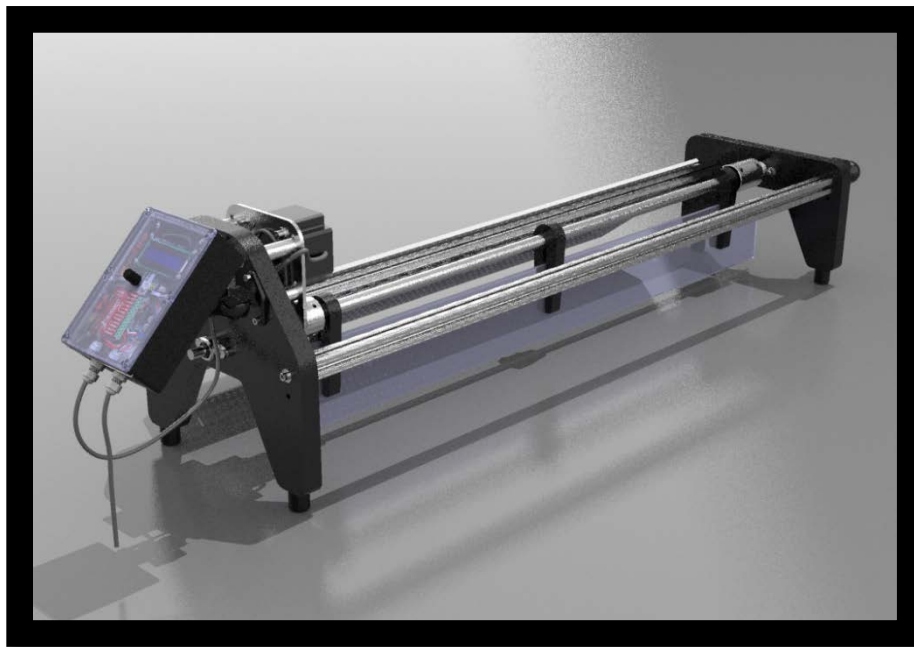


Wavemaker Setup and Use



550 N. University Ave.
Carbondale, Illinois, USA
phone +1.618.529.7423
fax +1.618.529.0927
info@emriver.com
www.emriver.com



Introduction

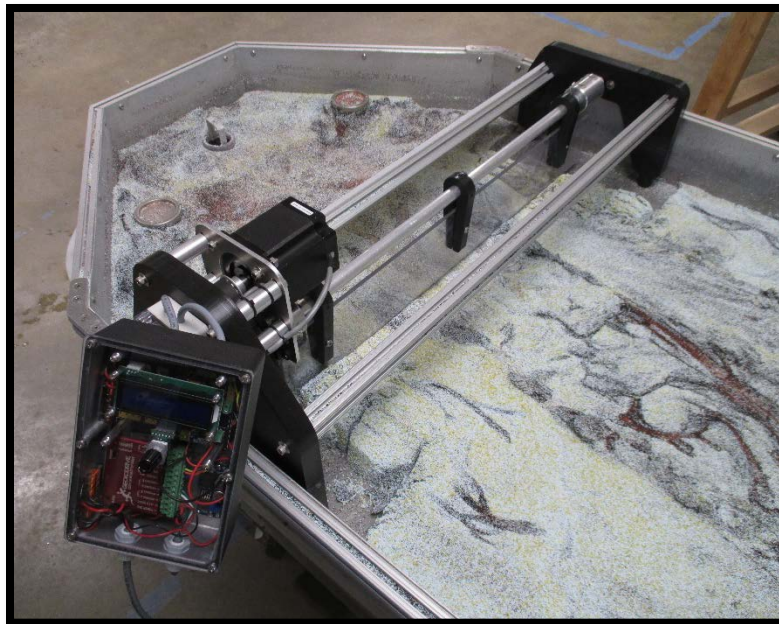
The Emriver wavemaker is designed to fit into your Emriver geomodel. It is shipped assembled, and requires just a few steps for installation. If you have questions during setup, please do not hesitate to call our office at 618-529-7423.

Wavemaker Setup Instructions

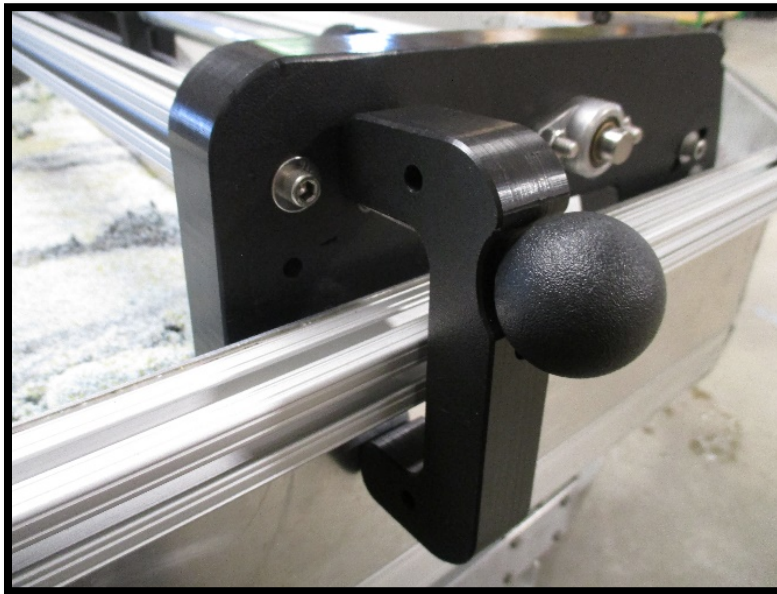
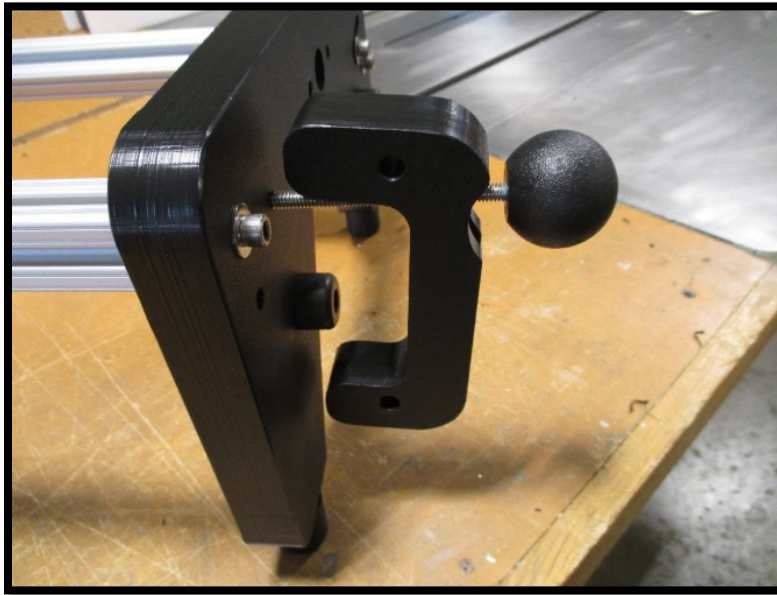
Unwrap the controller and attach it to the RAM mount on the end plate. Loosen the thumb screw on the arm, insert the ball mounts and retighten.



Place the wavemaker in your Emriver table.



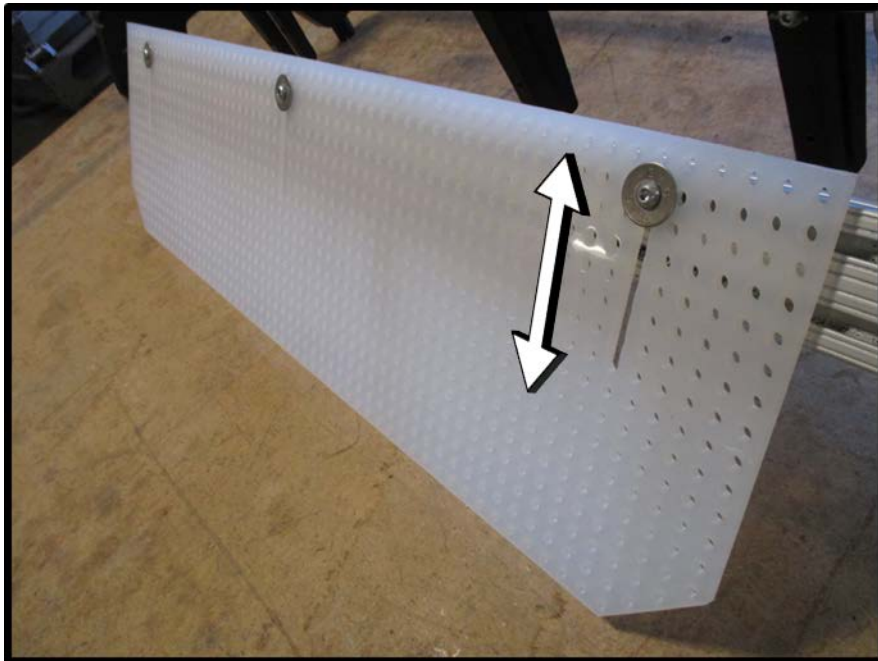
After placing the wavemaker into your Emriver table, secure the end opposite the motor end of the wavemaker to the side rail by inserting the $\frac{1}{4}$ " rod with the black knob through the black plastic clamp into the threaded hole on the end plate.



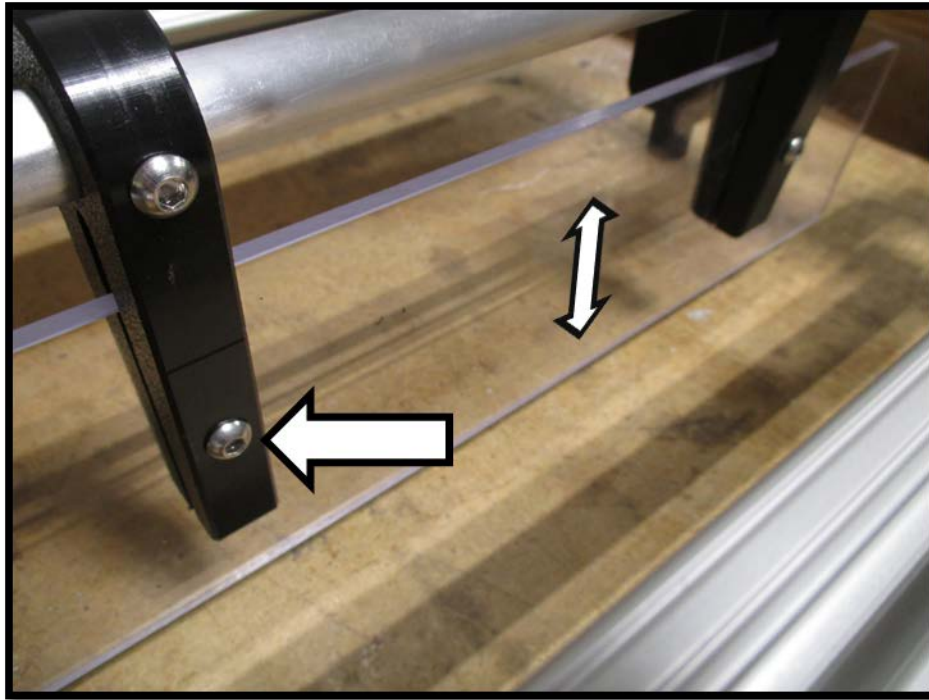
Adjust the angle of the 1"x2" rail by loosening the socket head bolts on both ends with a 3/16" hex driver. Pivot the rail. Start around 45°. Once in position, tighten the bolts. They only need to be snug, do not over tighten.



To extend the baffle, loosen the button cap screws on the rail (just slightly), with a 5/32" hex driver. Slide the perforated baffle down and retighten the screws.



The paddle depth can be adjusted by loosening the lower screws on the black paddle clamps and sliding the clear paddle up or down.



You may wish to experiment with the tilt of your model to maximize the body of water on the downstream end. **NOTE: If you have a static model, you may shim the downstream end to lift it, but do not do this with the model fully loaded with water and media. This could risk personal injury or damage to the box. Make the adjustment with the box mostly empty and dry.**

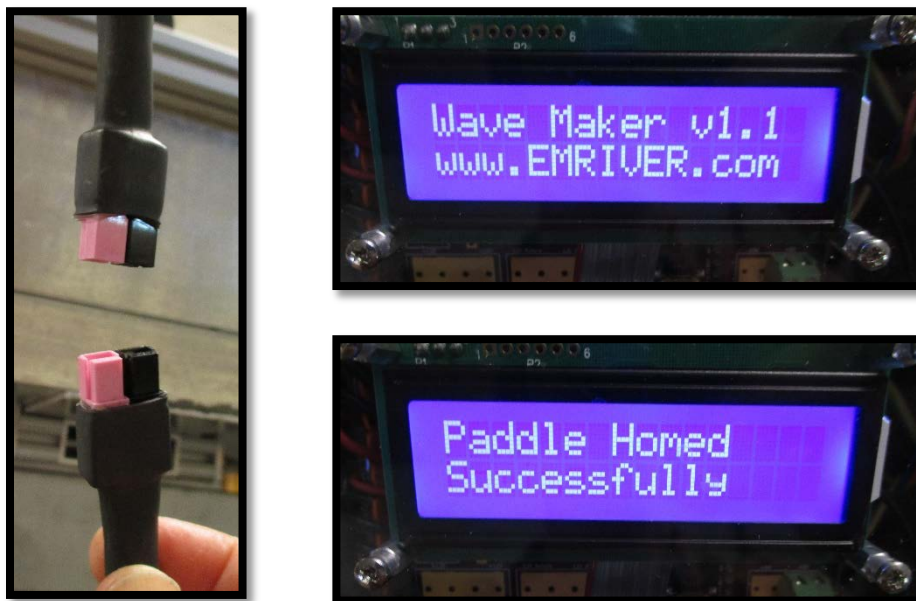
Wavemaker Controller Instructions

The Wavemaker uses a paddle, stepper motor, stepper motor driver, two hall effect sensors, and our K500 PCB to do its work. The operator adjusts settings using an optical encoder (the single black knob), and can view the settings on a 2x16 character display.

The following variables can be adjusted by the user:

- Delay between waves (seconds)
- Wave speed (percent)
- Range of paddle travel (degrees)

Upon being connected to the power supply, the paddle runs a homing routine to make sure everything is working. If the paddle cannot reach the home position, the display outputs error code 0. If error code 0 is displayed, check for any physical obstructions that would prevent the paddle from moving. If there are none, check for any damage to the hall effect sensors or the sensor wiring. Disconnect the power supply and reconnect. See instructions on page 8 for re-homing the paddle manually if necessary.



Make changes and selections using the following:

- Switch between menu screens by rotating the encoder knob.
- Start or stop the wave action by pressing the encoder button on the HOME screen.
- Turn on or off the edit mode on the applicable screens by pressing the encoder button.
- Send a tsunami wave by pressing the encoder button on the tsunami mode screen.

There are five display screens on your controller.

1. Home

The home screen is indicated by the 'HOME' reference, and displays the status of 3 different measurements:

- Top left corner: 0.0 WPM (Waves per minute, at current settings)
- Top right corner: 0W (Total waves sent since last power cycle, max display 999999)
- Bottom left corner: 0.0 DPS (Degrees per second, paddle speed)
- Bottom right corner: / (Animated paddle character, indicates start/stop of wave action)

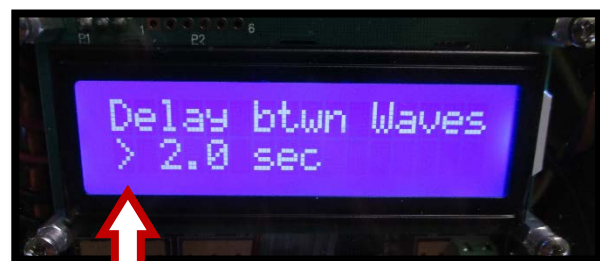
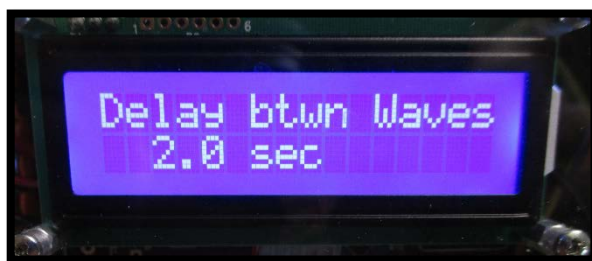
The data displays start at 0 when entering the HOME screen. It updates after the first wave is sent. Pressing the knob will start or stop the wave action while on the HOME screen. You cannot input changes while on this screen.



Indicates paddle
is operating

2. Delay Between Waves

At this screen you can adjust the delay between waves, measured in seconds, by turning the knob.



Indicates you can
input changes

3. Paddle Speed

At this screen you can adjust the travel speed of the paddle as a percentage. The range is from 1 to 100%, with 1 being the slowest possible wave and 100 being the fastest (excluding tsunami mode). The power of the wave in tsunami mode is stronger than any possible setting in the standard operation mode.



4. Travel Range

At this screen you can adjust the range of the paddle's travel in degrees.



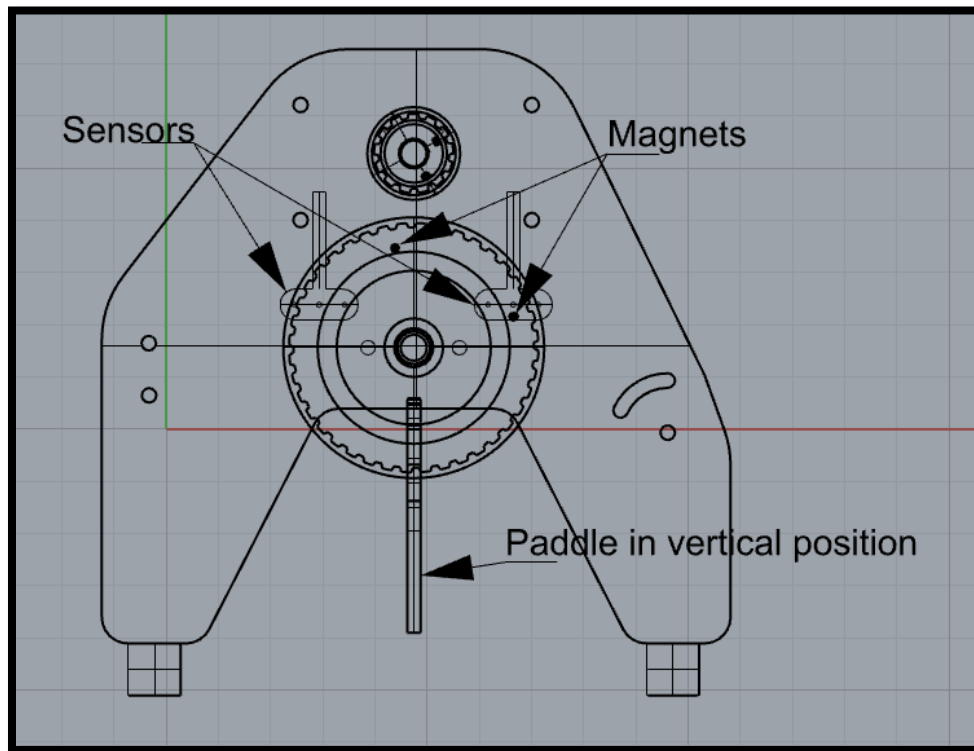
5. Tsunami Mode

In Tsunami mode, pressing the knob will create a single wave at the maximum speed of the stepper motor. No adjustments are made in this mode.



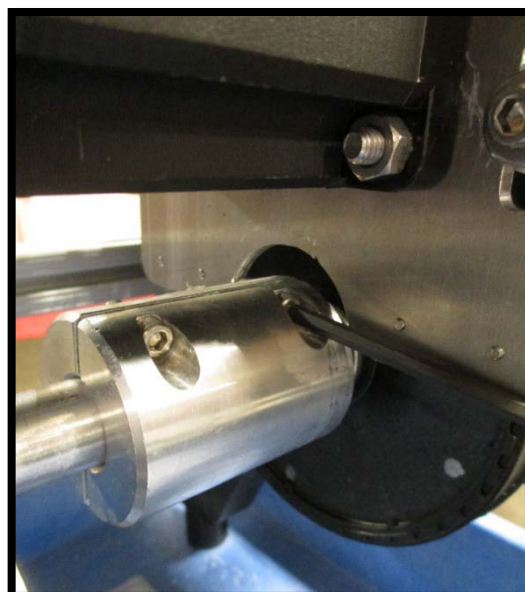
Instructions for Homing the Paddle

If you see a homing error when you start up the controller or if the paddle travels too far and hits one of the aluminum rails, first check to see that the magnets are positioned correctly in relation to the sensors on the aluminum motor plate. If they appear to be properly aligned, unplug the controller and restart.

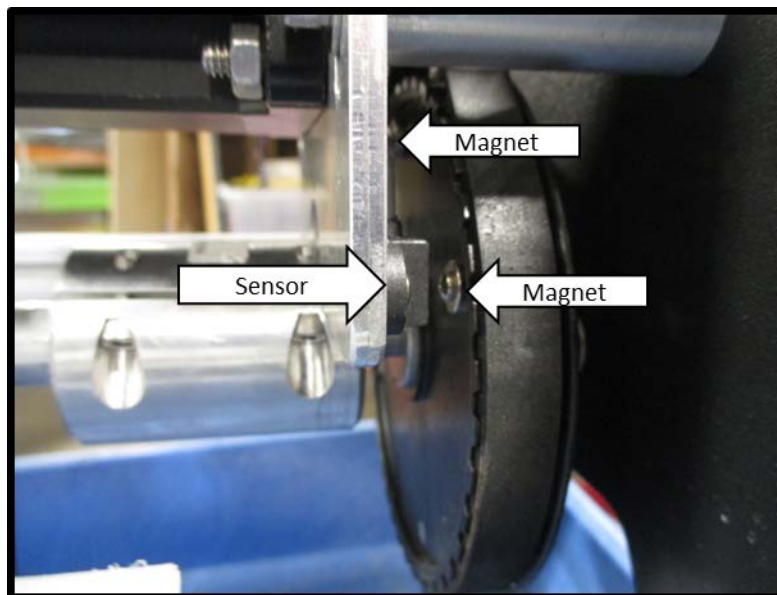
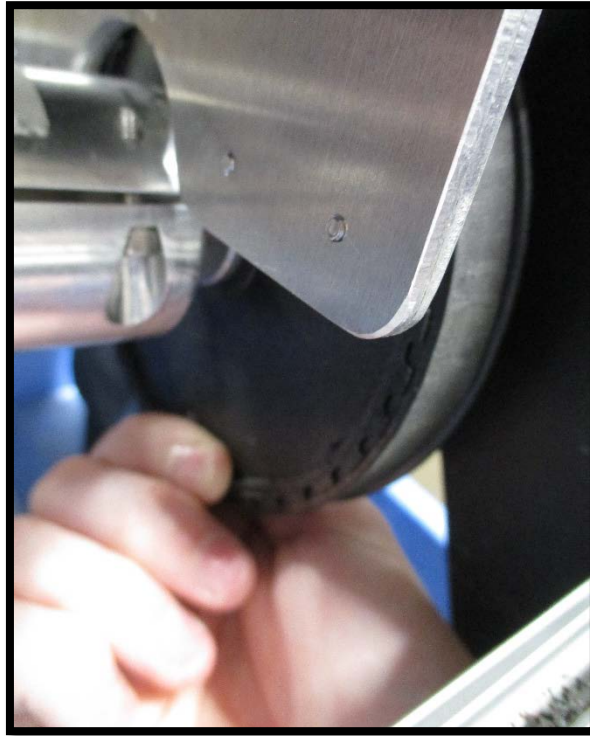


If the sensors and paddle do not appear properly aligned, reposition using the following steps.

1. Loosen the shaft coupling using a 5/32" hex driver.



2. Position the paddle so it's plumb, hanging straight down from the shaft. Turn the timing pulley by hand until the magnet lines up with the sensor as show.



3. Tighten the shaft coupling.

Quick Start Guide

Your Emriver Wavemaker is capable of producing many of the beach forms seen in the real world, including longshore bars and troughs, steps and ripple zones, beach berms and ridges, and terraces. When used with our color-coded media, the wavemaker gives stunning insights into depositional phenomena and stratigraphy.

For best results, place your wavemaker as far downstream in your stream table as possible. In an Em3 or Em4, this will be where the sides of the table start to taper inwards. In an Em2, the perforated baffle of the wavemaker should be 2-3 cm from the standpipe.

Move most of the media to the upstream half of your table, and create a straight or curved channel for a stream. A gently sloping beach face is a good starting point, and there will be considerable media piled up at the upstream end. If you are using the wavemaker in an Em2, remove two 5-gallon buckets of media for best results.

Set the slope of your table to around 1.5 degrees to start. If you have a static base, a 2x4 section of lumber placed on the downstream support works well.

Raise the standpipe to 8-10 cm. Start the pump and begin to fill the table. As the lake and delta begin to form, start the wavemaker on the default settings. Small waves will start to interact with the developing delta right away, and will interact with the stream channel as the water rises. If water starts to splash out of the downstream end of your table, lower the standpipe slightly.

The wavemaker will begin producing beach forms right away, and very complex morphology often takes two hours to fully develop.

Quick Experiments

Raise and lower the standpipe by 4 cm at 15-minute intervals to model a rising and falling tide.

If you have a K500 or Alix controller, run flood hydrographs. If you have a K28 or Crayfish controller, increase the flow every minute for 8 minutes, then decrease the flow over 4 minutes.

Build a barrier island in your model.

Begin with a beach that is diagonal to the wavemaker, or a beach that is very steep on one bank of the stream, and gently sloping on the other. You can also run the wavemaker without a stream at all.

Set up a beach with a narrow entrance to a harbor or back bay that is fed by a stream. What is the best way to protect the entrance?

Use vegetation and riprap or an impervious tide wall to protect the beach on one side of the stream. What happens to the beach on the other side of the stream?

When you are finished, and wish to examine the resulting stratigraphy, turn off the pump and lower the standpipe very gradually to preserve the trough, bar, and ripple patterns. Best results are when the groundwater is allowed to fully drain overnight.