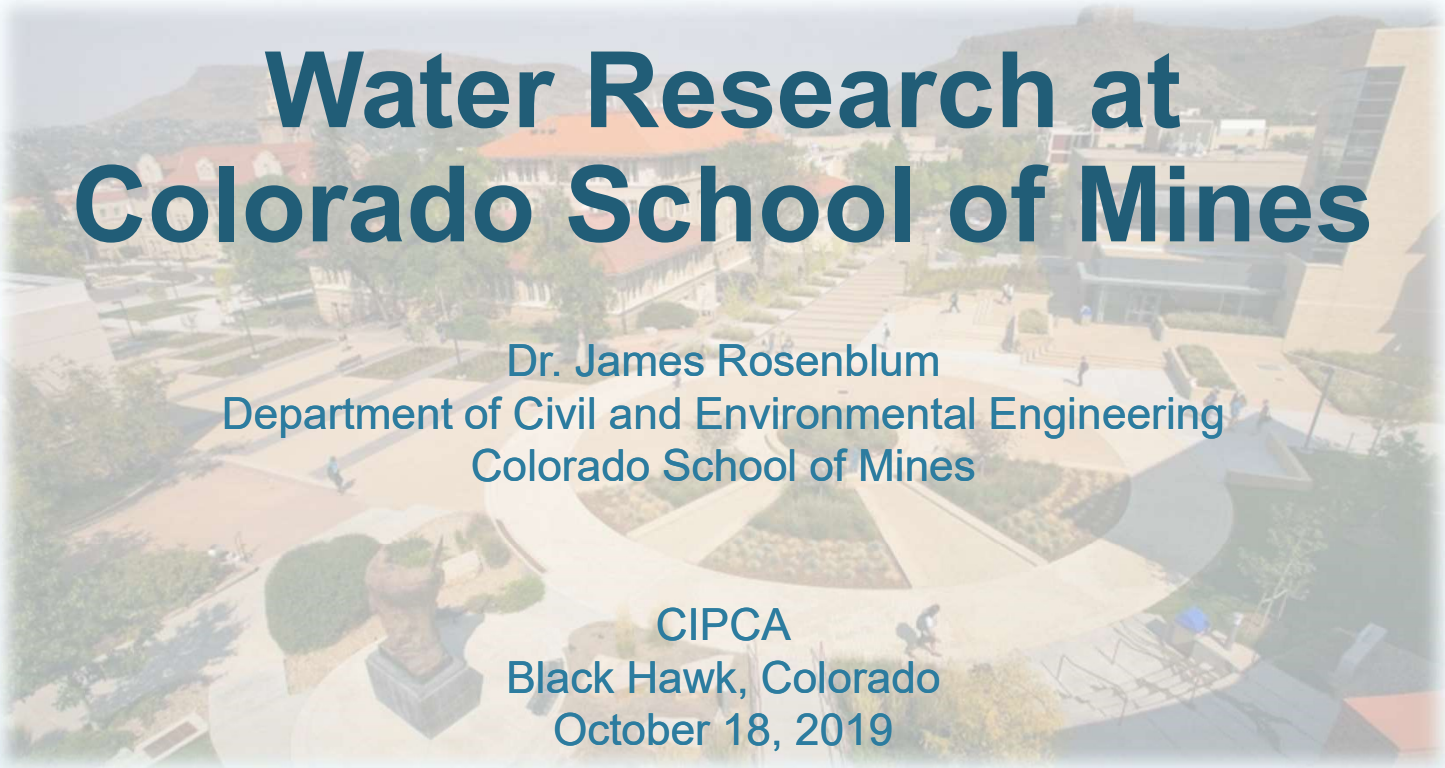
Water Research at Colorado School of Mines



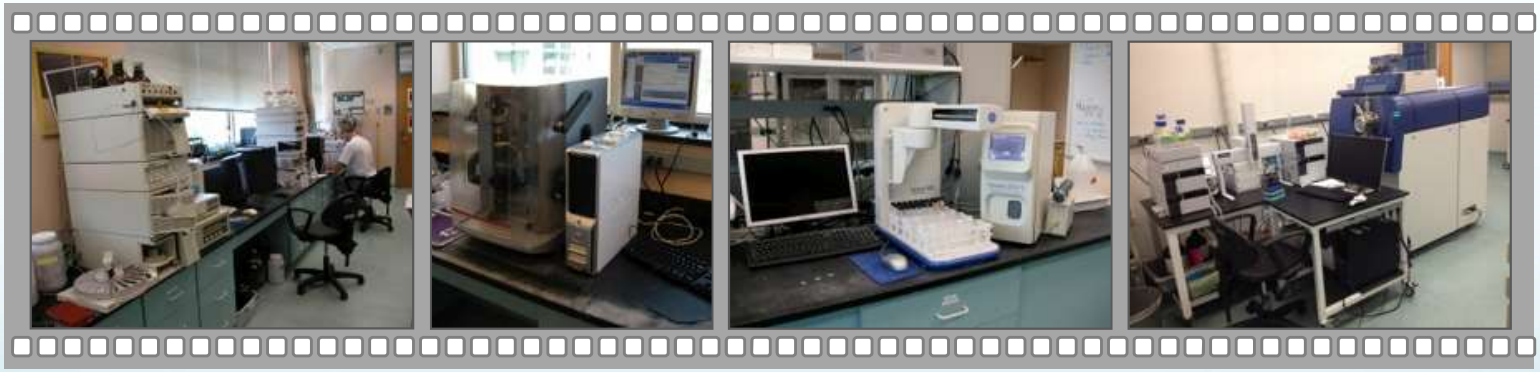
Dr. James Rosenblum
Department of Civil and Environmental Engineering
Colorado School of Mines

CIPCA
Black Hawk, Colorado
October 18, 2019

Water Research and Centers @ Mines

- Center for Experimental Study of Subsurface Environmental Processes
- Integrated Groundwater Modeling Center
- Advanced Water Technology Center
- ERC for Reinventing the Nations Urban Water Infrastructure
- The Colorado Center for Sustainable Water-Energy Education, Science, Technology

Facilities: State of the Art Water Quality Analysis Laboratory



Facilities: On Campus Laboratory-Scale & Pilot-Scale Research Lab

Facilities: Pilot Water Treatment Plant City of Golden

Demo Facilities: An Onsite Wastewater Treatment Testbed

A Testbed at Mines Park
Water Reclamation Research Facility

The Testbed at Mines Park Water Reclamation Research Facility

Sustainable landscape irrigation

Point-of-entry treatment

Pathogen mitigation strategies

Hyporheic zone management through (BEST)

Bioaccumulation of CECs in food crops

Energy efficient wastewater treatment

Osmotic MBR to support DPR

Mines New Research Facility in Denver: Industrial Wastewater Treatment Research

A New Testbed Facility @ Mines: The WE²ST – Water Technology Hub

- In 2016, NGL−EP terminated operation at the research facility
- NGL−EP offered to donate the equipment to Mines
- Mines offered to take over the entire facility and turn it into a regional/national water research center
- Zoma Foundation
  - $1.5 million donation

The Motivation

- Establish a center for the development of innovative industrial water/wastewater treatment technologies and solutions
- Support/collaborate with established industries, startups, and with other universities
- Cross-Scale Water treatment technologies development
  - Bench- to Demo-Scale
- Centrally located in NE Denver
  - Gives Mines a much-needed presence in the Denver area

Location (6756 E 47th Ave. Dr., Denver, CO 80216 (20 miles))

Inaugural Research at the WE²ST – Water Technology Hub

- DOE, Solar Energy Technologies Office
  - Energy where it matters: Delivering heat to the membrane/water interface for enhanced thermal desalination (collaborative effort led by UCLA)
- DOE, NREL
  - Demonstration of prototype membrane characterization system using hydrokinetic energy simulator
- ZOMA Foundation
  - Advanced biological pre-treatment of produced water for sustainable desalination and reuse
- DOD, ESTCP
  - Comparing media adsorption for treatment of PFOS- contaminated groundwater
- DOI, Bureau of Reclamation
  - Autonomous Solar Desalination

Session Presentations

- Emerging contaminants: PFAS treatment – Conner Murray
- Treatment of O&G produced water – Brett Van Houghton
- Data-driven process monitoring and control – Kate Newhart
- Open discussion