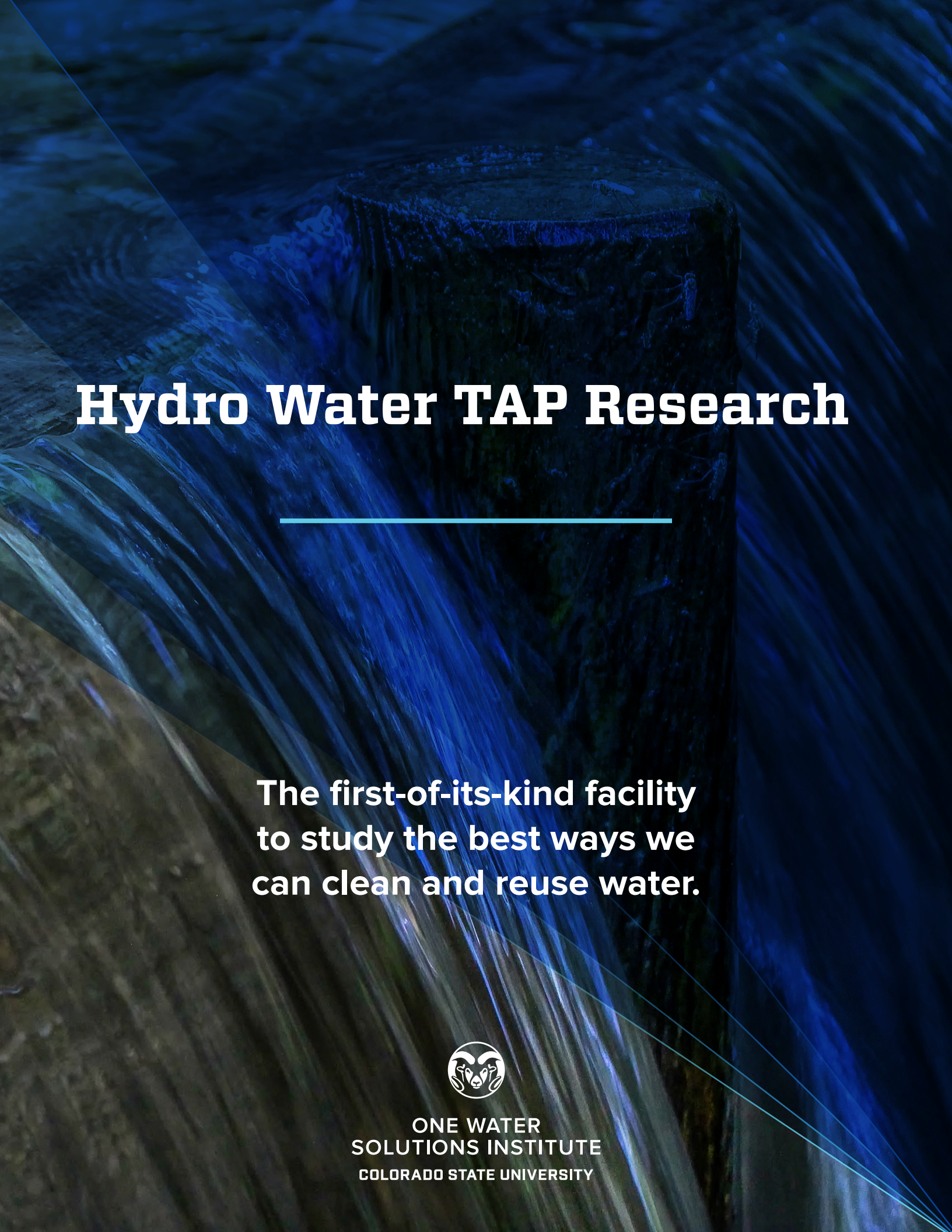


Hydro Water TAP Research

The first-of-its-kind facility to study the best ways we can clean and reuse water.

ONE WATER
SOLUTIONS INSTITUTE
COLORADO STATE UNIVERSITY

Program and Research Focus Areas

Graywater Research

We use and reuse water for many things. There are different standards for water quality based on how the water will ultimately be used. Drinking water, for example, needs to be much cleaner than the water used to flush our toilets. We call this concept “fit-for-purpose use,” where the water is safe for the intended end use, but not over-treated.

- Fit-for-purpose graywater use
  - Toilet flushing
  - Outdoor irrigation

Stormwater & Green Infrastructure Research

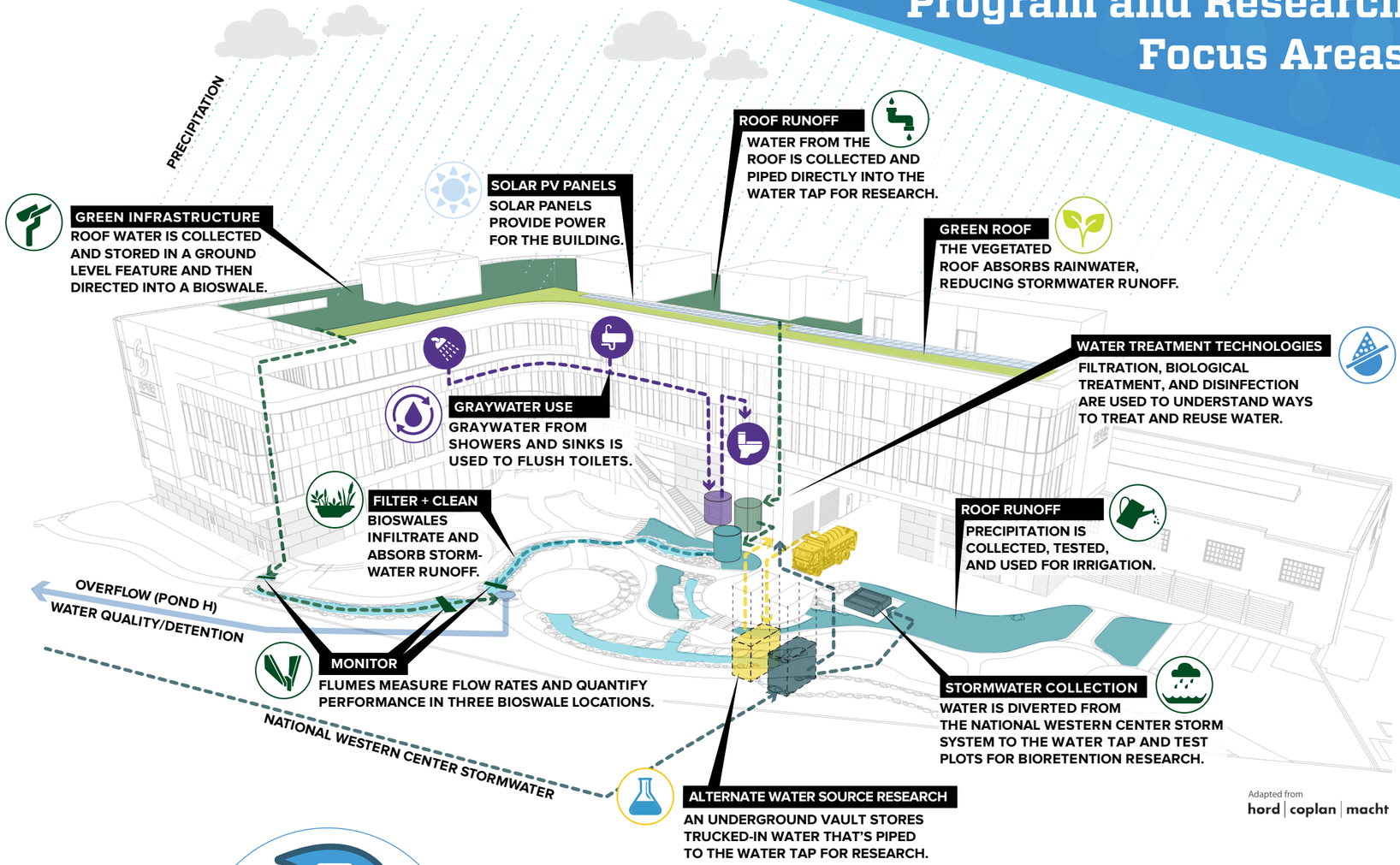
Stormwater is rain or melted snow that runs off streets, lawns and other surfaces. Green infrastructure filters and absorbs stormwater where it falls and includes a range of practices to reduce stormwater flows to sewer systems and/or surface waters such as rivers, lakes, and streams.

- Roof runoff can be collected for beneficial uses such as irrigation or toilet flushing.
- Bioswales filter and clean stormwater runoff.
- Rain gardens are depressions designed to collect rainfall from downspouts, allowing the water to naturally soak into the ground or be directed onto landscaped areas.
- Bioretention basins are landscaping features that remove contaminants from stormwater before it is infiltrated or discharged.
- A green roof is a vegetated surface that absorbs rainwater, reducing stormwater runoff. With proper treatment recycled graywater or harvested rainwater can also be used to irrigate food crops. Visit the Terra Building to see a green roof in action!

Water Treatment Technologies

Experts at the Water TAP explore technologies like filtration, biological treatment, and disinfection to understand new and better ways to treat and reuse water. These experiments also help policymakers determine actions to put into place for reusing and conserving water.

- Membrane filtration is used in water treatment to separate contaminants from water based on properties such as size or charge. Common membrane processes include microfiltration, ultrafiltration, nanofiltration, reverse osmosis, and electrodialysis.
- Biological treatment is a natural process in which living micro-organisms such as bacteria and algae clean water by decomposing organic waste.
- Plant-based systems filter and clean water as it is absorbed back into the natural system (i.e., green infrastructure).
- Ultraviolet (UV) treatment can remove microorganisms such as viruses, bacteria, and protozoa using UV light.



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Water Sources

- Stormwater
- Graywater
- River water
- Rainwater
- Treated wastewater

About the Water TAP

The first of its kind, this cutting-edge facility is a platform for testing new water treatment technologies on different water sources to study the best ways we can clean and reuse water.

In this lab, researchers test different water sources such as rain runoff from rooftops and graywater from showers and sinks, with a variety of advanced water treatment technologies. Filtration, biological treatment, and disinfection are used to understand new and better ways to treat and reuse water.

About the One Water Solutions Institute

Mazdak Arabi
Director, One Water Solutions Institute
Professor, Colorado State University

The One Water Solutions Institute (OWSI), directed by Mazdak Arabi at Colorado State University, provides world-class research and innovative technologies to promote collaboration between the University and outside partners such as local governments, utilities, private sector/industry members and non-profit organizations.

OWSI conducts a variety of research and service projects to help communities transition to more sustainable water resource management practices. The Institute also provides training and certification opportunities as well as educates and mentors graduate students pursuing careers in water sustainability and linked systems.

The Hydro Water Technology Acceleration Platform (Water TAP), is managed by Sybil Sharvelle. She has over 20-years of research experience on water reuse, integrated urban water management and waste conversion to energy.

Sybil Sharvelle
Lead Scientist, Hydro Water TAP
Professor, Colorado State University

Water TAP Research Areas

Membrane Distillation

Stormwater Management and Control

Biological Treatment Systems

Graywater Treatment and Reuse

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