Water connects all life. Yet we dis-integrate water into silos.

credit: Steve Moddemeyer, Collins Woerman

Formation of the District

- "…it has been stated by a competent authority that in the not too distant future, the City of Madison may be required to go to Lake Mendota for its drinking water supply….evidently it is not desirable to have an increased amount of effluent from sewage disposal plants enter the lake…"

- *First Annual Report of the Commission*, May 1931

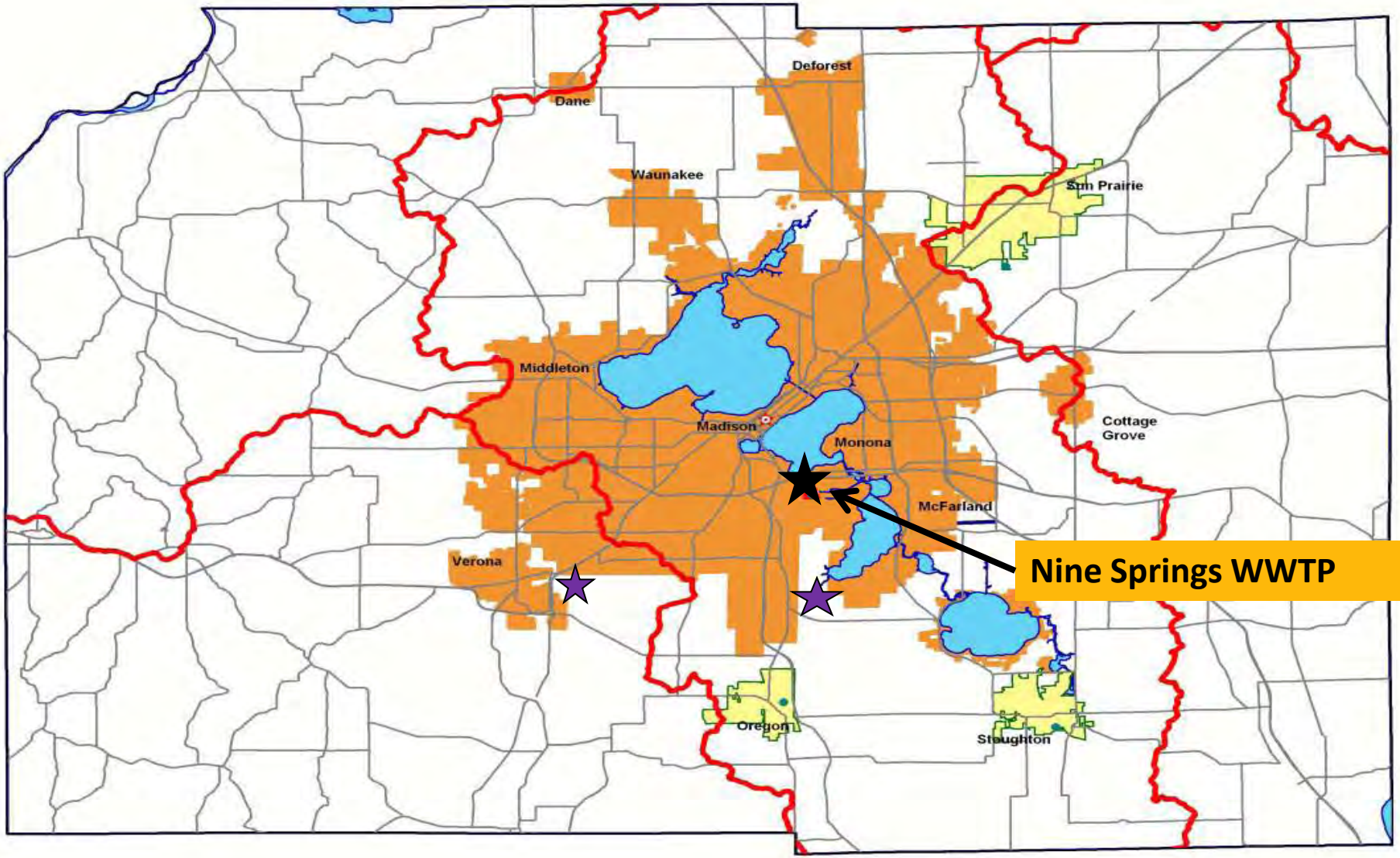

4 . . . Nov. 17, 1937 . . . . N.E. Intercepter . . .
Trench MH 47 to MH #8
Pipe #8
Sling around Pipe . . . . hooked to derrick . . . setting on timbe


PHOTOART
12-45-51

#299 . . . May 25, 1950

Outside Piping – 36" Reinf. Conc. Mixed Lig. Pipe -- Repair

Regional Service Area-Centralized Treatment




05/27/2011

Nothing but Stats

Serve 40 Communities

360,000 population

$27 million budget

94 employees

18 Pumpstations

135 miles of interceptor and force mains

40 million gallons a day

5 member Commission

Resource Recovery-Energy

Digester ⇨ Methane ⇨ Gas Engine

35% of the District's needs are obtained from renewable sources.

Demonstrate Use of Sewer Gas as Fuel at City Disposal Plant

A GROUP of 40 state power plant engineers, attending their 14th annual school at the university, ate hamburger sandwiches fried over a sewer gas flame at the Madison sewage disposal plant Thursday afternoon.

They were among the first to see the successful results of experiments carried on during the past three years by Superintendant James Mackin and his associates who have been seeking means to dispose of and utilize the fumes from Madison's sewage.

The gas, trapped in a metal box capping No. 6 settling tank, is piped into the laboratory and connected with an ordinary kitchen range. Every jet, including those heating the oven, was blazing merrily when the visitors were ushered into the laboratory by Mr. Mackin and Dr. Bernard Domogalla, city bio-chemist, to consume the luncheon prepared by Misses Eileen Mackin and Essa Du Bois.

Although Madisonn is not a pioneer in the utilization of sewer gas its engineers are among the first to apply a new method of trapping the fumes. German cities employing the Imhoff tank disposal system, an adaptation of which is in use here, have been burning their gas for several years and selling their surplus for public consumption.

Comparatively few American cities, however, have adopted the practice. Among them are Pasadena, Cal., and Antigo, Wis., which for some time has been using sewer gas for the heating of sludge to hasten the digestive process.

In most places the gases are trapped in under-surface tanks. To prevent interference with the efficient operation of the Madison plant, however, it was necessary to devise surface tanks which can be raised to permit removal of the sludge.

The Madison engineers were seeking primarily a means of eliminating odors from the city sewage plant and with the capping of all the settling tanks it is estimated that fully nine-tenths of all "aroma" can be killed, making the project well worth while aside from the value of the gas.

Only One Tank Capped

So far only one tank has been capped by a metal box designed under supervision of City Engineer E. E. Parker and manufactured by Trachte brothers at a total cost of about $1,500. It has been in operation only a few days and has shown an output of 2,000 cubic feet of gas in a period of 16 hours.

It is estimated that if all the tanks are capped Madison can produce 25,000 cubic feet of gas in a day. On the basis of consumption of 100 cubic feet by an average household this means a daily output sufficient to supply approximately 240 families.

At the current rate of $1.05 per thousand cubic feet, the daily accumulation would have a value of more than $25.

Methane gas constitutes about 90 per cent of the fumes arising from the settling tanks and engineers declare it produces 750 b. t. u. heat units per cubic foot compared to

- Moving toward energy independence


444H
DEERE

Fix Up Your Lawn and Shrubbery Before Winter!

An application now of "Nitrohumus" Fertilizer will provide a good food supply to the grass, perennials and shrubbery for next year.

Nitrohumus is economical, easy to apply, and produces results.

Delivered in Madison:

In 100-Lb. Sacks	**$0.75**
In Ton Quantities	**7.00**

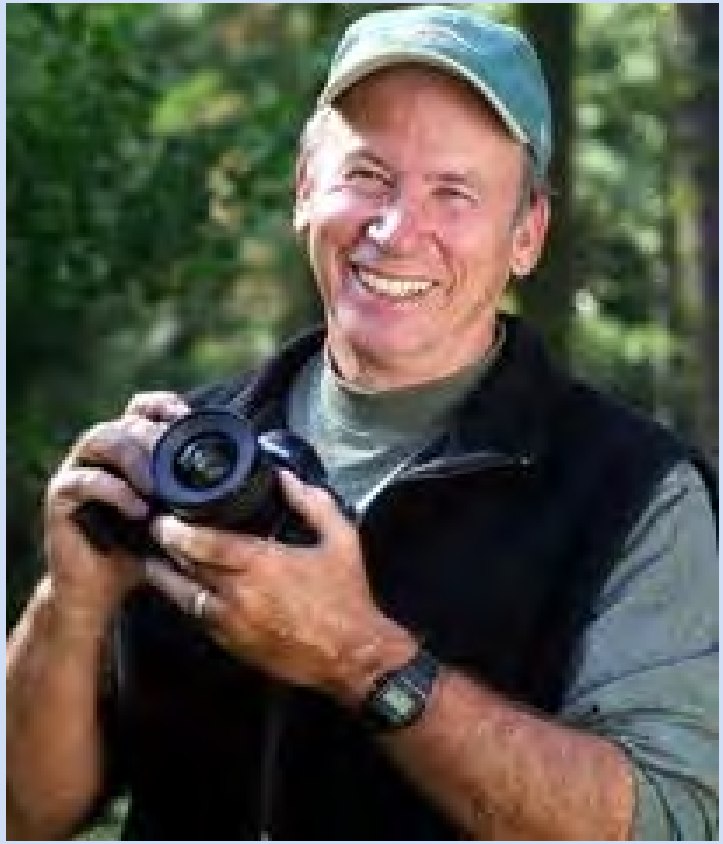
At the Nine Springs Sewage Treatment Plant:
[One-Half Mile South of Royal Airport]

In 100-Lb. Sacks	**$0.50**
In Ton Quantities	**5.00**

Phones: F. 6432-W—Nine Springs Sewage Treatment Works
B. 3307 —Main Pumping Station
F. 8318 —District Office

Madison Metropolitan Sewerage District

"The difference between success and significance is millimeters, not miles"



Dewitt Jones
National Geographic Photographer

From Invisible to Invaluable

Sewerage Treatment

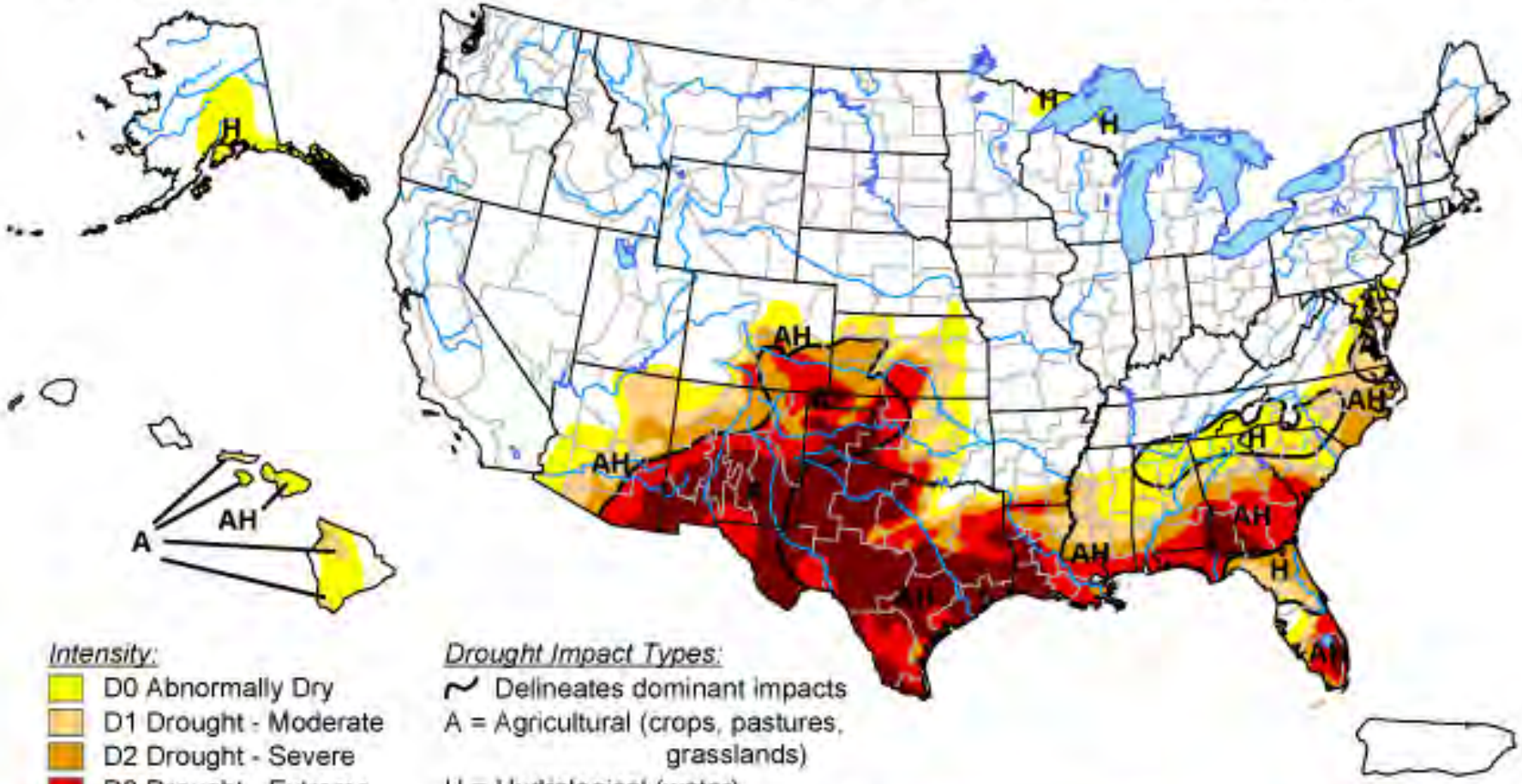
to

Water, Food and Energy Security

Enriching Life through Clean Water and Resource Recovery

U.S. Drought Monitor

June 14, 2011
Valid 8 a.m. EDT



Intensity:
- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:
- ~ Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

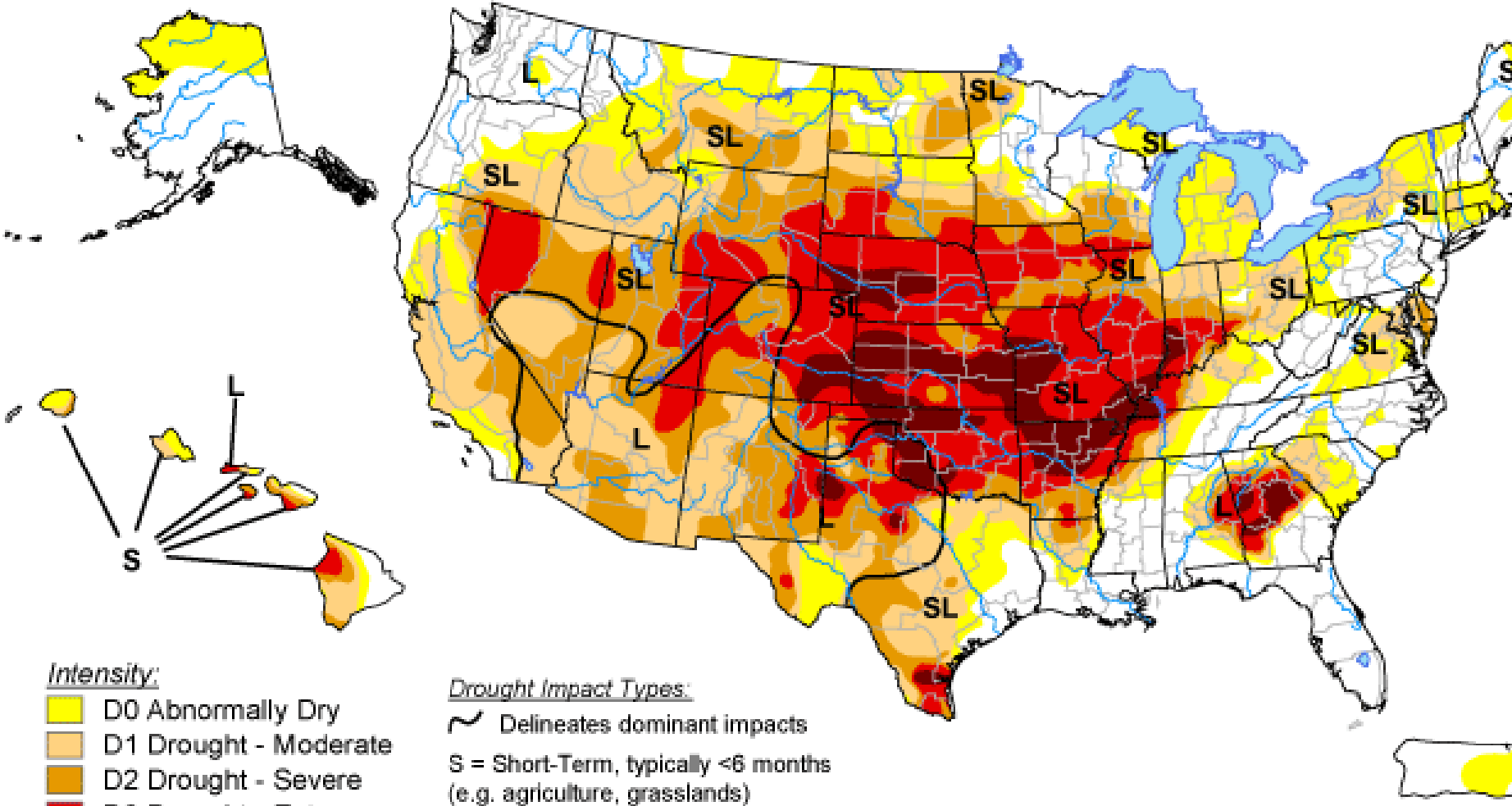
http://drought.unl.edu/dm

Released Thursday, June 16, 2011

Author: Brian Fuchs, National Drought Mitigation Center

U.S. Drought Monitor

August 28, 2012
Valid 7 a.m. EDT



Intensity:
- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

~ Delineates dominant impacts

S = Short-Term, typically <6 months (e.g. agriculture, grasslands)

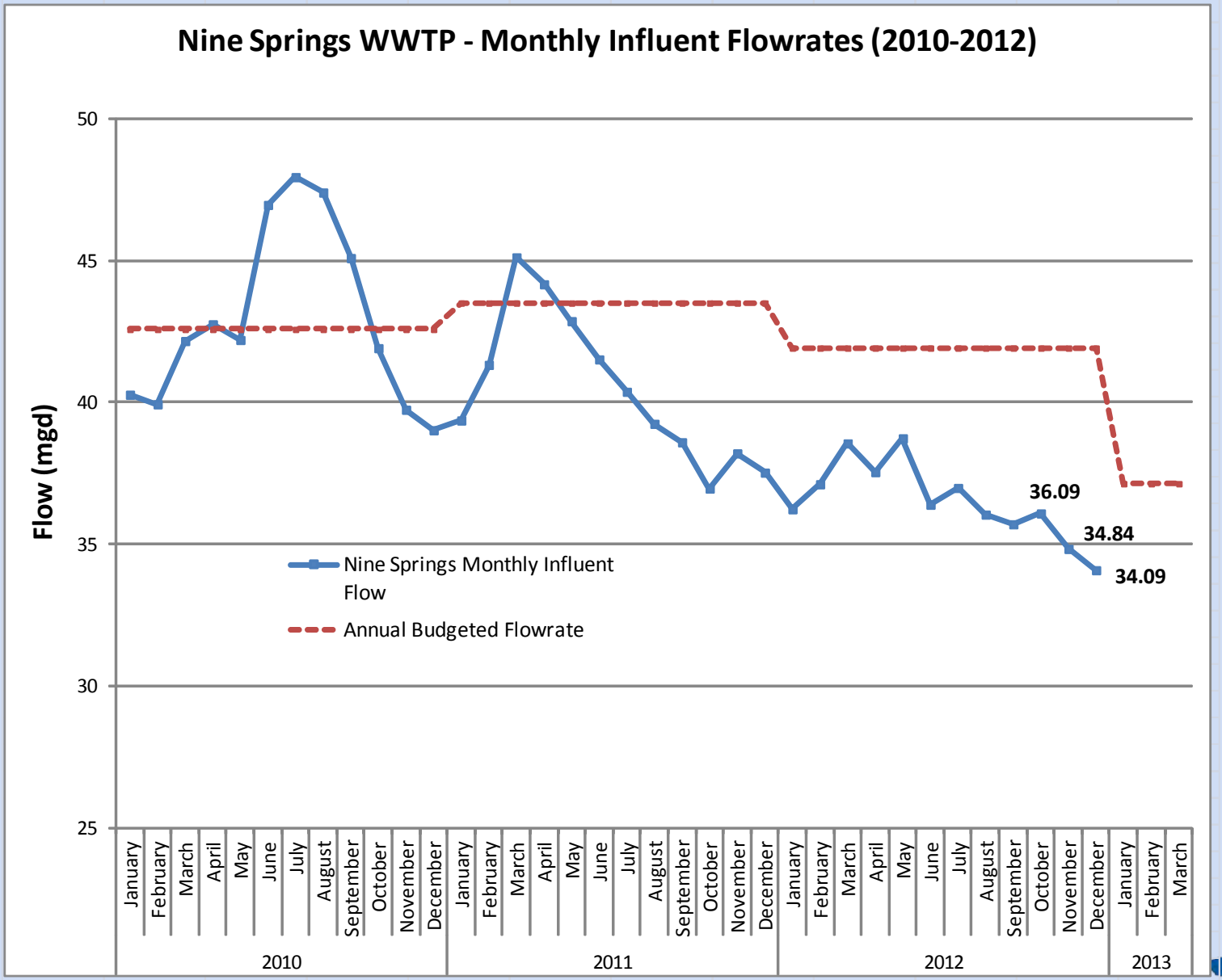
L = Long-Term, typically >6 months (e.g. hydrology, ecology)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

USDA National Drought Mitigation Center

Released Thursday, August 30, 201

Author: Brian Fuchs, National Drought Mitigation Cente


Nine Springs WWTP - Monthly Influent Flowrates (2010-2012)
Flow (mgd)
50
45
40
35
30
25
36.09
34.84
34.09
Nine Springs Monthly Influent Flow
Annual Budgeted Flowrate
January
February
March
April
May
June
July
August
September
October
November
December
2010
2011
2012
2013

Water Table Declines in Dane County

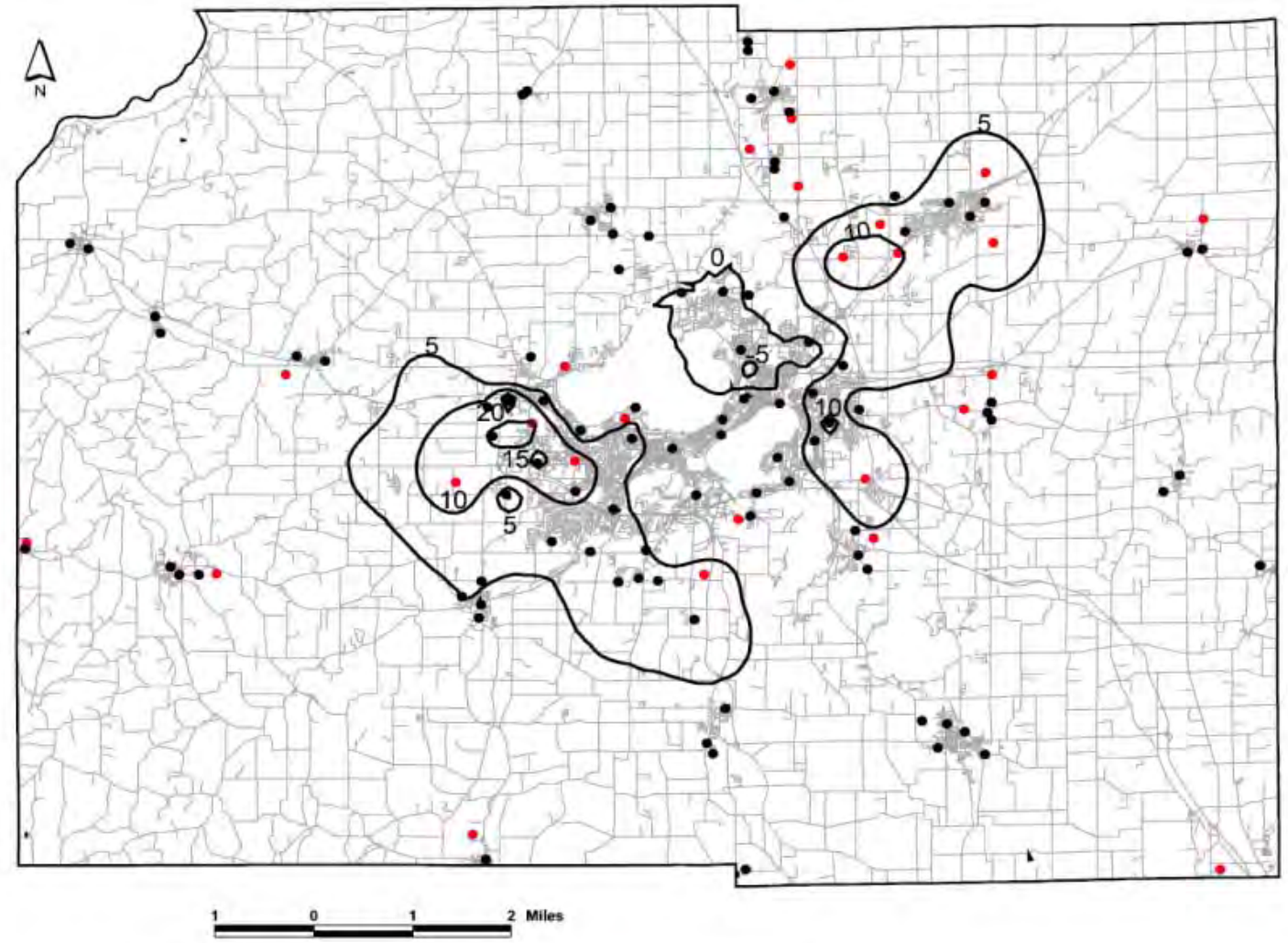
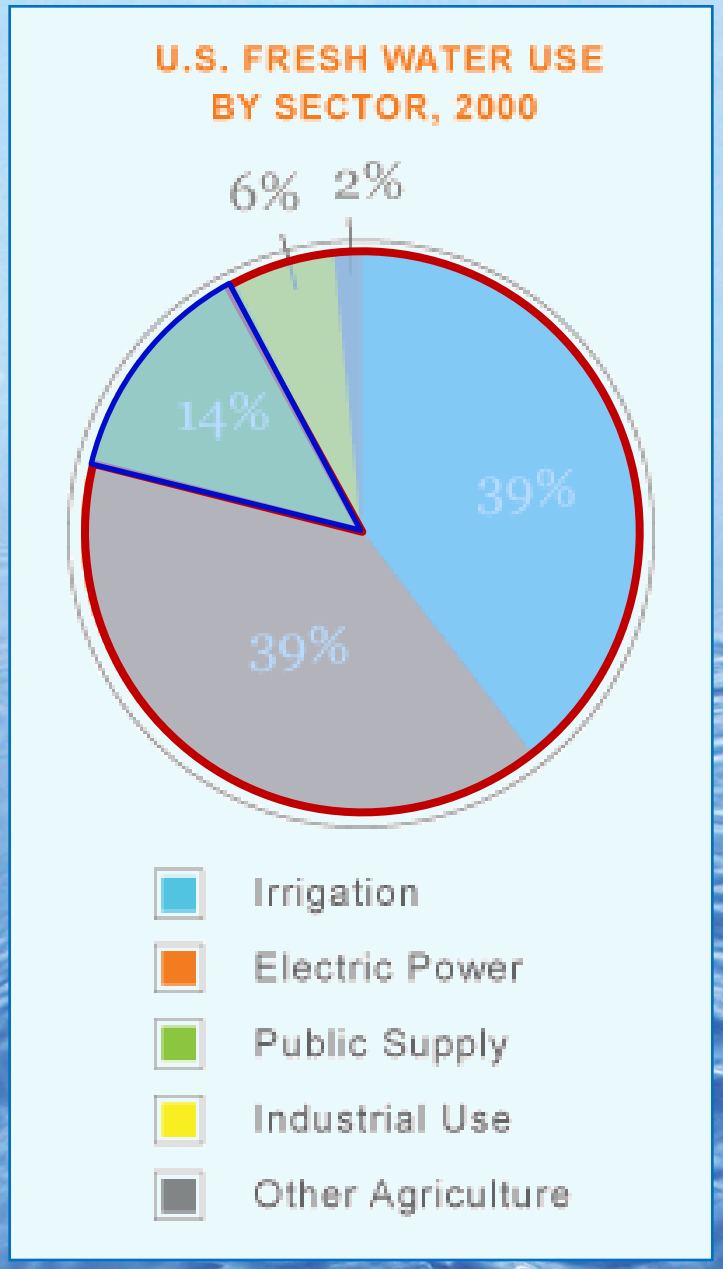


Figure 1.5. Simulated Drawdown at the Water Table, 2000-2030. Contours represent water level declines in feet.

Milwaukee on the "fresh coast," not "rust belt," says Milwaukee Mayor Tom Barrett in D.C. speech

Benefits of Reclaimed Water

Currently, the majority of all water used in the U.S. is potable water.



Reclaimed water can be used to meet a significant portion of the demand.

Potable water can be reserved for those uses that truly require it.


Alberta
Saskatchewan
Montana
North Dakota
Minneapolis
Wisconsin
Mississippi
South Dakota
Minnesota
Wyoming
Missouri
Iowa
Nebraska
Illinois
Indiana
Ohio
West Virginia
Kansas
Missouri
St. Louis
Ohio
Kentucky
Arkansas
Mississippi
Tennessee
Tennessee
Oklahoma
Memphis
Red
New Mexico
Texas
Atchafalaya
New Orleans
Gulf of Mexico
The course and watershed of the
Mississippi River
The Father of Waters
200 Miles
400 Km

Reclaimed Water

Pollution Prevention/Source Reduction

- An effective alternative to removal at treatment plant
- Increased focus for MMSD
- The business case-triple bottom line
- Requires partnerships
- Some past MMSD source reduction efforts
  - MedDrop-pharmaceuticals
  - Mercury-dental amalgam

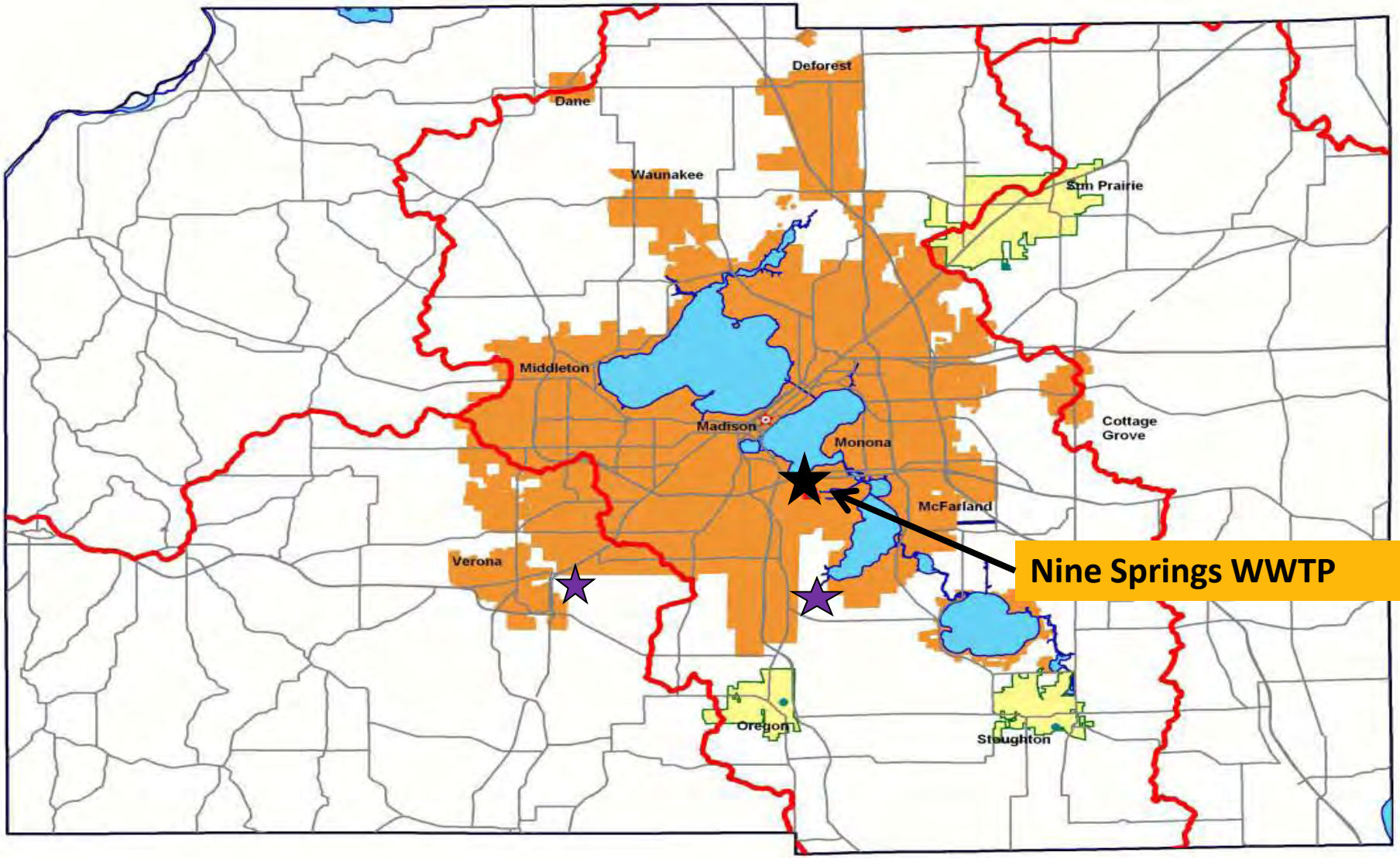
Traditional Compliance Approaches

- Independent actions
- Discharge focused solutions
- Expensive
- May not achieve desired environmental outcomes

What would this look like for MMSD?

- Build complex and expensive technology
- $79-$124 Million
- Resource intensive
- Large carbon footprint

Regional Service Area-Centralized Treatment



Watershed Adaptive Management

- Watershed based solutions
- Collaboration-pool resources and invest in lowest cost solutions
- Less reliance on traditional “brick and mortar” approaches
- Improved environmental outcomes

Yahara WINS Pilot Project Participants

Cities

Fitchburg
Madison
Middleton
Monona
Stoughton

Villages

Arlington
Cottage Grove
DeForest
Maple Bluff
McFarland
Oregon
Shorewood Hills
Waunakee

Towns

Blooming Grove
Bristol
Burke
Cottage Grove
Dunn
Middleton
Westport
Windsor

Others

CLA
Clean Wisconsin
Dane County
MG&E
MMSD
Sand County Foundation
Stoughton Utilities
USGS
WDNR
Yahara Pride Farm Group

USEPA Region 5

Other Interested Parties*

DATCP

CARPC

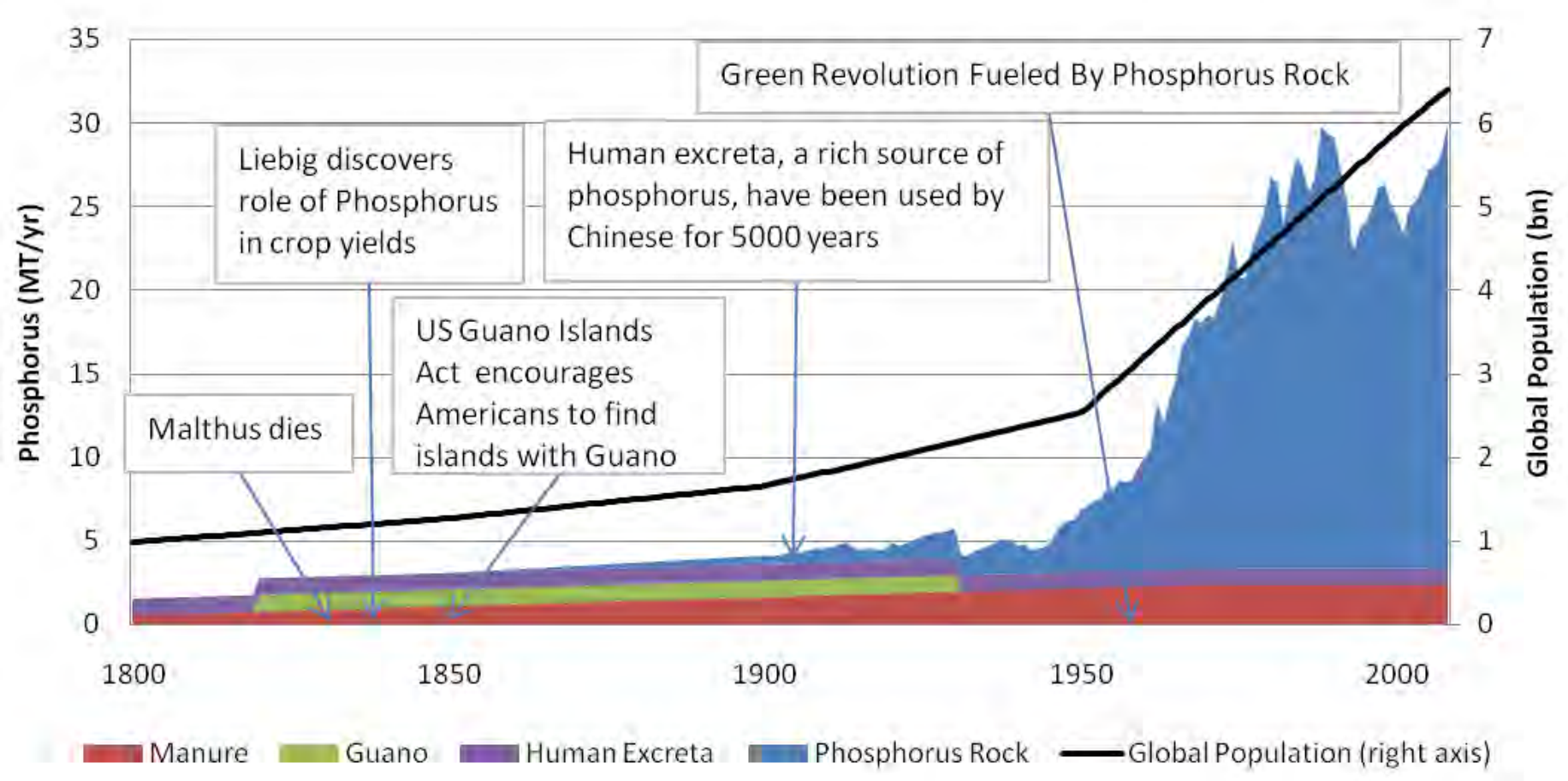
River Alliance

Yahara Lakes Association

Friend of BFC

* Periodically updated

History of Phosphorus-Based Fertilizers



Source: “The Story of Phosphorus: Global Security and Food For Thought”, Cordell, et.al.
Global Environmental Change, Volume 19, Issue 2, May 2009

Today's Phosphorus "Lifecycle"

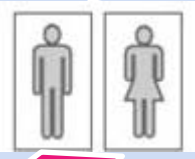
Fertilizer Production

Fertilizer Application

Phosphate Rock Mining

Production Wastewater

Food Consumption



Return to Environment

Wastewater Treatment

Future Phosphorus “Lifecycle”

Fertilizer Production

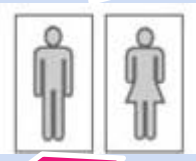
Fertilizer Application

Phosphate Rock Mining

Production Wastewater

Food Consumption

OSTARA
Creating Value from Waste



Return to Environment

Wastewater Treatment

Creating Value from Waste

Converting
Problems

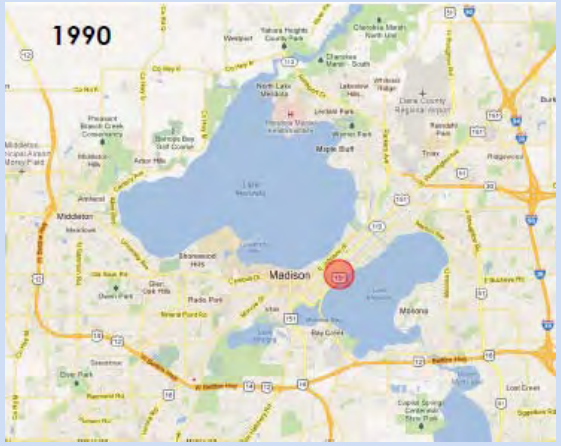
Pearl
Nutrient Recycling Process

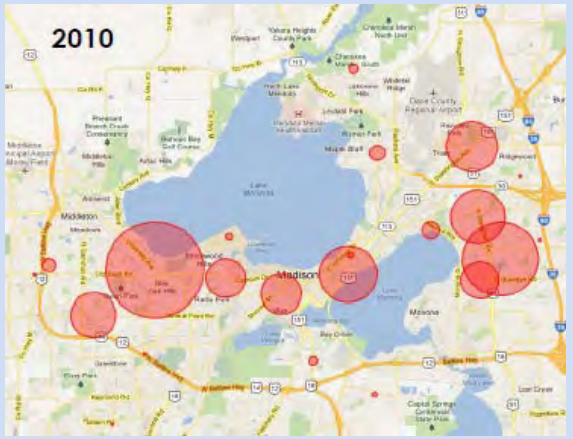
Into
Solutions


RSC Equipment Rental

Chloride Source Reduction

- A new initiative
- Goal → 15% reduction by 2015
  - Mass and concentration
- Multiple sources
  - Select industries
  - Groundwater
  - Residential softening
  - Road salt
- Success depends on partnerships

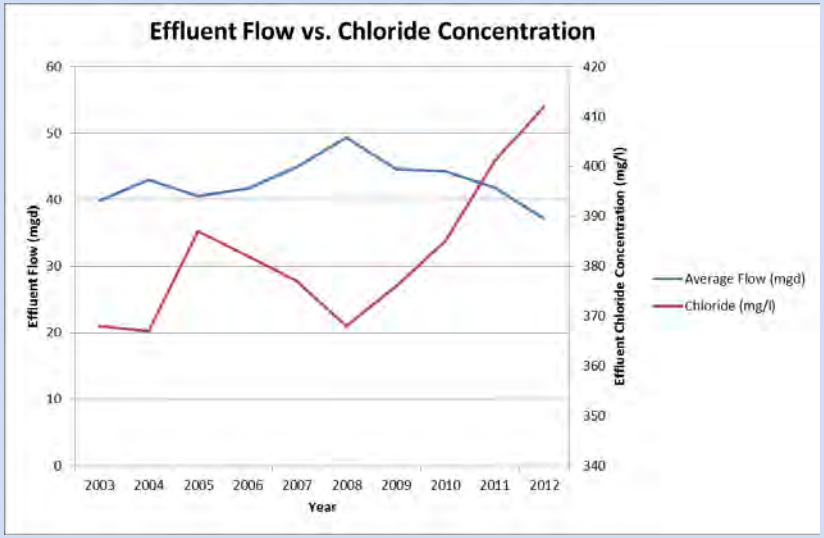


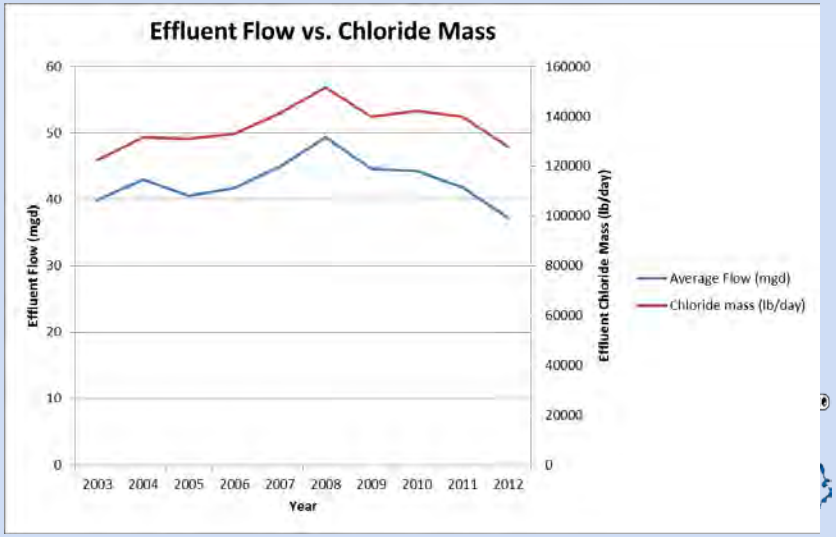


Relative levels of chloride in Madison wells (from 2011 Road Salt Report)

An interesting challenge

- **Accomplishing multiple goals**
  - **Reduce water use**
  - **Reduce chloride concentration**
  - **Reduce chloride mass**
- **Historical effluent trends**
  - **Concentration inversely related to flow**
  - **Mass directly related to flow**





Madison Metropolitan Sewerage District Protecting public health and the environment

TOO MUCH SALT IS BAD FOR YOUR BODY. IT'S ALSO BAD FOR OUR BODIES OF WATER.

Tired of carrying 40-pound bags of salt to your water softener? Here's a reason to lighten the load on your back. Our wastewater plant receives over 200,000 pounds of salt each day — that's 5,000 bags of salt. Our treatment processes cannot remove salt; one teaspoon of salt in five gallons of water has been shown to be harmful to aquatic life. Here's how you can lighten the load on you and our environment:

- **Schedule a water softener tune up**
- **Minimize your use of deicing salt on sidewalks and drives**

To learn more about chloride in the environment and how to use less salt, visit our web page:
madsewer.org/ChlorideQuestions

Madison Metropolitan Sewerage District
Protecting public health and the environment.

Contact me:

D. Michael Mucha
Madison Metropolitan Sewerage District
michaelm@madsewer.org
608-222-1201 (ext 242)