

STORMWATER MANAGEMENT:

WHY ARE WE DOING THIS?

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You are a part of this presentation!
...Let's warm up

Who will win the Super Bowl?

Mentimeter

0
49ers

0
Chiefs

0
Usher

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Presentation Outline

- ▶ How we “manage” stormwater
- ▶ Effects of urbanization
- ▶ Is stormwater “infrastructure” a utility?
 - ▶ Ownership
 - ▶ Funding
 - ▶ O&M
- ▶ What does the future look like?



What is the purpose of stormwater management?

 Mentimeter

- 1st** | Regulatory requirement
- 2nd** | Protect the environment
- 3rd** | Protect infrastructure
- 4th** | Protect people (health & safety)
- 5th** | I'm trying to figure that out

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The problem, Petermann said, would be if more rain fell. Because metro-area creeks are flash-flooding creeks by their nature, any problems would develop quickly and without significant warning, he said.

Omaha World Herald 06/21/2014

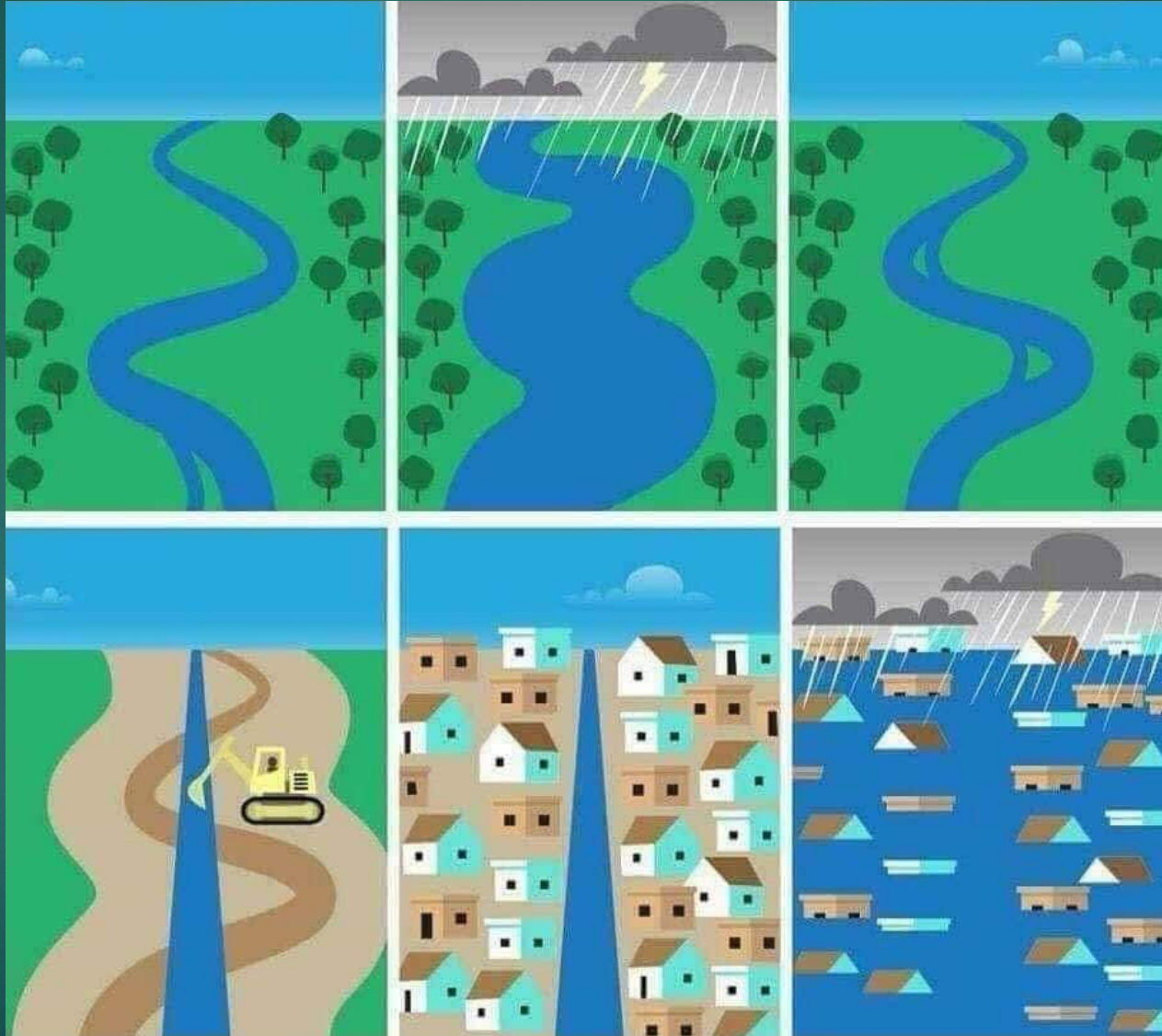


- ▶ Have the Papio Creeks always been flash-flooding?
- ▶ Get rid of water quickly = problems develop quickly

Bellevue city worker Rod Post clears debris left along the 36th Street bridge that crosses the Big Papillion Creek after a night of heavy rains.

JAMES R. BURNETT/THE WORLD-HERALD

Urbanization and Channelization



It isn't just big storms

- ▶ Channel forming flow usually occurs at relatively moderate flow events rather than large flow events since moderate events occur much more frequently than larger events¹



- ▶ Fiberoptic line
- ▶ Unstable and unsafe bank
- ▶ Bridge Pier
- ▶ Utilities
- ▶ Storm sewer
- ▶ Private Property

¹ Leopold et al., 1964, Knighton 1984

Who bears the cost?

- ▶ Urbanization leads to more runoff, higher flow rates, and stream degradation
- ▶ Stream degradation damages public infrastructure and private property
- ▶ Today: each harmed entity fends for themselves
- ▶ Wouldn't it be better to prevent the damage in the first place?



We've been here before

Water and Wastewater – early 1800s

- ▶ Drinking water:
 - ▶ Individual wells or central well
 - ▶ Haul your own
 - ▶ What you can carry determines what you can use
- ▶ Wastewater:
 - ▶ Cesspool (maybe)
 - ▶ Dumped in nearest stream
- ▶ Everybody fended for themselves
- ▶ Lots of people died from Cholera and Typhoid



What is the biggest barrier to treating stormwater as a public utility?

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○
Capital
Funding

○
Land Rights

○
Water Rights

○
Regulatory

○
Ongoing
Maintenance

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Stormwater management challenges

Stormwater

- ▶ Ownership Varies
- ▶ Funding uncertainty
- ▶ What maintenance??



Other “One Water” Utilities

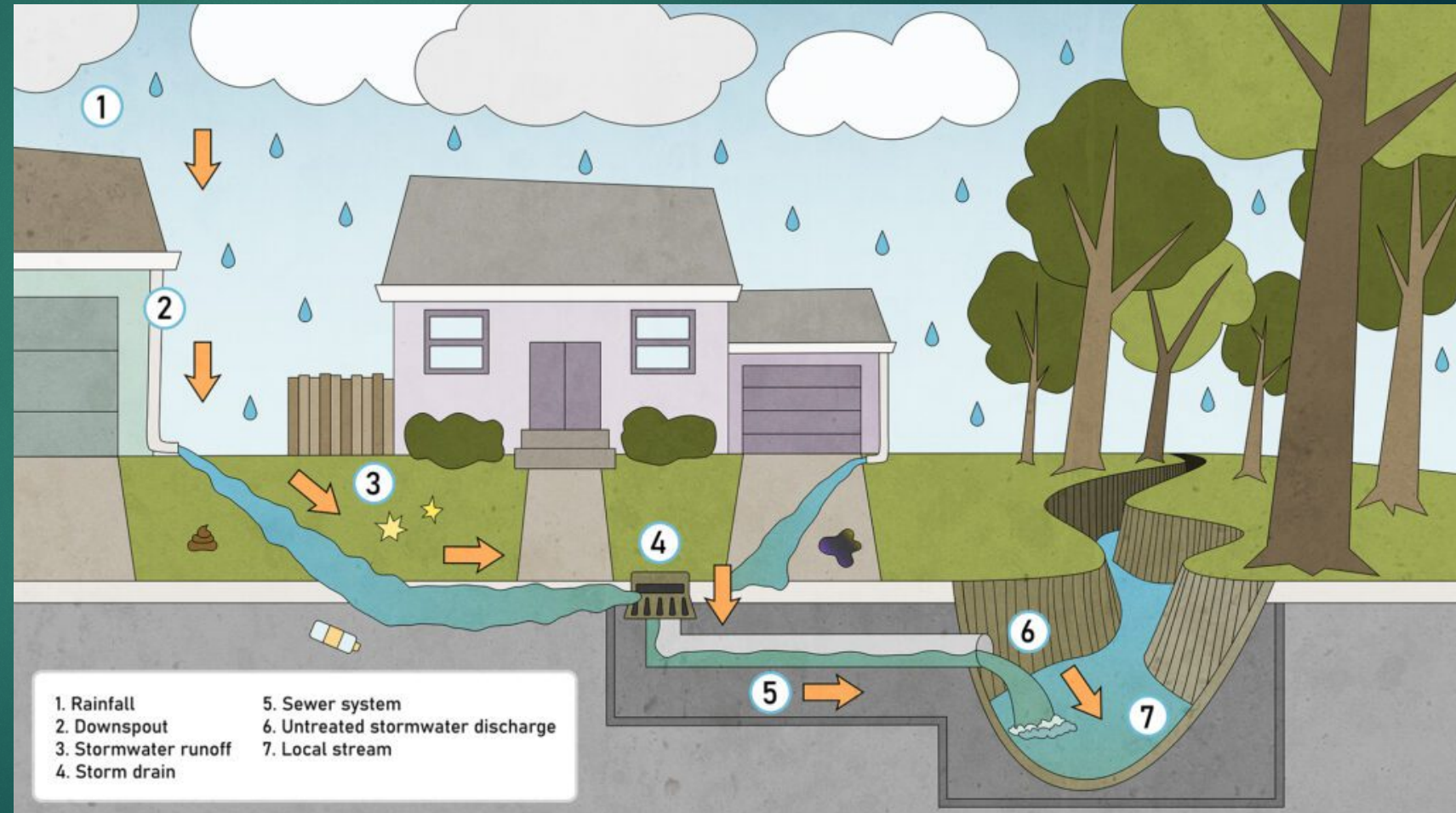
- ▶ Clear Ownership
- ▶ Established Funding Mechanism
- ▶ Established O&M



Ownership challenges

- ▶ A drop of rain changes “owners” many times

1. Landowner?
2. Home Owner
3. Property Owner
4. Public/Private Pavement Owner
5. Public/Private Sewer Owner
6. Public/Private Sewer Owner
7. Multiple Property Owners

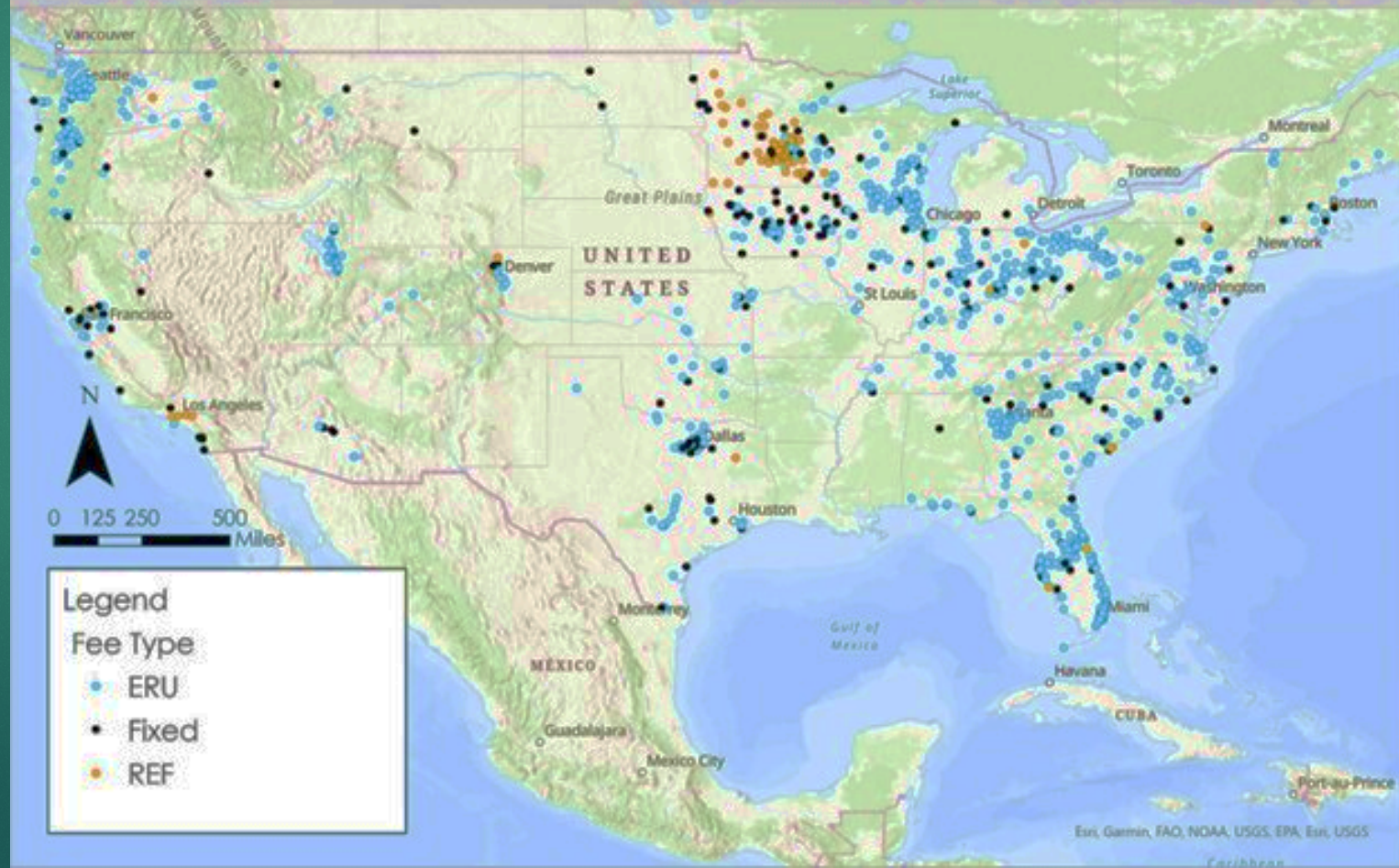


Funding Challenges

- ▶ Lack of stable revenue source
- ▶ Bonds
 - ▶ General fund
 - ▶ Uncertain renewal
- ▶ Grants
- ▶ Stormwater Utilities
 - ▶ Omaha
 - ▶ Norfolk
 - ▶ Columbus
 - ▶ Kearney

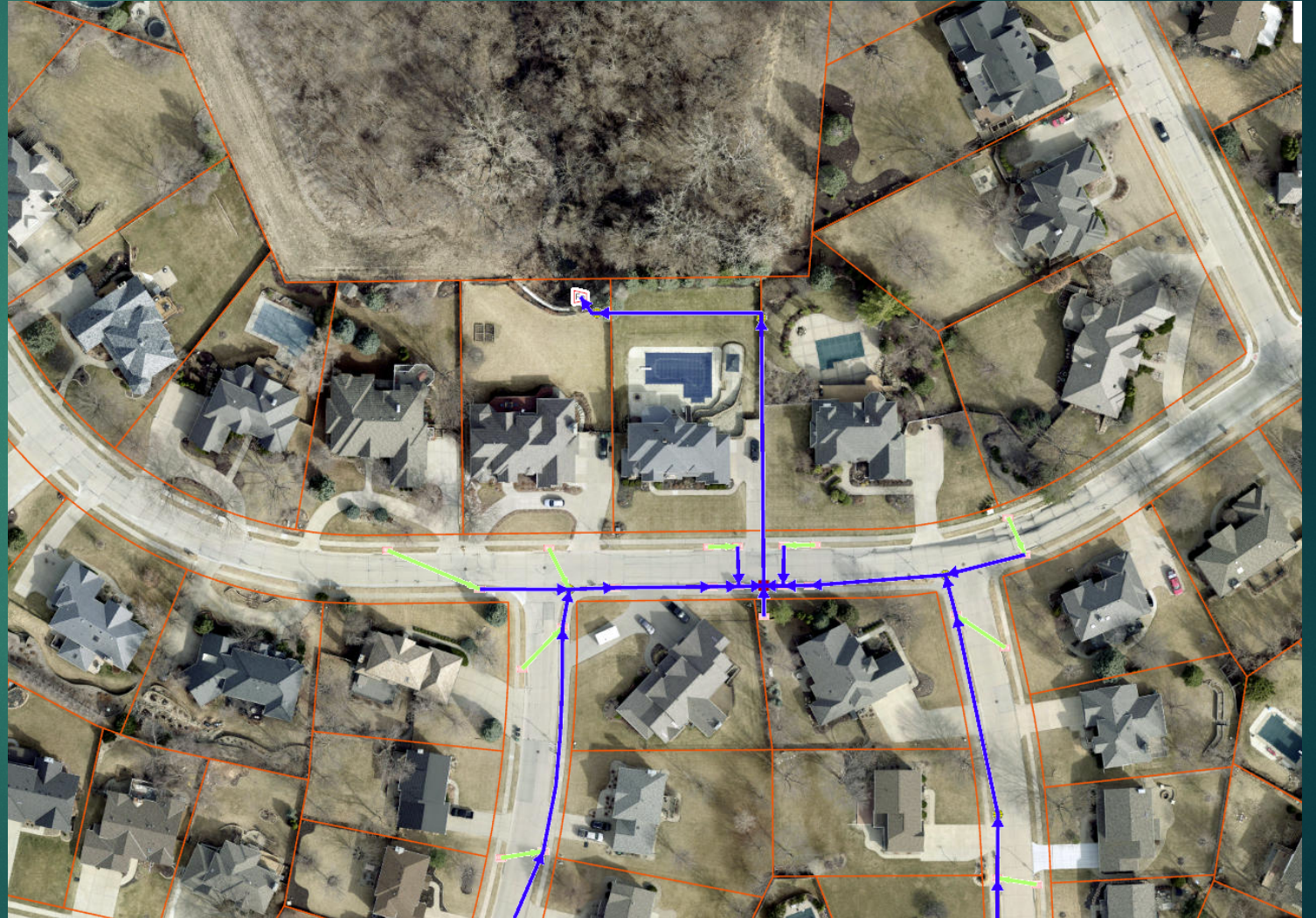
US Stormwater Utilities (2021) by Fee Type

Data Source: Western Kentucky University's 2021 Stormwater Utility Survey
Note: Map only shows utilities with per ERU, Fixed, and REF fee types.



O&M Challenges

- ▶ Variety of asset types
 - ▶ Pipes, inlets, manholes, outfalls
 - ▶ Open channels
 - ▶ Open storage
 - ▶ Structural/ underground storage
 - ▶ Vegetated assets
- ▶ Ownership
- ▶ Access
- ▶ Staff



Same water: two stories

▶ Rainwater as a NUISANCE

- ▶ Runoff erosion
- ▶ Flooding
- ▶ Pollutants

▶ With unclear and changing ownership...

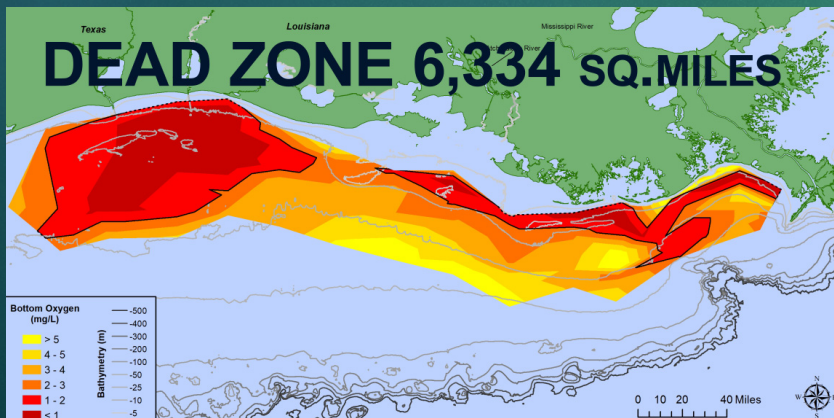
- ▶ Wait until it's someone else's problem!

▶ Rainwater as a RESOURCE

- ▶ Irrigation
- ▶ Water rights
- ▶ Colorado – Nebraska canal

▶ With unclear and changing ownership...

- ▶ We need to fight for our water!



What are the biggest challenges in stormwater management?

Mentimeter

- 1st Changing/Unclear Ownership
- 2nd Lack of Funding
- 3rd Geographic Challenges
- 4th Urban Runoff/Pollutants
- 5th Rural Runoff/Pollutants
- 6th Changing weather/climate

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So, what should we do?

- ▶ Quicker is not better
- ▶ Mimic natural processes
- ▶ Treat stormwater (rainwater) as a resource
- ▶ Value our natural assets



What can we do to manage stormwater better?

Waiting for responses ...

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We are making progress!



Men constructing a sewer at Saddle Creek and Farnam Streets in Omaha in 1934.

We are making progress!



Spring Lake Park Green Infrastructure

We are making progress!

Stormwater as a nuisance

- ▶ Streams are not valued
- ▶ Water is a nuisance
- ▶ Pipe the creek, fill it in, build a road



Men constructing a sewer at Saddle Creek and Farnam Streets in Omaha in 1934.

Stormwater as a resource

- ▶ Streams and open areas are valued
- ▶ Water is a resource
- ▶ Build amenities with water as a focal point



Spring Lake Park Green Infrastructure

Thank You!

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