

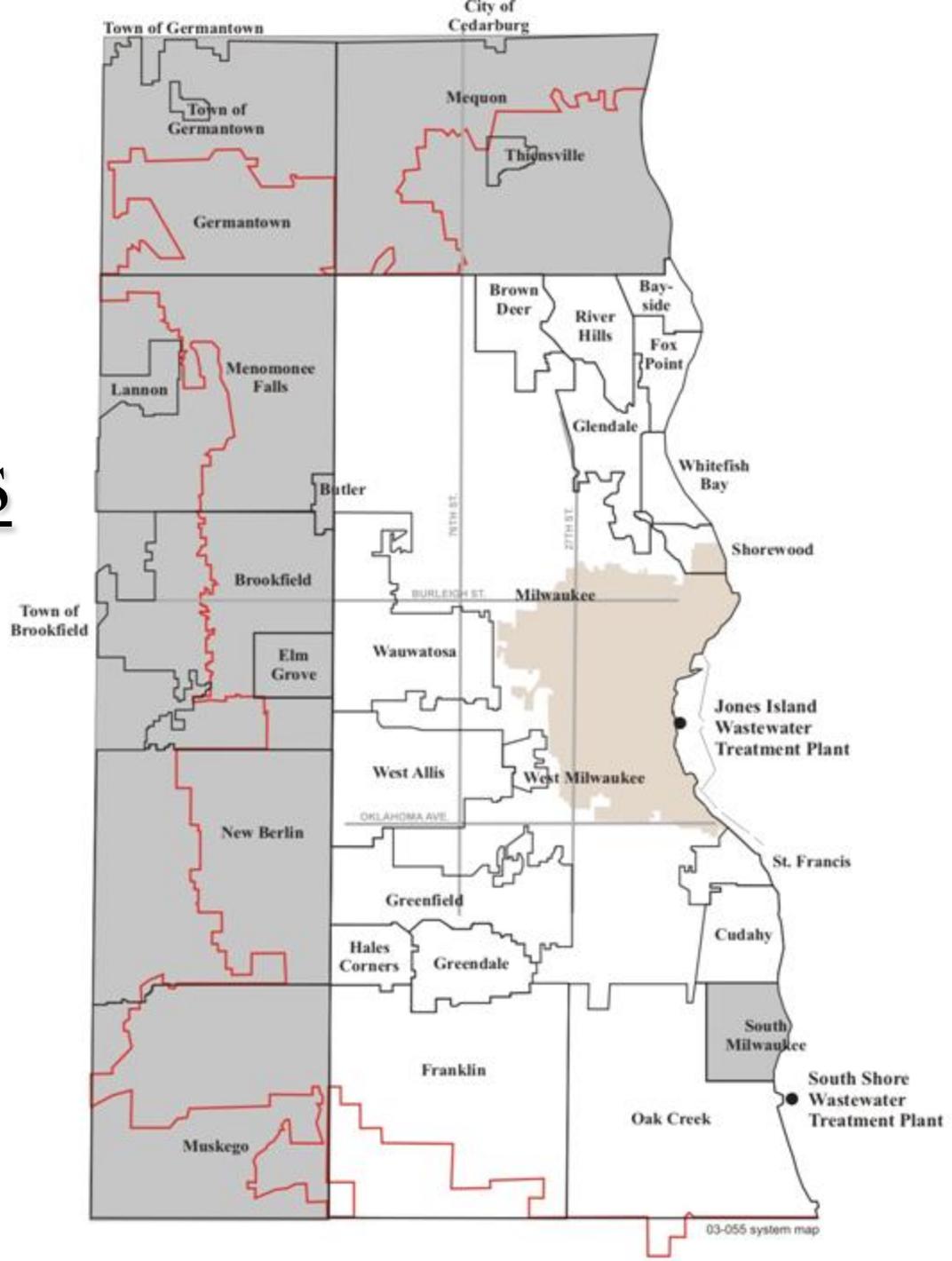
*Creating A **Blueprint** for the future of our  
**Rivers and Lake Michigan***

# What is MMMSD?

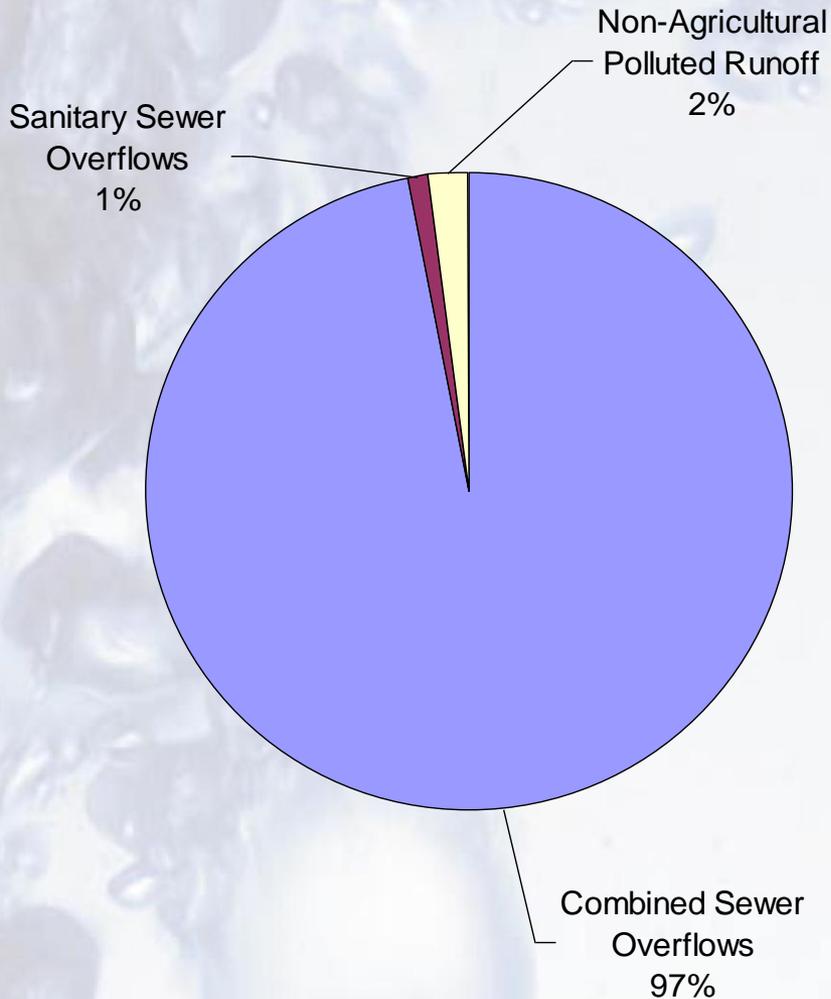
- State-chartered regional agency
  - Provides wastewater treatment and flood management
  - Serves 1.1 million customers in 28 communities
  - Covers 411 square miles
-

# MMSD Serves 28 Communities

- 10 Communities outside Milwaukee County
- 18 Communities inside Milwaukee County



# What was our Water Quality like in 1975?



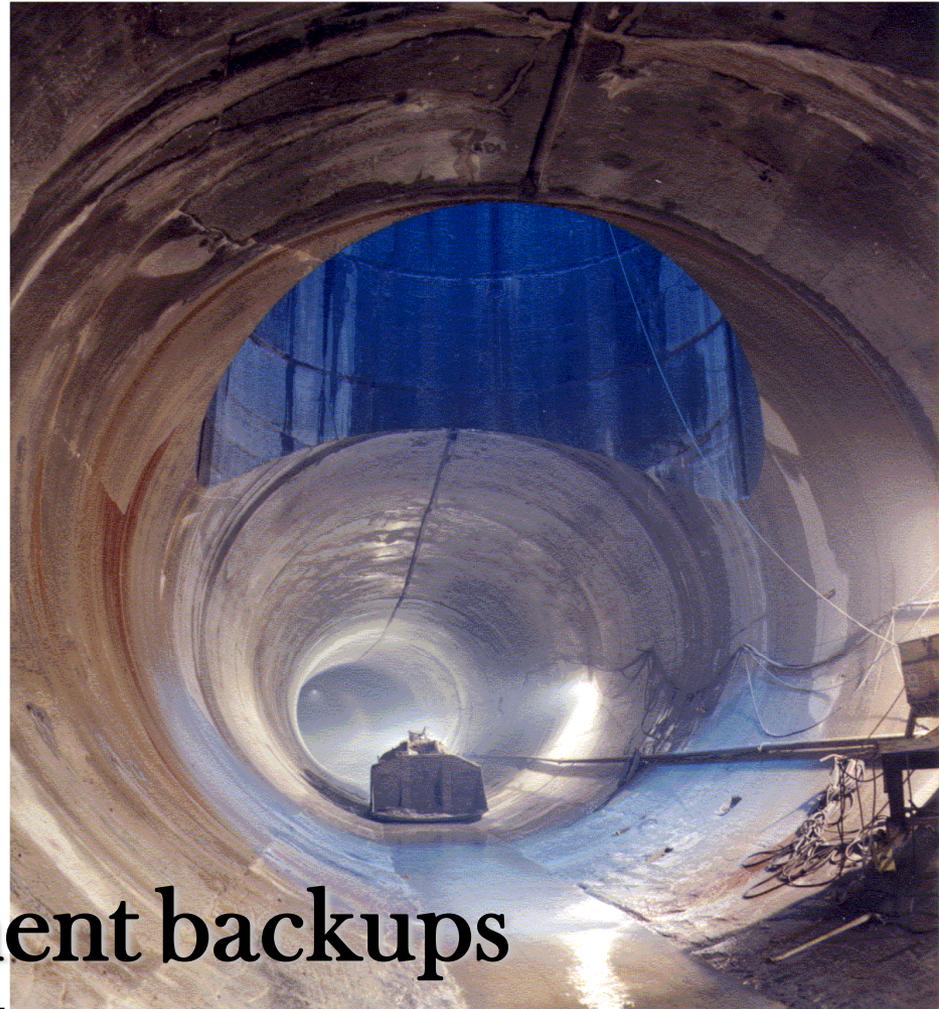
## Kinnickinnic River Fecal Coliforms

14,300 trillion  
cells/year

# Deep Tunnel System

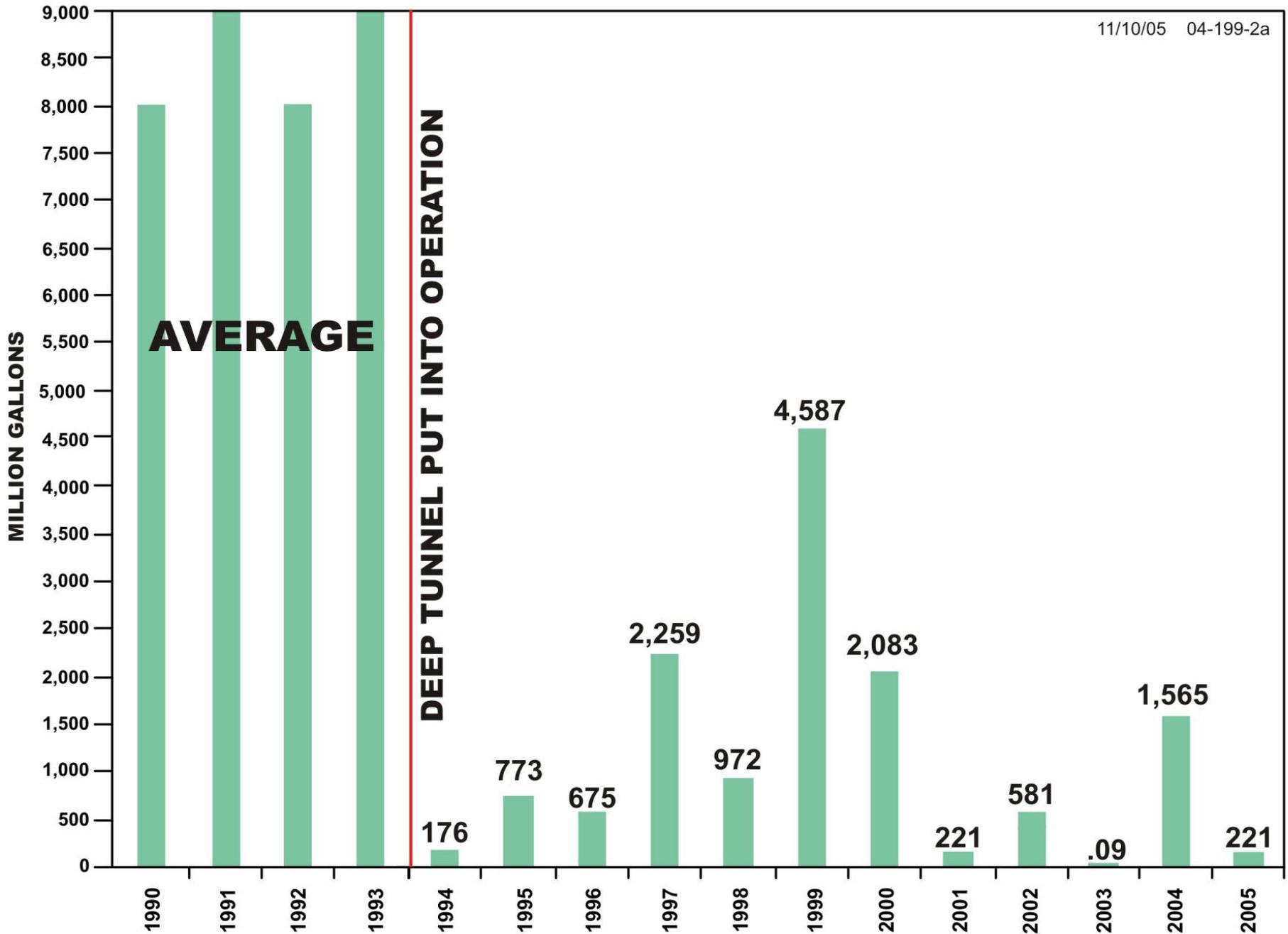


- 300 ft. below ground
- 405 million gallons
- 19.4 miles long
- Designed for 1-2 overflows a year
- Helps prevent basement backups



# CSO & SSO VOLUMES

11/10/05 04-199-2a



# Estimated CSOs

**DUMPING**

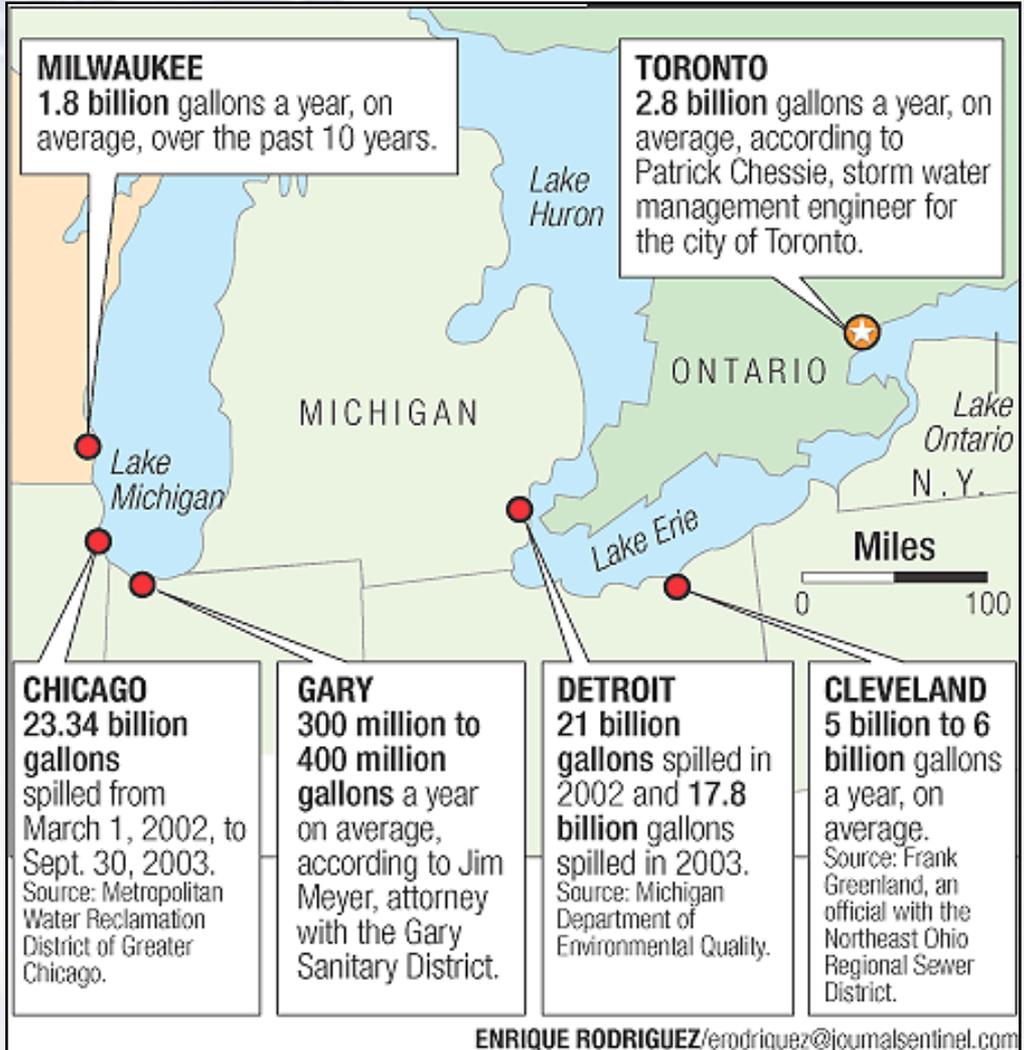
**ESTIMATED COMBINED SEWER OVERFLOWS**

While Milwaukee's recent sewage dumping has drawn much debate, other Great Lakes cities have similar problems.

*The volume number does not cover a consistent period. Some of it is a snapshot of a particular year or period, some of it is an estimated yearly average.*



Source: Journal Sentinel, 6/26/04

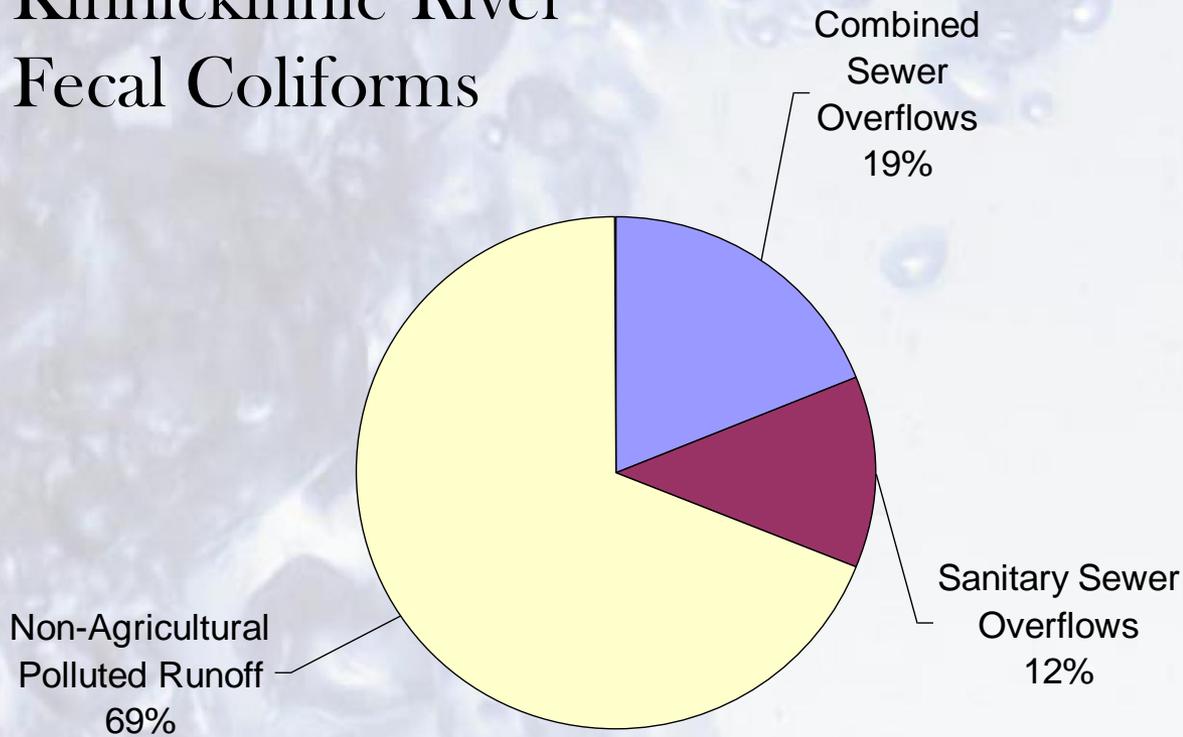


# Pollution: Where is it Coming From?

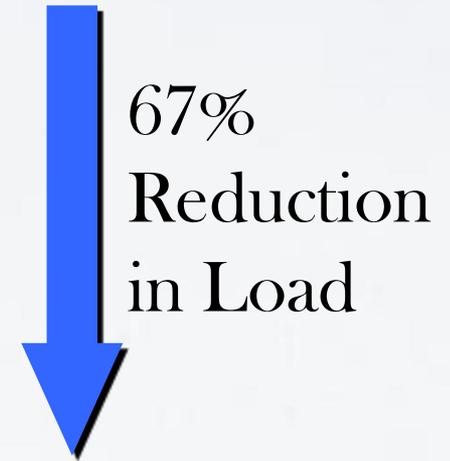


# What is our Water Quality like in 2000?

## Kinnickinnic River Fecal Coliforms



In 1975: 14,300 trillion cells/year



In 2000: 4,700 trillion cells/year

## Point Sources:

- Sanitary sewer overflows
- Combined sewer overflows
- Wastewater treatment plants
- Industrial discharges



# Non-Point Sources

- Bird & animal droppings
- Polluted urban & agricultural stormwater
- Construction & Industrial Site Runoff
- Transportation sources





Would you put  
this water in  
your fish bowl?



# Water Quality Initiative

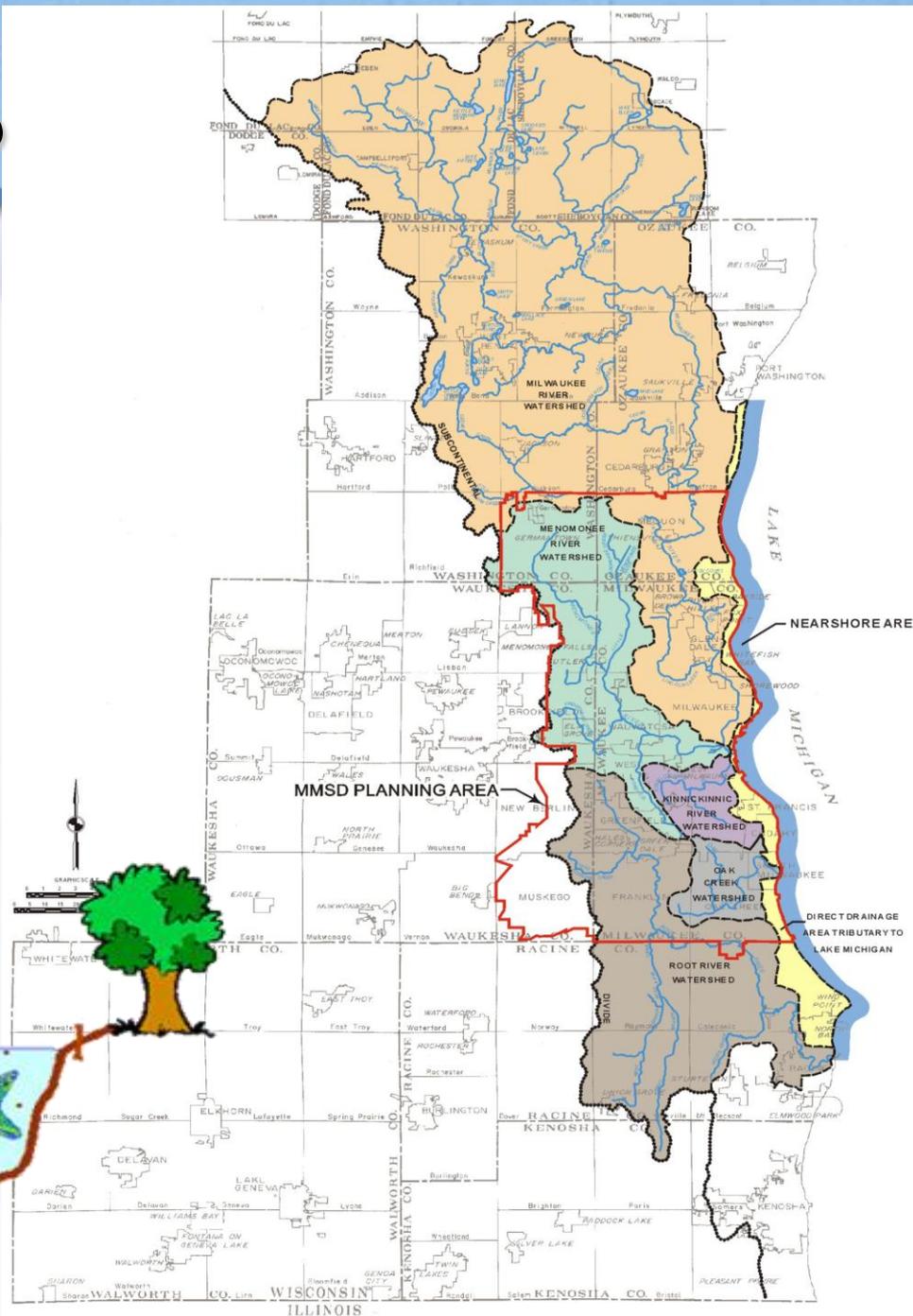
## Blueprint for the Future of Clean Water

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*The Water Quality Initiative* involves the public in identifying solutions to improve water quality.

Uses the EPA recommended Watershed Approach.

# What is a Watershed?



# Collaborating Agencies



Preserving The Environment •  
Improving Water Quality



# Planning Studies

Milwaukee Metropolitan Sewerage District → 2020 Facilities Planning Process

Southeastern Wisconsin Regional Planning Commission → Regional Water Quality Management Plan

# 2020 Planning Process Timeline



# Decisions Driven by Public Participation



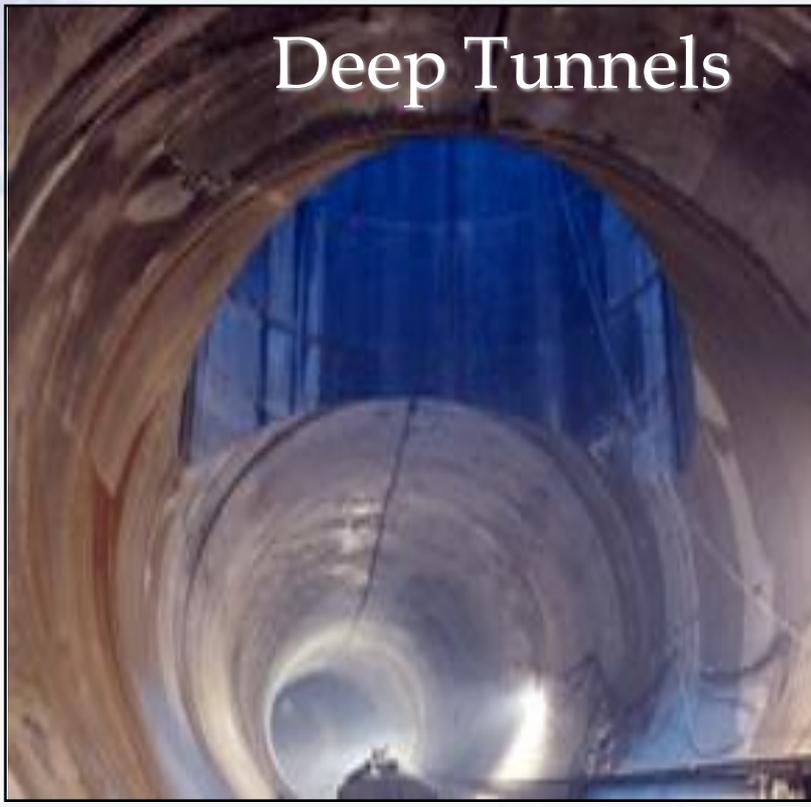
# What can be done?

## -Technologies-

# Traditional Technologies Studied by MMSD



Treatment Plants

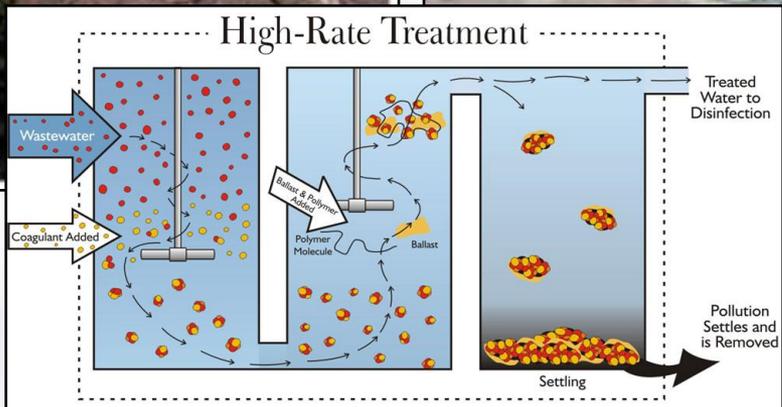
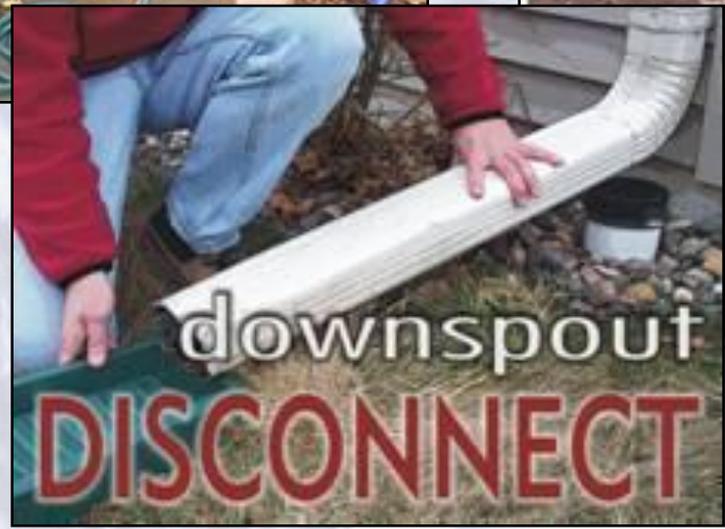


Deep Tunnels



Sewers

# Emerging Technologies Studied by MMSD



# What Can Be Done?

-11 Plan Alternatives-

# Every Alternative Includes

- Completion of MMSD flood management projects
- Maintenance of current I/I levels from existing development
- On going investment in MMSD assets
- Other initiatives - education, advocacy, etc.
- Costs for these items that are common to each alternative will be developed in the implementation plan

## Baseline

### What is It?

The Baseline Alternative includes water quality investments the region is already committed to making. This includes projects by MMSD, cities and villages, and the Department of Natural Resources (DNR). This and all alternatives are based on projected population and land use for the year 2020.

### What is Involved?

By MMSD: estimated \$820 million in 6-year financial plan.

By Others: local sewer infrastructure work & stormwater regulation implementation.

Total regional cost of this alternative is \$1.5-2.0 billion.

### What are the Results?

Serves as a Basis of Comparison for Every Alternative

As you review the other alternatives, you can see whether water quality improves or not.

## Overflow Elimination with Sewer Separation

### What is It?

This alternative uses sewer separation and a combination of other infrastructure investments to prevent overflows, based on rainfall and snowmelt data since 1940.

### What is Involved?

- Separate sewers in 89% of the combined sewer service area.
- Increase wastewater treatment plant capacity by 300 million gallons per day. Each of MMSD's treatment plants currently can handle about 300 million gallons per day.
- Increase Deep Tunnel pumping capability by 100 million gallons per day.
- Increase Deep Tunnel storage by 230 million gallons.

## Overflow Elimination without Sewer Separation

### What is It?

This alternative prevents overflows based on rainfall and snowmelt data since 1940 with major MMSD infrastructure investments.

### What is Involved?

- Increase wastewater treatment plant capacity by 300 million gallons per day. Each of MMSD's treatment plants currently can handle about 300 million gallons per day.
- Increase Deep Tunnel pumping capability by 100 million gallons per day.
- Increase Deep Tunnel storage by 1.6 billion gallons, three times more than what will be built by 2010.

## Eliminate Separate Sewer Overflows Only

### What is it?

This alternative prevents separate sewer overflows based on rainfall and snowmelt data since 1940 with major MMSD infrastructure investments.

### What is Involved?

- Increase wastewater treatment plant capacity by 300 million gallons per day. Each of MMSD's treatment plants currently can handle about 300 million gallons per day.
- Increase Deep Tunnel pumping capability by 100 million gallons per day.
- Increase Deep Tunnel storage by 160 million gallons.

## Fix Leaky Sewers

### What is it?

Eliminate separate sewer overflows by reducing the volume of water that leaks into the separate sewer system.

### What is Involved?

- Removal of inflow and infiltration using all possible methods - both public and private sewers and sewer laterals.
- Rehabilitation required in 90% of separate sewer area.

## Stormwater Best Management Practices

### What is It?

Implement widespread best management practices (BMPs) to help reduce the amount of polluted stormwater that gets into our rivers and lakes. This alternative includes a variety of BMPs for urban, suburban, and rural communities.

### What is Involved?

- Best management practices to control polluted stormwater in rural areas.
- Rain barrels, downspout disconnections, roof storage, green roofs, and more.
- Pet litter, waterfowl control, litter, and road salt reduction programs.

## Regulatory Approach (Everyone)

### What is It?

This alternative requires MMSD and others to meet all state and federal overflow and stormwater regulations. It includes full implementation of state mandated polluted storm water regulations.

### What is Involved?

- Reduce polluted storm water runoff by cities and villages.
- Establish low-impact farming practices.
- Implementation of downspout disconnections, rain gardens, rooftop storage, and other stormwater best management practices in the combined sewer area.
- Implement necessary sewer facilities to meet SSO and CSO regulations.

## Regulatory Approach

### What is it?

Requires MMSD and communities to meet all state and federal sewer and stormwater regulations- excluding agricultural areas.

### What is Involved?

- Requires full implementation of state mandated polluted stormwater regulations for all non-agricultural areas.
- Implement necessary sewer facilities to meet SSO and CSO regulations.
- Implement limited best management practices in non-agricultural areas.

## Change Operating & Regulatory Approach

### What is it?

This alternative proposes reducing overflows by operating MMSD facilities differently.

### What is Involved?

- Change operating strategy to account for no difference in combined sewer and separate sewer overflows (this might require a change in State and Federal regulations).
- Implement all State regulations for agricultural and non-agricultural runoff.
- Implement limited best management practices in non-agricultural areas.

## **Watershed Approach - Facility Improvements with Best Management Practices**

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### **What is It?**

This alternative proposes a variety of facility improvements and best management practices (BMPs) for agricultural and non-agricultural areas.

### **What is Involved?**

- Best management practices to reduce polluted stormwater in agricultural areas.
- Implement necessary sewer facilities to meet SSO and CSO regulations.
- Best management practice solutions for combined and separate sewer area.
- Disinfect polluted stormwater runoff at critical locations.

## Watershed Approach - Habitat Improvement

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### What is It?

This alternative maximizes restoration and protection of natural areas, such as wetlands and prairies. It also includes a variety of facility improvements and best management practices for agricultural and non-agricultural areas.

### What is Involved?

- Improve habitat through wetland restoration, establish prairies.
- Best management practices to reduce polluted stormwater in agricultural areas.
- Best management practice solutions for combined and separate sewer area.
- Disinfects polluted stormwater runoff at critical locations.

# Evaluation of Alternatives

We compared the 11 Alternatives using:

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- **Water Quality**
- **Publicly Inspired Goals**
  - **Overflows**
  - **Cost**

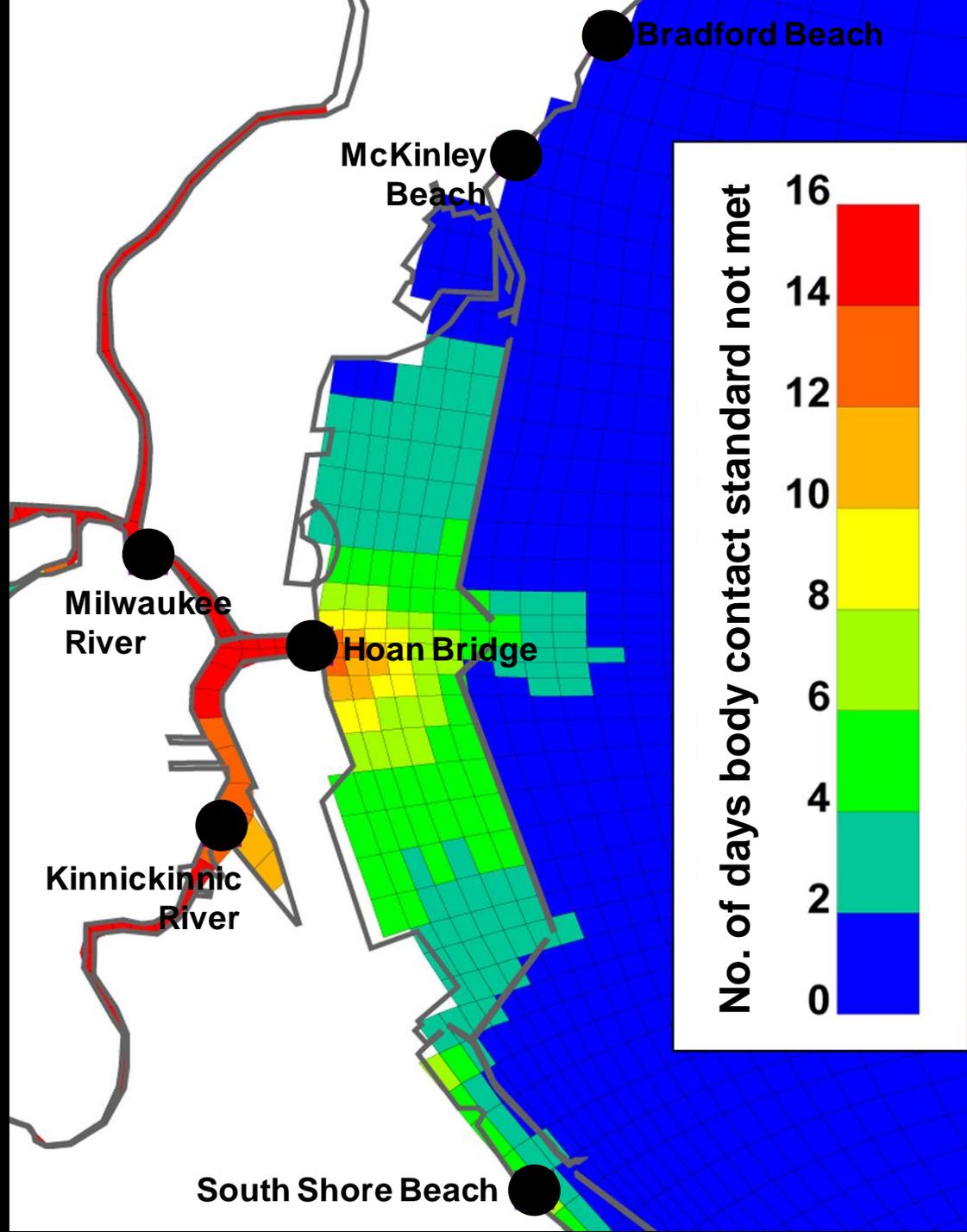
# Alternative Summary

1	Future Baseline Condition			
	<u>Screening Alternatives</u>		<u>Regulatory Alternatives</u>	<u>Watershed Alternatives:</u>
2	Overflow Elimination with Sewer Separation	7	Regulatory Approach (Everyone)	10 Watershed Approach - Facility Improvements with Best Management Practices
3	Overflow Elimination without Sewer Separation	8	Regulatory Approach	11 Watershed Approach - Habitat Improvement
4	Eliminate Sanitary Sewer Overflows Only	9	Change Operating and Regulatory Approach	
5	Fix Leaky Sewers			
6	Stormwater Best Management Practices			

		Criteria		
		Annual Sewer Overflows	Achieve WQ & Public Goals	Cost
		Sanitary Sewer	Combined Sewer	Billions

Alternatives	Screening Alternatives	#1: Baseline	1.2	3.6	5.7	—
		#2: Overflow Elimination with Sewer Separation	0	0	4.3	\$4.5-5.8
		#3: Overflow Elimination without Sewer Separation	0	0	5.1	\$4.9-6.4
		#4: Eliminate Separate Sewer Overflows Only	0	3.5	5.3	\$1.2-1.6
		#5: Fix Leaky Sewers	0	3.5	5.1	\$6.7-8.8
		#6: Stormwater Best Management Practices	0.9	2.9	7.7	\$1.1-1.5
	Regulatory Alternatives	#7: Regulatory Approach (Everyone)	0.2	2.1	6.1	\$1.0-1.5
		#8: Regulatory Approach (MMSD and Communities)	0.2	2.1	6.2	\$0.6-0.8
		#9: Change Operating & Regulatory Approach	1	1.1	6.1	\$1.1-1.5
	Watershed Alternatives	#10: Watershed Approach: Facility Improvements with Best Management Practices	0.9	2.9	8.4	\$1.5-2.1
		#11: Watershed Approach: Habitat Improvement	0.9	2.9	9.1	\$1.7-2.3

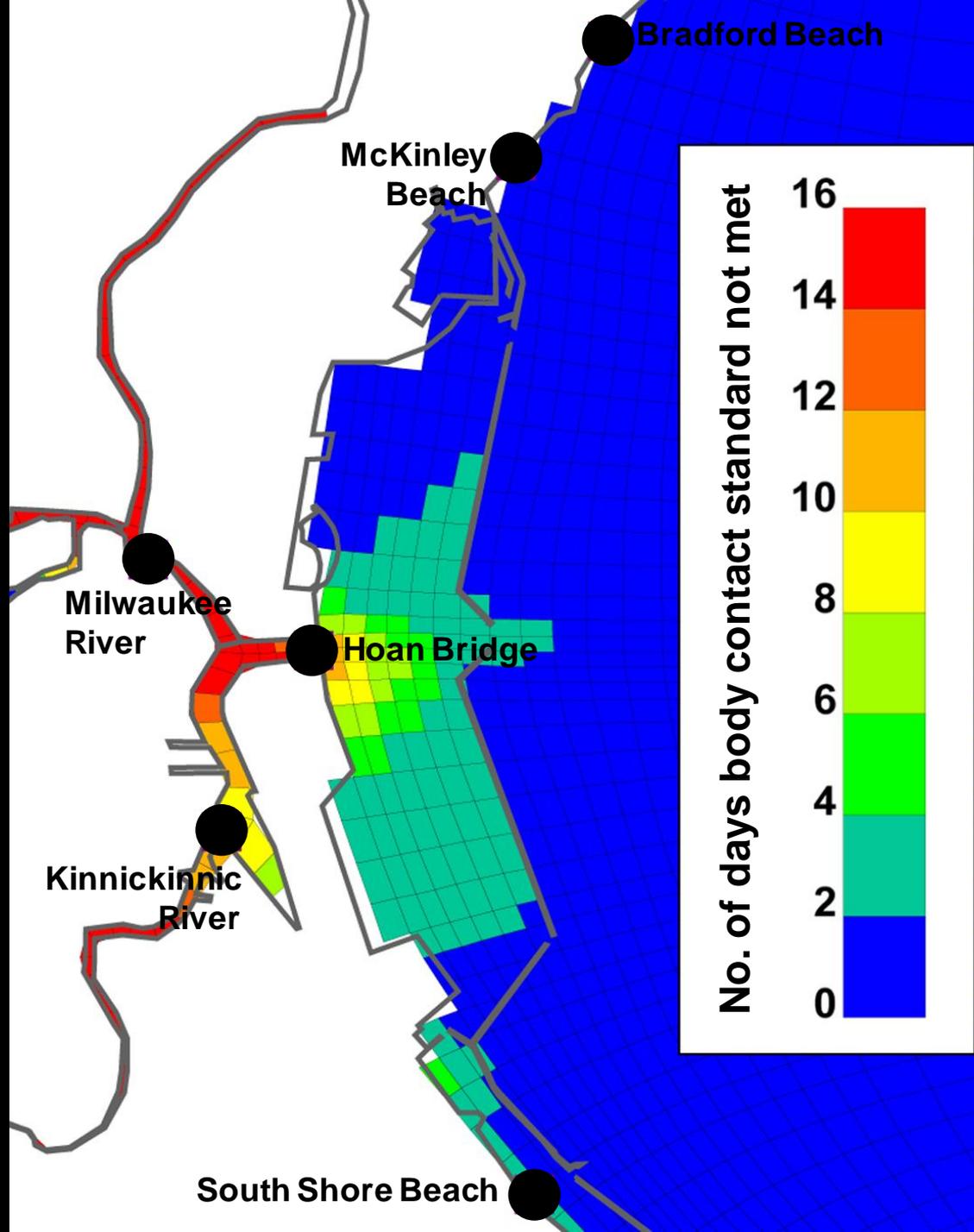
**Existing  
Condition-  
Fecal  
coliform  
(May  
through  
September  
153 days)**



# Alternative 1

## Future Condition

## Fecal Coliform

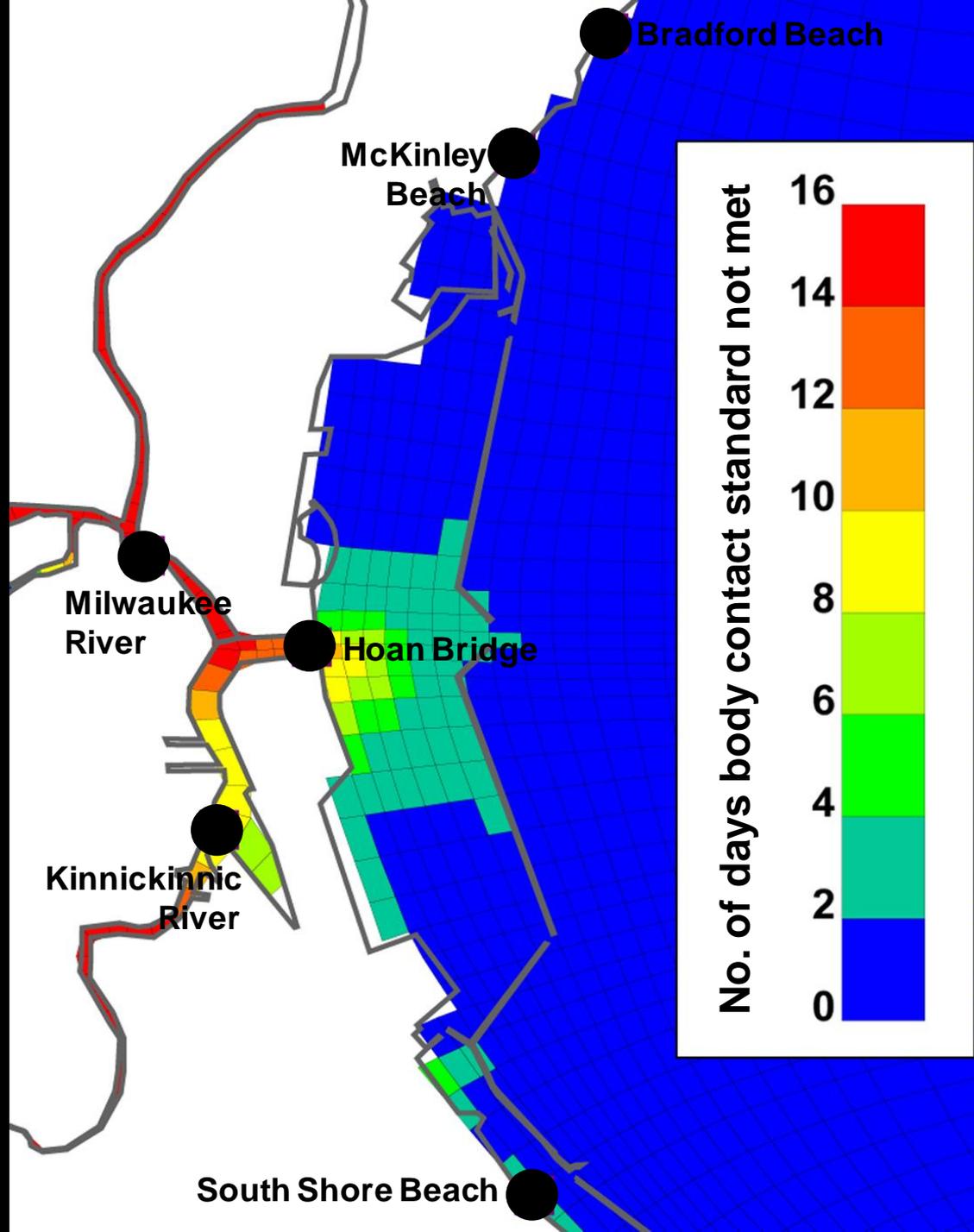


**Alternative**

**4 & 5**

**No SSO**

**Fecal  
Coliform**



**Alternative**

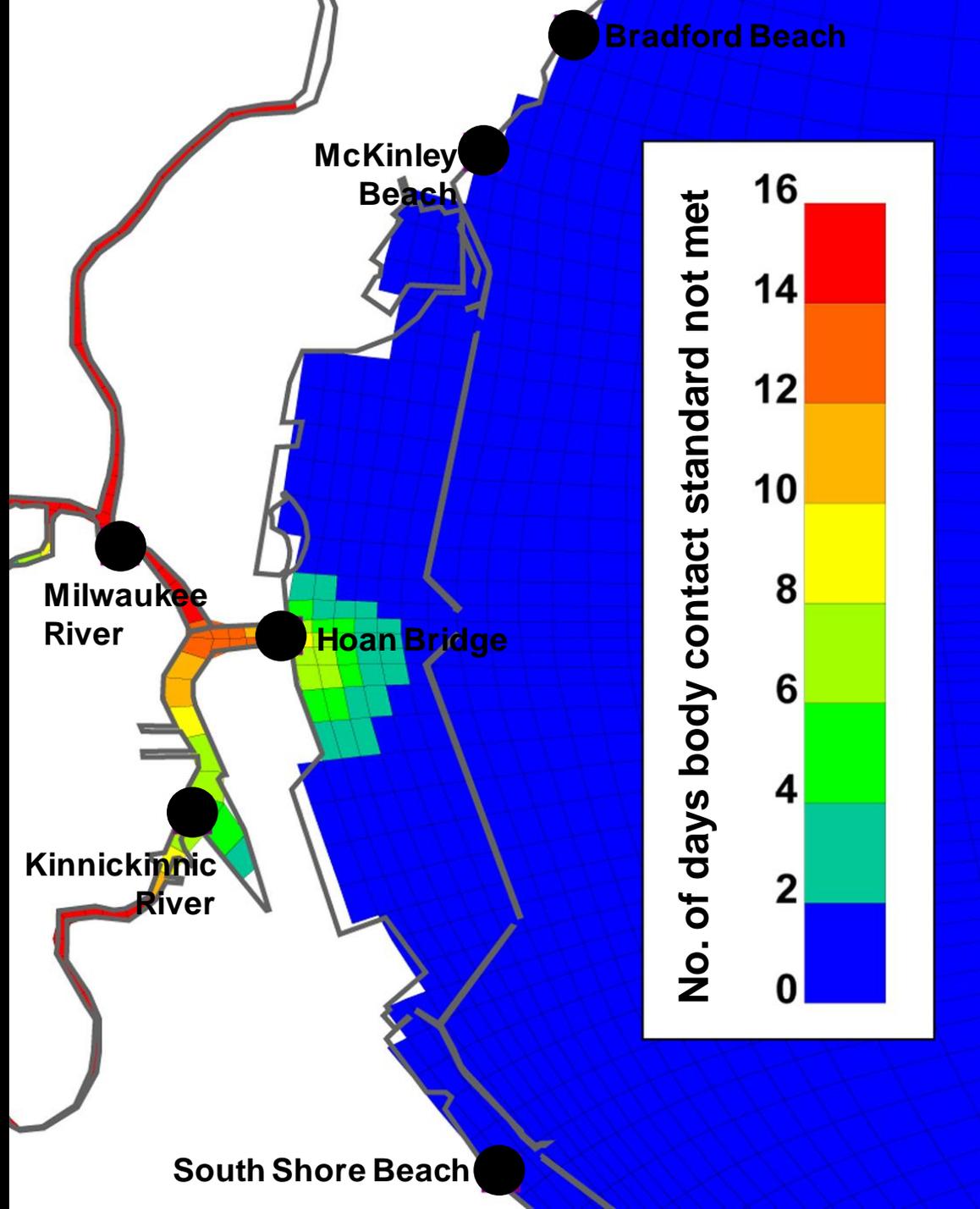
**2 & 3**

**No CSO**

**And**

**No SSO**

**Fecal  
Coliform**



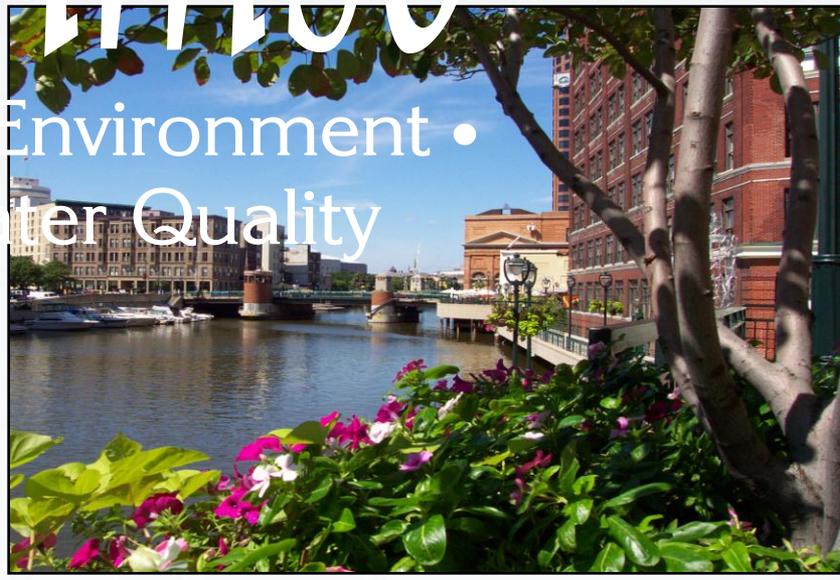
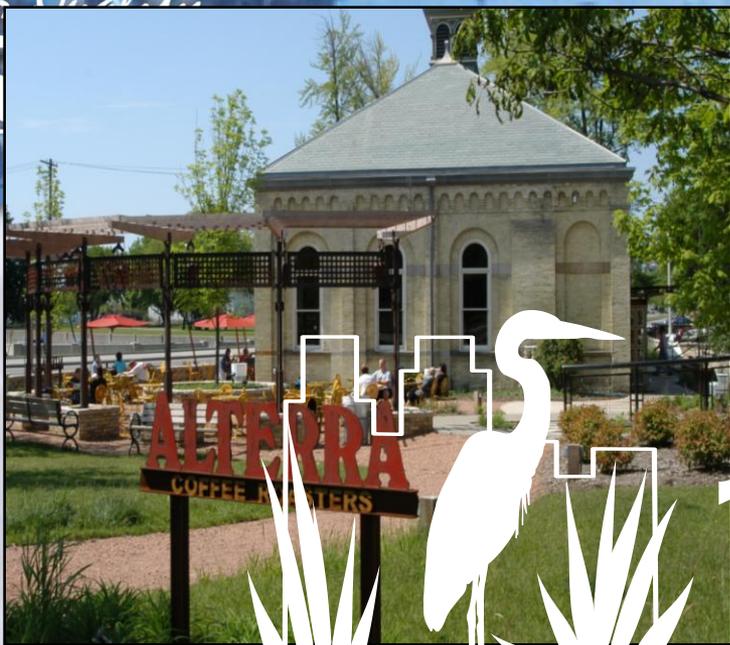
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# What Do You Think?

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Send questions and comments to:

Ms. Krista Chapdelaine: 225-2128 or  
[kchapdelaine@mmsd.com](mailto:kchapdelaine@mmsd.com)



Preserving The Environment •  
Improving Water Quality

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