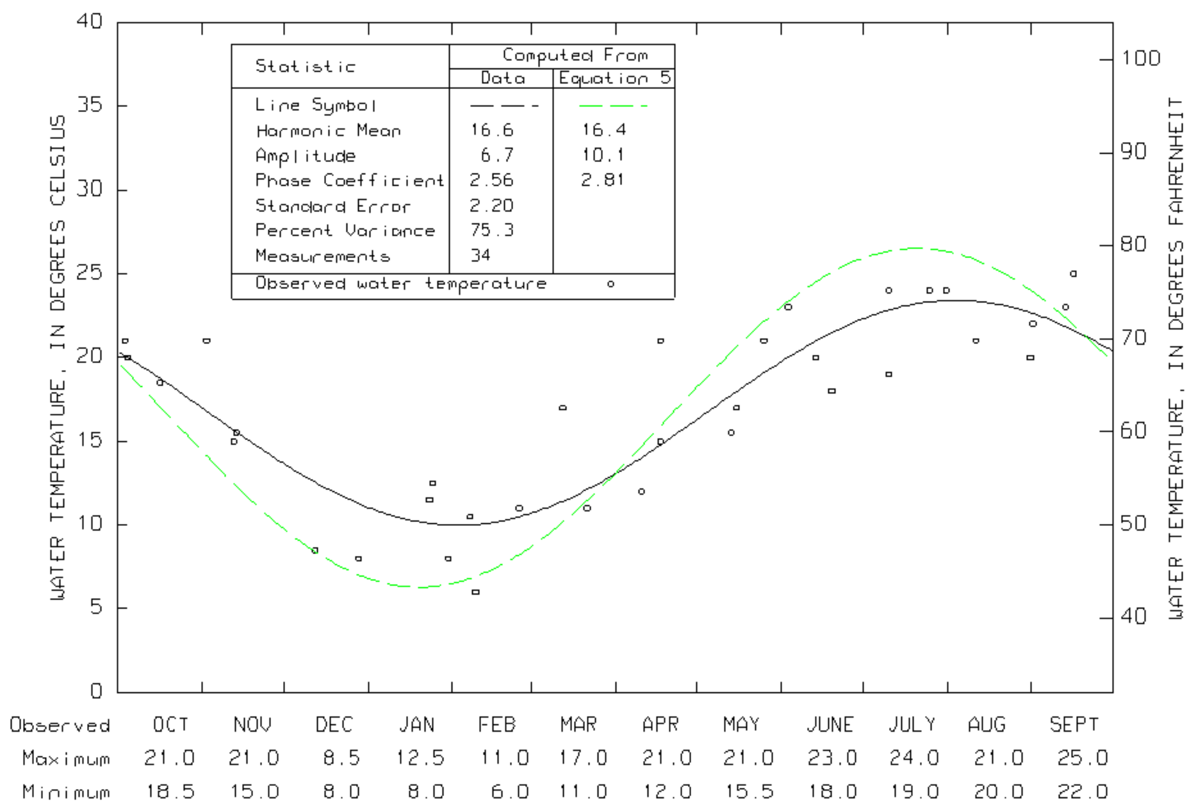
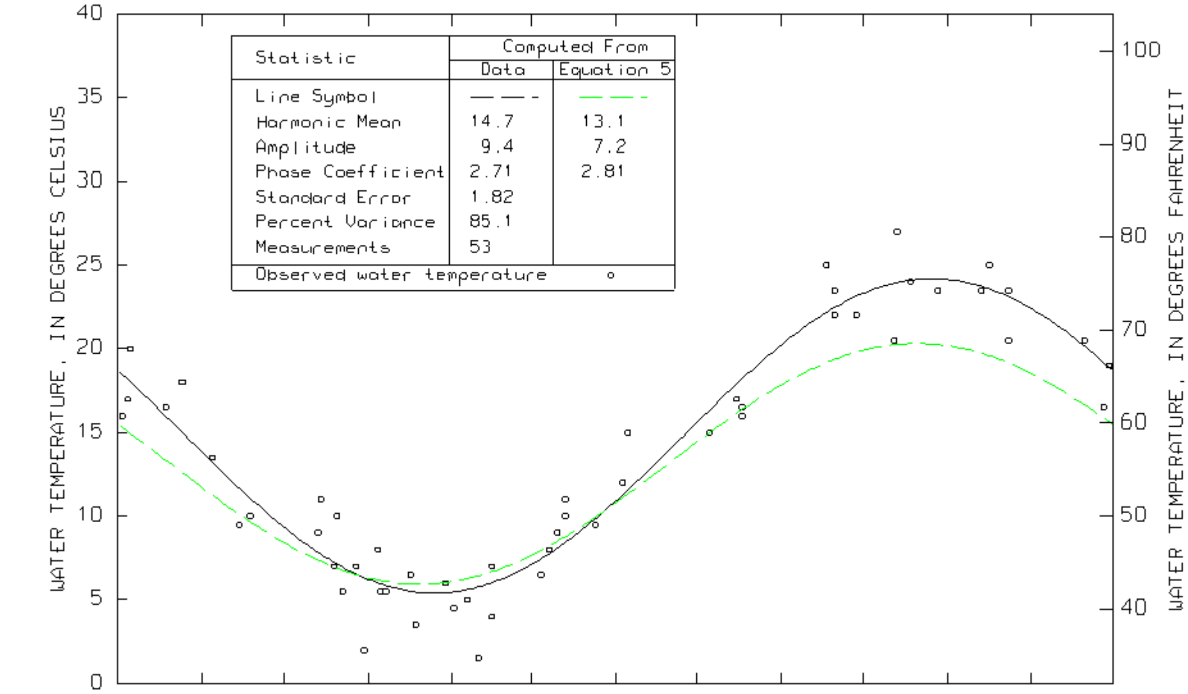
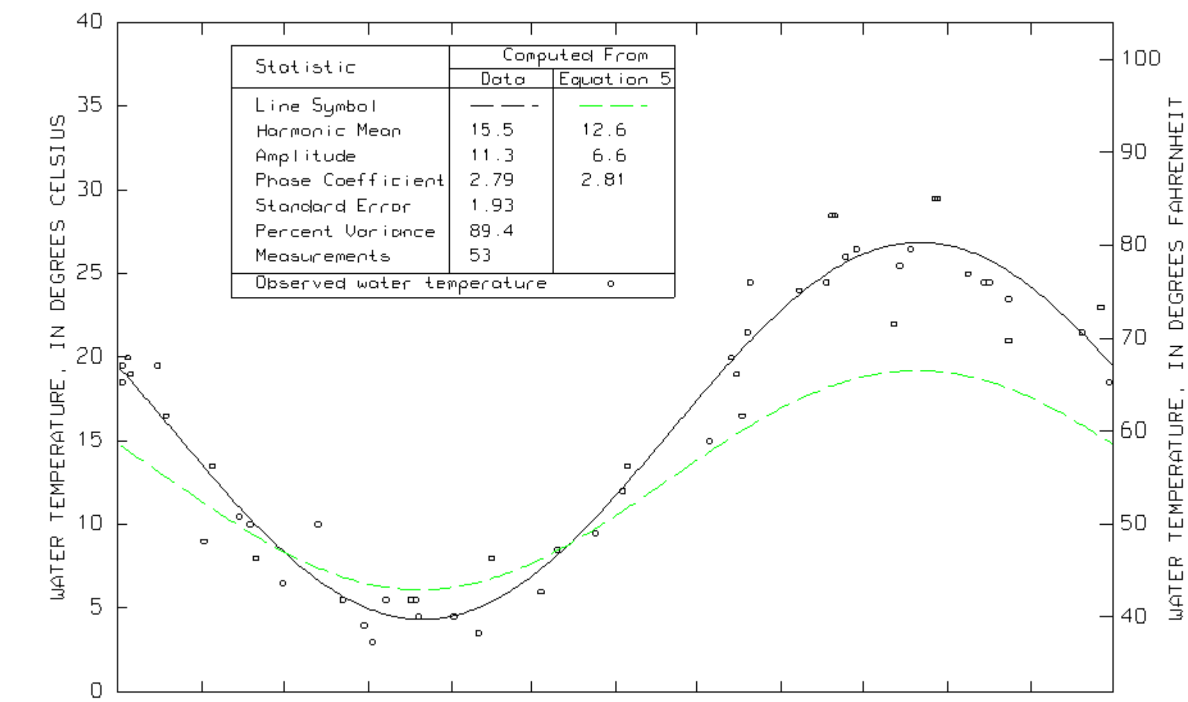


Figure 19. Savannah River near Calhoun Falls, South Carolina
Station 02189000, September 1957 to July 1974.



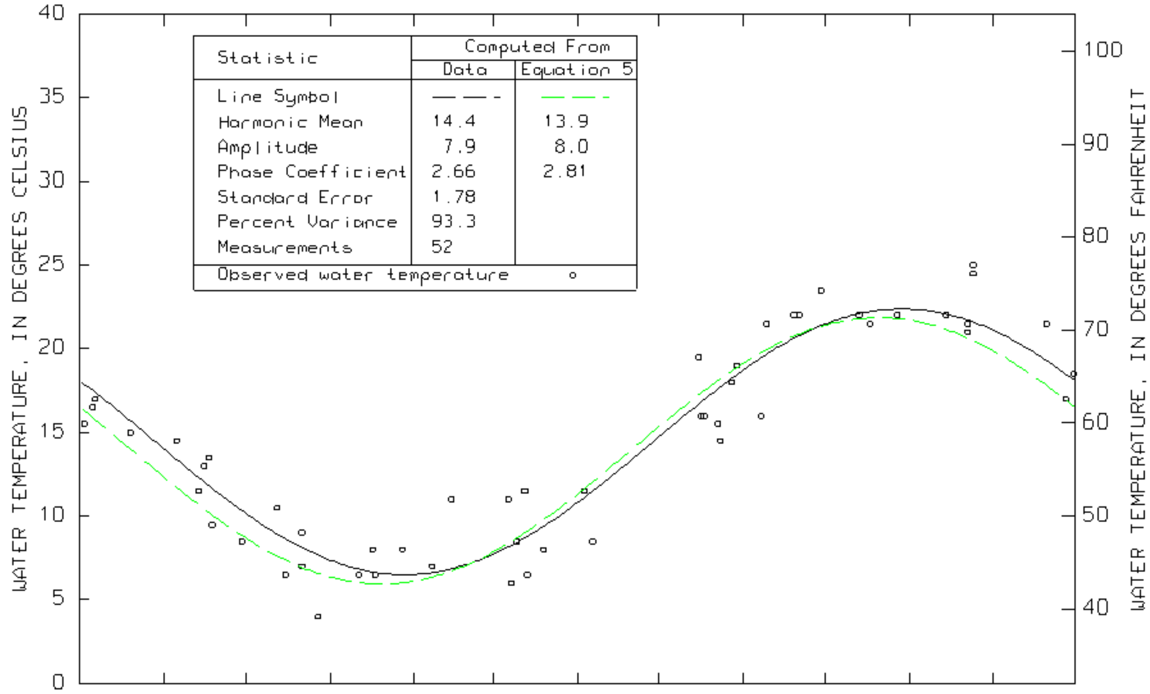
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	13.5	11.0	8.0	7.0	11.0	15.0	17.0	25.0	27.0	25.0	20.5
Minimum	16.0	9.5	2.0	3.5	1.5	6.5	12.0	15.0	22.0	20.5	20.5	16.5

Figure 20. North Fork Broad River above Toccoa, Georgia,
Station 02189050, October 1958 to August 1968.



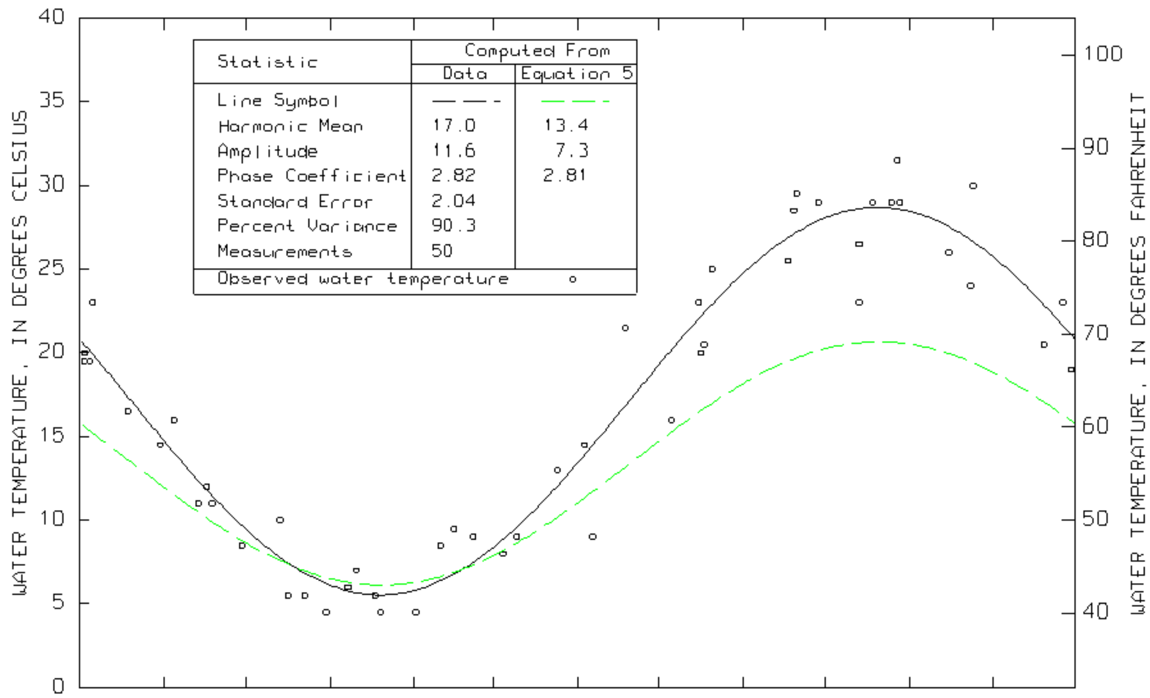
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	13.5	10.0	5.5	8.0	9.5	13.5	24.5	28.5	29.5	25.0	23.0
Minimum	16.5	6.5	4.0	3.0	3.5	6.0	12.0	15.0	24.0	22.0	21.0	18.5

Figure 21. Denmans Creek near Toccoa, Georgia,
Station 02189100, October 1958 to October 1969.



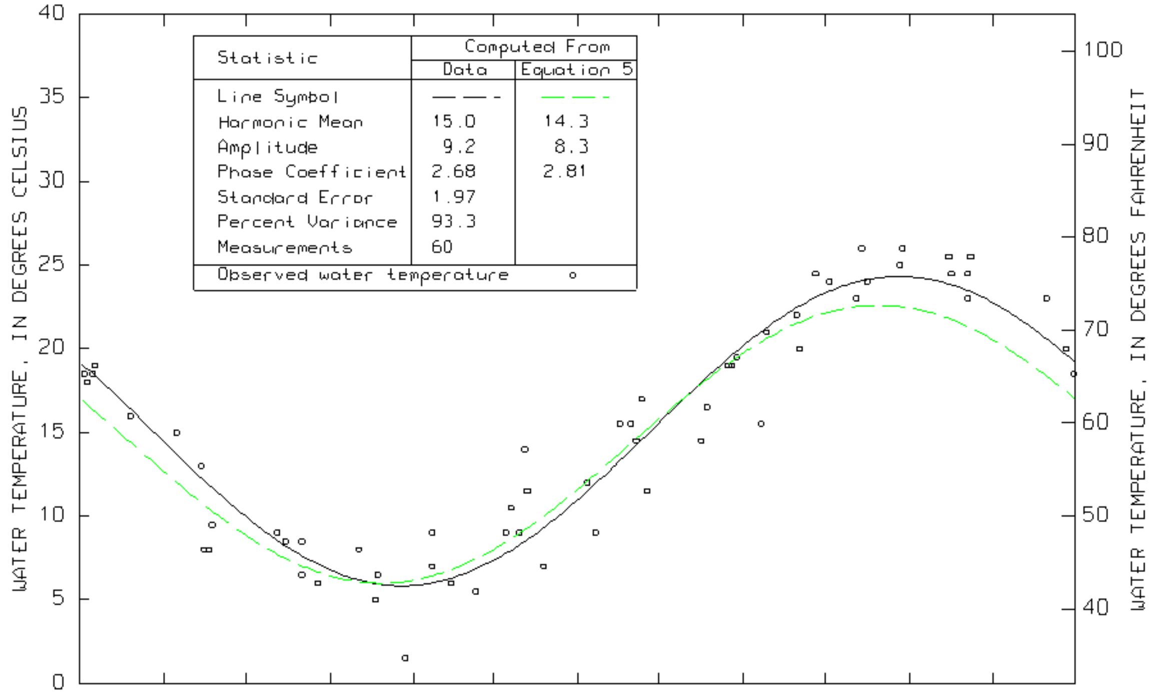
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	17.0	14.5	10.5	8.0	11.0	11.5	11.5	19.5	23.5	22.0	25.0	21.5
Minimum	15.0	8.5	4.0	6.5	7.0	6.0	8.5	14.5	16.0	21.5	21.0	17.0

Figure 22. North Fork Broad River near Toccoa, Georgia,
Station 02189500, October 1958 to August 1968.



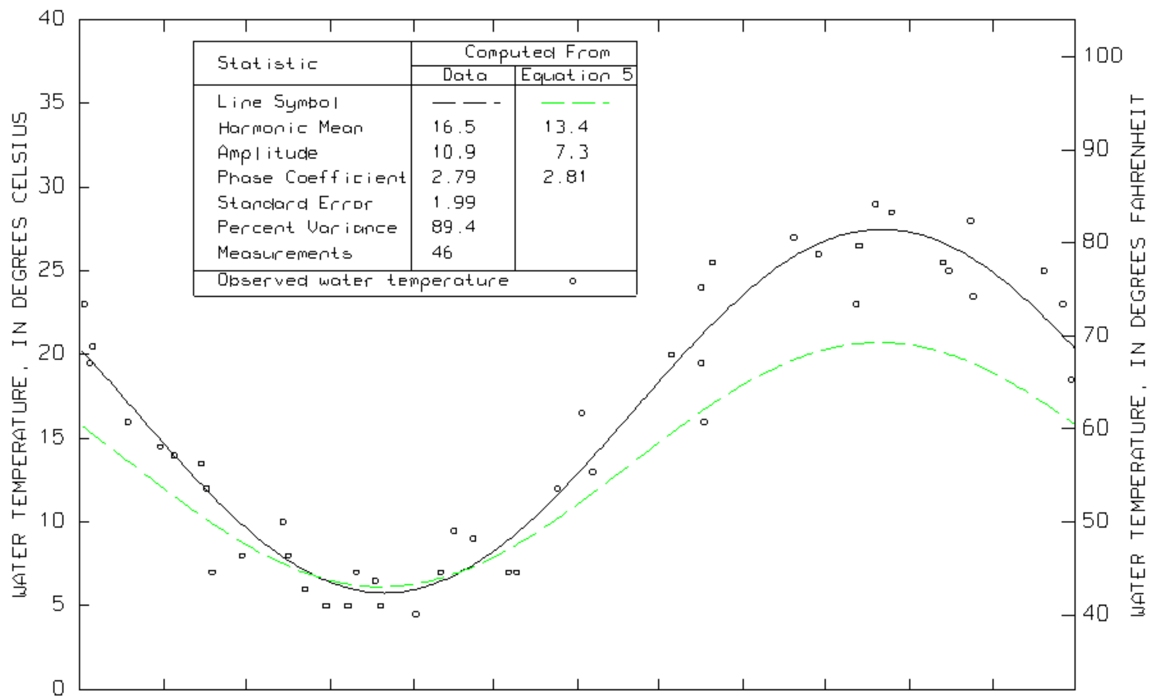
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	16.0	10.0	7.0	9.5	13.0	21.5	25.0	29.5	31.5	30.0	23.0
Minimum	14.5	8.5	4.5	4.5	4.5	8.0	9.0	16.0	25.5	23.0	24.0	19.0

Figure 23. Bear Creek near Mize, Georgia,
Station 02189600, October 1958 to July 1968.



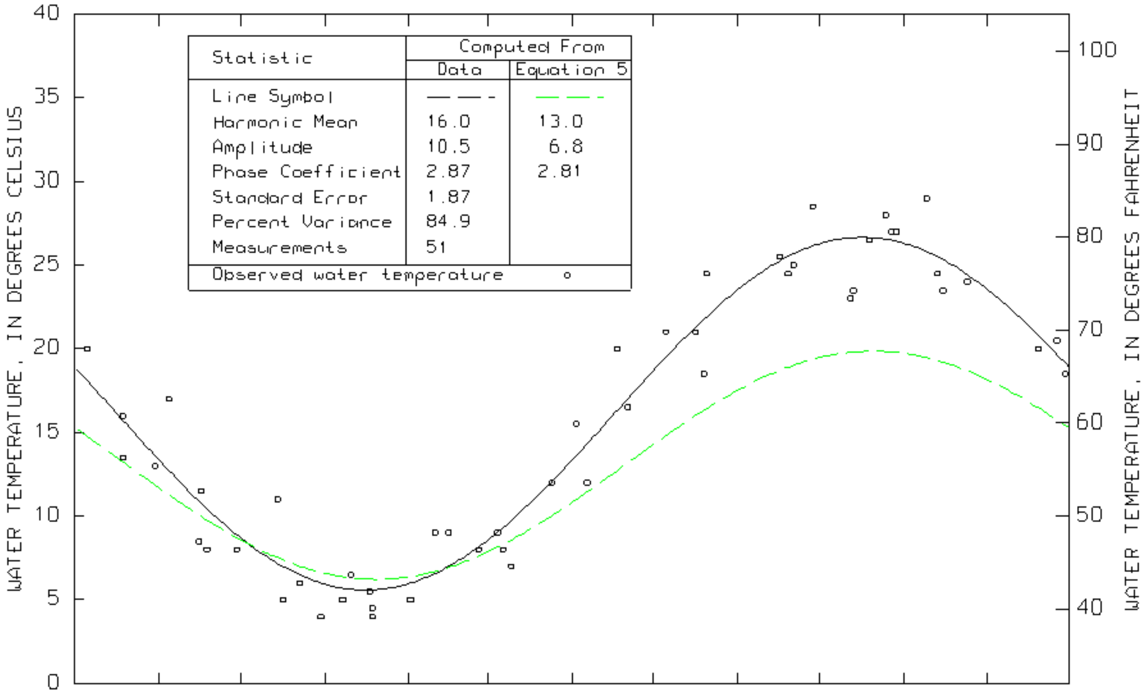
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.0	15.0	9.0	8.0	9.0	14.0	17.0	19.5	24.5	26.0	25.5	23.0
Minimum	16.0	8.0	6.0	1.5	5.5	7.0	9.0	14.5	15.5	23.0	23.0	18.5

Figure 24. North Fork Broad River near Lavonia, Georgia, Station 02190000, July 1958 to August 1968.



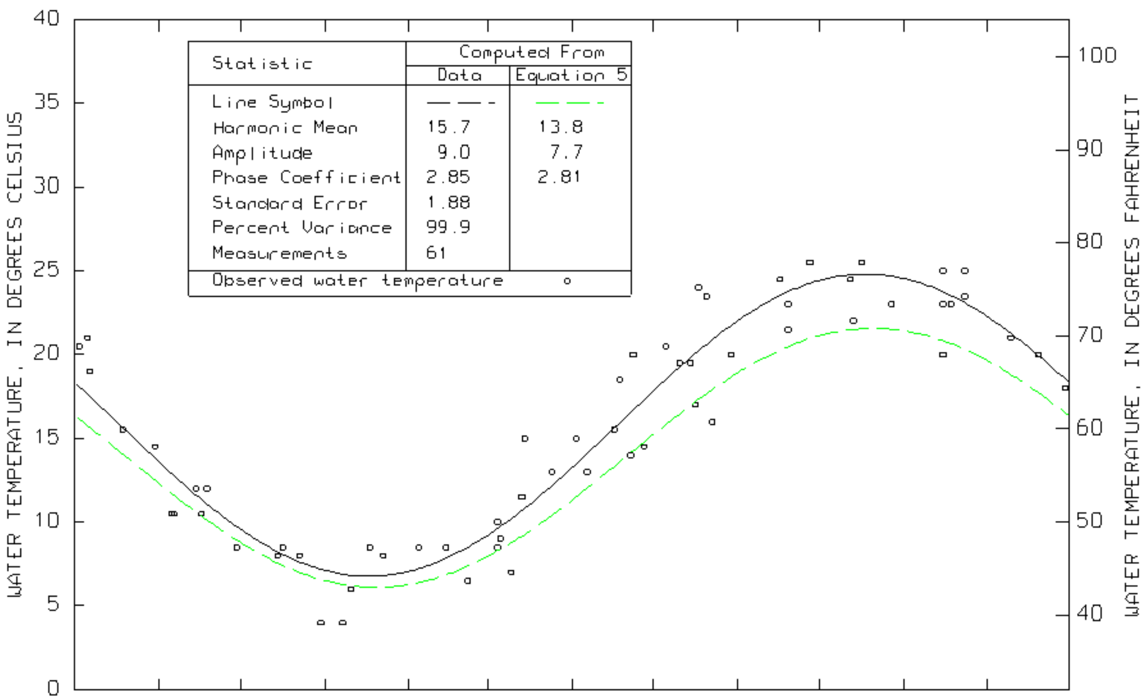
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	14.0	10.0	7.0	9.5	12.0	16.5	25.5	27.0	29.0	28.0	25.0
Minimum	14.5	7.0	5.0	5.0	4.5	7.0	13.0	16.0	26.0	23.0	23.5	18.5

Figure 25. Toms Creek near Eastanollee, Georgia, Station 02190100, July 1962 to August 1968.



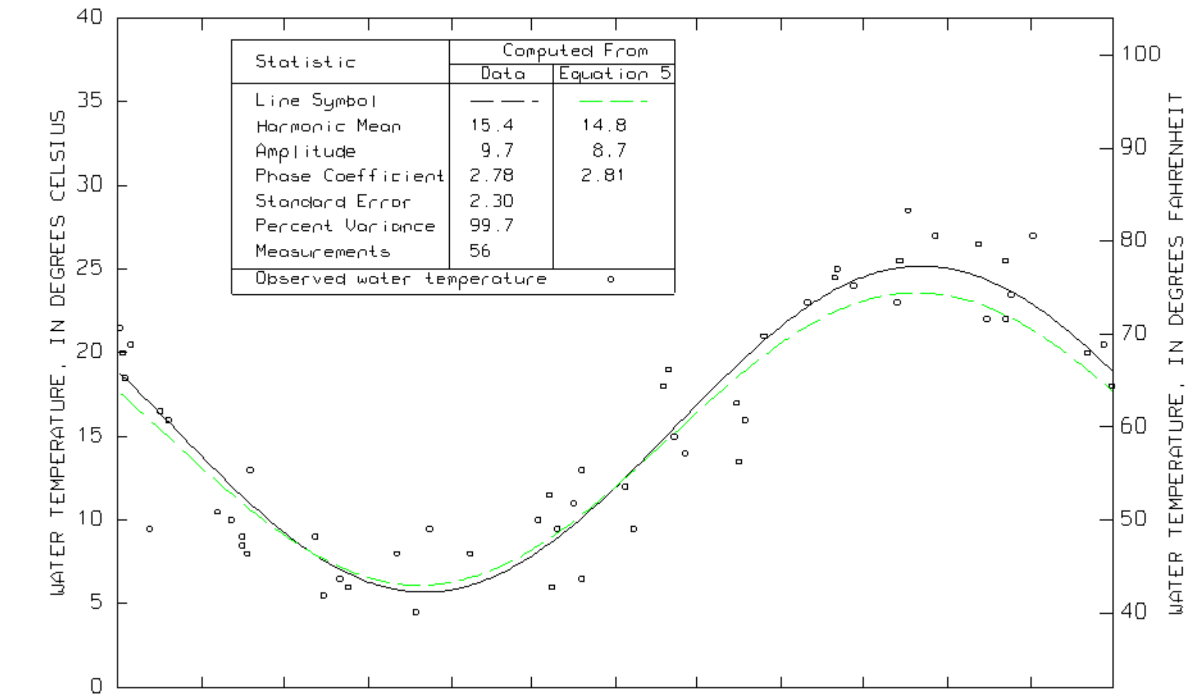
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	17.0	11.0	6.5	9.0	12.0	20.0	24.5	28.5	28.0	29.0	20.5
Minimum	13.0	8.0	4.0	4.0	5.0	7.0	12.0	18.5	24.5	23.0	23.5	18.5

Figure 26. Toms Creek tributary near Avalon, Georgia,
Station 02190200, July 1962 to August 1968.



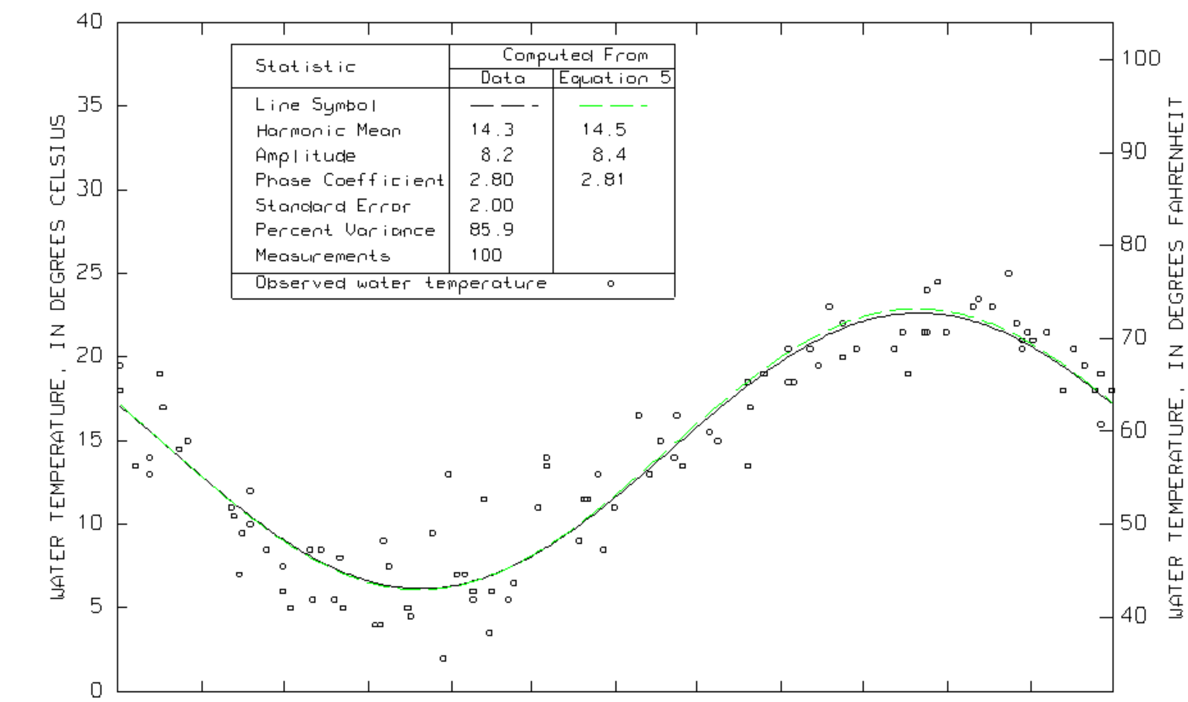
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	12.0	8.5	8.5	8.5	15.0	20.0	24.0	25.5	25.5	25.0	21.0
Minimum	14.5	8.5	4.0	4.0	6.5	7.0	13.0	16.0	21.5	22.0	20.0	18.0

Figure 27. Toms Creek near Martin, Georgia,
Station 02190500, October 1962 to September 1968.



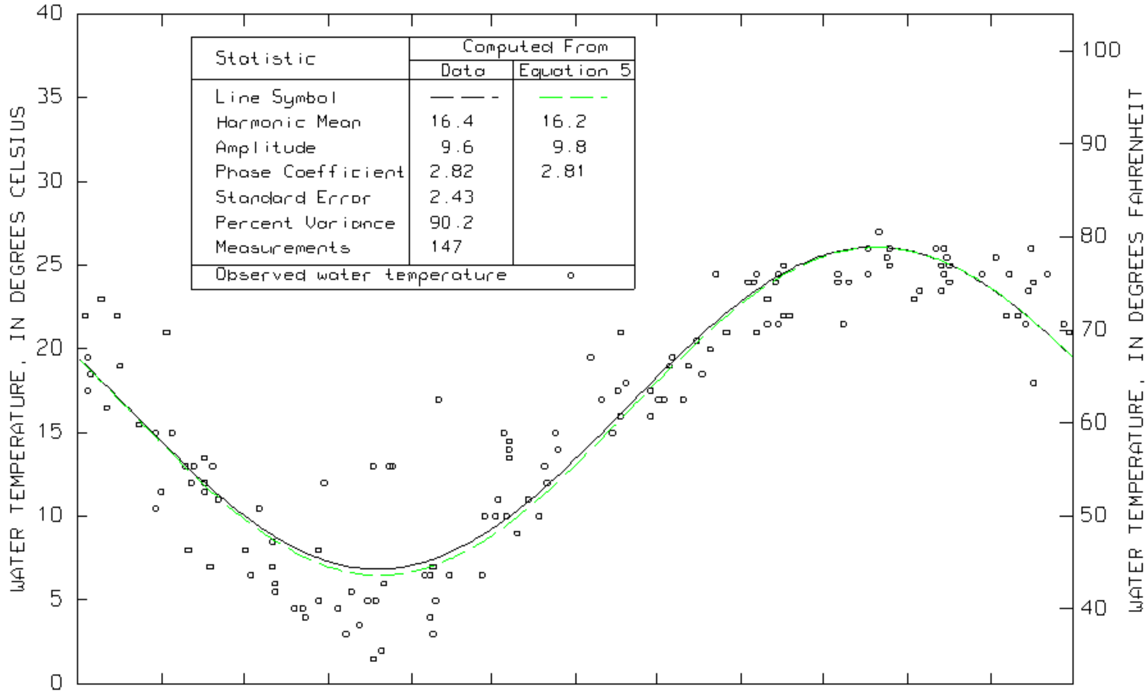
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.5	13.0	9.0	9.5	8.0	13.0	19.0	21.0	25.0	28.5	26.5	27.0
Minimum	9.5	8.0	5.5	4.5	8.0	6.0	9.5	13.5	23.0	23.0	22.0	18.0

Figure 28. North Fork Broad River near Carnesville, Georgia, Station 02191000, October 1962 to September 1970.



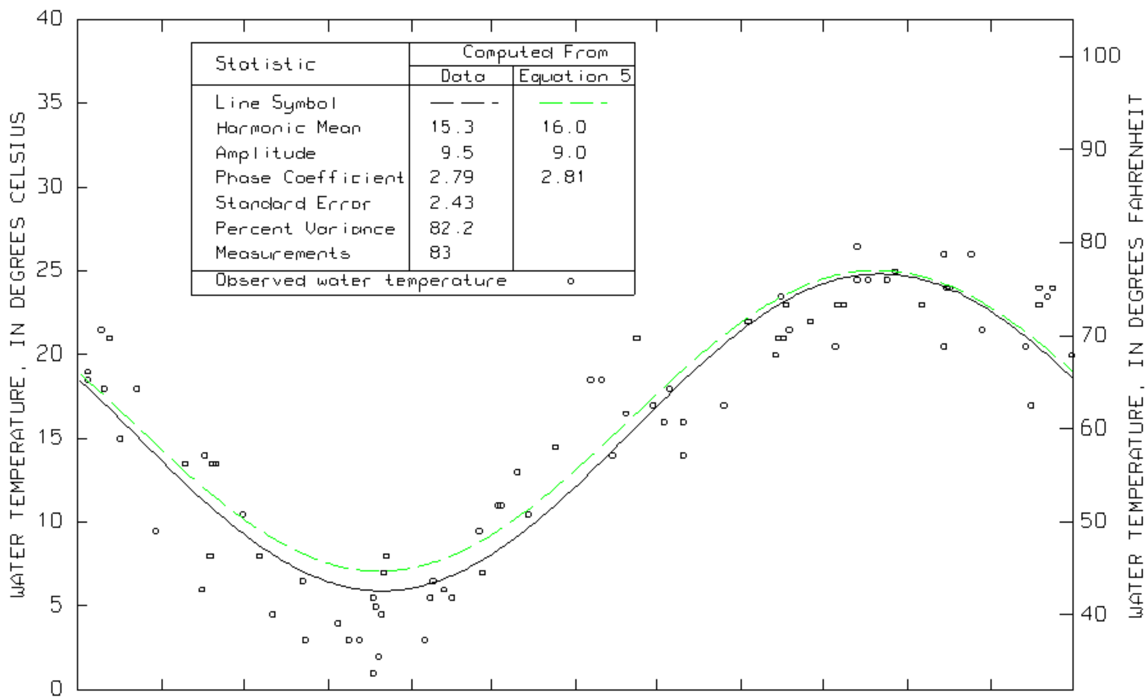
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.5	12.0	8.5	13.0	11.5	14.0	16.5	19.0	23.0	24.5	25.0	21.5
Minimum	13.0	6.0	5.0	2.0	3.5	8.5	13.0	13.5	18.5	19.0	20.5	16.0

Figure 29. Hudson River at Homer, Georgia, Station 02191200, August 1962 to July 1975.



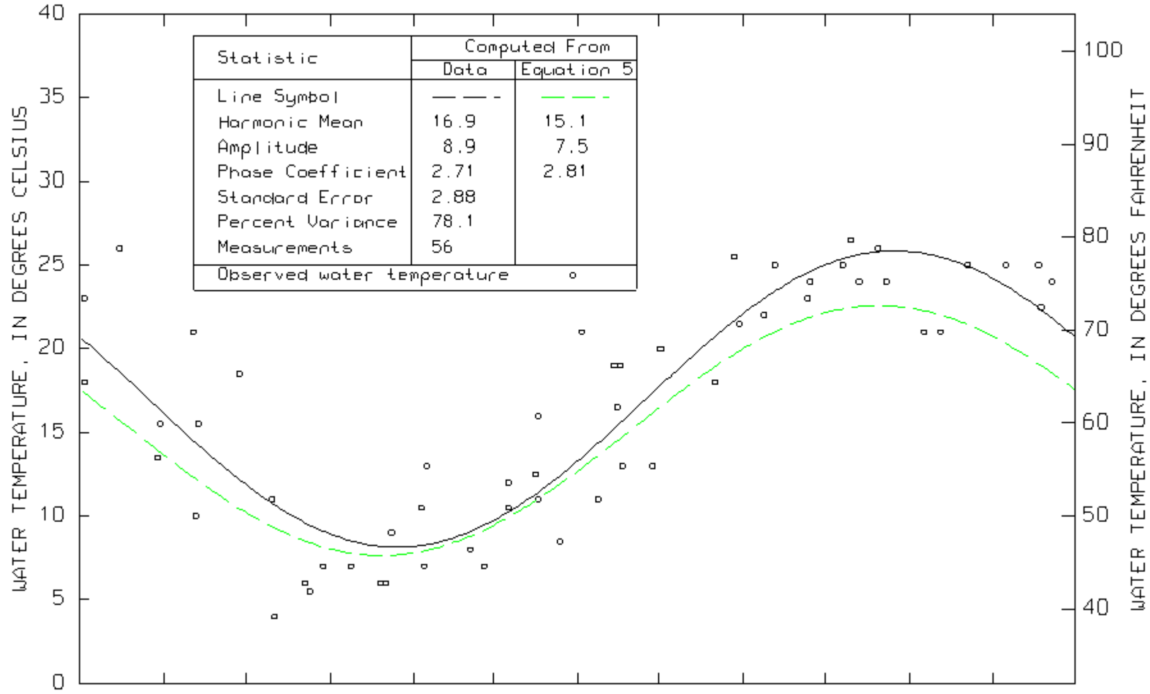
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	21.0	12.0	13.0	17.0	15.0	21.0	24.5	25.0	27.0	26.0	26.0
Minimum	10.5	7.0	4.0	1.5	3.0	9.0	15.0	17.0	21.0	21.5	23.0	18.0

Figure 30. Broad River near Bell, Georgia,
Station 02192000, October 1956 to October 1979.



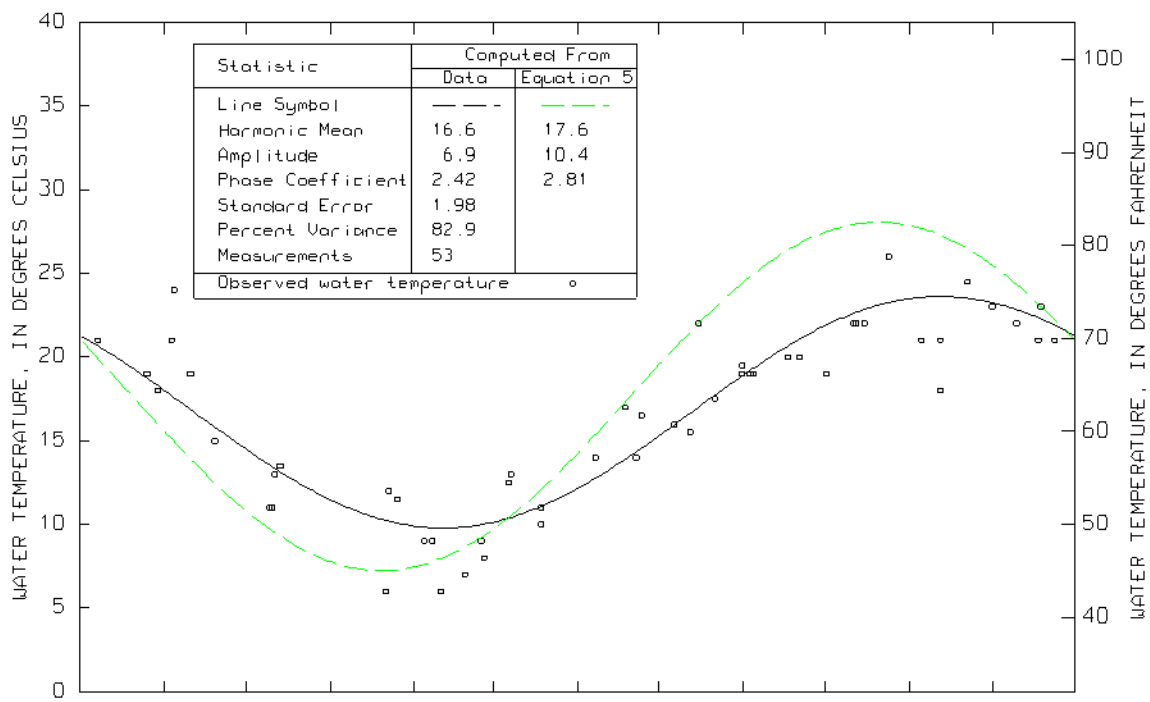
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.5	14.0	8.0	8.0	9.5	14.5	21.0	18.0	23.5	26.5	26.0	24.0
Minimum	9.5	6.0	3.0	1.0	3.0	10.5	14.0	14.0	20.0	20.5	20.5	17.0

Figure 31. Little River near Washington, Georgia,
Station 02193500, October 1954 to June 1974.



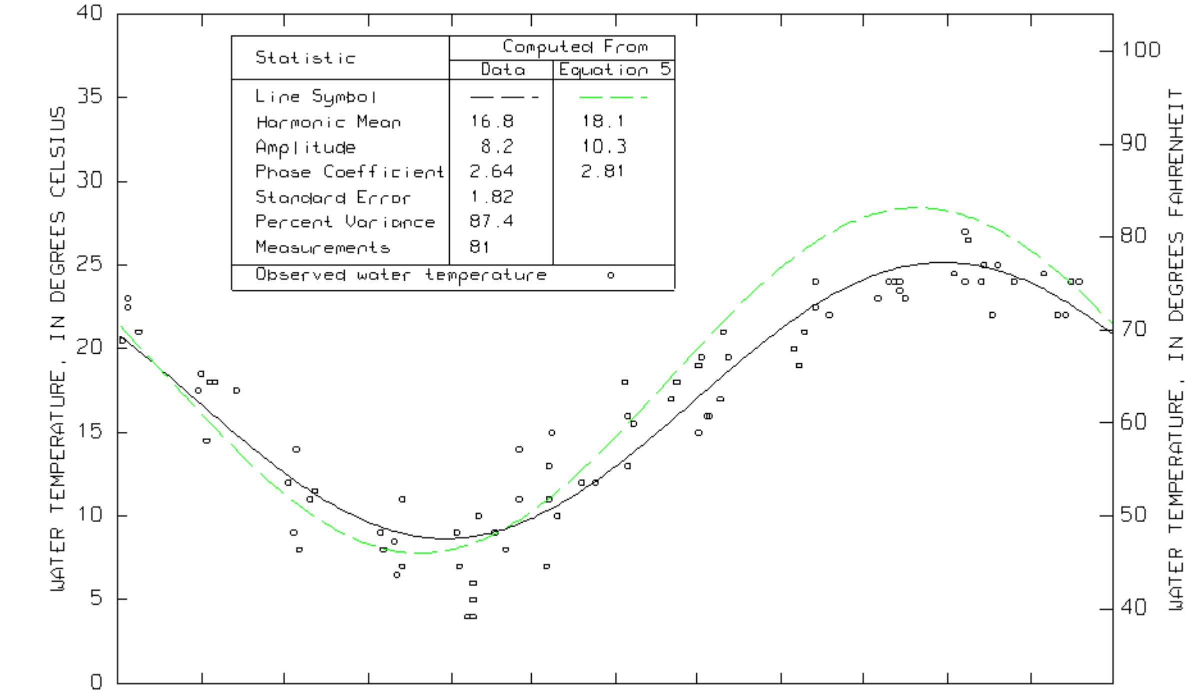
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	26.0	21.0	11.0	9.0	13.0	16.0	21.0	25.5	25.0	26.5	25.0	25.0
Minimum	13.5	10.0	4.0	6.0	7.0	8.5	11.0	18.0	22.0	24.0	21.0	22.5

Figure 32. Butler Creek at Fort Gordon, Georgia,
Station 02196820, March 1968 to July 1976.



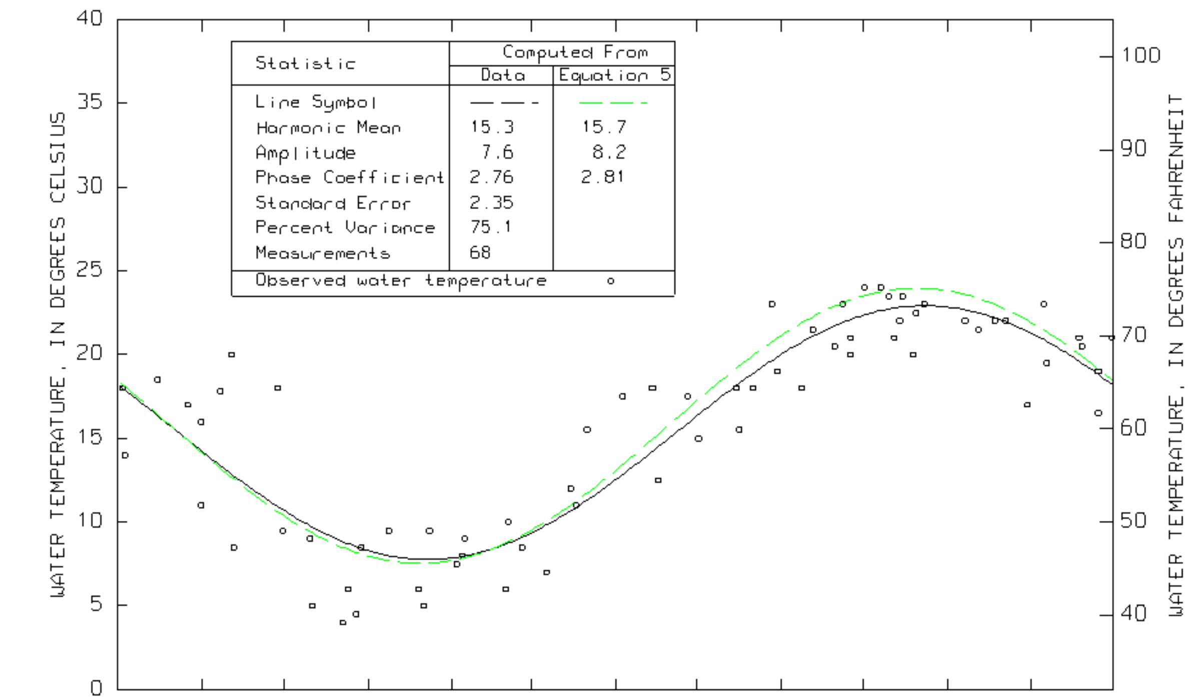
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	24.0	13.5	12.0	9.0	13.0	17.0	22.0	20.0	26.0	24.5	23.0
Minimum	18.0	15.0	11.0	6.0	6.0	10.0	14.0	15.5	19.0	19.0	18.0	21.0

Figure 33. Savannah River at Augusta, Georgia,
Station 02197000, February 1958 to July 1973.



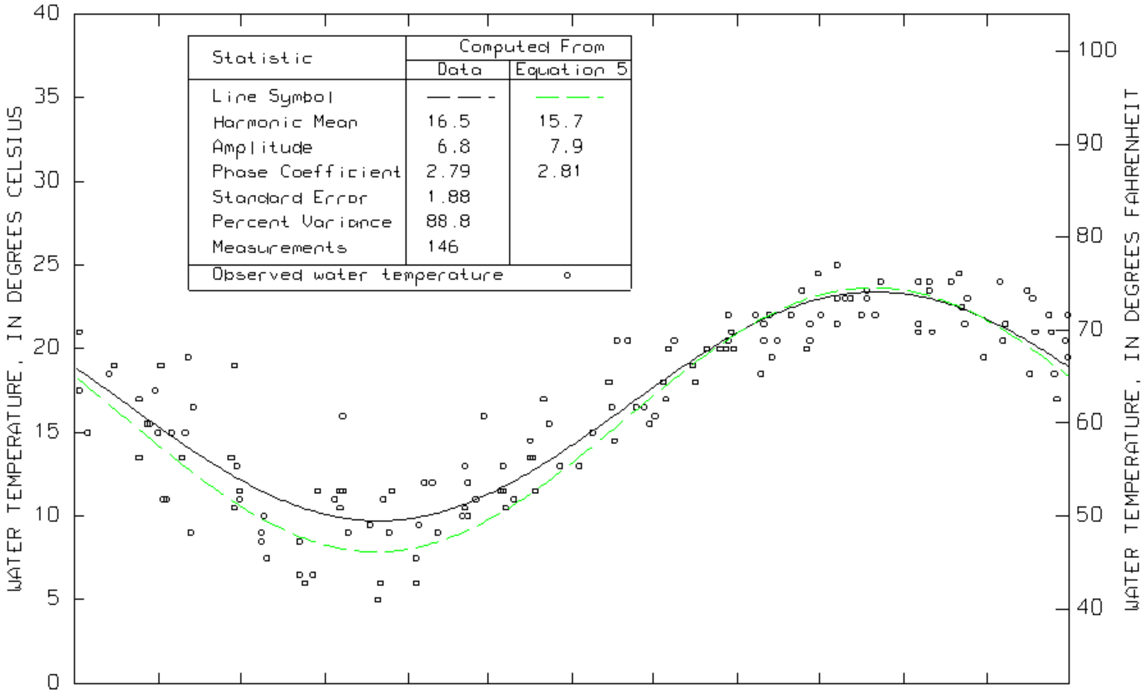
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	18.0	14.0	11.0	14.0	15.0	18.0	21.0	24.0	24.0	27.0	24.5
Minimum	17.5	14.5	8.0	6.5	4.0	7.0	13.0	15.0	19.0	23.0	22.0	22.0

Figure 34. Savannah River at Burtons Ferry near Millhaven, Georgia, Station 02197500, August 1957 to June 1979.



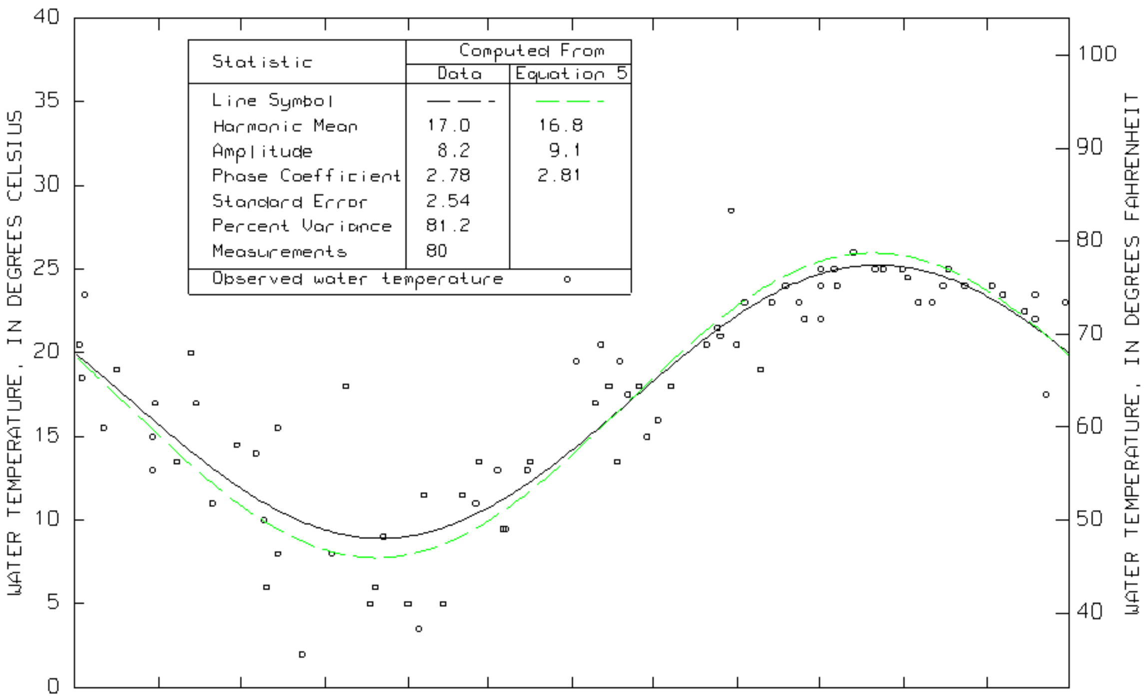
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	18.5	20.0	9.0	9.5	10.0	15.5	18.0	23.0	23.0	24.0	22.0	23.0
Minimum	11.0	8.5	4.0	5.0	6.0	7.0	12.5	15.0	18.0	20.0	17.0	16.5

Figure 35. Brier Creek near Thomson, Georgia, Station 02197520, November 1958 to July 1976.



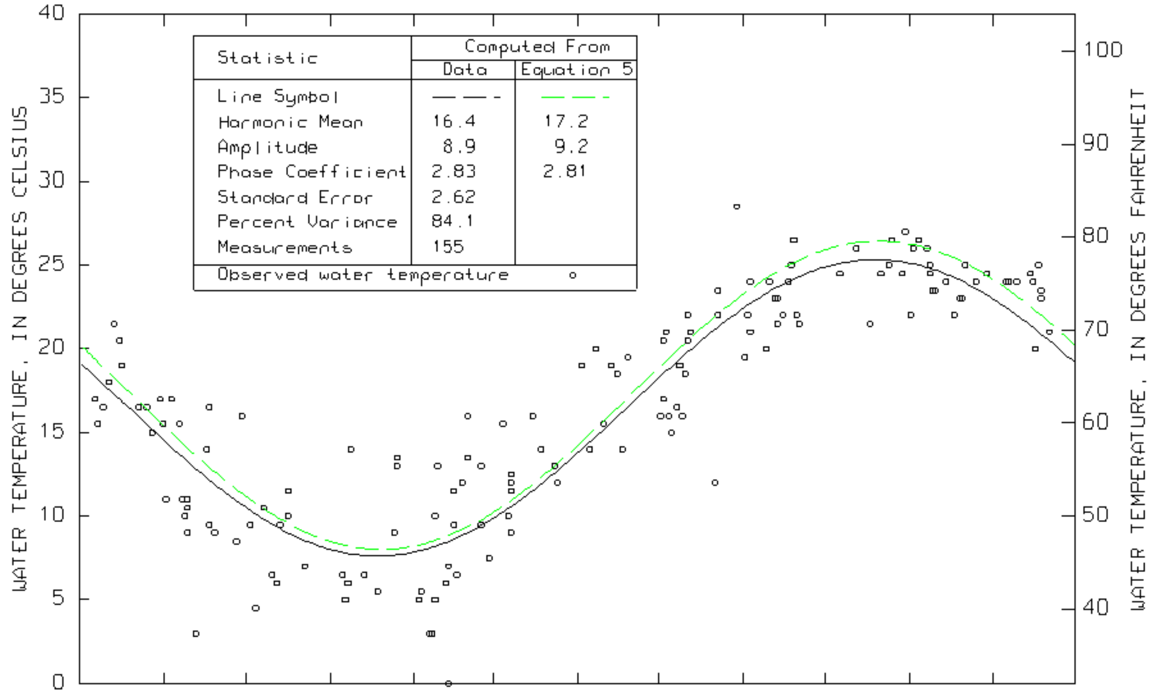
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	19.5	11.5	16.0	16.0	17.0	20.5	22.0	24.5	25.0	24.5	24.0
Minimum	13.5	9.0	6.0	5.0	6.0	10.5	13.0	16.0	18.5	21.5	19.5	17.0

Figure 36. Brushy Creek near Wrens, Georgia,
Station 02197600, May 1958 to July 1976.



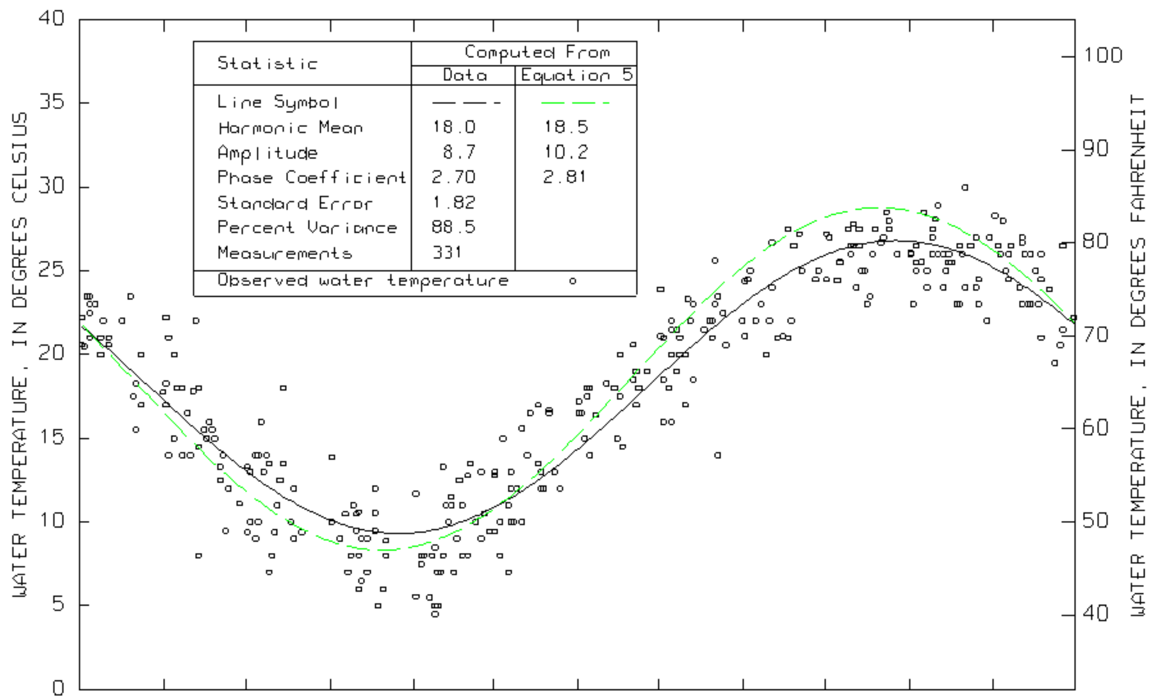
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.5	20.0	15.5	18.0	13.5	13.5	20.5	28.5	24.0	26.0	25.0	24.0
Minimum	13.0	11.0	2.0	5.0	3.5	9.5	13.5	16.0	19.0	22.0	23.0	17.5

Figure 37. Brier Creek near Waynesboro, Georgia,
Station 02197830, October 1954 to September 1983.



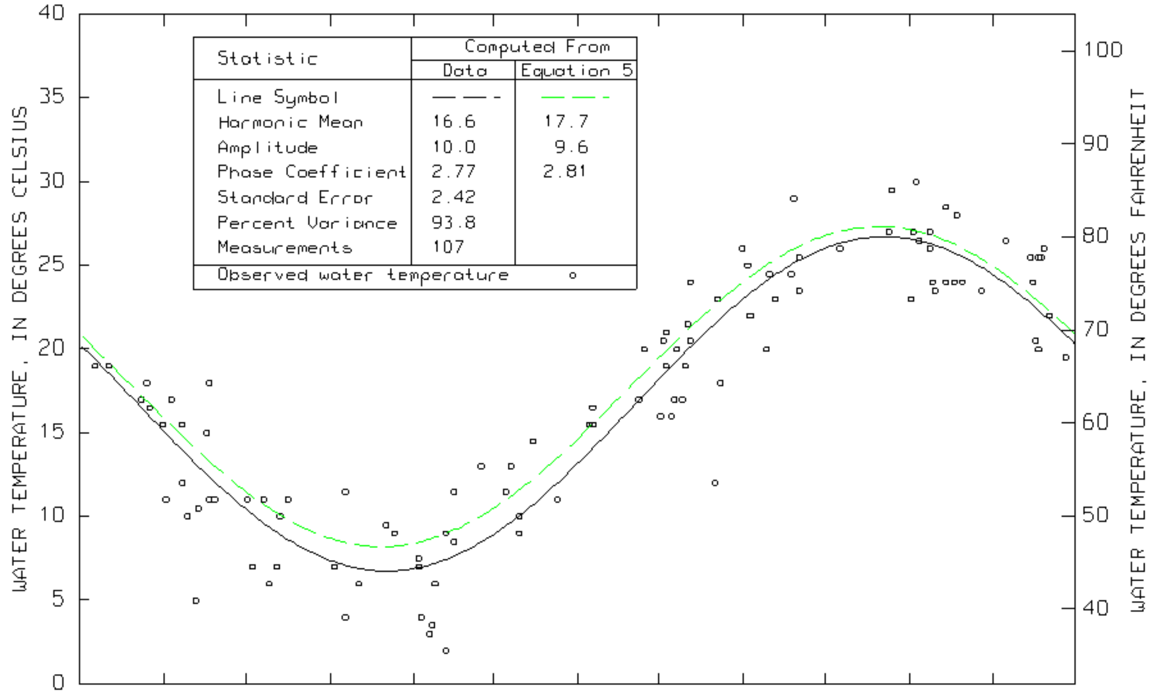
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.5	17.0	11.5	14.0	16.0	16.0	20.0	28.5	26.5	27.0	26.5	25.0
Minimum	15.0	3.0	4.5	5.0	0.1	9.0	14.0	12.0	19.5	21.5	22.0	20.0

Figure 38. Brier Creek at Millhaven, Georgia, Station 02198000, July 1954 to June 1979.



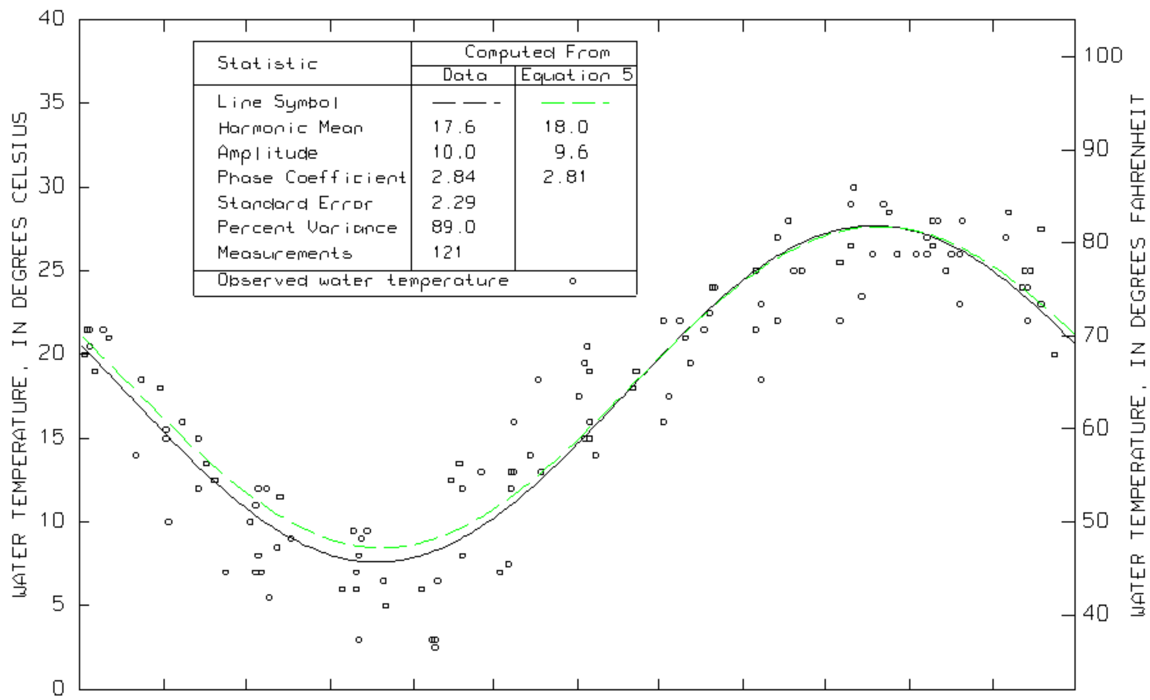
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.5	22.2	18.0	13.9	13.5	17.0	20.6	25.6	27.5	28.5	30.0	28.3
Minimum	15.5	8.0	7.0	5.0	4.5	7.0	14.0	14.0	20.0	23.0	22.0	19.5

Figure 39. Savannah River near Clyo, Georgia, Station 02198500, May 1938 to December 1984.



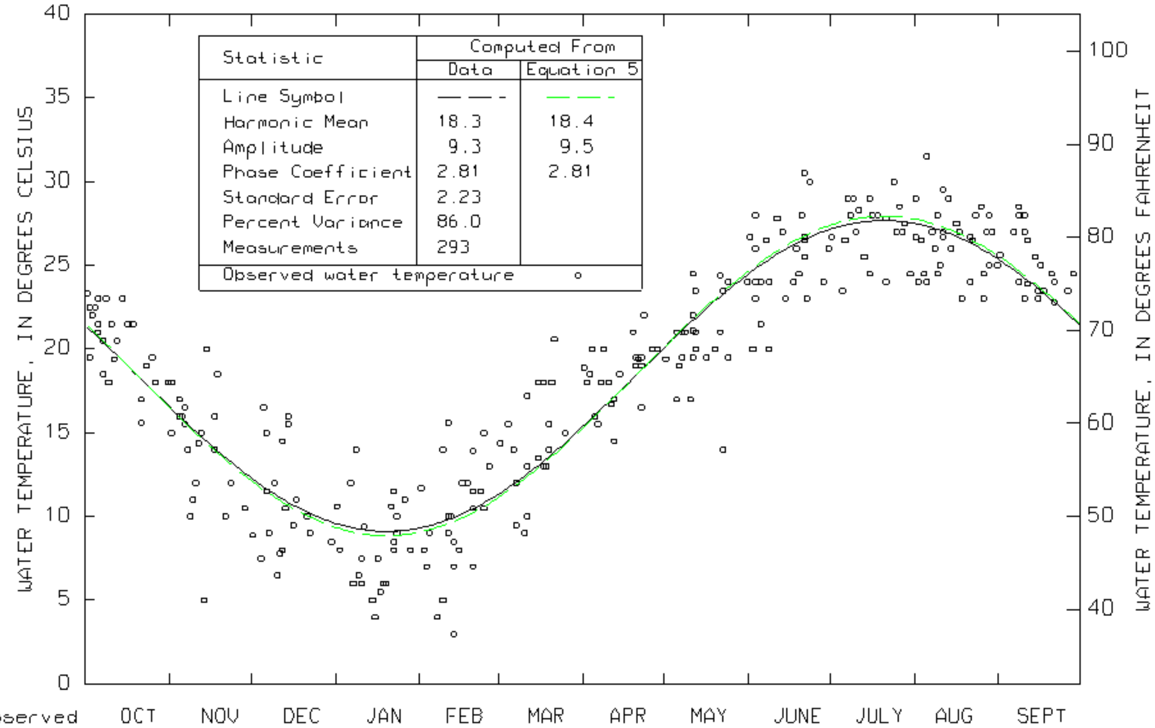
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.0	18.0	11.0	11.5	13.0	14.5	20.0	26.0	29.0	29.5	30.0	26.5
Minimum	15.5	5.0	6.0	4.0	2.0	9.0	15.5	12.0	20.0	26.0	23.0	19.5

Figure 40. Ogeechee River at Scarboro, Georgia,
Station 02202000, October 1954 to June 1979.



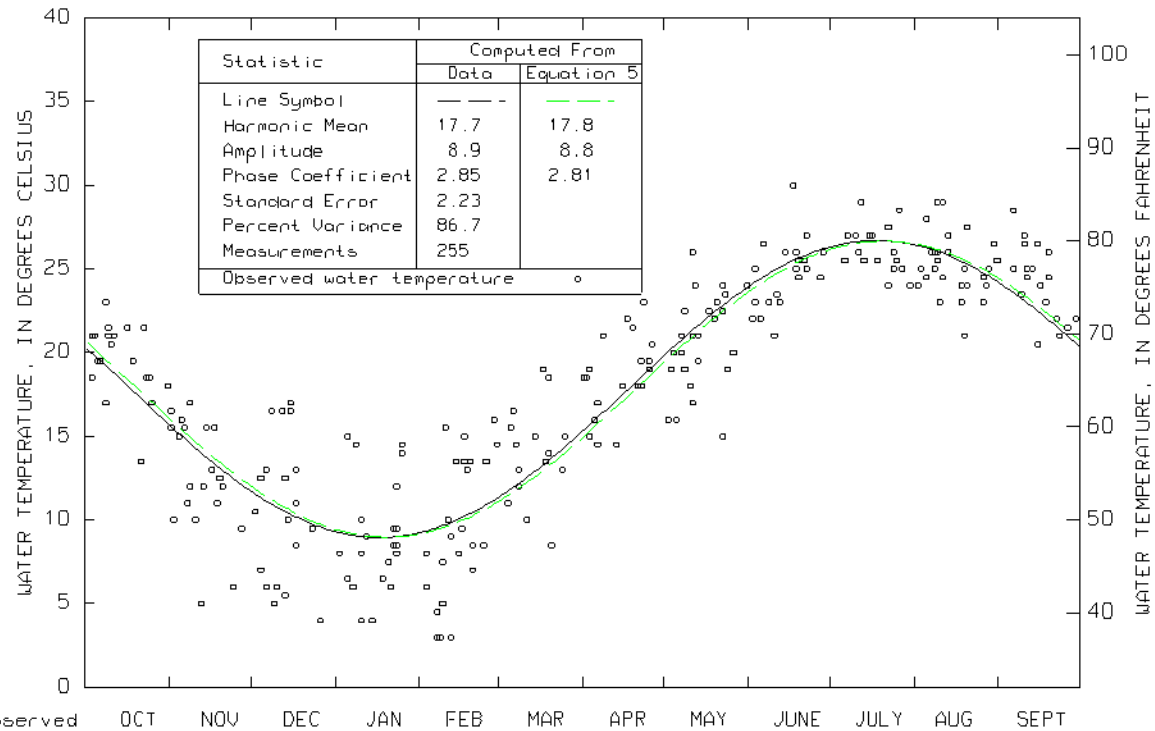
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.5	16.0	12.0	9.5	13.5	18.5	20.5	24.0	28.0	30.0	28.0	28.5
Minimum	14.0	7.0	5.5	3.0	2.5	7.0	14.0	16.0	18.5	22.0	23.0	20.0

Figure 41. Ogeechee River at Oliver, Georgia,
Station 02202190, August 1974 to December 1984.



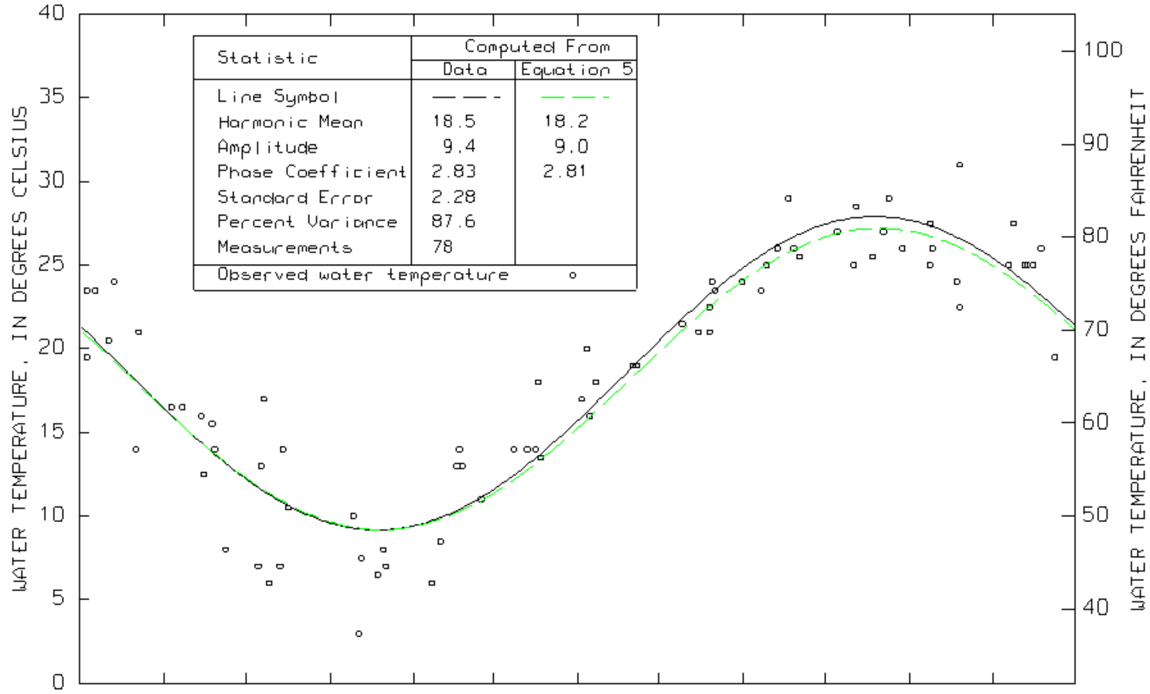
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.3	20.0	16.5	14.0	15.6	20.6	22.0	24.5	30.5	30.0	31.5	28.5
Minimum	15.6	5.0	6.5	4.0	3.0	9.0	14.5	14.0	20.0	23.5	23.0	22.8

Figure 42. Ogeechee River near Eden, Georgia,
Station 02202500, May 1937 to October 1984.



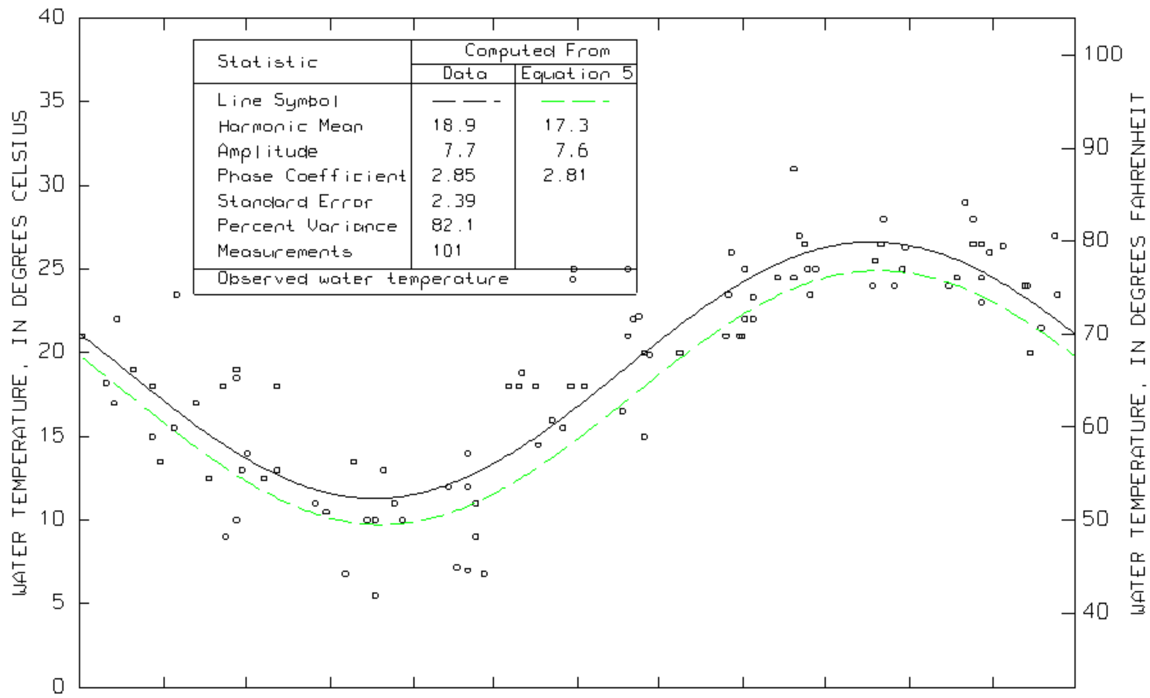
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	17.0	17.0	15.0	16.0	19.0	23.0	26.0	30.0	29.0	29.0	28.5
Minimum	13.5	5.0	4.0	4.0	3.0	8.5	14.5	15.0	21.0	24.0	21.0	20.5

Figure 43. Canoochee River near Claxton, Georgia,
Station 02203000, September 1954 to December 1984.



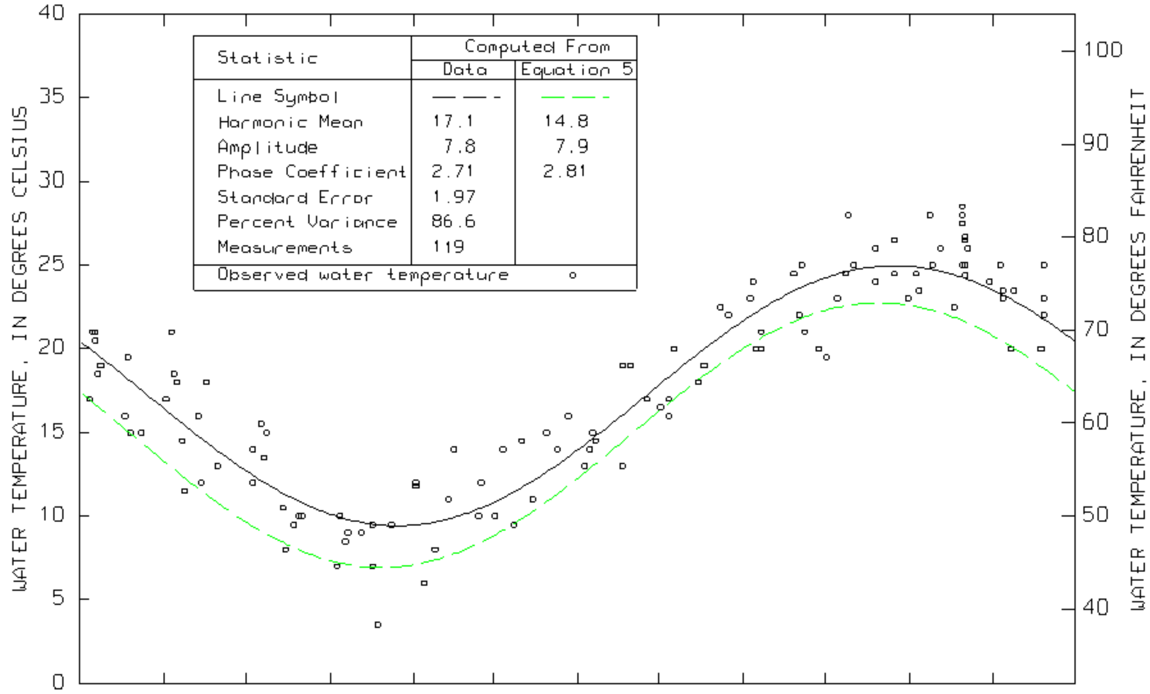
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.0	16.5	17.0	10.0	14.0	18.0	20.0	24.0	29.0	29.0	31.0	27.5
Minimum	14.0	8.0	6.0	3.0	6.0	13.5	16.0	21.0	23.5	25.0	22.5	19.5

Figure 44. Canoochee River at Fort Stewart, Georgia, Station 02203519, February 1958 to December 1984.



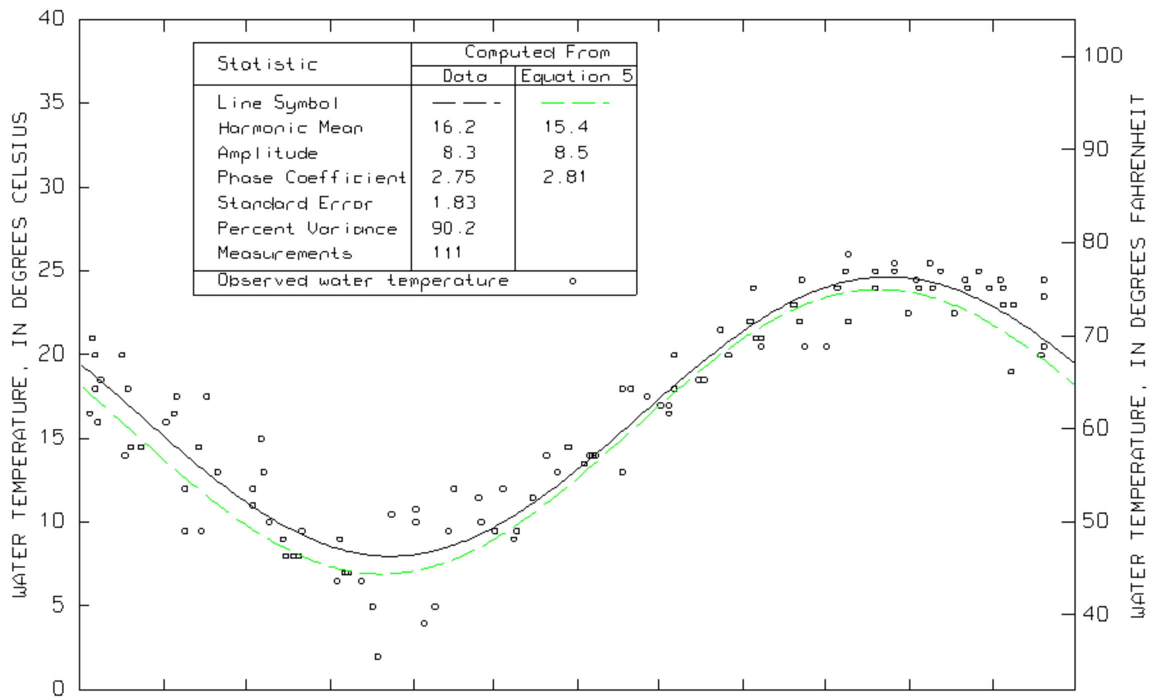
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	22.0	23.5	18.0	13.5	14.0	25.0	25.0	26.0	31.0	28.0	29.0	27.0
Minimum	13.5	9.0	10.5	5.5	6.8	14.5	15.0	20.0	22.0	24.0	23.0	20.0

Figure 45. Peacock Creek at McIntosh, Georgia, Station 02203559, September 1966 to November 1977.



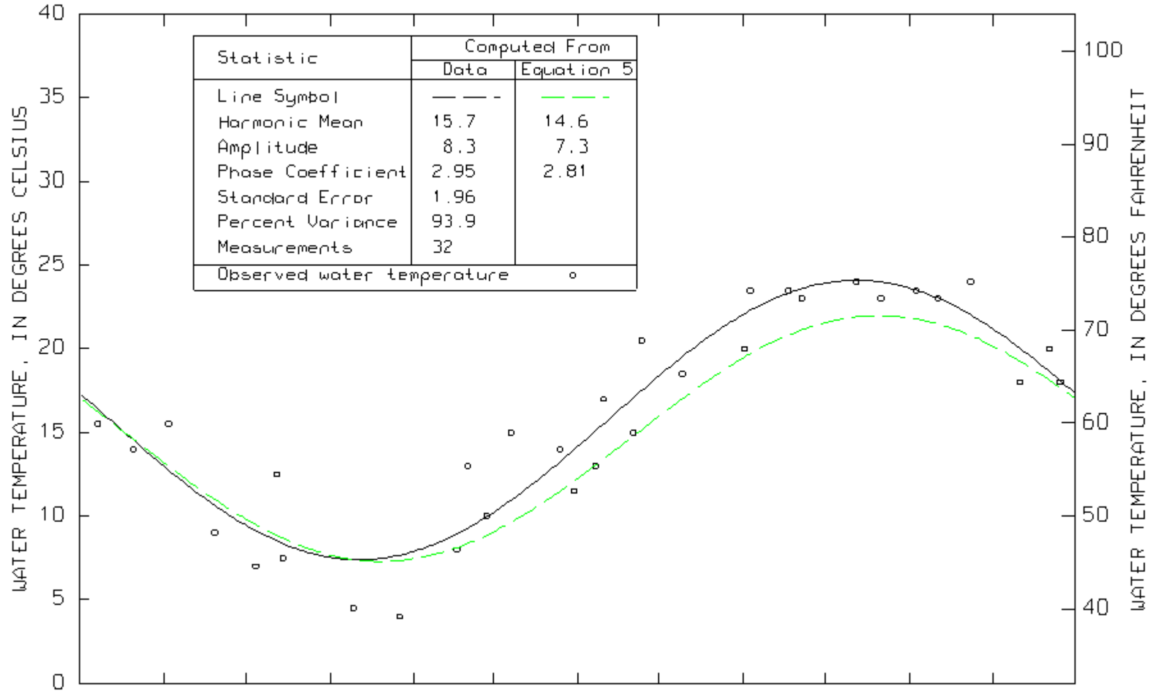
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	21.0	15.5	10.0	14.0	16.0	19.0	22.5	25.0	28.0	28.5	25.0
Minimum	15.0	11.5	8.0	3.5	6.0	9.5	13.0	16.0	20.0	19.5	22.5	20.0

Figure 46. South River at Bouldercrest Road at Atlanta, Georgia, Station 02203800, August 1970 to December 1984.



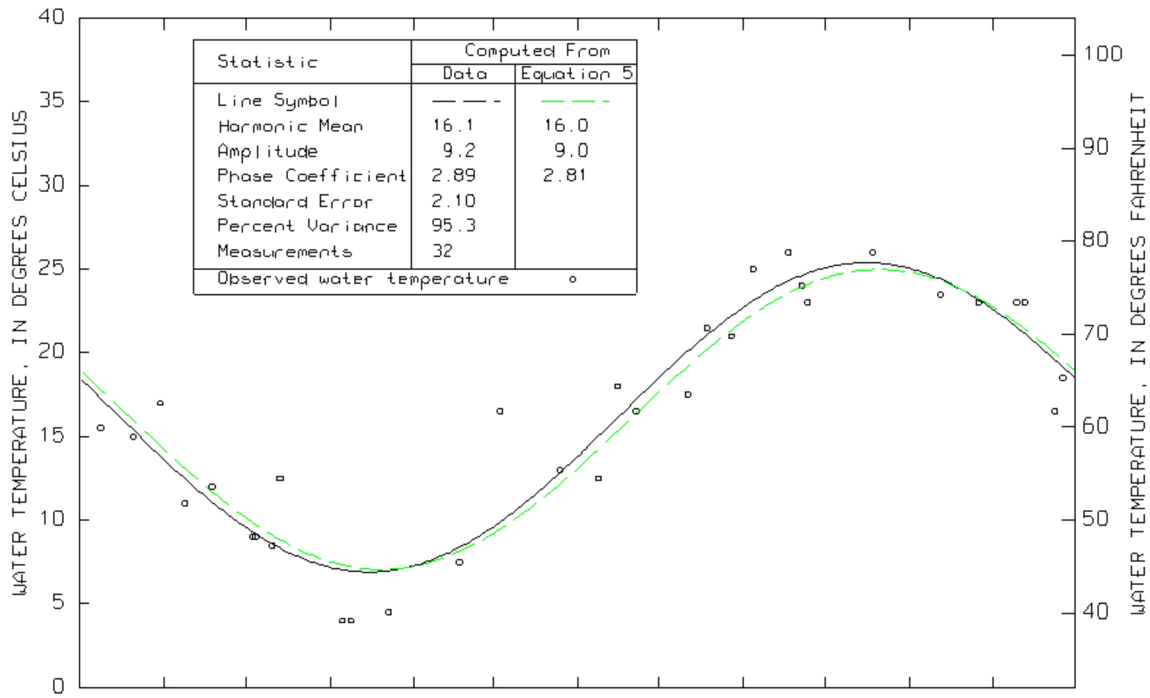
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	17.5	15.0	10.5	12.0	14.5	18.0	21.5	24.5	26.0	25.5	24.5
Minimum	14.0	9.5	8.0	2.0	4.0	9.0	13.0	16.5	20.5	20.5	22.5	19.0

Figure 47. South River at State Highway 155 near Atlanta, Georgia, Station 02203965, October 1970 to December 1984.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	15.5	15.5	12.5	4.5	13.0	15.0	20.5	18.5	23.5	24.0	24.0	20.0
Minimum	14.0	9.0	7.0	4.0	8.0	11.5	13.0	18.5	20.0	23.0	23.0	18.0

Figure 48. Pates Creek at Buster Lewis Road near Flippen, Georgia, Station 02204285, February 1978 to August 1983.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	17.0	12.0	12.5	4.5	7.5	16.5	18.0	21.5	26.0	26.0	23.5	23.0
Minimum	15.0	11.0	8.5	4.0	7.5	13.0	12.5	17.5	23.0	26.0	23.0	16.5

Figure 49. South River near McDonough, Georgia, Station 02204500, December 1957 to September 1982.

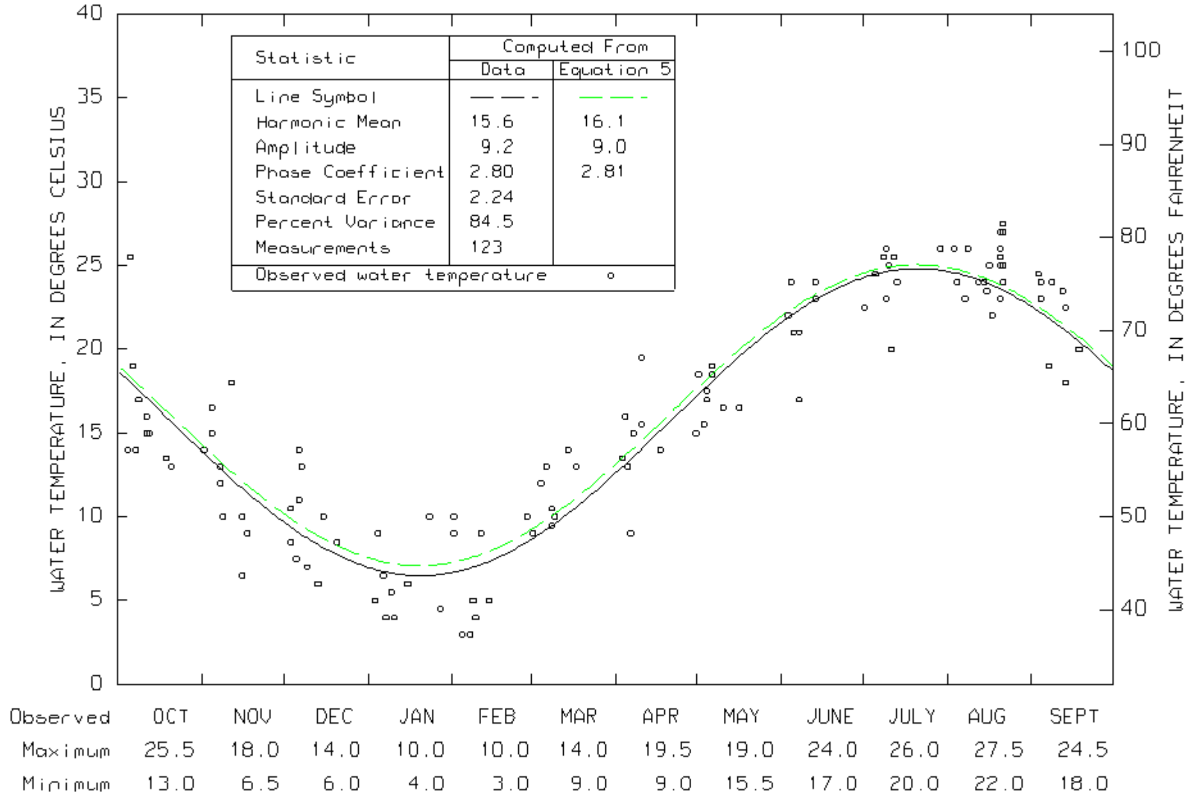


Figure 50. South River at State Highway 81 at Snapping Shoals, Georgia, Station 02204520, August 1970 to December 1984.

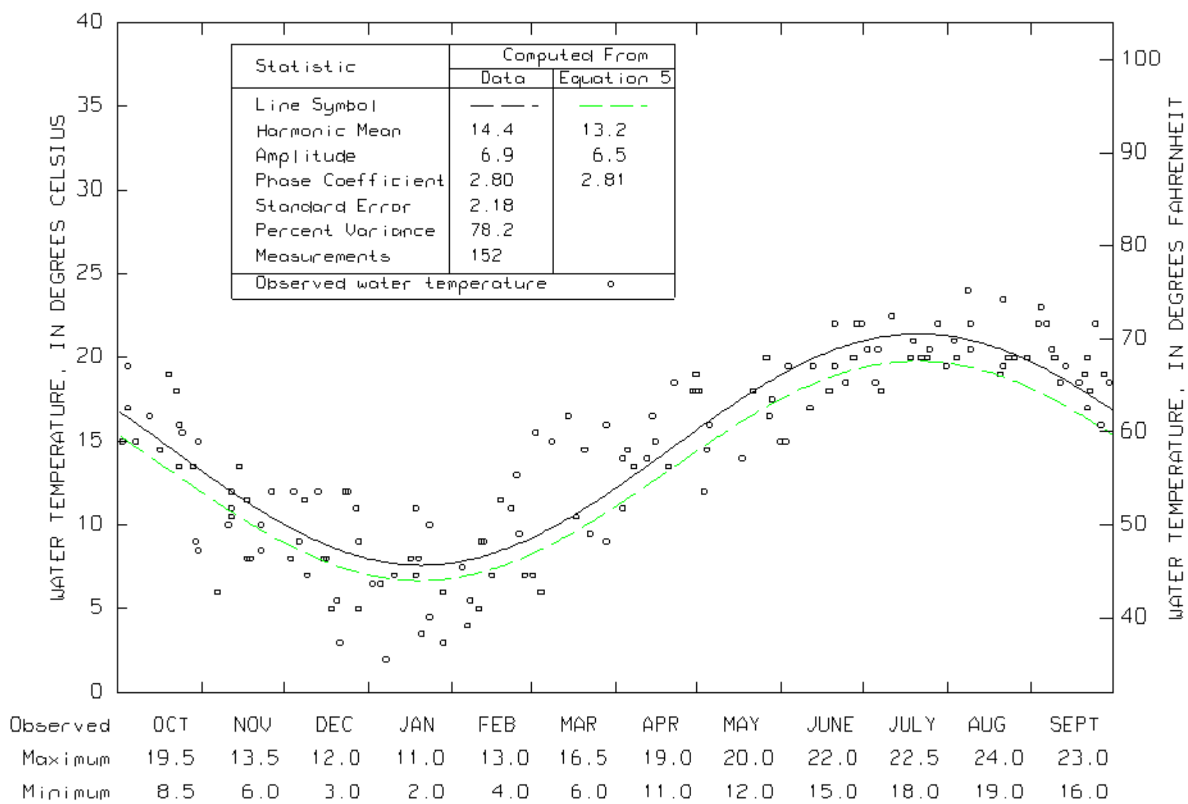
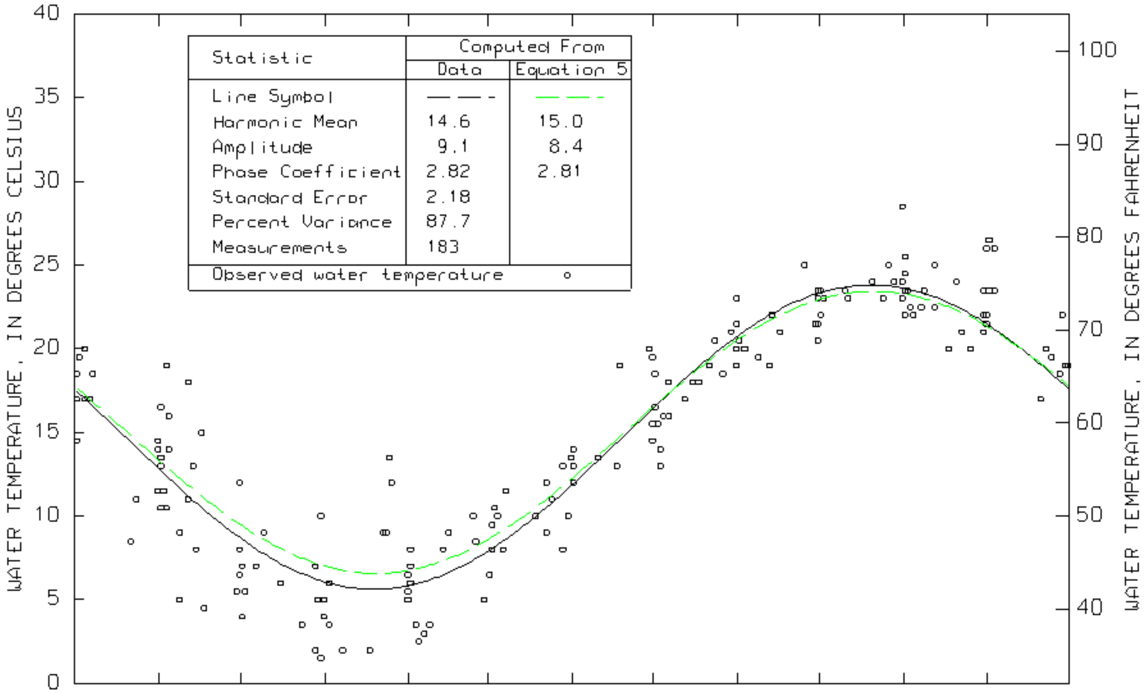
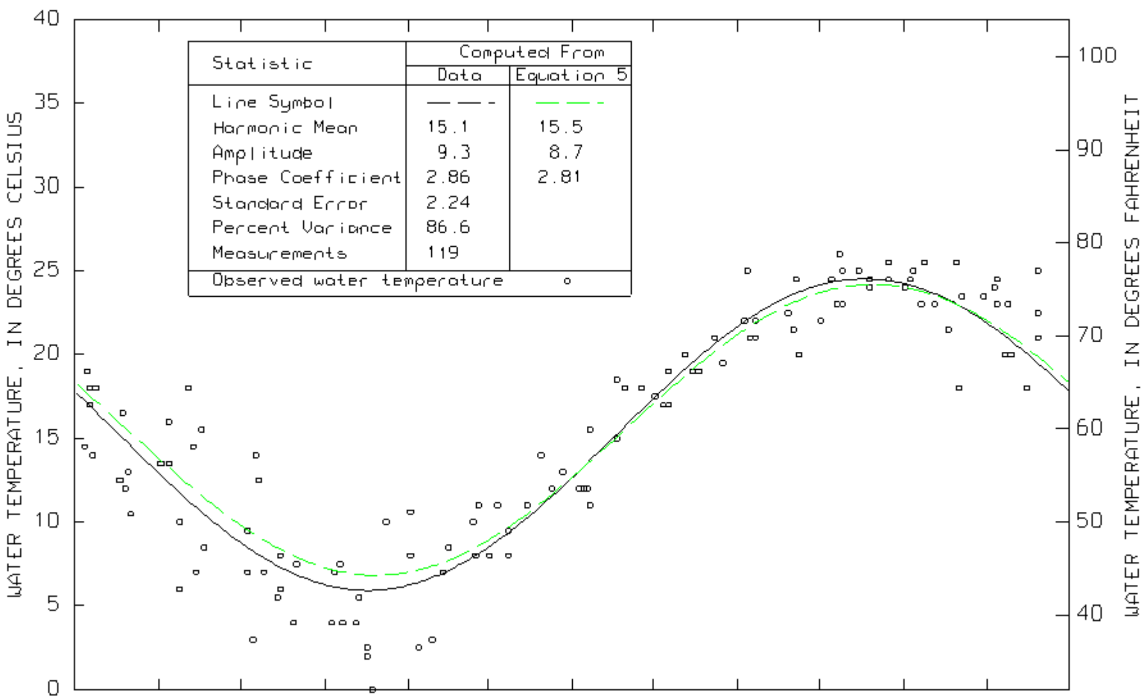


Figure 51. Wildcat Creek near Lawrenceville, Georgia, Station 02205000, October 1956 to September 1976.



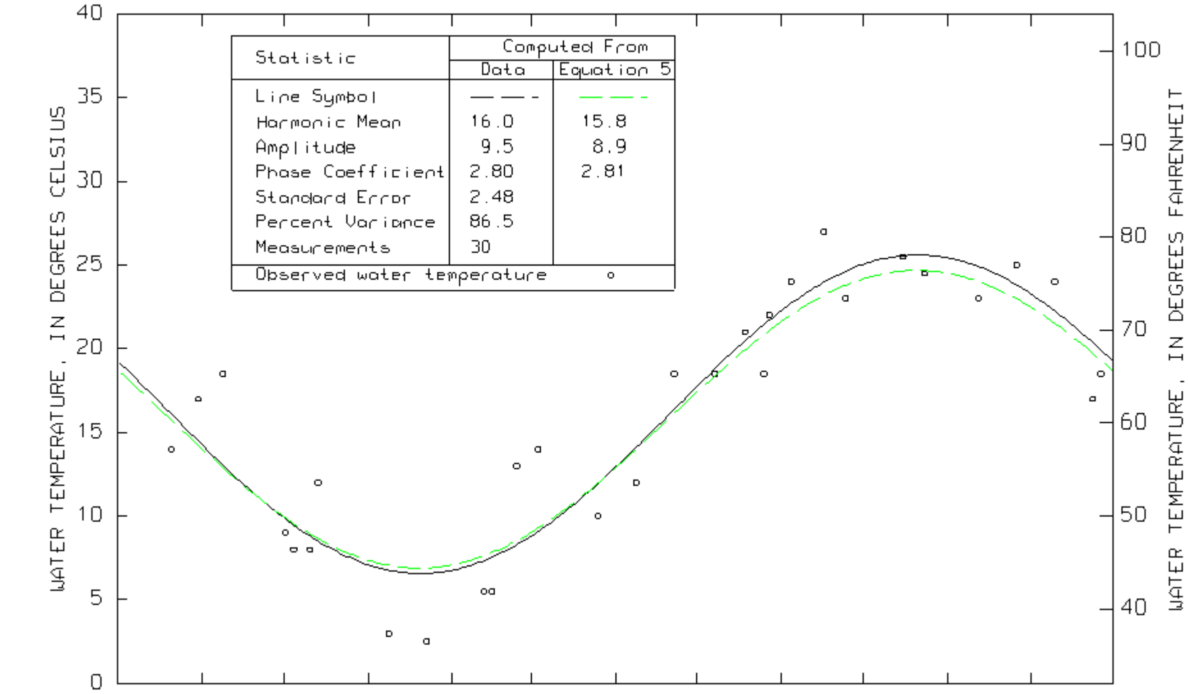
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	19.0	10.0	13.5	10.0	13.5	20.0	23.0	25.0	28.5	26.0	26.5
Minimum	8.5	4.5	1.5	2.0	2.5	6.5	12.0	13.0	19.0	22.0	20.0	17.0

Figure 52. Yellow River near Snellville, Georgia,
Station 02206500, August 1956 to November 1984.



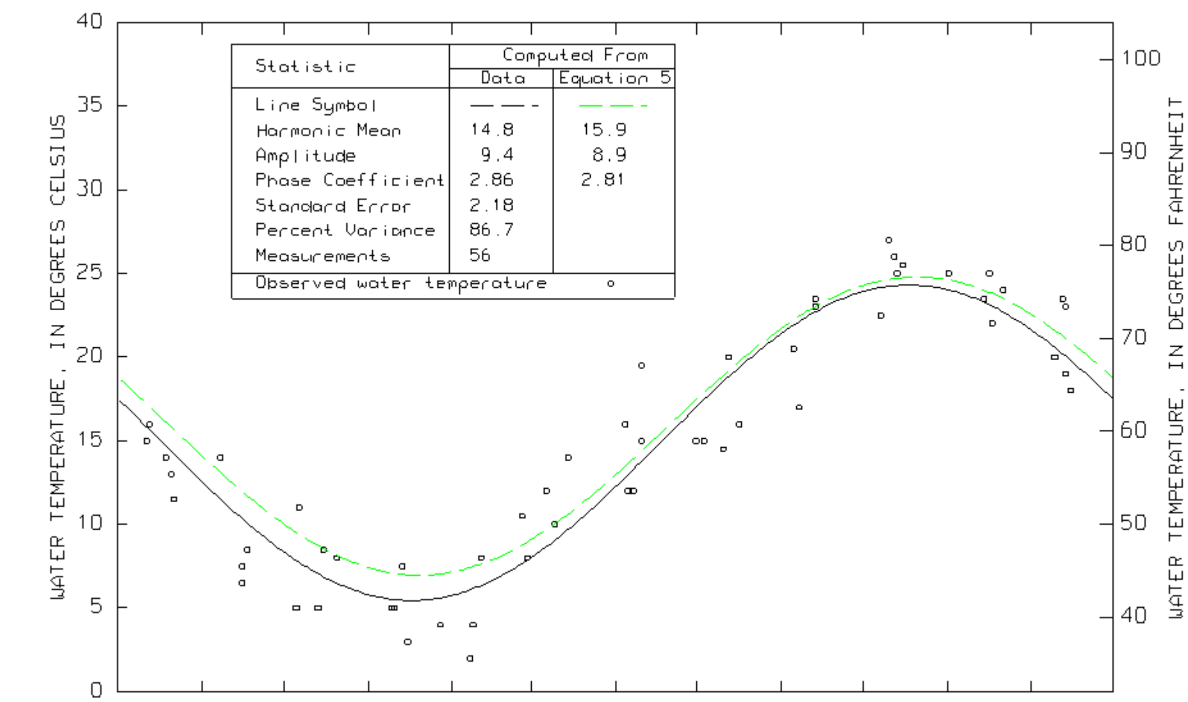
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.0	18.0	14.0	10.0	11.0	14.0	18.5	21.0	25.0	26.0	25.5	25.0
Minimum	10.5	6.0	3.0	0.1	2.5	8.0	11.0	17.0	20.0	22.0	18.0	18.0

Figure 53. Yellow River (Conyers Intake) at Conyers, Georgia,
Station 02207300, July 1974 to December 1984.



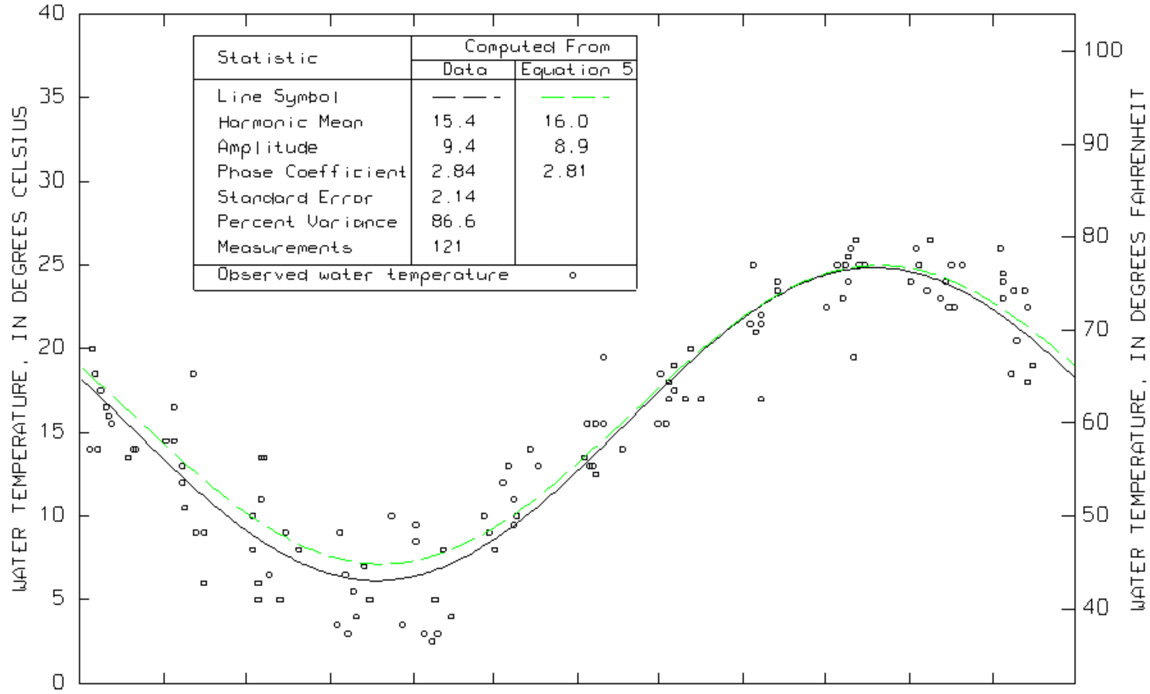
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	17.0	18.5	12.0	3.0	13.0	14.0	18.5	22.0	27.0	25.5	25.0	24.0
Minimum	14.0	18.5	8.0	2.5	5.5	10.0	12.0	18.5	23.0	24.5	23.0	17.0

Figure 54. Yellow River near Covington, Georgia,
Station 02207500, December 1957 to September 1982.



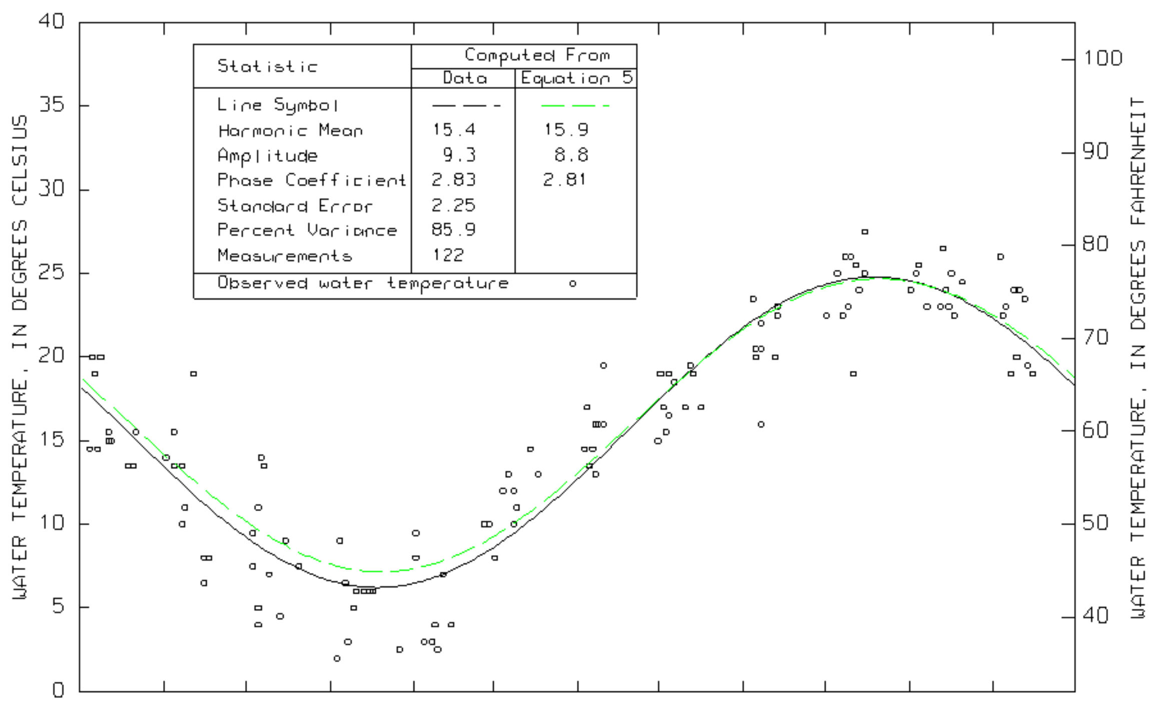
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	16.0	14.0	11.0	7.5	10.5	14.0	19.5	20.0	23.5	27.0	25.0	23.5
Minimum	11.5	6.5	5.0	3.0	2.0	10.0	12.0	14.5	17.0	22.5	22.0	18.0

Figure 55. Yellow River at Porterdale, Georgia,
Station 02207540, July 1974 to June 1979.



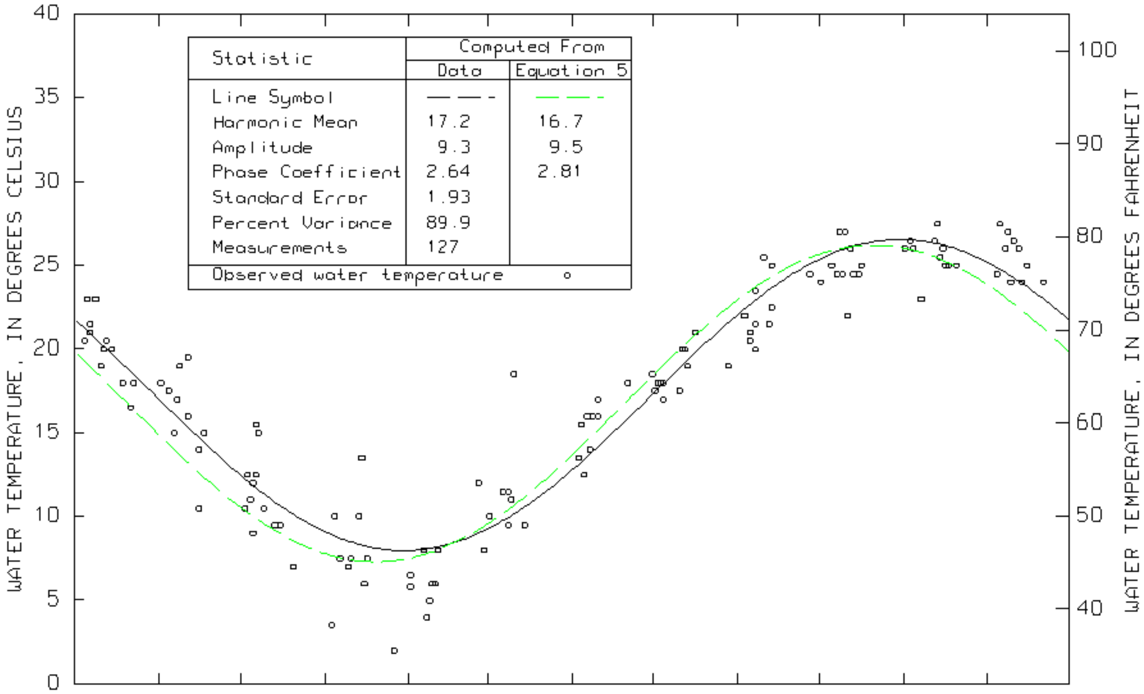
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	18.5	13.5	10.0	10.0	14.0	19.5	20.0	25.0	26.5	26.5	26.0
Minimum	13.5	6.0	5.0	3.0	2.5	8.0	12.5	15.5	17.0	19.5	22.5	18.0

Figure 56. Yellow River at State Highway 212 near Stewart, Georgia, Station 02208005, July 1974 to December 1984.



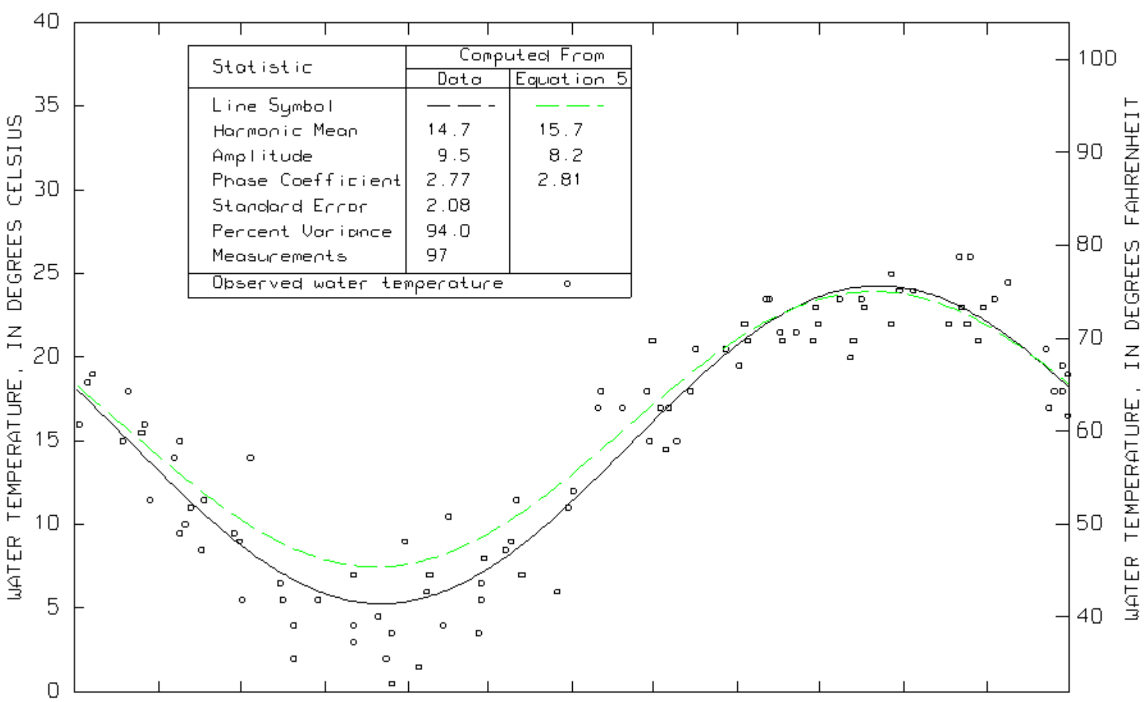
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	19.0	14.0	9.0	10.0	14.5	19.5	19.5	23.5	27.5	26.5	26.0
Minimum	13.5	6.5	4.0	2.0	2.5	8.0	13.0	15.5	16.0	19.0	22.5	19.0

Figure 57. Alcovy River Newton above Stewart, Georgia, Station 02209260, May 1972 to December 1984.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	19.5	15.5	13.5	12.0	18.5	18.5	21.0	25.5	27.0	27.5	27.5
Minimum	16.5	10.5	7.0	2.0	4.0	9.5	12.5	17.0	20.0	22.0	23.0	24.0

Figure 58. Ocmulgee River near Jackson, Georgia,
Station 02210500, December 1957 to December 1984.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.0	15.0	14.0	9.0	10.5	11.5	21.0	20.5	23.5	25.0	26.0	24.5
Minimum	11.5	8.5	2.0	0.5	1.5	6.0	12.0	14.5	19.5	20.0	21.0	16.5

Figure 59. Towaliga River near Jackson, Georgia,
Station 02211300, June 1960 to December 1973.

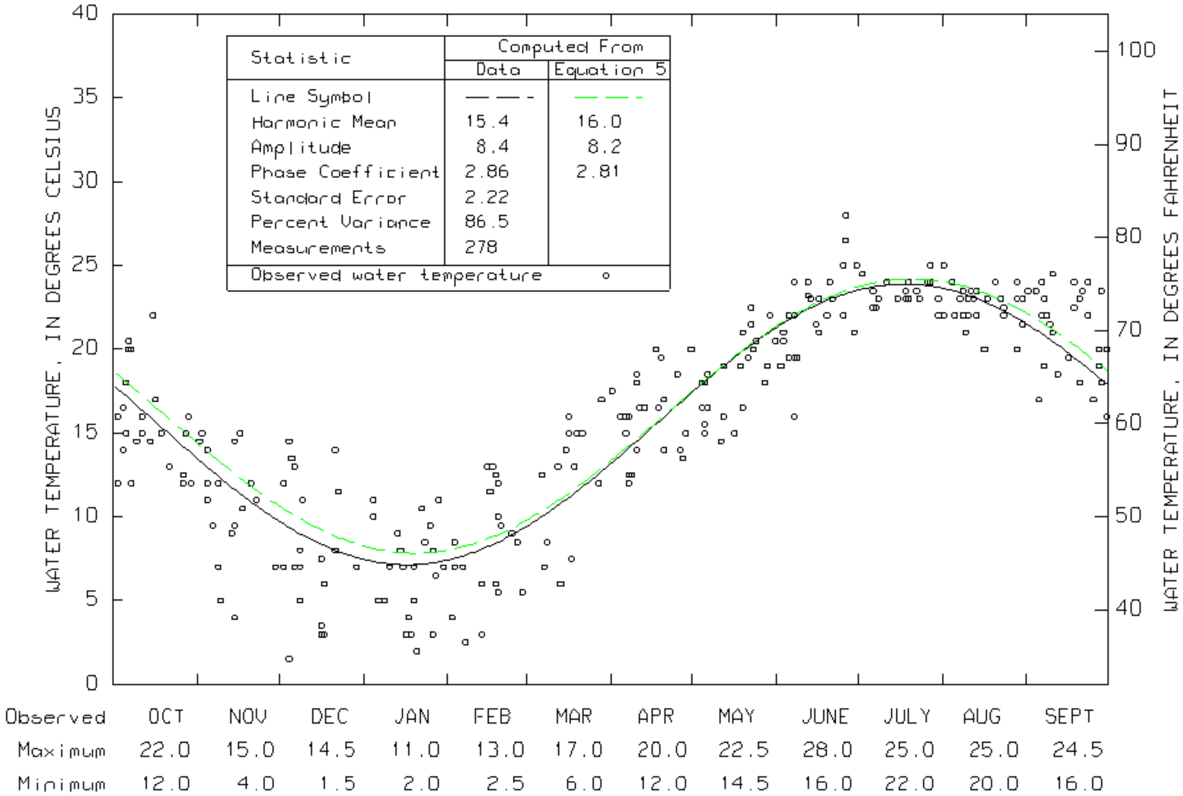


Figure 60. Falling Creek near Juliette, Georgia, Station 02212600, July 1964 to January 1985.

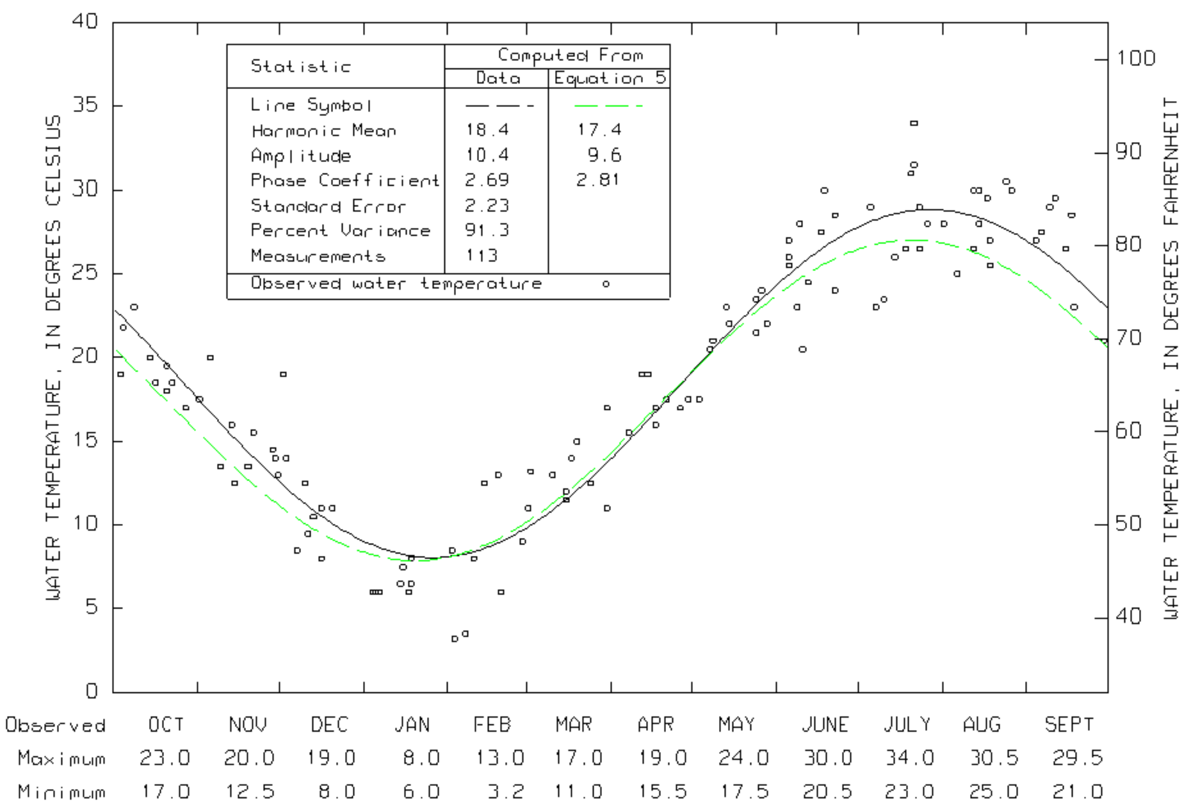
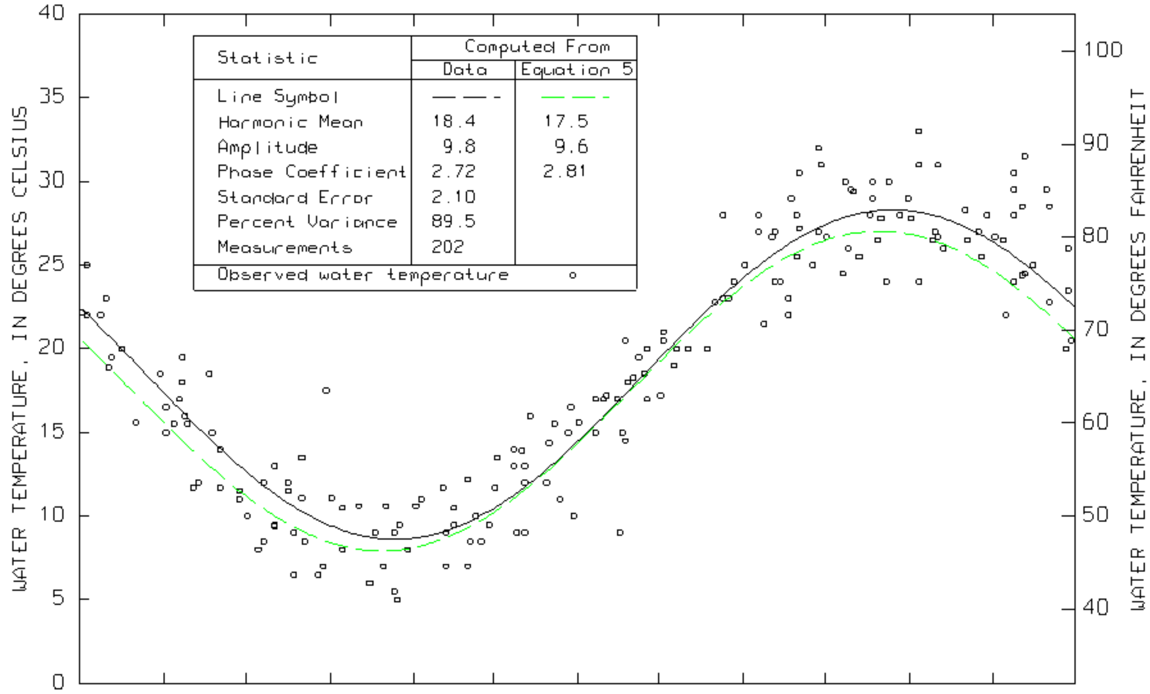
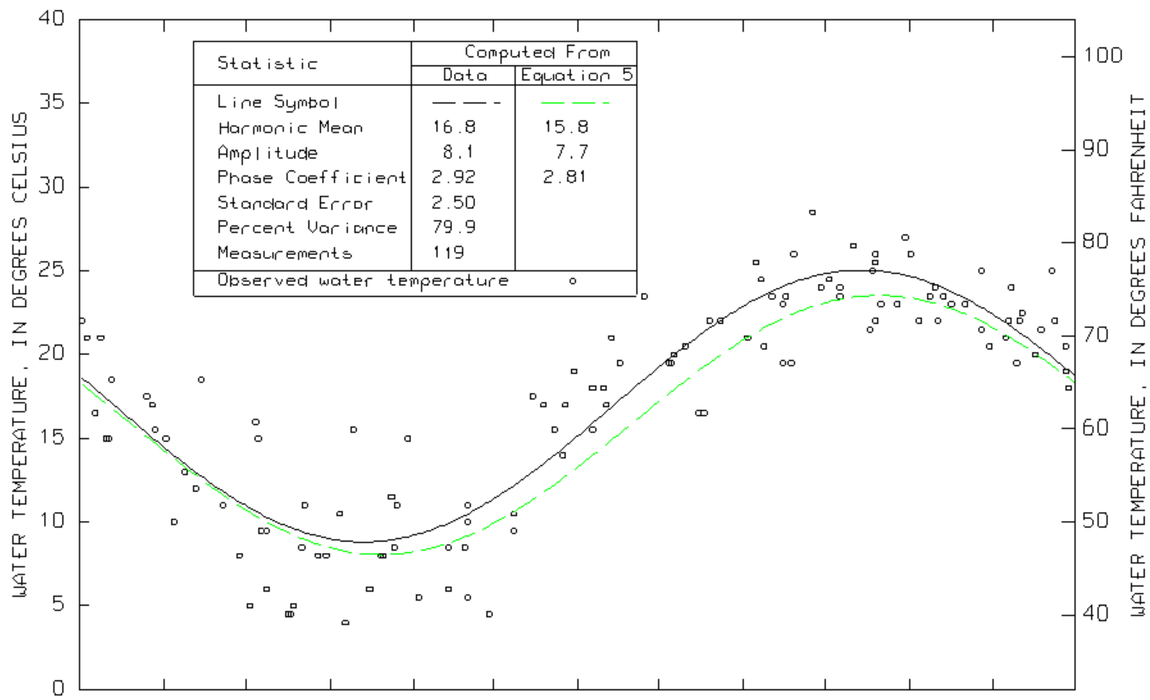


Figure 61. Ocmulgee River (Macon Intake) at Macon, Georgia, Station 02212950, July 1974 to December 1984.



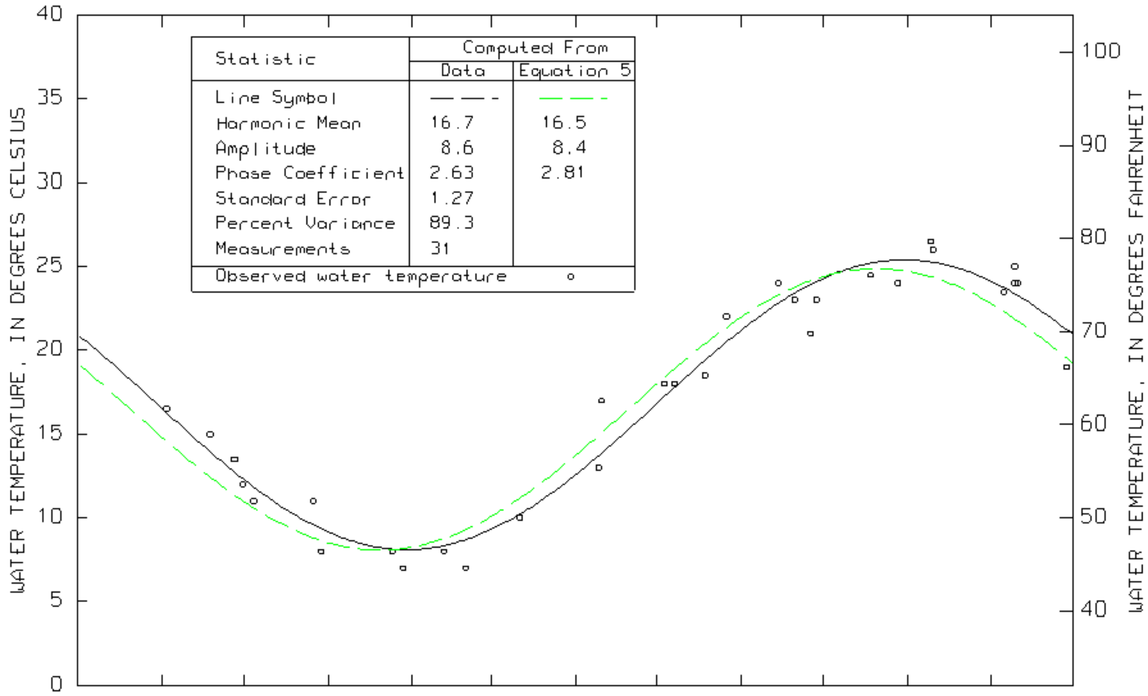
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	25.0	19.5	17.5	11.1	12.2	16.5	20.5	28.0	32.0	30.0	33.0	31.5
Minimum	15.6	11.0	6.5	5.0	7.0	9.0	9.0	17.2	21.5	24.0	24.0	20.0

Figure 62. Ocmulgee River at Macon, Georgia,
Station 02213000, May 1937 to December 1975.



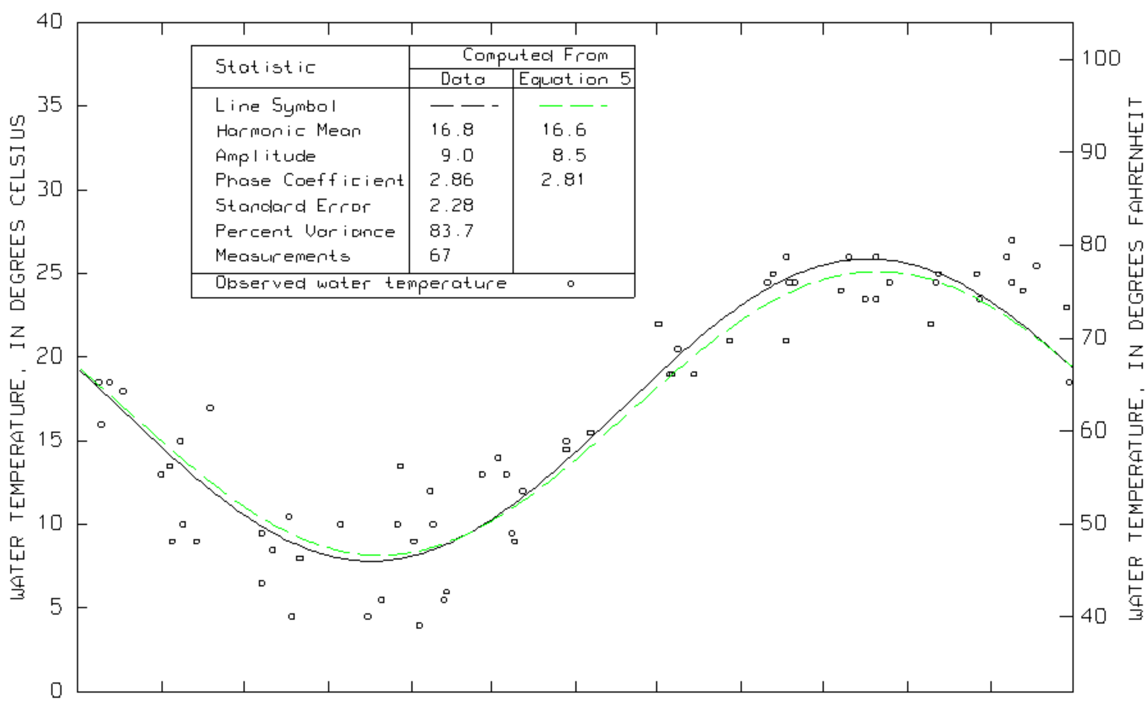
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	22.0	18.5	16.0	15.5	11.0	19.0	23.5	22.0	28.5	27.0	26.0	25.0
Minimum	15.0	8.0	4.5	4.0	4.5	9.5	15.5	16.5	19.5	21.5	20.5	18.0

Figure 63. Walnut Creek near Gray, Georgia,
Station 02213050, August 1962 to July 1976.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum		16.5	11.0	8.0	8.0	10.0	17.0	22.0	24.0	24.5	26.5	25.0
Minimum		12.0	8.0	7.0	7.0	10.0	13.0	18.0	21.0	24.0	26.0	19.0

Figure 64. Tobesofkee Creek above Macon, Georgia, Station 02213470, May 1967 to December 1973.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	18.5	17.0	10.5	13.5	13.0	15.0	15.5	22.0	26.0	26.0	25.0	27.0
Minimum	13.0	9.0	4.5	4.5	4.0	9.0	15.5	19.0	21.0	23.5	22.0	18.5

Figure 65. Tobesofkee Creek near Macon, Georgia, Station 02213500, October 1955 to October 1966.

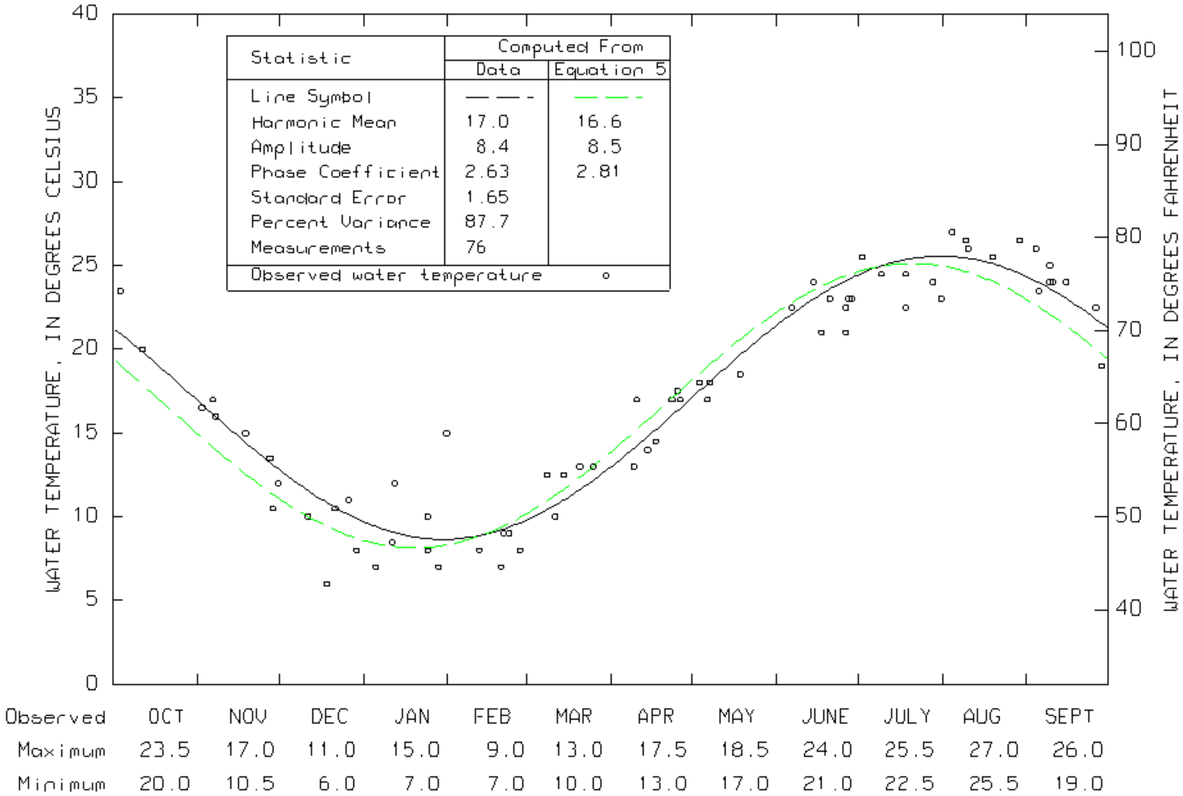


Figure 66. Tobesofkee Creek near Macon, Georgia,
Station 02213500, November 1966 to September 1974.

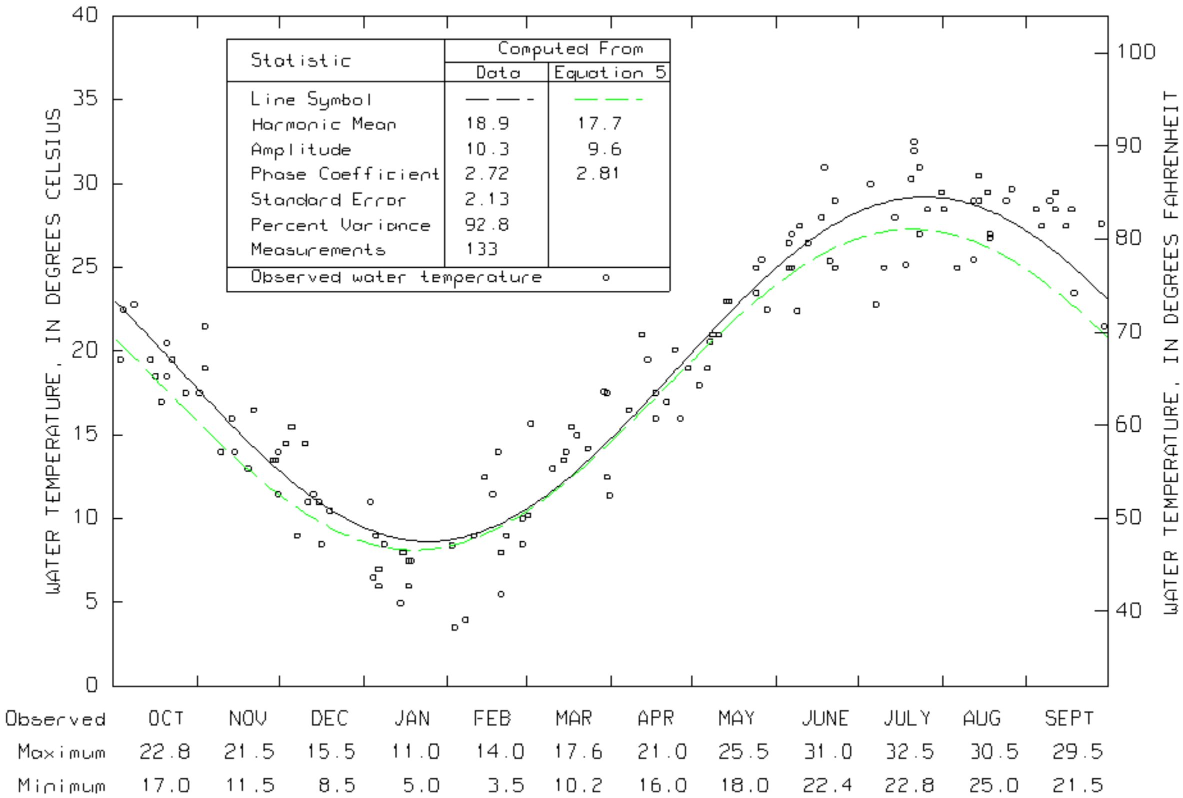
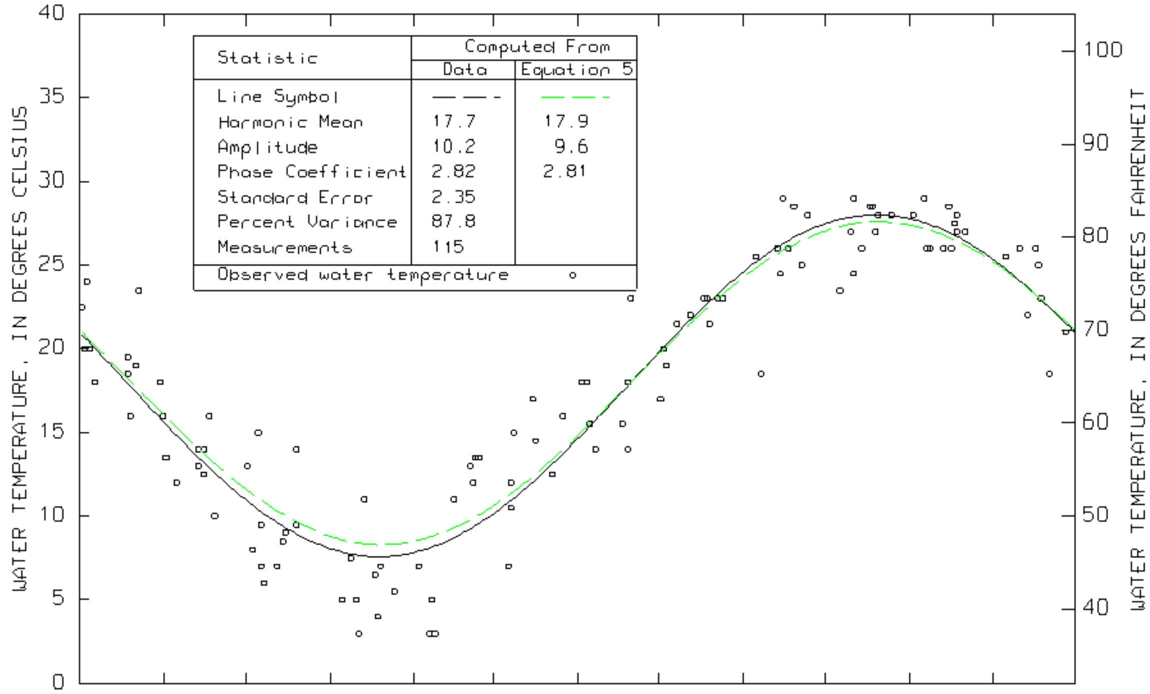
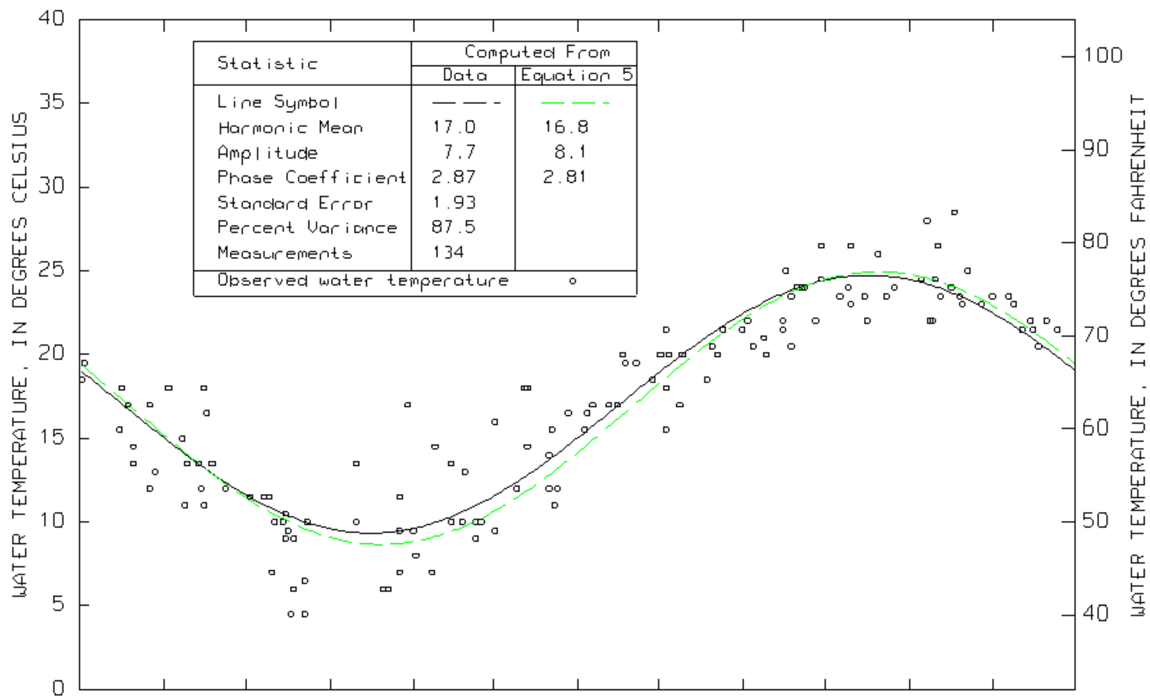


Figure 67. Ocmulgee River near Warner Robins, Georgia,
Station 02213700, November 1970 to December 1984.



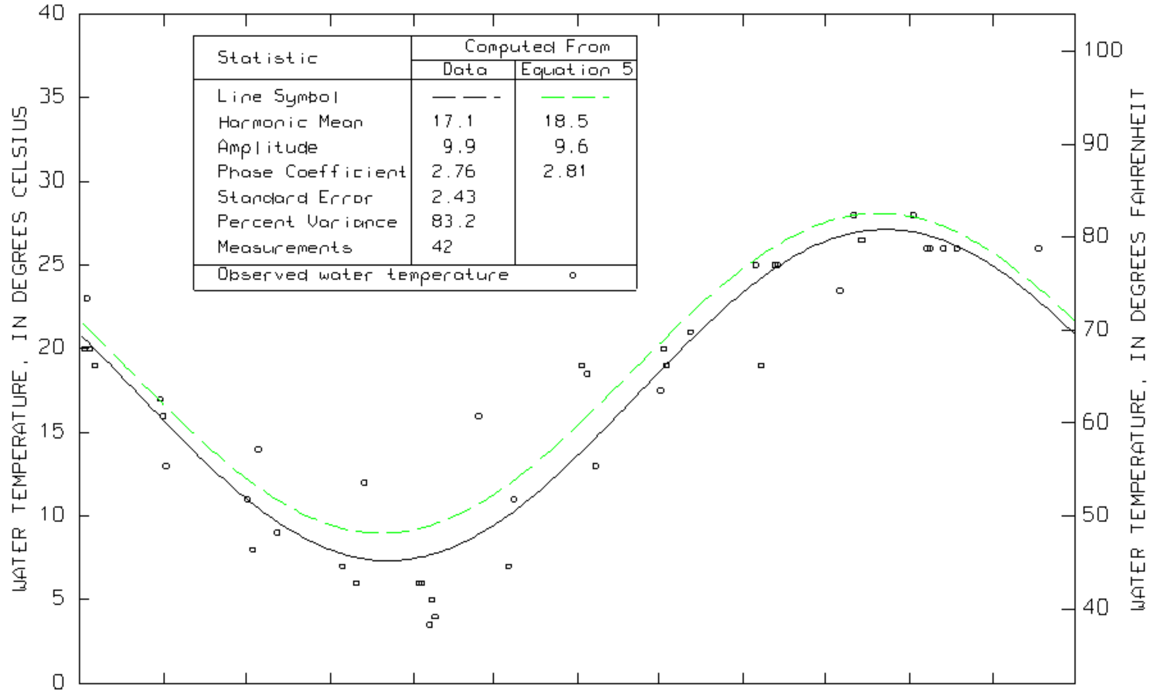
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.0	16.0	15.0	11.0	13.5	17.0	23.0	23.0	29.0	29.0	29.0	26.0
Minimum	16.0	10.0	6.0	3.0	3.0	7.0	14.0	17.0	18.5	23.5	26.0	18.5

Figure 68. Ocmulgee River near Bonaire, Georgia,
Station 02214265, August 1974 to December 1984.



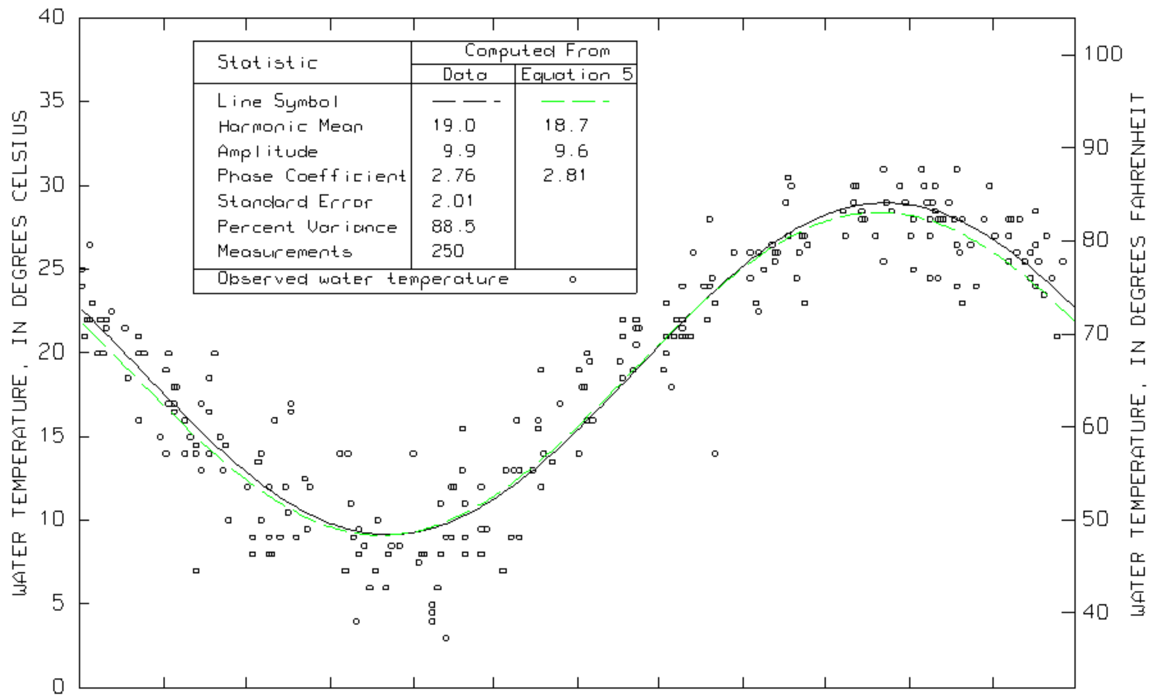
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.5	18.0	11.5	17.0	14.5	18.0	20.0	21.5	26.5	26.5	28.5	23.5
Minimum	12.0	11.0	4.5	6.0	7.0	9.5	15.5	15.5	20.0	22.0	22.0	20.5

Figure 69. Big Indian Creek at Perry, Georgia,
Station 02214500, April 1954 to January 1974.



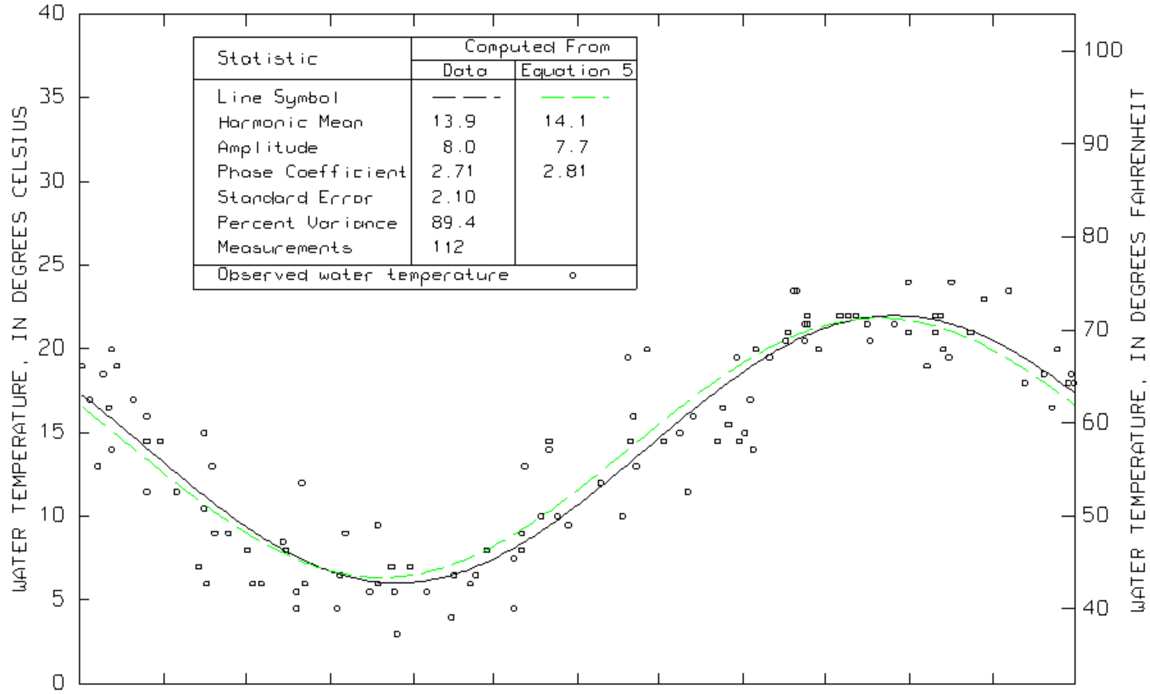
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	13.0	14.0	12.0	16.0	11.0	19.0	21.0	25.0	28.0	28.0	26.0
Minimum	16.0	13.0	8.0	6.0	3.5	7.0	13.0	17.5	19.0	23.5	26.0	26.0

Figure 70. Ocmulgee River at Abbeville, Georgia,
Station 02215260, February 1958 to June 1979.



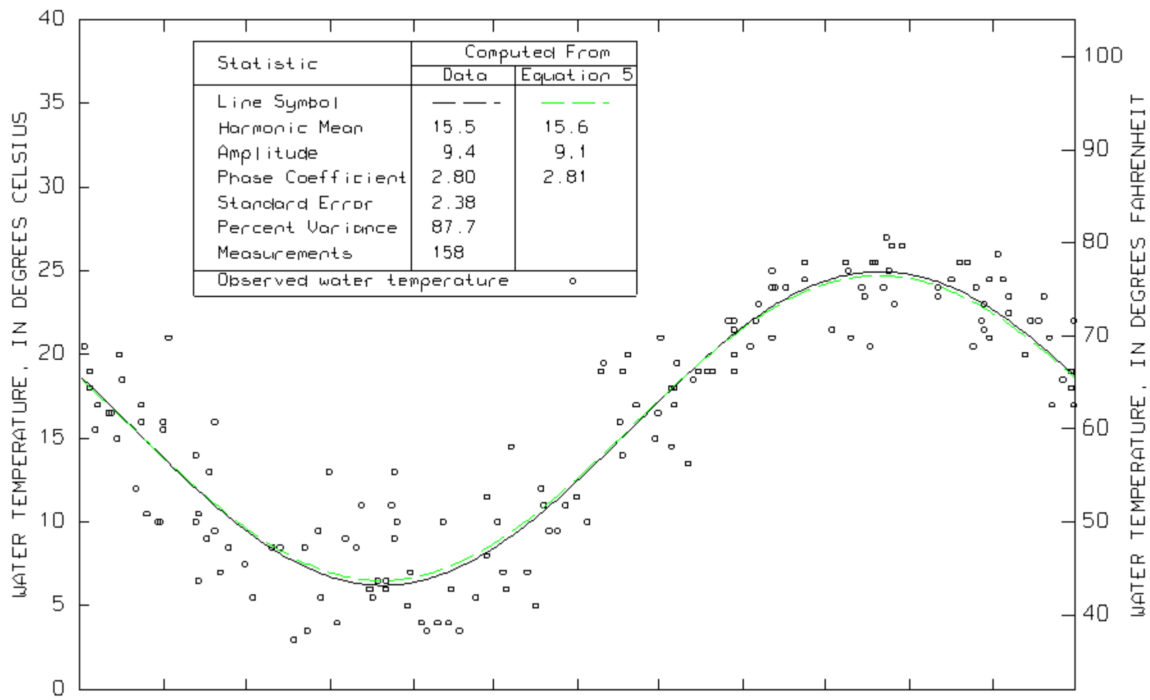
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	26.5	20.0	17.0	14.0	15.5	19.0	22.0	28.0	30.5	31.0	31.0	28.5
Minimum	15.0	7.0	8.0	4.0	3.0	7.0	14.0	14.0	22.5	25.5	23.0	21.0

Figure 71. Ocmulgee River at Lumber City, Georgia,
Station 02215500, June 1954 to December 1984.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	15.0	12.0	9.5	8.0	14.5	20.0	19.5	23.5	24.0	24.0	23.5
Minimum	11.5	6.0	4.5	3.0	4.0	4.5	10.0	11.5	14.0	20.5	19.0	16.5

Figure 72. Allen Creek at Talmo, Georgia,
Station 02217000, October 1956 to June 1974.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.5	21.0	13.0	13.0	11.5	14.5	20.0	22.0	25.5	27.0	25.5	26.0
Minimum	10.0	6.5	3.0	4.0	3.5	5.0	10.0	13.5	20.5	20.5	20.5	17.0

Figure 73. Middle Oconee River near Athens, Georgia,
Station 02217500, August 1956 to October 1977.

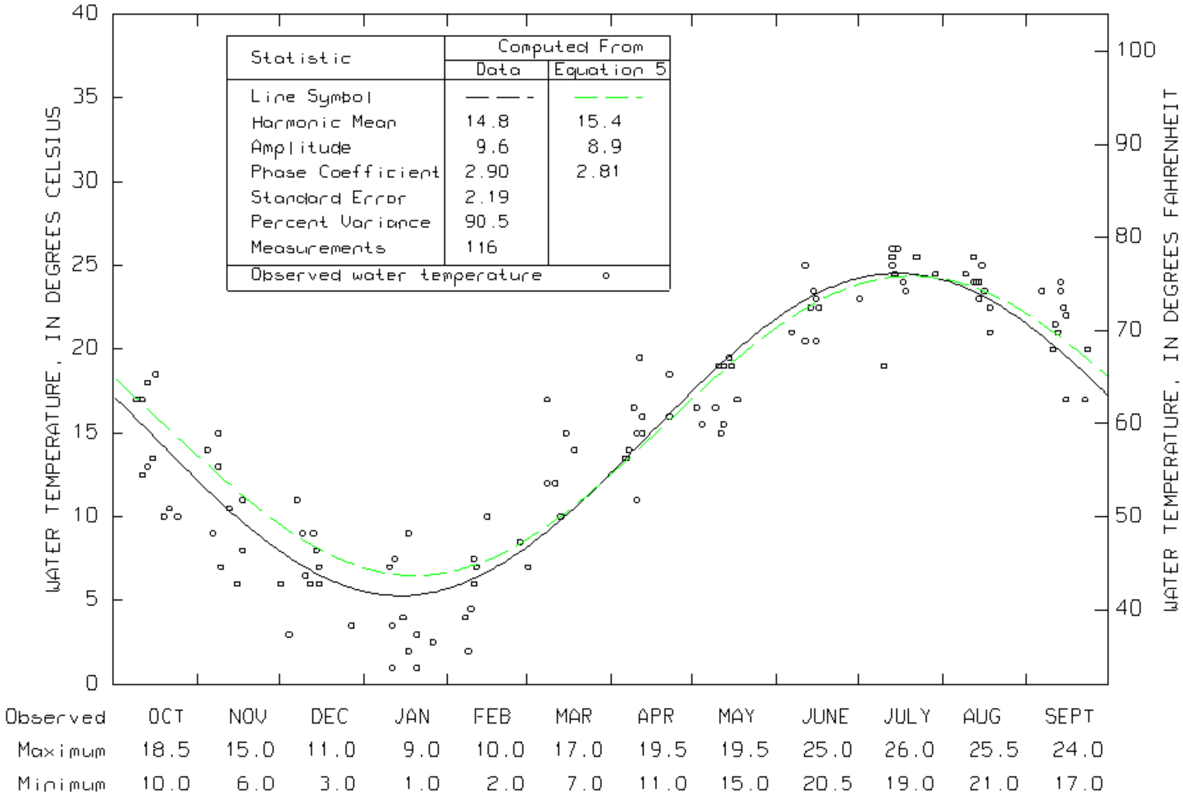


Figure 74. North Oconee River (Athens Intake) at Athens, Georgia, Station 02217740, July 1974 to December 1984.

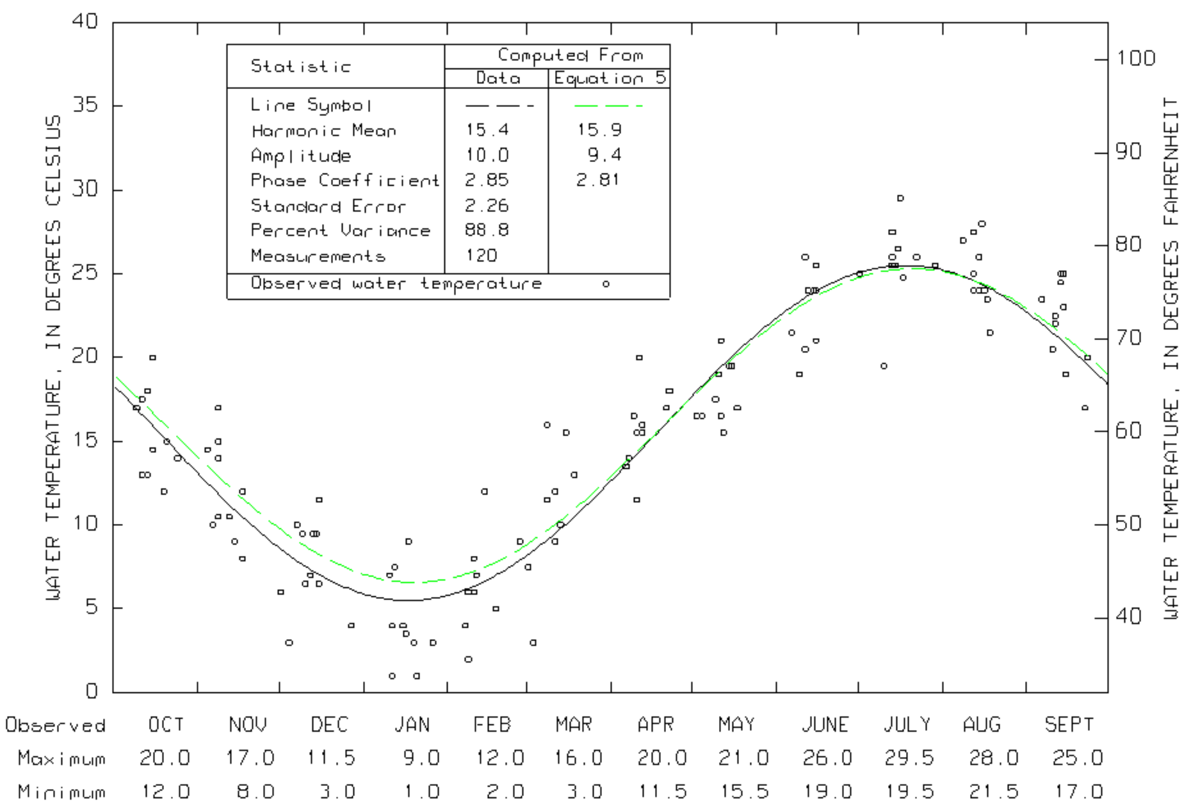
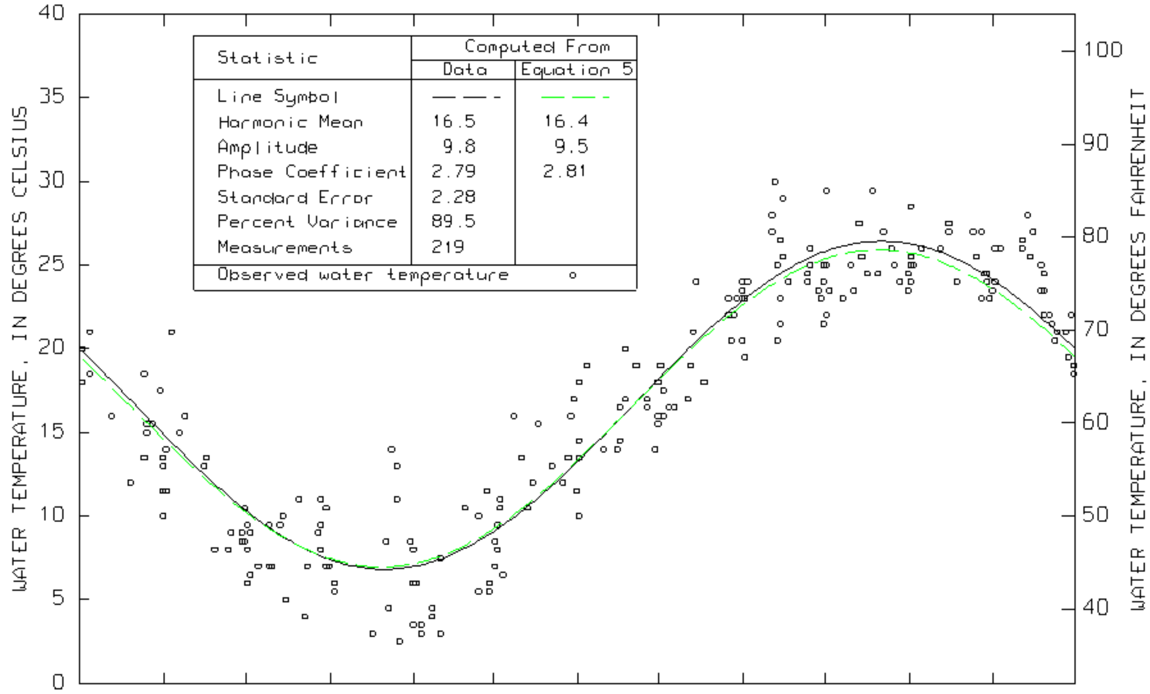
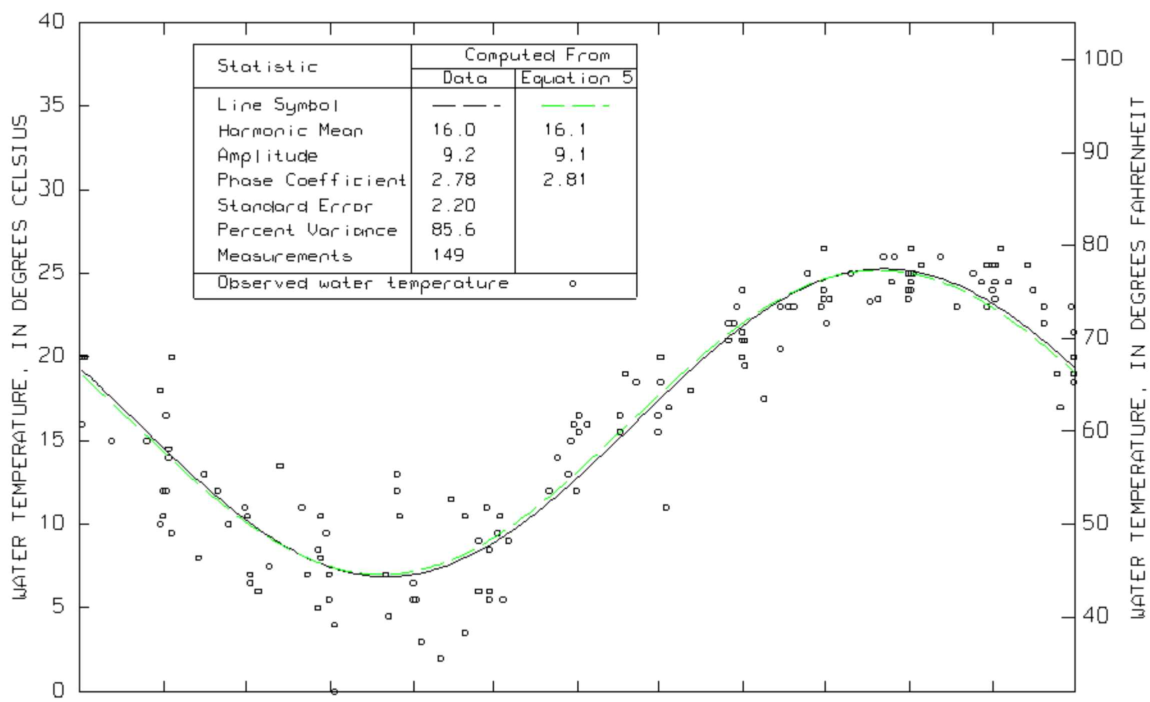


Figure 75. Oconee River at Barnett Shoals near Watkinsville, Georgia, Station 02218000, July 1974 to December 1984.



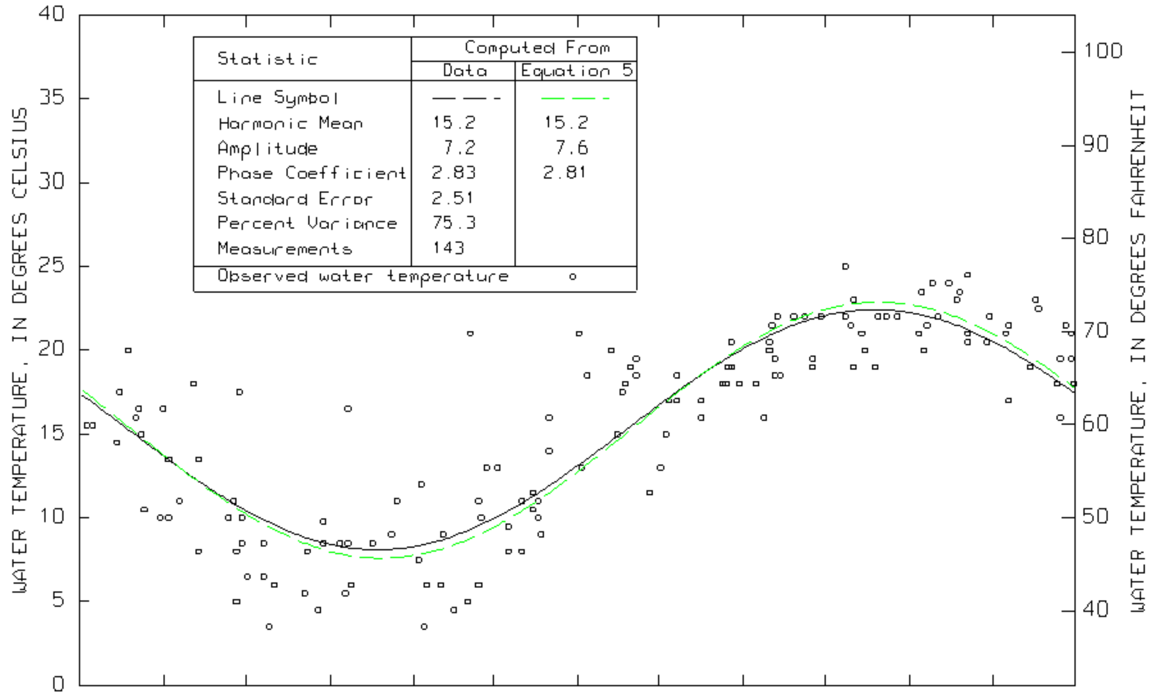
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	21.0	11.0	14.0	11.5	17.0	20.0	24.0	30.0	29.4	28.5	28.0
Minimum	10.0	8.0	4.0	2.5	3.0	6.5	10.0	16.0	19.5	22.0	23.0	18.5

Figure 76. Oconee River near Greensboro, Georgia,
Station 02218500, July 1956 to December 1984.



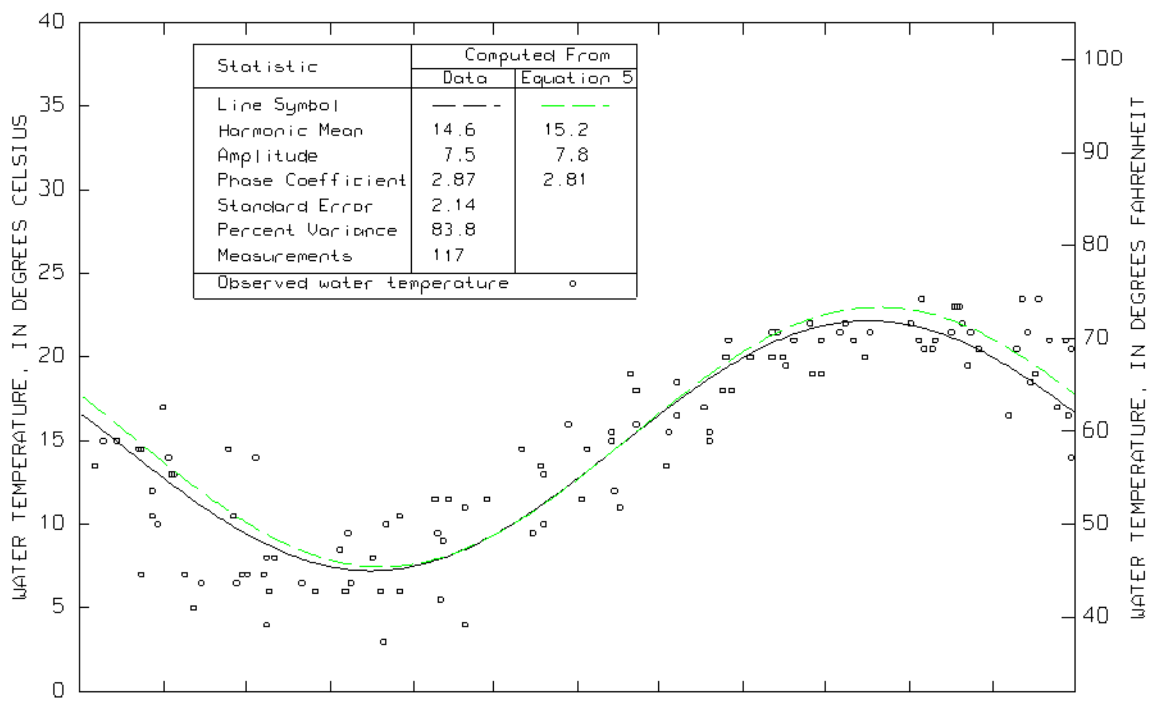
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	20.0	13.5	13.0	11.5	16.0	19.0	24.0	26.5	26.0	26.5	26.5
Minimum	10.0	8.0	5.0	0.1	2.0	5.5	15.5	11.0	17.5	22.0	23.0	17.0

Figure 77. Apalachee River near Buckhead, Georgia,
Station 02219500, July 1956 to July 1976.



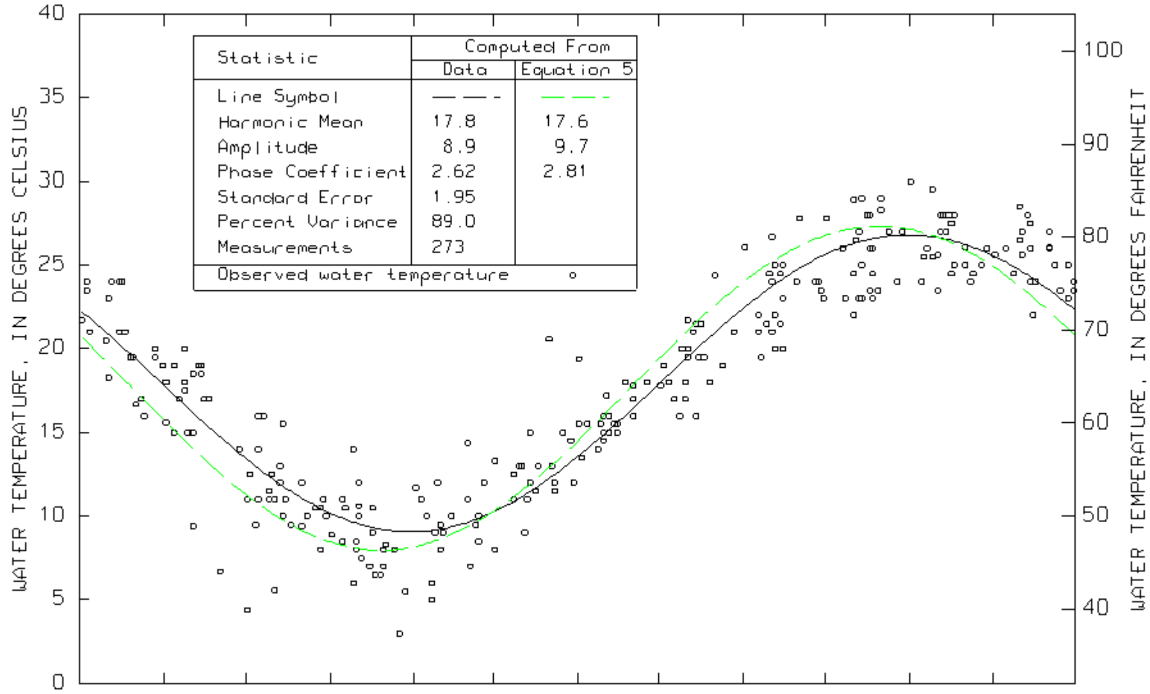
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	18.0	9.8	16.5	21.0	16.0	21.0	20.5	22.0	25.0	24.5	23.0
Minimum	10.0	5.0	3.5	5.5	3.5	8.0	11.5	13.0	16.0	19.0	20.0	16.0

Figure 78. Whitten Creek near Sparta, Georgia,
Station 02220550, December 1960 to August 1976.



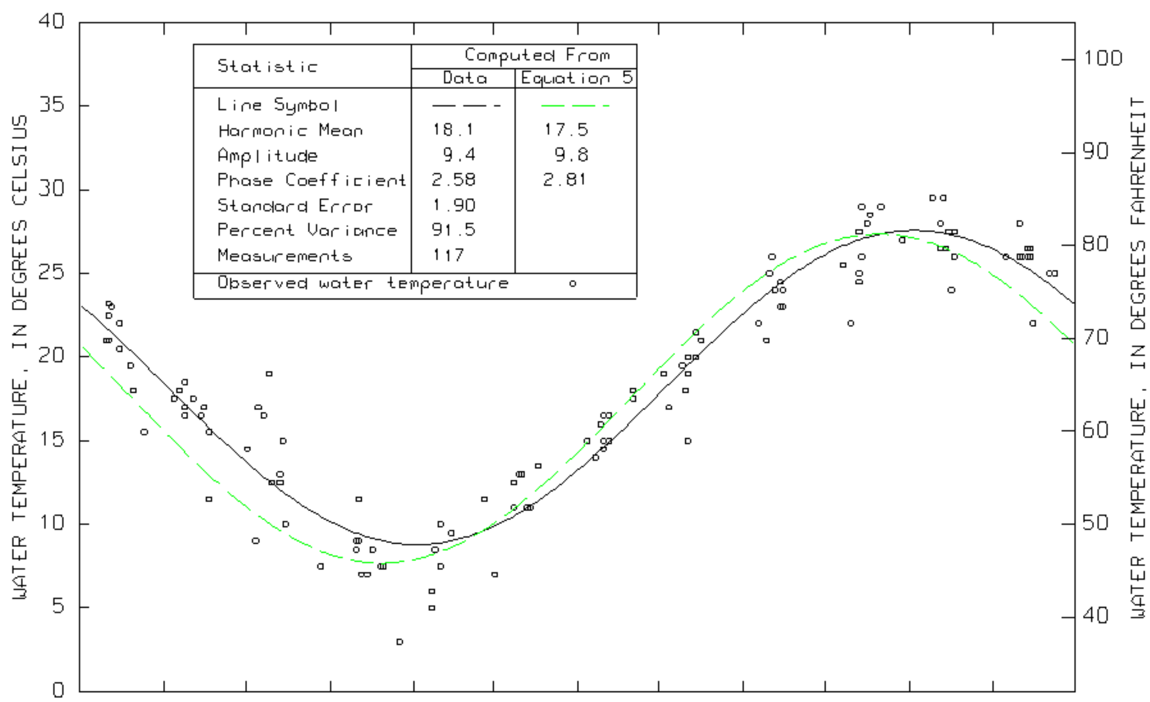
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	17.0	14.5	14.0	10.5	11.5	16.0	19.0	21.0	22.0	22.0	23.5	23.5
Minimum	7.0	5.0	4.0	3.0	4.0	9.5	11.0	13.5	19.0	20.0	19.5	14.0

Figure 79. Murder Creek near Monticello, Georgia,
Station 02221000, August 1956 to December 1973.



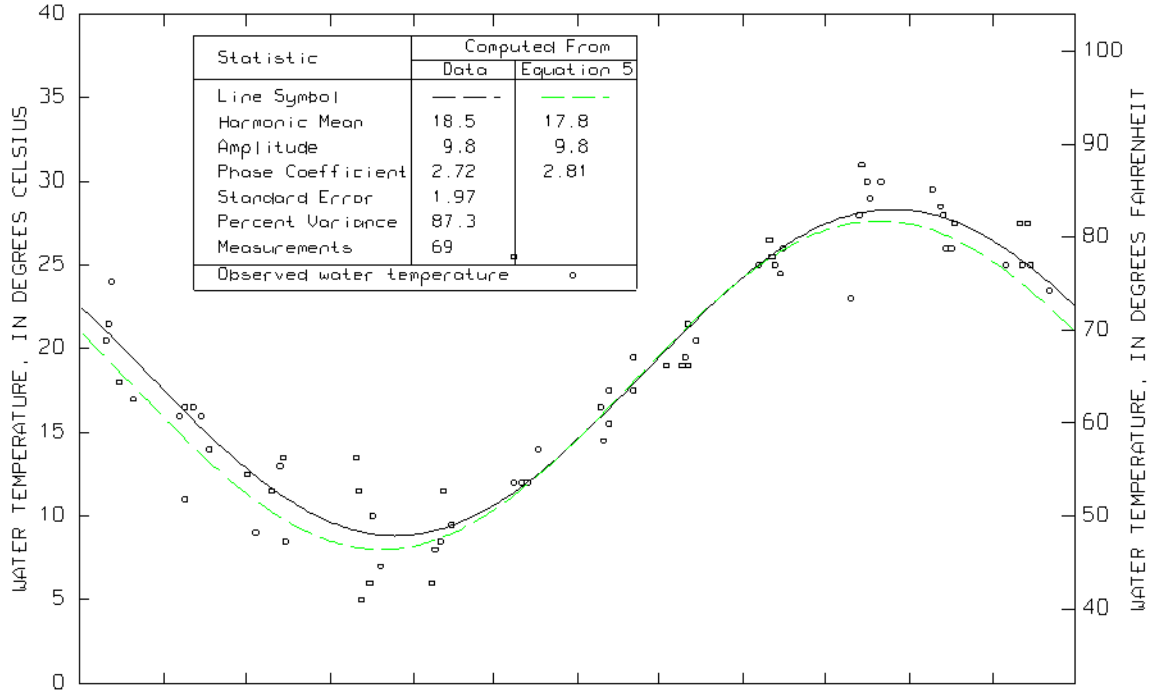
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.0	20.0	16.0	14.0	14.4	20.6	19.4	24.4	27.8	29.0	30.0	28.5
Minimum	16.0	6.7	4.4	3.0	5.0	8.0	13.5	16.0	19.5	22.0	23.5	22.0

Figure 80. Oconee River at Milledgeville, Georgia,
Station 02223000, May 1937 to December 1984.



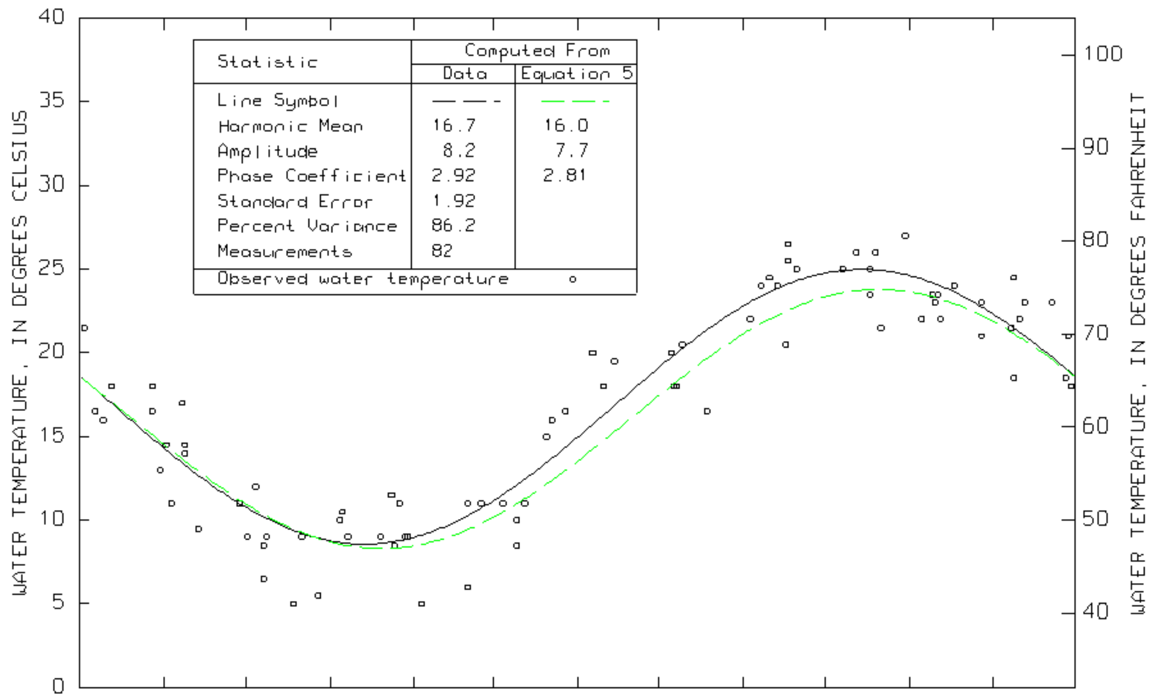
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.2	18.5	19.0	11.5	11.5	13.5	18.0	21.5	26.0	29.0	29.5	28.0
Minimum	15.5	11.5	7.5	3.0	5.0	7.0	14.0	15.0	21.0	22.0	24.0	22.0

Figure 81. Oconee River near Hardwick, Georgia,
Station 02223040, July 1974 to December 1984.



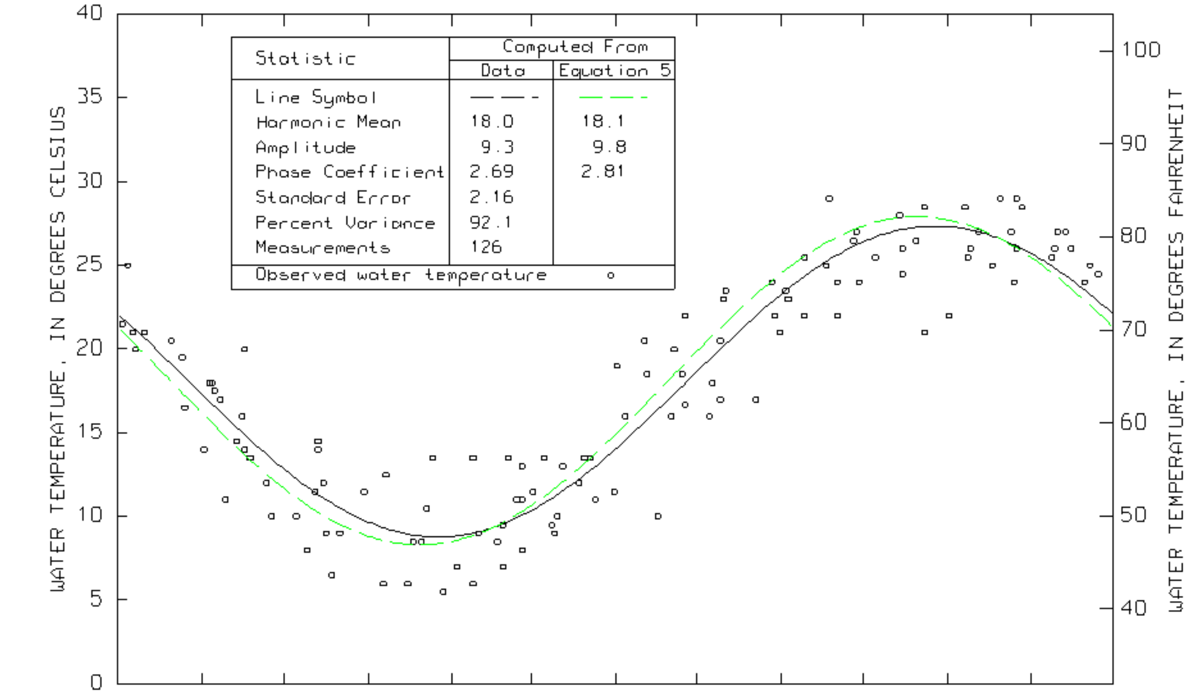
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.0	16.5	13.5	13.5	11.5	25.5	19.5	21.5	26.5	31.0	29.5	27.5
Minimum	17.0	11.0	8.5	5.0	6.0	12.0	14.5	19.0	24.5	23.0	26.0	23.5

Figure 82. Oconee River at State Highway 57 near Toomsboro, Georgia, Station 02223250, February 1979 to December 1984.



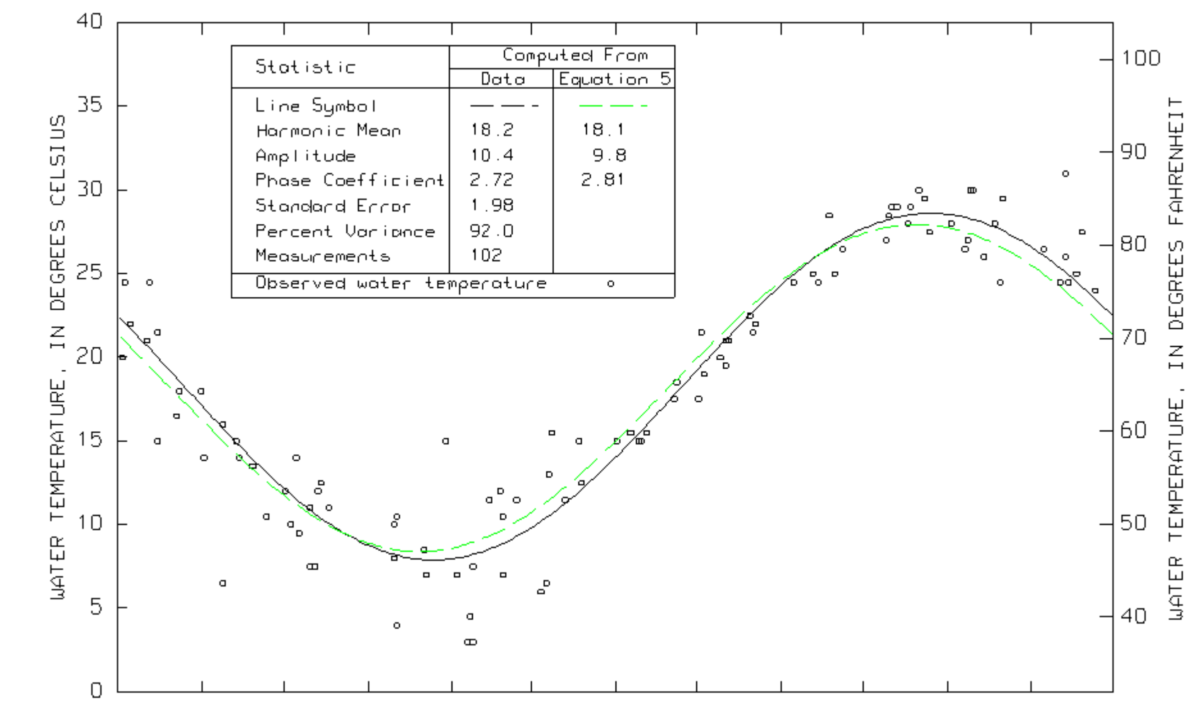
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.5	17.0	12.0	11.5	11.0	16.5	20.0	20.5	26.5	27.0	24.0	24.5
Minimum	13.0	9.5	5.0	8.5	5.0	8.5	18.0	16.5	20.5	21.5	21.0	18.0

Figure 83. Big Sandy Creek near Jeffersonville, Georgia, Station 02223300, August 1958 to December 1973.



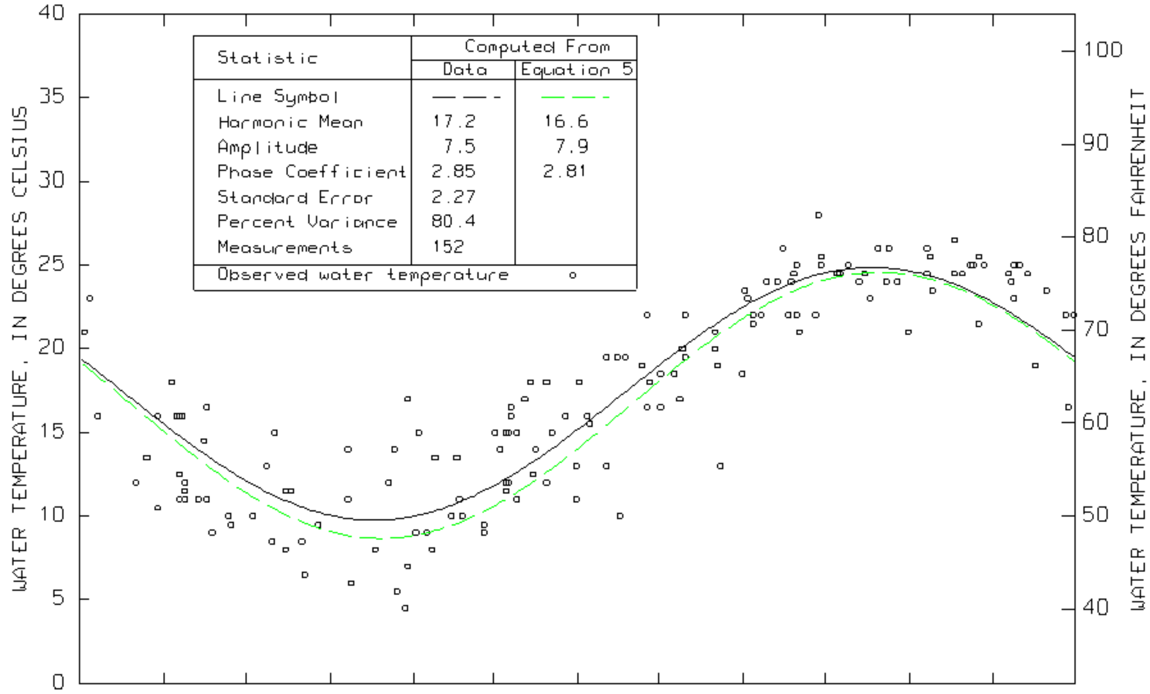
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	25.0	20.0	14.5	13.5	13.5	13.5	22.0	24.0	29.0	28.5	29.0	27.0
Minimum	16.5	10.0	6.5	5.5	6.0	9.0	10.0	16.0	22.0	21.0	22.0	24.0

Figure 84. Oconee River at Dublin, Georgia, Station 02223500, November 1954 to November 1976.



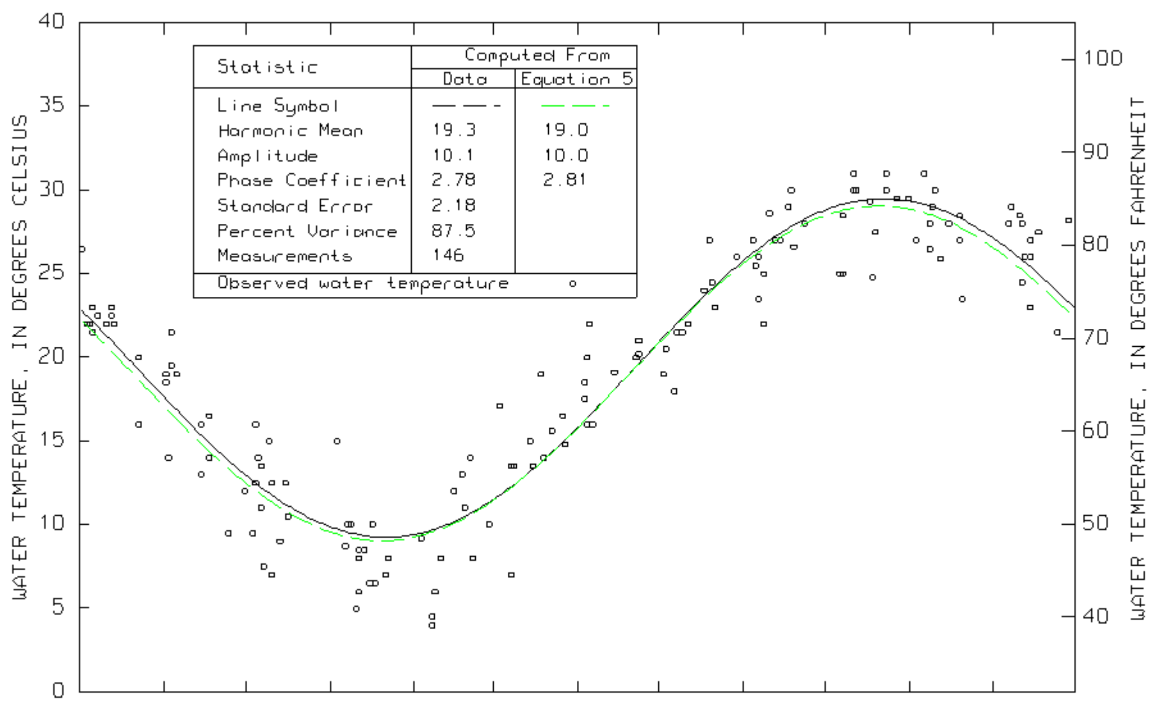
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.5	16.0	14.0	15.0	12.0	15.5	18.5	22.5	28.5	30.0	30.0	31.0
Minimum	15.0	6.5	7.5	4.0	3.0	6.0	15.0	17.5	24.5	27.0	24.5	24.0

Figure 85. Oconee River at Interstate Highway 16 near Dublin, Georgia, Station 02223600, October 1973 to December 1984.



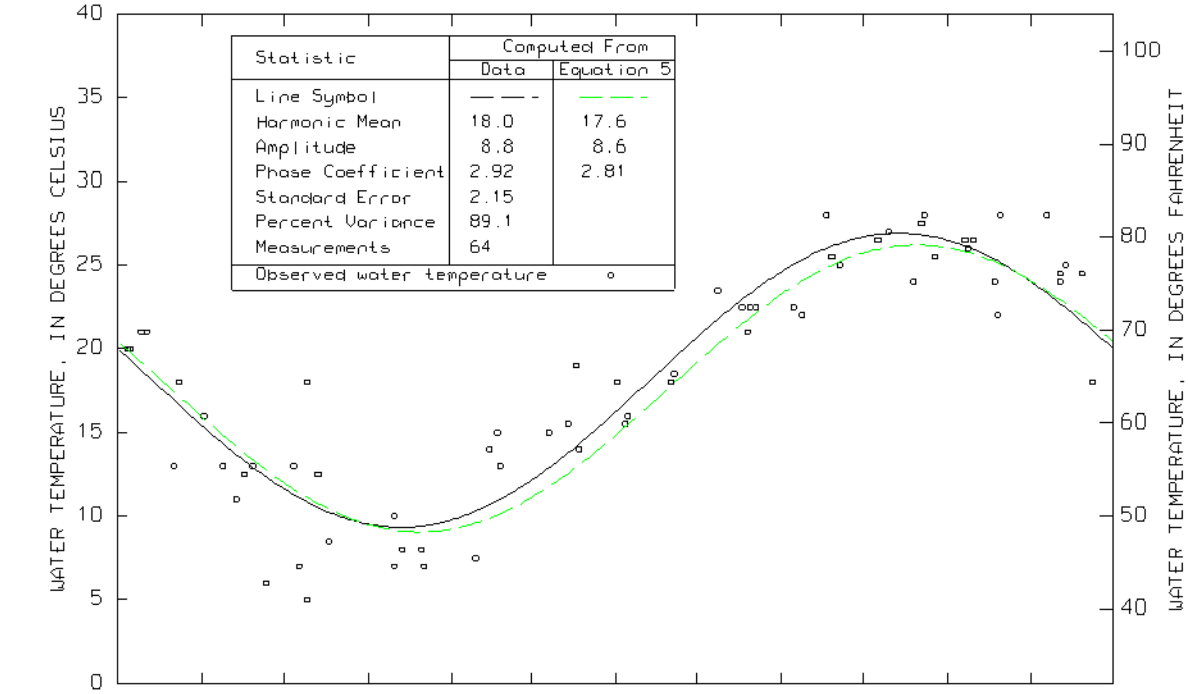
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	18.0	15.0	17.0	15.0	18.0	22.0	22.0	28.0	26.0	26.5	25.0
Minimum	10.5	9.0	6.5	4.5	8.0	11.0	10.0	13.0	21.0	21.0	21.5	16.5

Figure 86. Rocky Creek near Dudley, Georgia,
Station 02224000, August 1954 to March 1984.



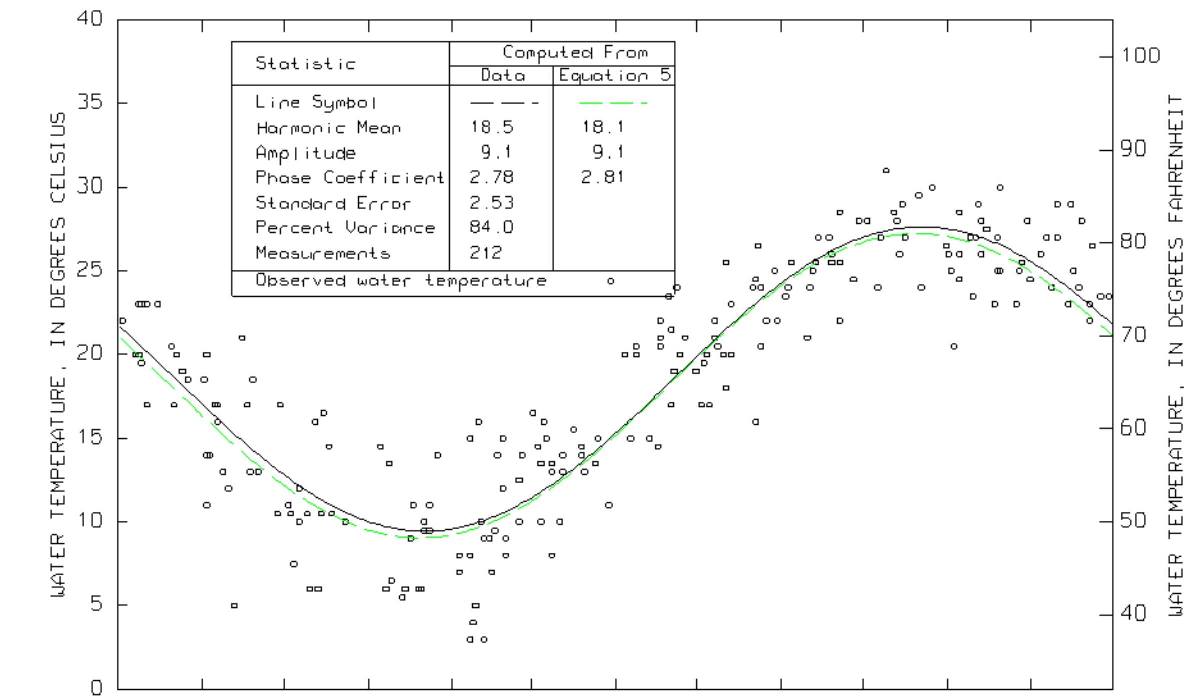
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	26.5	21.5	16.0	15.0	14.0	19.0	22.0	27.0	30.0	31.0	31.0	29.0
Minimum	16.0	9.5	7.0	5.0	4.0	7.0	16.0	18.0	22.0	24.8	23.5	21.5

Figure 87. Altamaha River near Baxley, Georgia,
Station 02225000, December 1957 to December 1984.



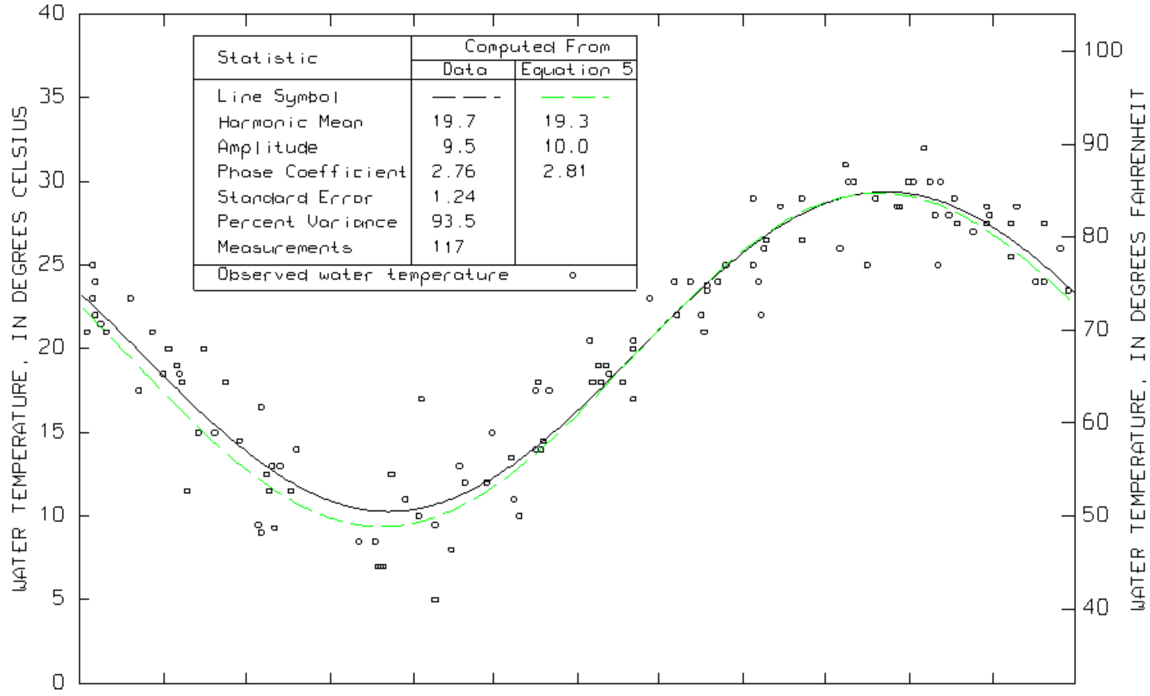
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	16.0	18.0	10.0	15.0	19.0	18.5	23.5	28.0	28.0	28.0	28.0
Minimum	13.0	6.0	5.0	7.0	7.5	14.0	15.5	21.0	22.0	24.0	22.0	18.0

Figure 88. Pendelton Creek at State Highway 86 below Ohoopee, Georgia, Station 02225470, July 1979 to December 1984.



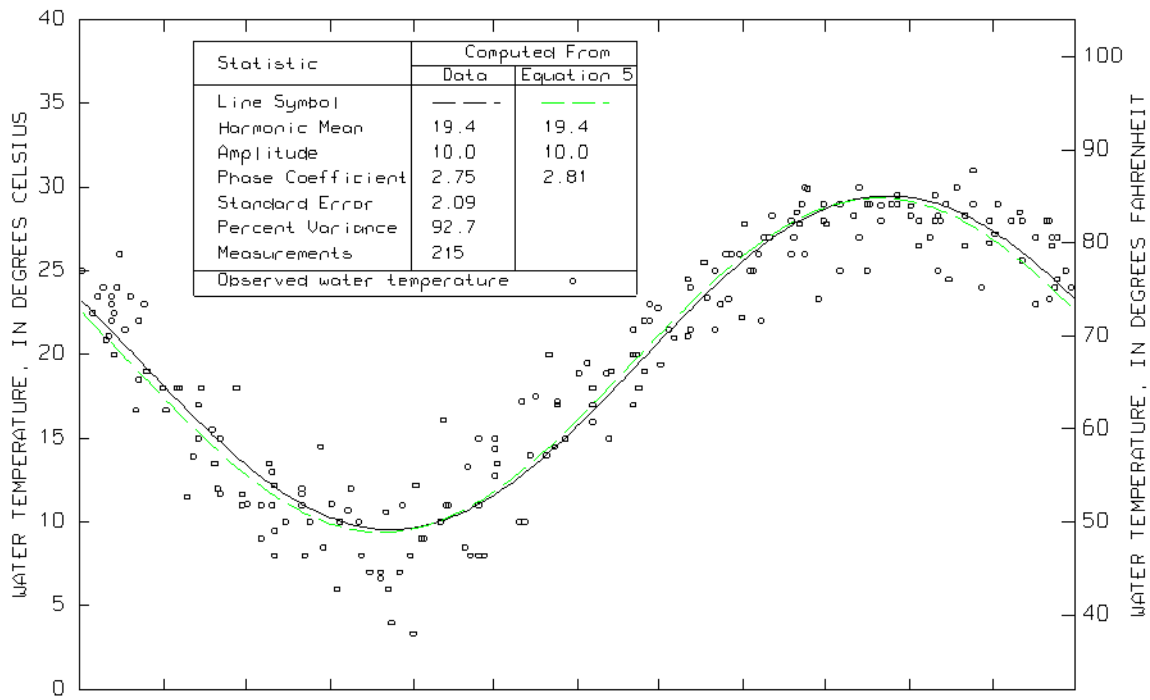
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	21.0	16.5	14.5	16.0	16.5	24.0	26.5	28.5	31.0	30.0	29.0
Minimum	17.0	5.0	6.0	5.5	3.0	8.0	14.5	16.0	21.0	24.0	20.5	22.0

Figure 89. Ohoopee River near Reidsville, Georgia, Station 02225500, July 1954 to October 1982.



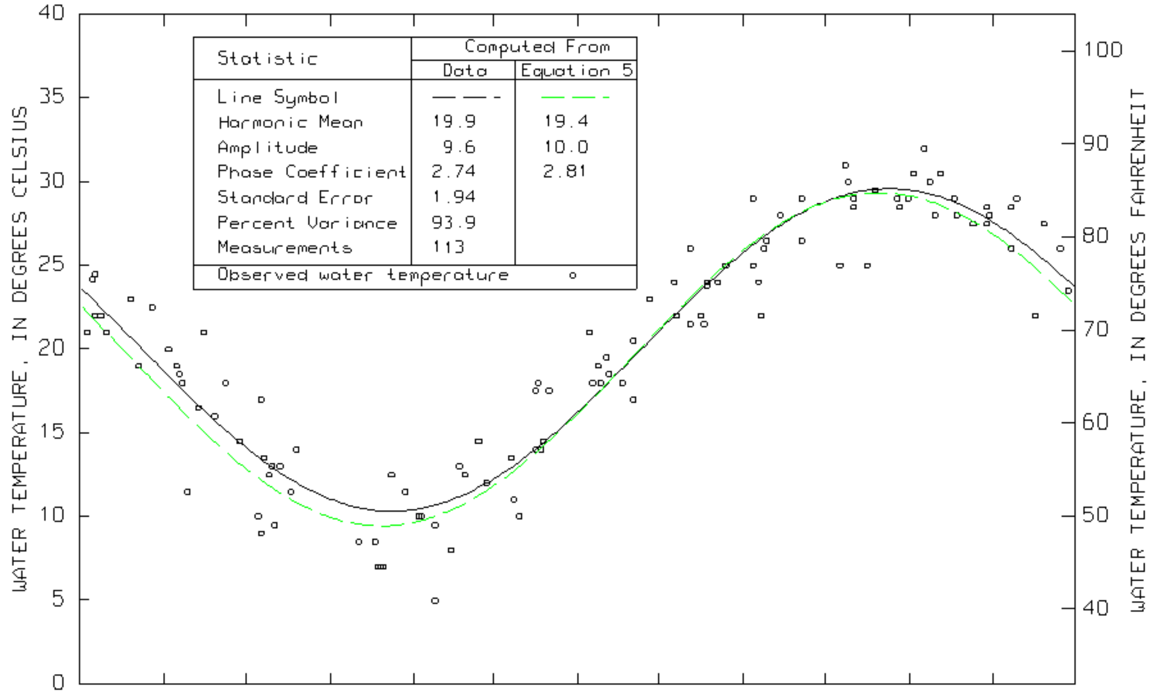
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	25.0	20.0	16.5	12.5	17.0	18.0	23.0	25.0	29.0	31.0	32.0	28.5
Minimum	17.5	11.5	9.0	7.0	5.0	10.0	17.0	21.0	22.0	25.0	25.0	23.5

Figure 90. Altamaha River near Jesup, Georgia,
Station 02225990, August 1974 to December 1984.



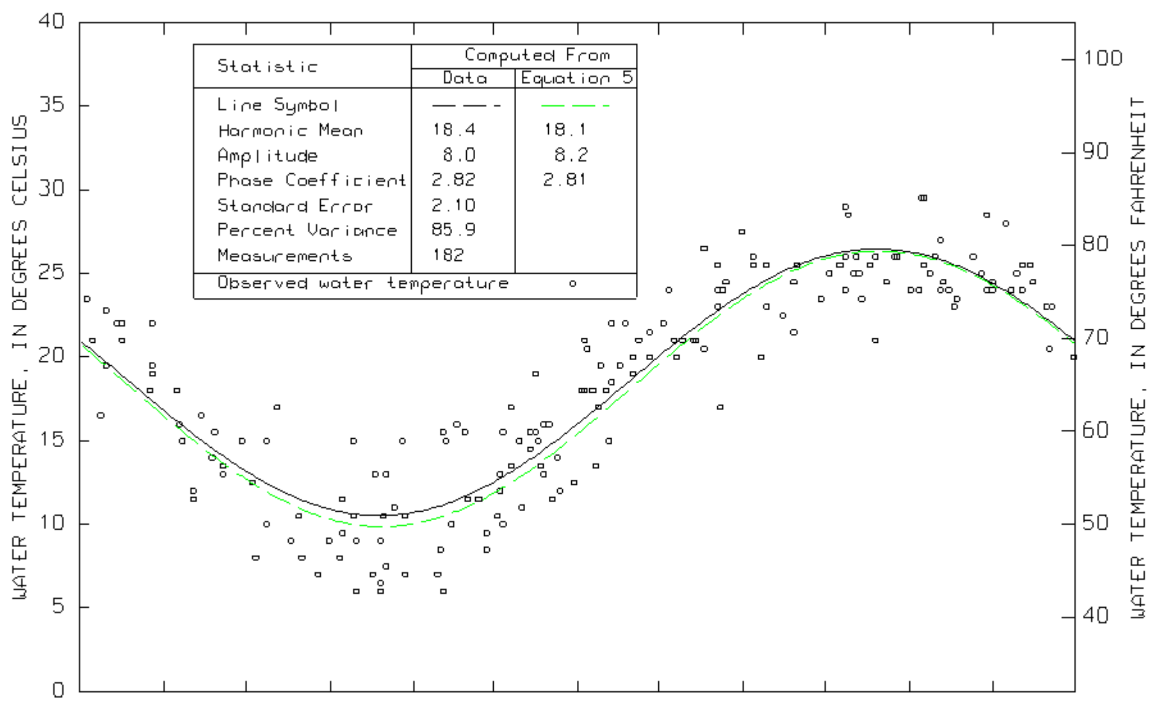
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	26.0	18.0	14.5	12.0	16.1	20.0	23.0	26.0	30.0	30.0	31.0	29.0
Minimum	16.7	11.0	8.0	3.3	8.0	10.0	15.0	19.4	22.0	25.0	24.0	23.0

Figure 91. Altamaha River at Doctortown, Georgia,
Station 02226000, May 1937 to October 1979.



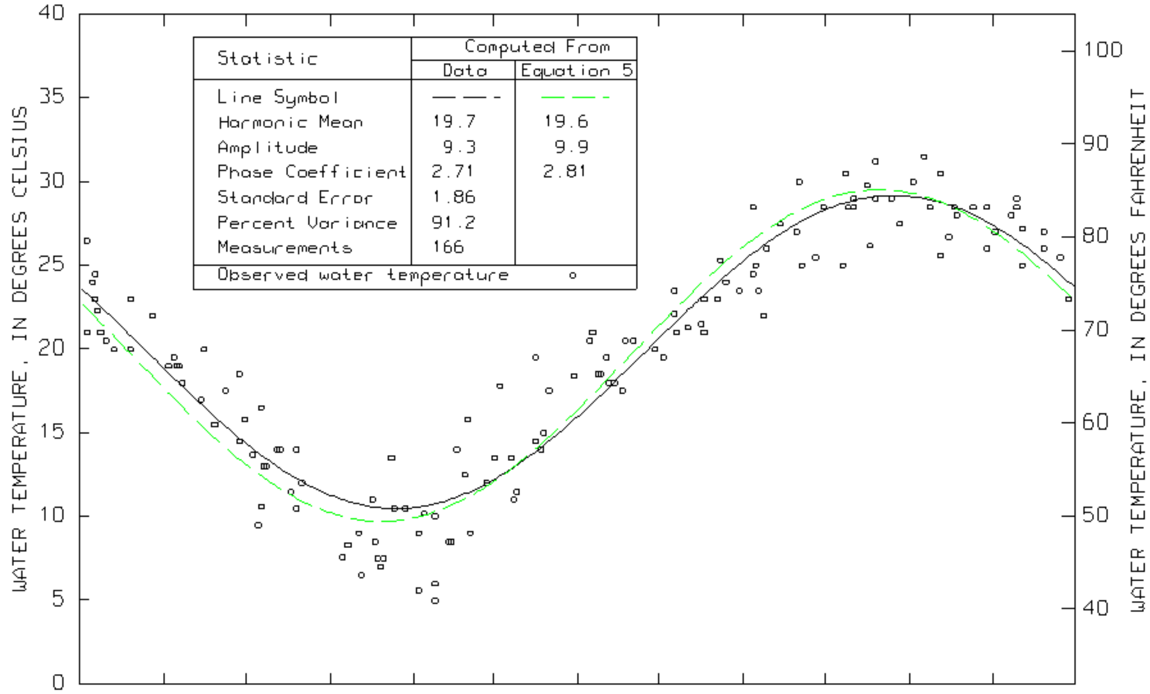
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.5	21.0	17.0	12.5	14.5	18.0	23.0	26.0	29.0	31.0	32.0	29.0
Minimum	19.0	11.5	9.0	7.0	5.0	10.0	17.0	21.5	22.0	25.0	27.5	22.0

Figure 92. Altamaha River near Gardi, Georgia,
Station 02226010, November 1974 to December 1984.



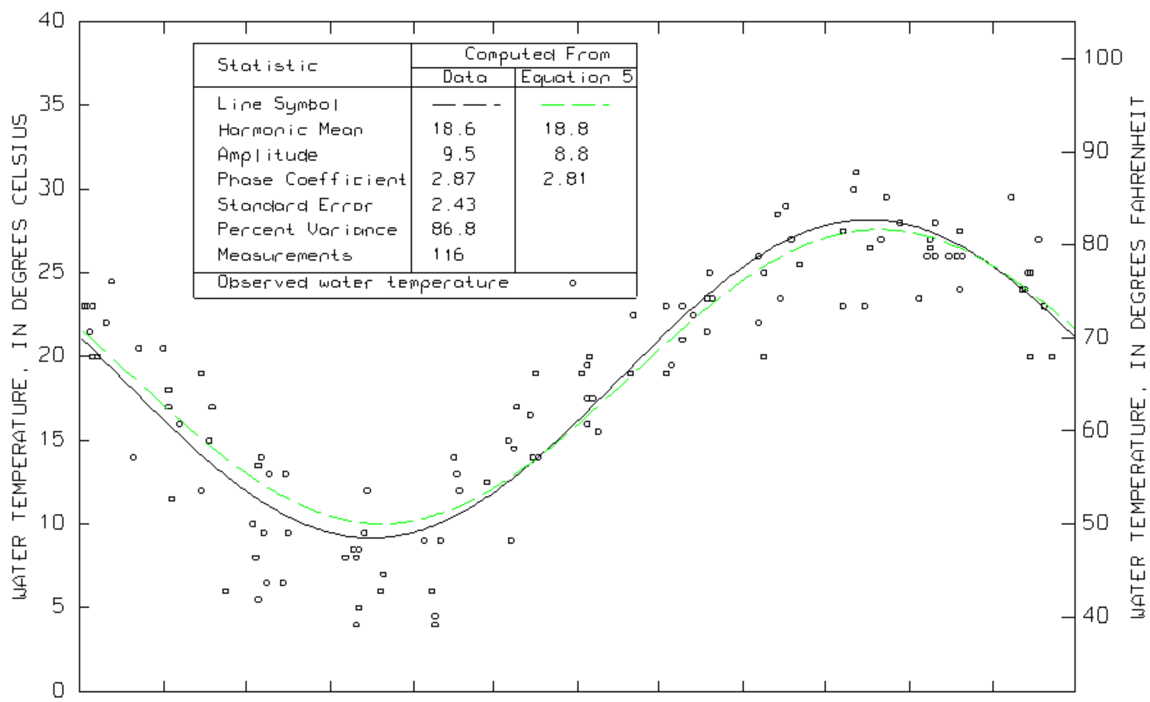
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.5	18.0	17.0	15.0	16.0	19.0	22.0	27.5	26.0	29.0	29.5	28.0
Minimum	16.5	11.5	7.0	6.0	6.0	10.0	13.5	17.0	20.0	21.0	23.0	20.0

Figure 93. Penholoway Creek near Jesup, Georgia,
Station 02226100, December 1958 to July 1984.



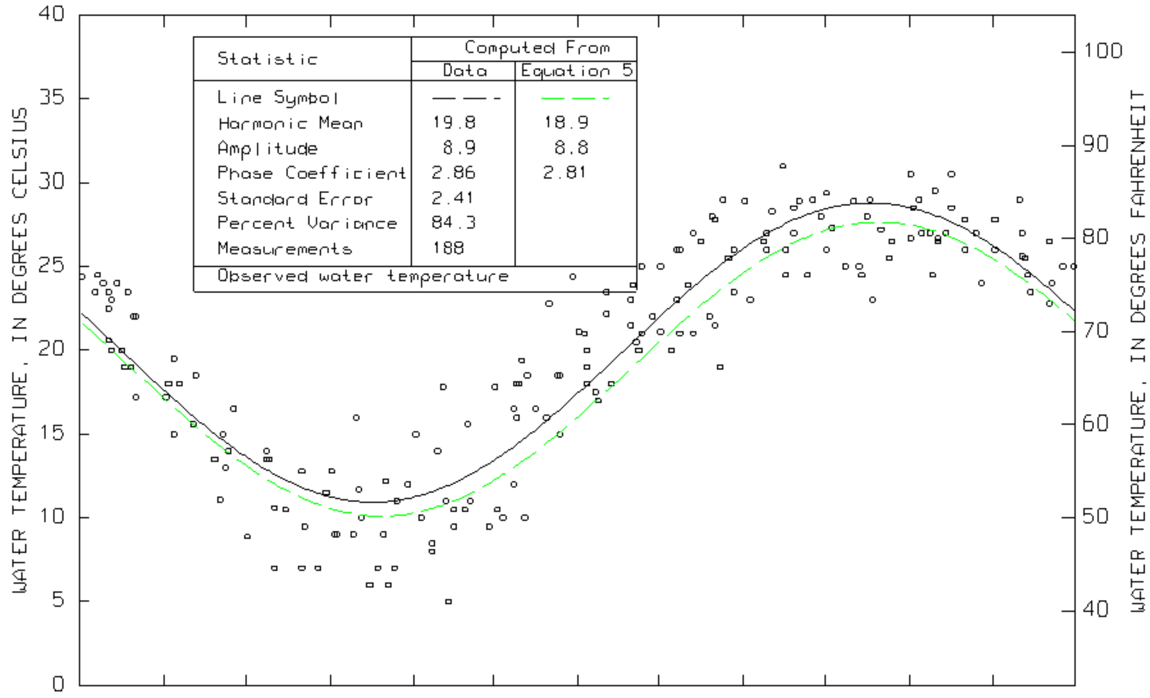
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	26.5	20.0	16.5	13.5	15.8	19.5	21.0	25.3	30.0	31.2	31.5	29.0
Minimum	20.0	14.5	9.5	6.5	5.0	11.0	17.5	19.5	22.0	25.0	25.6	23.0

Figure 94. Altamaha River at Everett City, Georgia, Station 02226160, December 1970 to December 1984.



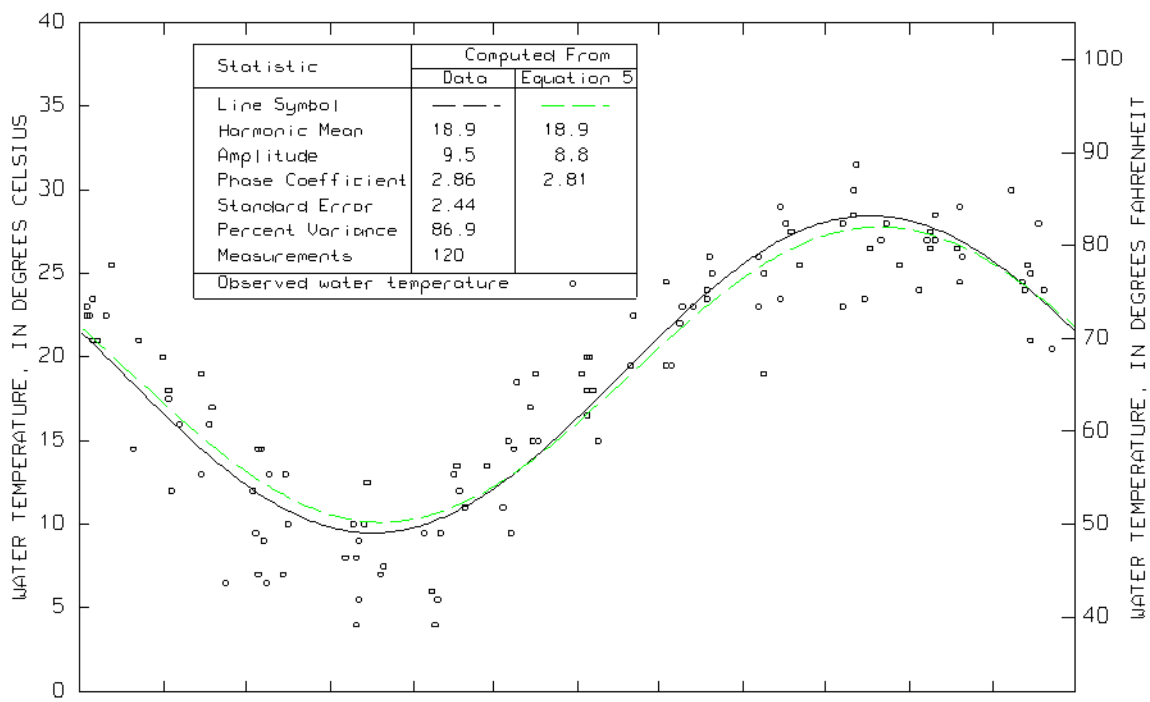
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.5	19.0	14.0	12.0	14.0	19.0	22.5	25.0	29.0	31.0	28.0	29.5
Minimum	14.0	6.0	5.5	4.0	4.0	9.0	15.5	19.0	20.0	23.0	23.5	20.0

Figure 95. Satilla River at Waltertown, Georgia, Station 02226475, August 1974 to December 1984.



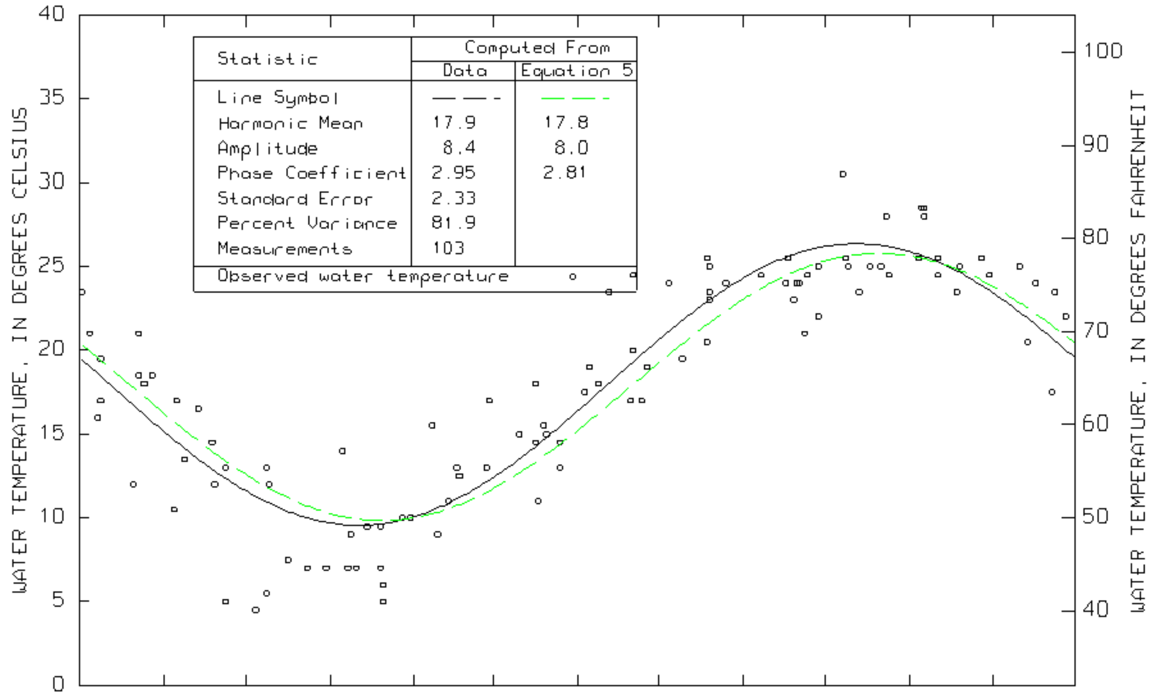
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.5	19.5	14.0	16.0	17.8	22.8	25.0	29.0	31.0	29.4	30.5	29.0
Minimum	17.2	11.1	7.0	6.0	5.0	10.0	17.0	19.0	23.0	23.0	24.0	22.8

Figure 96. Satilla River near Waycross, Georgia,
Station 02226500, May 1937 to August 1974.



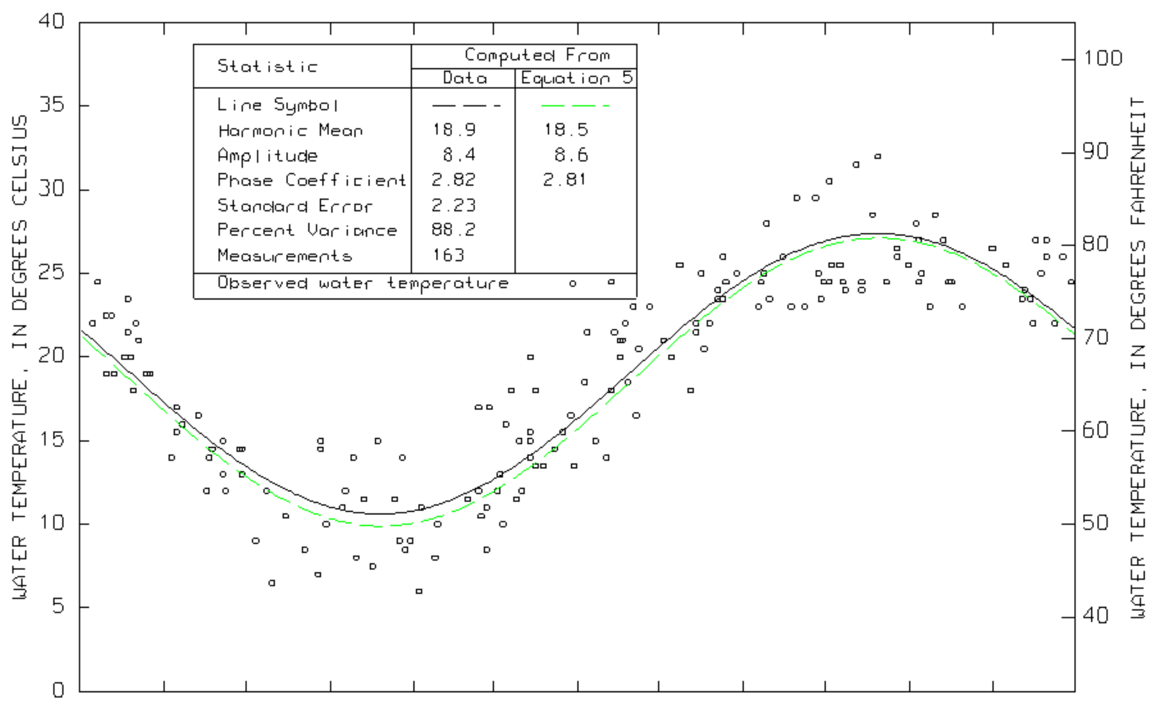
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	25.5	19.0	14.5	12.5	13.5	19.0	22.5	26.0	29.0	31.5	29.0	30.0
Minimum	14.5	6.5	6.5	4.0	4.0	9.5	15.0	19.5	19.0	23.0	24.0	20.5

Figure 97. Satilla River at State Highways 15 and 121 near Hoboken, Georgia,
Station 02226582, August 1974 to December 1984.



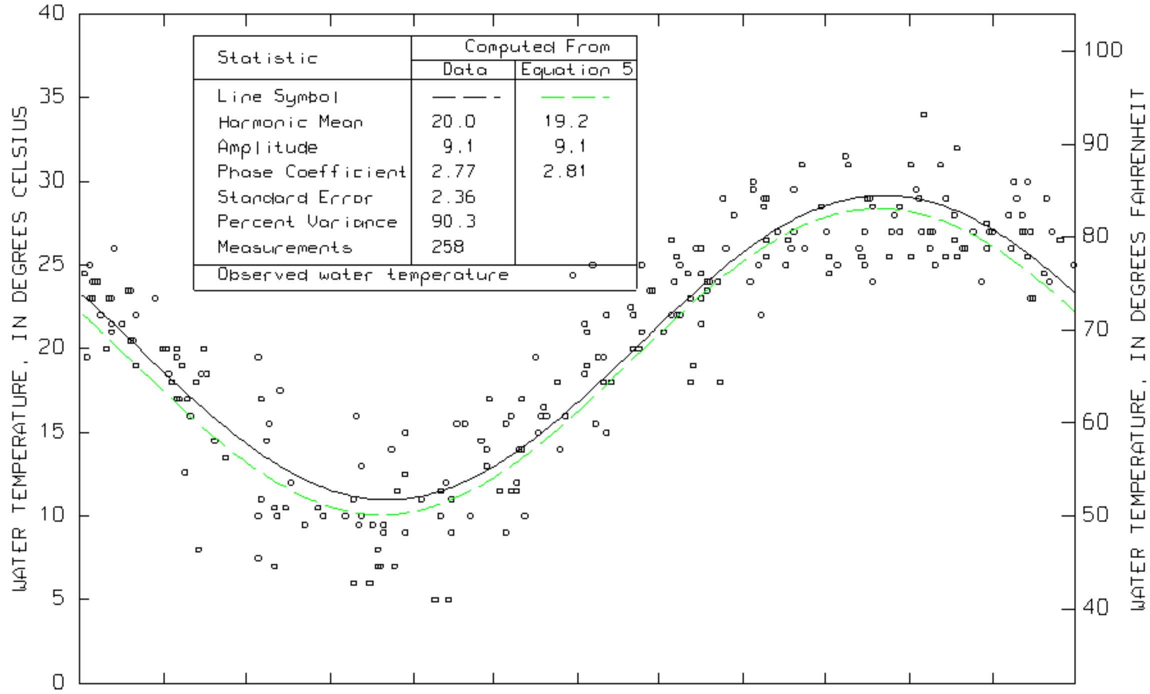
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.5	17.0	13.0	14.0	17.0	18.0	24.5	25.5	25.5	30.5	28.5	25.0
Minimum	12.0	5.0	4.5	5.0	9.0	11.0	17.0	19.5	21.0	23.5	23.5	17.5

Figure 98. Hurricane Creek near Alma, Georgia,
Station 02227000, January 1955 to June 1982.



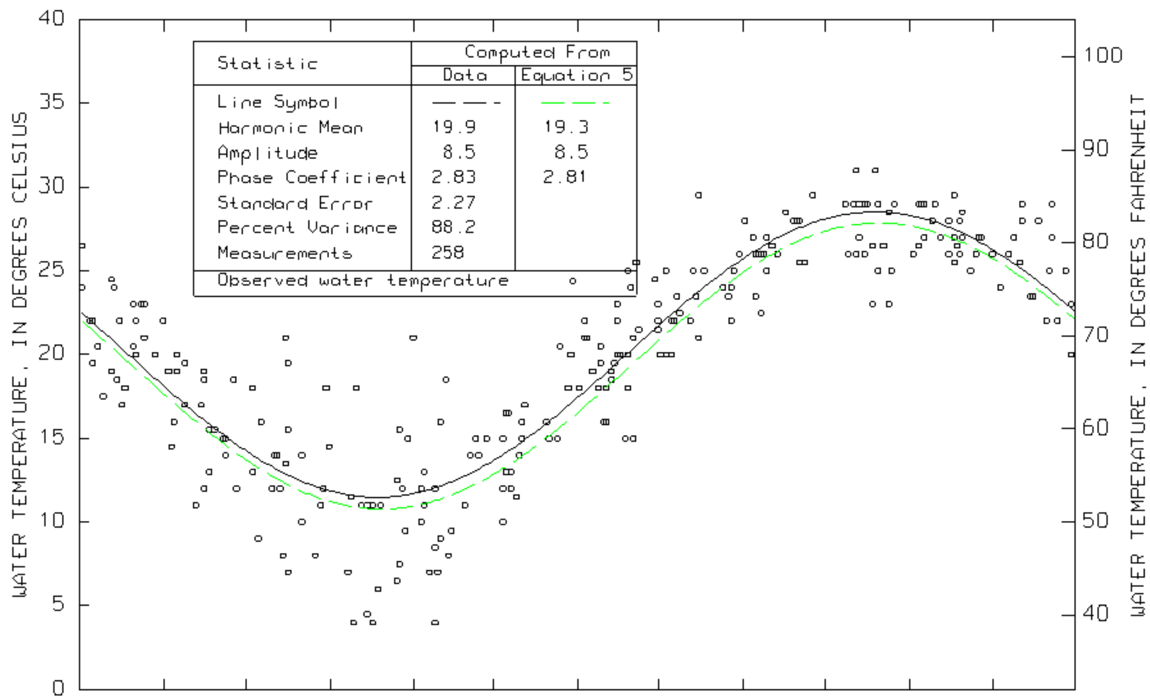
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.5	17.0	15.0	15.0	17.0	20.0	24.5	26.0	29.5	32.0	28.5	27.0
Minimum	18.0	12.0	6.5	7.5	6.0	10.0	14.0	18.0	23.0	24.0	23.0	22.0

Figure 99. Little Satilla River near Offerman, Georgia,
Station 02227500, January 1955 to September 1983.



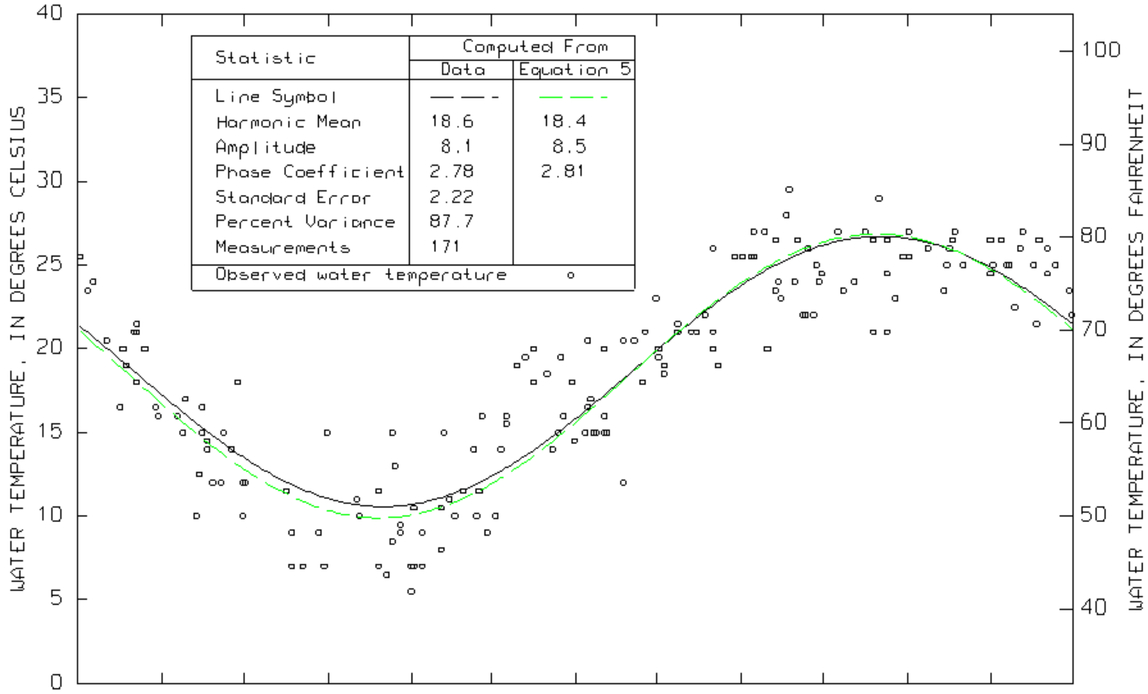
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	26.0	20.0	19.5	16.0	17.0	19.5	25.0	29.0	31.0	31.5	34.0	30.0
Minimum	19.0	8.0	7.0	6.0	5.0	9.0	15.0	18.0	22.0	24.0	24.0	23.0

Figure 100. Satilla River at Atkinson, Georgia,
Station 02228000, May 1954 to October 1984.



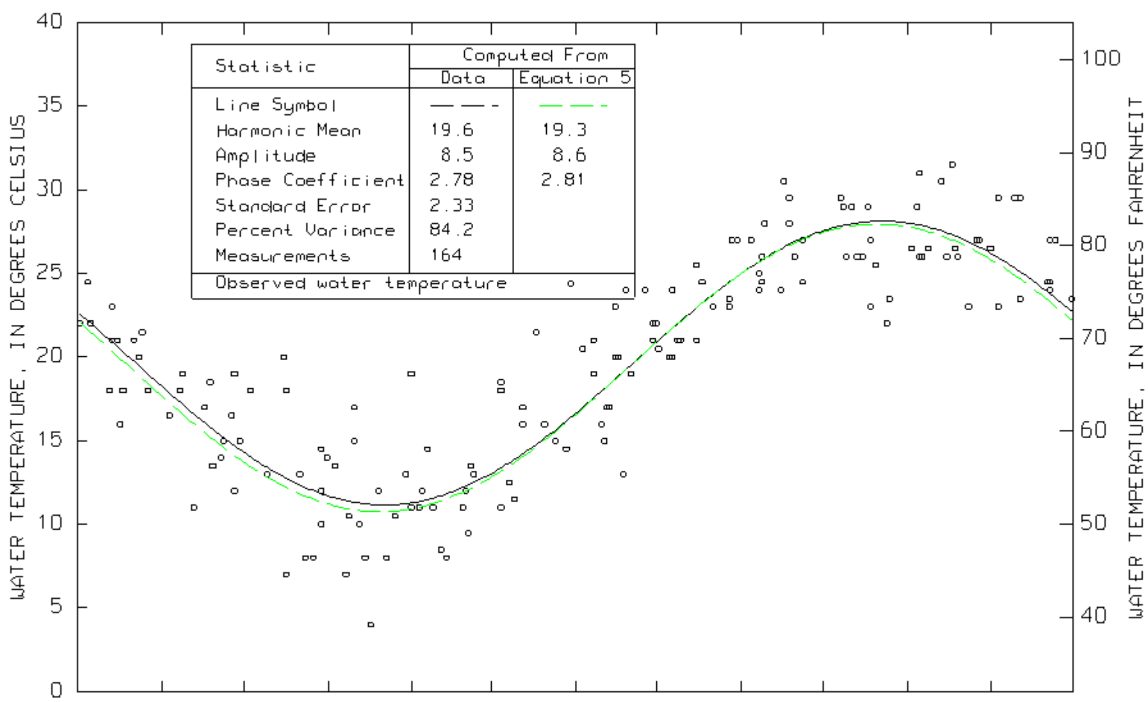
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	26.5	20.0	21.0	21.0	18.5	20.5	25.5	29.5	29.5	31.0	29.5	29.0
Minimum	17.0	11.0	7.0	4.0	4.0	10.0	15.0	20.0	22.5	23.0	25.0	20.0

Figure 101. Suwannee River at Fargo, Georgia,
Station 02314500, August 1957 to November 1984.



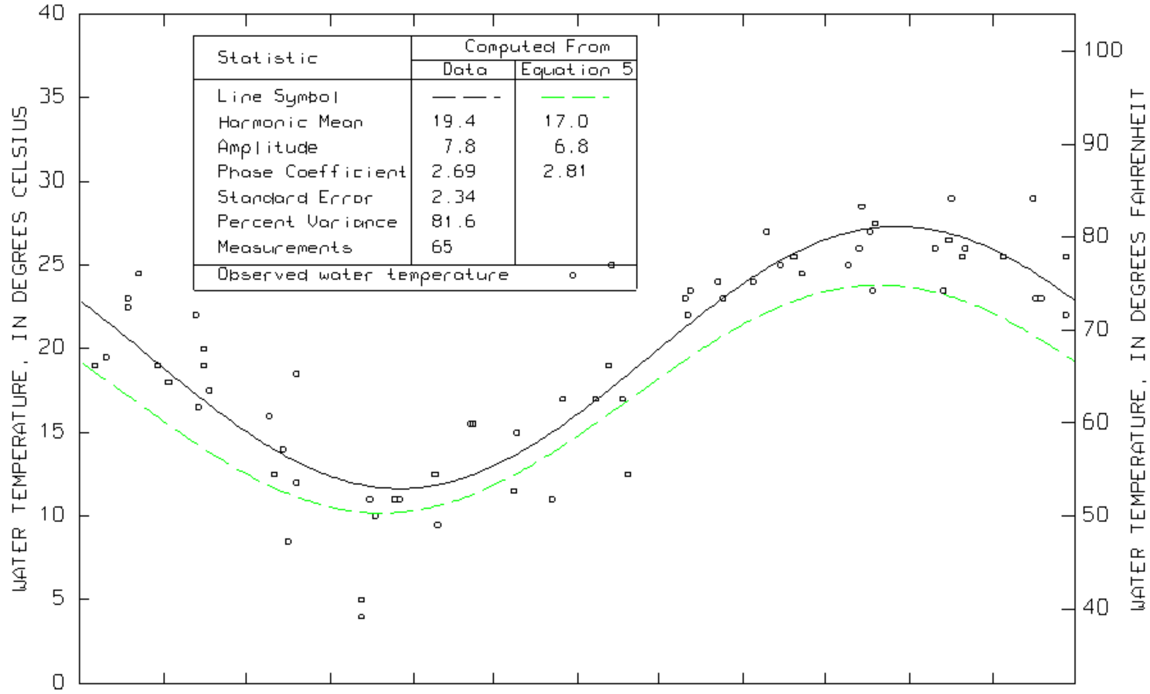
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	25.5	18.0	15.0	15.0	16.0	20.0	23.0	26.0	29.5	29.0	27.0	27.0
Minimum	16.0	10.0	7.0	5.5	7.0	10.0	12.0	18.5	20.0	21.0	23.5	21.5

Figure 102. Alapaha River near Alapaha, Georgia,
Station 02316000, March 1953 to July 1984.



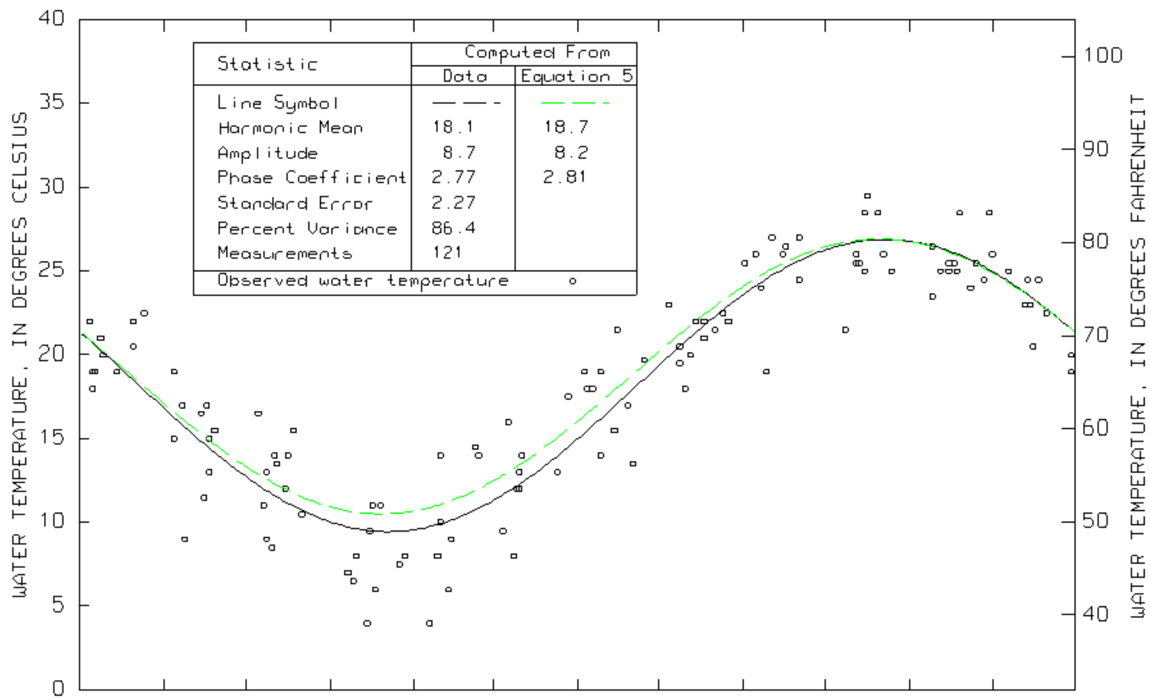
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.5	19.0	20.0	19.0	14.5	21.5	24.0	27.0	30.5	29.5	31.5	29.5
Minimum	16.0	11.0	7.0	4.0	8.0	11.0	13.0	20.0	24.0	22.0	23.0	23.0

Figure 103. Alapaha River at Statenville, Georgia,
Station 02317500, January 1954 to August 1974.



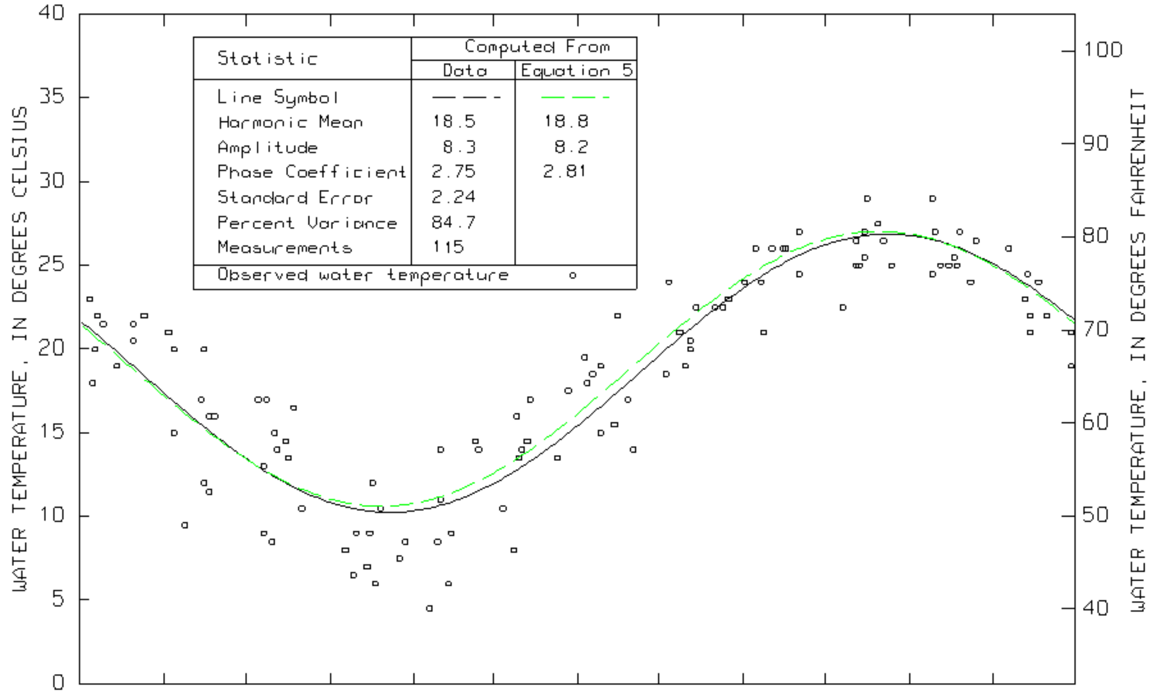
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.5	22.0	18.5	11.0	15.5	17.0	25.0	24.0	27.0	28.5	29.0	29.0
Minimum	19.0	16.5	8.5	4.0	9.5	11.0	12.5	22.0	24.0	23.5	23.5	22.0

Figure 104. New River at U.S. Highway 82 near Tifton, Georgia, Station 02317718, July 1979 to December 1984.



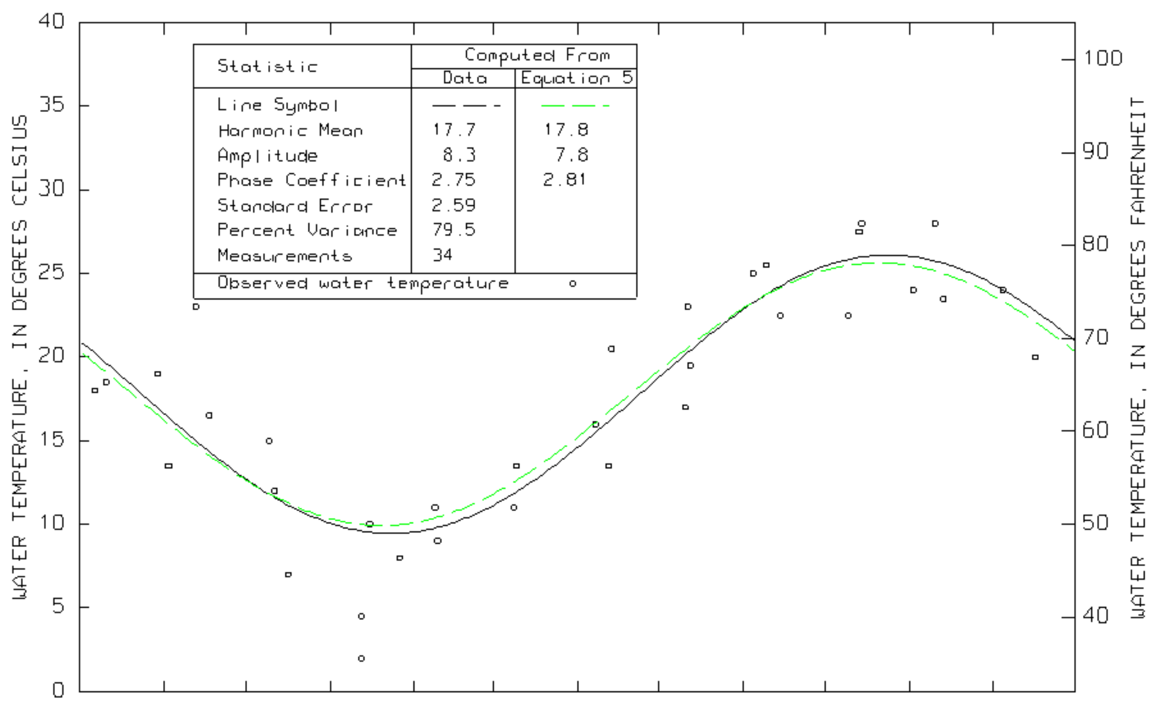
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	22.5	19.0	16.5	11.0	14.5	17.5	21.5	23.0	27.0	29.5	28.5	25.0
Minimum	18.0	9.0	8.5	4.0	4.0	8.0	13.5	18.0	19.0	21.5	23.5	19.0

Figure 105. Withlacoochee River near Valdosta, Georgia, Station 02317749, November 1974 to December 1984.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	21.0	17.0	12.0	14.5	17.5	22.0	24.0	27.0	29.0	29.0	26.0
Minimum	18.0	9.5	8.5	6.0	4.5	8.0	14.0	18.5	21.0	22.5	24.0	19.0

Figure 106. Withlacoochee River at State Highway 94 near Valdosta, Georgia, Station 02317757, November 1974 to December 1984.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.0	23.0	15.0	10.0	11.0	13.5	20.5	23.0	25.5	28.0	28.0	24.0
Minimum	18.0	13.5	7.0	2.0	9.0	11.0	13.5	17.0	22.5	22.5	23.5	20.0

Figure 107. Little River at U.S. Highway 82 near Tifton, Georgia, Station 02317800, August 1977 to June 1982.

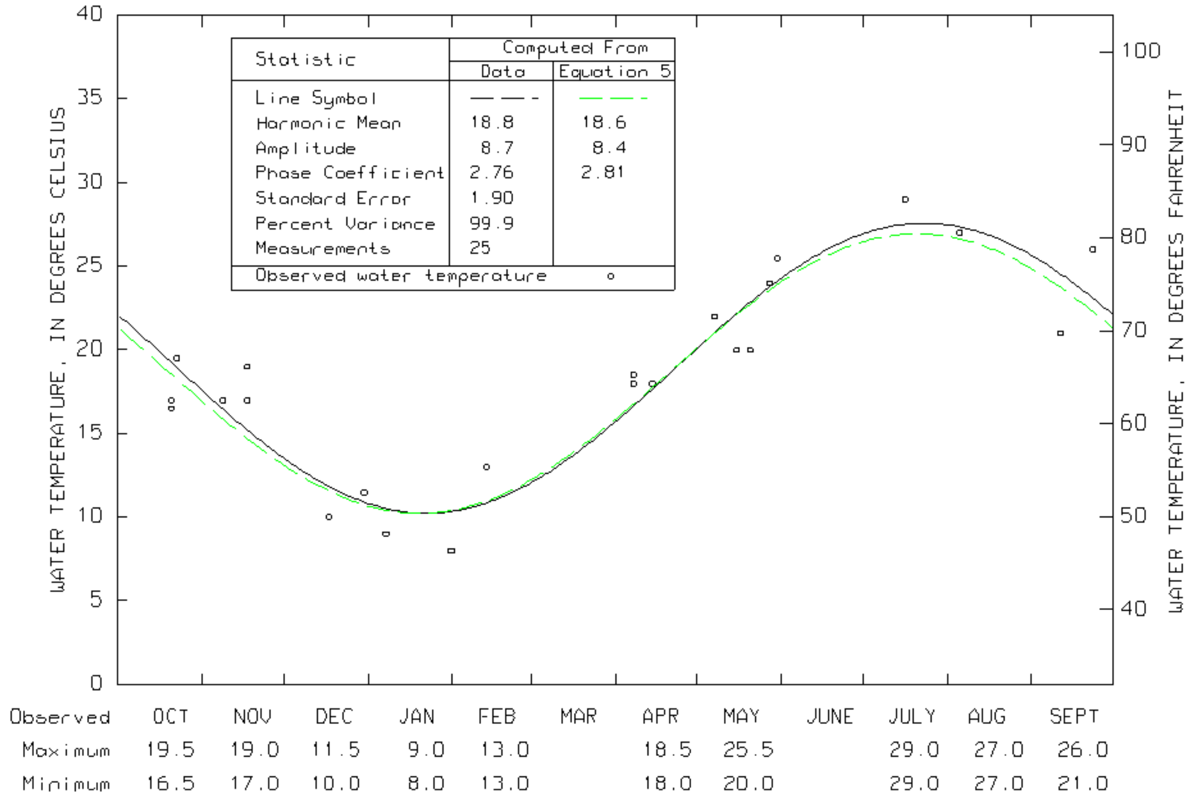


Figure 108. Little River near Adel, Georgia,
Station 02318000, October 1955 to March 1961.

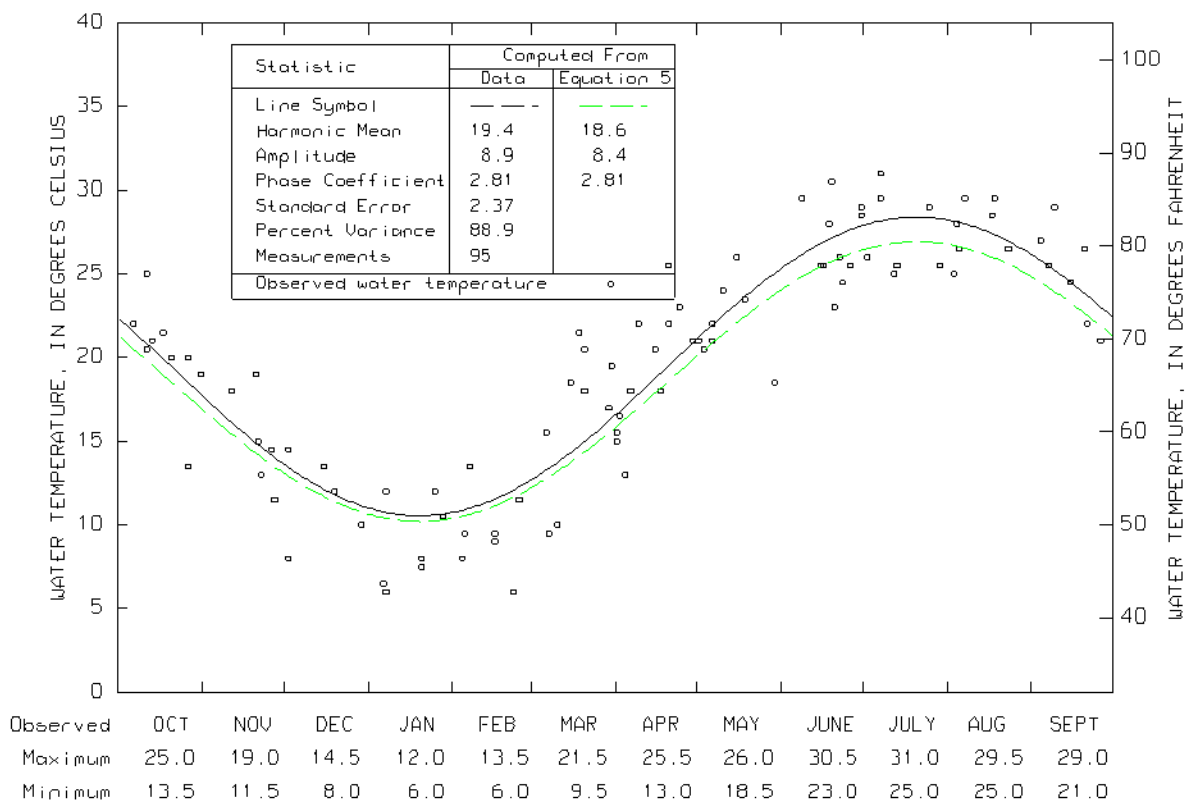
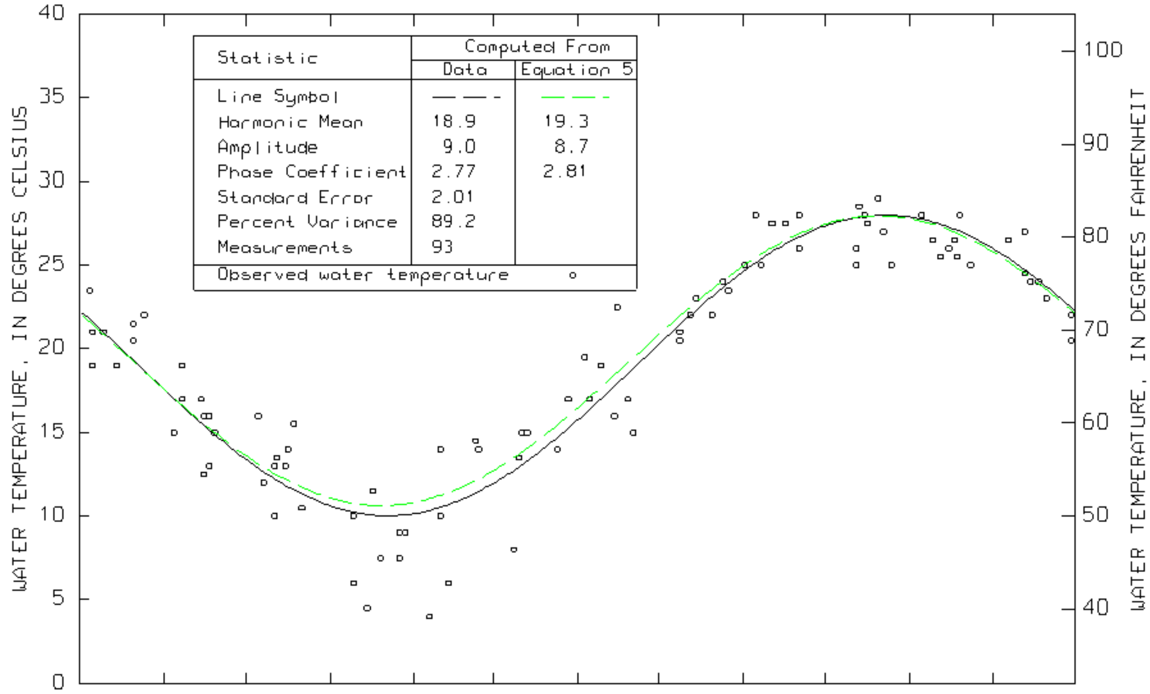
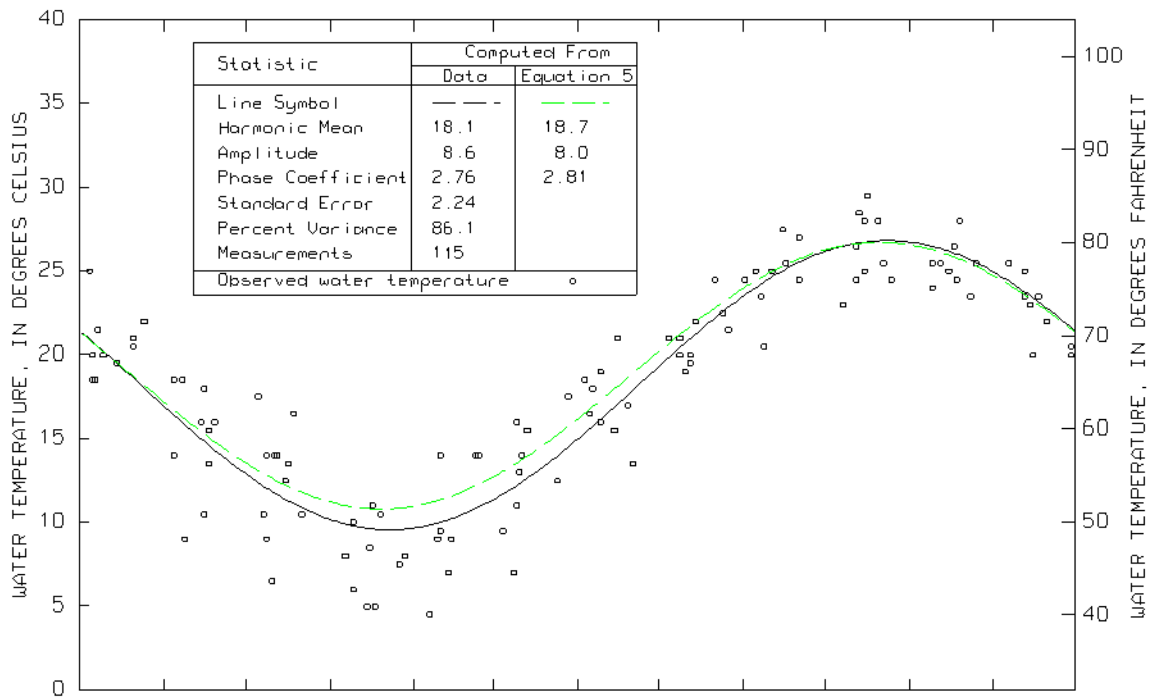


Figure 109. Little River near Adel, Georgia,
Station 02318000, April 1961 to July 1974.



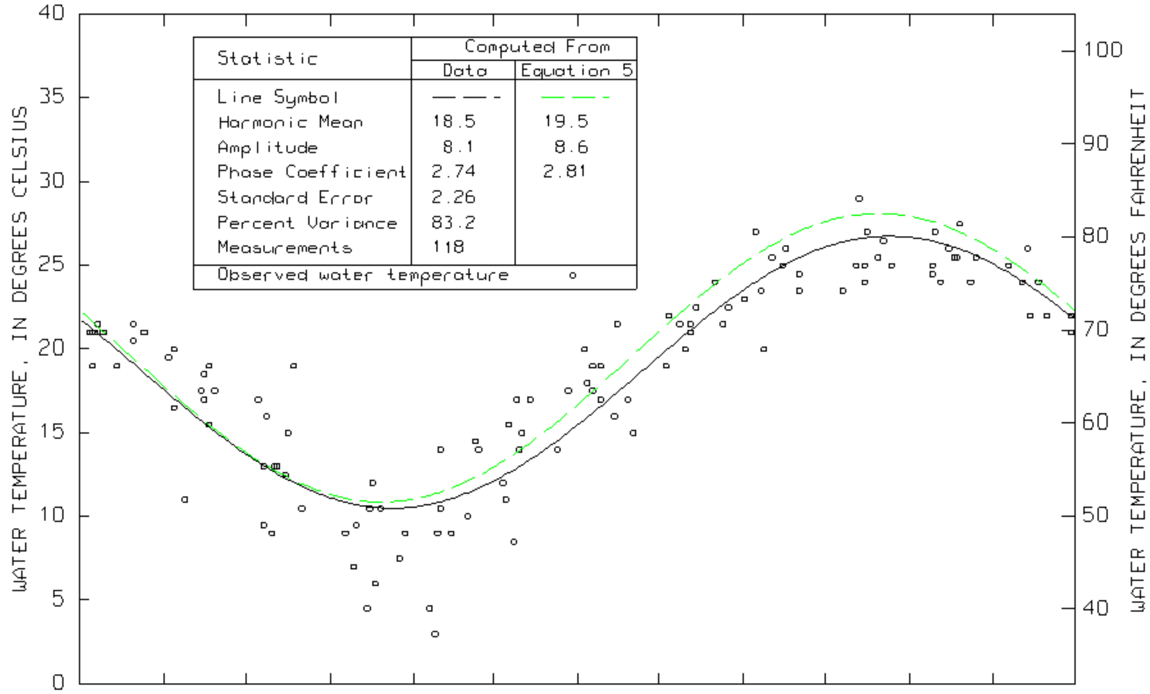
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.5	19.0	16.0	11.5	14.5	17.0	22.5	24.0	28.0	29.0	28.0	27.0
Minimum	19.0	12.5	10.0	4.5	4.0	8.0	15.0	20.5	25.0	25.0	25.0	20.5

Figure 110. Withlacoochee River near Quitman, Georgia,
Station 02318500, August 1957 to December 1984.



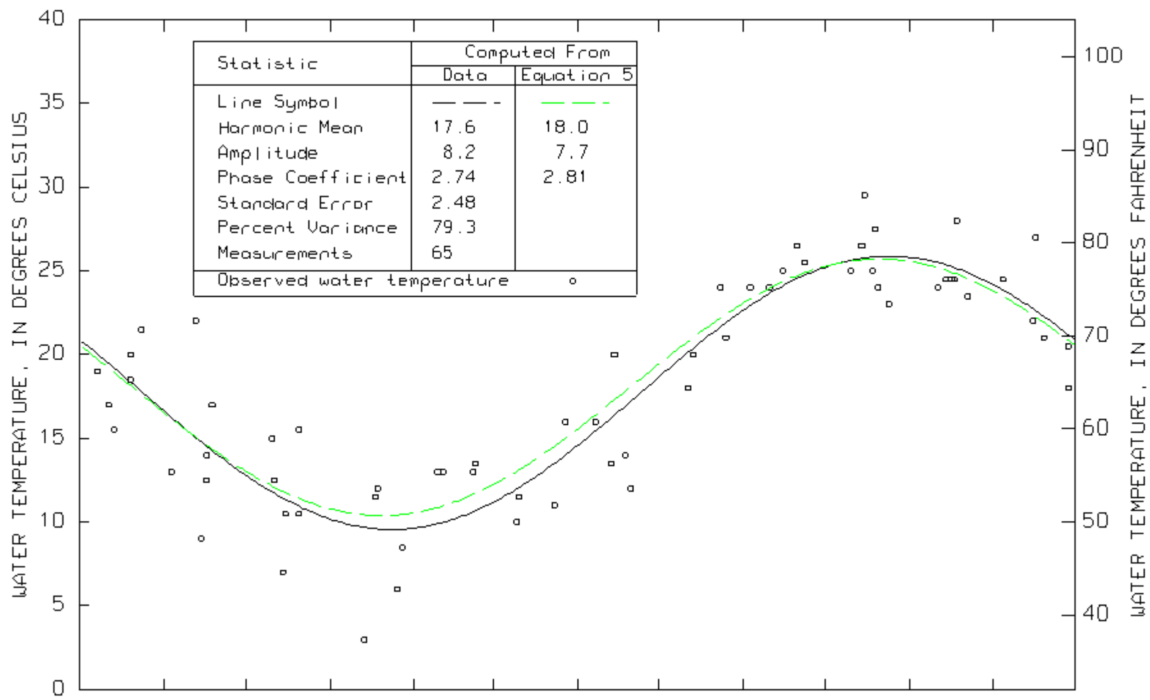
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	25.0	18.5	17.5	11.0	14.0	17.5	21.0	24.5	27.5	29.5	28.0	25.5
Minimum	18.5	9.0	6.5	5.0	4.5	7.0	13.5	19.0	20.5	23.0	23.5	20.0

Figure 111. Okapilco Creek at U.S. Highway 84 at Quitman, Georgia
Station 02318725, November 1974 to December 1984.



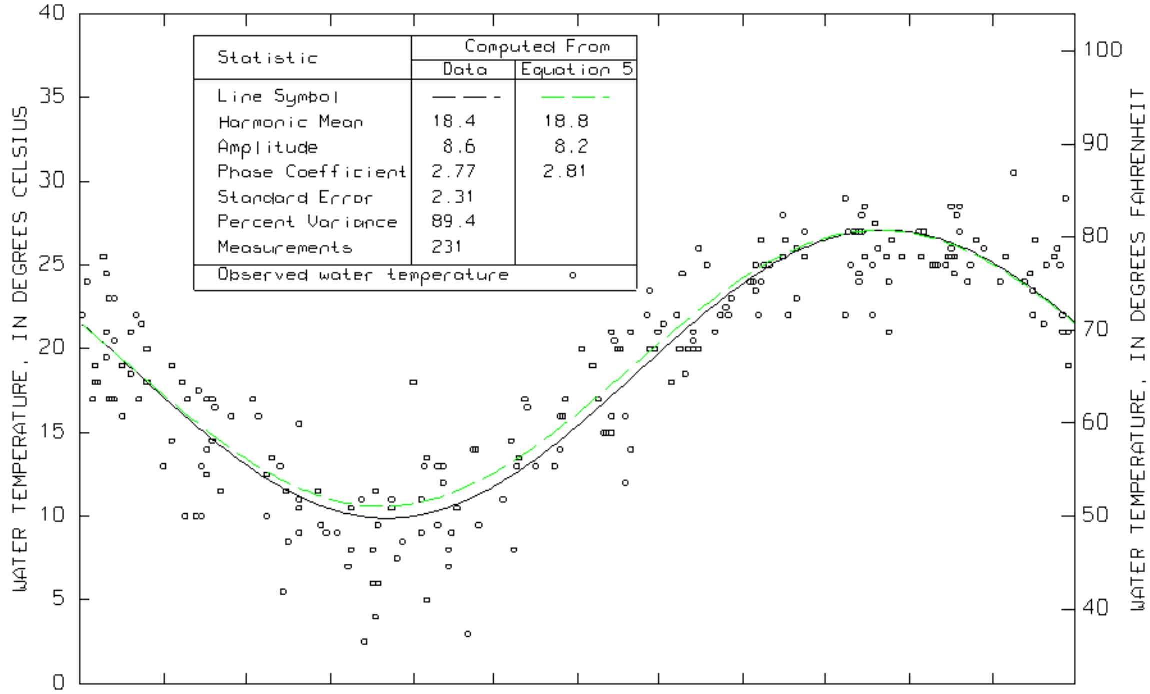
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.5	20.0	19.0	12.0	14.5	17.5	21.5	24.0	27.0	29.0	27.5	26.0
Minimum	19.0	11.0	9.0	4.5	3.0	8.5	15.0	19.0	20.0	23.5	24.0	21.0

Figure 112. Withlacoochee River near Clyattville, Georgia, Station 02318960, November 1974 to December 1984.



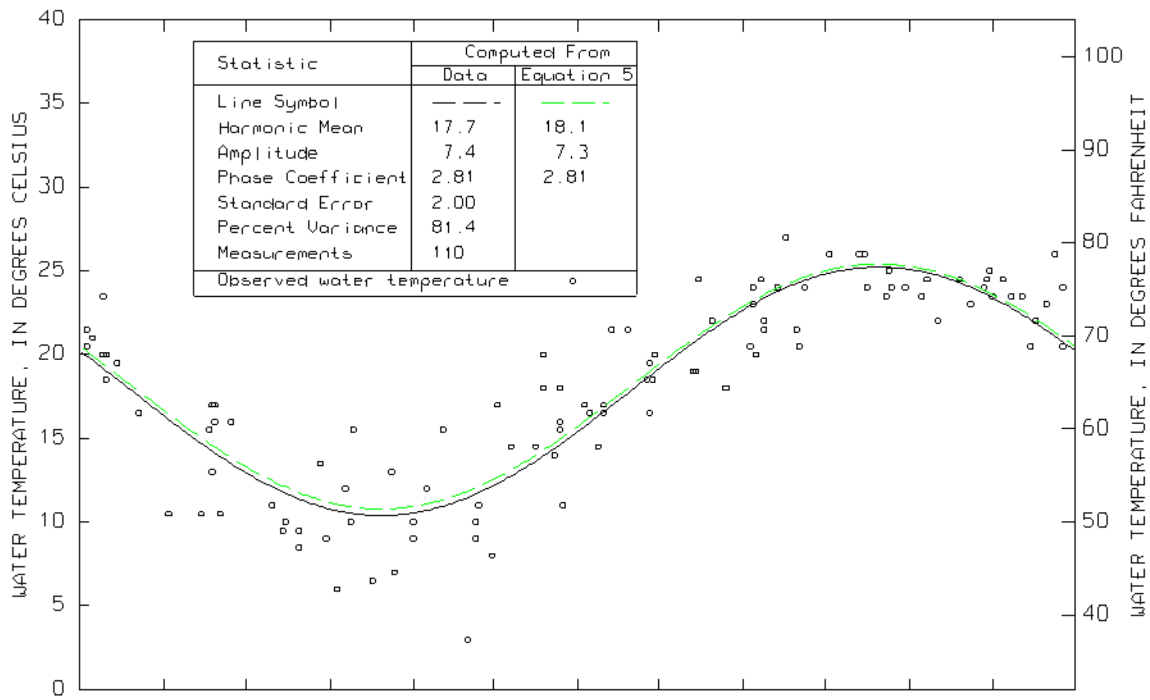
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.5	22.0	15.5	12.0	13.5	16.0	20.0	24.0	26.5	29.5	28.0	27.0
Minimum	15.5	9.0	7.0	3.0	13.0	10.0	12.0	18.0	24.0	23.0	23.5	18.0

Figure 113. Ochlockonee River near Moultrie, Georgia, Station 02327205, July 1979 to December 1984.



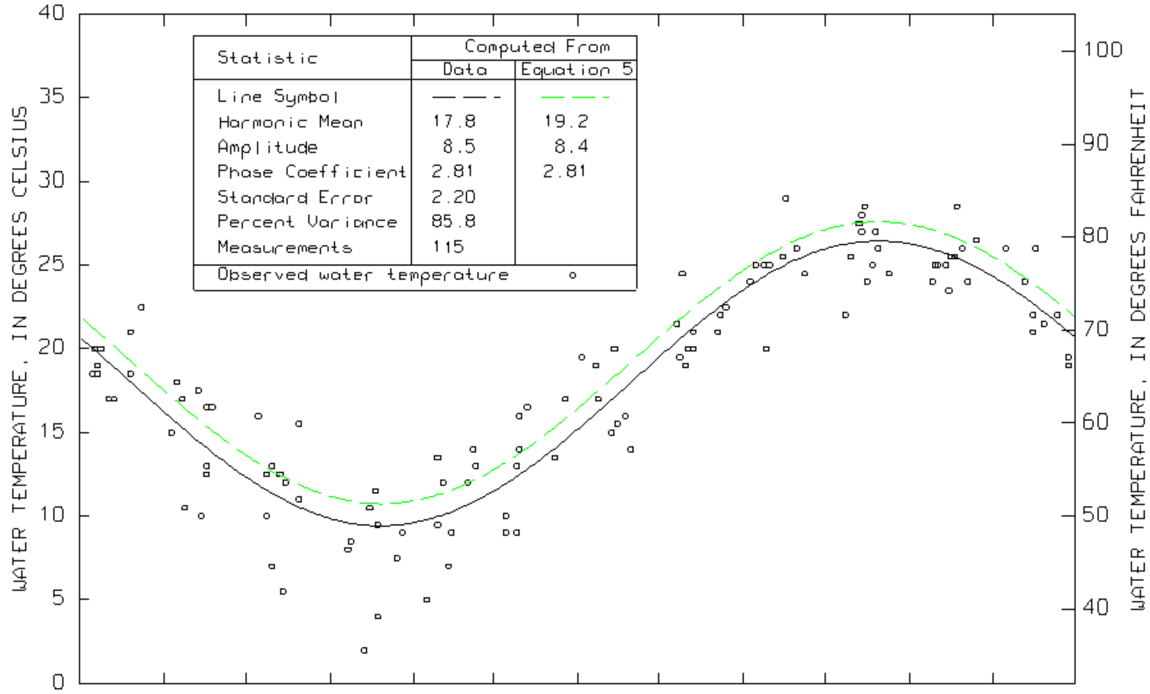
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	25.5	19.0	17.0	18.0	14.0	17.0	23.5	26.0	28.0	29.0	28.5	30.5
Minimum	13.0	10.0	5.5	2.5	3.0	8.0	12.0	18.0	22.0	21.0	24.0	19.0

Figure 114. Ochlockonee River near Thomasville, Georgia,
Station 02327500, April 1954 to December 1984.



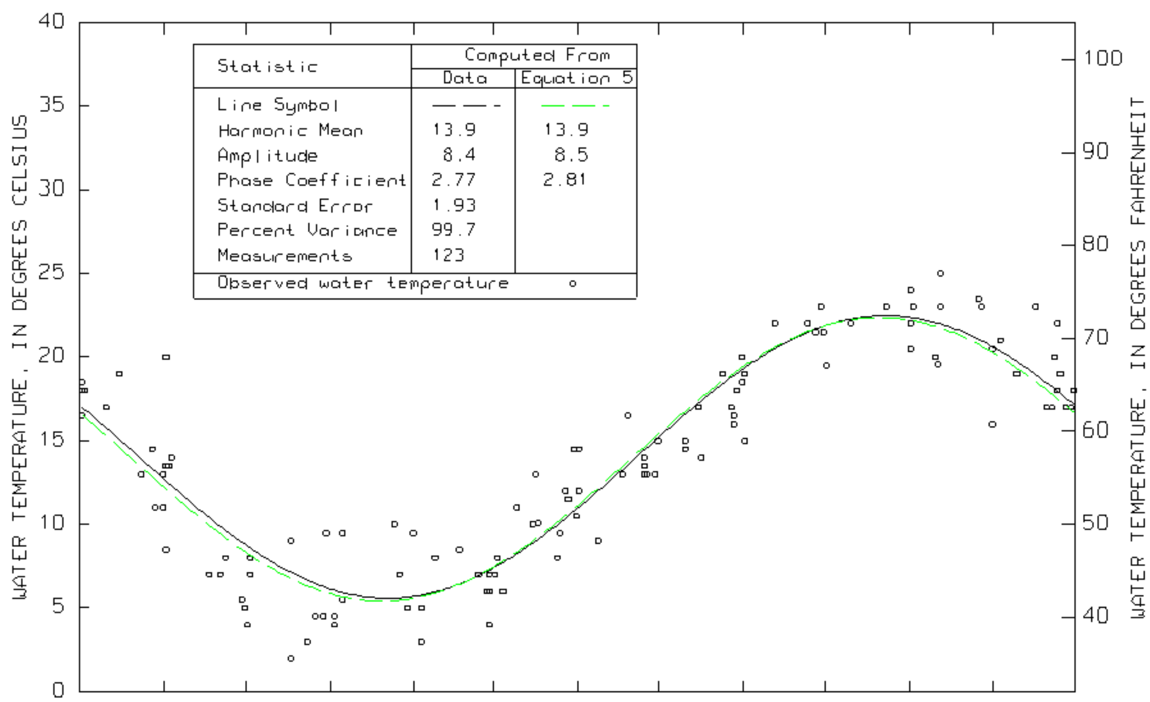
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.5	17.0	13.5	15.5	15.5	20.0	21.5	24.5	27.0	26.0	25.0	26.0
Minimum	16.5	10.5	8.5	6.0	3.0	11.0	14.5	18.0	20.0	23.5	22.0	20.5

Figure 115. Tired Creek near Cairo, Georgia,
Station 02328000, May 1954 to July 1974.



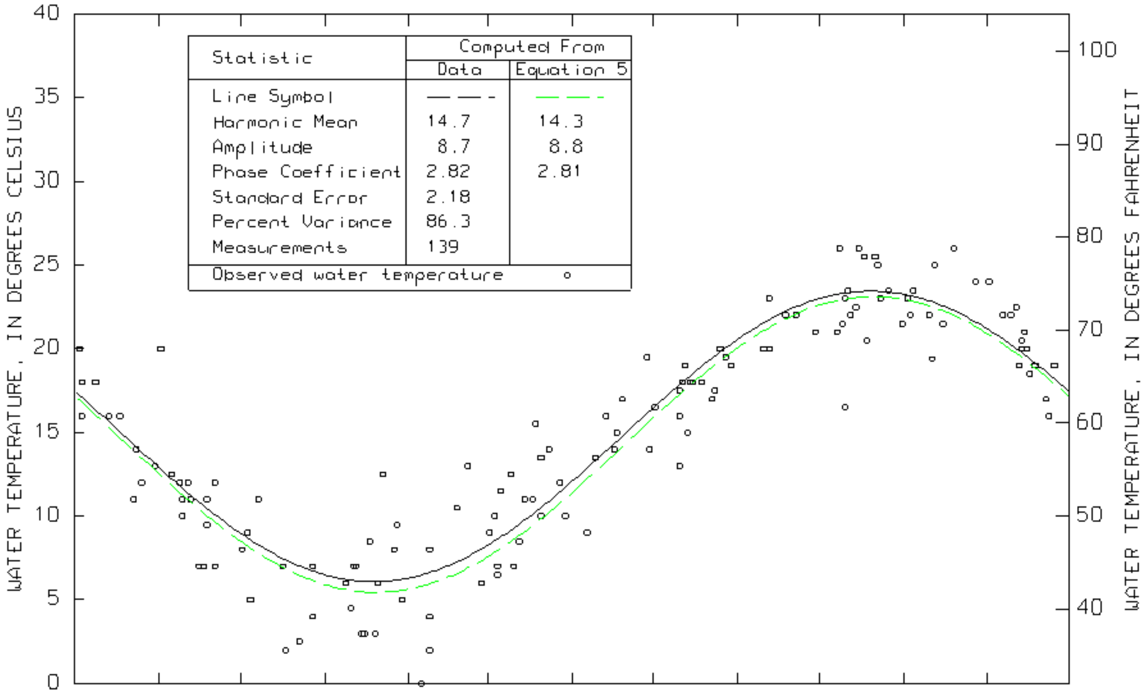
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	22.5	18.0	16.0	11.5	14.0	17.0	20.0	24.5	29.0	28.5	28.5	26.0
Minimum	17.0	10.0	5.5	2.0	5.0	9.0	14.0	19.0	20.0	22.0	23.5	19.0

Figure 116. Ochlockonee River near Calvary, Georgia,
Station 02328200, August 1974 to December 1984.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.0	20.0	9.5	10.0	8.5	14.5	16.5	20.0	23.0	23.0	25.0	23.0
Minimum	11.0	5.0	2.0	4.0	3.0	6.0	9.0	14.0	15.0	19.5	16.0	17.0

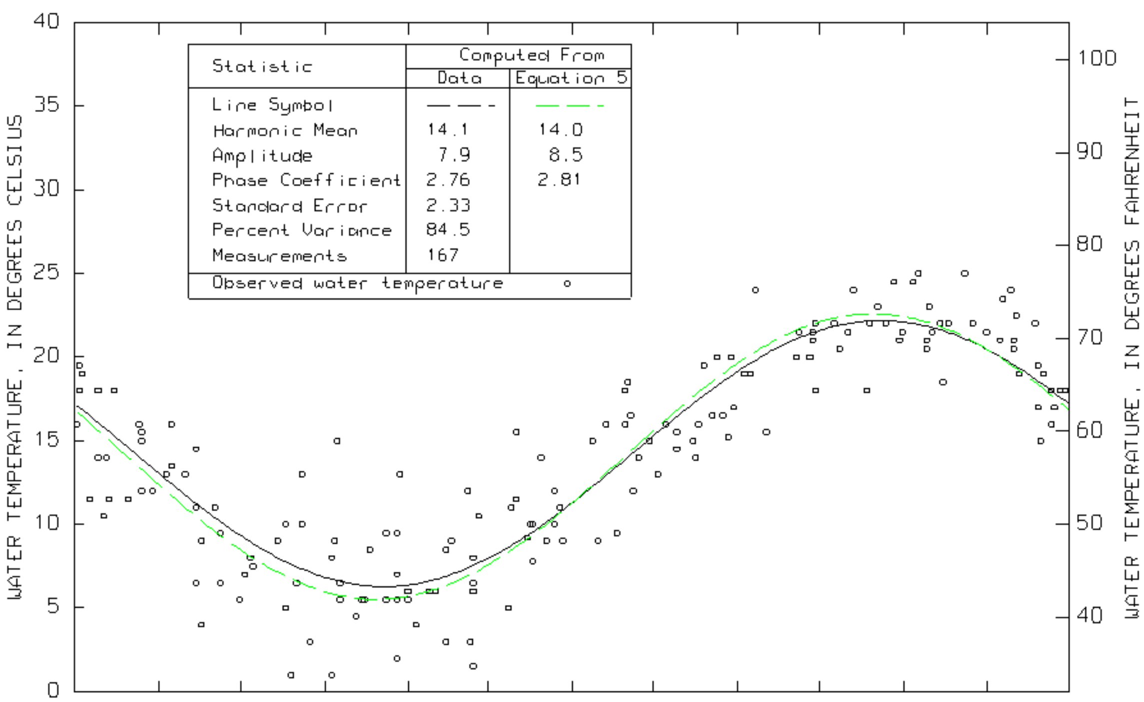
Figure 117. Chattahoochee River near Leaf, Georgia,
Station 02331000, September 1957 to August 1976.



Statistic	Computed From Data	Computed From Equation 5
Line Symbol	— — -	— — —
Harmonic Mean	14.7	14.3
Amplitude	8.7	8.8
Phase Coefficient	2.82	2.81
Standard Error	2.18	
Percent Variance	86.3	
Measurements	139	

Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	20.0	11.0	12.5	13.0	15.5	19.5	20.0	23.0	26.0	26.0	24.0
Minimum	11.0	7.0	2.0	3.0	0.1	6.5	9.0	13.0	20.0	16.5	19.4	16.0

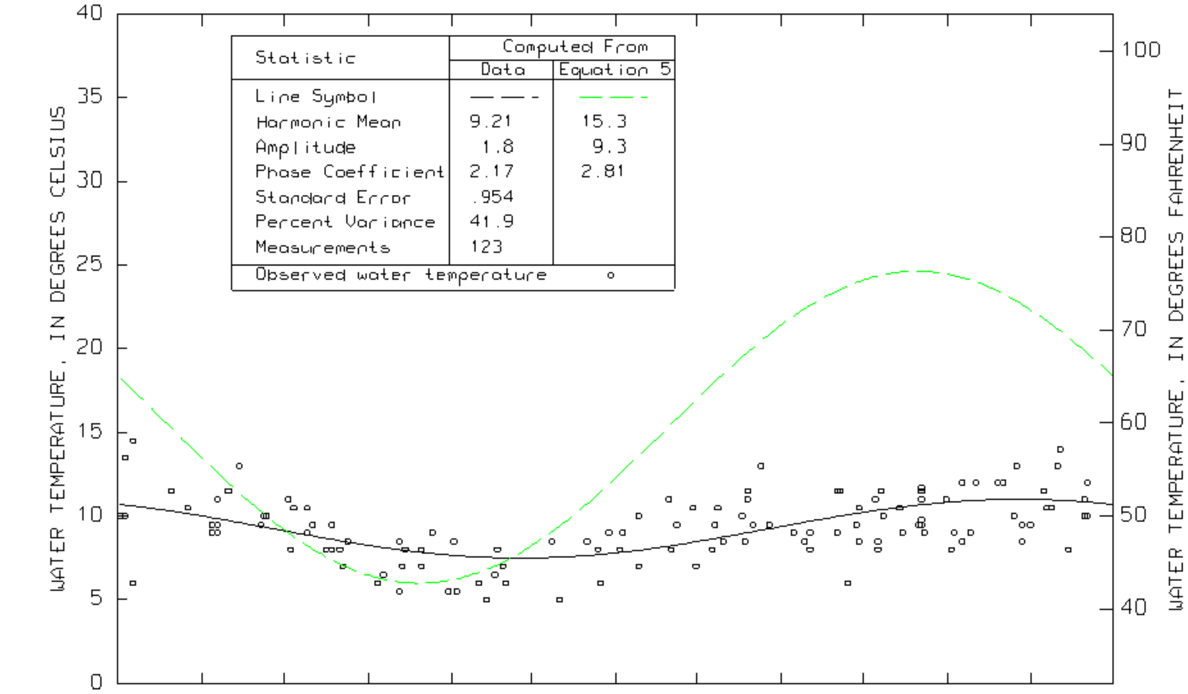
Figure 118. Chattahoochee River near Cornelia, Georgia, Station 02331600, February 1968 to November 1984.



Statistic	Computed From Data	Computed From Equation 5
Line Symbol	— — -	— — —
Harmonic Mean	14.1	14.0
Amplitude	7.9	8.5
Phase Coefficient	2.76	2.81
Standard Error	2.33	
Percent Variance	84.5	
Measurements	167	

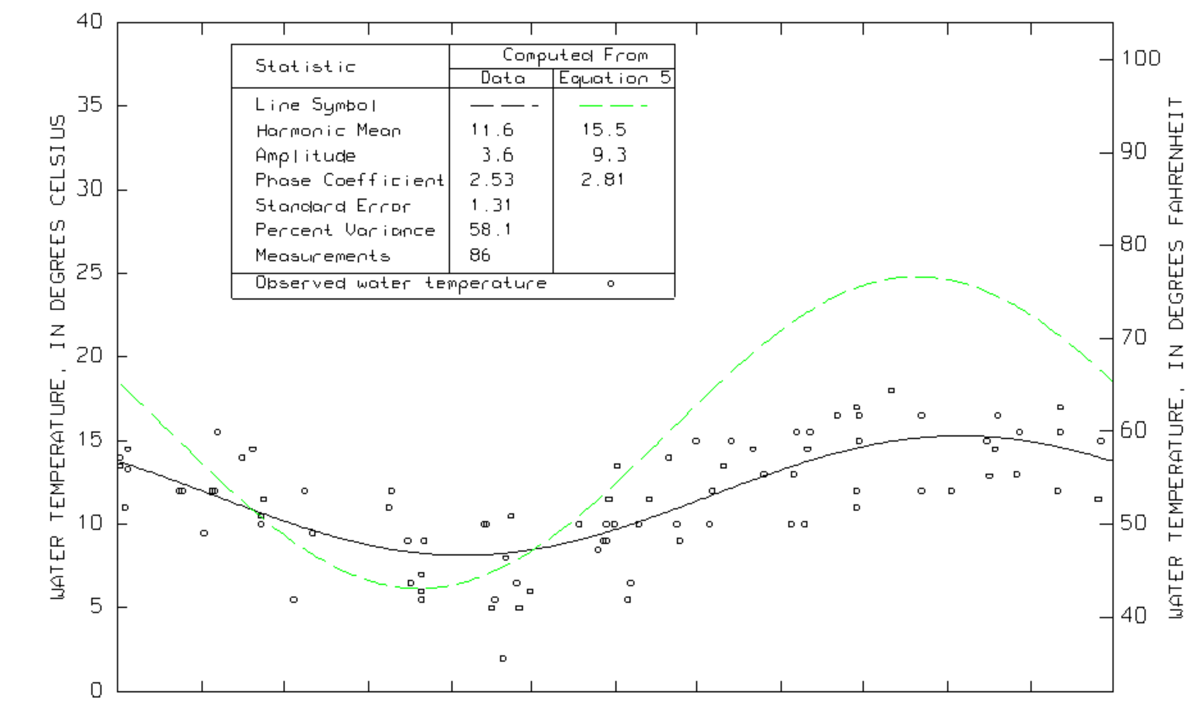
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.5	16.0	13.0	15.0	12.0	15.5	18.5	20.0	24.0	24.5	25.0	24.0
Minimum	10.5	4.0	1.0	1.0	1.5	5.0	9.0	13.0	15.5	18.0	18.5	15.0

Figure 119. Chestatee River at State Highway 52 near Dahlonega, Georgia, Station 02333500, October 1956 to September 1976.



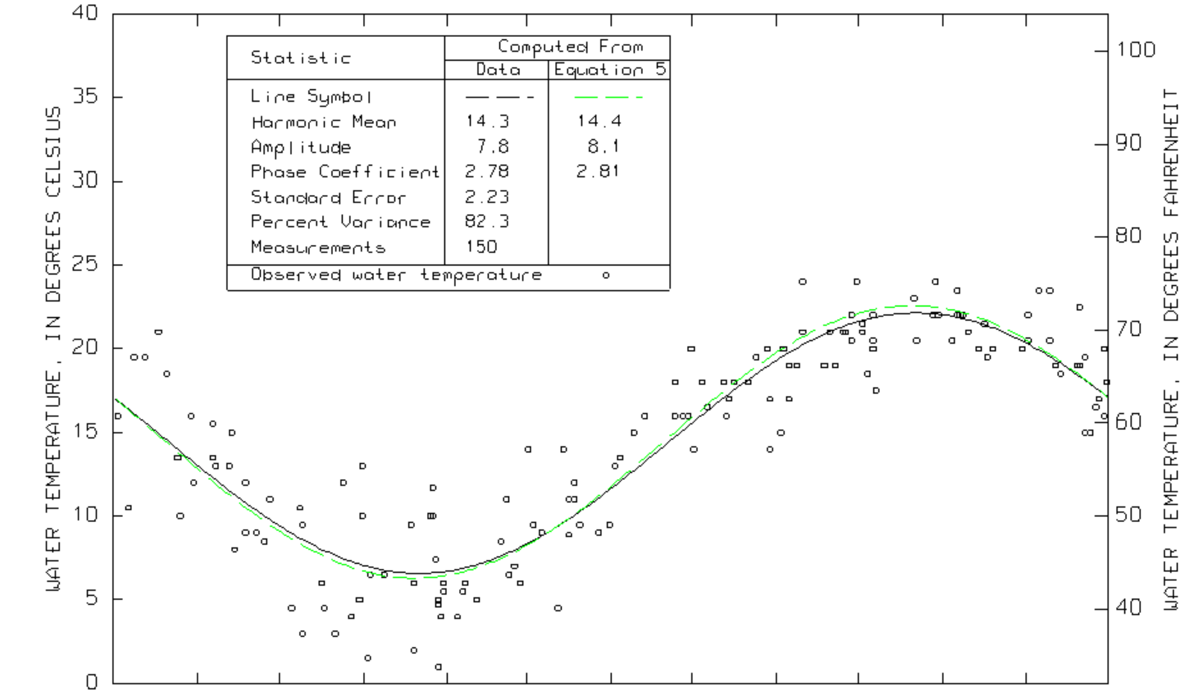
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	14.5	13.0	11.0	9.0	8.5	9.0	11.0	13.0	11.5	11.7	13.0	14.0
Minimum	6.0	9.0	7.0	5.5	5.0	5.0	7.0	8.0	6.0	8.0	8.0	8.0

Figure 120. Chattahoochee River near Buford, Georgia,
Station 02334500, May 1957 to August 1977.



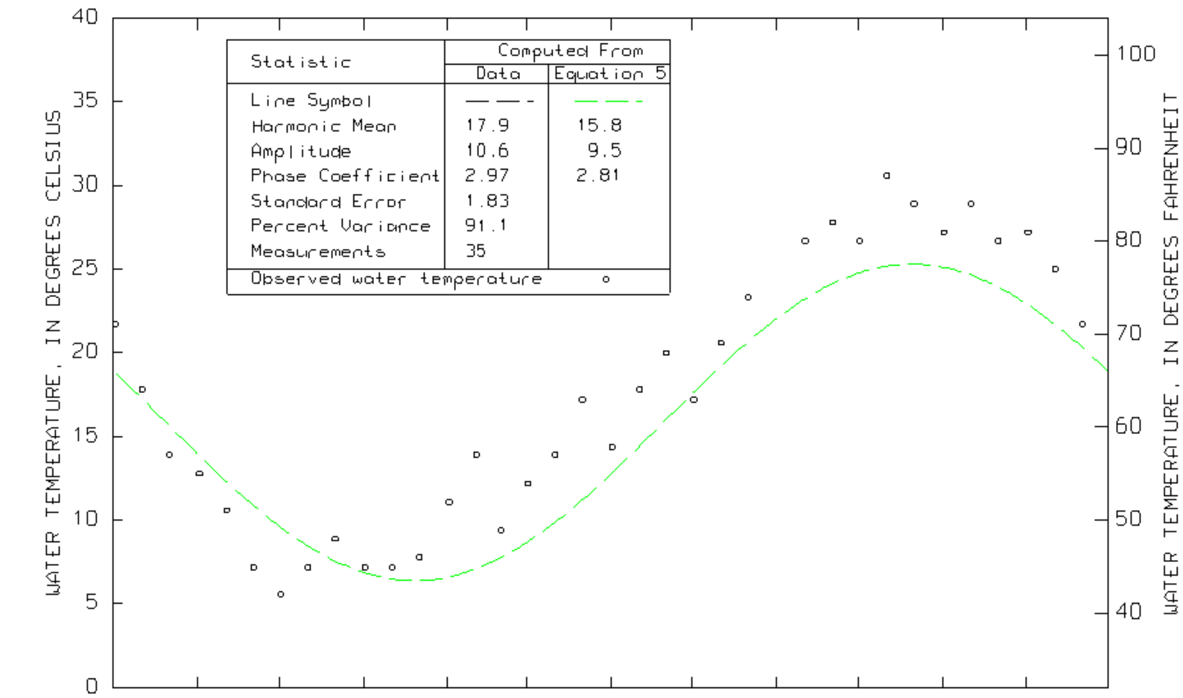
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	14.5	15.5	12.0	12.0	10.5	11.5	15.0	15.0	17.0	18.0	16.5	17.0
Minimum	11.0	9.5	5.5	5.5	2.0	8.5	5.5	10.0	10.0	12.0	12.0	11.5

Figure 121. Chattahoochee River near Norcross, Georgia,
Station 02335000, October 1957 to September 1976.



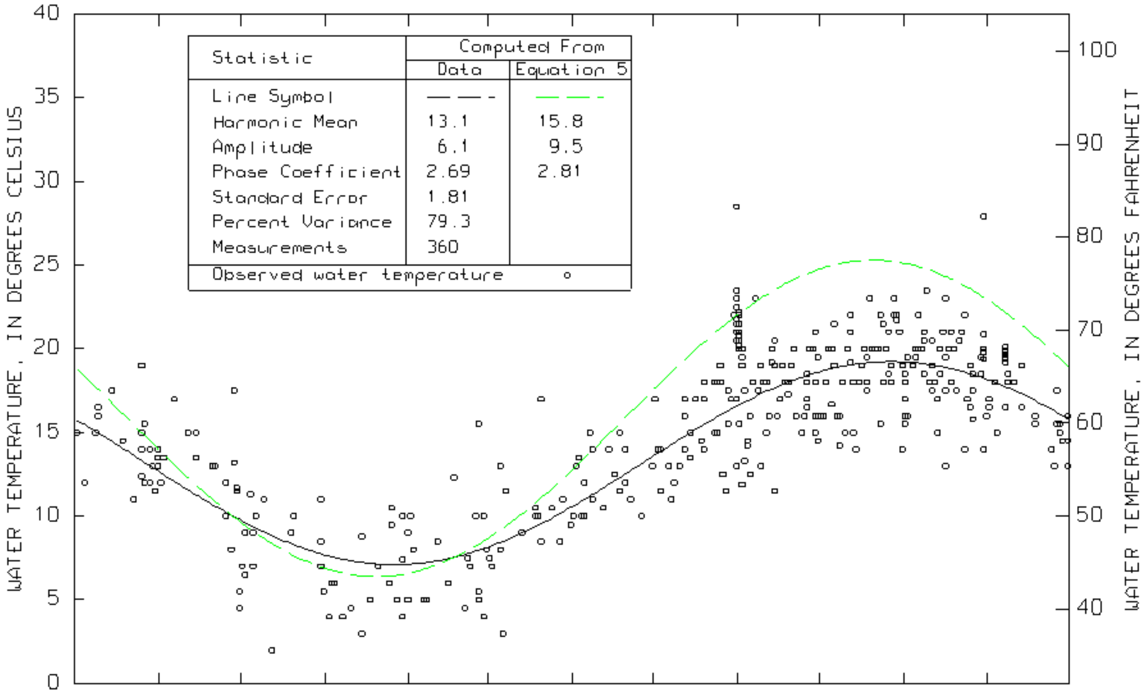
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	15.5	13.0	11.7	11.0	14.0	20.0	20.0	24.0	24.0	23.5	23.5
Minimum	10.0	8.0	3.0	1.0	4.0	4.5	13.0	14.0	15.0	17.5	19.5	15.0

Figure 122. Big Creek near Alpharetta, Georgia,
Station 02335700, May 1960 to September 1976.



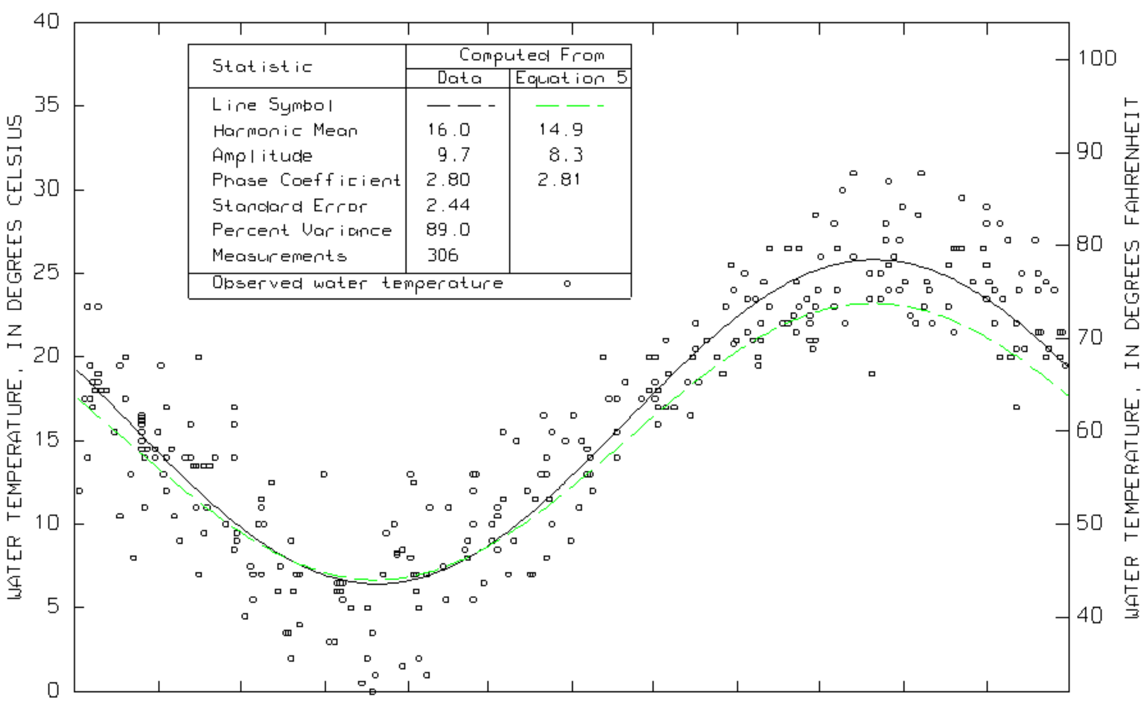
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.7	12.8	8.9	7.8	13.9	17.2	20.0	23.3	27.8	30.6	28.9	27.2
Minimum	13.9	7.2	5.6	7.2	9.4	12.2	14.4	17.2	26.7	26.7	26.7	21.7

Figure 123. Chattahoochee River at Atlanta, Georgia,
Station 02336000, May 1937 to December 1938.



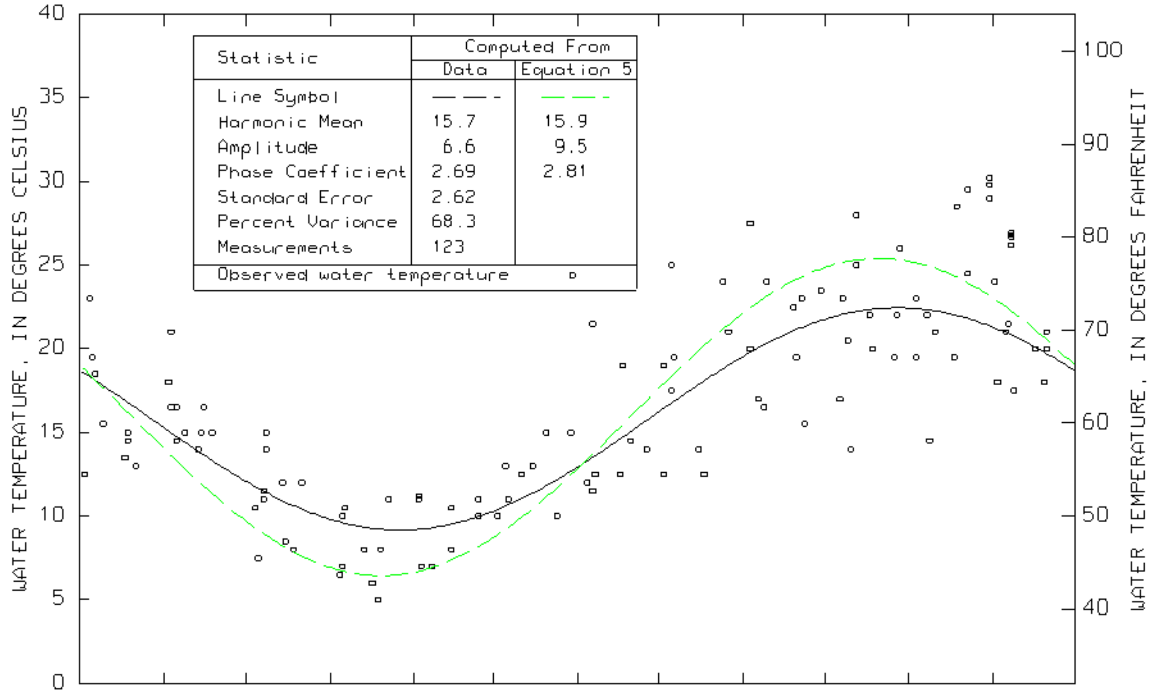
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.0	17.5	11.3	10.5	15.5	17.0	15.0	28.5	23.0	23.0	27.9	20.1
Minimum	11.0	4.5	2.0	3.0	4.0	3.0	10.0	11.0	11.5	14.0	13.0	13.0

Figure 124. Chattahoochee River at Atlanta, Georgia, Station 02336000, November 1957 to September 1979.



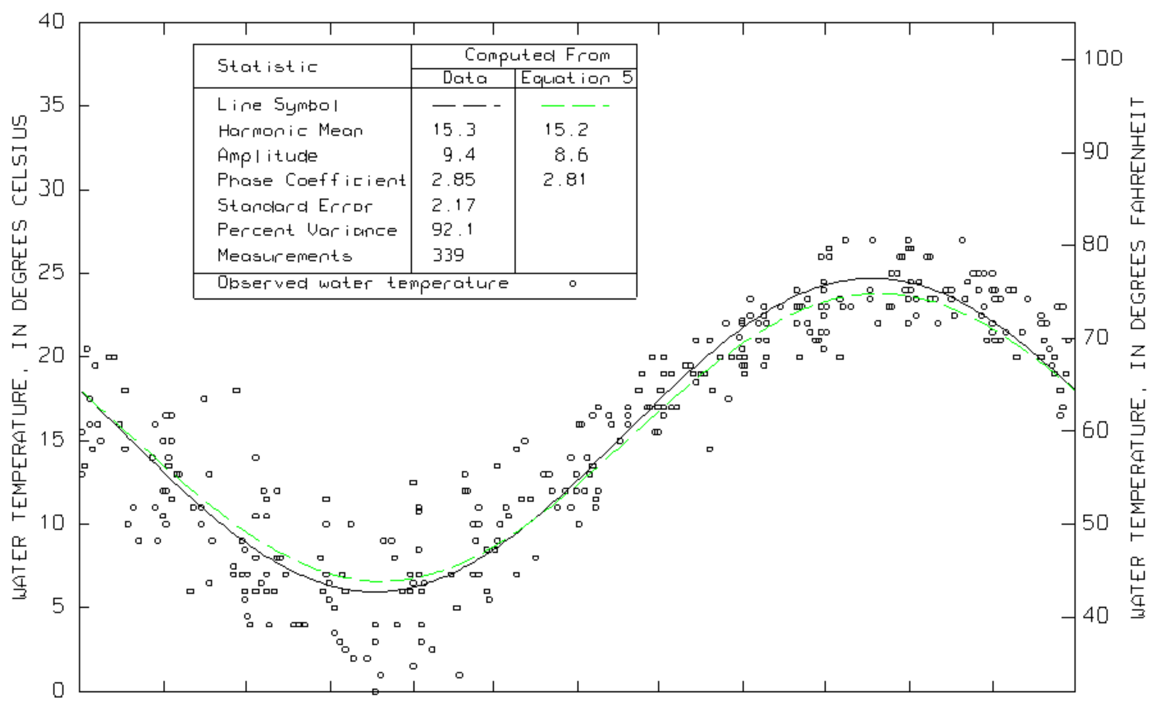
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	20.0	13.0	10.0	13.0	16.5	20.0	25.5	28.5	31.0	31.0	28.0
Minimum	8.0	7.0	2.0	0.1	1.0	7.0	11.0	16.0	19.5	19.0	21.5	17.0

Figure 125. Peachtree Creek at Atlanta, Georgia, Station 02336300, July 1959 to December 1984.



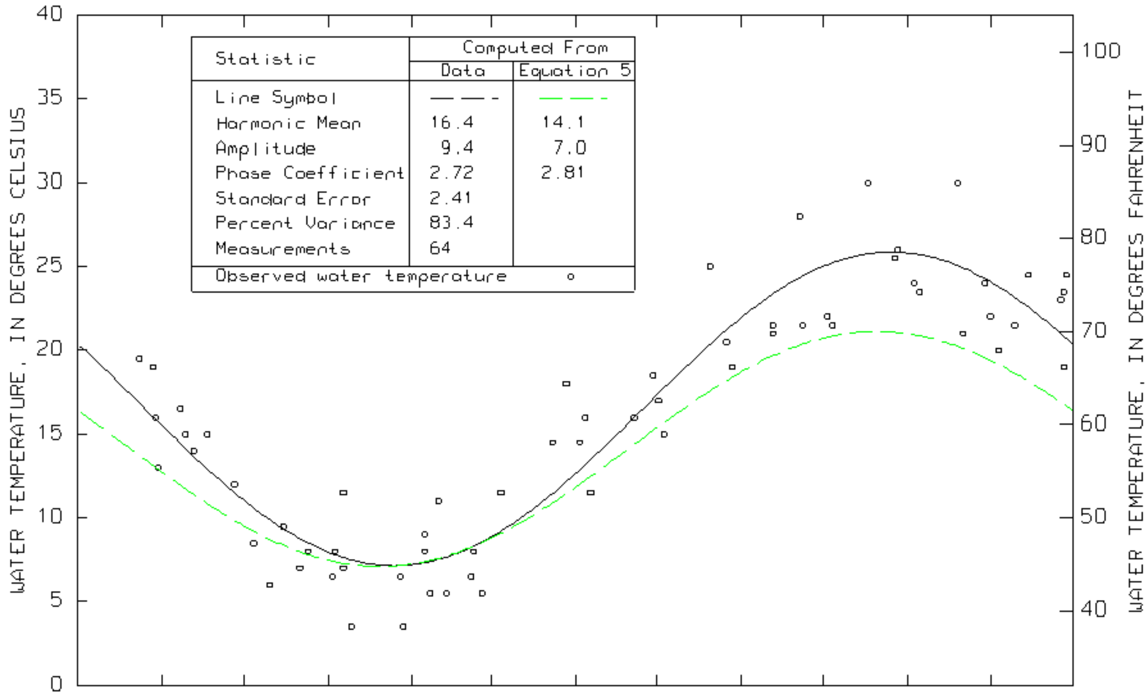
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	21.0	15.0	11.0	11.2	15.0	21.5	25.0	27.5	28.0	30.2	26.9
Minimum	12.5	14.0	7.5	5.0	7.0	10.0	11.5	12.5	15.5	14.0	14.5	17.5

Figure 126. Chattahoochee River at Interstate Highway 285 near Atlanta, Georg
Station 02336502, July 1975 to December 1984.



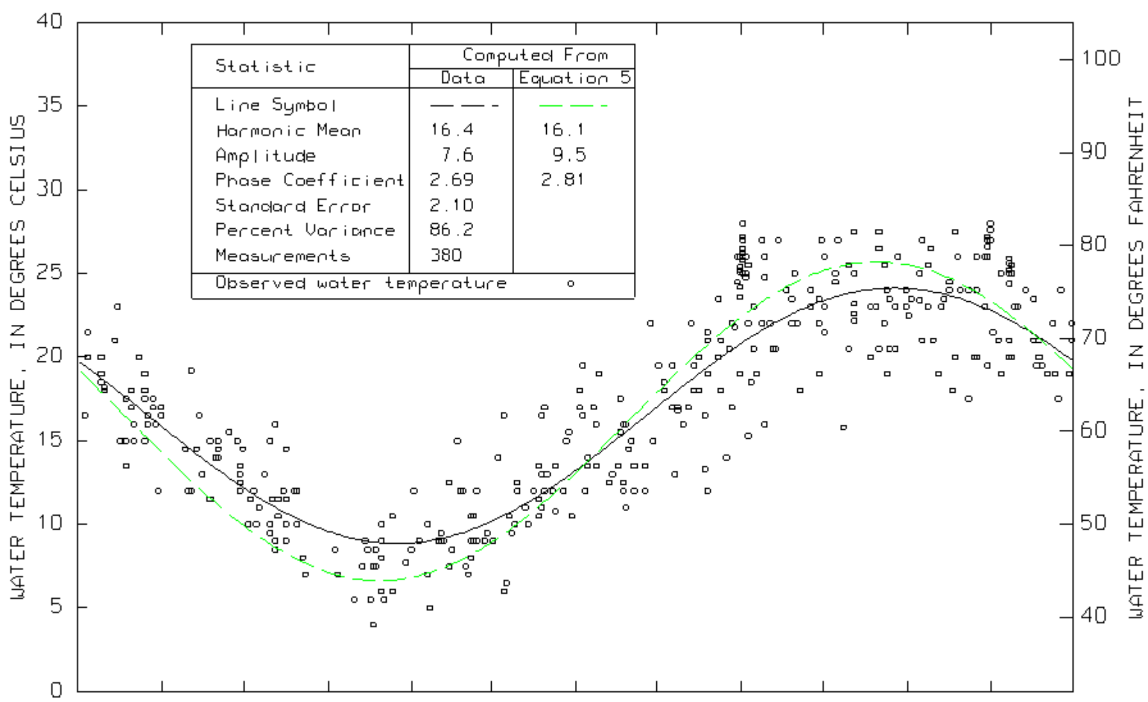
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.5	18.0	14.0	12.5	13.0	15.0	20.0	22.2	26.0	27.0	27.0	24.0
Minimum	9.0	5.5	4.0	0.1	1.0	7.0	10.0	14.5	19.0	20.0	21.0	16.5

Figure 127. Sweetwater Creek near Austell, Georgia,
Station 02337000, May 1957 to December 1984.



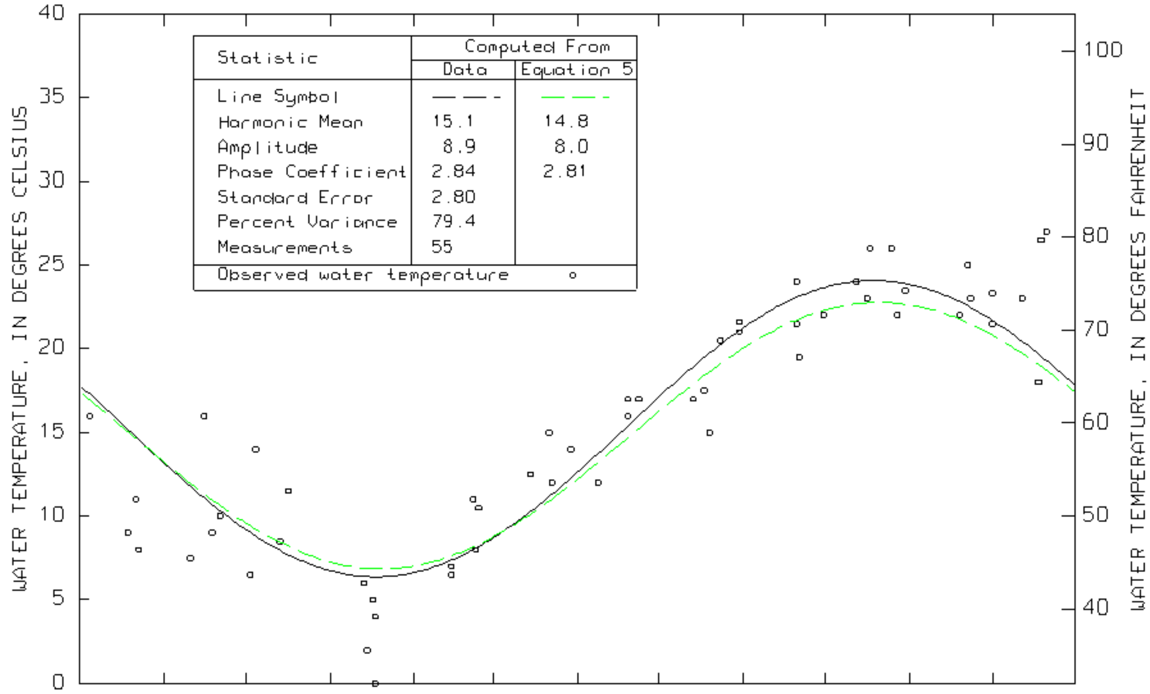
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.5	16.5	9.5	11.5	11.0	18.0	18.5	25.0	28.0	30.0	30.0	24.5
Minimum	13.0	12.0	6.0	3.5	5.5	11.5	11.5	15.0	21.0	21.5	21.0	19.0

Figure 128. North Fork Camp Creek at Atlanta, Georgia, Station 02337100, October 1963 to July 1970.



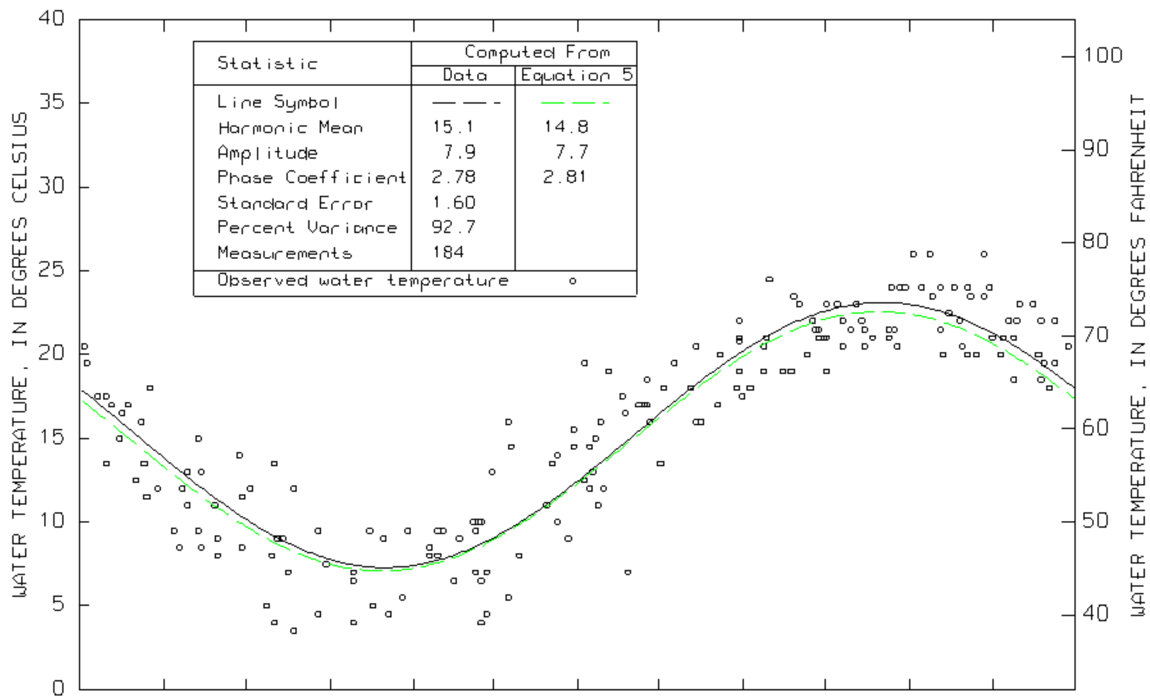
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	19.2	16.0	10.5	15.0	17.0	22.0	26.0	28.0	27.5	28.0	25.9
Minimum	12.0	11.5	7.0	4.0	5.0	6.0	11.0	12.0	15.3	15.8	17.5	17.5

Figure 129. Chattahoochee River near Fairburn, Georgia, Station 02337170, July 1965 to December 1984.



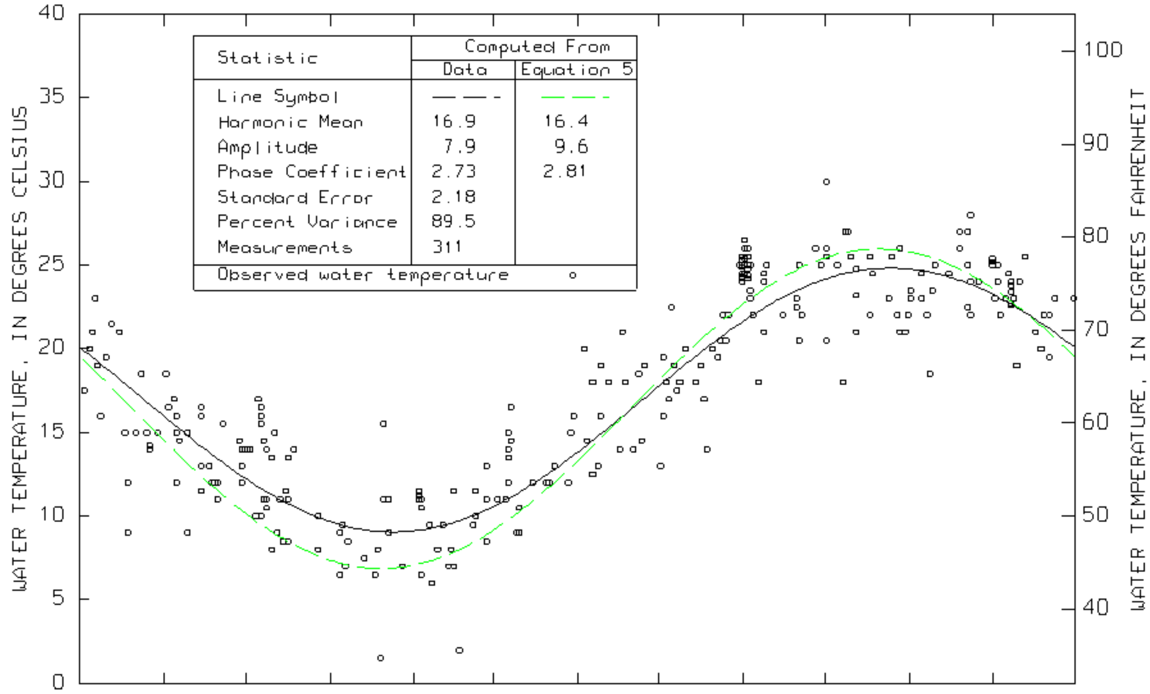
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	16.0	16.0	14.0	6.0	11.0	15.0	17.0	21.6	24.0	26.0	25.0	27.0
Minimum	8.0	7.5	6.5	0.1	6.5	12.0	12.0	15.0	19.5	22.0	21.5	18.0

Figure 130. Dog River at State Highway 166 near Fairplay, Georgia, Station 02337438, July 1974 to May 1979.



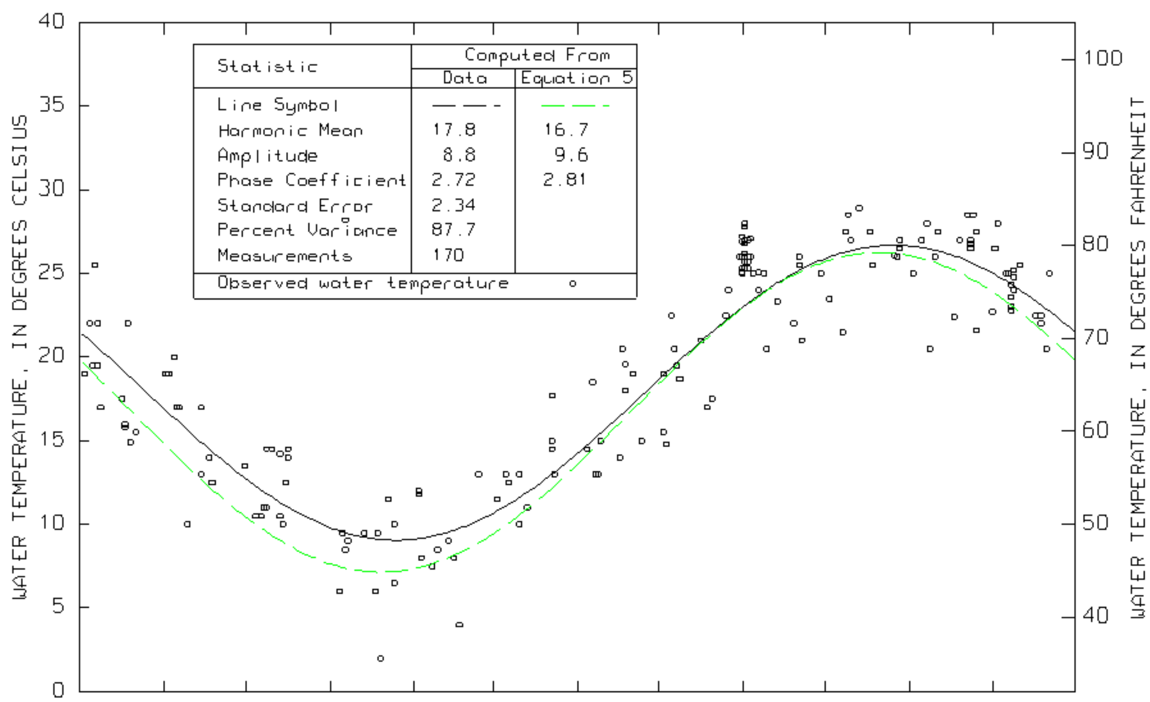
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.5	15.0	13.5	9.5	13.0	16.0	19.5	22.0	24.5	24.0	26.0	23.0
Minimum	11.5	8.0	3.5	4.0	4.0	5.5	7.0	13.5	18.0	19.0	20.0	18.0

Figure 131. Snake Creek near Whitesburg, Georgia, Station 02337500, October 1959 to July 1984.



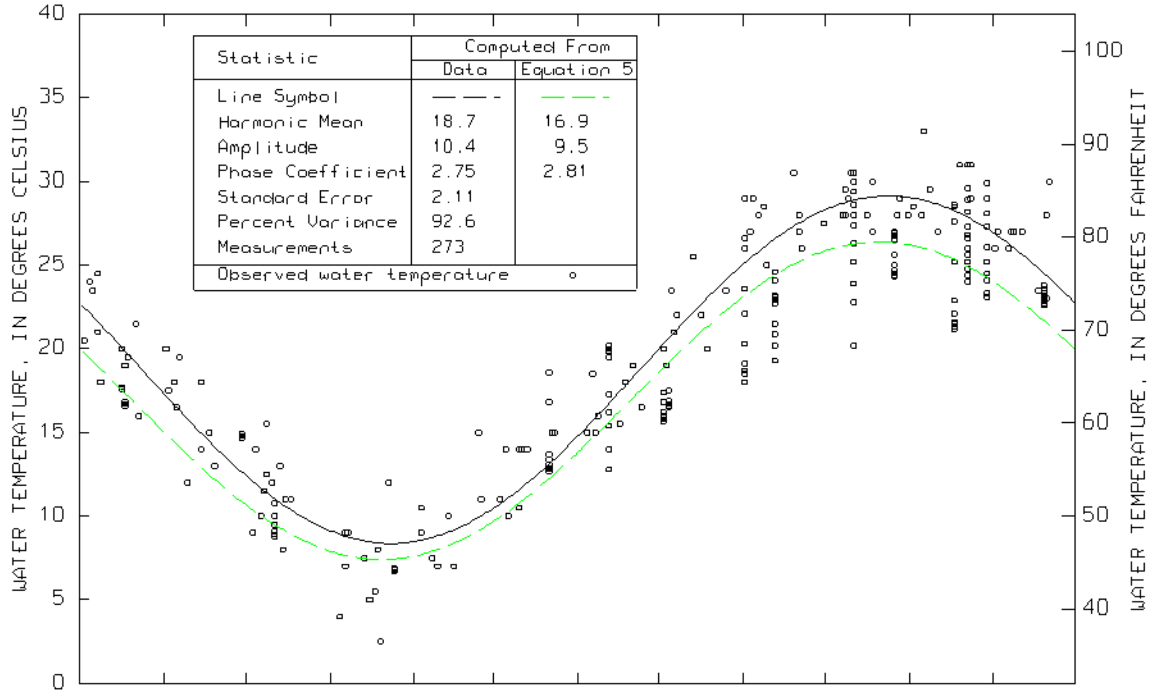
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	18.5	17.0	15.5	13.0	16.5	21.0	25.5	26.5	30.0	28.0	25.5
Minimum	9.0	9.0	8.0	1.5	2.0	9.0	12.5	13.0	18.0	18.0	18.5	19.0

Figure 132. Chattahoochee River near Whitesburg, Georgia, Station 02338000, February 1958 to December 1984.



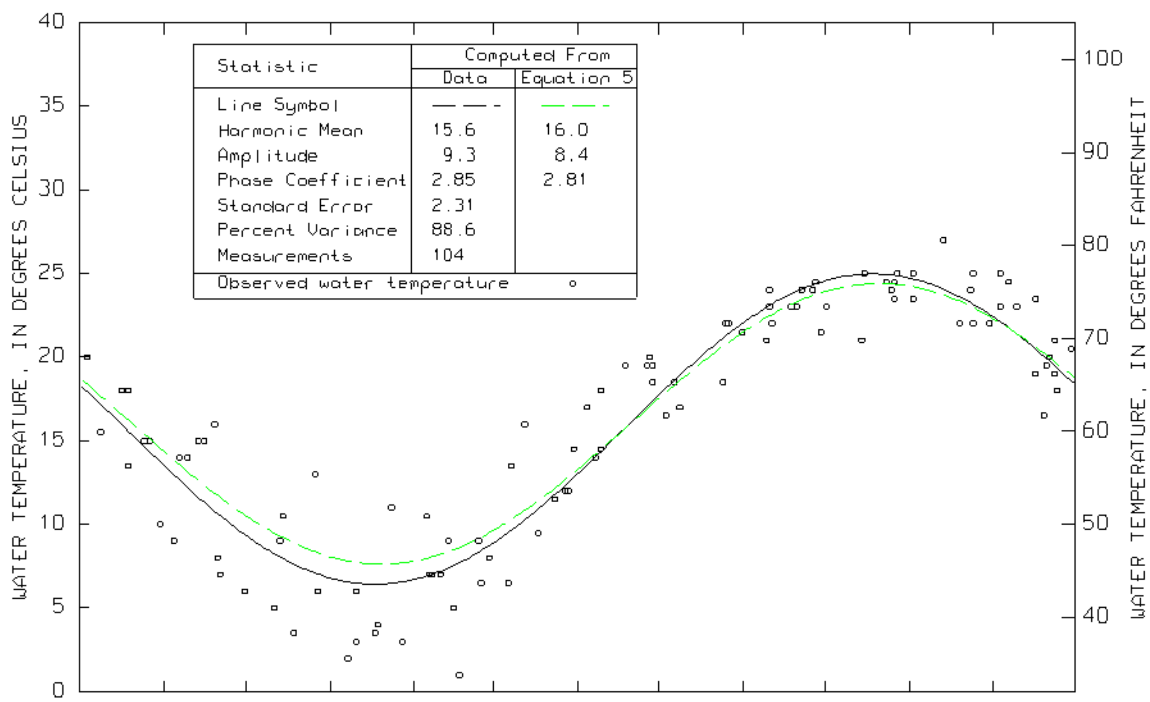
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	25.5	20.0	14.5	28.2	13.0	17.7	20.5	27.2	28.0	28.9	28.5	28.0
Minimum	14.9	10.0	10.0	2.0	4.0	10.0	13.0	14.8	20.5	21.5	20.5	20.5

Figure 133. Chattahoochee River at U.S. Highway 27 at Franklin, Georgia, Station 02338500, February 1958 to December 1984.



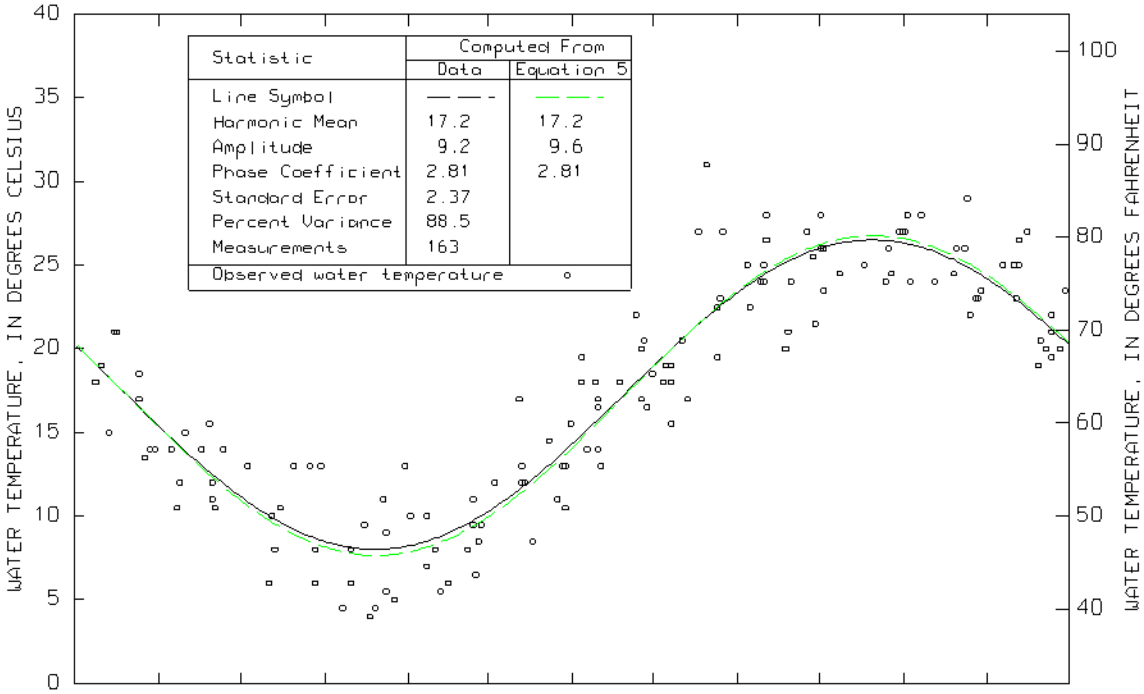
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.5	20.0	15.5	12.0	15.0	18.6	20.2	25.5	30.5	30.5	33.0	30.0
Minimum	16.0	12.0	8.0	2.5	7.0	10.0	12.8	15.7	18.0	20.2	21.2	22.6

Figure 134. Chattahoochee River (LaGrange Intake) near LaGrange, Georgia, Station 02338720, July 1974 to December 1984.



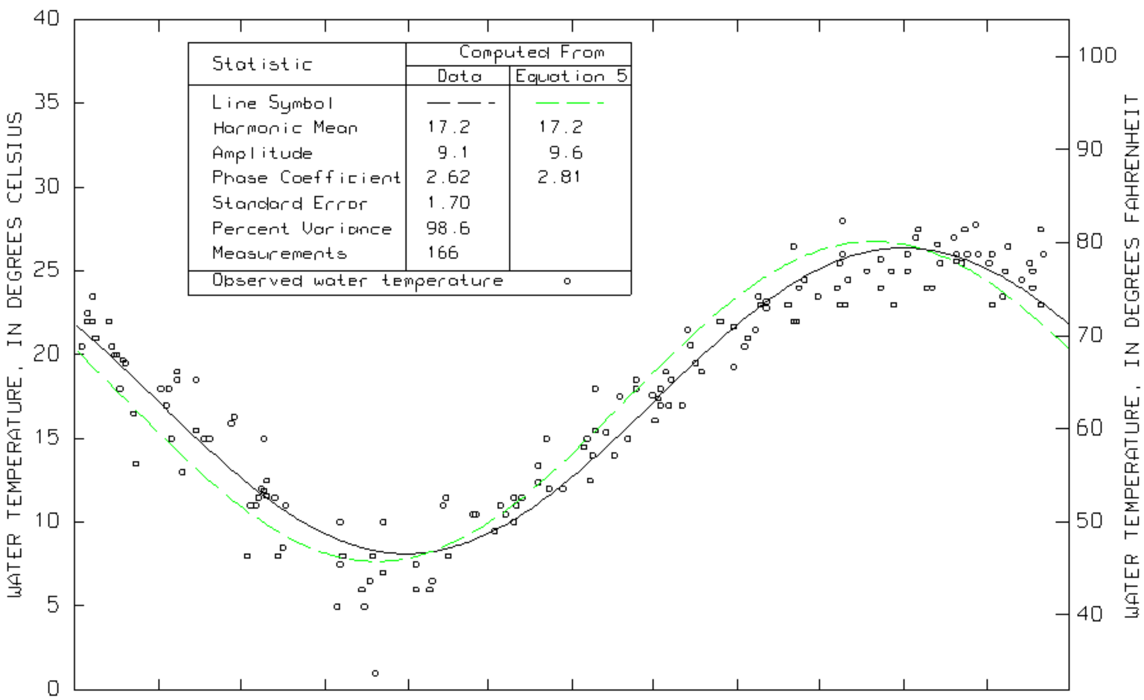
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	16.0	13.0	11.0	10.5	16.0	20.0	22.0	24.5	25.0	27.0	25.0
Minimum	10.0	6.0	3.5	2.0	1.0	6.5	14.0	16.5	21.0	21.0	22.0	16.5

Figure 135. Yellowjacket Creek near LaGrange, Georgia, Station 02339000, August 1956 to September 1970.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	15.5	13.0	13.0	11.0	17.0	22.0	31.0	28.0	28.0	29.0	27.0
Minimum	13.5	10.5	6.0	4.0	5.5	8.5	13.0	15.5	20.0	23.5	22.0	19.0

Figure 136. Chattahoochee River at West Point, Georgia, Station 02339500, September 1957 to September 1974.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.5	19.0	15.0	10.0	11.5	15.0	18.5	22.0	26.5	28.0	27.8	27.5
Minimum	13.5	13.0	8.0	1.0	6.0	9.5	12.5	16.1	20.5	23.0	24.0	23.0

Figure 137. Chattahoochee River at West Point, Georgia, Station 02339500, October 1974 to December 1984.

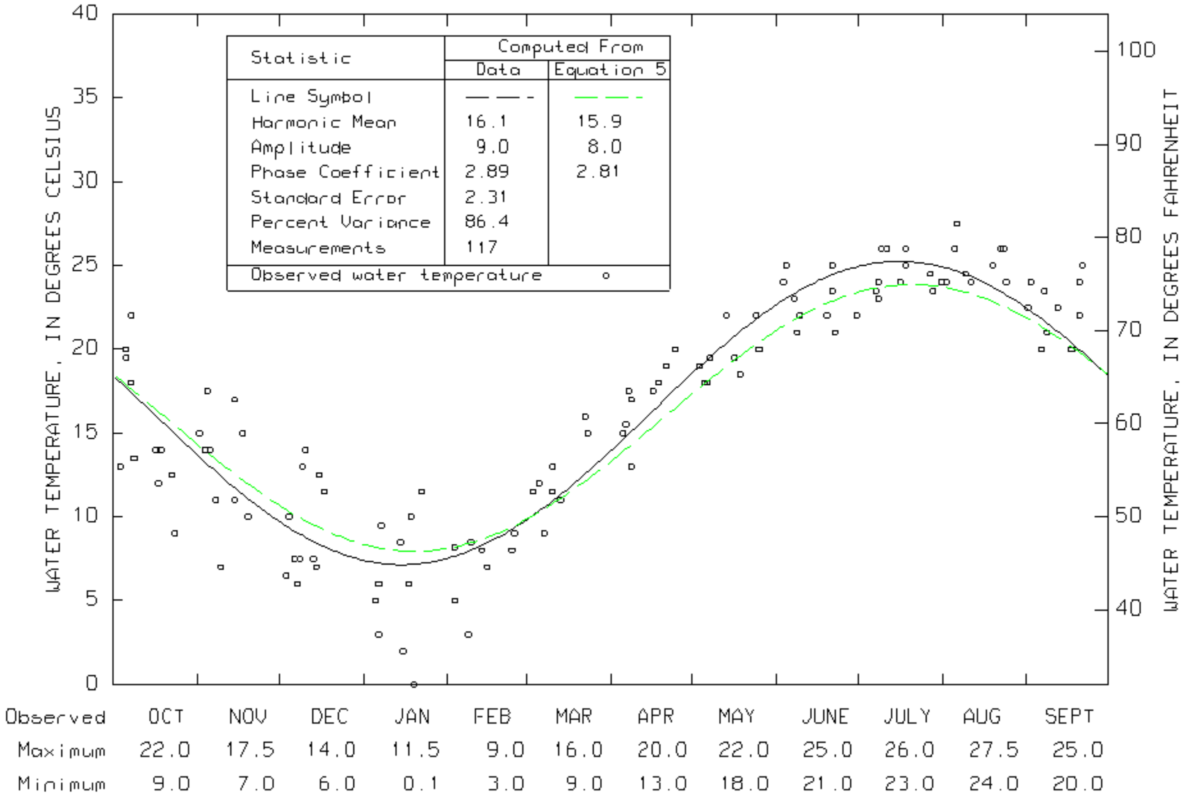


Figure 138. Long Cane Creek near West Point, Georgia,
Station 02339720, July 1974 to December 1984.

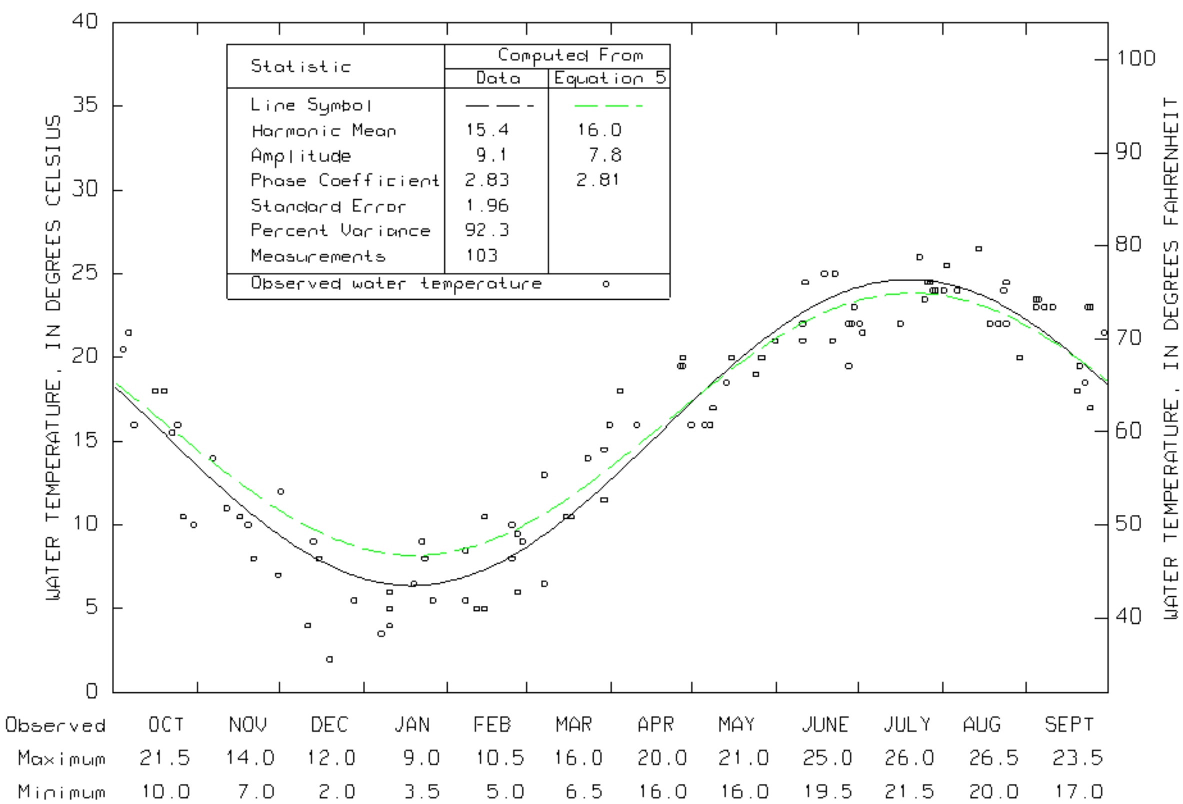
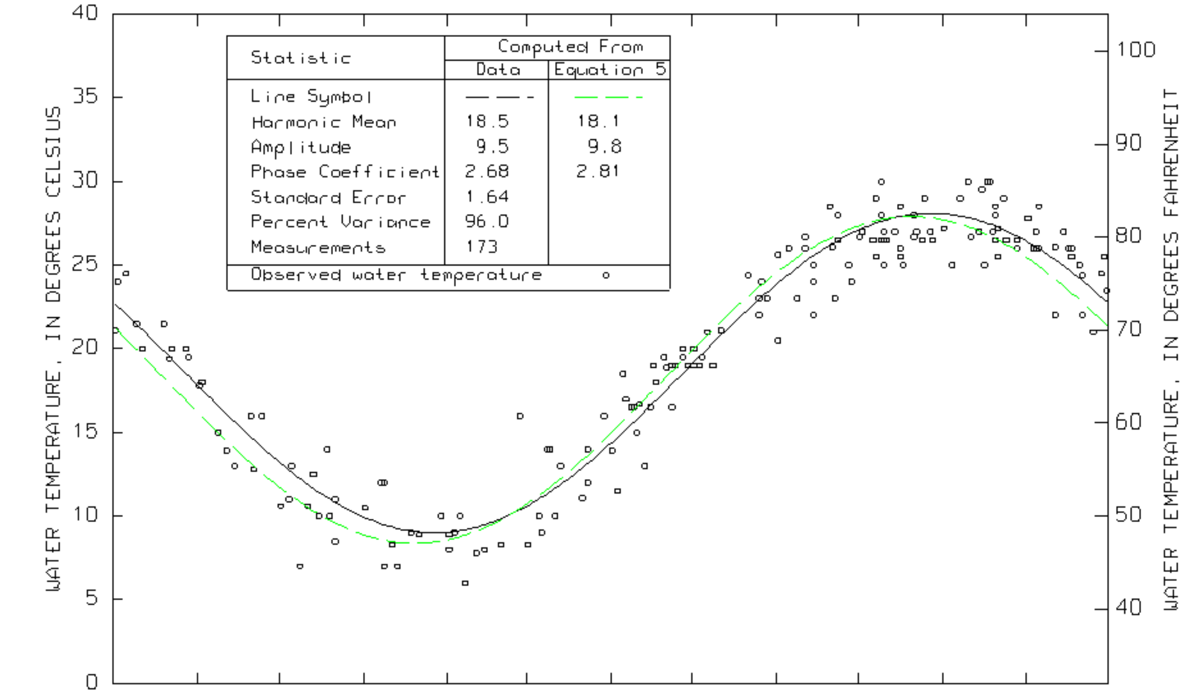
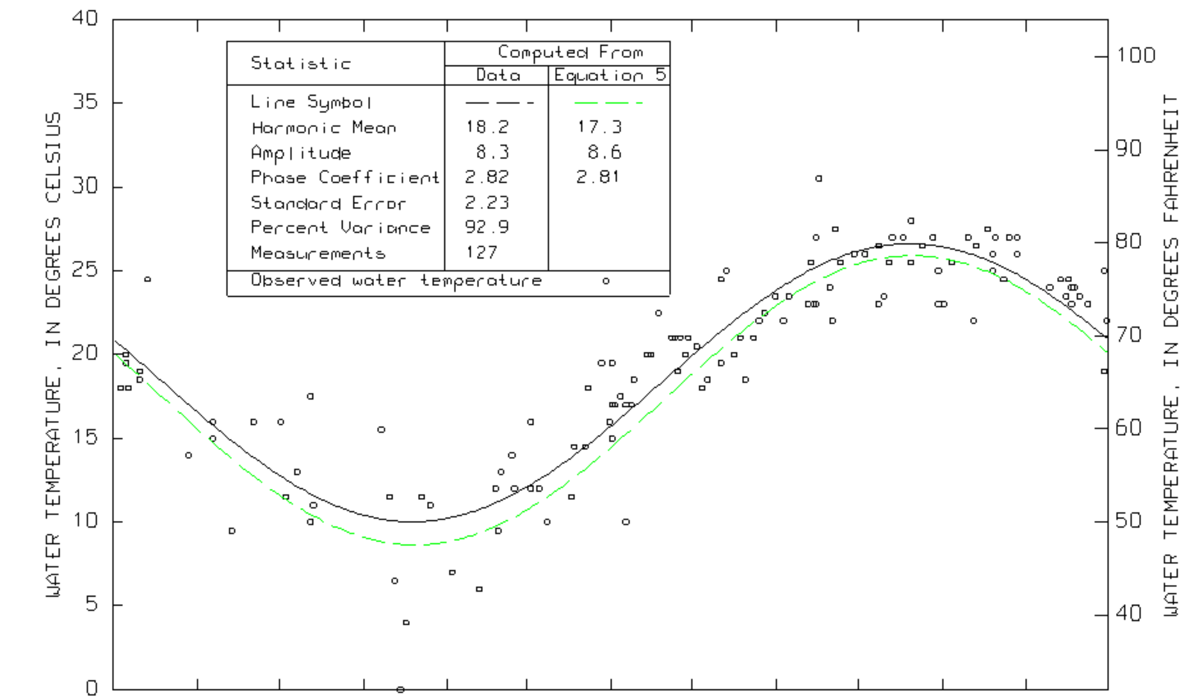


Figure 139. Mountain Oak Creek near Hamilton, Georgia,
Station 02340500, August 1956 to June 1974.



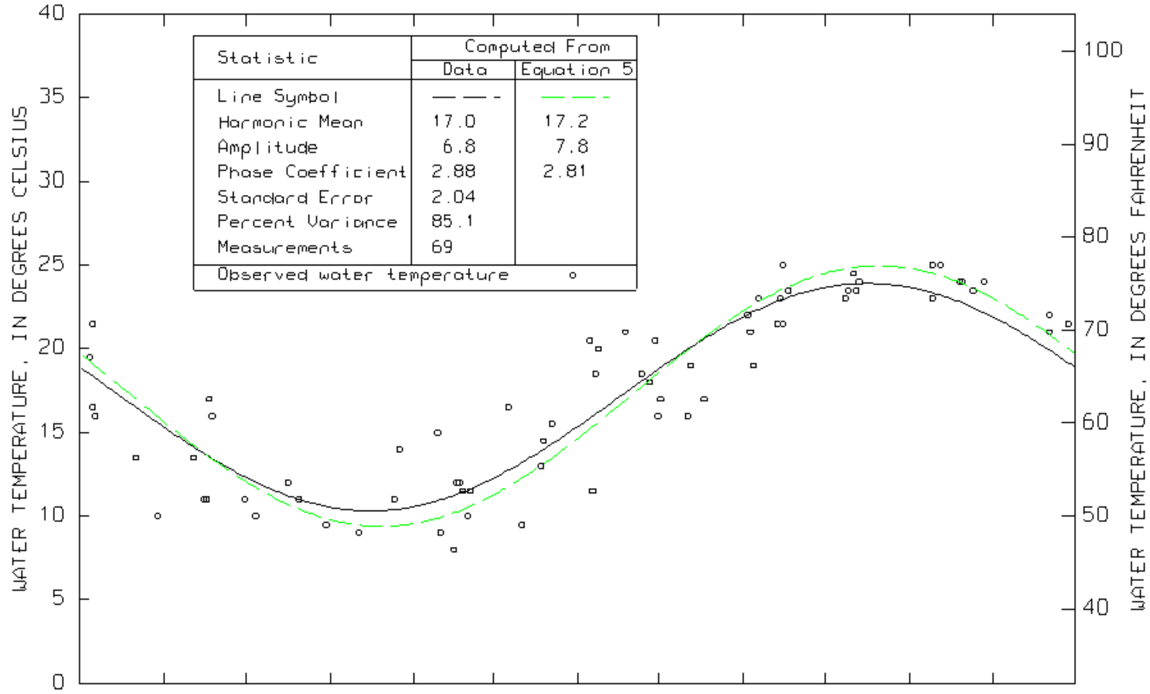
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.5	18.0	14.0	12.0	16.0	16.0	20.0	24.4	28.5	30.0	30.0	28.5
Minimum	19.4	12.8	7.0	7.0	6.0	8.3	11.5	19.0	20.5	25.0	25.0	21.0

Figure 140. Chattahoochee River at Columbus, Georgia, Station 02341500, October 1940 to September 1974.



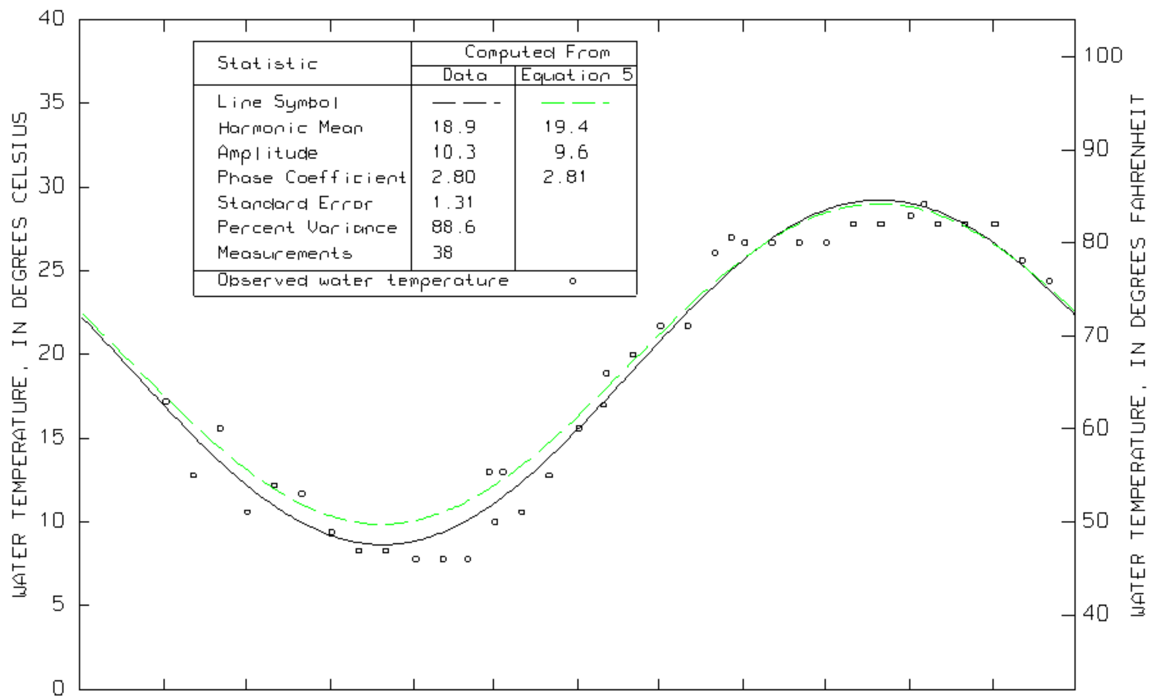
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.5	16.0	17.5	15.5	14.0	19.5	22.5	25.0	30.5	28.0	27.5	25.0
Minimum	14.0	9.5	10.0	0.1	6.0	10.0	10.0	18.0	22.0	23.0	22.0	19.0

Figure 141. Upatoi Creek near Columbus, Georgia, Station 02341800, April 1965 to September 1983.



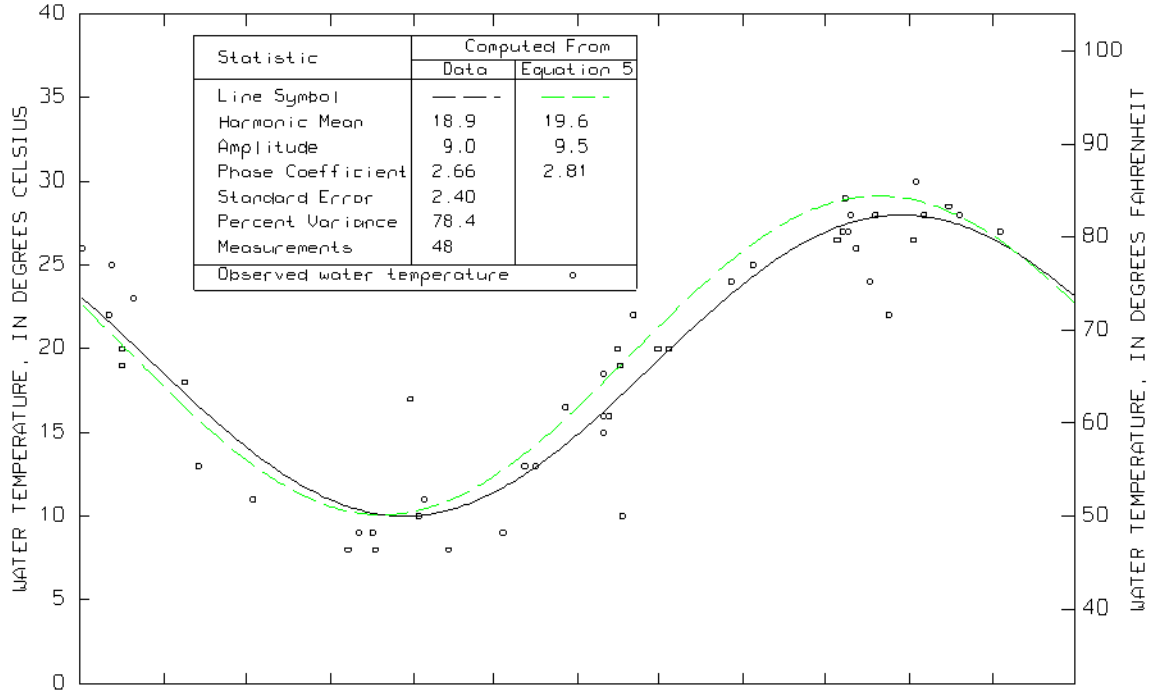
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.5	17.0	12.0	14.0	15.0	16.5	21.0	19.0	25.0	24.5	25.0	22.0
Minimum	10.0	11.0	9.5	9.0	8.0	9.5	11.5	16.0	19.0	23.0	23.0	21.0

Figure 142. Pataula Creek near Lumpkin, Georgia,
Station 02343200, August 1962 to November 1973.



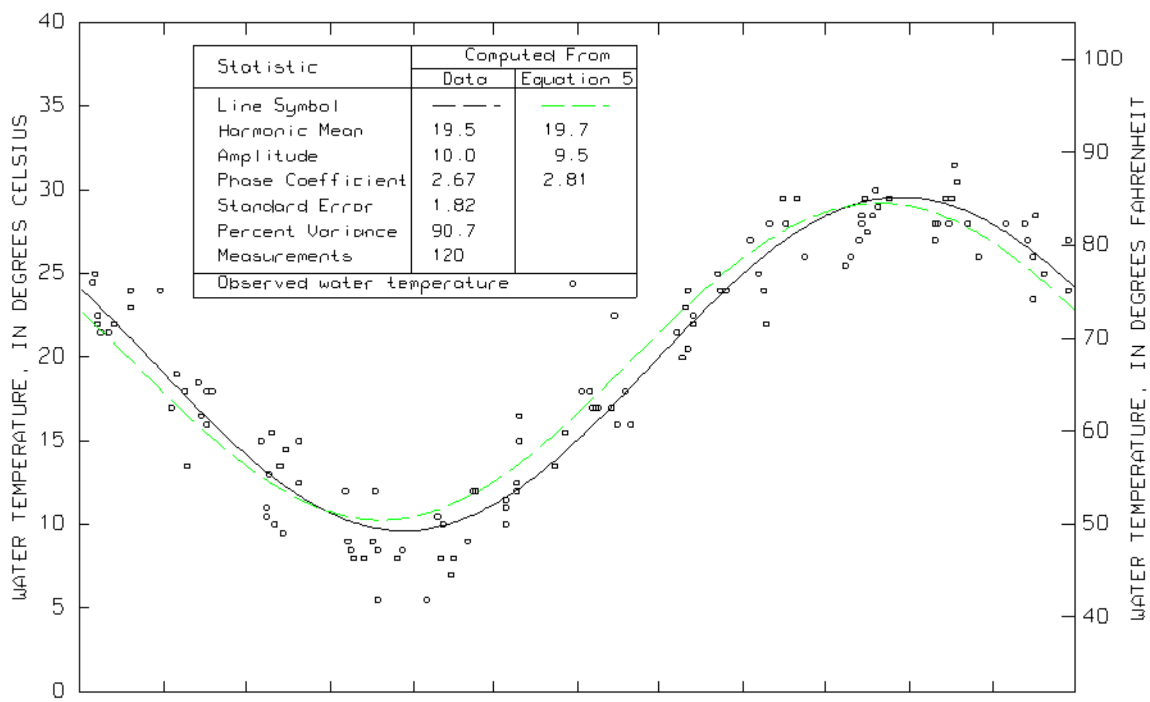
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum		17.2	12.2	9.4	13.0	13.0	20.0	27.0	26.7	27.8	29.0	27.8
Minimum		12.8	10.6	8.3	7.8	10.0	15.6	21.7	26.7	26.7	27.8	24.4

Figure 143. Chattahoochee River at Columbia, Alabama,
Station 02343500, November 1940 to April 1958.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	26.0	18.0	11.0	17.0	11.0	16.5	22.0	24.0	25.0	29.0	30.0	27.0
Minimum	19.0	13.0	11.0	8.0	8.0	9.0	10.0	20.0	25.0	22.0	26.5	27.0

Figure 144. Chattahoochee River at Alaga, Alabama, Station 02344000, January 1964 to July 1974.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	25.0	19.0	15.5	12.0	12.0	16.5	22.5	25.0	29.5	30.0	31.5	28.5
Minimum	21.5	13.5	9.5	5.5	5.5	10.0	16.0	20.0	22.0	25.5	26.0	23.5

Figure 145. Chattahoochee River near Steam Mill, Georgia, Station 02344040, October 1974 to December 1984.

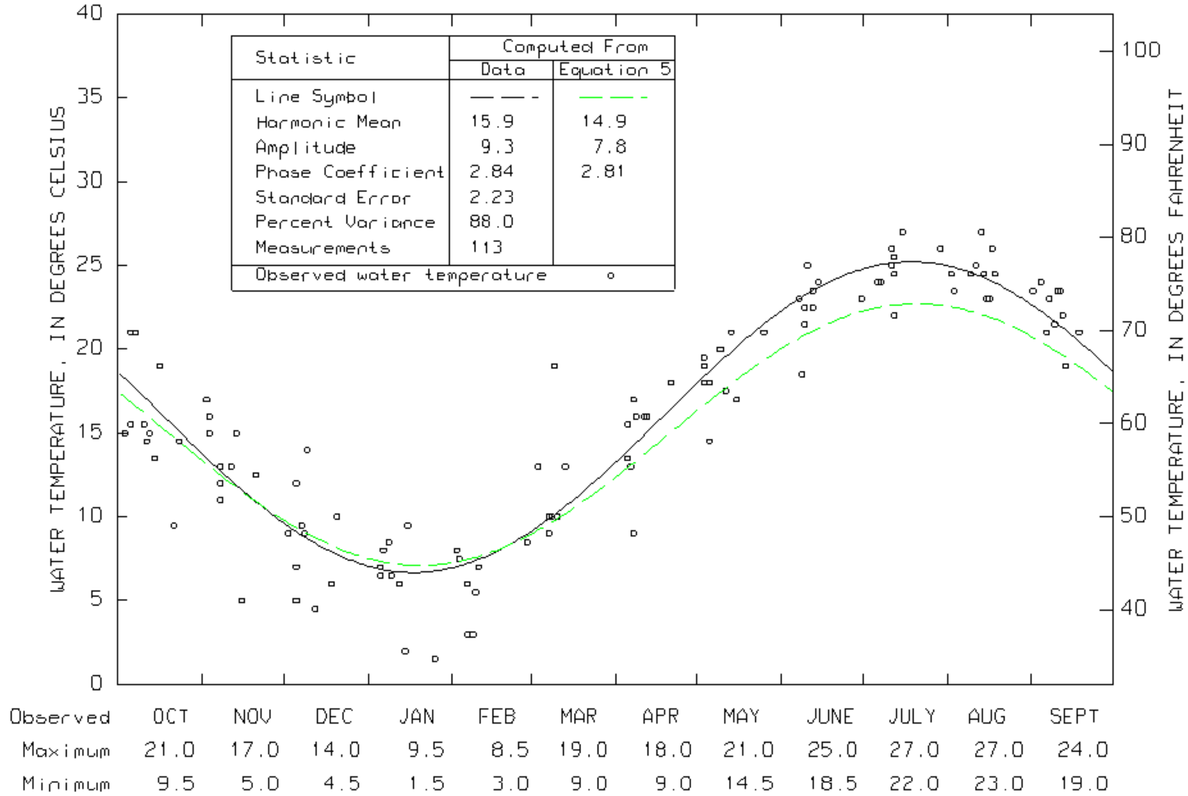


Figure 146. Flint River at State Highway 138 near Jonesboro, Georgia, Station 02344180, May 1958 to December 1984.

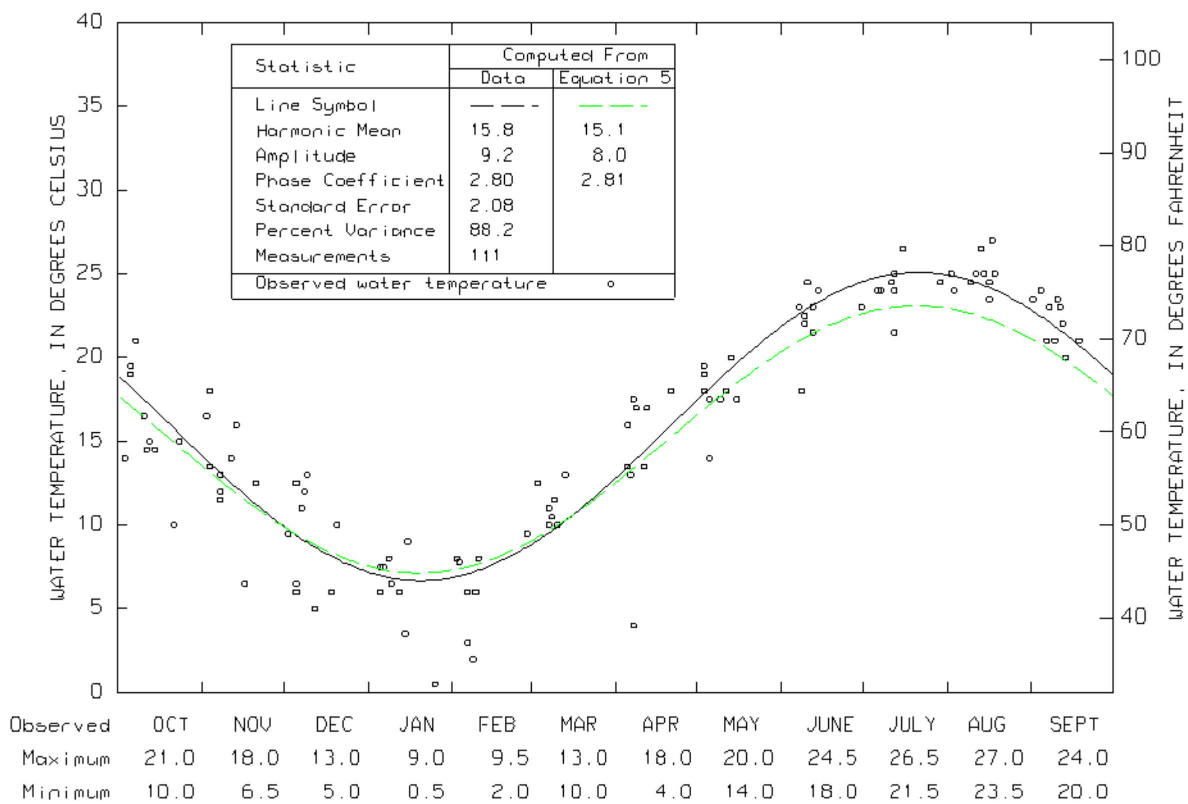
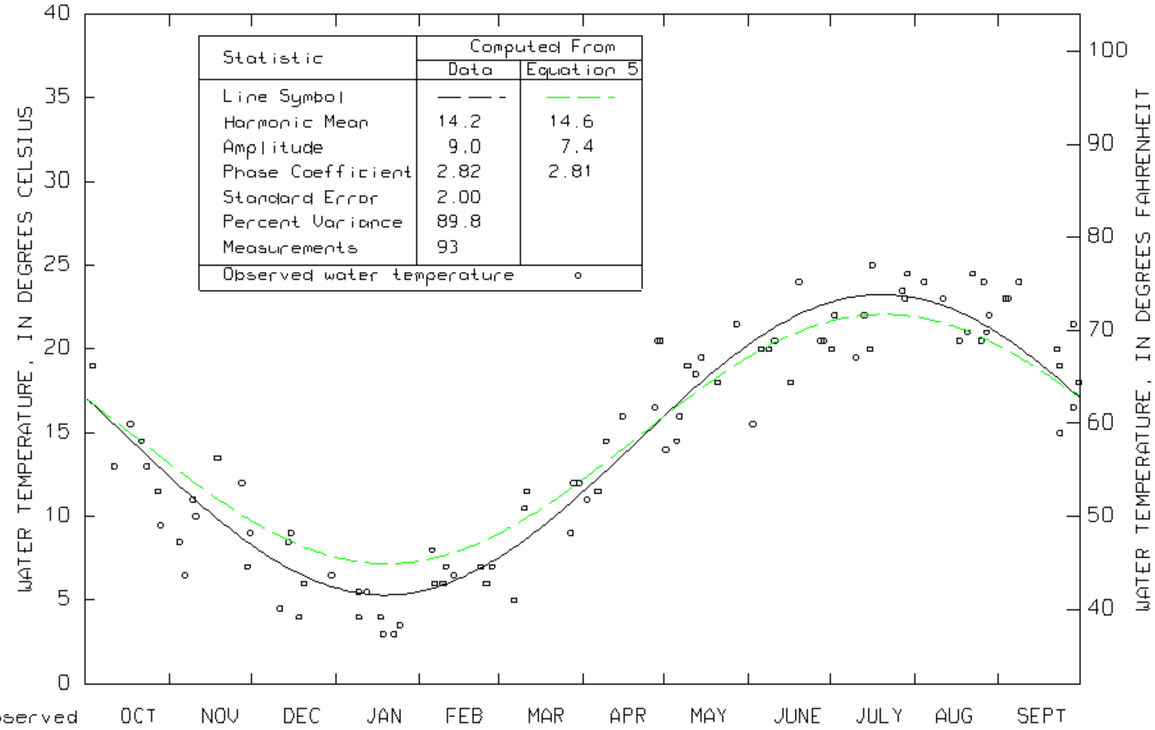
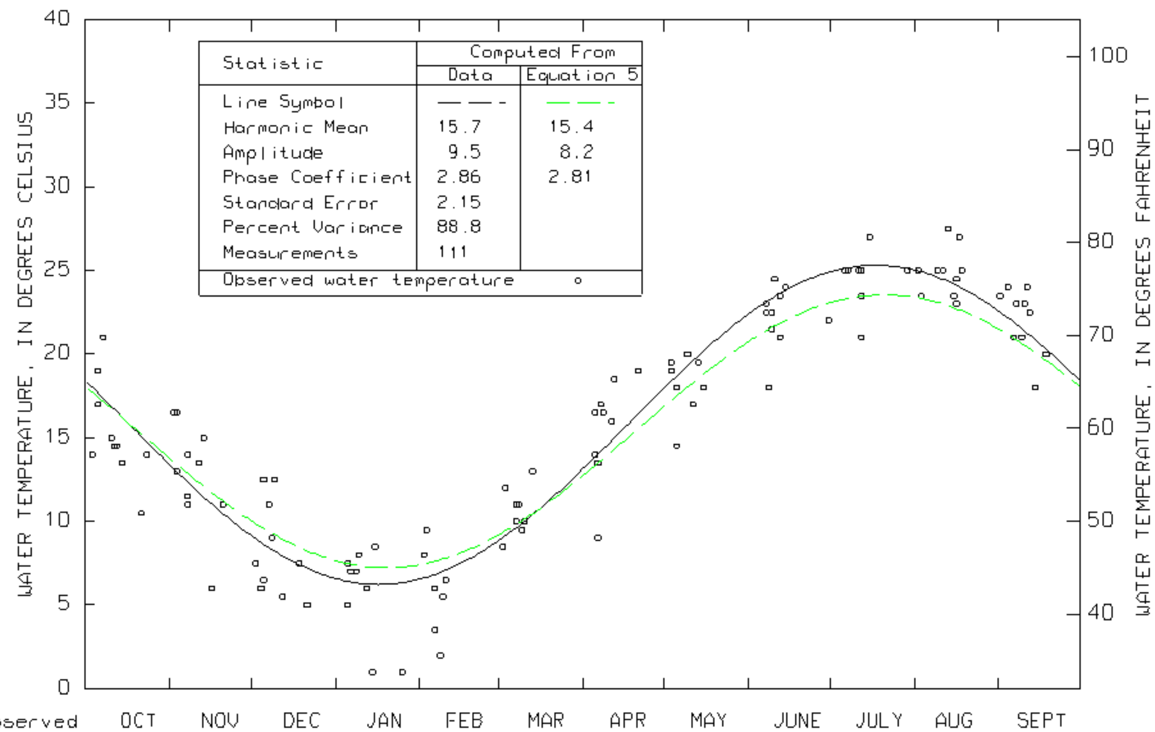


Figure 147. Flint River at State Highway 54 near Fayetteville, Georgia, Station 02344190, July 1975 to December 1984.



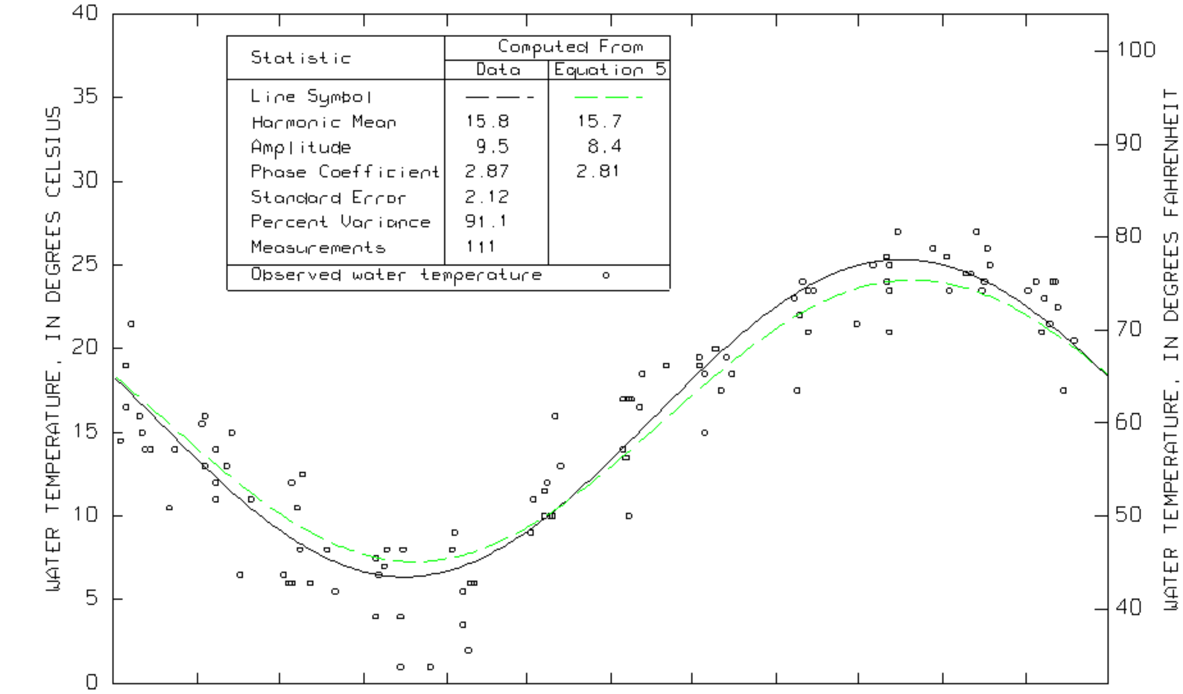
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.0	13.5	9.0	5.5	8.0	12.0	20.5	21.5	24.0	25.0	24.5	24.0
Minimum	9.5	6.5	4.0	3.0	6.0	5.0	11.0	14.0	15.5	19.5	20.5	15.0

Figure 148. Camp Creek near Fayetteville, Georgia,
Station 02344300, July 1960 to September 1970.



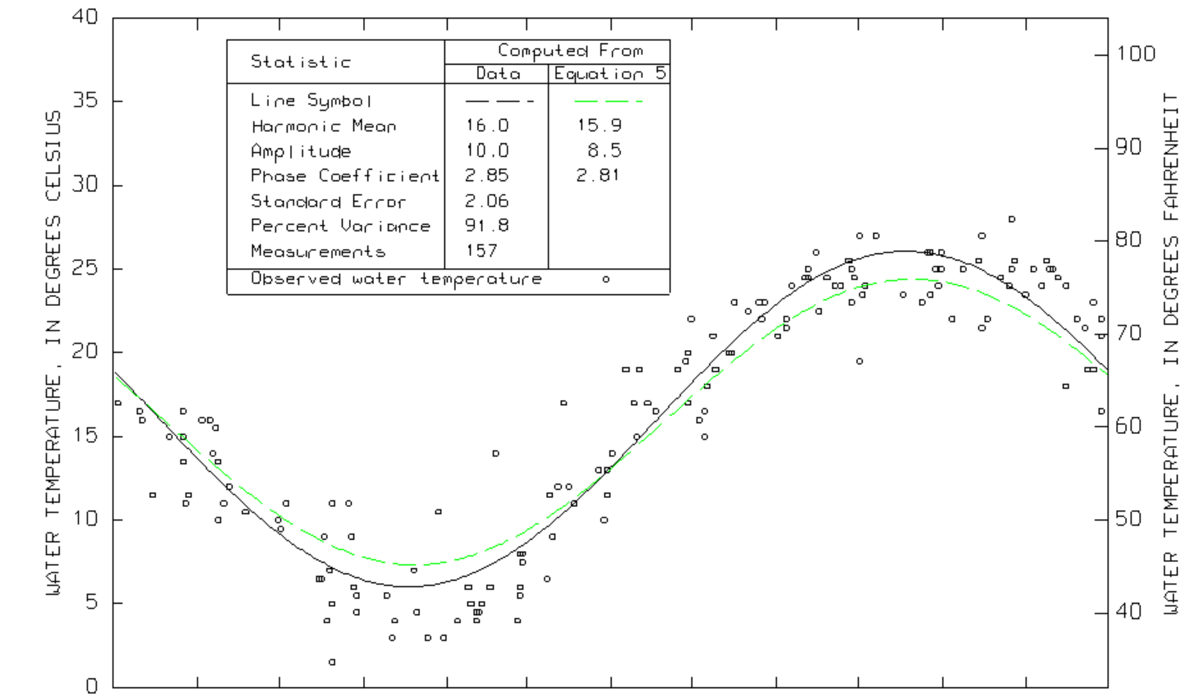
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	16.5	12.5	8.5	9.5	13.0	19.0	20.0	24.5	27.0	27.5	24.0
Minimum	10.5	6.0	5.0	1.0	2.0	8.5	9.0	14.5	18.0	21.0	23.0	18.0

Figure 149. Flint River at Ackert Road near Inman, Georgia,
Station 02344380, July 1975 to December 1984.



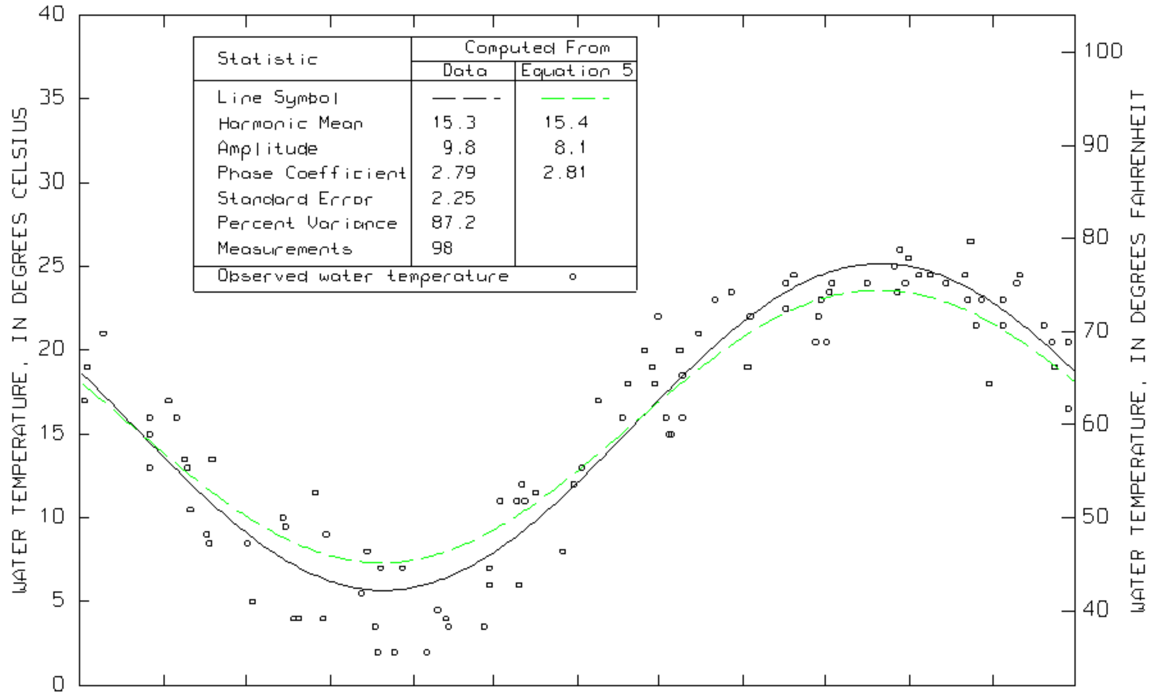
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.5	16.0	12.5	8.0	9.0	16.0	19.0	20.0	24.0	27.0	27.0	24.0
Minimum	10.5	6.5	5.5	1.0	2.0	9.0	10.0	15.0	17.5	21.0	23.5	17.5

Figure 150. Flint River at State Highway 92 above Griffin, Georgia, Station 02344400, July 1975 to December 1984.



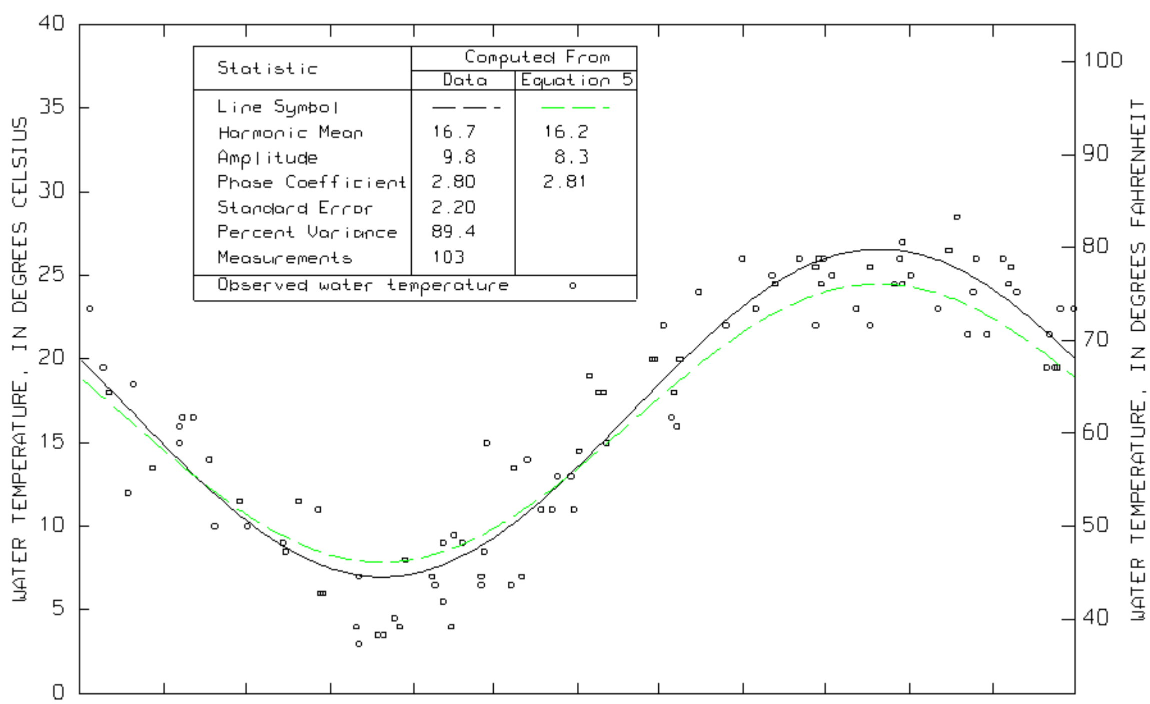
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	17.0	16.0	11.0	10.5	14.0	17.0	22.0	23.0	26.0	27.0	28.0	25.5
Minimum	11.0	10.0	1.5	3.0	4.0	6.5	14.0	15.0	21.0	19.5	21.5	16.5

Figure 151. Flint River near Griffin, Georgia, Station 02344500, August 1956 to July 1976.



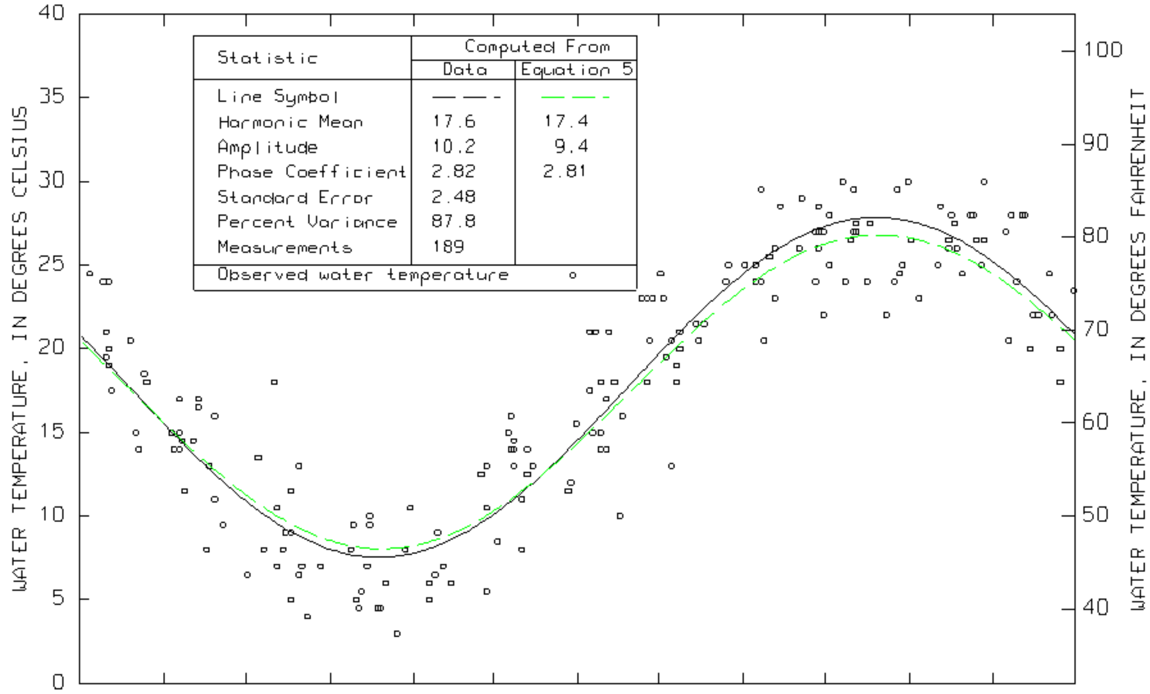
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	17.0	11.5	8.0	7.0	12.0	22.0	23.5	24.5	26.0	26.5	24.5
Minimum	13.0	8.5	4.0	2.0	2.0	6.0	13.0	15.0	19.0	20.5	18.0	16.5

Figure 152. Line Creek near Senoia, Georgia, Station 02344700, September 1964 to July 1976.



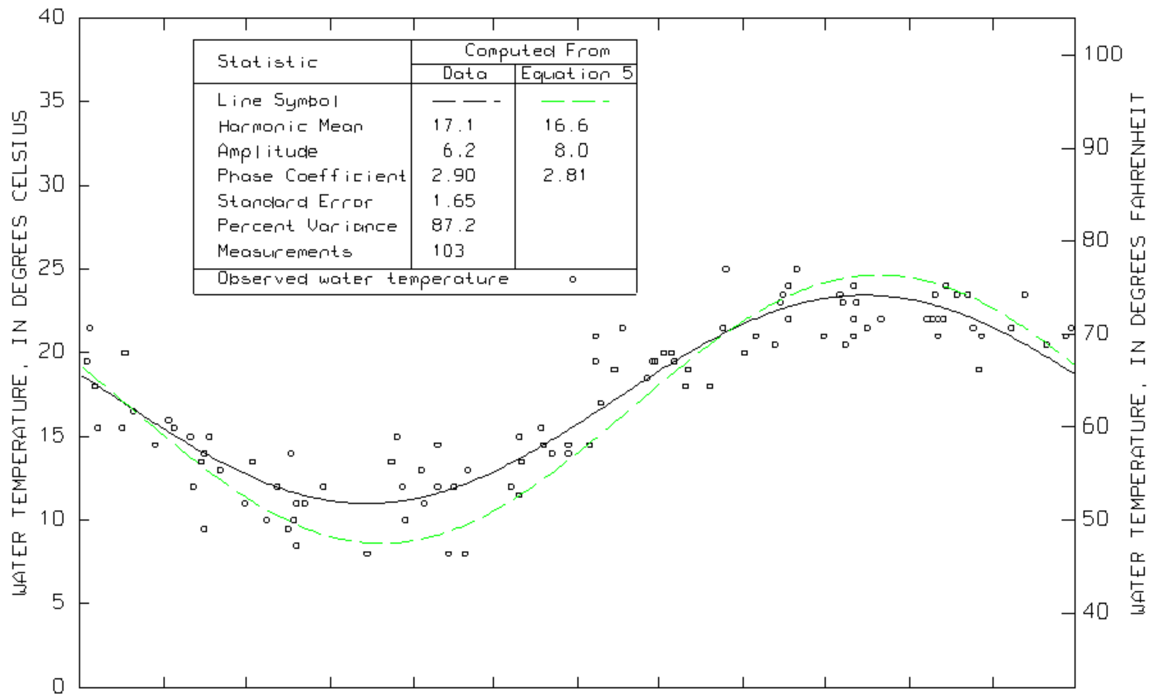
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	16.5	11.5	8.0	15.0	14.0	20.0	26.0	26.0	27.0	28.5	26.0
Minimum	12.0	10.0	6.0	3.0	4.0	6.5	14.5	16.0	22.0	22.0	21.5	19.5

Figure 153. Potato Creek near Thomaston, Georgia, Station 02346500, July 1956 to June 1974.



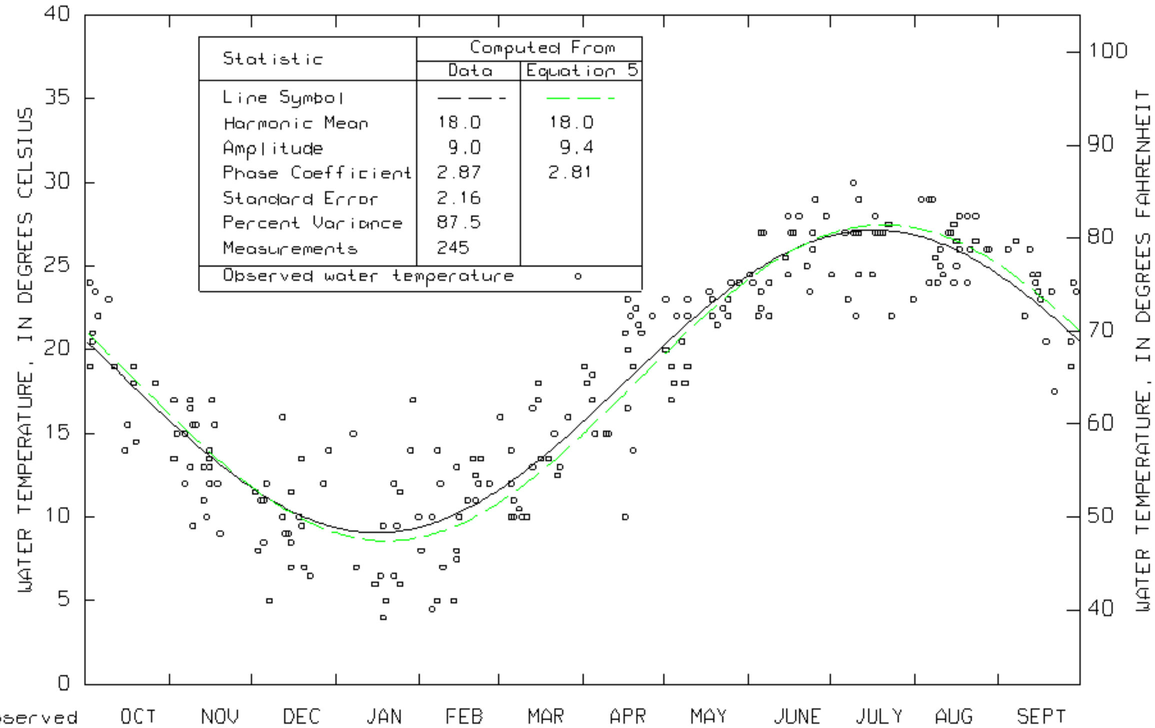
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.5	17.0	18.0	10.5	13.0	16.0	23.0	25.0	29.5	30.0	30.0	28.0
Minimum	14.0	8.0	4.0	3.0	5.0	8.0	10.0	13.0	20.5	22.0	23.0	18.0

Figure 154. Flint River near Culloden, Georgia,
Station 02347500, April 1954 to June 1979.



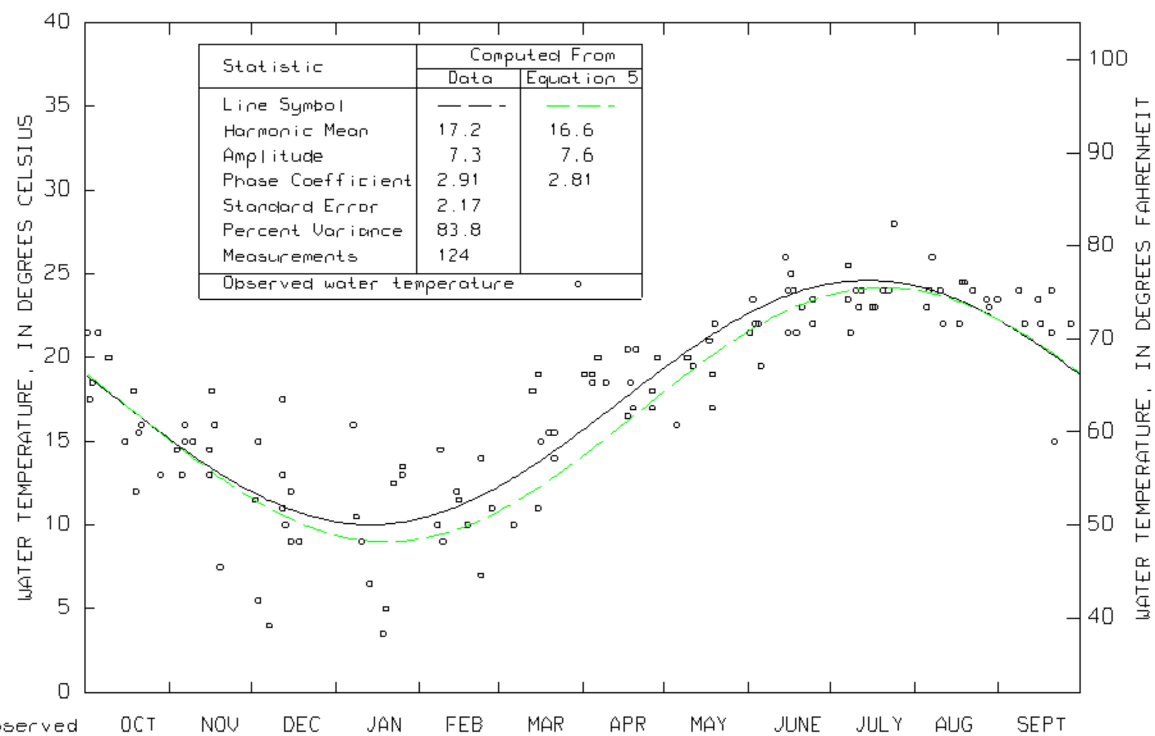
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.5	16.0	14.0	15.0	14.5	15.5	21.5	25.0	25.0	24.0	24.0	23.5
Minimum	14.5	9.5	8.5	8.0	8.0	11.5	14.5	18.0	20.0	20.5	19.0	20.5

Figure 155. Whitewater Creek below Rambulette Creek near Butler, Georgia,
Station 02349000, April 1954 to November 1973.



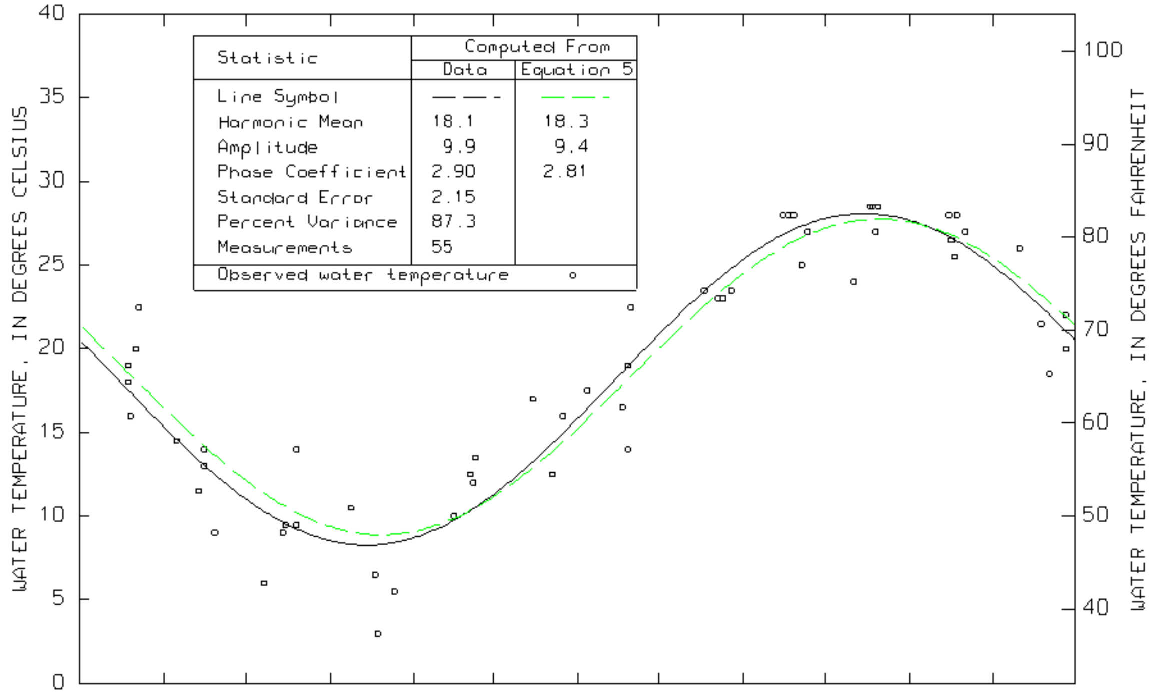
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	24.0	17.0	16.0	17.0	14.0	18.0	23.0	24.0	29.0	30.0	29.0	26.5
Minimum	14.0	9.0	5.0	4.0	4.5	10.0	10.0	17.0	22.0	22.0	24.0	17.5

Figure 156. Flint River at Montezuma, Georgia,
Station 02349500, May 1954 to December 1984.



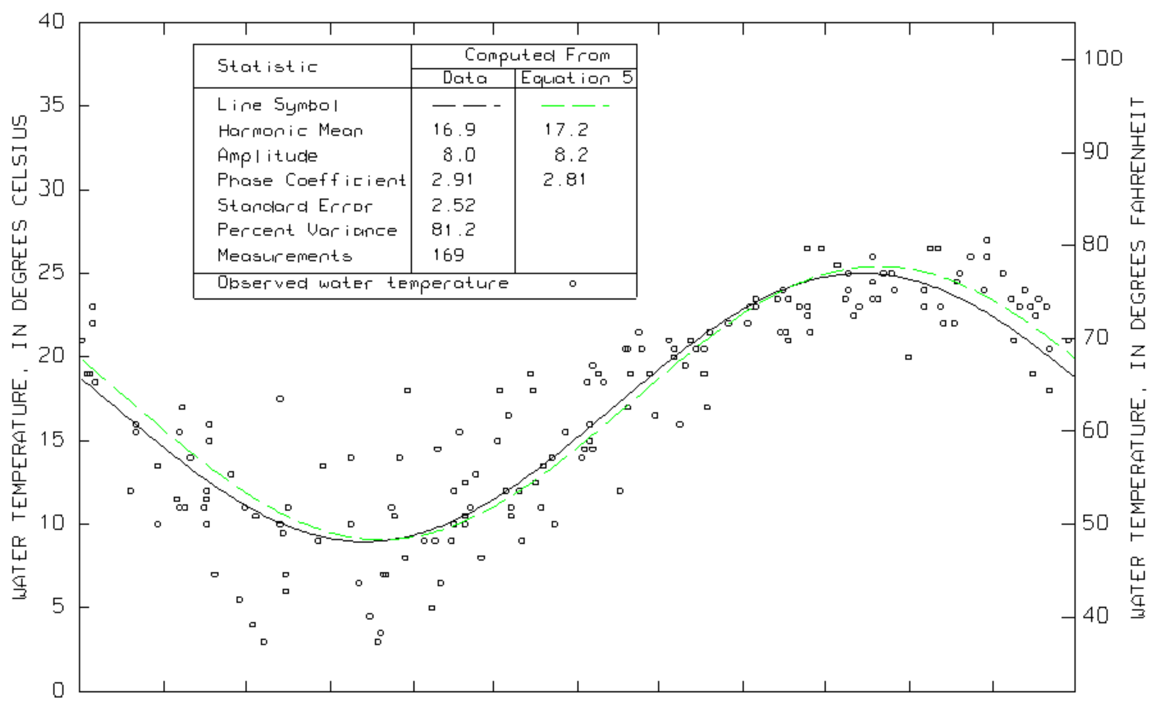
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.5	18.0	17.5	16.0	14.5	19.0	20.5	22.0	26.0	28.0	26.0	24.0
Minimum	12.0	7.5	4.0	3.5	7.0	10.0	16.5	16.0	19.5	21.5	22.0	15.0

Figure 157. Turkey Creek at Byromville, Georgia,
Station 02349900, July 1954 to June 1982.



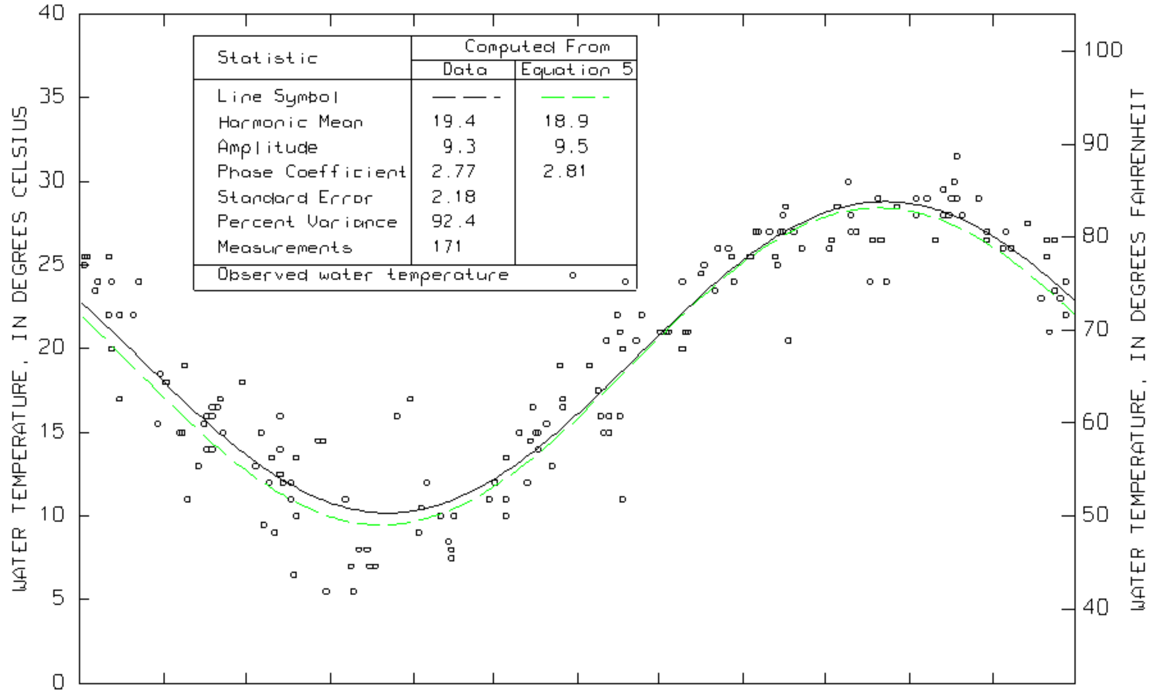
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	22.5	14.5	14.0	10.5	13.5	17.0	22.5	23.5	28.0	28.5	28.0	26.0
Minimum	16.0	9.0	6.0	3.0	10.0	12.5	14.0	23.0	25.0	24.0	25.5	18.5

Figure 158. Flint River at State Highway 27 near Vienna, Georgia, Station 02350001, July 1979 to December 1984.



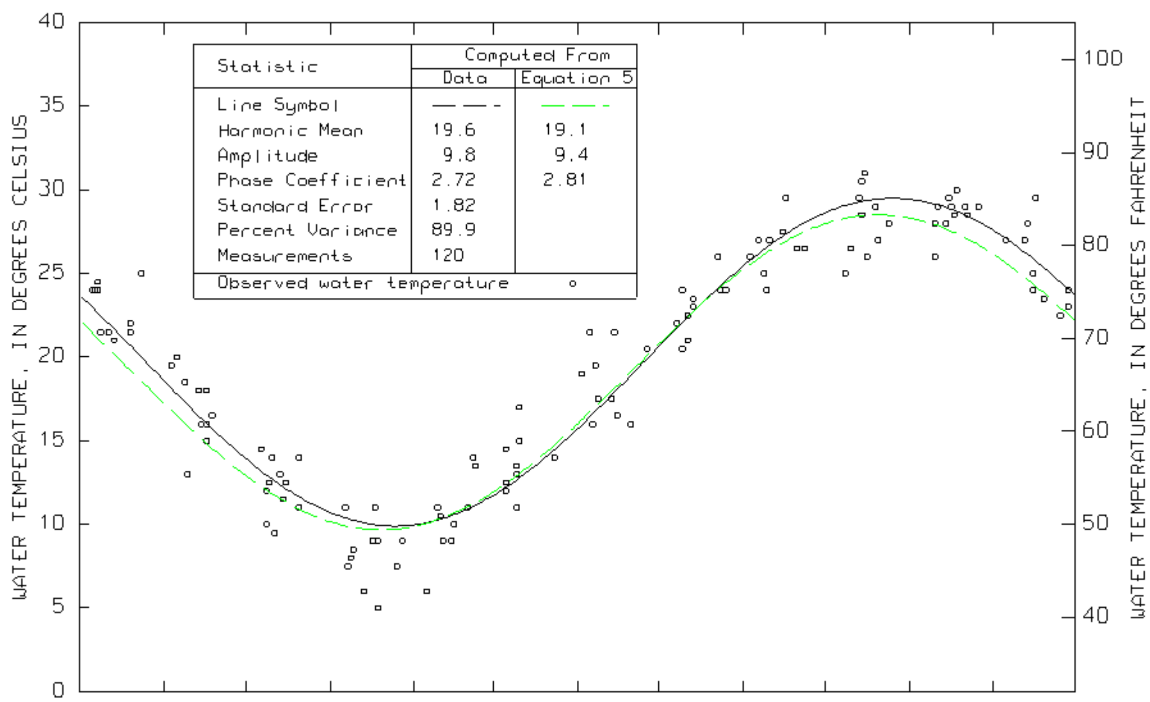
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	17.0	17.5	18.0	15.5	19.0	21.5	22.0	26.5	26.0	27.0	25.0
Minimum	10.0	5.5	3.0	3.0	5.0	9.0	12.0	16.0	21.0	20.0	22.0	18.0

Figure 159. Kinchafoonee Creek at Preston, Georgia, Station 02350600, May 1954 to July 1984.



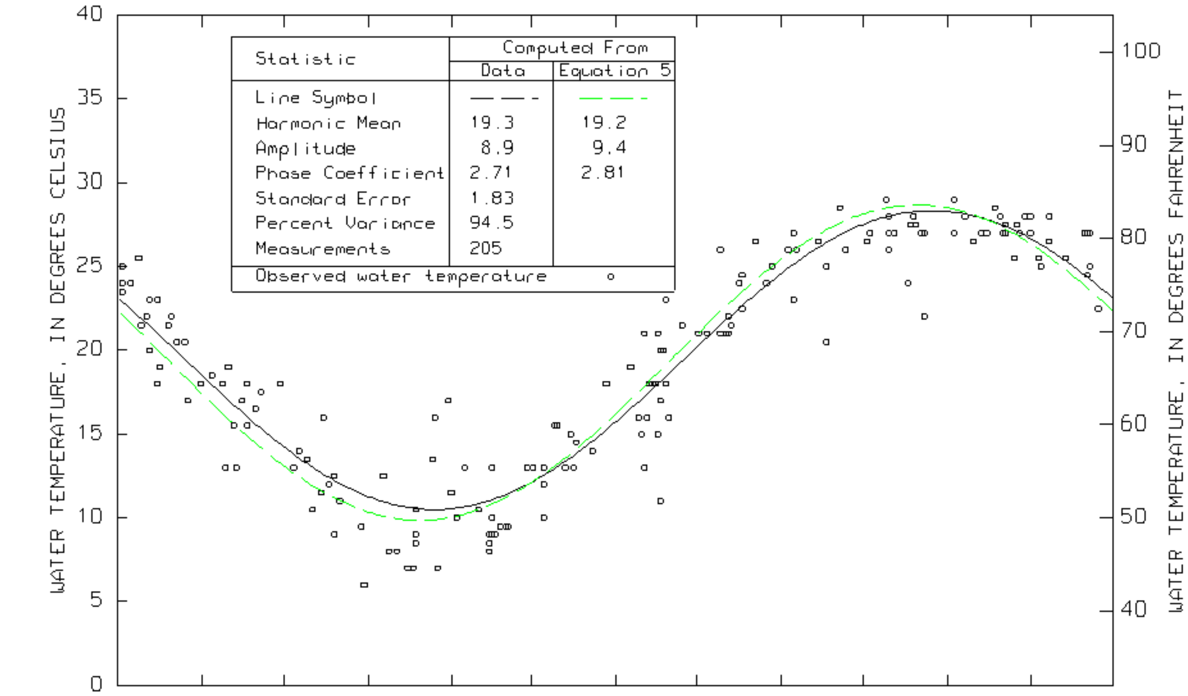
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	25.5	19.0	16.0	17.0	12.0	19.0	24.0	26.0	28.5	30.0	31.5	27.5
Minimum	15.5	11.0	5.5	5.5	7.5	10.0	11.0	20.0	20.5	24.0	26.5	21.0

Figure 160. Flint River at Albany, Georgia,
Station 02352500, May 1954 to December 1984.



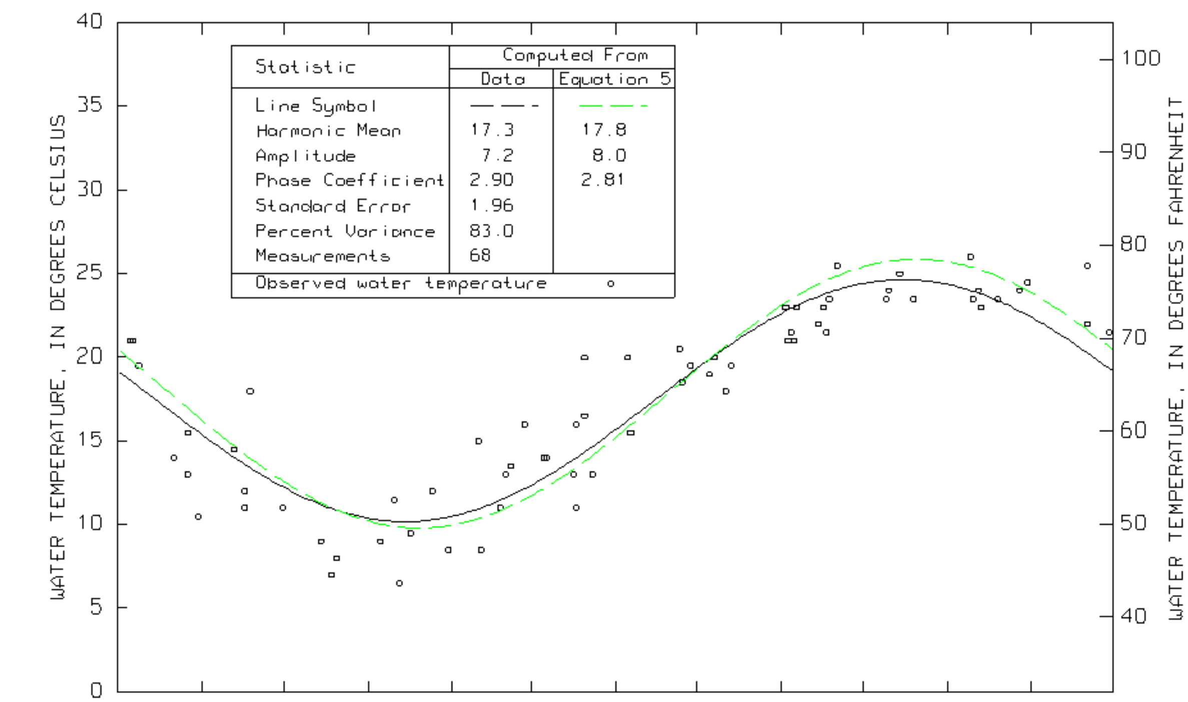
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	25.0	20.0	14.5	11.0	14.0	17.0	21.5	26.0	29.5	31.0	30.0	29.5
Minimum	21.0	13.0	9.5	5.0	6.0	11.0	16.0	20.5	24.0	25.0	26.0	22.5

Figure 161. Flint River (Putney Intake) near Putney, Georgia,
Station 02352790, August 1974 to December 1984.



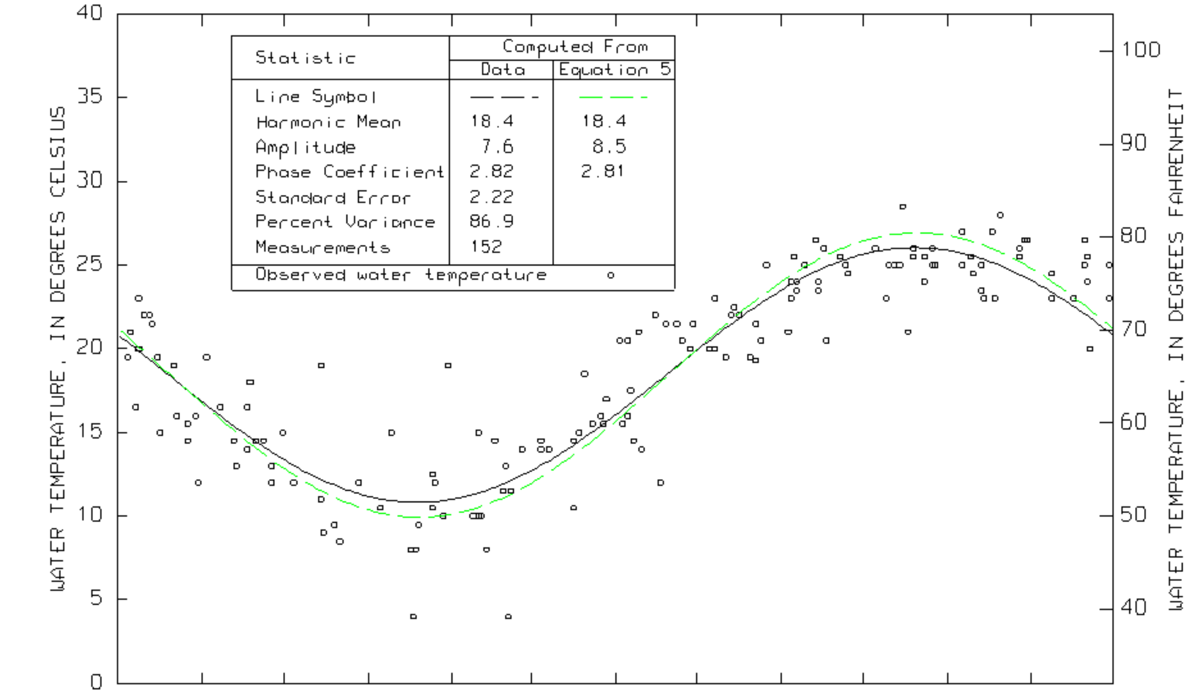
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	25.5	19.0	16.0	17.0	13.0	18.0	23.0	26.5	28.5	29.0	29.0	28.0
Minimum	17.0	13.0	6.0	7.0	8.0	10.0	11.0	21.0	20.5	22.0	25.5	22.5

Figure 162. Flint River at Newton, Georgia,
Station 02353000, August 1956 to October 1984.



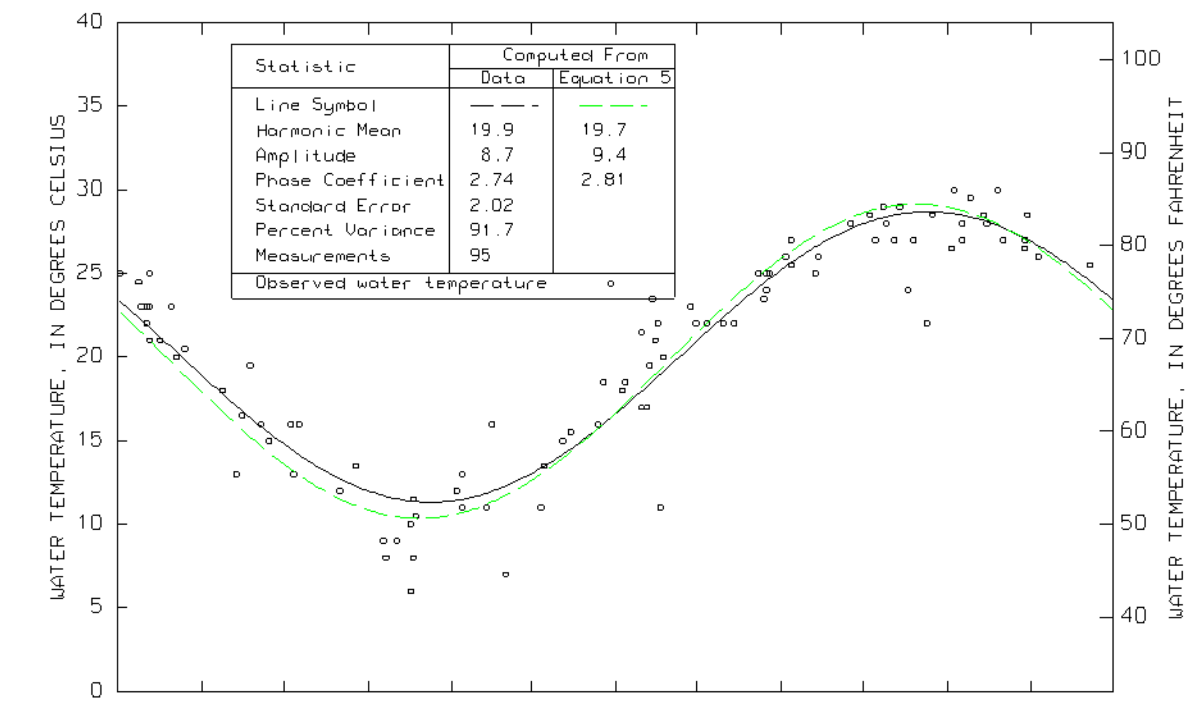
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	18.0	9.0	12.0	16.0	20.0	20.5	20.0	25.5	25.0	26.0	25.5
Minimum	10.5	11.0	7.0	6.5	8.5	11.0	15.5	18.0	21.0	23.5	23.0	21.5

Figure 163. Pachitla Creek near Edison, Georgia,
Station 02353400, October 1954 to November 1973.



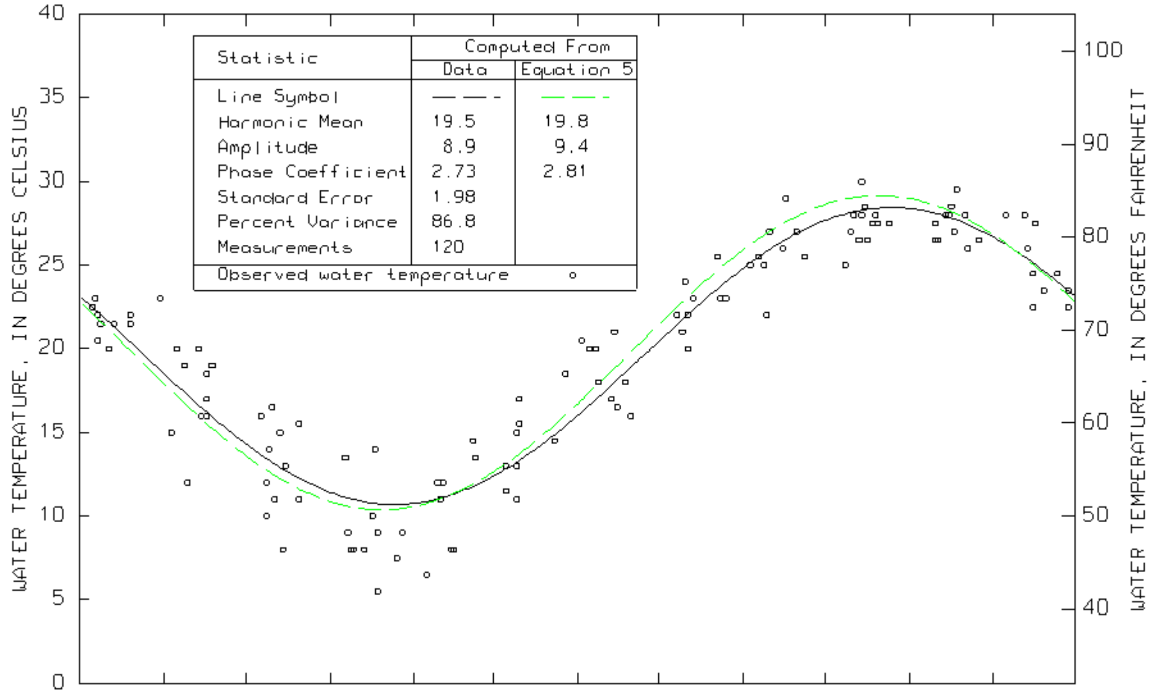
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	19.5	19.0	19.0	15.0	18.5	22.0	25.0	26.5	28.5	28.0	26.5
Minimum	12.0	12.0	8.5	4.0	4.0	10.5	12.0	19.3	20.5	21.0	23.0	20.0

Figure 164. Ichawaynochaway Creek at Milford, Georgia,
Station 02353500, April 1954 to July 1984.



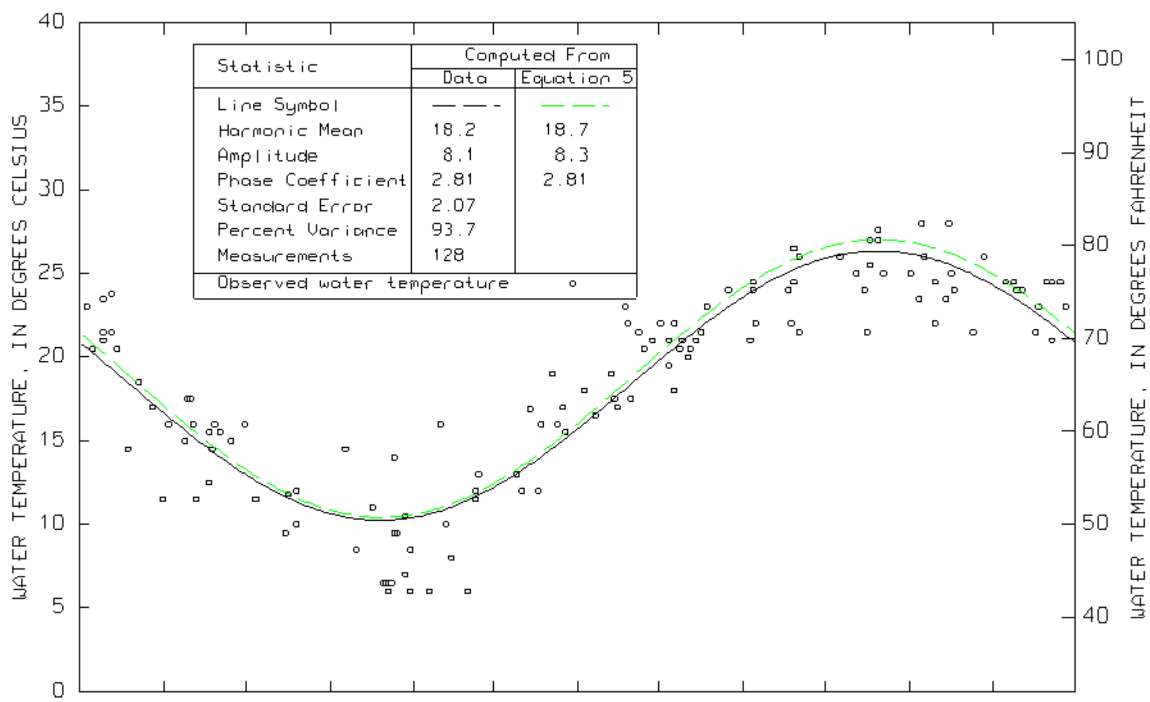
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	25.0	19.5	16.0	11.5	16.0	18.5	23.5	25.0	28.0	29.0	30.0	26.0
Minimum	20.0	13.0	12.0	6.0	7.0	11.0	11.0	22.0	25.0	22.0	26.5	25.5

Figure 165. Flint River at Bainbridge, Georgia,
Station 02356000, April 1954 to July 1973.



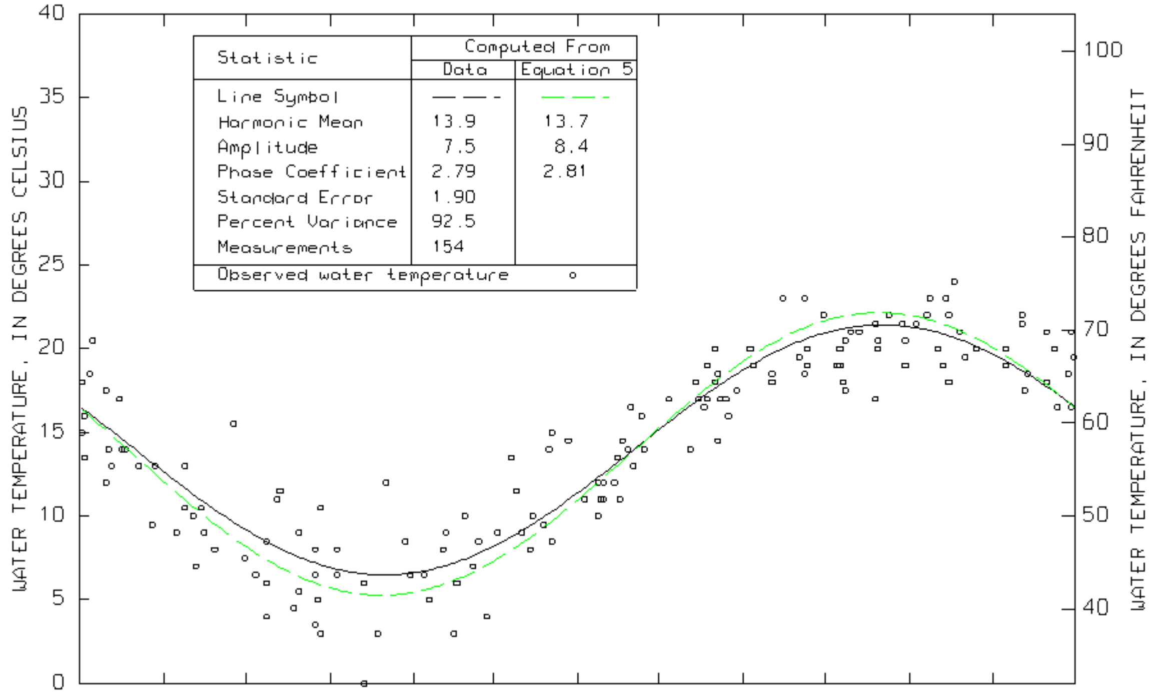
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	20.0	16.5	14.0	14.5	18.5	21.0	25.5	29.0	30.0	29.5	28.0
Minimum	20.0	12.0	8.0	5.5	6.5	11.0	16.0	20.0	22.0	25.0	26.0	22.5

Figure 166. Flint River below State Docks at Bainbridge, Georgia, Station 02356015, July 1974 to December 1984.



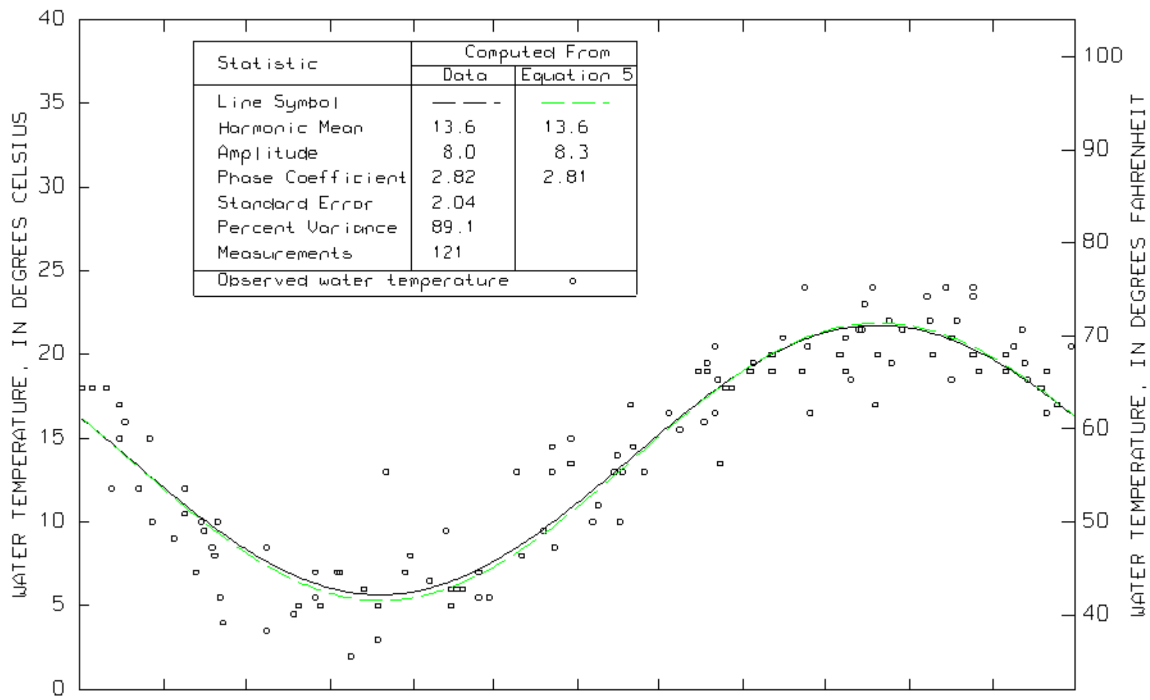
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.8	17.5	12.0	14.5	16.0	19.0	23.0	24.0	26.5	27.6	28.0	24.5
Minimum	11.5	11.5	9.5	6.0	6.0	12.0	16.5	18.0	21.0	21.5	21.5	21.0

Figure 167. Spring Creek near Iron City, Georgia, Station 02357000, August 1957 to July 1978.



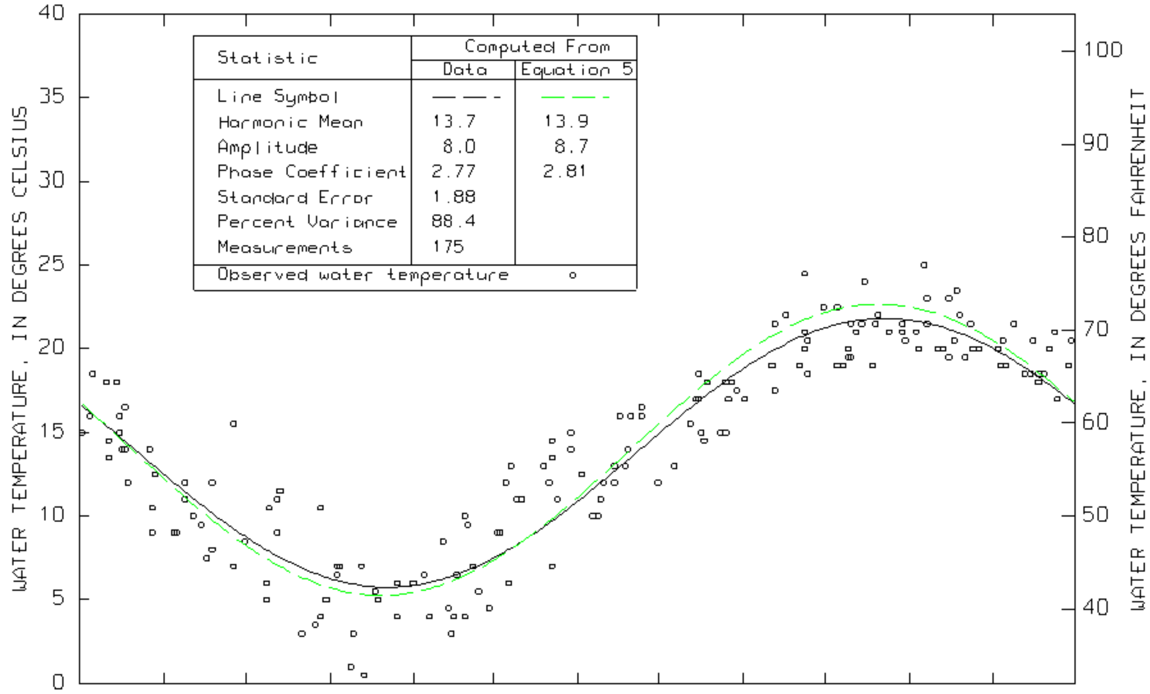
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.5	15.5	11.5	12.0	10.0	15.0	16.5	20.0	23.0	22.0	24.0	22.0
Minimum	9.5	7.0	3.0	0.1	3.0	8.0	10.0	14.0	18.0	17.0	18.0	16.5

Figure 168. Cartecay River near Ellijay, Georgia,
Station 02379500, June 1957 to August 1975.



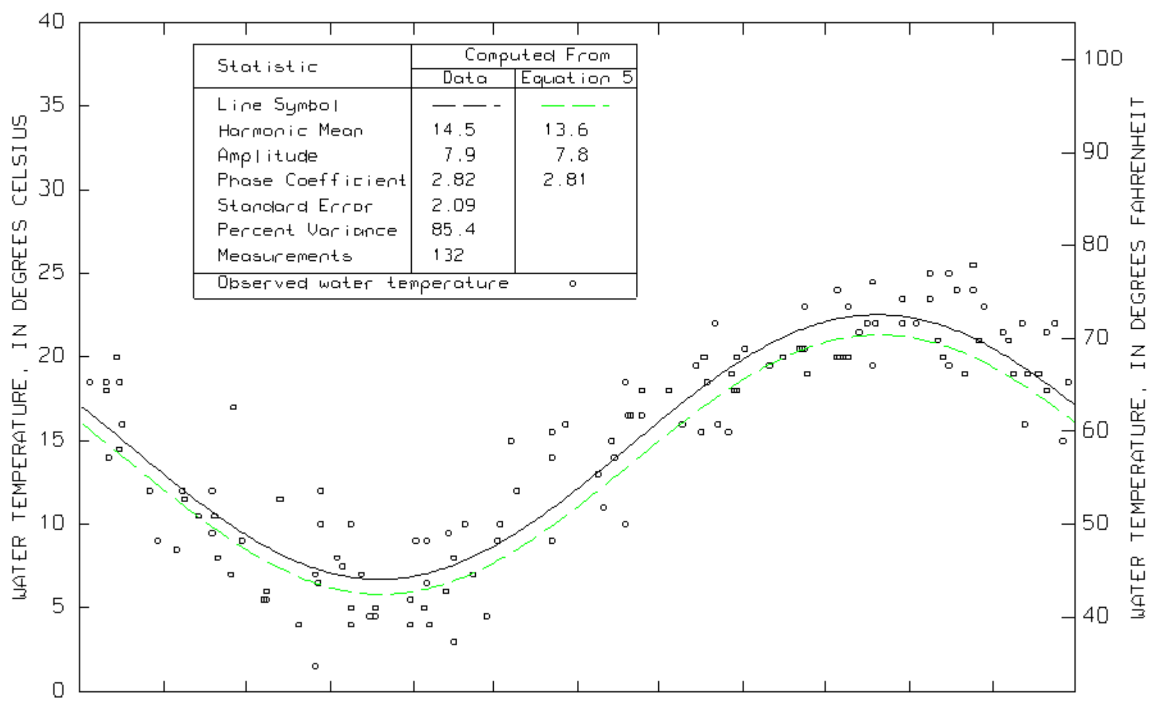
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	18.0	12.0	8.5	13.0	9.5	15.0	17.0	20.5	24.0	24.0	24.0	21.5
Minimum	10.0	4.0	3.5	2.0	5.0	8.0	10.0	13.5	16.5	17.0	18.5	16.5

Figure 169. Ellijay River at Ellijay, Georgia,
Station 02380000, June 1957 to July 1974.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	18.5	15.5	11.5	7.0	10.0	15.0	16.5	18.5	24.5	24.0	25.0	21.5
Minimum	9.0	7.0	3.0	0.5	3.0	6.0	10.0	13.0	17.0	19.0	19.5	17.0

Figure 170. Coosawattee River near Ellijay, Georgia, Station 02380500, May 1963 to August 1983.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	17.0	12.0	10.0	10.0	16.0	18.5	22.0	23.0	24.5	25.5	22.0
Minimum	9.0	7.0	1.5	4.0	3.0	9.0	10.0	15.5	19.0	19.5	19.0	15.0

Figure 171. Scarecorn Creek at Hinton, Georgia, Station 02382000, May 1959 to July 1974.

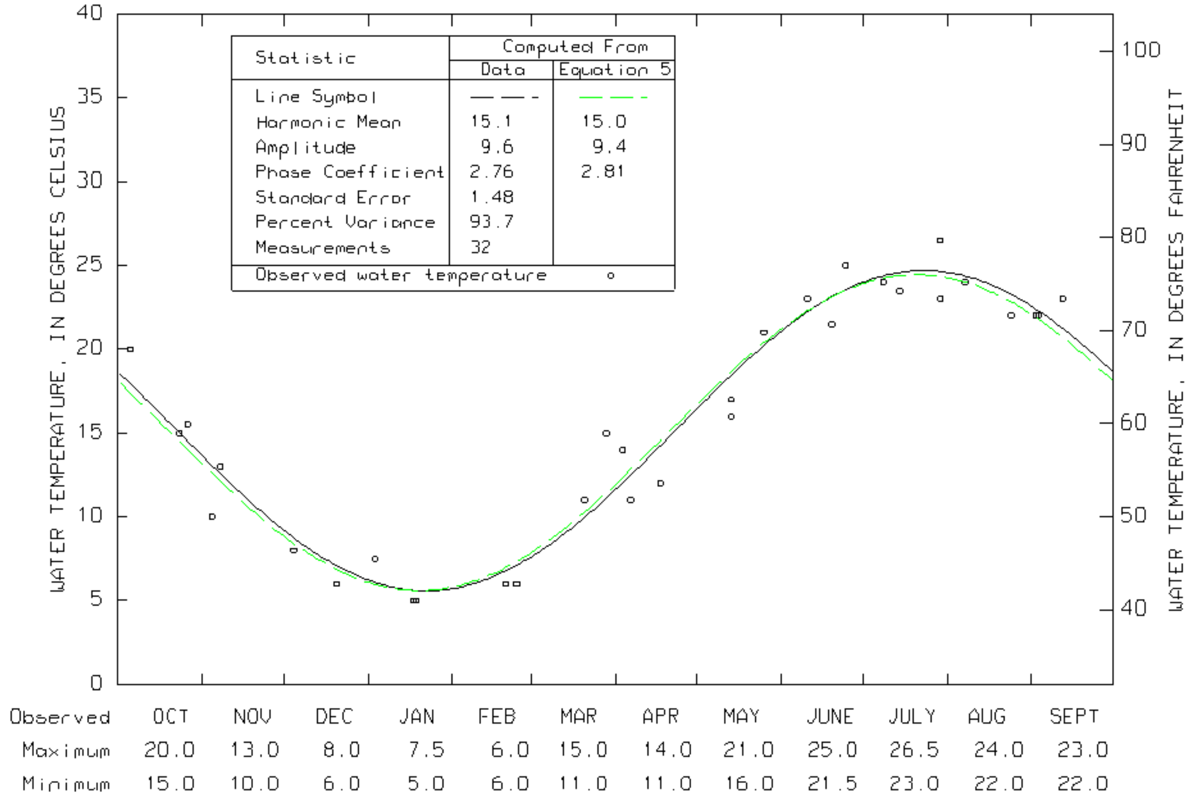


Figure 172. Coosawattee River at Carters, Georgia,
Station 02382500, July 1965 to December 1972.

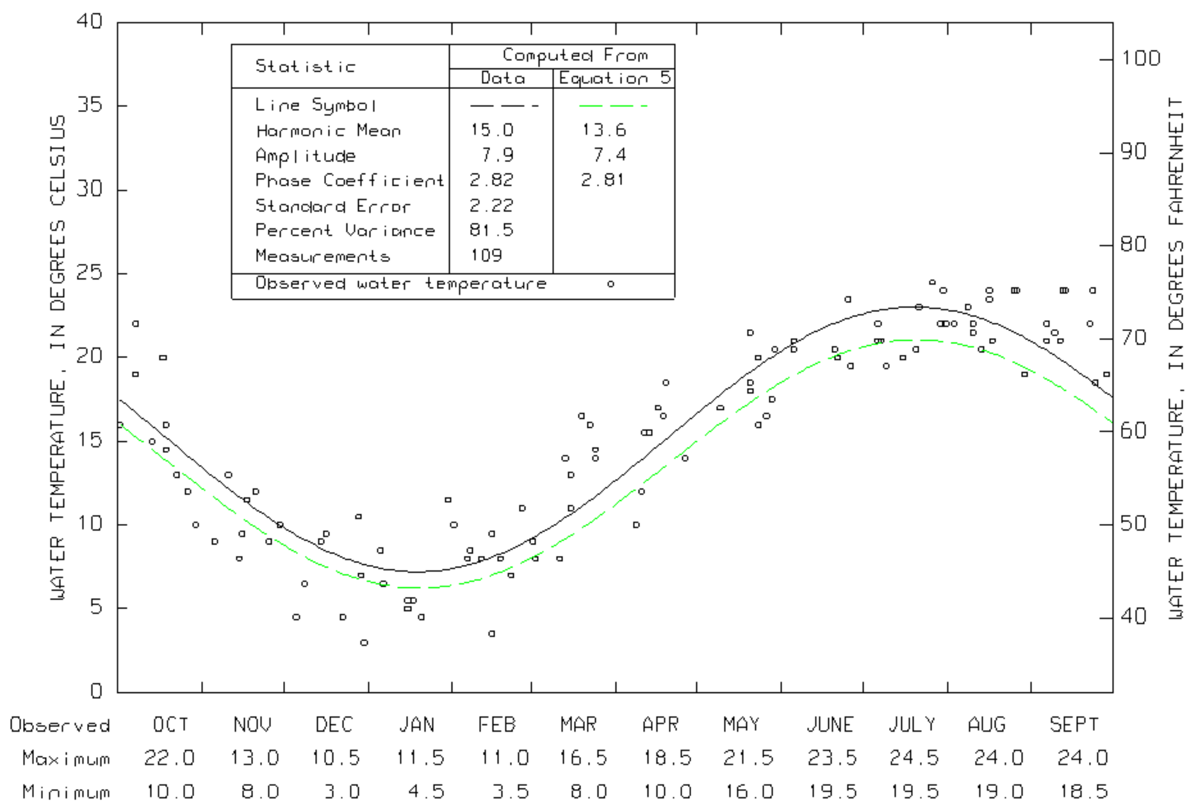
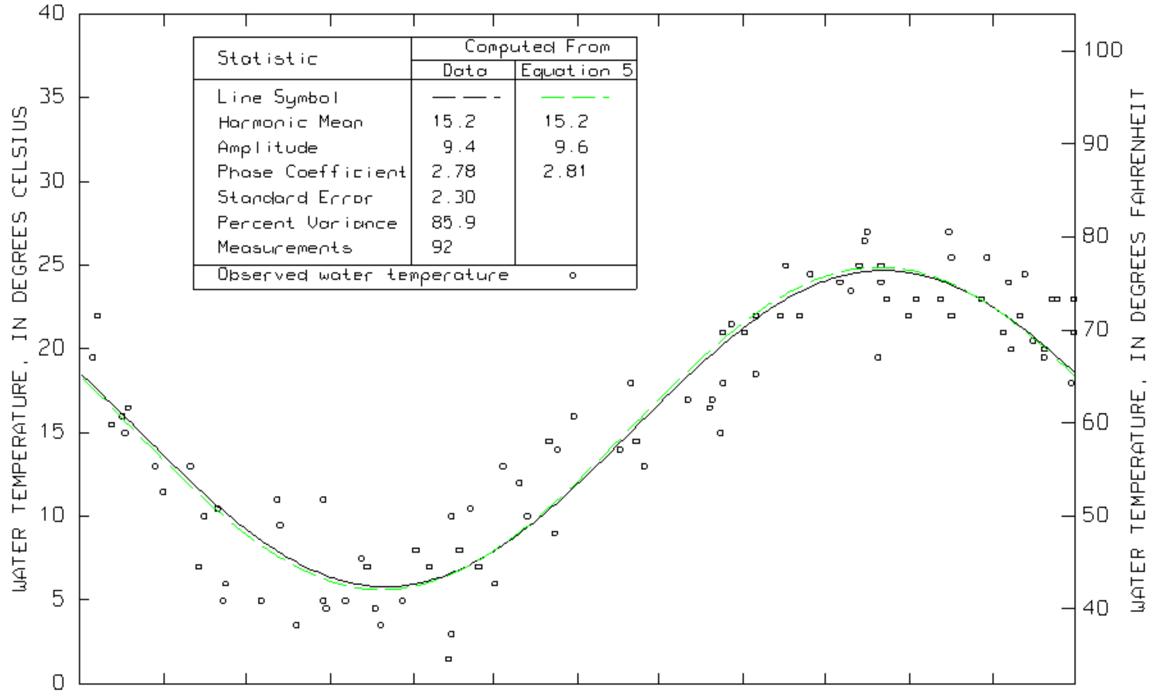
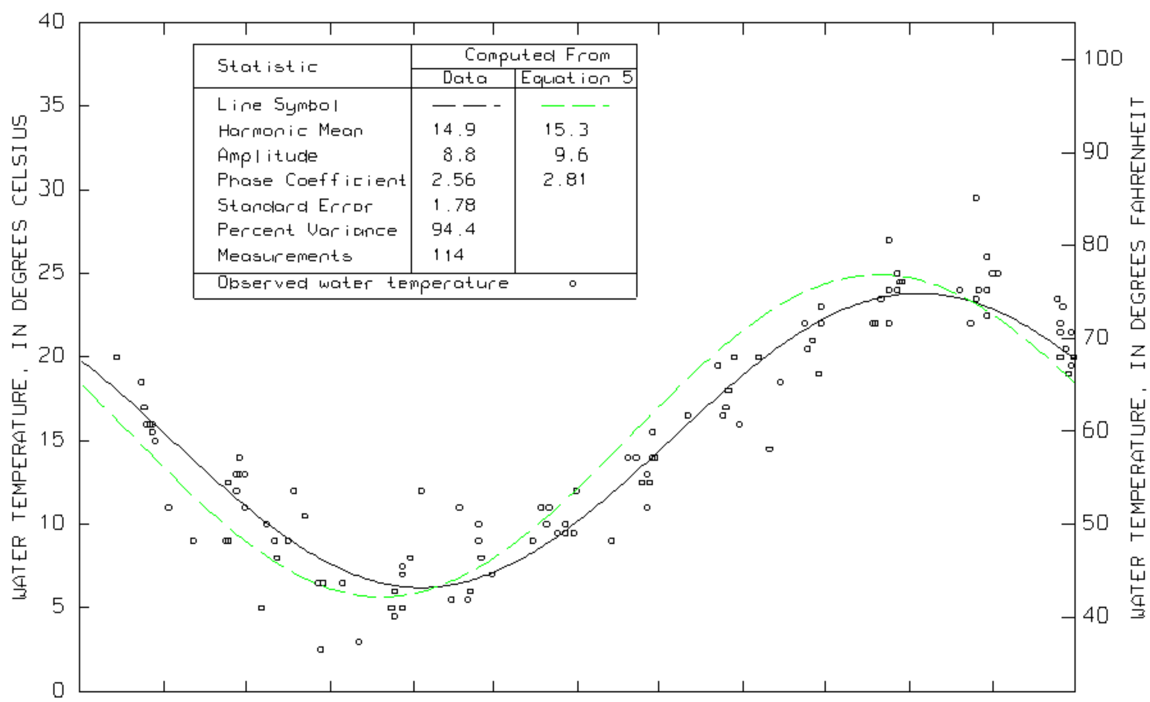


Figure 173. Rock Creek near Fairmount, Georgia,
Station 02383000, July 1957 to September 1972.



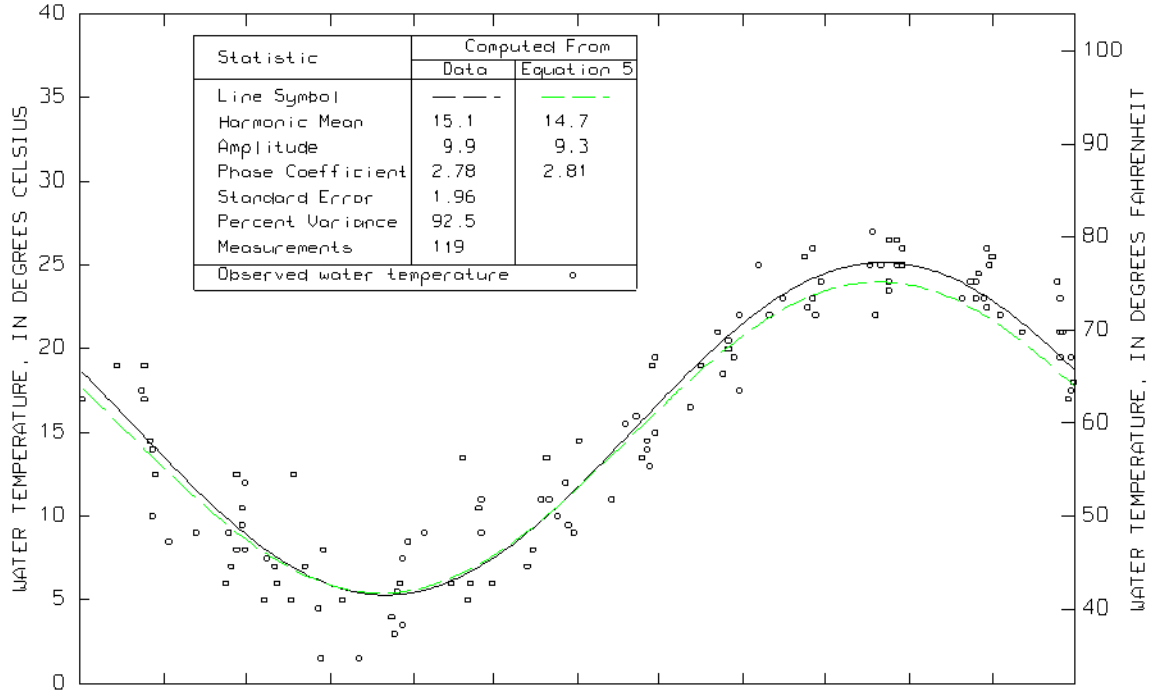
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	22.0	13.0	11.0	7.5	10.5	16.0	18.0	21.5	25.0	27.0	27.0	24.5
Minimum	11.5	5.0	3.5	3.5	1.5	6.0	13.0	15.0	18.5	19.5	22.0	18.0

Figure 174. Coosawattee River near Pine Chapel, Georgia,
Station 02383500, June 1957 to December 1972.



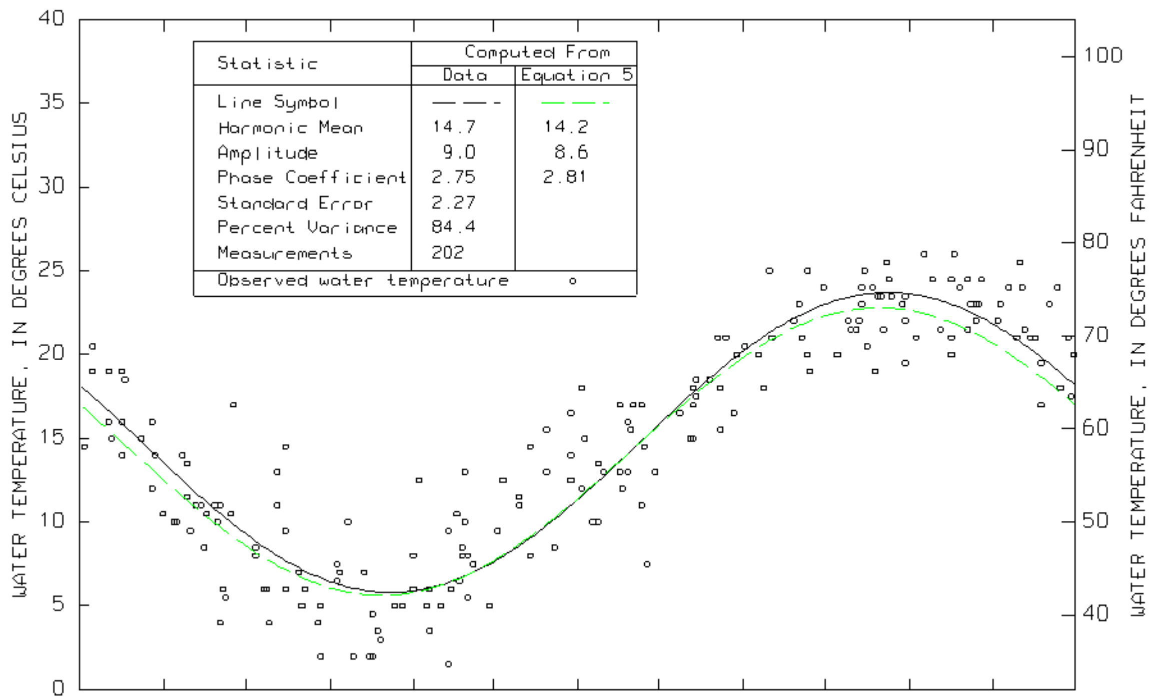
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	14.0	12.0	8.0	12.0	12.0	15.5	20.0	23.0	27.0	29.5	25.0
Minimum	15.0	9.0	2.5	3.0	5.5	9.0	9.0	16.0	14.5	22.0	22.0	19.0

Figure 175. Coosawattee River near Calhoun, Georgia,
Station 02383540, August 1974 to December 1984.



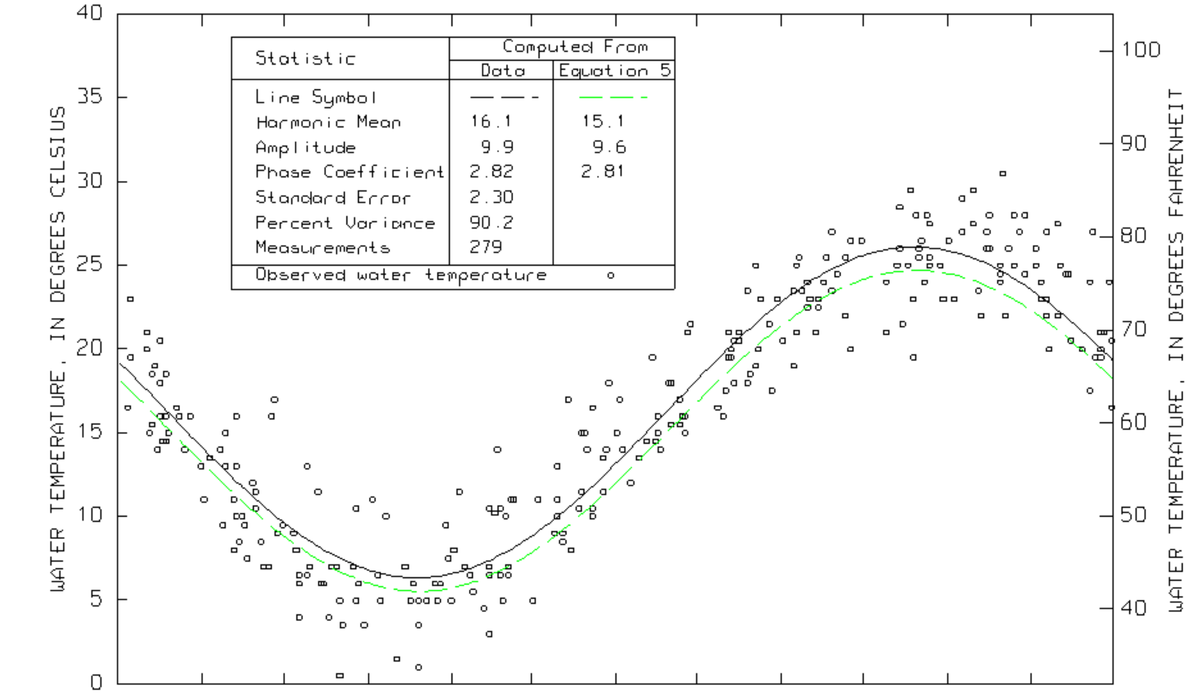
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.0	12.5	12.5	8.5	13.5	13.5	19.5	22.0	26.0	27.0	26.0	24.0
Minimum	10.0	6.0	1.5	1.5	5.0	7.0	11.0	16.5	22.0	22.0	22.5	17.0

Figure 176. Conasauga River (Dalton Intake) near Dalton, Georgia, Station 02384748, July 1974 to December 1984.



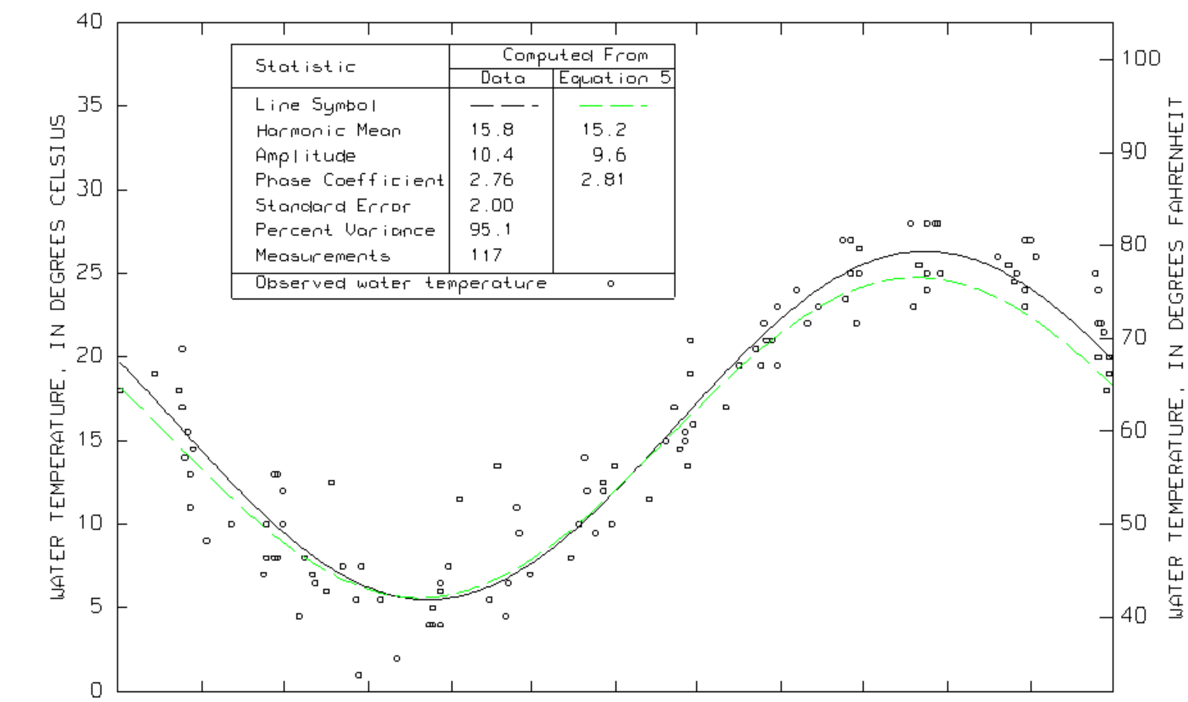
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.5	17.0	14.5	10.0	13.0	16.5	18.0	21.0	25.0	25.5	26.0	25.5
Minimum	10.5	4.0	2.0	2.0	1.5	8.0	7.5	15.0	18.0	19.0	20.0	17.0

Figure 177. Holly Creek near Chatsworth, Georgia, Station 02385800, July 1960 to June 1983.



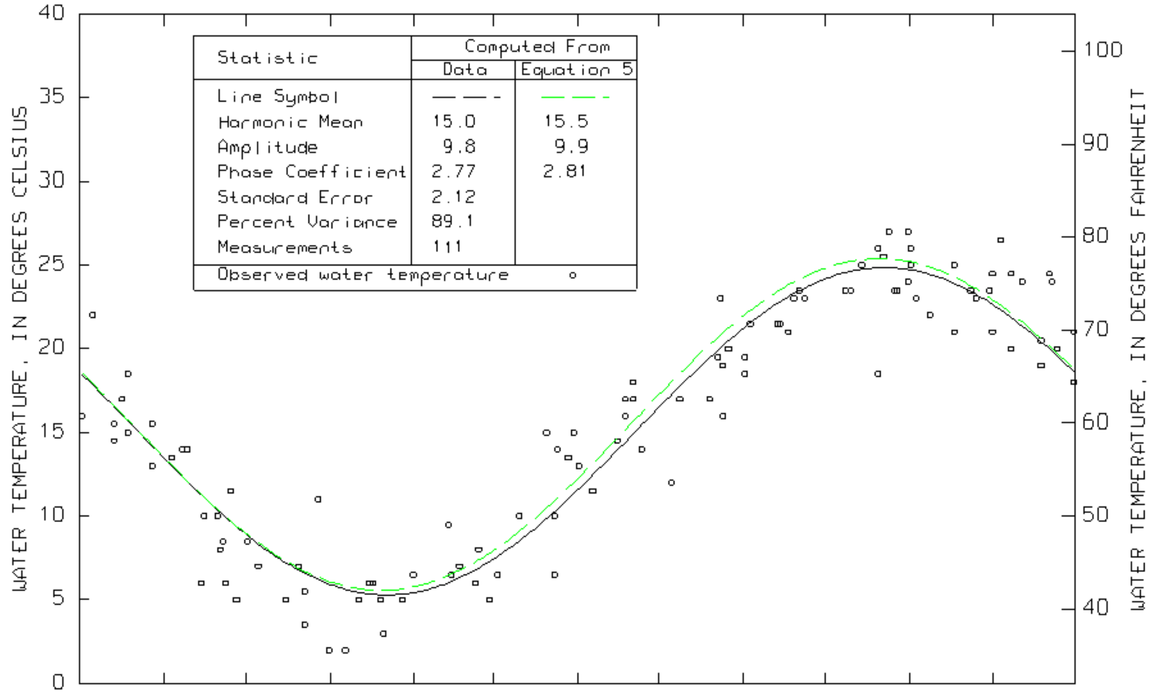
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	17.0	13.0	11.0	14.0	18.0	21.5	25.0	27.0	29.5	30.5	27.5
Minimum	13.0	7.0	0.5	1.0	3.0	5.0	12.0	16.0	19.0	19.5	22.0	16.5

Figure 178. Conasauga River at Tilton, Georgia,
Station 02387000, June 1957 to December 1984.



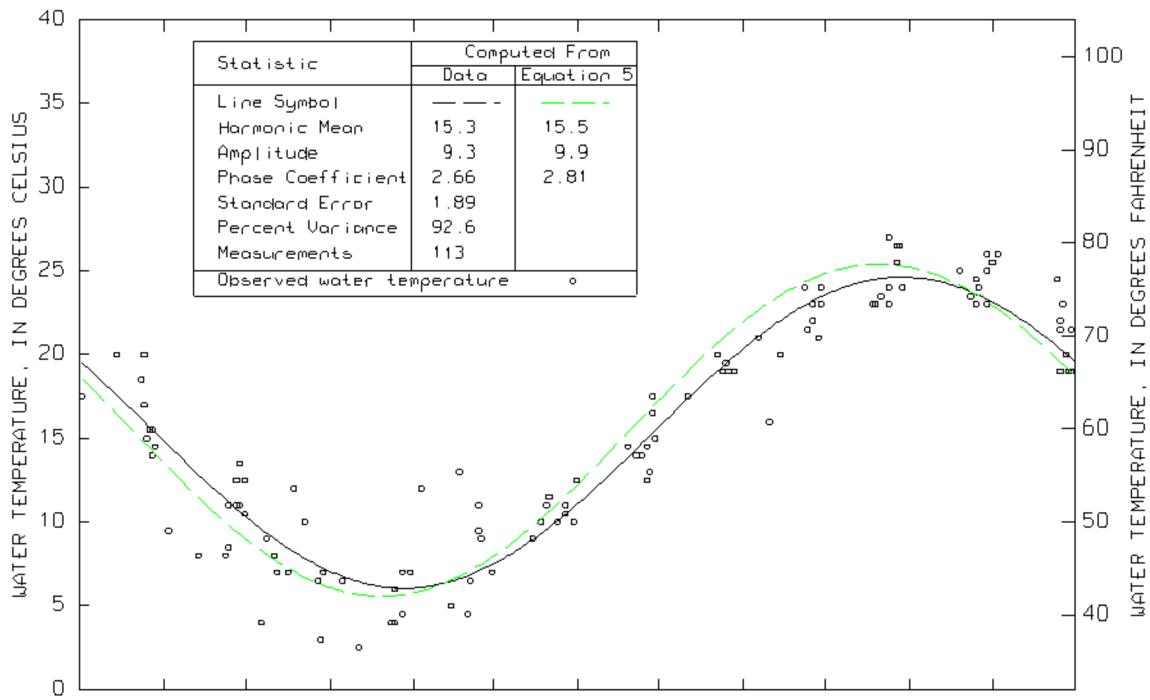
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.5	13.0	12.5	7.5	13.5	14.0	21.0	23.0	27.0	28.0	27.0	26.0
Minimum	11.0	7.0	1.0	2.0	4.5	8.0	11.5	17.0	22.0	23.0	23.0	18.0

Figure 179. Conasauga River near Resaca, Georgia,
Station 02387050, August 1974 to December 1984.



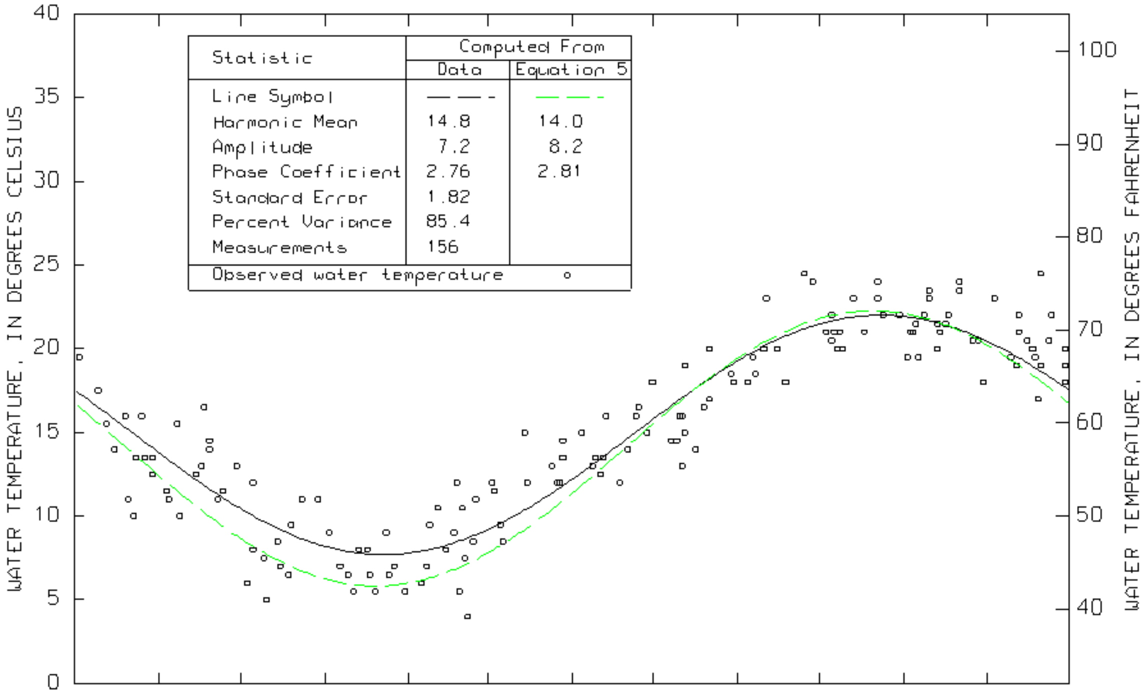
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	22.0	14.0	11.0	6.5	9.5	15.0	18.0	23.0	23.5	27.0	26.0	26.5
Minimum	13.0	5.0	2.0	2.0	5.0	6.5	11.5	12.0	18.5	18.5	21.0	18.0

Figure 180. Oostanaula River at Resaca, Georgia,
Station 02387500, September 1957 to December 1972.



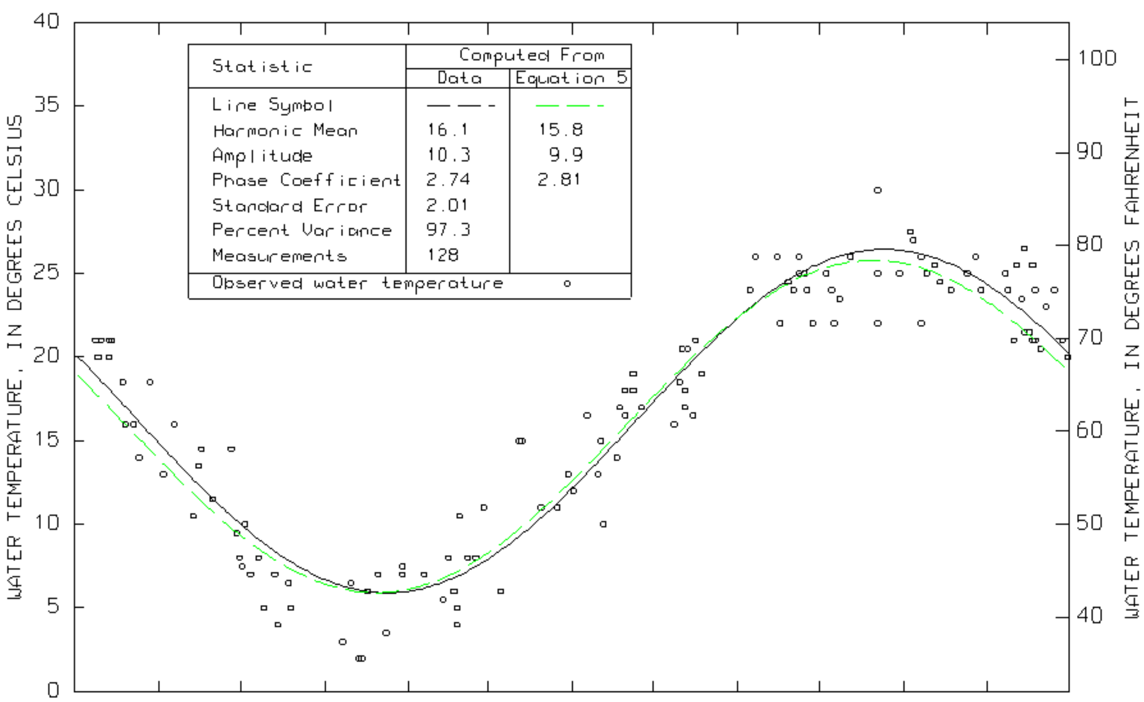
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	13.5	12.0	7.0	13.0	12.5	17.5	20.0	24.0	27.0	26.0	26.0
Minimum	14.0	8.0	3.0	2.5	4.5	9.0	12.5	17.5	16.0	23.0	23.0	19.0

Figure 181. Oostanaula River at Interstate Highway 75 at Resaca, Georgia,
Station 02387502, August 1974 to December 1984.



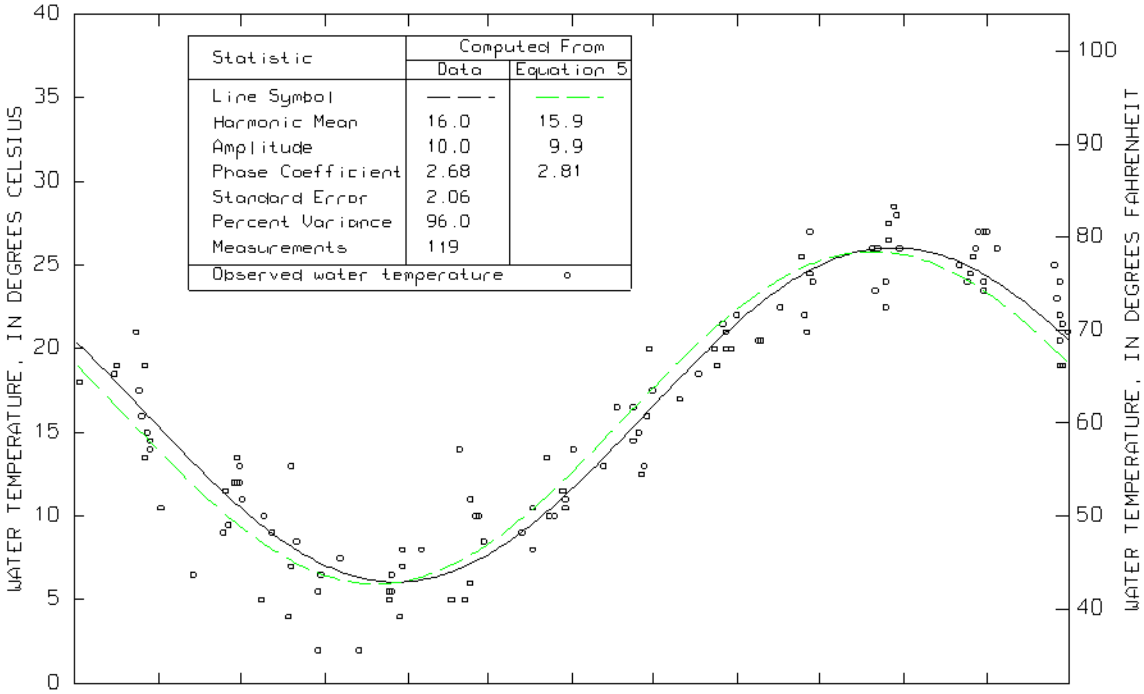
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.5	16.5	12.0	9.0	12.0	15.0	18.0	20.0	24.5	24.0	24.0	24.5
Minimum	10.0	10.0	5.0	5.5	4.0	8.5	12.0	13.0	18.0	20.0	18.0	17.0

Figure 182. West Armuchee Creek near Subligna, Georgia,
Station 02388000, May 1960 to April 1982.



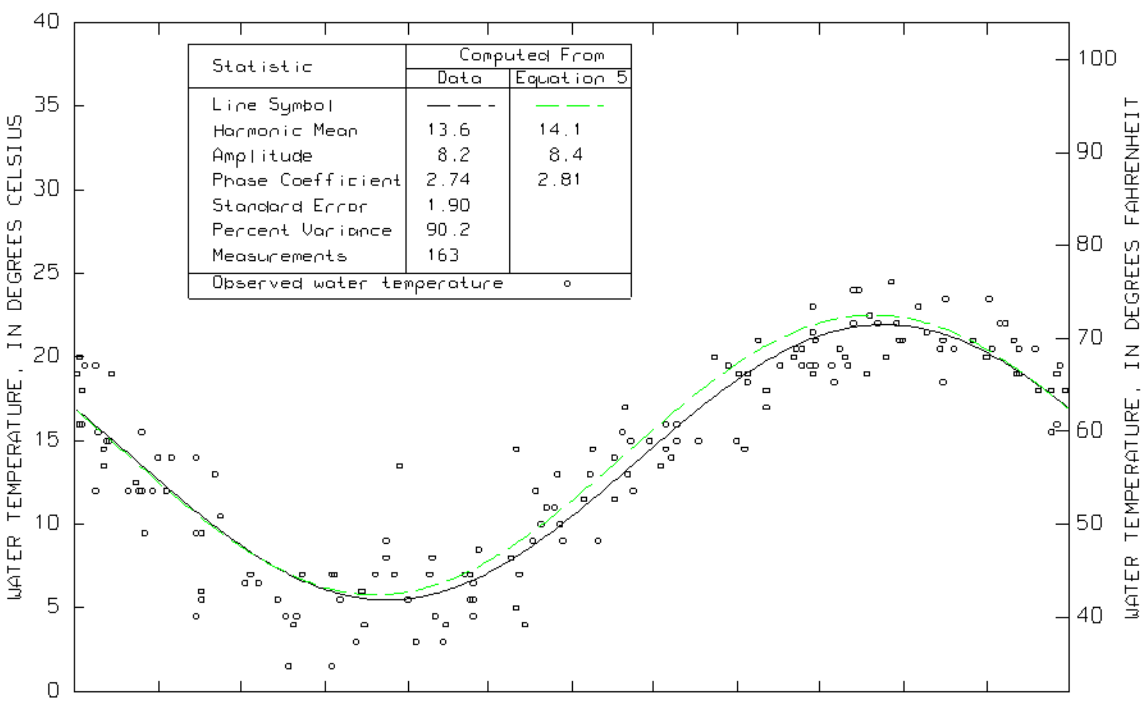
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	16.0	10.0	7.5	11.0	15.0	19.0	21.0	26.0	30.0	27.5	26.5
Minimum	14.0	8.0	4.0	2.0	4.0	6.0	10.0	16.0	22.0	22.0	22.0	20.0

Figure 183. Oostanaula River at Rome, Georgia,
Station 02388500, September 1957 to December 1973.



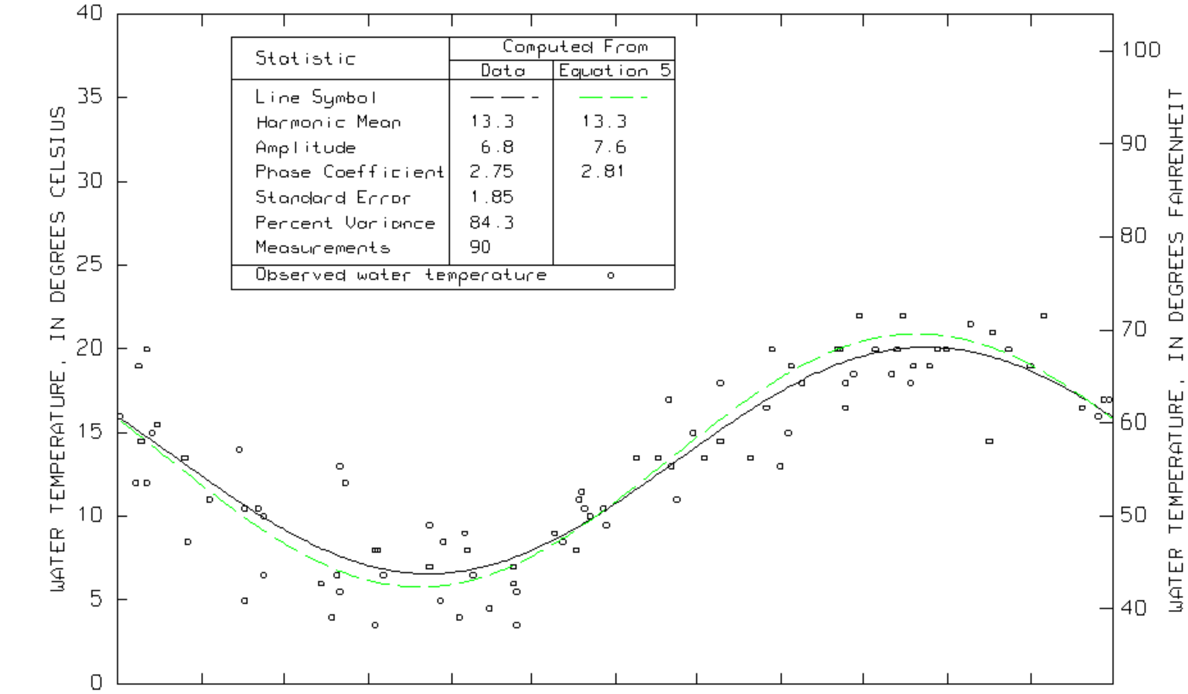
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	13.5	13.0	8.0	14.0	13.5	20.0	22.0	27.0	28.5	27.0	26.0
Minimum	13.5	6.5	2.0	2.0	5.0	8.0	12.5	17.0	20.5	22.5	23.5	19.0

Figure 184. Oostanaula River (Rome Intake) at Rome, Georgia,
Station 02388520, August 1974 to December 1984.



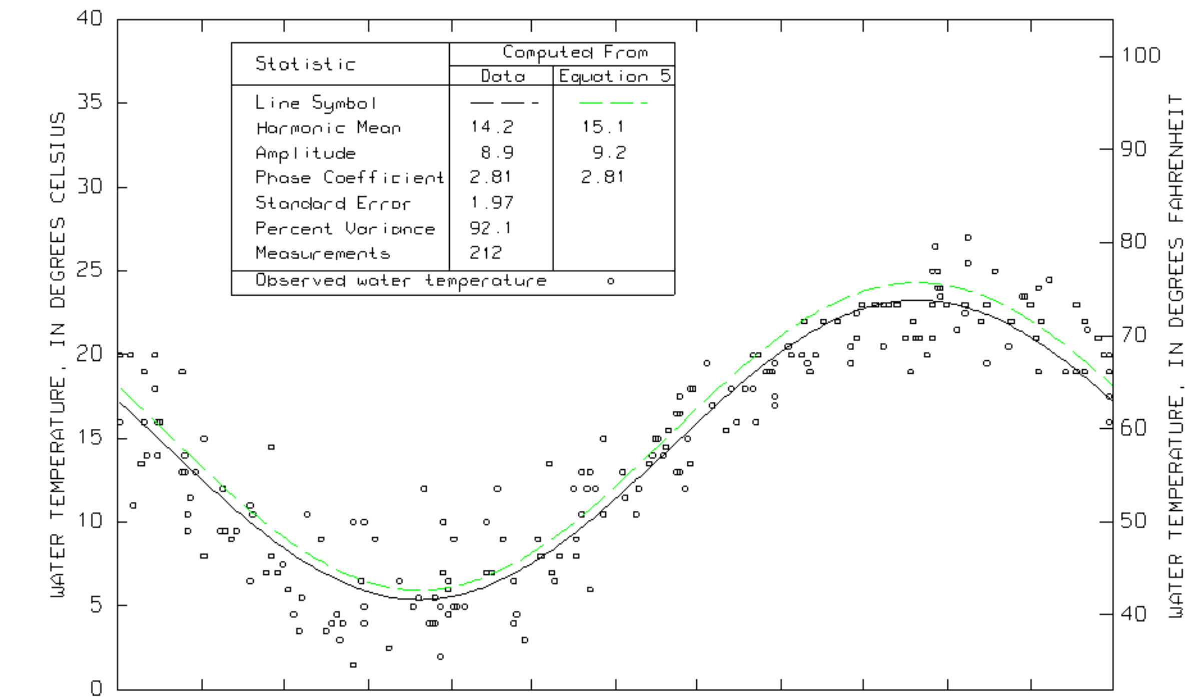
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	14.0	7.0	13.5	8.5	14.5	17.0	20.0	23.0	24.5	23.5	23.5
Minimum	9.5	4.5	1.5	1.5	3.0	4.0	9.0	13.5	14.5	18.5	18.5	15.5

Figure 185. Etowah River near Dawsonville, Georgia,
Station 02389000, September 1956 to August 1984.



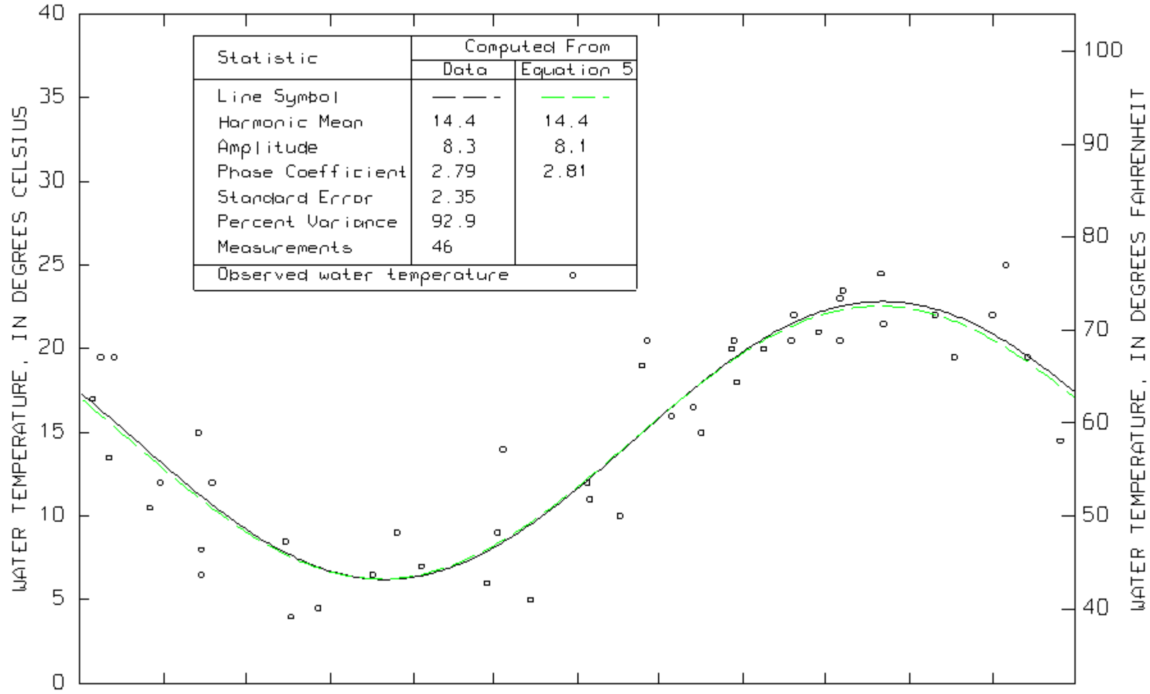
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	14.0	13.0	9.5	9.0	11.5	17.0	20.0	22.0	22.0	21.5	22.0
Minimum	8.5	5.0	4.0	3.5	3.5	8.0	11.0	13.0	15.0	18.0	14.5	16.0

Figure 186. Shoal Creek near Dawsonville, Georgia,
Station 02389300, June 1958 to June 1974.



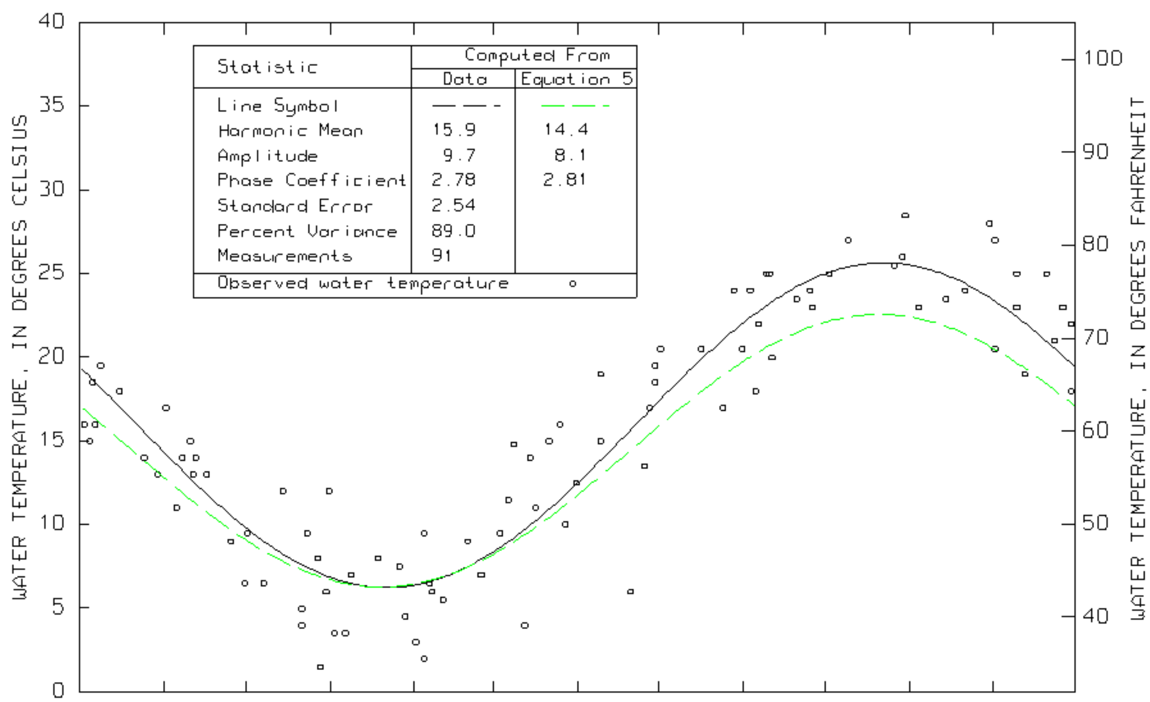
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	15.0	10.5	12.0	12.0	15.0	18.0	20.0	23.0	26.5	27.0	24.5
Minimum	9.5	6.5	1.5	2.0	3.0	6.0	10.5	15.5	19.0	19.0	19.5	16.0

Figure 187. Etowah River at Canton, Georgia,
Station 02392000, June 1957 to October 1984.



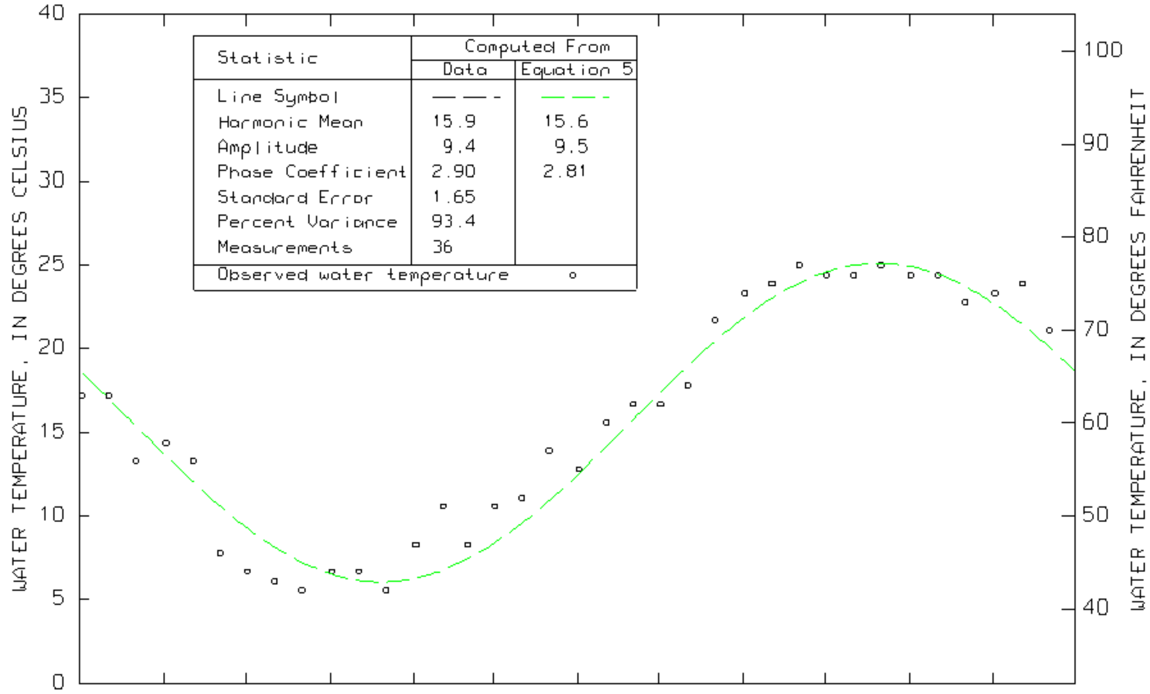
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.5	15.0	8.5	9.0	7.0	14.0	20.5	20.5	22.0	24.5	22.0	25.0
Minimum	10.5	6.5	4.0	6.5	6.0	5.0	10.0	15.0	20.0	20.5	19.5	14.5

Figure 188. Little River near Roswell, Georgia,
Station 02392500, August 1959 to September 1964.



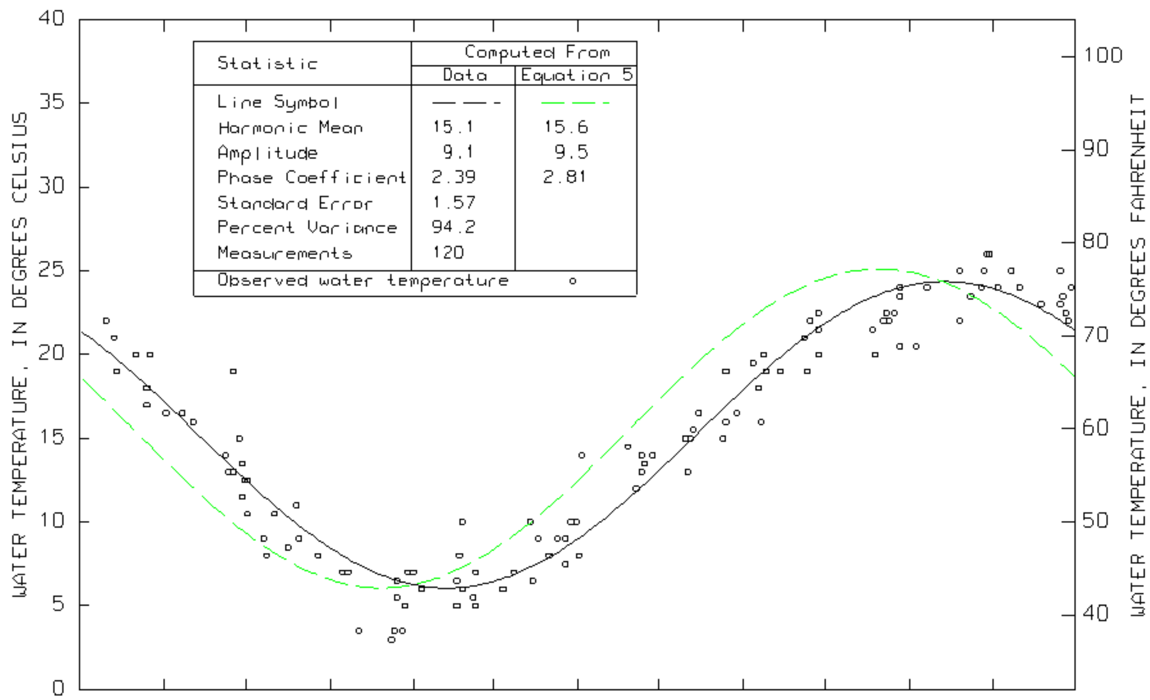
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.5	17.0	12.0	8.0	9.5	16.0	19.5	24.0	25.0	28.5	28.0	27.0
Minimum	13.0	6.5	1.5	3.5	2.0	4.0	6.0	17.0	18.0	25.0	23.0	18.0

Figure 189. Little River near Roswell, Georgia,
Station 02392500, October 1964 to June 1975.



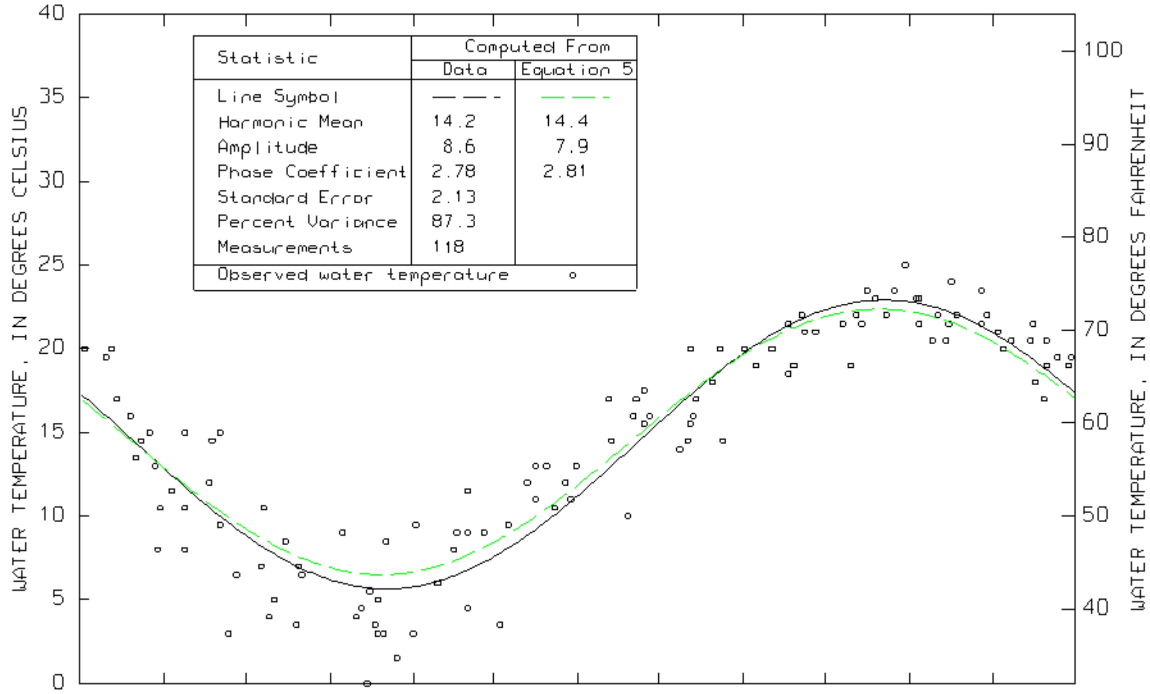
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	17.2	14.4	6.7	6.7	10.6	13.9	16.7	21.7	25.0	25.0	24.4	23.9
Minimum	13.3	7.8	5.6	5.6	8.3	10.6	12.8	16.7	23.3	24.4	22.8	21.1

Figure 190. Etowah River at Allatoona Dam above Cartersville, Georgia, Station 02394000, October 1938 to September 1939.



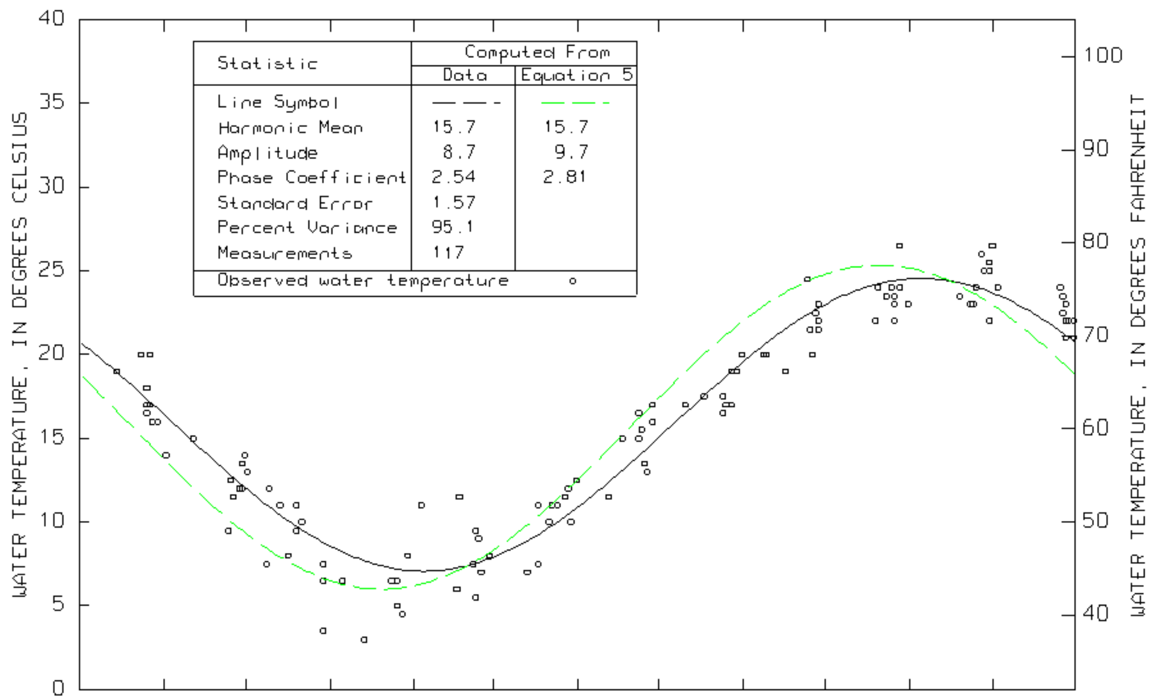
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	22.0	19.0	12.5	7.0	10.0	10.0	14.5	19.0	22.5	24.0	26.0	25.0
Minimum	17.0	11.5	8.0	3.0	5.0	6.0	8.0	13.0	16.0	20.0	20.5	22.0

Figure 191. Etowah River at Allatoona Dam above Cartersville, Georgia, Station 02394000, January 1958 to November 1984.



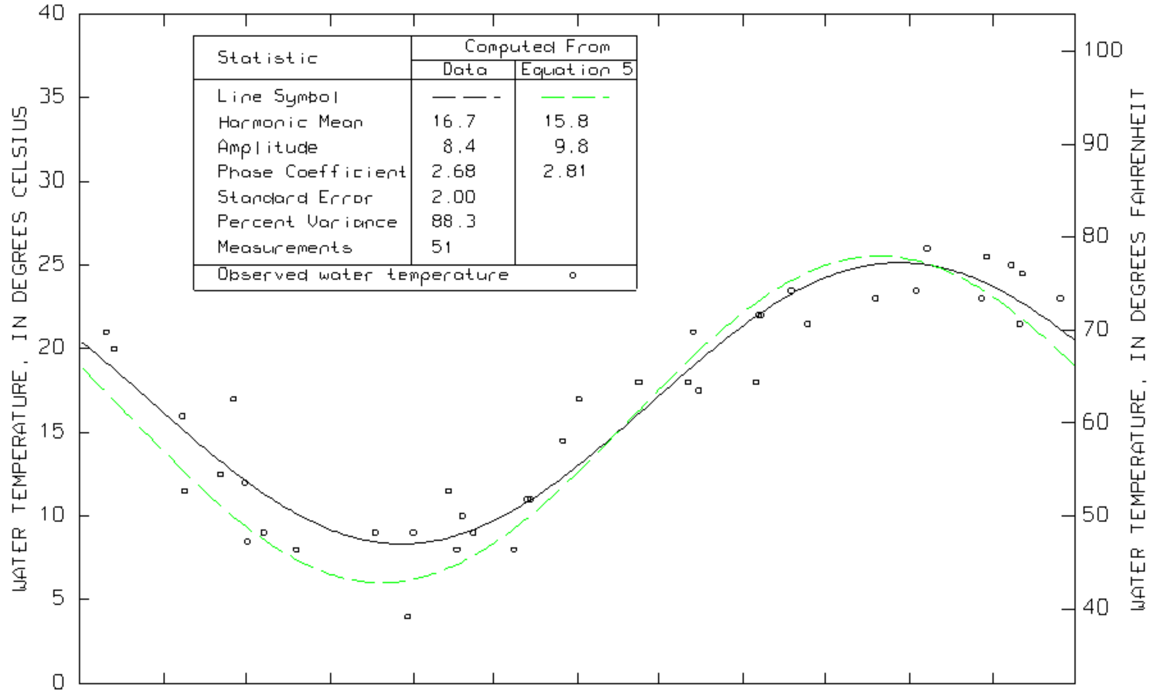
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	15.0	10.5	9.0	11.5	13.0	17.5	20.0	22.0	25.0	24.0	21.5
Minimum	8.0	3.0	3.5	0.1	4.5	3.5	10.0	14.0	18.5	19.0	20.5	17.0

Figure 192. Hills Creek near Taylorsville, Georgia,
Station 02394950, June 1959 to July 1974.



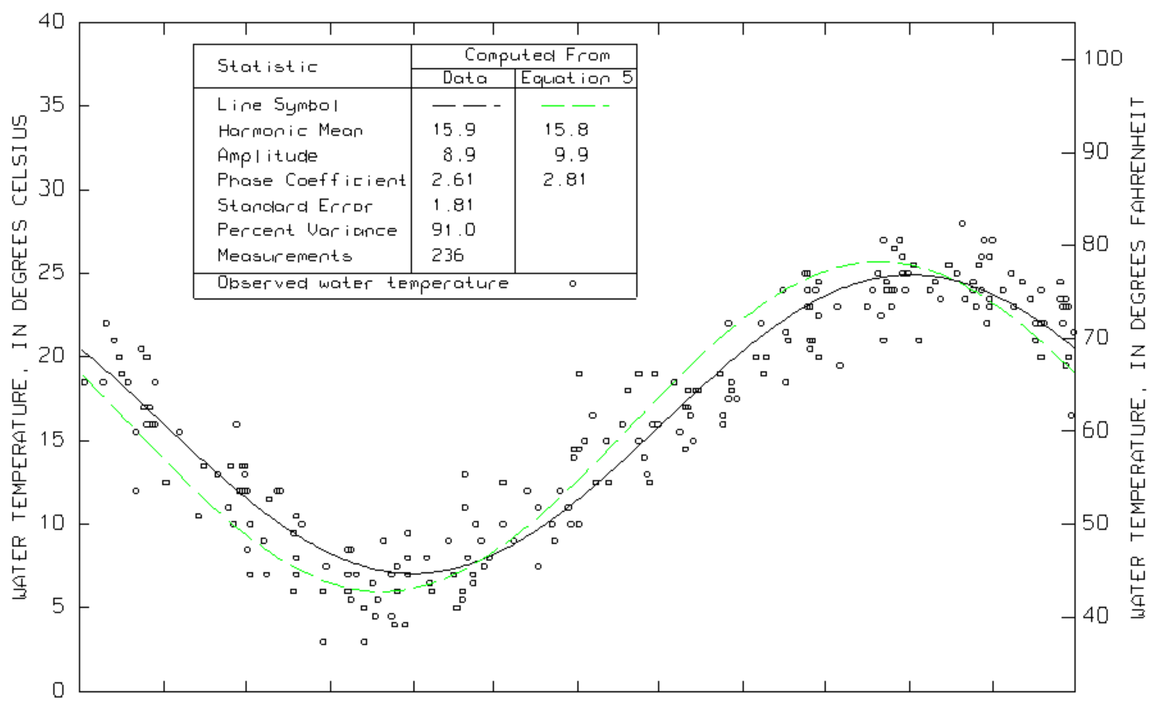
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	15.0	13.0	8.0	11.5	12.5	17.0	20.0	24.5	26.5	26.5	24.0
Minimum	16.0	9.5	3.5	3.0	5.5	7.0	11.5	16.5	19.0	22.0	22.0	21.0

Figure 193. Etowah River above Kingston, Georgia,
Station 02394980, August 1974 to December 1984.



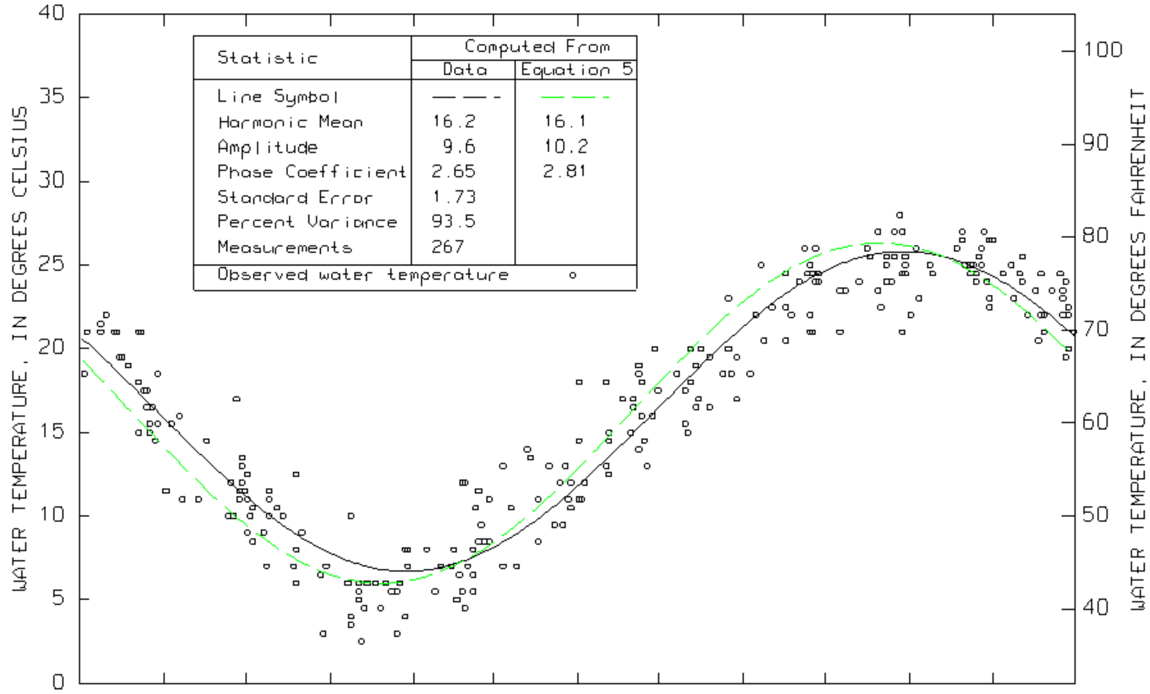
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	17.0	9.0	9.0	11.5	14.5	18.0	21.0	23.5	23.0	26.0	25.0
Minimum	20.0	11.5	8.0	4.0	8.0	8.0	17.0	17.5	18.0	23.0	23.0	21.5

Figure 194. Etowah River near Kingston, Georgia,
Station 02395000, October 1969 to September 1984.



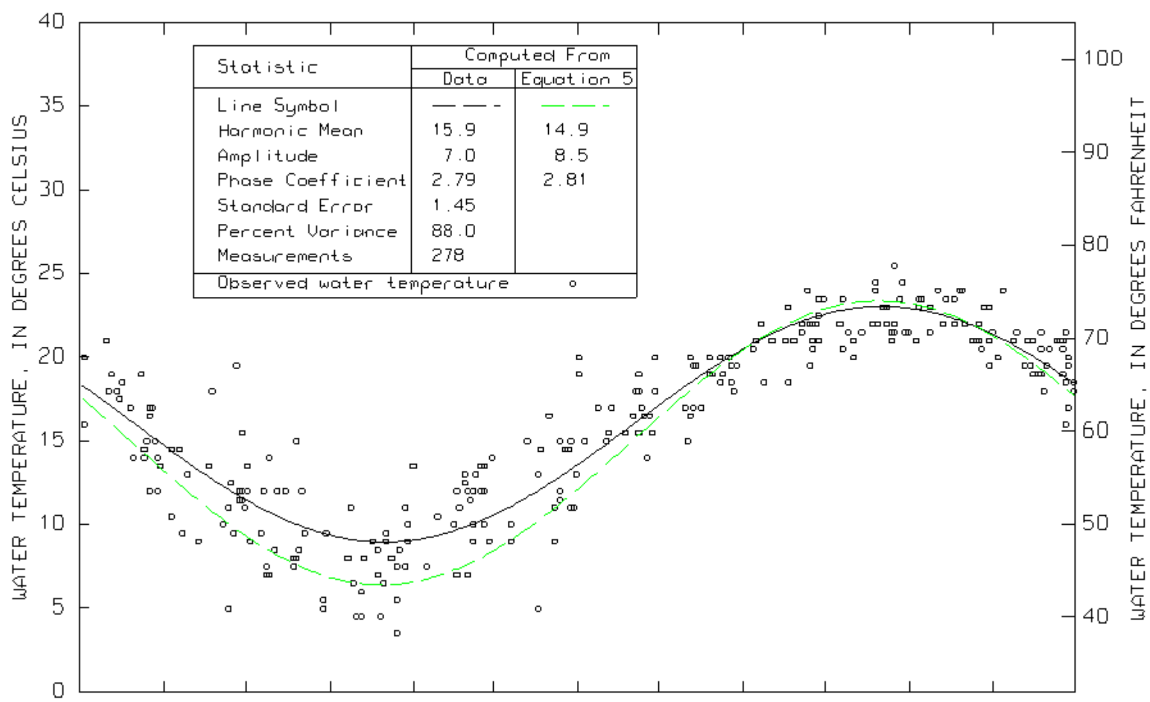
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	22.0	16.0	12.0	9.5	13.0	14.5	19.0	22.0	25.0	27.0	28.0	25.0
Minimum	12.0	10.0	3.0	3.0	5.0	7.5	10.0	14.5	18.5	19.5	21.0	16.5

Figure 195. Etowah River at Rome, Georgia,
Station 02396000, September 1957 to December 1984.



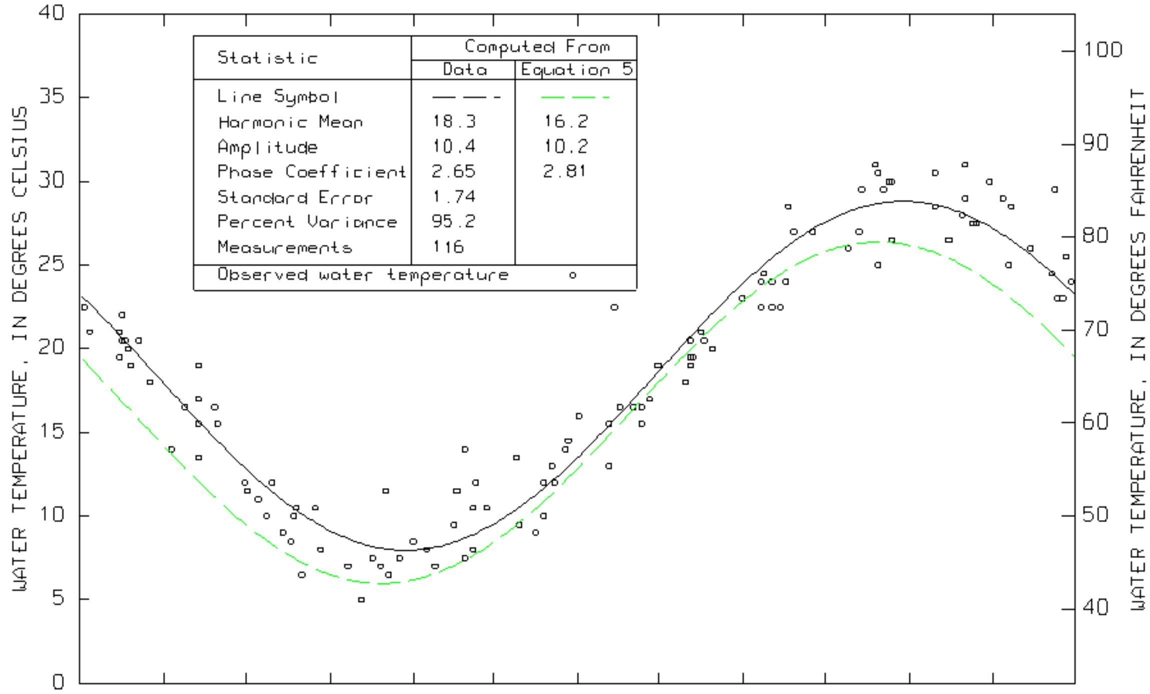
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	22.0	17.0	12.5	10.0	12.0	14.0	20.0	23.0	26.0	28.0	27.0	25.5
Minimum	14.5	10.0	3.0	2.5	4.5	7.0	11.0	15.0	18.5	21.0	22.0	19.5

Figure 196. Coosa River near Rome, Georgia,
Station 02397000, July 1957 to December 1984.



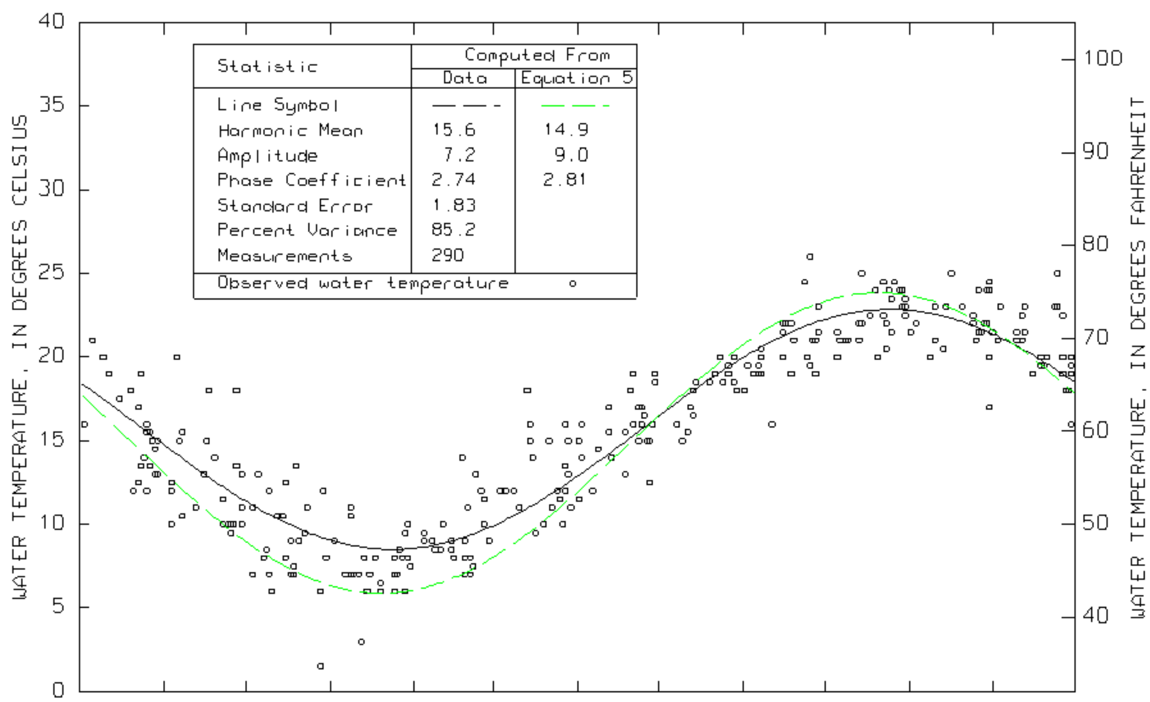
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	19.5	15.0	13.5	14.0	16.5	20.0	20.0	24.0	25.5	24.0	24.0
Minimum	12.0	5.0	5.0	3.5	7.0	5.0	14.0	15.0	18.5	20.0	19.5	16.0

Figure 197. Cedar Creek near Cedartown, Georgia,
Station 02397500, June 1957 to December 1984.



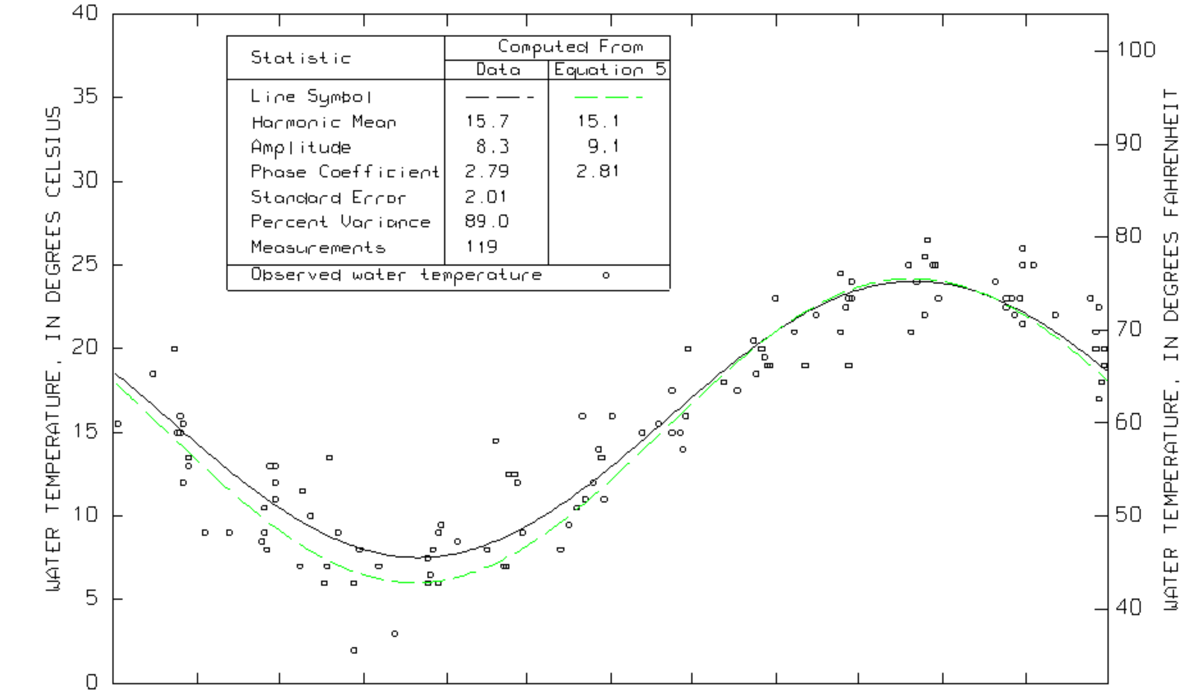
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	22.5	19.0	12.0	11.5	14.0	14.5	22.5	23.0	28.5	31.0	31.0	29.5
Minimum	18.0	12.0	6.5	5.0	7.0	9.0	13.0	18.0	22.5	25.0	26.5	23.0

Figure 198. Coosa River near Coosa, Georgia,
Station 02397530, August 1974 to December 1984.



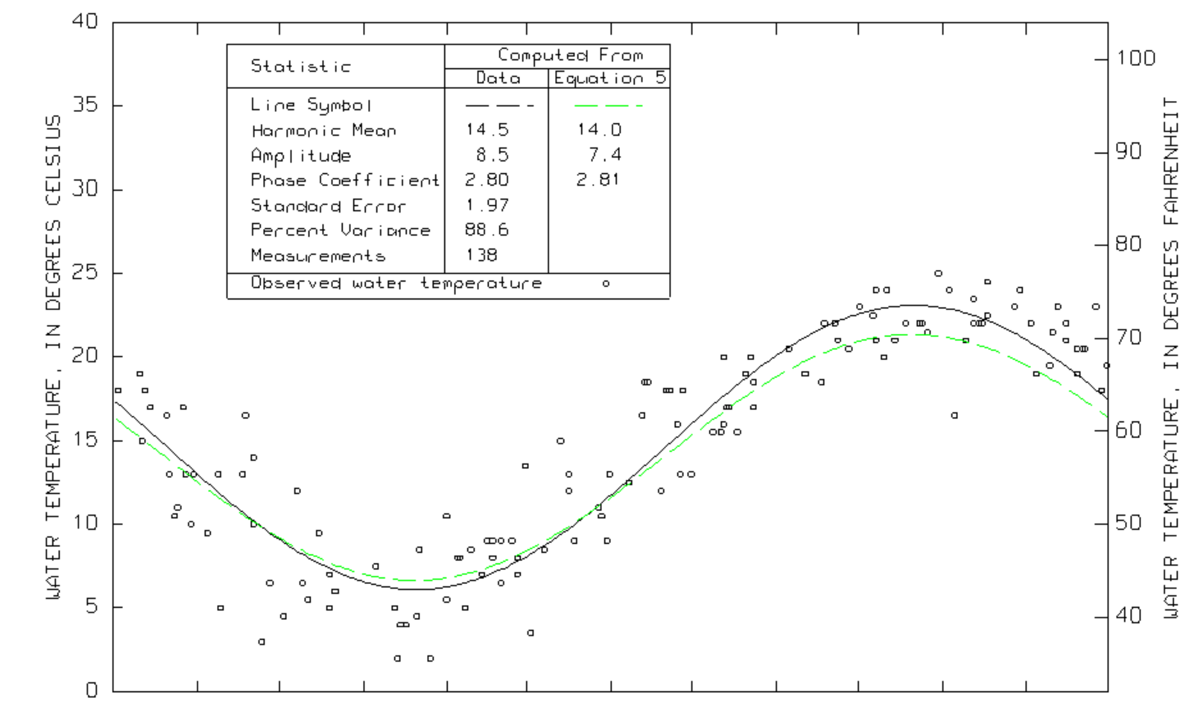
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	21.0	20.0	13.5	11.0	14.0	18.0	19.0	20.0	26.0	25.0	25.0	25.0
Minimum	12.0	9.5	1.5	3.0	7.0	9.5	11.5	15.0	16.0	20.0	17.0	16.0

Figure 199. Chattooga River at Summerville, Georgia,
Station 02398000, July 1957 to December 1984.



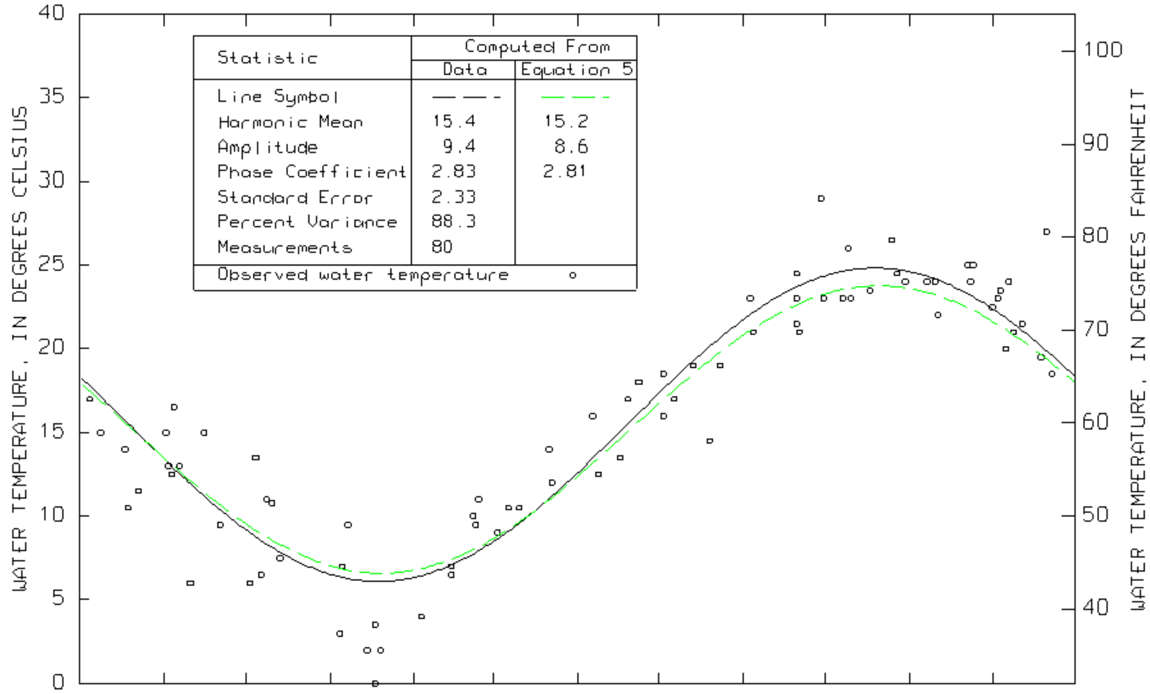
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	13.0	13.5	9.5	14.5	16.0	20.0	23.0	24.5	26.5	26.0	25.0
Minimum	12.0	8.0	2.0	3.0	7.0	8.0	14.0	17.5	19.0	21.0	21.5	17.0

Figure 200. Chattooga River at Chattoogaville, Georgia,
Station 02398037, August 1974 to December 1984.



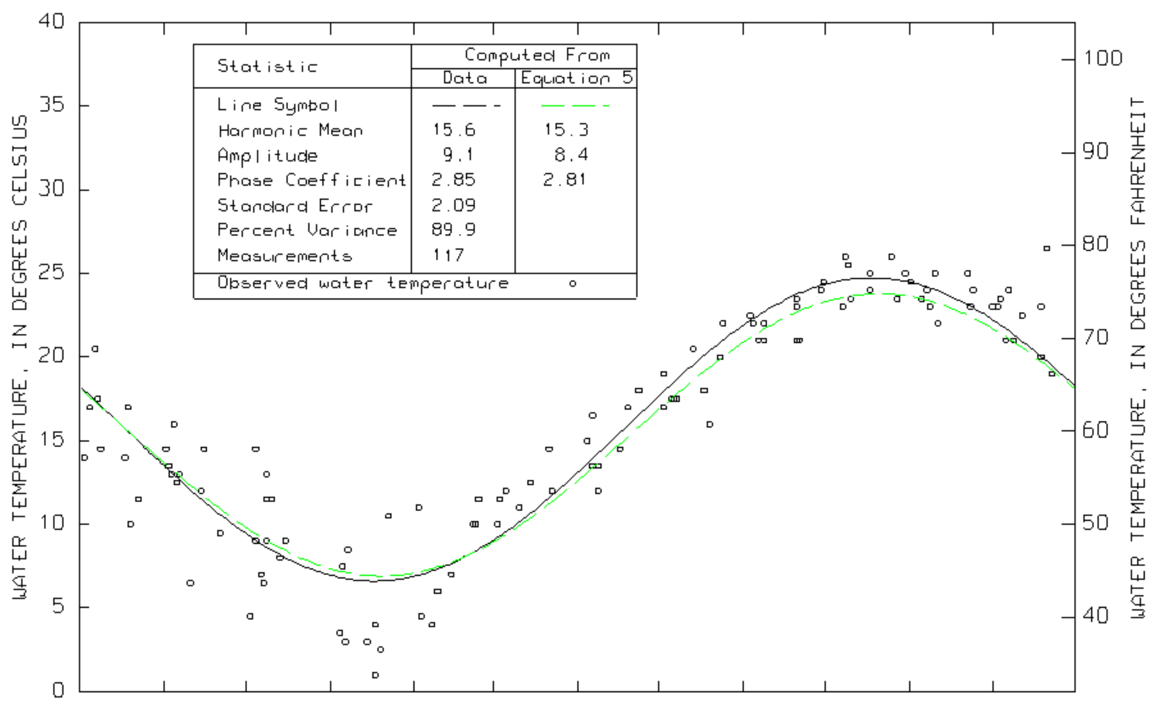
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.0	16.5	12.0	10.5	13.5	15.0	18.5	20.0	22.0	25.0	24.5	23.0
Minimum	10.0	3.0	4.5	2.0	5.0	3.5	12.0	15.5	18.5	20.0	16.5	18.0

Figure 201. Little River near Buchanan, Georgia,
Station 02411800, May 1959 to August 1975.



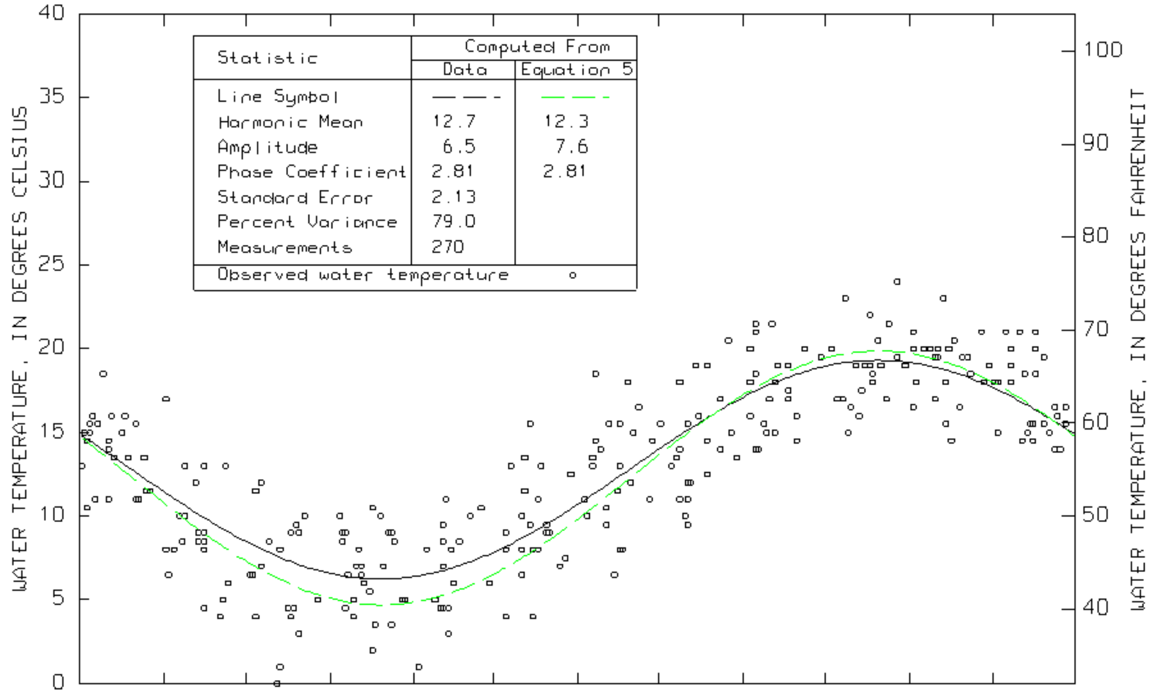
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	17.0	16.5	13.5	9.5	11.0	14.0	18.0	19.0	29.0	26.5	25.0	27.0
Minimum	10.5	6.0	6.0	0.1	4.0	9.0	12.5	14.5	21.0	23.0	22.0	18.5

Figure 202. Tallapoosa River below Tallapoosa, Georgia,
Station 02411930, July 1974 to November 1984.



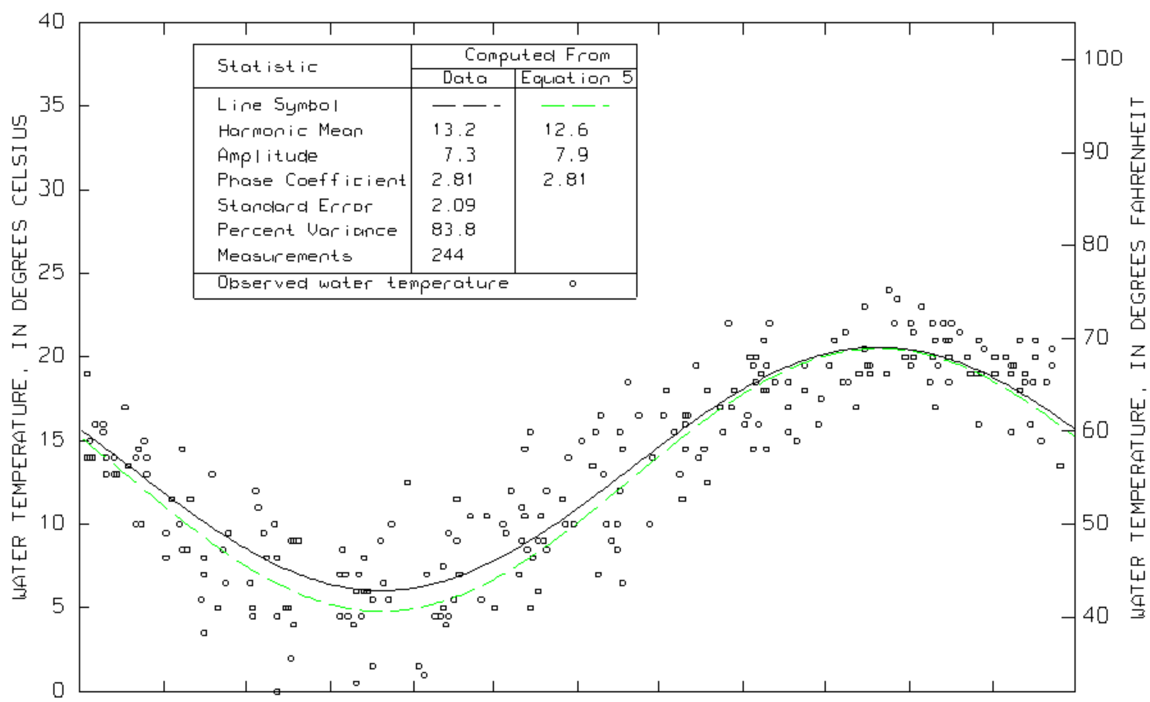
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.5	16.0	14.5	10.5	11.5	14.5	18.0	22.0	24.5	26.0	25.0	26.5
Minimum	10.0	6.5	4.5	1.0	4.0	10.0	12.0	16.0	21.0	23.0	22.0	19.0

Figure 203. Little Tallapoosa River below Bowdon, Georgia,
Station 02413210, July 1974 to December 1984.



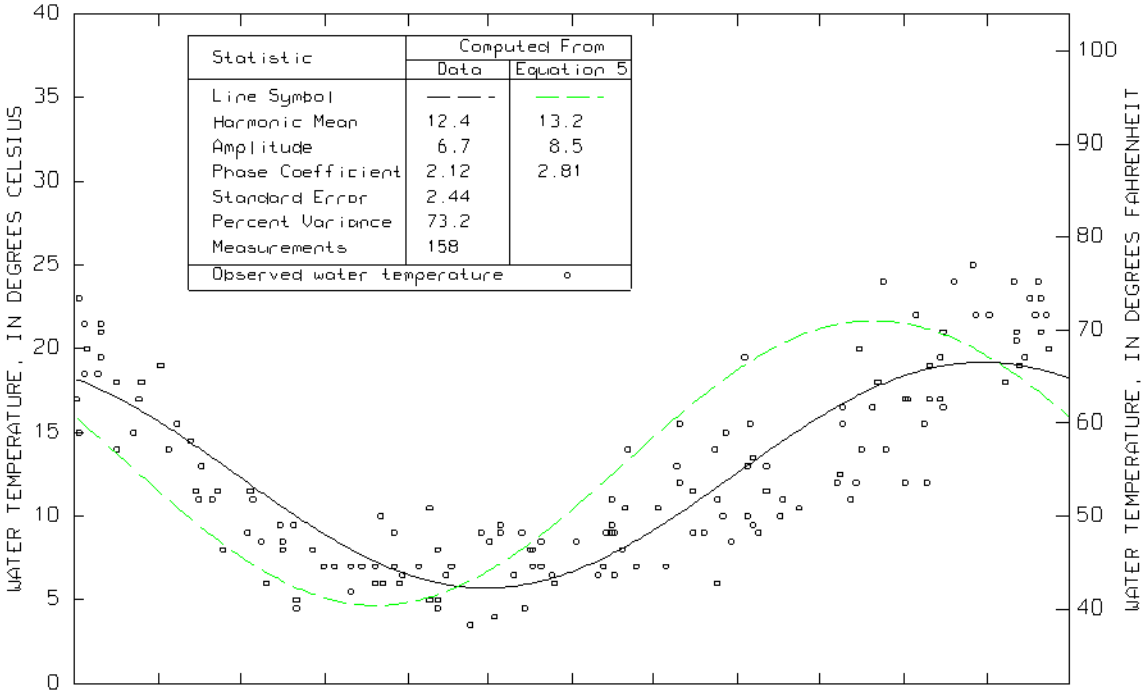
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	18.5	17.0	12.0	10.5	11.0	15.5	18.5	20.5	21.5	24.0	23.0	21.0
Minimum	10.5	4.0	0.1	2.0	1.0	4.0	6.5	9.5	14.0	15.0	14.5	14.0

Figure 204. Hiwassee River at Presley, Georgia,
Station 03545000, August 1951 to June 1982.



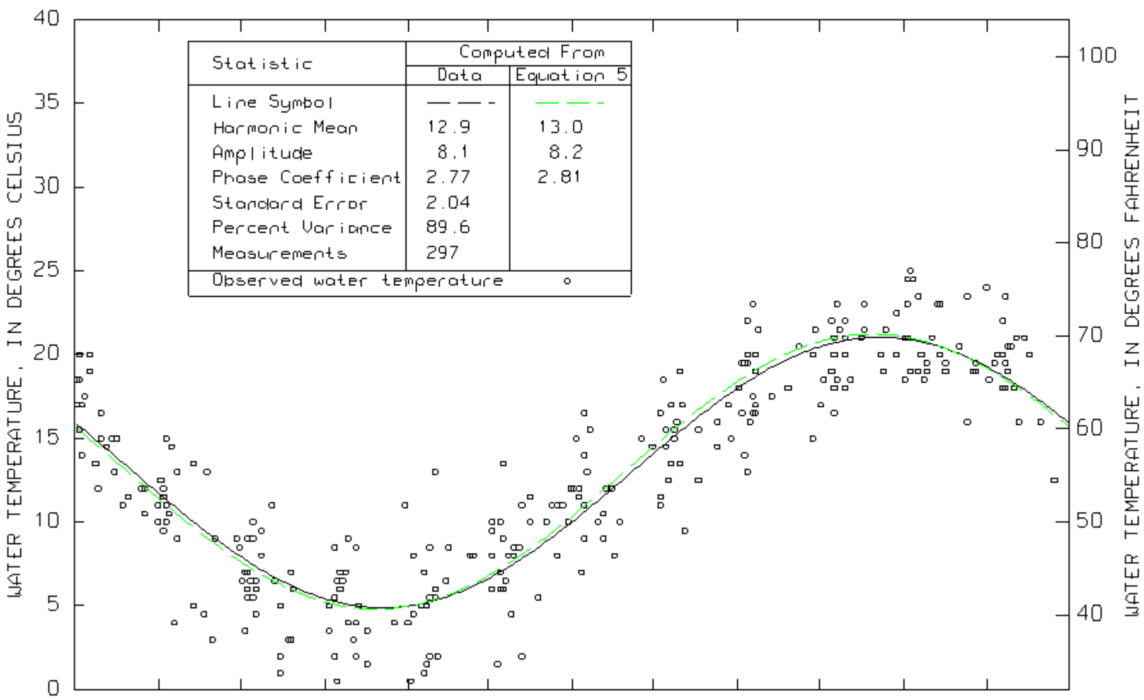
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.0	14.5	12.0	12.5	11.5	15.5	18.5	22.0	22.0	24.0	23.0	21.0
Minimum	10.0	3.5	0.1	0.5	1.0	5.0	6.5	11.5	14.5	17.0	16.0	13.5

Figure 205. Nottely River near Blairsville, Georgia,
Station 03550500, August 1951 to June 1982.



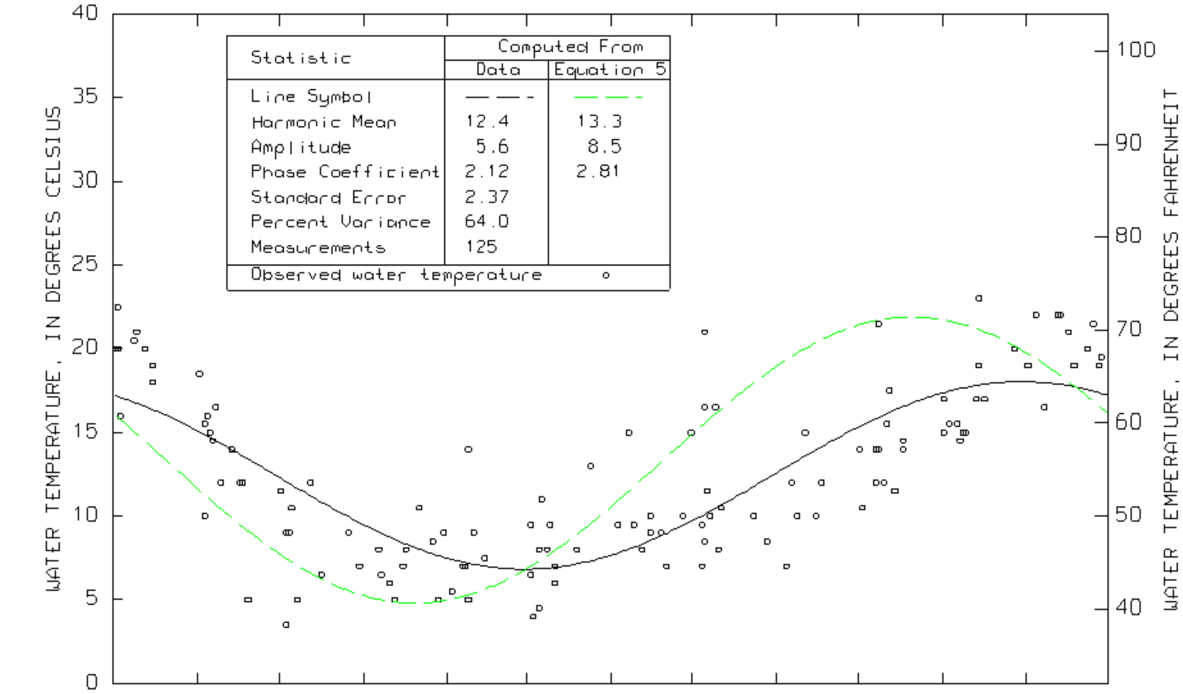
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	23.0	19.0	11.5	10.0	10.5	9.5	14.0	15.5	19.5	24.0	25.0	24.0
Minimum	14.0	8.0	4.5	5.5	3.5	4.0	6.5	6.0	9.0	11.0	12.0	18.0

Figure 206. Nottely River at Nottely Dam near Ivylog, Georgia, Station 03553500, September 1951 to July 1974.



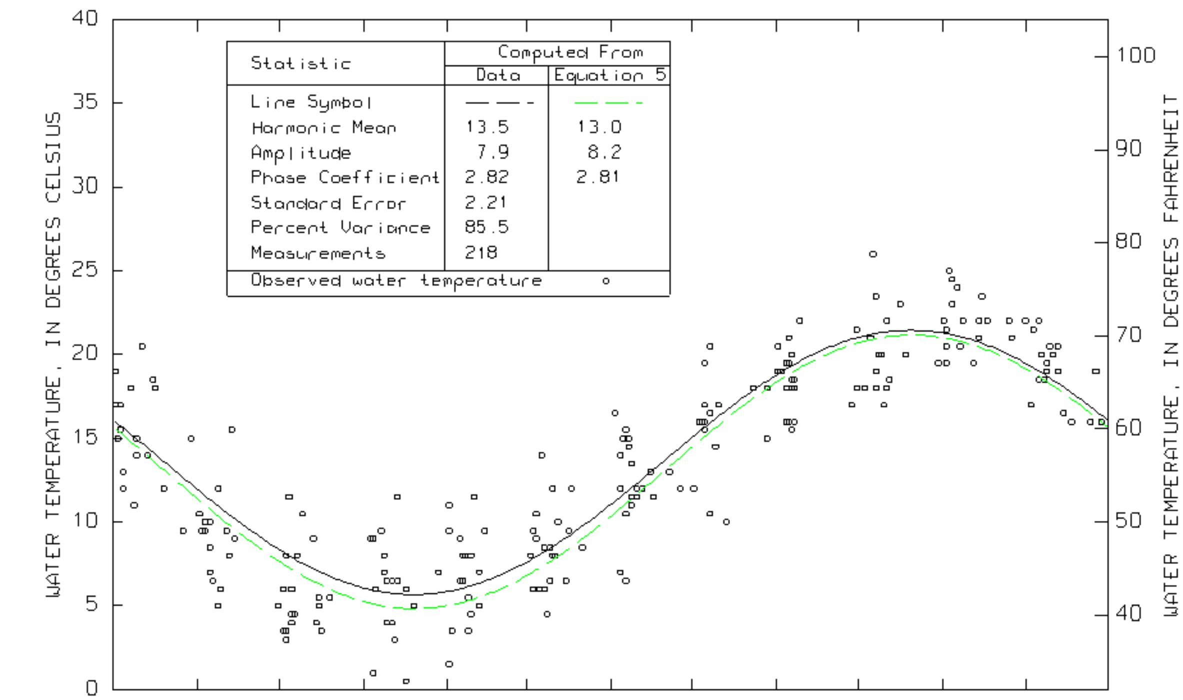
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.0	15.0	11.0	11.0	13.0	13.5	16.5	19.0	23.0	23.0	25.0	23.5
Minimum	10.0	3.0	1.0	0.5	0.5	1.5	7.0	9.5	13.0	16.5	16.0	12.5

Figure 207. Toccoa River near Dial, Georgia, Station 03558000, January 1951 to June 1984.



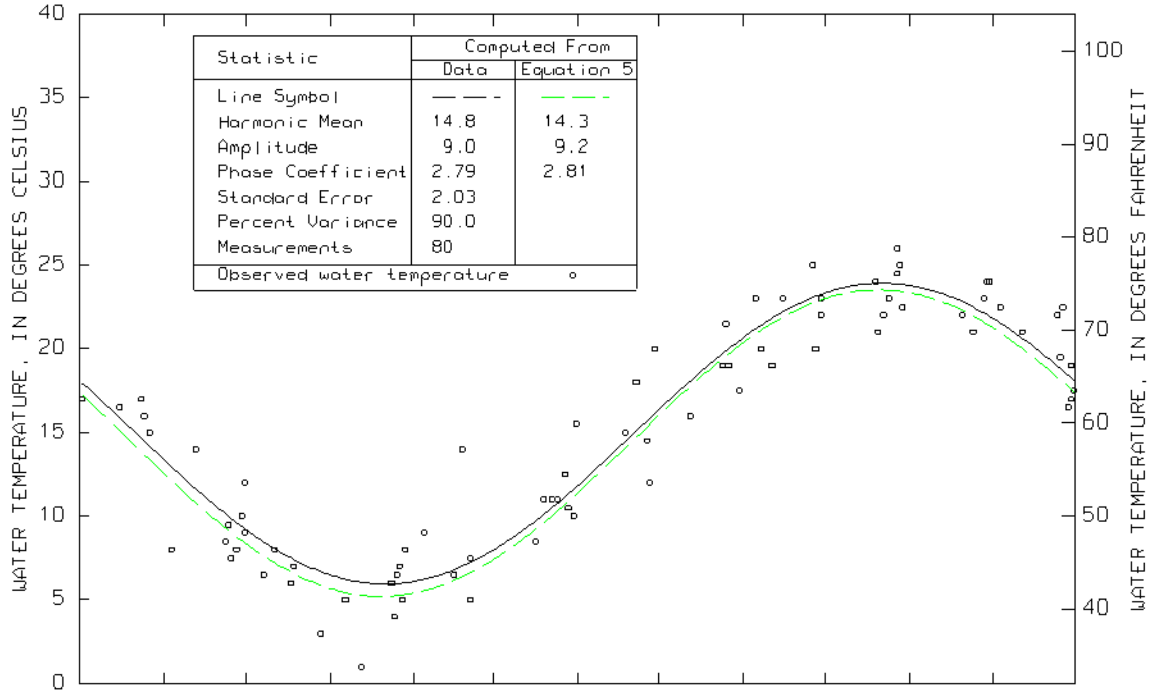
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	22.5	18.5	12.0	10.5	14.0	13.0	15.0	21.0	15.0	21.5	23.0	22.0
Minimum	16.0	5.0	3.5	5.0	5.0	4.0	7.0	7.0	7.0	10.5	14.5	16.5

Figure 208. Toccoa River near Blue Ridge, Georgia,
Station 03559000, January 1951 to July 1974.



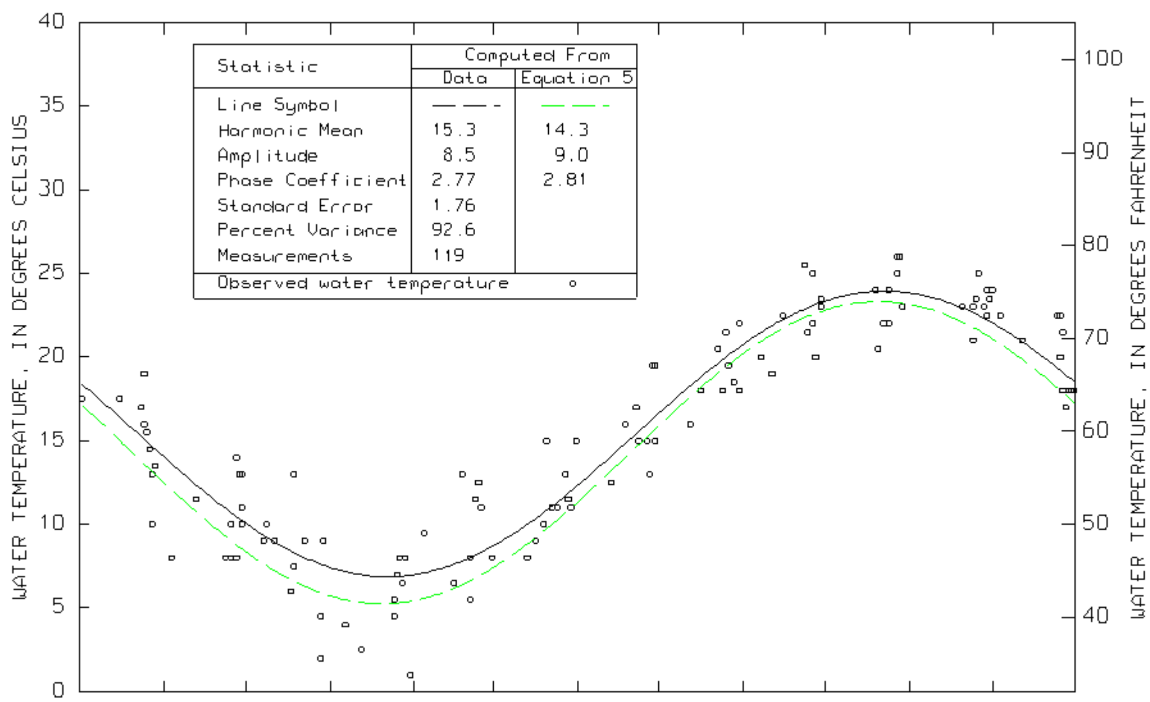
Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	20.5	15.5	11.5	11.5	11.5	14.0	16.5	20.5	22.0	26.0	25.0	22.0
Minimum	9.5	5.0	3.0	0.5	1.5	4.5	6.5	10.0	15.5	17.0	19.5	16.0

Figure 209. Fightingtown Creek at McCaysville, Georgia,
Station 03560000, January 1951 to June 1974.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	17.0	14.0	8.0	8.0	14.0	15.5	20.0	21.5	25.0	26.0	24.0	22.5
Minimum	15.0	7.5	3.0	1.0	5.0	8.5	12.0	16.0	19.0	21.0	21.0	16.5

Figure 210. South Chickamauga Creek at Graysville, Georgia,
Station 03566800, August 1974 to November 1984.



Observed	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT
Maximum	19.0	14.0	13.0	8.0	13.0	15.0	19.5	22.0	25.5	26.0	25.0	22.5
Minimum	10.0	8.0	2.0	1.0	5.5	8.0	12.5	16.0	19.0	20.5	21.0	17.0

Figure 211. West Chickamauga Creek near Lakeview, Georgia,
Station 03567340, August 1974 to December 1984.