

High Water Mark Training Initiative to Record Flood Elevations

March 18, 2017



North Carolina Emergency Management



High-Water Mark Training

- Benefits of high-water marks
- Setting and documenting marks
- High-water mark field kits
- NC HWM photo submittal phone application



North Carolina Emergency Management



Benefits of a High Water Mark (HWM)

- Are the best resource to document a flood event
- HWM information can be used in a variety of mitigation and planning efforts
- HWM data is perishable and time of the essence



North Carolina Emergency Management



Setting High-Water Marks

- Locate marks
- Flag the marks with durable markers
- Document the flagged marks
- An elevation will need to be determined for the marks later for them to be useful.



North Carolina Emergency Management



Locating Marks

- The need for speed – marks can be highly perishable
- Rain can quickly degrade/destroy marks
- Important to locate and flag ASAP after a flood



North Carolina Emergency Management



Types of Marks

- Mud lines
- Seed Lines
- Debris lines on the ground
- Debris snags in branches



North Carolina Emergency Management



Examples



North Carolina Emergency Management



Mud Lines



North Carolina Emergency Management



Seed Lines



Debris lines on the ground



North Carolina Emergency Management



Debris snags in branches



You Found a HWM

Now What?



North Carolina Emergency Management



Flagging a HWM

- Use a durable marker to note water surface
 - Nail/cap
 - Surveyor's tape
 - Paint mark
 - Wooden stake
 - Chiseled square or line in concrete/rock
- **IMPORTANT** – make sure you get permission of property owners before flagging marks!

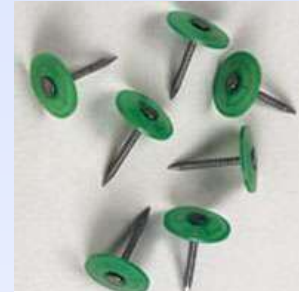


North Carolina Emergency Management



Basic HWM Field Kit

- Nails
- HWM disks, washers, bottle caps
- Wooden stakes
- Paint crayon – spray paint
- Surveying flagging tape – high vis.
- Hammer
- Chisel
- Container – canvas bag, toolbox, bucket with tool pouch
- Easily put together for <\$50



North Carolina Emergency Mana



Marking Examples



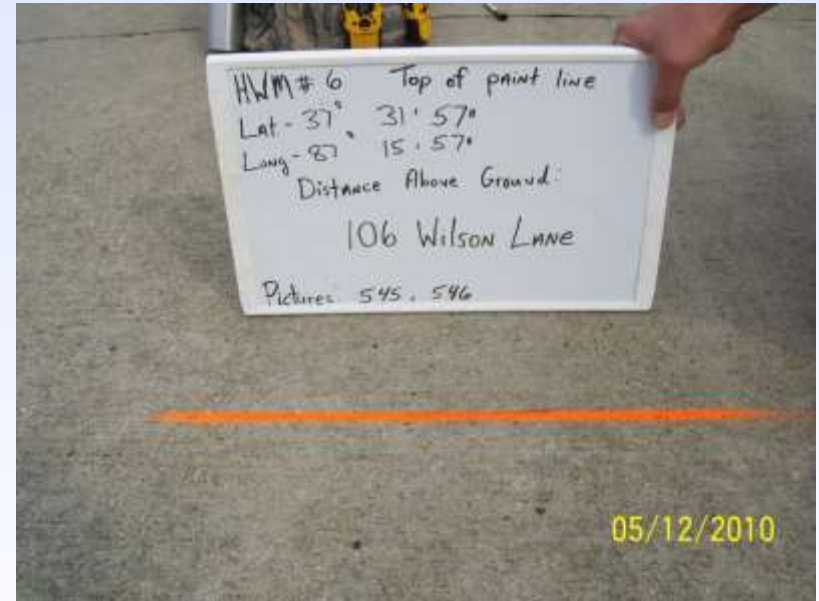


North Carolina Emergency Management





Chiseled square on sidewalk

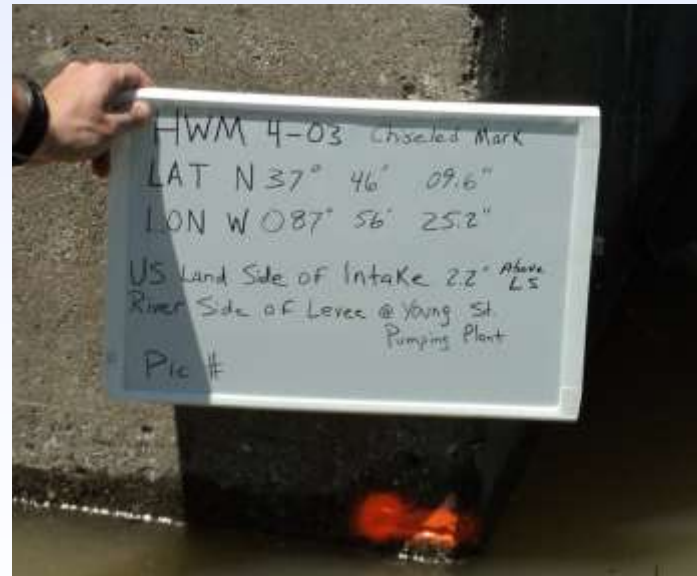


Painted Line on Boat Ramp



North Carolina Emergency Management





Some Tips

- Always look a little higher
 - Make sure you are not:
 - Marking a lower, secondary peak which is common
 - Setting multiple marks can be advantageous, also try to get them on both sides of the channel
 - A HWM should represent the water surface in relatively still water



Look for areas off the main channel, where water would likely be pooled and not piling up due to swift current.

Photo courtesy of Arizona Geologic Hazards Center

If some time has elapsed between flood and a HWM search, look for them in sheltered areas. Note for a mark in a structure, transfer the mark height outside with a leveling device – that way if the owner cleans the structure the mark height is preserved.

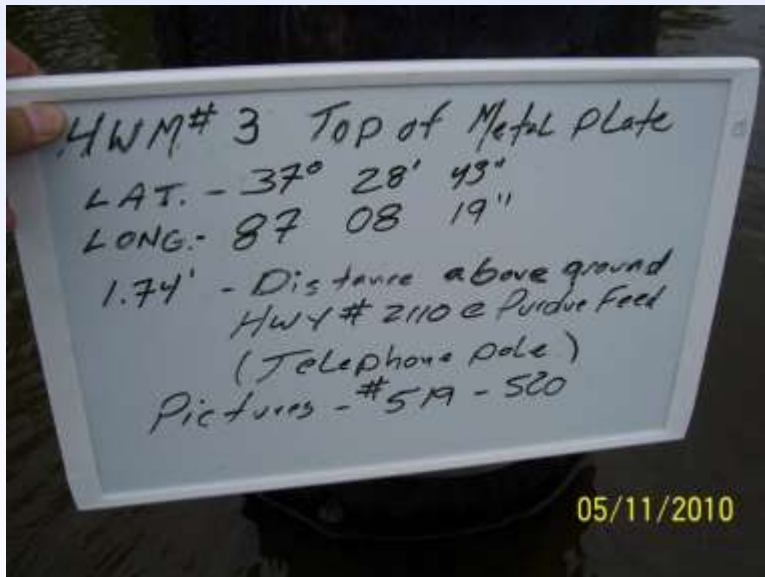


North Carolina Emergency Management



Get at least 2 pictures of each HWMK

- One up close with description visible
- One with background in frame



Be Careful at Boat Ramps



HWM Documentation

- Type of mark – e.g. mud line, seed line
- Location of mark – lat/long, distance from a well defined point
- Type of flagging used e.g. nail through bottle cap
- Quality of the mark
- Miscellaneous important notes
 - Landowner contact info
 - Logistics/safety information
- Noting mark location on a map/site sketch is helpful
- Date stamped digital photo of marks is helpful



North Carolina Emergency Management



High Water Mark (HWM) Photo Application

Hurricane Matthew High Water Mark Location

Please Mark the location of the building or object that exhibits a high water mark from flooding related to Hurricane Matthew. Search for your location by using the buttons provided below, or use the zoom and pan tools to move the map to your exact location. Attach a photo to help surveyors locate the mark.


1. Enter Information

Name of Collector

Photo Type

High Water Mark

Add a note less than 150 Characters if desired

 Take or Attach Photo


Select File

Use your mobile device to take a photo of the high water mark, or attach a photo you've already taken to your location point

2. Select Location

Specify the location for this entry by clicking/tapping the map or by using one of the following options.

Search

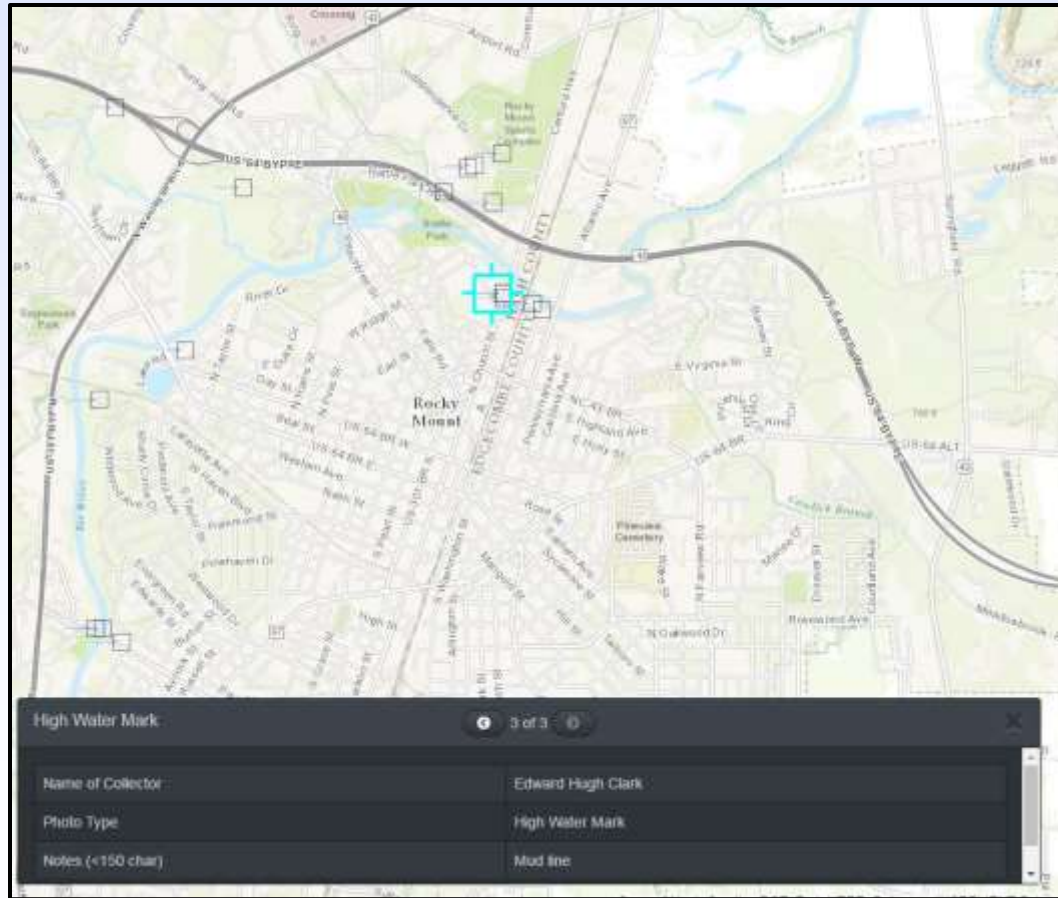
Find address or place 



North Carolina Emergency Management



HWM Web Viewer



North Carolina Emergency Management



HWM Photo



QUESTIONS?



North Carolina Emergency Management

