WxCODER

*A Web-Based Entry System for
National Weather Service
Cooperative Observers*

User's Guide

Version 2.0.1.1
September 2014

WxCoder Users Guide Introduction:

WxCoder III (WC3), version 2.0, includes a new method using a data entry enhancement, titled the "**Superform**." This allows observers to **submit data quickly** via a spreadsheet indicating what days have already been submitted and showing the current day without any data. The end result is no lost days of data, improving overall station data quality.

For those accustomed to the previous methods of either daily or monthly input, these features remain. WC3 decreases the time period between observations reaching National Weather Service (NWS), Regional Climate Center's (RCCs), and the National Climate Data Center (NCDC). These offices all work to collect, quality control, and redistribute COOP data. Monthly forms automatically sum and average temperature, precipitation, and snowfall observations. WC3 contains "behind-the-scenes" Quality Control/Assurance (QC/QA) functions to assist the observer in an accurate observation. The program allows a supervising Weather Forecast Office (WFO) to customize the weather reporting criteria for a specific COOP station, and update user and station information. WC3 allows a WFO to enter an observer's observations when they either lose internet connectivity or have personal computer hardware/software problems.

WC3's QC/QA significantly reduces data errors resulting from manual entry of daily data, keypunch errors, and incorrect administrative information. Examples of some of these checks include:
- Temperature consistency checks (e.g., a minimum temperature cannot exceed a maximum temperature for the same observing period, etc.)
- Precipitation consistency checks (e.g., no negative precipitation values)
- Winter precipitation consistency checks (e.g., if snowfall exceeds three inches, snow depth must increase, etc.)

WC3's design:
- Provides an efficient, ***easy-to-use data entry system*** for participating COOP observers
- Ensures ***timely*** availability of COOP data for all customers
- Improves data ***quality*** through automated near-real-time data QA/QC
- Achieves a ***paperless*** electronic data collection, transmission, and archiving system
- Allows system ***flexibility*** to meet demands of integrating data from future observing systems and parameters (including phenology—the study of natural events, e.g., date migrating birds return, when spring flowers bloom, etc.)

Obtaining a WC3 Account:

If you already have an account, see the "**Signing In:**" section below. If not, your servicing WFO creates an account for you. Your account enables WC3 to identify you at login, tailor the information it presents to you, and give access to other features.

To establish an account, provide your NWS contact with the "**Username**" you want to use to login to WC3 and an email address. The username you select should contain between 3 and 255 characters in length. You may have any combination of upper and lower case letters, numbers, the "**at**" (@) sign, and the period. Using your station name as the username makes a great starting point in the selection process.

The email address you provide allows WC3 to send a welcoming message and includes a randomly generated, and usually hard to remember "Access Code." Your servicing NWS office can create an access code to something easy to remember. This access code, with your username, completes the login process.

Hardware/Software Requirements:

WC3 does not have special hardware requirements. WC3 uses an internet-ready computer connected to either cable, DSL, or a dial-up Internet connection. WC3 needs a functioning web browser like, Google Chrome, Microsoft Internet Explorer, Firefox, etc.

WC3 uses cookies and JavaScript to enable some of its features. Cookies and JavaScript are enabled within your browser for WC3 to function. If either cookies or JavaScript are disabled on your computer, WC3 sends a special message page. The page includes information about cookies or JavaScript along with instructions on how to enable either/both for WC3 operation.

Signing In:

Go to **http://wxcoder.org**. When the WC3 page opens (**Figure 1**), enter your *username* and *access code*. If you forget your access code or are accessing the system for the first time, click on "**Having trouble?**" in the sign-in box and provide either the username or e-mail address you gave your servicing NWS office. A new access code arrives via e-mail. Take care to protect your username and access code from non-WC3 users. Reset the access code if it becomes known to non-users. Both your username and access code are case-sensitive. For example, your username is **smith**. Entries such as **SMITH** or **Smith** will fail and prevent you from signing into your account.
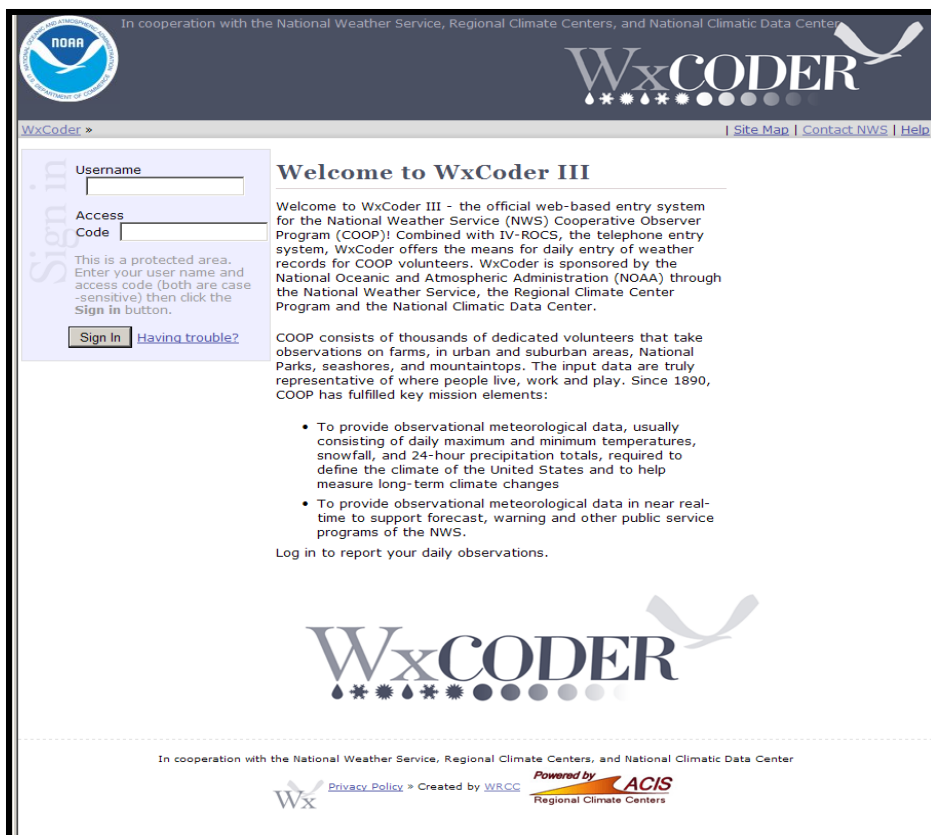
Figure 1: WxCoder Log-in Page

WC3 Home Page (managing your account):

When WC3 opens, it displays the home page and provides any "**News**" on updates/changes from the WC3 programmers. There are also a number of key navigation features (**Figure 2**):

1.) *Main Menu*: Provides access to observation and information pages. Menu item "**My Observations**" provides access to the **superform**.

2.) *Time Stamp*: Three dates and times are seen: current date/time; last sign-in; and last observation sent. These serve as a reminder of your frequency of use.

3.) *Bread Crumb*: This provides a quick snapshot of where you are within WC3.

4.) *Additional Help*: You can find available help throughout the active session pages, including a Site Map, Contact NWS, and Help. Question marks (**?)** on **Figure 4** provide help for individual entry boxes and pull-down menus. To contact your local WFO cooperative administrator, click on "Contact NWS." WC3 provides you with an e-mail address and/or other information to contact your local NWS office.

5.) *Interface Acknowledgments*: Collaboration between NOAA and its Regional Climate Center, along with reference to the Applied Climate Information System (ACIS), are shown at the bottom of all WC3 web-pages.
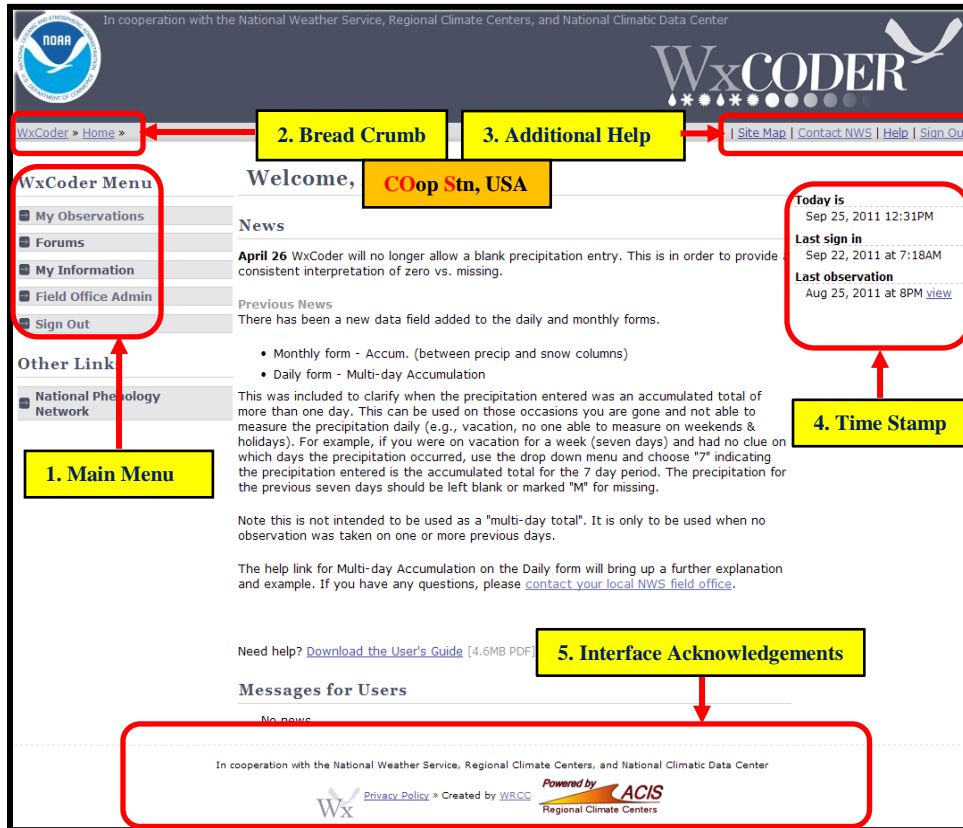
Figure 2: WxCoder Home Page

WC3 Observations Page:

From the WC3 "**Home**" page, selecting "**My Observations**" from the main menu sends you to the entry page for observations (**Figure 3**). This screen allows you to access or retrieve (download) observations. For those with multiple stations, a "**Change Site**" box allows access to the additional station/s.
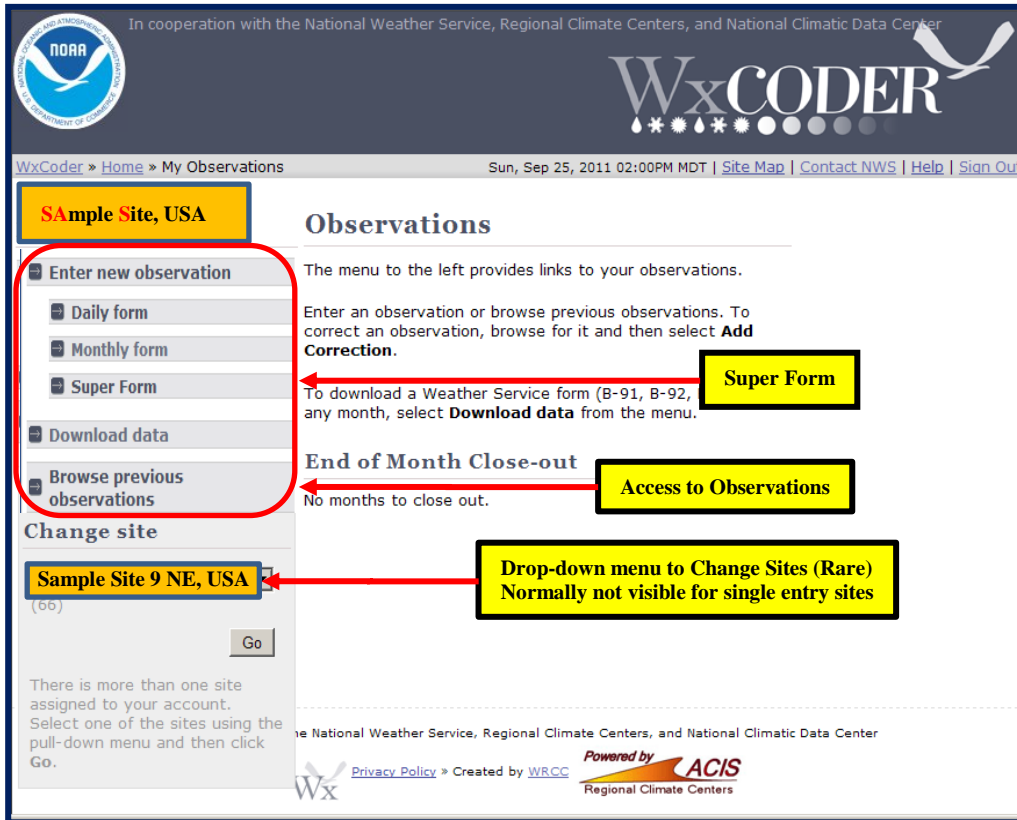
Figure 3: My Observations Page

You can access your NWS Form B-91 observations either for the current month or any previous month using the "**Download B-91**" menu item (**Figure 13**). You can also download and print a blank form (**Figure 13;** blank B-91sample at **Figure 14**) using Windows, Linux, or Macintosh operating systems. **Figure 15** illustrates the data entry sections, including remarks.

Figure 4: Daily Observation Entry Page

Figure 4 shows the Daily Observation **"Enter**" page and currently the most common page for entering your observation.

Entering Your Data (Example below may vary due to your specific reporting elements):

The following key features can assist in entering your observation:

1.) *Station Information*: Provides key metadata (data about the station), including ID, official time of observation, location, elevation, and supervising local NWS office.

2.) *Date and Time of Observation*:   Defaults to the current calendar day.   Your individual observation time spans a 24-hour period. For example: If you report at 8am, then your data spans the 24-hour period from just after 8am the day before to 8 am of the current day. If entering a previous report, change the date using the drop-down menu.

3.) *Type of Observation*: Most observers provide information for the 24-hour period preceding their official time of observation. However, you can report additional/supplemental information using the pull-down menu in cooperation with your supervising NWS office.

4.) *On-Screen Help*: A mouse-click on a question mark (**?**), or "**help**" throughout WC3 provides additional information to assist/clarify the meaning of an entry or element.

5.) *Observation Entry Areas*: The seven observation areas in **Figure 7** correspond to entry areas on the NWS Form B-91, as shown in **Figure 15**.

- *Temperature*:   Separate entry boxes for maximum, minimum, and at-observation temperatures. All entries are in whole degrees Fahrenheit. Enter an "**M**" for missing data.

- *Precipitation*:   For the measurement period (the last 24-hours), enter the **liquid** total accumulation of rain and/or hail, ice pellets, glaze, and snow in inches and hundredths to include the decimal point. Record "**Trace**" observations with a capital "**T**." If precipitation is unknown, enter an "**M**" for missing data.   When entering a number of preceding days of precipitation, one may prefer either the "**Superform**" or the "**Monthly form**."

   a. Open the "**Monthly form.**" Unlock each date with no precipitation entry (click the padlock icon—the lock turns green when open). Opening the "**Superform**" does not require unlocking anything-it is ready for data input. Once the day(s) open, enter an "**M**" in (each) precipitation block(s). For the superform, click on the respective blocks and enter an "**M**."

   b. Click the drop-down menu under "**Accum**. or **Multi-day Accumulation**" column for the current day and enter total number of days with no report plus one (you need to include the current day). See **Figures 4, 7, and 10** for the multi-day input locations, for examples.

   c. Now click the "**Save**" button. You now need to "**Confirm**" each of the day(s) you had open (Daily and Monthly input). For the Superform, click "**Save Changes**."

   NOTE: You can make these entries via the **Daily form**, but it takes much longer to complete than the **Monthly** or **Superform**.

- *Snowfall:* For the measurement period, enter the total of newly fallen snow in inches and tenths, including the decimal point. For trace observations, enter a capital "**T**." **If none, enter zero** (**0.0**). Enter at least a trace "**T**" in the snowfall column when reporting hail to indicate frozen precipitation did occur, particularly in hail-prone months. For hail, enter size, if known, or comment the entry is all from hail in remarks.

- *Snow Depth*: At observation time, enter the average depth (accumulation) of all snow and other frozen precipitation on the ground in the vicinity of the station in whole inches. Record "**Trace**" observations with a capital "**T**" (for an average depth greater than zero but less than one-half inch – 0.5"). **If no snow depth, enter a zero** (**0**).

Precipitation, B-91/92: Indicate each hourly period when you notice/suspect precipitation fell over the course of your 24-hour reporting period. The number in each block indicates the start of the hour (e.g., 6 AM represents the period 6:00 – 6:59). The "**Superform**" does not have this section to save space in the data-base.

Monthly Form: select the appropriate "**Observed**" or "**Estimated**" radio button. Then click on the block for each hour corresponding to precipitation occurrence. Two calendar days are shown (**Figure 7**) to allow you to enter precipitation occurring after your observation time yesterday, to this morning's observation. Paragraph **5.),** above, highlights the observation period for the current mornings report.

- *Key Weather in Past 24-hours:* Click the appropriate box(s) under the "**Weather**" column when Fog, Hail, Ice pellets, Damaging wind, Glaze, and Thunderstorm occur within your reporting period.

- *Remarks:* Enter any additional notes regarding a phenomena not part of the B-91 form. Common examples include sky condition (cloud coverage, cloud type, optical phenomena), astronomical (e.g., eclipses), seismological (e.g., earthquakes), phenology (e.g., killing frost, status of leaves, blooms, pollens, first arrival of migratory birds, etc.), river conditions, details about weather entries (e.g., hail size), or other observations of the natural environment.

6.) *Submit*: When all observation entries are complete, click the "**Submit**" button. Your entries now undergo an evaluation for quality. WC3 displays any errors or entry omissions where corrections/additions are necessary before WC3 accepts the observation.

The most common error is temperature. Using the reporting period of (8am): Yesterday's "**At observation**" temperature has a value lower than this morning's low temperature. Replace your current morning's entry with yesterday's "**At observation**" temperature (See **Figure 11**, page 16).

Remember, you are reporting a 24-hour observation day, not a calendar day (exception: you report at midnight).

NOTE: Many observers often enter their current morning minimum temperature in "**Remarks**" to indicate occurrence of the actual observed value. For example, yesterday's "**At Observation**" temp = 32 is lower than the morning observed temperature; In "**Remarks,**" enter the observed minimum temperature, say "AM low 40." Then, enter yesterdays "**At Observation** temperature in the minimum temperature block. This ensures everyone understands you reported the lowest temperature of your 24-hour **OBSERVATION** day which occurred in the first minute. If you report in the afternoon/evening, the example above normally applies to your maximum temperature when it occurs in the first minute of your 24-hour reporting period (See new example at **Figure 11**, and the **Correcting a Temperature Error:** section beginning on page 42).

Observation Confirmation:

Once you "**Submit**" an observation from either the daily, or monthly observation entry page, a final display allows you to check the data before final confirmation. This confirmation step ensures against typographical errors and provides an opportunity to make any necessary corrections. Review all elements and make appropriate corrections using the "Make corrections" button) before submission (**Figure 5**). **Figures 6, 8, and 9** show Daily and Monthly examples of observations under review before confirmation. The monthly confirmation window may have multiple entries. Click the small "**Confirm**" box next to each entry before clicking "**Confirm All Checked**."

The Superform avoids the above "**Confirm**" step as it performs the Quality Control/Assurance (QC/QA) in the background via "**Save Changes**."

Figure 5: Confirm Daily Input Example

Once you confirm, WC3 returns to the "**My Observations**" page when using the daily input as shown in **Figure 4.** When using the "**Monthly Form**," "the confirmation statement displays on the "**Confirm page**" as shown in **Figure 6**.

For the monthly format, one may have several days to enter to either bring to currency or to fill in a missed entry. As a suggestion, when a month ends, open the "Monthly Form" or the "Superform" to view your observations. Missing observation(s) are quite noticeable. Simply click on the lock/superform block, make your entry, "Save," and "Confirm." This quality control check ensures completion of a monthly set of daily data and emphasizes the importance of documenting all observations on a paper B-91/92/83A (booklets of these forms are available from your supervising WFO).

Figure 6: Confirmed Daily Observation

Figure 7 shows the "**Monthly Observation Page**." This page allows you to view your data from a monthly viewpoint while entering/editing daily values.

Figure 7: Monthly B-91 Form with Sample Entries

Figure 8: Monthly Confirmation Example

Figure 9: Confirmed Multiple Monthly Observations

The Superform:

Figure 10: WxCoder Superform – most COOP stations

Figure 10 is a partial example of a more common cooperative weather station entry.

The superform allows either the observer or supporting WFO, the opportunity to view an entire month of information from a single screen, enter individual days, blocks of days, or an entire month, with the current day empty and awaiting data. In the above example, the superform can display much more data than the observer B-91 (**Figures 10 and 12**). All quality control/assurance features remain active with the superform as it has for the daily and monthly entry formats. Each station's superform remains tailored to what the observer has agreed to provide, i.e. high, low, at observation temperatures, precipitation, snowfall, etc.

When the superform opens, click on the first box to the right of the date (max. temp.). Simply tab across for all remaining entries unique to your station. The multi-day column is normally blank but will default to a "**1**" when any precipitation is entered. Use the drop-down menu for multiple-day accumulations (**Figure 11**). For remarks, simply double-mouse-click on the space and a small window opens to allow for lengthy remarks, if needed (**Figure 11**). Once remarks are entered, click the Remarks "**Save**" button.

Use of the superform does not deny use of the more normal station entry using either the daily or monthly menu entry. Using the more familiar entry mode automatically transfers to the superform. The benefit of the superform becomes evident when you open the form after a few days of making no entries, after returning from vacation, etc. You immediately notice the last entry made and or where a day may have been missed/not transmitted.

Unique features:

1. The form opens in a separate window/browser tab to display all data previously entered for the month, with the current day ready to accept data—A mouse-click opens the box for maximum temperature. Use the Tab key either to move right for further same-day entries, or use the arrow keys for multi-day entries of the same type, i.e., precipitation. Pre-saved entries display a **red triangle** (**Figure 11**) in the upper left corner of a box.

2. Multi-Day Accumulation column:

3. The hourly precipitation occurrence (Section "**5**" in **Figure 15**) was omitted to improve data storage capacity.

4. Observation period weather is a drop-down menu where you can enter key weather events within your **OBSERVATION** day. If you reported a thunderstorm, did you have hail? If yes, include this element as they will both display. Use **Remarks** to indicate hail size, if known.

5. Remarks entries use a pop-up menu. **Double-click** on the remarks box of the spreadsheet.

6. If reportable information is missing, temperature, precipitation, etc., enter an "**M**."

7. If no snow fall or snow depth, make a daily zero "**0**"entry. Enter at least a trace "**T**" in the snowfall column when reporting hail to indicate frozen precipitation did occur, particularly in hail-prone months. Comment in **Remarks** if the entry is exclusively from hail.
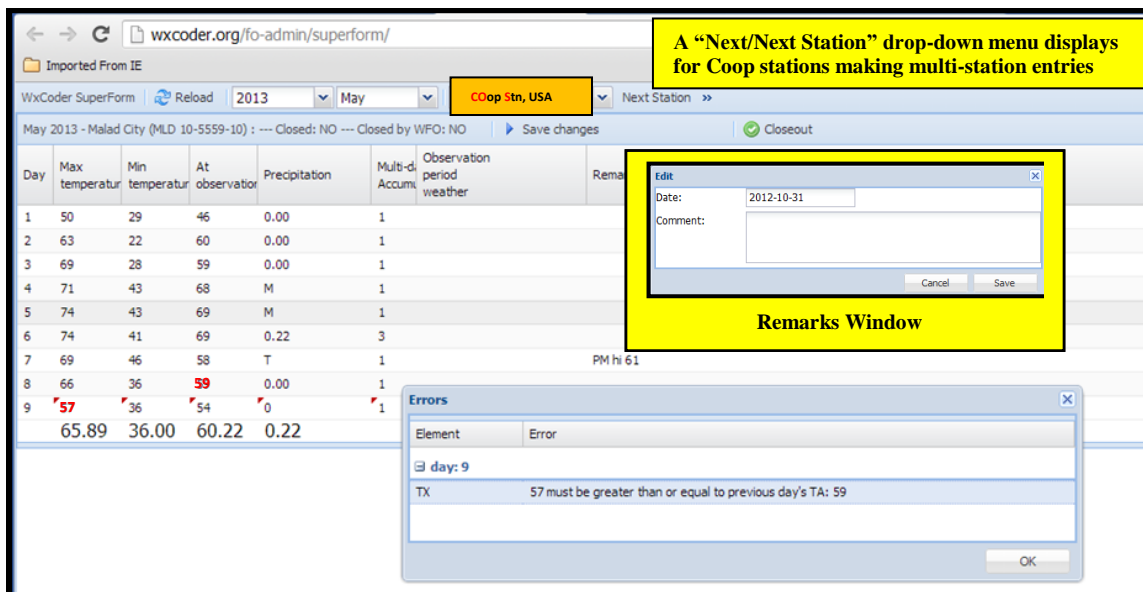
Figure 11: Error flag for Temperature and Remarks Window

Correcting a Temperature Error:

Note **Figure 11** above. The high temperature at the start of the 24-hour reporting period was the "**At Observation**" temperature reported on the **8**th at **59**F and the high at reporting time on the **9**th was **57**F. This generates the "**Errors**" pop-up window.

To fix:

1. Enter **59**F in the "**Max Temperature**" block on the 9th
2. Enter in remarks the current 24-hour high temperature you have read from the NIMBUS recorder. An entry can be "**PM hi 57**" or "**Today's high 57**" or something similar. Click "**OK**" on the "**Errors**" window, and then "**Save changes**."

Figure 12: WC3 Superform – Evaporation Station

Figure 12 is an example of an agricultural station reporting evaporation, water temperature, and wind-flow in whole miles (**B-92 Example:** The anemometer mile reading comes directly from the unit and the 24-hour movement is the difference of current-from-past-day reading). These types of stations often include soil temperature.

Remarks are added via <u>double-clicking</u> on the "**Remarks**" column.

Retrieving Data:

Figure 13: Download Data Access

Figure 14: Sample Blank B-91 Form

Figure 15: Entries: Temp.; Precip.; Snowfall; Snow Depth; Hours; Wea.; Rmks

Signing Out:

To sign out of an active session of WC3, click on "**Sign Out**" in the upper right-hand corner of the Confirmation page **(Figure 5 or 9)**. WC3 returns you to the home page **(Figure 16)** with a message, in red, indicating success in signing out of WC3.
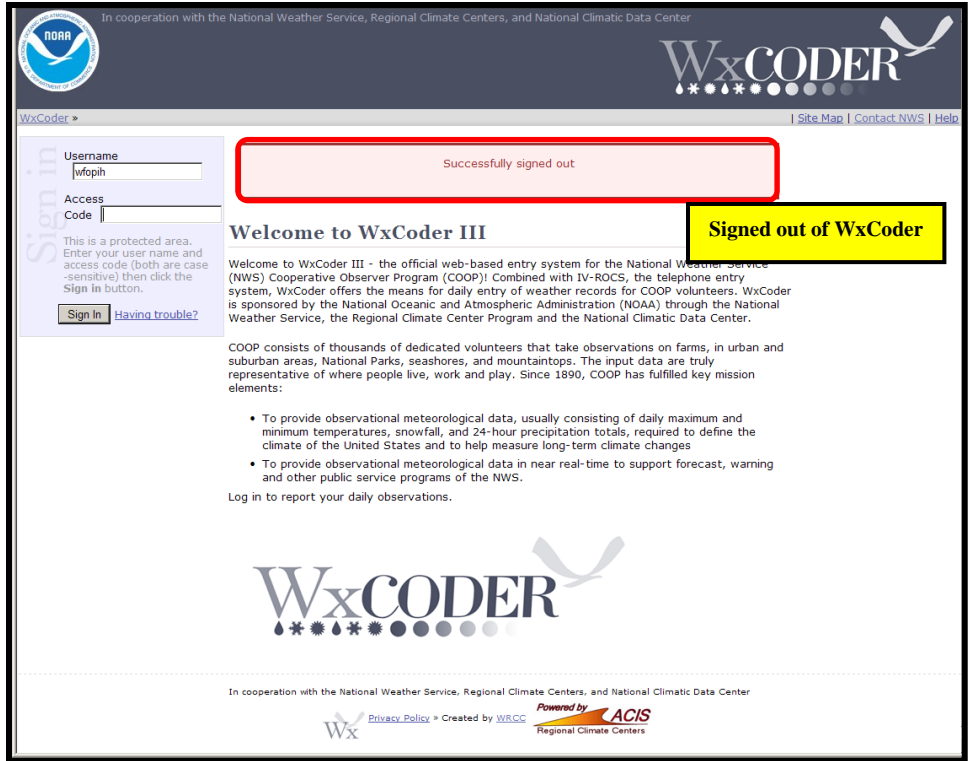
Figure 16: Signed Out of WxCoder