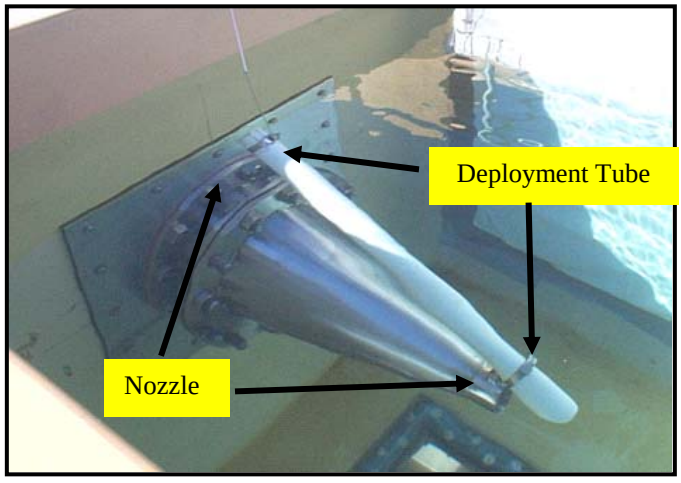
Shear Tank Test Flume

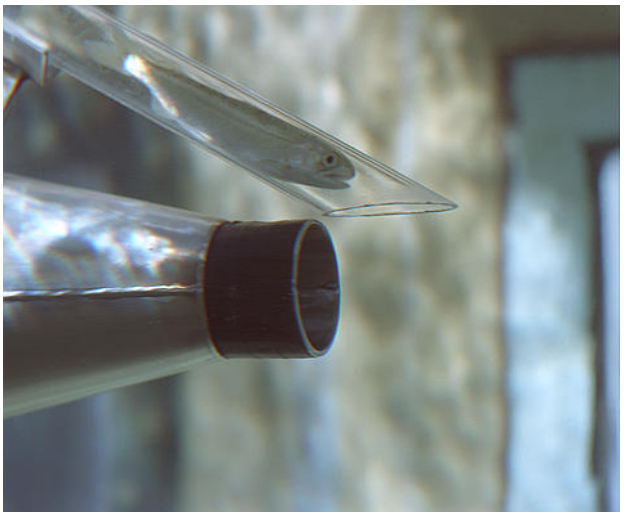
The shear tank test flume (shown in foreground) was designed to get reproducible results and identify the effects (i.e., biological response) of shear environments within hydroelectric turbines.

The rectangular flume is 9 m long x 1.2 m wide x 1.2 m deep. At one end of the flume is a reservoir from which water is pumped through a submerged nozzle to the outflow end of the flume. An electric pump with a programmable drive is used to generate the desired flow condition. A wide variety of nozzles may be attached to the outflow end to produce desired velocities.



Close-up of nozzle and fish deployment tube

High speed cameras are utilized to document fish exposures via viewing ports near the nozzle. Flow field mapping is achieved by means of a computer controlled positioning apparatus incorporating Laser Doppler Velocimeter (LDV) or Acoustic Doppler Velocimeter (ADV) measuring devices. Based on these and related studies, PNNL has provided biological specifications for design of more fish-friendly turbines.



Fish exiting deployment tube