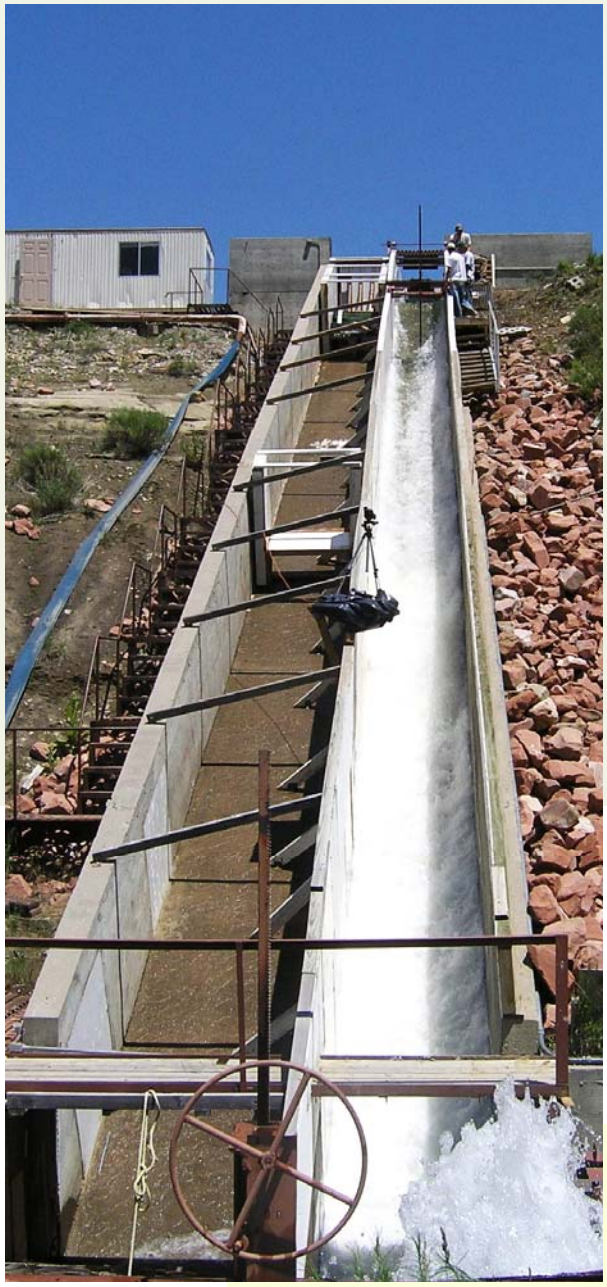


10-ft outdoor flume configured to a 4-ft channel width conveying 86 cfs with a corresponding overtopping depth of 3 ft.

HYDRAULICS LABORATORY FACULTY AND STAFF

Dr. Steven R. Abt, PE
Professor of Civil Engineering
sabt@engr.colostate.edu
Hydraulic Research

Dr. Brian P. Bledsoe, PE
Assistant Professor
bbledsoe@engr.colostate.edu
Environmental Hydraulic Research

Tom Brisbane
Research Associate
brisbane@engr.colostate.edu
Closed Conduit Flow, Instrumentation

Amanda L. Cox
Research Associate
amandal@engr.colostate.edu
Hydraulics, Physical Modeling, River Mechanics

Gloria Garza
Research Coordinator
ggarza@engr.colostate.edu
Webpage Development, Project Administration

Dr. Pierre Y. Julien
Professor of Civil Engineering
Pierre@engr.colostate.edu
River Mechanics, Erosion and Sedimentation

Michael D. Robeson, PE
Research Associate
Manager, Hydraulics Laboratory
mrobeson@engr.colostate.edu
Hydraulic Research, Performance Testing

Dr. Christopher I. Thornton, PE
Assistant Professor
Director, Engineering Research Center
Director, Hydraulics Laboratory
thornton@engr.colostate.edu
Hydraulics, River Mechanics, Erosion and Sedimentation

Dr. Chester C. Watson, PE
Professor of Civil Engineering
cwatson@engr.colostate.edu
Fluvial Geomorphology

CONTACT

Dr. Christopher I. Thornton, PE
Daryl B. Simons Building *at the*
Engineering Research Center
1320 Campus Delivery
Colorado State University
Fort Collins, CO 80523
thornton@engr.colostate.edu
Phone (970) 491-8394 Fax (970) 491-8671

OVERTOPPING PERFORMANCE TESTING

Overtopping Performance Testing

Colorado State University (CSU) has four Overtopping Facilities which are part of a unique research center designed for hydraulic model studies, testing and calibration in the fields of open channel and closed conduit hydraulics.

The overtopping facilities at the Engineering Research Center provide a wide range of sizes and capacities to meet any project need (Table 1). Two of the overtopping facilities, the 10-ft and the 6-ft mild, are located outdoors; while the 6-ft steep and 4-ft are located indoors.

Outdoor facilities are supplied with water from Horsetooth Reservoir by a 36-inch diameter pipeline. Average static head to the system throughout the year is approximately 200 feet. Reservoir water quality has a very low turbidity and a water temperature ranging from 40 to 55 degrees Fahrenheit.

Indoor facilities are supplied by individual pumps in conjunction with a one acre-ft sump located beneath the laboratory floor. The ability to test year around is the inherent benefit of indoor facilities

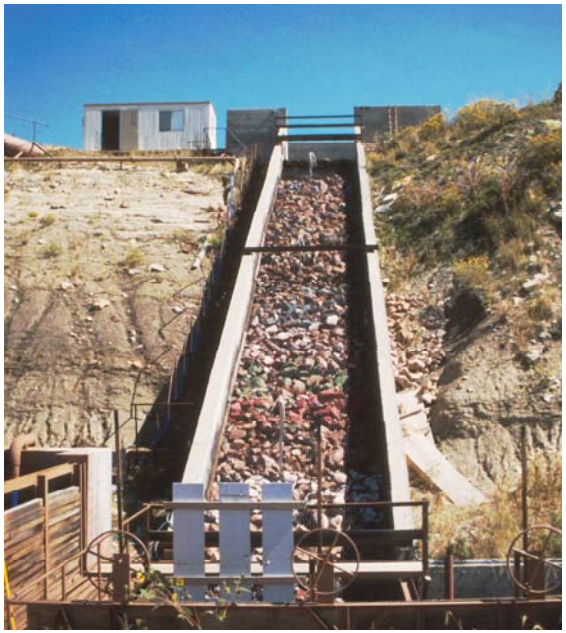
Table 1: ERC Overtopping Facilities

	Facility			
	4-ft	**6-ft Mild**	**6-ft Steep**	**10-ft**
Width (ft)	Up to 4.0	Up to 6.3	Up to 6.0	Up to 10
Length (ft)	30	75	40	120
Slope (%)	Up to 50%	13%	Up to 22%	50%
Maximum Discharge (cfs)	22	160	55	170
Overtopping Depth (ft)	Up to 2	Up to 6	Up to 3	Up to 6
Embankment Height (ft)	Up to 15	Up to 9	Up to 8	Up to 60

*Not all combinations of configurations are possible.

Common overtopping studies performed at the Hydraulics Laboratory include:

- Embankment Erosion Protection
  - Articulated Concrete Blocks (ACB)
  - Synthetic Groundcover
  - Vegetative Systems
  - Pour-in-place Systems
  - Riprap and Culvert Protection
  - Rolled Erosion Control Products
- Spillway Examination
- Performance under Hydraulic Jump Conditions
- Dam Foundation Erosion
- Energy Dissipation Techniques



Articulated Concrete Block Testing Procedures

ACB testing facilities and procedures conform to current testing standards as follows:

- Specify and classify soil type
  - Grain size distribution (mechanical)
  - Grain size distribution (hydrometer)
  - Standard proctor analysis
  - Atterberg limits
- Construct embankment
- Test embankment for compaction specifications
- Install protection scheme
- Prepare for testing
- Test protection scheme
  - Each test includes a potential 1-foot, 2-foot, 3-foot, and 4-foot overtopping depth.
  - Each potential overtopping depth includes 4 hours of continuous testing with data collected each hour
  - Bed and water surface elevations along with one-dimensional velocities are collected for each hour
- Tabulate data for a data report

Each ACB system is tested until it exceeds the performance threshold or the discharge capacity of the facility.