

Multipurpose River Hydraulics Research Facility

ABSTRACT

Effective management of water resources is dependent upon a detailed understanding of river systems. As recreational destinations, wildlife habitats, irrigation sources, and leading mediums of power generation, rivers and river systems are integral to ecosystem services and economic development. Gaining insights into effective river management will result in the development of sustainable operational methods which help prevent flooding while promoting fish passage, stream restoration, and aquatic habitat protection.

The **Multipurpose River Hydraulics Research Facility**, designed and proposed by Dr. Arturo Leon and YunJi Choi at Oregon State University (OSU), is scheduled to be built at the O.H. Hinsdale Wave Research Laboratory, with construction beginning summer 2012. The proposed facility will provide a suitable setting to conduct laboratory experiments modeling complex riverine processes in a controlled environment. Funded by the **Research Equipment Reserve Fund** at OSU, the facility has been designed to accommodate two simultaneous and independent experiments. It will advance current knowledge of riverine processes and reveal implications for water resources management.

PEOPLE

- Principal Investigator (PI): Dr. Arturo Leon, Assistant Professor of Civil & Construction Engineering, Oregon State University (OSU)
- Primary Custodian: Dr. William McDougal, O.H. Hinsdale Wave Research Laboratory Director, OSU
- Co-PI: Dr. Desiree Tullos, Biological & Ecological Engineering, OSU
- Co-PI: Dr. Guillermo Giannico, Fisheries and Wildlife, OSU
- Co-PI: Dr. David Hill, Civil & Construction Engineering, OSU

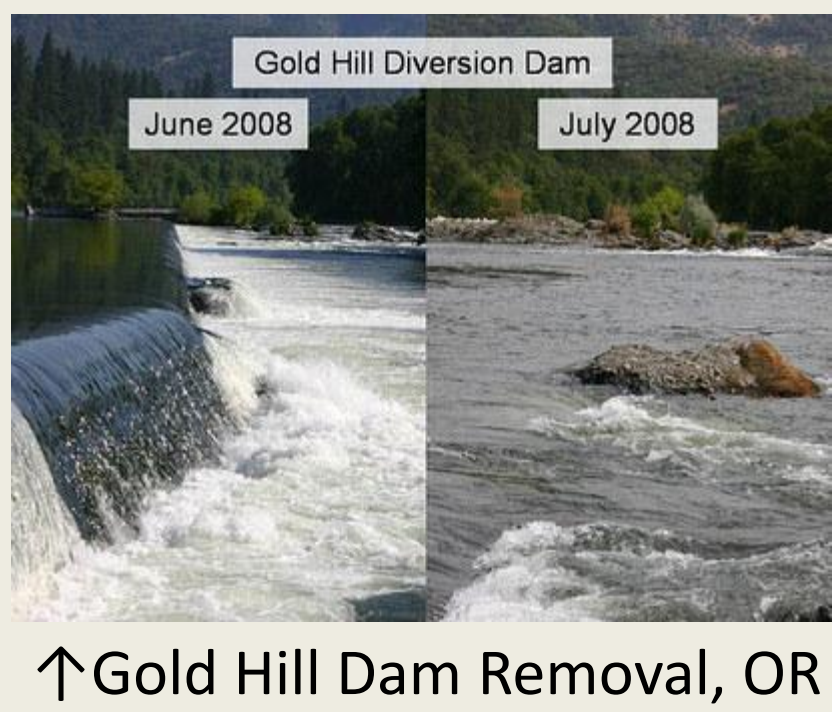
PROJECT LOCATION

The proposed facility is scheduled to be implanted at the O.H. Hinsdale Wave Research Laboratory.



POTENTIAL APPLICATIONS

Dam removal is an active area of research at OSU with several continuing sponsored projects. The proposed facility will allow controllable and repeatable laboratory experiments for a wide array of conditions.



↑ Gold Hill Dam Removal, OR

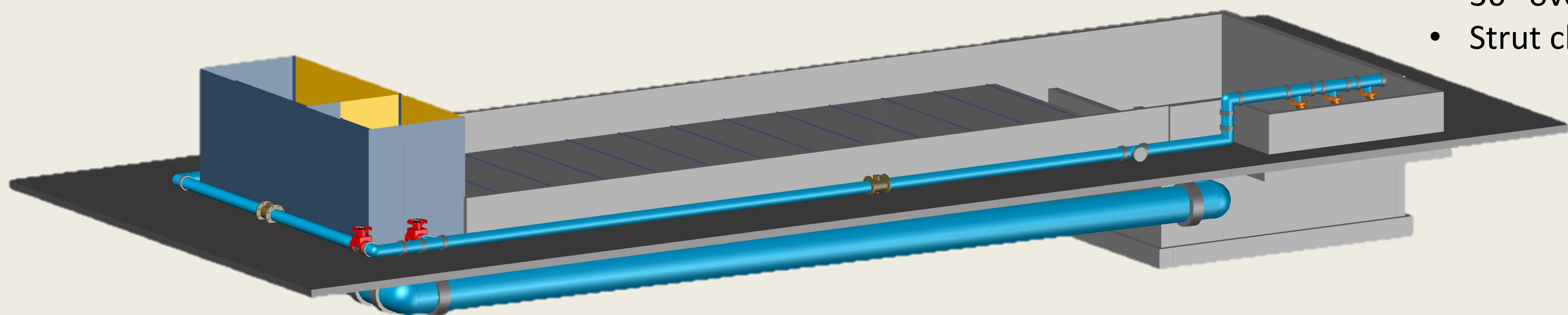
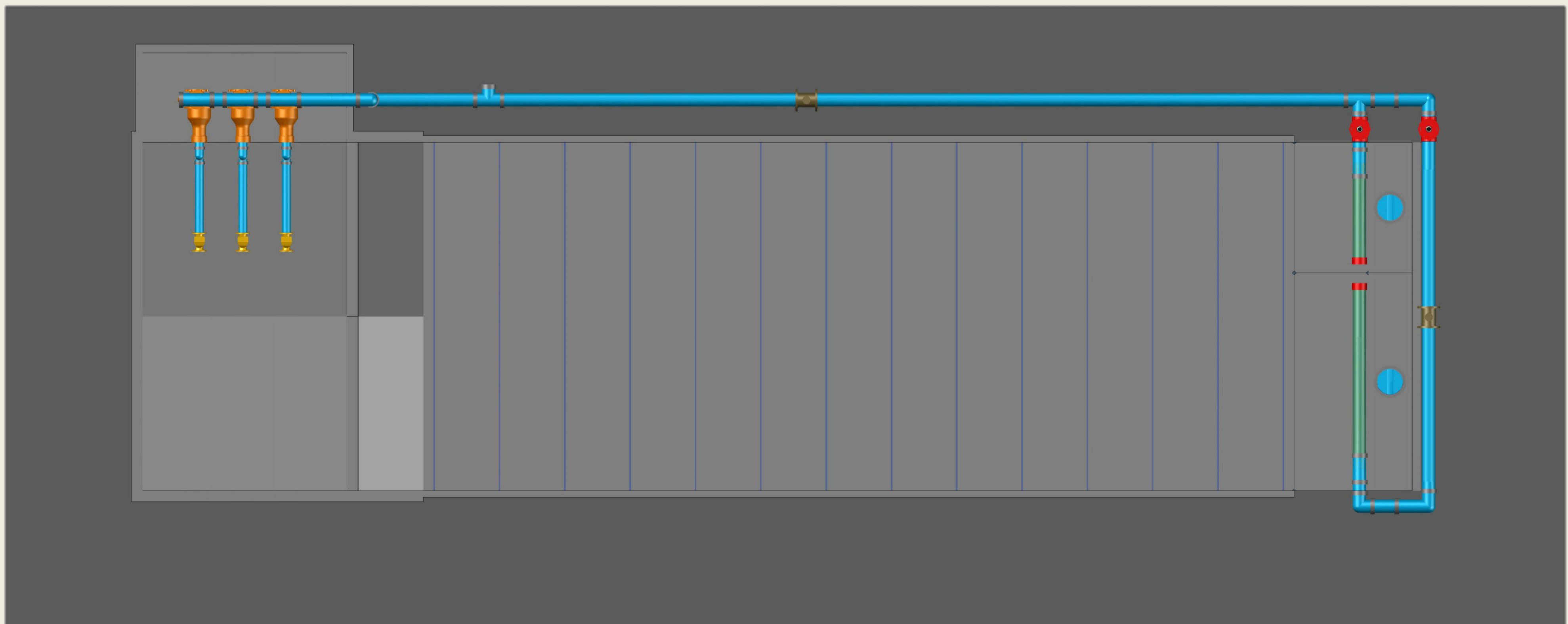
Flood control The need to upgrade flood control strategies has never been more urgent. A facility such as the proposed one will allow to test innovative strategies for flood control.

River restoration The proposed facility will assist in the design of future gravel augmentation and channel-floodplain reconstruction projects.



↑ Meander bend on Willamette River, Oregon, USA.

PROPOSED FACILITY



The **Multipurpose River Hydraulics Research Facility** is planned to be implemented over a phased construction schedule. During the first phase of the construction, the most essential components of the facility will be built. This will provide the minimum capacity to run experiments. During the second phase of the construction, the rest of the design features of the facility will be implemented. The second phase will start once the scheduled initial experiments have been completed.

Phase I

- Clean water sump: 15'9"L x 26'3"W x 10'10"D
- Sediment catchment: 4'11"L x 26'3"W x 10'10"D
- Concrete slab: 65'7"L x 26'3"W
- Head tank with moveable walls and weirs
- 12" impulsion UPVC pipe
- 36" overflow PVC pipe installed below group
- Strut channel at 4'9" spacing

Phase II

- Overall Dimension: 117'10"L x 47'W
- Clean water sump: 15'9"L x 26'3"W x 10'10"D
- Sediment catchment: 4'11"L x 26'3"W x 10'10"D
- Concrete slab: 65'7"L x 26'3"W
- Head tank with moveable walls and weirs
- 12" impulsion UPVC pipe
- 36" overflow PVC pipe installed below group
- Strut channel at 4'9" spacing
- 3 x 25 HP centrifugal pumps
- 2 x 12" magnetic flow meter
- 2 x 12" Valves
- 2 x 8" Check valves