## Citizen Lake Monitoring Network

# Do-It-Yourself Staff Gauge Building

Citizen lake level monitoring program with the Wisconsin Department of Natural Resources and the University of Wisconsin - Extension Lakes Program

UW Extension
University of Wisconsin-Extension

WISCONSIN DEPT. OF NATURAL RESOURCES

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# Citizen Lake Level Monitoring Program - Staff Gauge Construction Supplies List

Reference to any particular vendors is for example purposes only; it does not imply endorsement by the Wisconsin Department of Natural Resources or the University of Wisconsin – Extension Lakes Program. Prices are current as of February 2016 and may vary by store.

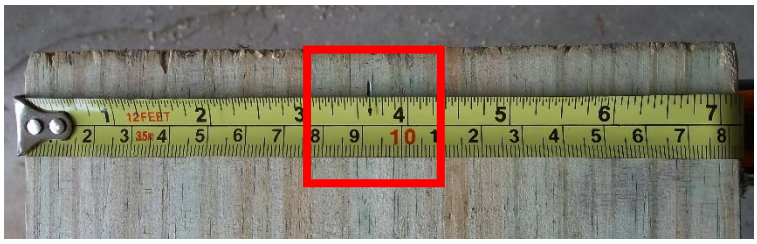
| Item | Purpose | Quantity | Cost | Purchase Location |
|---|---|---|---|---|
| **Staff Gauge** | | | | |
| Style "A" Stream Gauge* - 0-3.33ft | To read water level measurements | 1 | $ 39.95 | Forestry Suppliers |
| **Board**** | | | | |
| Pressure-Treated Pine Board** - 2"x8"x8' | Attach for additional stability | 1 | $7.87 | Hardware Store |
| **Fence Post** | | | | |
| Steel U Channel Post - 8' galvanized steel | Install the gauge in the lake bottom | 1 | $38 | ULINE |
| **Nuts and Bolts***** | | | | |
| '12x1' flathead screws | Attach gauge plate to board | 12 | ~$2 | Hardware Store |
| 4" x 5/16" hex bolt | Attach board to fence post | 2 | <$1/bolt | Hardware Store |
| 5/16" hex nut | Secure hex bolt on fence post | 2 | <$1/nut | Hardware Store |
| 1/4" flat washer | Secure hex bolt on fence post | 2 | <$1/washer | Hardware Store |
| 1/4" lock washer | Secure hex bolt on fence post | 2 | <$1/washer | Hardware Store |
| 2" lag bolt | Indicate '0' marker for stadia rod | 1 | <$1/bolt | Hardware Store |
| **Mini Levels** | | | | |
| Camco 25523 Standard Levels | Level for front of gauge | 1 | ~$3/unit | Hardware Store |
| 6 x 3/4 flat head – Phillips screws | Attach levels to board | 4 | <$1/screw | Hardware Store |

*A Style "A" stream gauge is necessary so that all lake level monitoring projects report in the same units (hundredths of feet).
**Only a 4' board is needed for the gauge. Please seek assistance from hardware store employees about cutting the 8' board down to size.
***All nuts and bolts purchased for building a staff gauge need to be stainless steel.

## Construction Guide

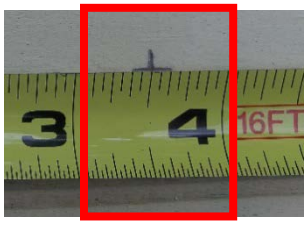
1. Purchase staff gauge building supplies and set up your building station

   Recommended tools for construction:
   - Sawhorses (2)
   - Power Drill
   - 5/16" Drill bit
   - 1/4” Drill Bit
   - Phillips and Phillips-Square Screwdriver Bits
   - Hammer
   - Dog bone wrench or 5/16" ratchet
   - Clamps (2)
   - Staple Gun
   - Tape Measure
   - Pencil or Pen

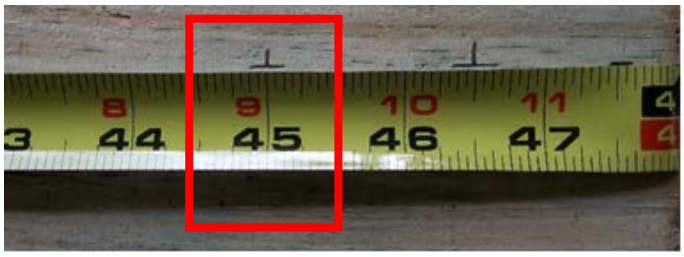


2. Using a tape measure, mark the half way point at both ends of the board. The actual width will be 7.25 inches, so the midway point is 3.625 inches.

3. To ensure that spacing for the bolts matches that of the fence post, there are two options:
   a. If you have the fence post with you, lay the fence post across the board (not pictured) and mark the drill holes in line with where the holes are on the post.
      i. Placement Recommendation: Mark a hole three and a half inches from the top of the board and one and a half inches from the bottom of the board
   b. Lay the tape measure out between the center markings made in Step 2 (see right) and make one marking three and a half inches from the top (at 3.5 inches; bottom left) and another at one and a half inches from the bottom (at 46.5 inches; bottom right)



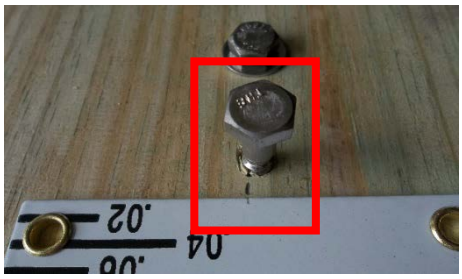
4. A third hole for the lag bolt needs to be marked off at 45 inches (1.5 inches above the bottom marking). This will be used by the surveyors to anchor the stadia rod.




5. Using a 5/16" drill bit, drill two bolt holes (one at 3.5 inches and one at 46.5 inches) and install the following in the top and bottom holes (red arrow):
    a. hex. bolt
    b. hex. nut
    c. flat washer
    d. lock washer

6. Using a 1/4" drill bit, drill one hole at the middle mark (at 45 inches) and install a lag bolt (purple arrow)
    a. Do not screw the lag bolt in all of the way - only screw far enough that it is snug, leaving about one inch protruding from the board. (see right)

7. Center the staff gauge on the wooden board (gauge plate is 4" wide and board is 7.25" wide; red box at right) and place the gauge plate snug against the lag bolt (see below)



8. Use the clamps to hold the gauge plate securely to the wooden board.

9. Use the drill and the Phillips-Square screwdriver bit to secure the gauge plate to the wooden board with the 12x1 screws
    a. Once done, remove the clamps from the board


10. Attach a mini level to the board loosely so it can be tightened level at the time of installation