Where we (mostly) work
Runoff
Overflows
Erosion
have
have

want
have → do → want
10 sq mi
Pond

10 sq mi
Pond

Bioswale

10 sq mi
Pond

Bioswale

10 sq mi
Pond

Bioswale
10 sq mi

Pond

Bioswale
Comparison of water level, erosion, etc., at Site 1 and Site 2 before and after construction:

- **Site 1**:
  - Pre-construction: Higher water levels and erosion
  - Post-construction: Lower water levels and erosion

- **Site 2**:
  - Pre-construction: Constant water levels and erosion
  - Post-construction: Lower water levels and erosion

The graph shows a significant improvement in water management and erosion control post-construction.
Site 1

Site 2

Water level, erosion, etc.

Time

Better

Pre-construction

Post-construction

Better

D
Water level, erosion, etc.

Site 1
Better

Site 2
Better

Downstream

Time

Pre-construction
Post-construction
Site 1
Site 2
Downstream

Water level, erosion, etc.

Better
Better
Worse?

Time

Pre-construction
Post-construction
have → do → measure → want
have → do → measure → want

adapt
Multiuse flow management using real-time data

Is it possible to manage flow to stay within the natural range of variation?
High-resolution data

Kensington

Depth (Feet)

Flow (CFS)
Automatically trigger remote samplers as water levels change.
Sensors **instantly** report the water level at streams and road crossings.
If flooding is detected, an **automatic alert** is sent immediately.
Neighborhood 1

Neighborhood 2

Downstream point

Water level

Time

Flooding/Erosion
Neighborhood 1

Controller

Neighborhood 2

Water level

Without Control

With Control

Flooding/Erosion

Time

Downstream point
~2 miles
After
• 22.5 million Gallons
• $16/gal
• 800 lb/yr Total P

Before
• 15 Million Gallons Storage
• $22/gal
• 600 lb/yr Total P

50% Increase in Capacity

After
• 22.5 million Gallons
• $16/gal
• 800 lb/yr Total P
Sheehan estimated that prior to installing Open Storm, it cost Ann Arbor $23 per gallon to drain storm water. That cost has dropped to $16 per gallon, roughly saving the city $1 million in infrastructure costs thanks primarily to the water valve, which costs only a few thousand dollars.
Outlet

10 sq. mi.
The Opportunity

100+ Sensors

20+ Control Points
Reprogram the System vs Build More

100 MG sewer Overflow Reduction

100 MG storage
have → do → want