

# Tropical Cyclone Winds at Landfall: The ASOS Wind Exposure Documentation Project

## Documentation Instructions - Guidelines

(Please check [www.aoml.noaa.gov/hrd/asos](http://www.aoml.noaa.gov/hrd/asos) for recent updates to these instructions and for the answers to frequently asked questions FAQ)

During routine maintenance visits, photographically document the upstream wind fetch exposure of ASOS stations in areas potentially affected by landfalling hurricanes. A list of WFO's in this category are listed in the FAQ and cover from Texas to Maine, Hawaii, Guam, Puerto Rico, and the U.S. Virgin Islands.

### Tools needed:

Nikon Cool Pix 300 Digital camera (640x480 resolution)

2 sets of fresh 4 AA sized batteries

A compass

A GPS unit

A measuring tape

Tools for lowering the anemometer mast

A notebook.

A range finder (if available) could help estimate distances to major obstacles.

### Before Starting

Be sure you feel comfortable with the operation of the camera and especially with how to use the text annotation and voice recording features, how to download the images on to your PC using Nikon View software, and how to enhance the images to improve their quality using the Photo Enhancer software.

Make sure you have plenty of memory to store the needed images (8), text files (8), and voice files (2). Delete files that you no longer need. Setup the camera for "Single frame" shooting mode, Speed-Light Flash to "Off", Image quality to "FINE", Sound mode to "On" and "Mode 2", Speaker to "on" volume "3", Self timer to "off."

Check the manuals that came with the camera for more information. Its a good idea to take some practice images and download them to the PC before going into the field.

### I. Documentation Procedure

1. Park your vehicle far enough away from the site that it will not significantly block the view of the upstream exposure. Use the handheld GPS unit to measure the latitude and longitude of the ASOS instrument bank in degrees, minutes, and seconds and write it in the notebook. [Image 1]



Image 2

2. Lower the anemometer mast and determine the height of the anemometer with the tape measure and write it in the notebook. It may be helpful to have an electronics or ASOS technician to assist. [Image 2]

3. Use the voice recording button to record a short message with the Lat and Lon (in degrees, min, sec) Anemometer height, and compass direction the camera is looking towards. [Image 6]



Image 1

4. Photos of exposure for 8 compass headings (every 45 degrees)

- a. From a distance of about 30 yds. away from the mast, use the digital camera to document the upwind exposure. Keep the anemometer mast in the center of the image on the compass heading [Image 4], in the middle to lower foreground of the image, but not so close that it obstructs the view. Continue the exposure photos every 45 deg of compass heading [Image 3]. The wind exposure documentation will consist of 8 pictures per station, taken every 45 degrees of direction relative to true north centered on 0/360, 45, 90, 135, 180, 225, 270, and 315 degrees. One or more of the images should contain the ASOS temperature sensor and rain gage. **Having the mast in the center foreground helps to aim the camera on the correct compass heading. Taking the photo from 20-30 yds away allows for some overlap on adjacent images giving a broader view of the terrain upstream of the mast.**



Image 3



Image 4



Image 5

- b. Use the text annotation feature of the camera to add the direction the camera was pointed in and the 3 letter station ID [Image 5]. To do this, go to the menu and select the picture you just took, then use the stylus pen and touch the image lightly (three color blocks will show on the screen), lightly touch the red block and then write the station ID and compass heading on the image, then hit the return button with the pen and the text will be saved along with the image. Try to write small, clear and legible without blocking the ASOS sensors or upstream terrain features in the image.

**Note it is difficult to see the image on the LCD screen on bright sunny days. If you have trouble viewing the image, go to the vehicle and write on the image from inside the vehicle.**

Repeat this for each of the eight compass directions: 0/360, 45, 90, 135, 180, 225, 270, and 315 degrees. Use the notebook to identify significant terrain features or obstacles (e.g. buildings, trees) and document their distance and estimated height. If available, use the range finder to estimate distances to obstacles.

- c. After taking all 8 pictures and annotating them, **Use your notes and the voice recording button to record a single concise message pointing out major obstacles to the flow (the approximate distance, height and their heading from the anemometer mast).** [Image 6]



Image 6

5. That's it for the field work! When field work is completed you should have:

(1) voice file with anemometer height and station Lat and Lon in Deg, min, sec.

(8) upstream exposure images

(8) text annotations associated with each image

(1) voice file summarizing major flow obstructions in each of the 8 direction sectors.

Notebook entries for Station ID, Date, time, personnel, Lat, Lon, anemometer height, and significant flow obstructions (with approx. distance and height) in each of the 8 direction sectors

## II. Downloading Images and Sending information to NCDC

6. When you get back to the office, make sure that you have lots of battery power left in the camera or connect the camera to the A/C adapter, connect the camera serial cable to the serial port of your PC, turn the camera on, and download the images into a directory for the station ID. To download each image with the text superposed, start up Nikon View, select the camera, select an image file in the browser and click on the "Acquire" button. The image will be loaded into a window with the text file superposed. Then save the image as a SIDDIR.jpg file to a directory named after the station ID, for example all the files for the Opalocka ASOS will be in a directory named **OPF** and each file name will be Station ID (SID) Compass Direction (DIR).jpg e.g. OPF000.jpg for the image pointed due North. Be sure to save from the image window and NOT from the file browser. This will store the text and image as one file. Repeat until all 9 images with text are on the PC directory. Download the 2 voice files (e.g. OPF1.wav) from the camera to the same directory. It takes about 1 min to download each image.

7. If needed, use the supplied Photo Enhancer software to inspect the images and enhance them to improve their quality. Usually this involves changing the image to lighten it up on dark days or darken and sharpen it on very bright days. Check over all the images and text annotations to make sure things are legible and then put the final images in a separate directory.

8. Using the notes taken in your field notebook, run the JAVA application supplied by HRD to fill out the form for the station and bundle the images and text annotation using the final directory location [Image 7]. The JAVA program will compress and archive the images and use the file transfer protocol (ftp) to send all the information for a particular station to NCDC. This program will run on any PC, MacOSX, or UNIX Workstation with the latest Java Runtime. If you have any problems with the JAVA program contact HRD at [asosproject@aoml.noaa.gov](mailto:asosproject@aoml.noaa.gov). (Note: if you have trouble getting the latest JRE please try upgrading your browser)

A quick rundown on the instructions for the Asos Documentation Application:

- 1) On the first screen "Station Information", it is important that the "Set ID" button is clicked after you've entered it in the text field. (see image 7a)
- 2) Please make sure to click the "Set Information" button when all fields have been set on the first screen. (see image 7a)
- 3) After filling in the "Station Information" screen, click the tab for "Exposure Comments".
- 4) Please, fill in all the fields on this page (see image 7b), you will not be allowed to send the files via this application without first filling in the exposure information. This information is very useful when interpreting the picture later.
- 5) Press the "Set Exposure Information" button when finished and then click the "Load Station Files" tab at the top of the window.

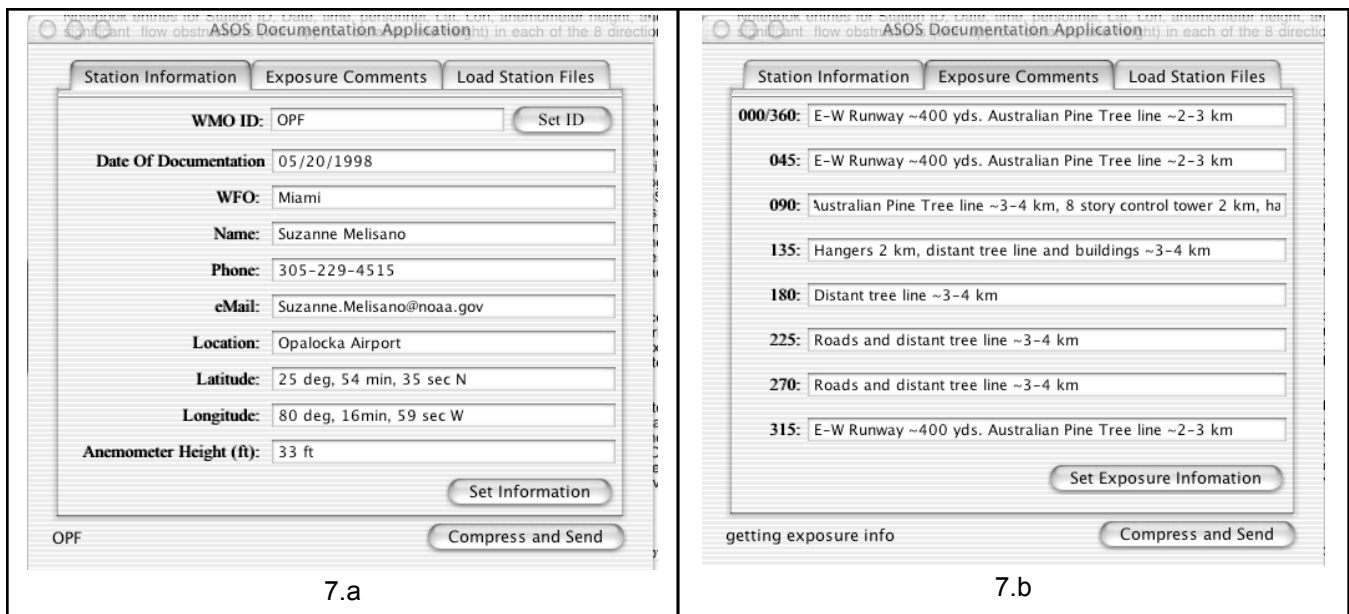


Image 7

- 6) There are two ways to set the files for being set (see image 8a):  
 (a) Click on the respective buttons and select each file individually.

(b) Create a directory containing all the necessary files using the following naming structure: "000.jpg", "045.jpg", "090.jpg", "135.jpg", "180.jpg", "225.jpg", "270.jpg", "315.jpg", "WMO1.wav" and "WMO2.wav" where WMO is the 3-letter station id. If all files are present, you may click the "Load Directory" button and select the directory containing these files.

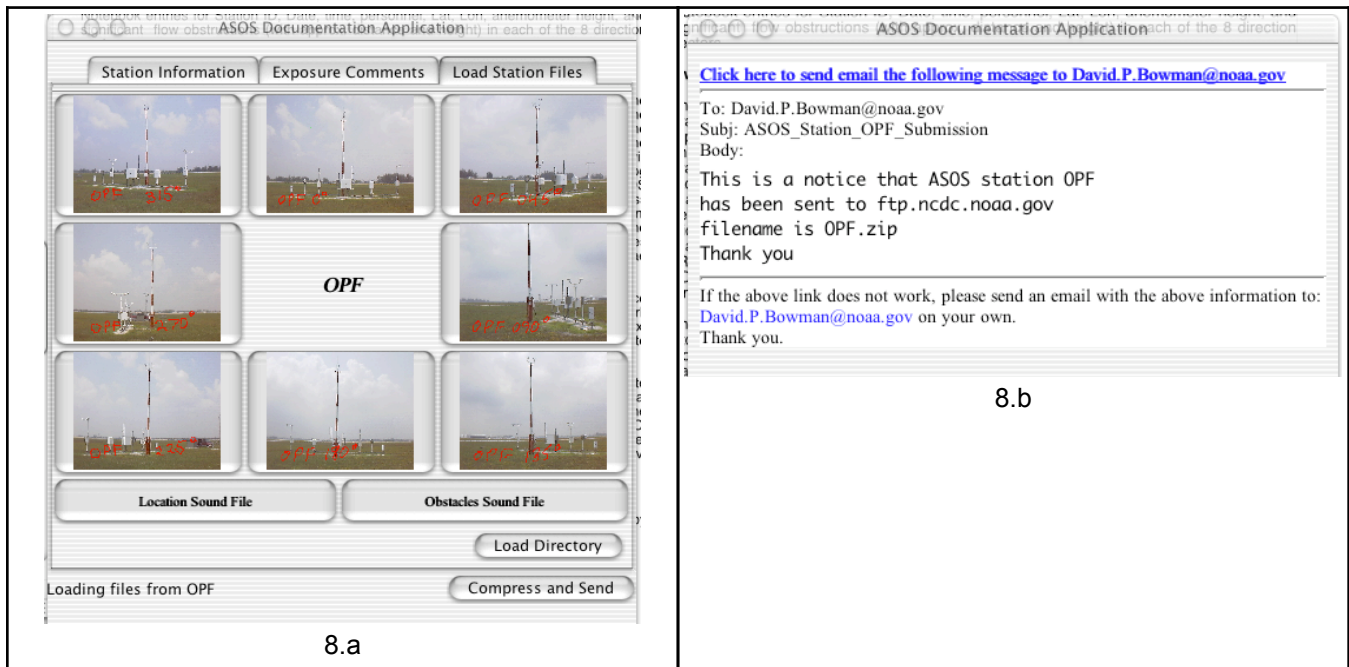


Image 8

- 7) When all of the files have been load either by using the individual buttons or the load directory button, press the "Compress and Send" button. If all of the previous screens are complete and there respective "set" button pressed the "Compress and Send" button will compress the files into a zip file and send it to the NCDC ftp site dicussed

later. First it will check if the previous parts were complete and if not ask you to complete them.

8) After the files have been sent to the NCDC ftp site, a final screen will appear with the email information that is to be sent to David Bowman (see image 8b). Please do so at that time. See below for more information about the email.

9. If you run into problems with the JAVA approach, send the site info directly to NCDC by using anonymous ftp.

**NCDC's ftp site address is:**

**ftp.ncdc.noaa.gov**

**user:** anonymous

**password:** <e-mail address>

**change directory:** cd /pub/upload/

Again after ftp'ing the data, send an email to Dave Bowman:

**David.P.Bowman@ncdc.noaa.gov**

The email should tell Dave that the file has been ftp'd, what the file name is, and what compression routine was used (tar, winzip, pkzip204g, etc.). If the JAVA app. was used the compression routine should be "zip". The email is critical so NCDC knows when to access the ftp server because there is a time limit on the order of a week after which the files will be deleted from the ftp server. NCDC plans to access the server shortly after receiving the email so that if there is a problem, they can work to correct it while its fresh in your mind.