

“How to” Guide for Setting up Wetland Mesocosms (for manipulating hydrology)

(by Gina Bledsoe and [Ariane Peralta](#), Dept. of Biology, East Carolina University)

SUPPLIES

For field:

- Measuring tape
- Landscaping knife for cutting soil
- Shovels for extracting soil from field
- Plastic bin (dark plastic, 43 cm × 30 cm × 20 cm deep)
 - ◆ Model: 7160HFT-386-234-623
 - ◆ [Hefty Hi-Rise 4.5-Gallon \(18-Quart\) Grey/Green Tote with Latching Lid](#)
[Lowes.com](#)
 - ◆ Lid comes in handy for transporting from the field.

For laboratory:

- Vinyl tubing (¼”), ~12-18” per mesocosm bin
- 1L HDPE square bottle (or larger reservoir) per mesocosm bin
- 20 µm stainless steel mesh (if doing plant/no plant treatment)

PROTOCOL Photo credit (Gina Bledsoe: ginabbledsoe@gmail.com):

To collect field soils

- Cut out soil blocks from the desired field location, cut blocks a few centimeters larger than the dimensions of the container (43 cm × 30 cm × 20 cm deep). The blocks should fit snugly in the container. Use landscaping knives and shovels to cut the block shape and free the soil block. (A frame or cutting guide would be useful here). Next trim the block to fit the container and transfer.
 - Note (consider before starting the experiment): depending on the goal of your experiment, consider leaving the soils blocks (now in the plastic bins) to ‘stabilize’ in lab conditions.
 - Note (consider before collecting mesocosm samples): Airspace in between the container and soil block can be artificially dry, so when sampling, make sure to collect samples toward the center of the mesocosm.

Photo of mesocosms getting transported from field to hoop house.



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Photo of soil mesocosms ‘equilibrating’ before experiment



To manipulate hydrology

- Drill hole for vinyl tubing slightly smaller than $\frac{1}{4}$ ". If the hole is too large it will need to be sealed. (Note: DO NOT do this before collection, the bins will leak.)
- Insert vinyl tubing 3 cm from the bottom of the mesocosm container on each side running along the longer side of the bin.
- Connect vinyl tubing to 1 L HDPE square bottle.
- Maintain water levels of each mesocosm by filling the bottle to target height (see photo)



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To manipulate the presence of vegetation

- Divide mesocosm using root screen (20 μ m stainless steel mesh) - allow plants to grow on one side and carefully remove above and belowground vegetation from ‘no plant’ side



Photo of a greenhouse gas sampling day



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Photo of set up under a covered hoop house.

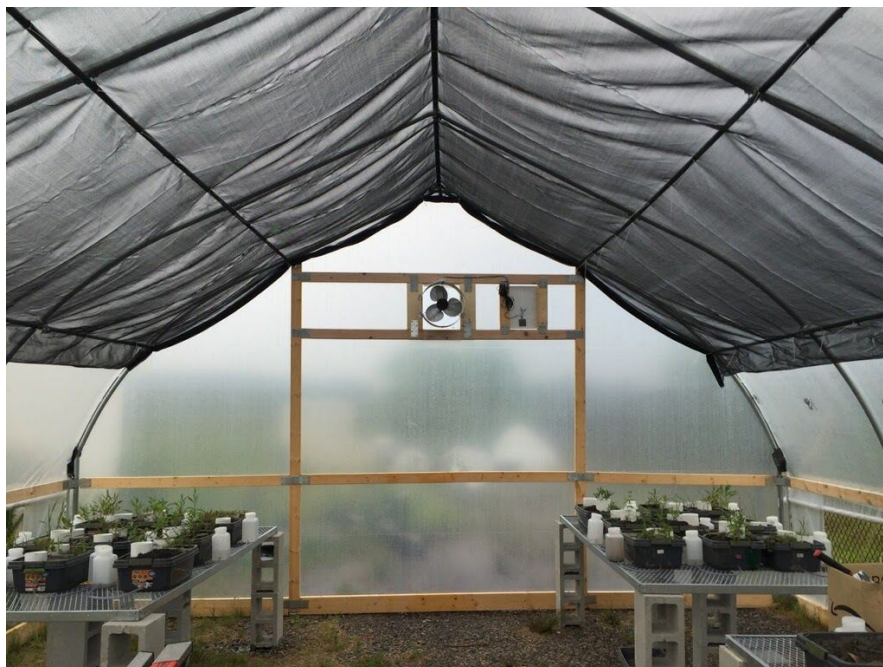
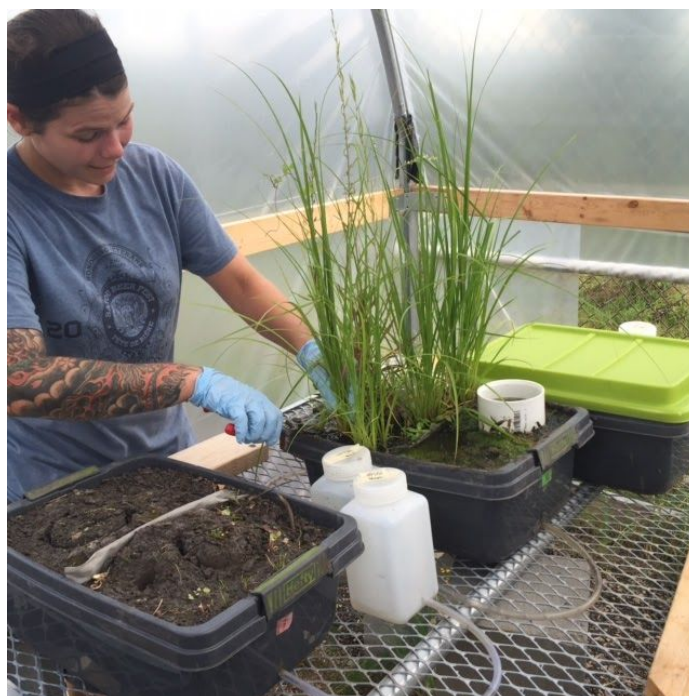


Photo of Gina Bledsoe sampling the mesocosms.



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View of the experiment after 8 weeks!

