

surfacestations.org

A resource for climate station records and surveys

How to do a USHCN, GHCN or GISS weather station site survey

Items needed:

- **Digital Camera**, 3 megapixels or higher resolution preferred, any brand capable of copying pictures to your PC maximum image size supported for upload is 2048x2048 pixels, be sure to set camera to this or lower
- **Handheld GPS**, preferably one with 100' or better accuracy that allows marking locations and naming them Accuracy is important, a [WAAS enabled](#) GPS is most accurate. We use the [Magellan Explorist 200](#), available at Wal-Mart
- **PDA, paper notebook, or voice recorder**, to take notes while doing site survey, used to fill out survey form
- **A tape measure**, used to record height of and the distance of the weather station from nearby structures or objects.
- **Prints of the common weather station shelters** to help people whom you might ask for directions identify the weather stations. A picture showing both types is at the end of these instructions for your use.

Preparation:

Choose a site to survey near you on along your travel route This can be done by visiting the master station list at http://www.surfacestations.org/USHCN_stationlist.htm and looking up what sites are in need of surveying.

Find the location of the weather station site to be surveyed in advance. Sites are listed by name, state (see list on [surfacestations.org](http://www.surfacestations.org)) and give an approximate lat/long to the nearest hundredth of a degree, but that likely will be too coarse to locate with a GPS. You'll need to find out where it is located by place name, some web research will likely be needed, though sometimes the name itself is the best clue. There is an online resource operated by the NWS called the **Multi Metadata Search (MMS)** which you can use to locate stations more precisely at <http://mi3.ncdc.noaa.gov/mi3qry/login.cfm>

1. **Open the [NOAA MMS Station locator](#) to get better latitude/longitude coordinates, press "Guest Login" button and then type station name in the search box.**
2. **Locate the station in the list, note detailed latitude and longitude info which you can put into Google Earth or similar mapping program to help locate the station.**
3. **Click on the Name of the station, it will pop up a new window. Note below the "Begin Date" there is a highlighted link with the actual dates; click the date to open details.**
4. **Look for "Managing Parties" in the MMS results (you may have to scroll down) and that will tell you the name of the observer, be it a private residence, government entity, or organization. Do additional Google searches as needed for the name, city, state and you may locate a telephone number.**

Weather stations are often located at some governmental entity, such as an airport, agricultural experiment farm, water or sewage treatment plant, fire station, police station, ranger station, municipal yard, highway department, or school/library. Some sites are operated by media such as newspapers, and a few are at private residences.

Often calling ahead can help you locate just exactly where the station might be. Again a web search can help you locate the telephone numbers and email addresses of contacts that may be able to help you. Some stations may be on restricted property, so it's a good idea to let people know you are coming.

When all else fails, you can drive to the nearest location to the weather station and show people nearby the picture at the back of this document showing what a station might look like. You can usually get directions from residents or government employees.

At the site:

Onsite Photography. Photographs will be the most important record you can make, so don't hesitate to shoot as many pictures as you want. You can always pick the best ones later to be uploaded to the www.surfacestations.org website.

Locate the temperature shelter; there could be one or two, depending on the age history of the station. Look for these two types:



MMTS Temperature shelter



Stevenson Screen aka "Cotton Region" Shelter

There are five most important pictures to get, but get as many pictures as possible

An **overall view** that best expresses the character of the site, plus views looking **North, South, East, and West**. Get more pictures that show things around the station within a few hundred feet. ALWAYS try to get the station itself in the photo for reference.

If both shelter types exist, get pictures for both. If only the MMTS type exists, ask the curator where the Stevenson Screen was originally located and try to get pictures of the location in overall, N/S/E/W format plus a GPS fix.

Look for nearby influences. Additionally get pictures that show any nearby structures, trees, roads, or other things that interrupt the flat terrain near the weather station shelter. In some cases, inappropriately placed things such as parking lots, air conditioner fans, metal outbuildings, trash incinerators, pools, or sprinkling systems may be nearby. Be sure to get pictures of these things showing the weather station shelter in the picture also. Measure the height above ground of the temperature sensor shelter and the distance from the shelter to influences if close by, 25 feet or less. If they are more than 25 feet away, use your best estimate of distance. Make notes in your PDA, notebook, or voice recorder.

Get a GPS latitude and longitude fix

Preferred readings are in degrees with decimal points, such as 39.69104 N and 121.82127 W

Place your handheld GPS device with a meter of the station and if it has a "marking" function, mark that location and store it in its memory. If the device allows naming the point you marked, give it the name of the site.

CAUTION: Some handheld GPS devices don't reach maximum accuracy until 2-5 minutes after power on, be sure to wait until the manufacturers recommended time or indication of maximum accuracy occurs.

If your GPS does not have the ability to record/mark points, then write down the latitude and longitude in your PDA, notebook, or make a voice memo. Later you'll transcribe the latitude and longitude to the site survey form in your PC.

Make notes of site details.

Note the type of shelter (Stevenson screen or stacked plate shield). If the shelter is a Stevenson screen note if has been repainted. Look for paint chips or missing paint. If possible get pictures of chipped paint, missing paint, and paint drips or brush marks.

If the shelter is a Stevenson screen, if possible, get pictures of the interior and the instruments.

Ask the curator/observer about the site history.

Sometime the site may have been moved, damaged, or some other event may have interrupted record taking. Here are a few questions to ask that can help:

How long has this been operating at this location?

Has any of the instruments ever been replaced or repaired?

Has the shelter ever been replaced, repaired, or moved in any way?

Have you ever repainted the shelter, and if so, what kind of paint? (Latex, enamel, gloss, flat, etc.)

(if there is some odd nearby influence, ask this) How long has the “X” been near the weather station?

(if there are parking spaces nearby, ask) Do vehicles get parked near the weather station regularly?

(if the curator indicates the site/shelter has been moved, ask) Can you show where it was previously located? Once there get new photos and a GPS fix. It is important to determine what year, and if possible, the month, that the site/shelter was moved and make a note of it.

After visiting the site

Fill out the site survey form. Using your word processor, complete the site survey form. Fill in as many details you measured and photographed as possible along with whatever you learned about the site from the curator/observer. A free Microsoft Word compatible word processor is available at <http://www.openoffice.org> It has the ability to save as PDF natively, see below.

IMPORTANT: After completing the form, **save it as a PDF file** with the site name like this: [yoursitename_sitesurvey.pdf](#) If you don't have the ability to create a PDF document from your word processor, try the free [PrimoPDF](#) program or go to Adobe's free trial online PDF creator website at <http://createpdf.adobe.com/> and use the free service.

Preparing your pictures for upload to www.surfacestations.org.

Sizing pictures

If you took pictures at resolutions greater than 3.1 megapixels (2048x1536) the pictures may be too large to upload. Use any photo editor to reduce their size.

If your camera setting was at 3.1 megapixels, 2048 pixels wide or lower then you can skip picture size reduction.

Renaming pictures

IMPORTANT: You should rename your pictures to reflect the site name, like this:

[sitename_overall.jpg](#)

[sitename_looking_north.jpg](#)

[sitename_looking_east.jpg](#)

[sitename_looking_south.jpg](#)

[sitename_looking_west.jpg](#)

Other pictures:

sitename_1.jpg sitename_2.jpgsitename_x.jpg etc or whatever name suffix you want. The naming is critical, except that you need to include the site name somehow in the picture filename.

SUGGESTION: Use underscores like this: **Chico_University_Farm_overall.jpg** rather than spaces in your filenames, while the space won't prevent the picture from being uploaded, it will cause a %20 (the code for a space) to be inserted in some web browsers: **Chico%20University%20Farm%20overall.jpg** when viewing the filename. It's a small annoyance, but not critical.

ALSO: If you are so inclined, download a free copy of **Google Earth** from <http://earth.google.com/> and use the GPS lat/long coordinates you measure at the site to locate the site from the air. Go to the highest zoom level so the temperature shelter is centered and land influences around it are visible. Save a picture and upload the Google Earth picture along with your other pictures.

Uploading pictures and the site survey form

Go to <http://gallery.surfacestations.org> and register if you have not already done so. You cannot upload your files without registering. Registration is free. After completing the registration for, you'll be sent an email with a confirmation link to click on, once doing that you'll be registered.

Next, use the website navigation; locate the station that you recently surveyed in the gallery. If you cannot locate the station in the USHCN or GHCN/GISS databases, it may be that a blank placeholder has not been added yet. Contact info@surfacestations.org to have it added if this is the case.

If you have been granted "power user" status, you can do an "Add Album" under the appropriate country, state or province to create a blank album for the USHCN or GHCN weather station site you want to upload photos to.

Enter the album of the USHCN or GHCN weather station site. It will be blank except for a message saying The Album is empty, add a photo.

Click on **Add Items** on the left side menu or the **Add a Photo** link on the main window and you'll be presented with the upload form:

Add Items

From Web Browser From Local Server Link WebCam/Live Image

Upload files directly from your computer. Enter the full path to the file and an optional caption in the boxes below.

Note: You can upload up to 8 megabytes at one time. No individual file may be larger than 2 megabytes. If you want to upload more than that, you must upload the files separately, use a different upload format, or ask your system administrator to allow larger uploads.

File
 C:\Users\home\Documents\orland\orland_overall.jpg

Caption
 Orland Overall Site View

File
 C:\Users\home\Documents\orland\Orland_StationSurvey.pdf

Caption
 Orland Station Survey

[More Upload Boxes...](#) **Add additional forms (max 4 recommended)**

Set item titles from: Assign caption to: Summary Description

Thumbnails
 Gallery can create thumbnails at upload time, or create them the first time you want to see the thumbnail itself. Either way, it will create the thumbnail once and save it, but if you create them at upload time it makes viewing albums for the first time go faster at the expense of a longer upload time.

Create thumbnails now **Be sure "create thumbnails now" is checked**

Use the "Browse" button to locate the pictures and completed site survey form in the folder on your computer hard drive.

IMPORTANT: Be sure to choose the "overall" picture as the first upload, it will become the thumbnail for the station album. **ALSO:** Choose the sitename_surveyform.pdf as the second upload. This will ensure that the form exist on the first page of the album thumbnails.

You can add additional upload forms by clicking on “More Upload Boxes...” but we suggest no more than four at a time, because if your connection is slow, and a large number of pictures and bytes is being transferred, the system may time out, assume there is a communications error and cancel the upload.

Do NOT use the “Link” method to link to pictures on websites, because if that website disappears, so will the picture. If you have pictures on websites, save pictures from the website to your local disk, then upload the picture to the surfacestations.org server. The Webcam/live image method is also not recommended for the same reason. “From Local Server” is disabled.

Click the “Add Items” button to start the transfer. You’ll see a message when the transfer has been completed.

Repeat the process as needed until all photos are uploaded. If you make a mistake in uploading a file, you can overwrite it later.

Navigate back to the Album and check it out to make sure you’ve completed all your uploads

EMAIL THE ADMINISTRATOR OF SURFACETSTATIONS.ORG to advise the site survey has been uploaded

Email address is info@surfacestions.org

Your submission could be featured on the front page of the website, so be sure to let us know!

You are done! Thanks very much for providing this important climatic resource.

Print this picture on the next page to carry along to show to others when asking for directions to help identify what a weather station may look like.



MMTS type shelter (stacked plates) and Stevenson Screen aka "Cotton Region Shelter" on 4 legs. Rain gauges to left.