

## SERVICES

Materials and services provided for projects that use the laboratory:

- ◆ fish food
- ◆ reagents for fish anesthesia and euthanasia, and for parasite baths
- ◆ all tank cleaning and fish feeding
- ◆ fish health surveillance, external microscopic exams and ectoparasite diagnosis
- ◆ facilities and equipment to work up fish at the conclusion of experiments
- ◆ disposal of experimental organisms, contaminated materials, reagents and hazardous materials

Laboratory personnel are available to assist with experimental design and planning when needed. The lab keeps a staff of technicians for daily operations. Given sufficient advance notice, additional skilled student help can be arranged through the Undergraduate Scholars Program at Montana State University.

Laboratory fees are either charged according to a standard tank rental rate or by individual agreement, based on an accounting of specific services required by the project. Please contact the Laboratory Manager or consult the lab website for more details (see Inquiries).

*Fish specimens in glass aquaria.*



## INQUIRIES

The State of Montana is justly proud of the biological integrity of its lakes and streams, and requires a permit for the import of live fish or other biological organisms into the state. The Laboratory Manager can assist investigators with planning transport and procuring a permit to move research organisms into/within Montana.

Inquiries from potential investigators are welcome. Please contact the Laboratory Manager at 406-581-3482, or the Montana Water Center at 406-994-6690. The laboratory website can be found at <http://watercenter.montana.edu/aquaticlab>.



### Montana Water Center

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The Montana Water Center is one of 54 water research institutes in the United States established by a 1964 Act of Congress. Our administrative center is located on the campus of Montana State University, but we also serve the research needs of our affiliated research institutions, the University of Montana and Montana Tech.

January 2007

# Aquatic Sciences Laboratory



*Hosting  
research  
to  
enhance  
the health  
of  
freshwater  
ecosystems*

# Aquatic Sciences Laboratory

## INTRODUCTION TO THE LAB

The Aquatic Sciences Laboratory is a multipurpose research lab operated by the Montana Water Center on the campus of Montana State University - Bozeman. Originally established as the Wild Trout Research Laboratory in the fall of 1996, the facility was designed specifically for research on various aspects of whirling disease. In the fall of 2006, the facility was rededicated as the Aquatic Sciences Laboratory with expanded capabilities and a broader research focus. Lab facilities are available to fishery biologists and other aquatic scientists on a rental basis.



## WHAT'S SPECIAL ABOUT THE AQUATIC SCIENCES LAB?

The lab facility's design, an artifact of its whirling disease research origins, makes it unique among similar research laboratories. As in many facilities, the main tank systems are designed as closed recirculating systems with minimal water discharge, and fitted with sand filtration and UV irradiation units to clean and sterilize the water supply. A unique feature is that wastewater from the research systems, utility sinks, and floor drains is drained into an industrial boiler system, where it can be disinfected prior to release into a septic drain field. Also, the lab is not located near any open water bodies nor connected to the city's sewage system, so the chance of organismal escape or contamination of local water bodies is minimal. The isolation and sterilization capabilities of the Aquatic Sciences Laboratory render it well-suited for research on exotic or invasive aquatic species, as well as on pathogens.

Researchers can conduct studies involving these potentially hazardous organisms without the threat of release into the environment. The lab's capabilities are broad and flexible. Past studies include research on fish biology and restoration, stream passage design, invasive species, fish pathogens, and aquatic invertebrates.

## LAB FACILITIES

Laboratory layout includes a 1500-square-foot main building and an enclosed area behind the building to accommodate outdoor and larger studies. In addition, the lab collaborated with other research facilities on the Montana State University campus to conduct studies that would not otherwise be possible, such as some highly pathogenic fish disease research. The main aquaculture systems are minimum discharge, closed recirculating water systems. Water temperature, dissolved oxygen, pH, conductivity, ammonia and nitrite, and flow are closely monitored and controlled. A water monitoring system continuously observes several parameters, which are downloaded to an on-site lab computer, and will page lab personnel if parameters vary outside their normal boundaries.

The lab has four permanent recirculating research systems. The standard lab system design is a rack of 64 ten-gallon glass aquaria; if desired, these flexibly-designed systems may be fitted with aquaria of larger or smaller volume. Additionally, there is one system of six 140-gallon raceways, for studies on larger fish, or small fish at higher densities, among other research possibilities. With the necessary precautions in place, researchers can conduct work on different species, pathogens, or treatment groups in separate parts of the lab facility.

## PAST RESEARCH

Species that have been housed or researched at our facilities have included: rainbow trout (*Oncorhynchus mykiss*), cutthroat trout species (*Oncorhynchus clarki* spp.), brown trout (*Salmo trutta*), arctic grayling (*Thymallus arcticus*), mountain whitefish (*Prosopium willamsoni*), tubifex worms, New Zealand mudsnails (*Potamopyrgus antipodarum*), bliss rapids snails (*Taylorconcha serpenticola*), the whirling disease parasite (*Myxobolus cerebralis*), and the bacterial coldwater disease (*Flavobacterium psychrophilum*).

System maintenance provided by lab assistant.



Water filtration equipment.



Up to 200 tanks can be served by the system.

Investigators who have used the laboratory have come from:

- ◆ US Fish and Wildlife Service
- ◆ National Park Service
- ◆ Montana Fish, Wildlife and Parks
- ◆ Fish and Wildlife Management Program at Montana State University
- ◆ Montana Cooperative Fishery Research Unit
- ◆ Colorado Division of Wildlife
- ◆ Idaho Department of Fish and Game
- ◆ Utah Division of Wildlife Resources
- ◆ Wyoming Game and Fish Department