Fish Respirometer/Swim Chambers

PNNL has two respirometry/swim chambers. Each can produce water velocities up to 1.75 m/sec. The working sections of the systems are large enough to exercise most fish, including adult salmon.

Fine-control of temperature and water flow allow researchers to examine oxygen uptake of fishes over a range of swimming speeds at various water temperatures. Information from studies conducted on adult Chinook salmon have been used by managers to determine if mainstem hydroelectric dams increase pre-spawning mortality due to excessive energy used by adult salmon migrating upstream to spawning grounds. One of the respirometers is portable to the field and was used to assess the bioenergetics of juvenile white sturgeon in the Snake River downstream from a load-following dam.

In addition, groups of juvenile salmon have been swum in the respirometers to determine if acoustic transmitters affect swimming performance as compared to untagged groups of fish. This information is being used by the client to make hydropower project relicensing decisions.

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