

2008 Genesee Lakes Flooding: Issues Alternatives Organizations

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Plans and Research

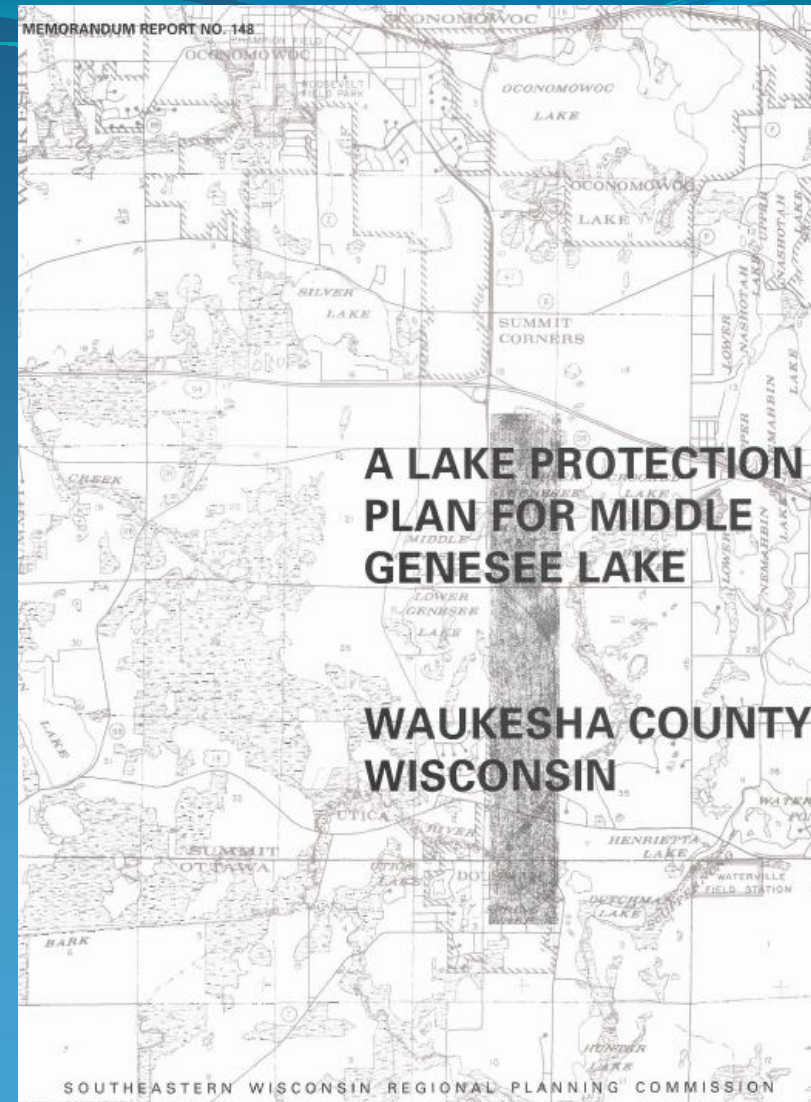
Lake Protection Plan for Middle Genesee Lake

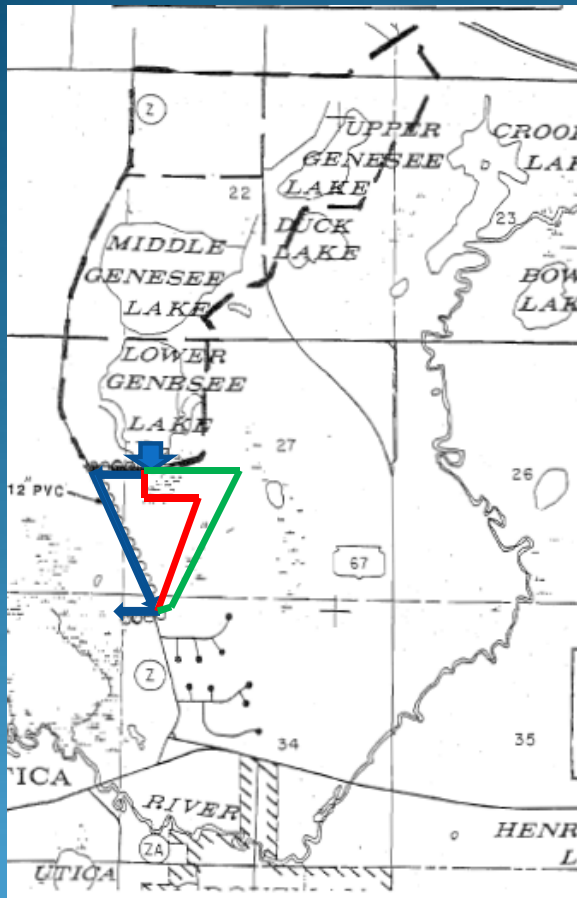
Simulation of the Shallow Hydrologic System in the Vicinity of
Middle Genesee Lake

SEWRPC Historic Involvement with the Genesee Lakes



www.sewrpc.org





Initial concerns regarding high lake levels were addressed during 1987 with proposals to convey “excess” water to the Bark River

Costs of construction were revised in 1993

The alternatives were incorporated into the Lake Protection Plan for Middle Genesee Lake, published during 2003

A modified version of one of these alternatives was implemented by the Town of Summit during 2008



Fixed Crest Overflow Structure -- The “Morning Glory Spillway”



Note: Implementation would require
WDNR permits pursuant to Ch. 30
and 31, Stats.

Source: Davis Wiki

USGS Historic Involvement with the Genesee Lakes



<http://wi.water.usgs.gov>

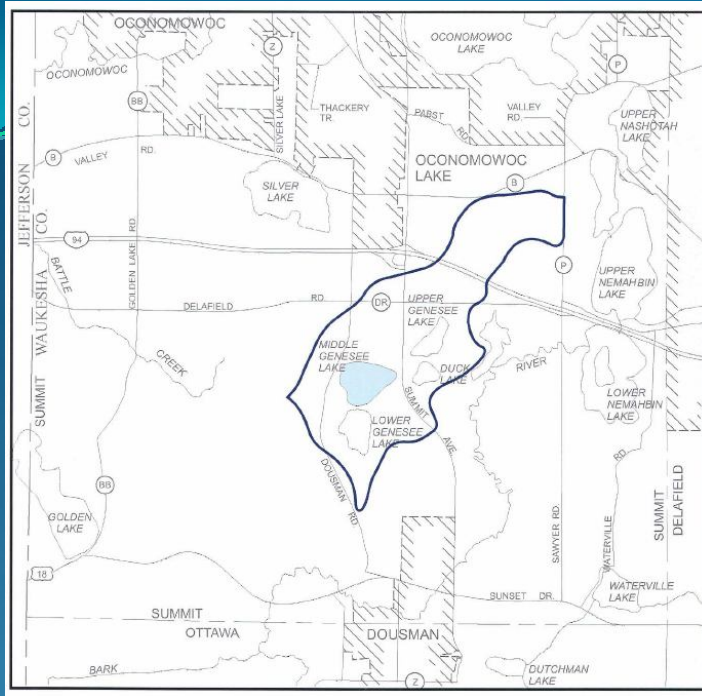
U.S. Department of the Interior
U.S. Geological Survey

Simulation of the Shallow Hydrologic System in the Vicinity of Middle Genesee Lake, Wisconsin, Using Analytic Elements and Parameter Estimation

Water-Resources Investigations Report 00-4136

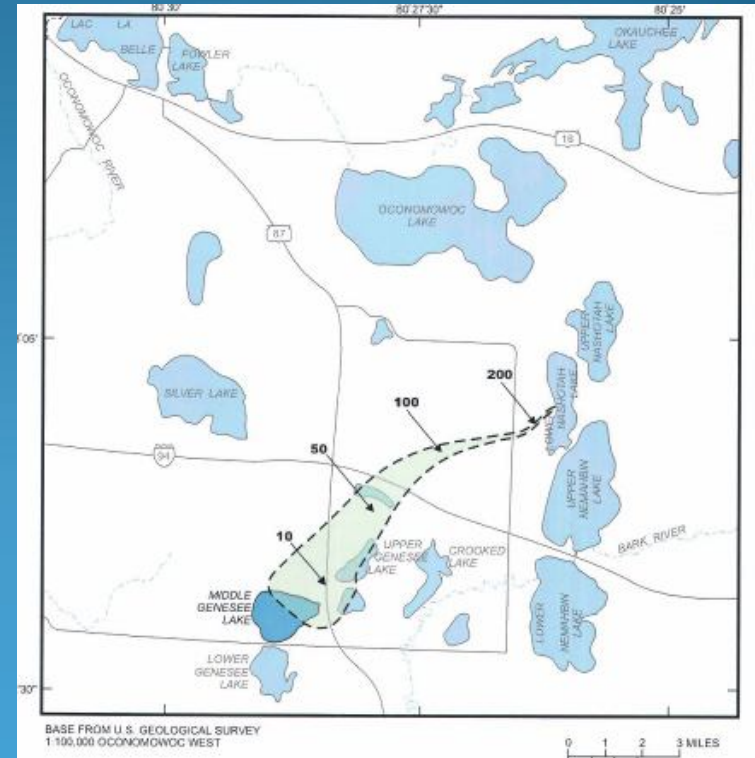


Prepared in cooperation with the
Middle Genesee Lake Management District
Wisconsin Department of Natural Resources



← Surface Drainage Pattern

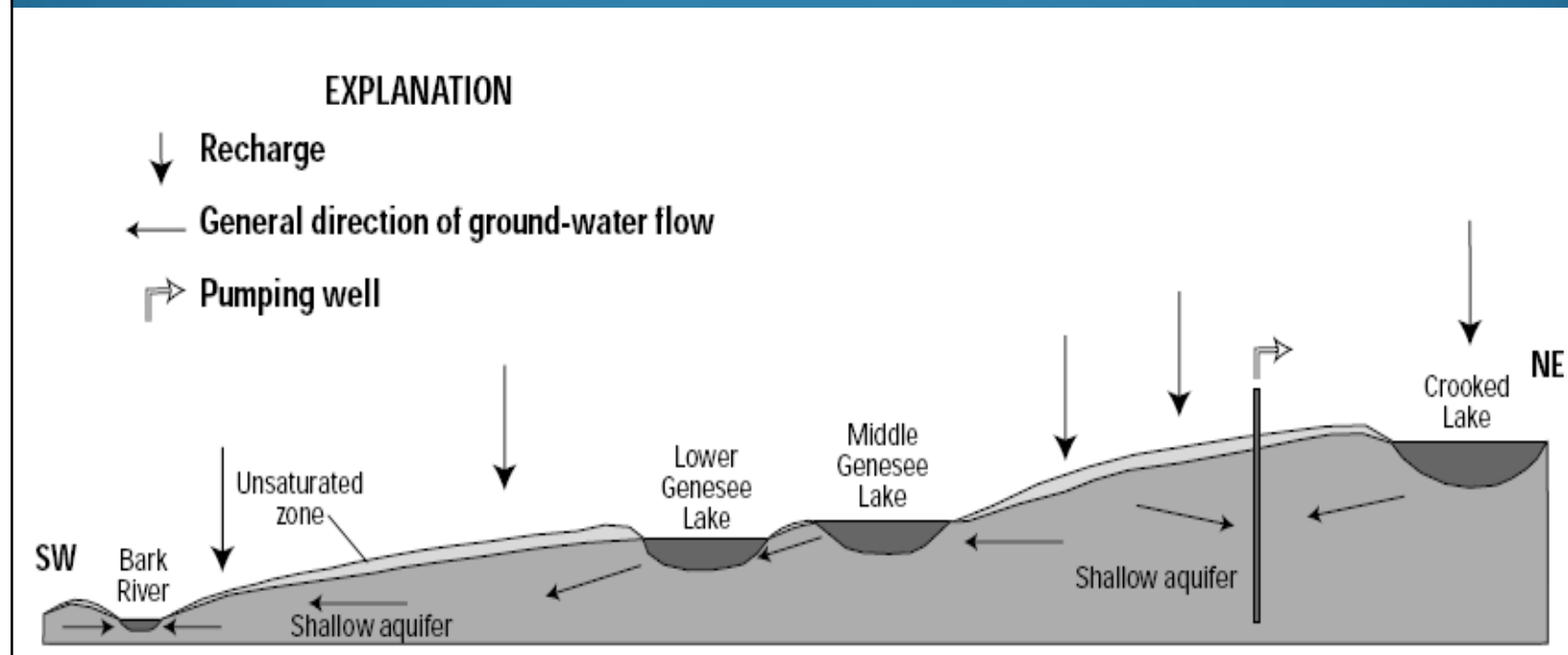
↓ Groundwater Flow Pattern



Results of the
Research and
Planning

Groundwater movement

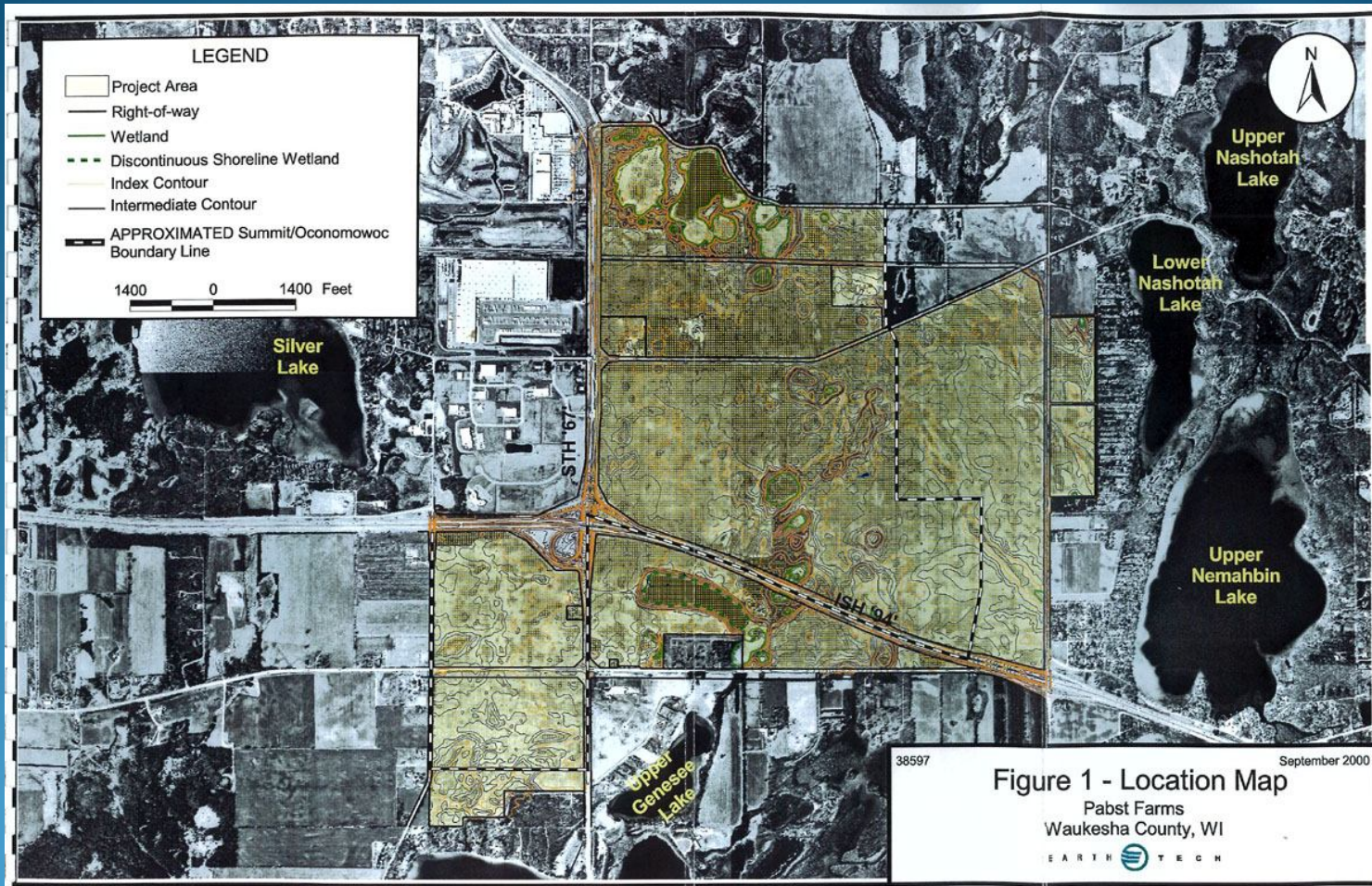
- Groundwater discharges to the southwest
- Groundwater and surface water patterns are similar



Pabst Farms

Pabst Farms Joint Stormwater District

Pabst Farms Joint Storm Water District Area



Projects to the North

Pabst Farms Development

- Pabst Farms Conceptual Storm Water Management Plan
- Technical Advisory Group (TAG). Members of the Group: City of Oconomowoc, Town of Summit, Waukesha County, WDNR, SEWRPC, WISPARK, Pabst Farms, Earth Tech
 - Key concepts
 - o Maintain the existing hydrology of the site
 - o Maximize infiltration
 - o Treat storm water before discharging
- All projects designed within the Pabst Farms District have been designed to the technical standards based on the final Pabst Farms Conceptual Storm Water Management Plan.

Projects to the North (continued)

Aurora project

- Town required additional study of groundwater effects
- GZA study conclusions
 - A west-southerly groundwater flow direction predominates the local groundwater flow pattern. Therefore, Upper and Middle Genesee Lakes are not directly down gradient of the Site and do not receive recharge from water that infiltrates the Site.
 - Storm water discharge into the reconfigured Pond will not result in significant water level changes in nearby lakes, including Upper and Middle Genesee Lakes.
 - The effect of change in infiltration over the Site as a result of Site development will not result in significant water level changes in the groundwater system and nearby lakes.

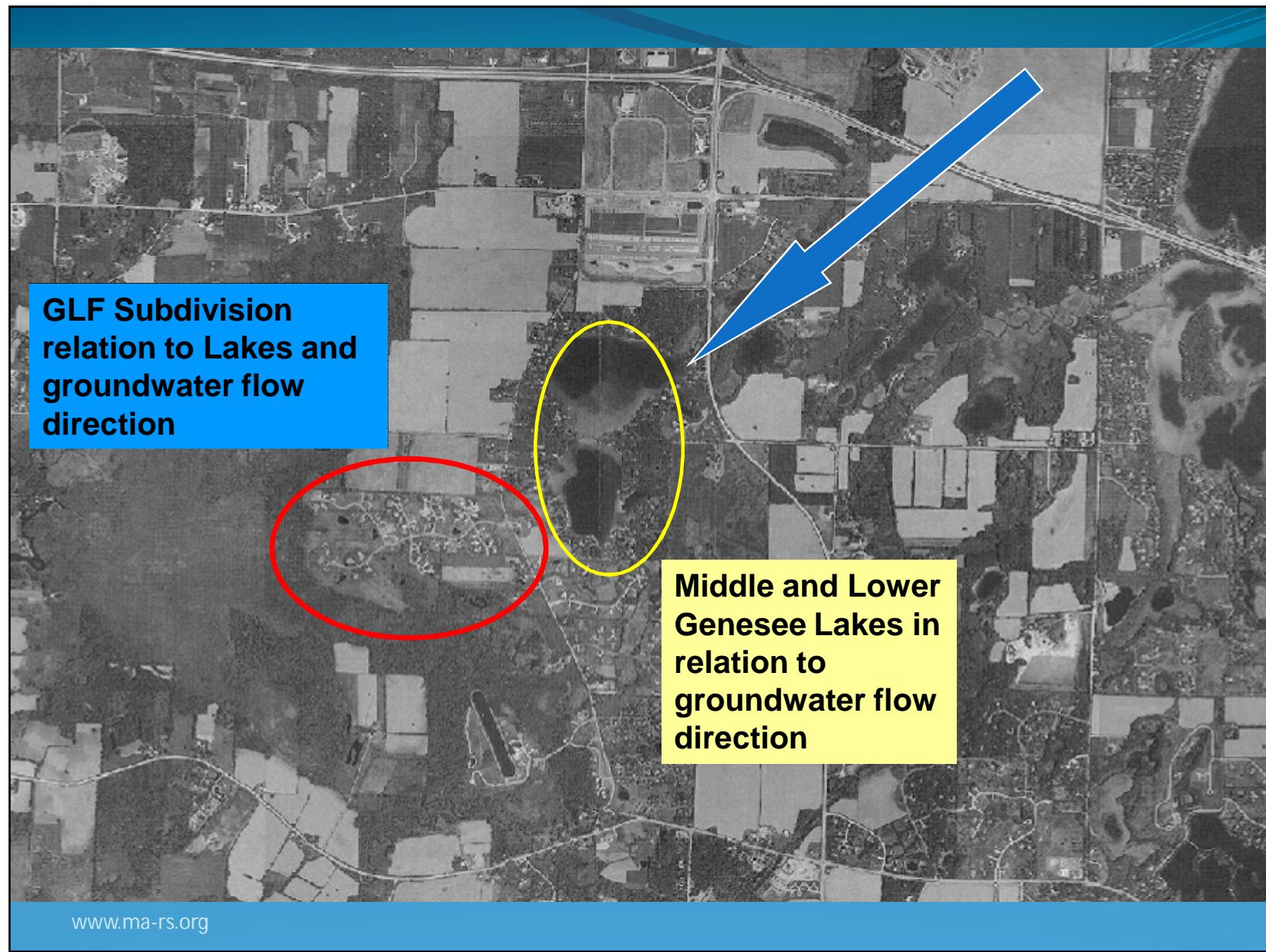
Projects to the North (continued)

Other projects outside of Pabst Farms

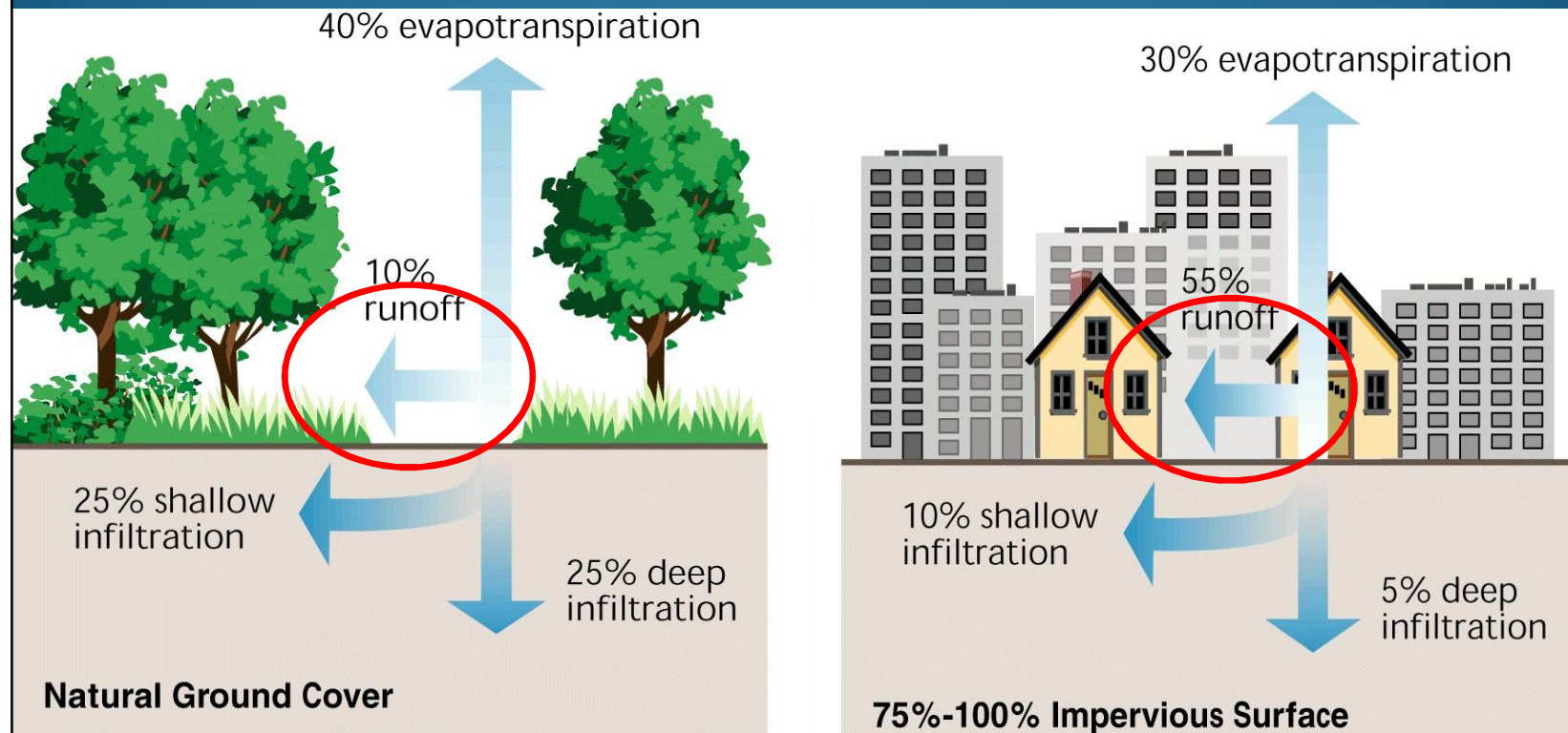
- Brightwater Subdivision
- Summit Village Commons
 - Used technical standards of Pabst Farms

Summary

- The Genesee Lakes are seepage lakes
- Groundwater enters and leaves the Lakes as shallow groundwater flows
- Groundwater flow is to the SW
- Lake and subdivision water levels are related



Managing changes to the water balance produced by development



The June 2008 Floods

USGS Investigation of the June 2008 Regional Floods



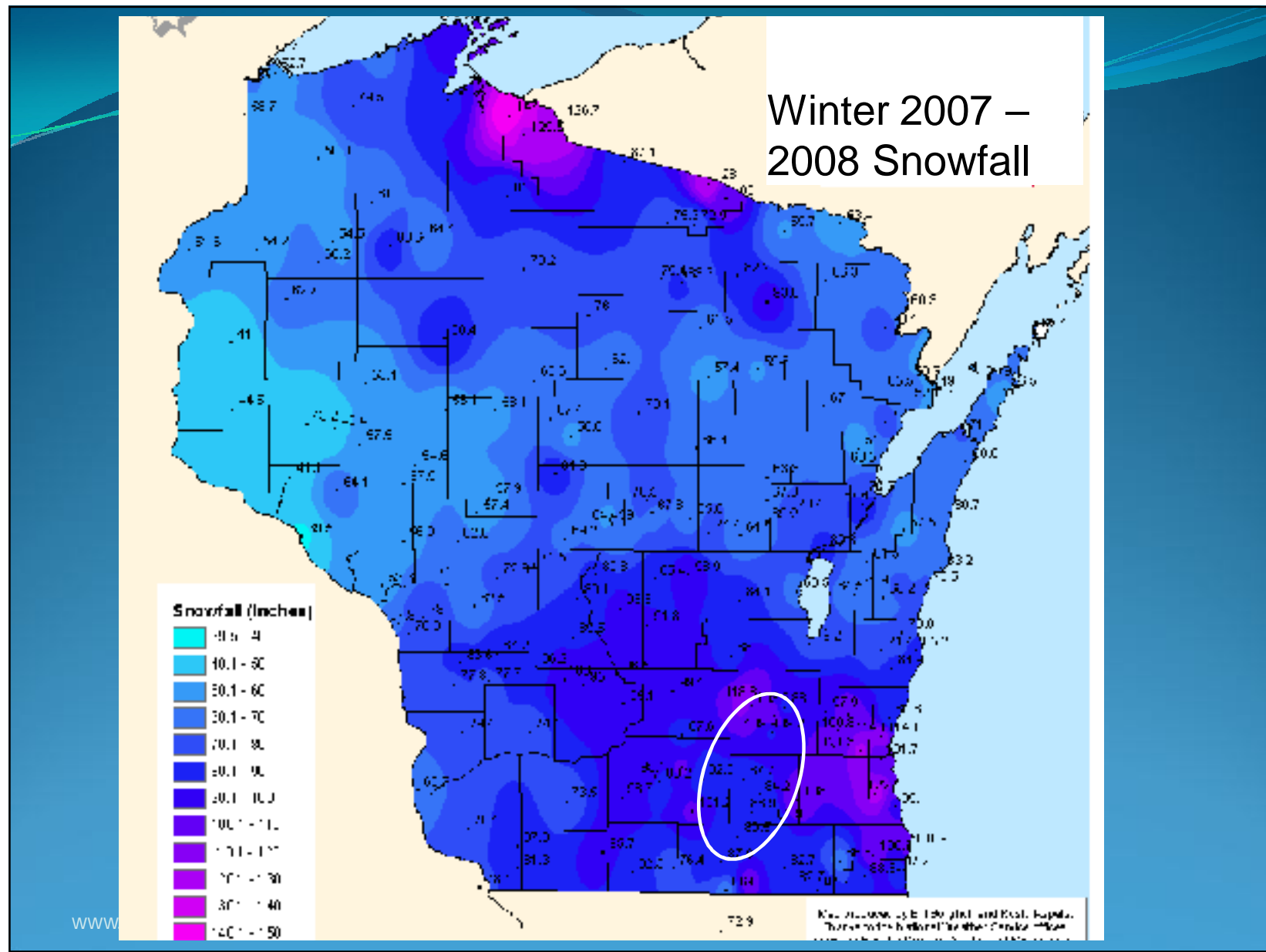
Prepared in cooperation with the Federal Emergency Management Agency

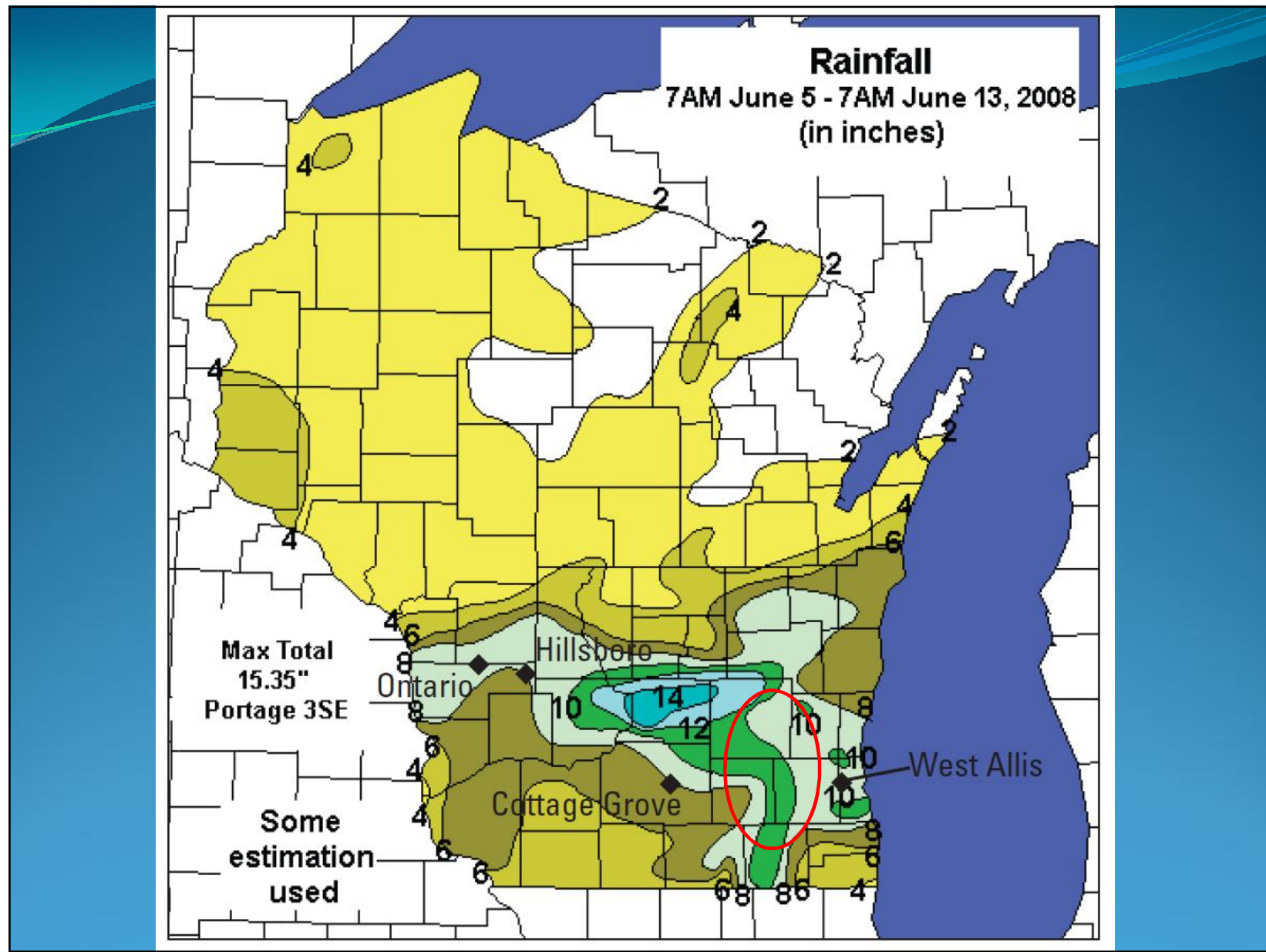
Flood of June 2008 in Southern Wisconsin



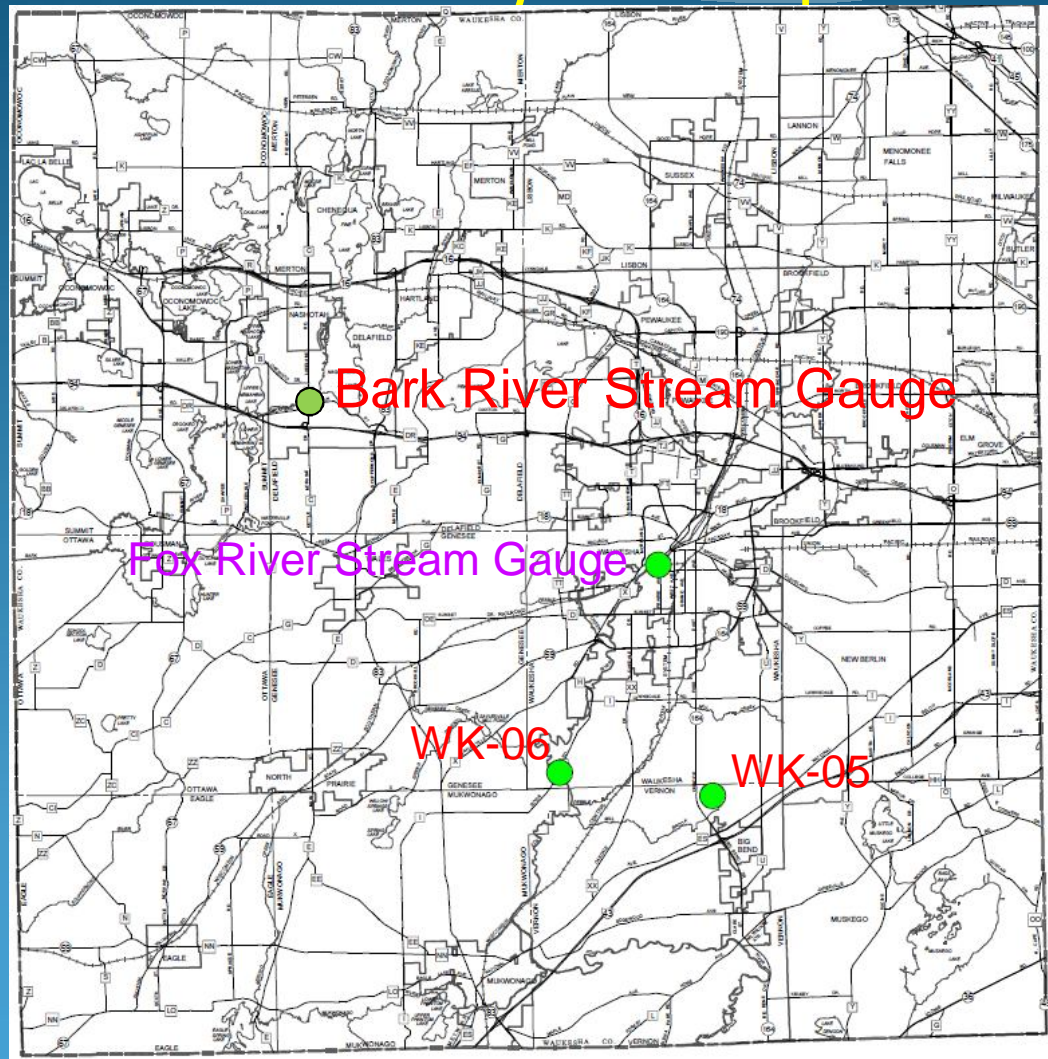
Scientific Investigations Report 2008–5235

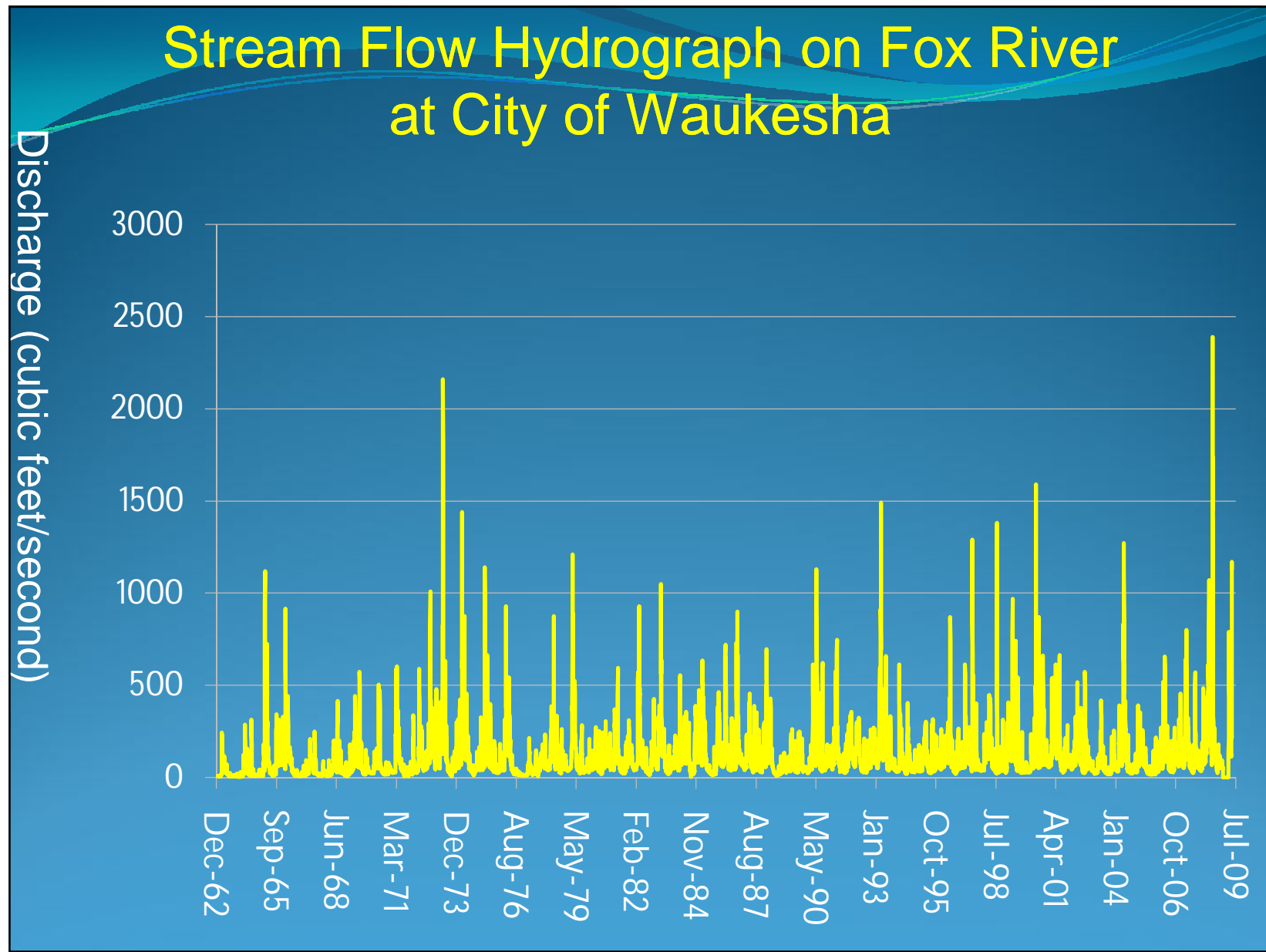
U.S. Department of the Interior
U.S. Geological Survey

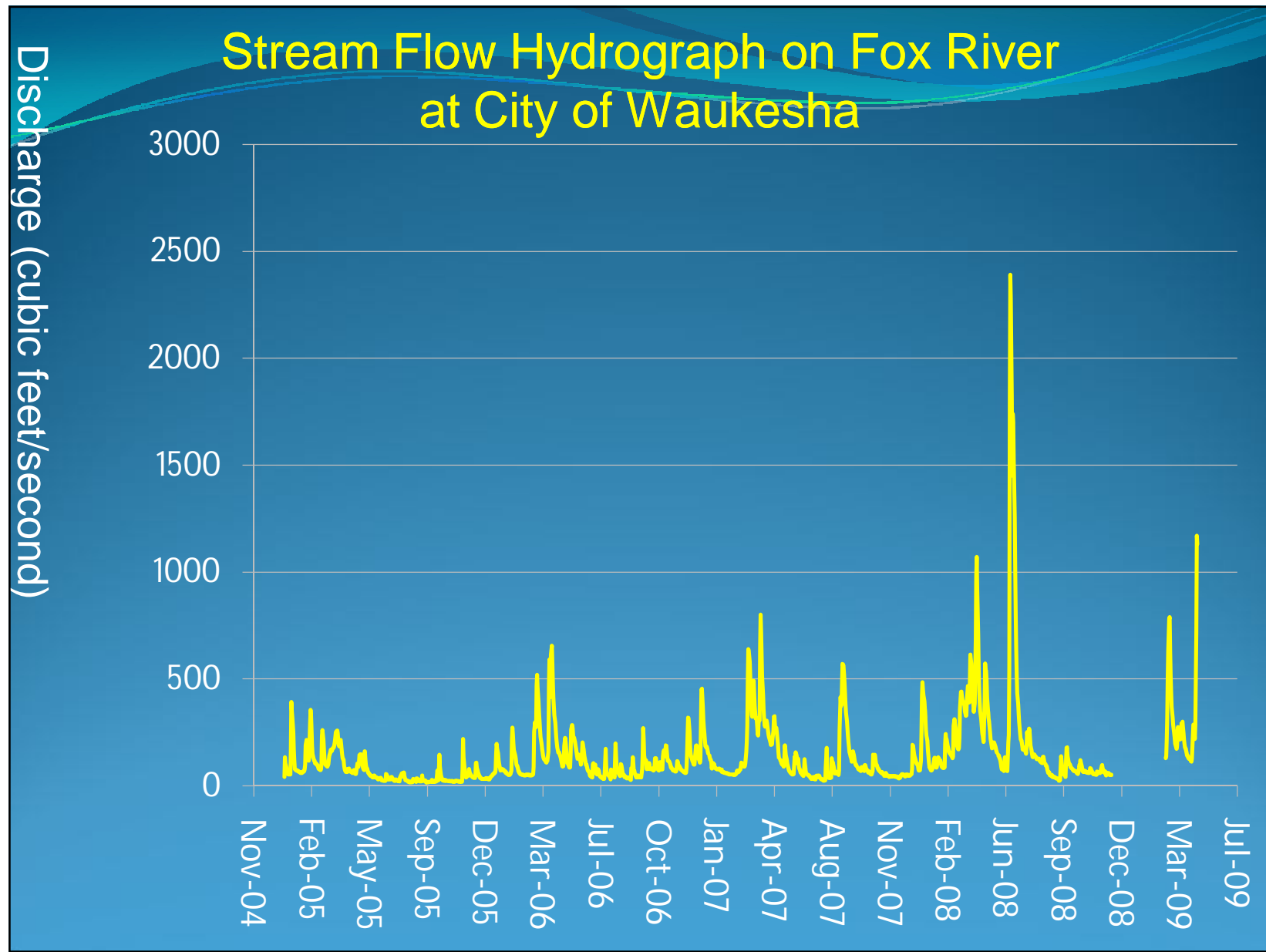




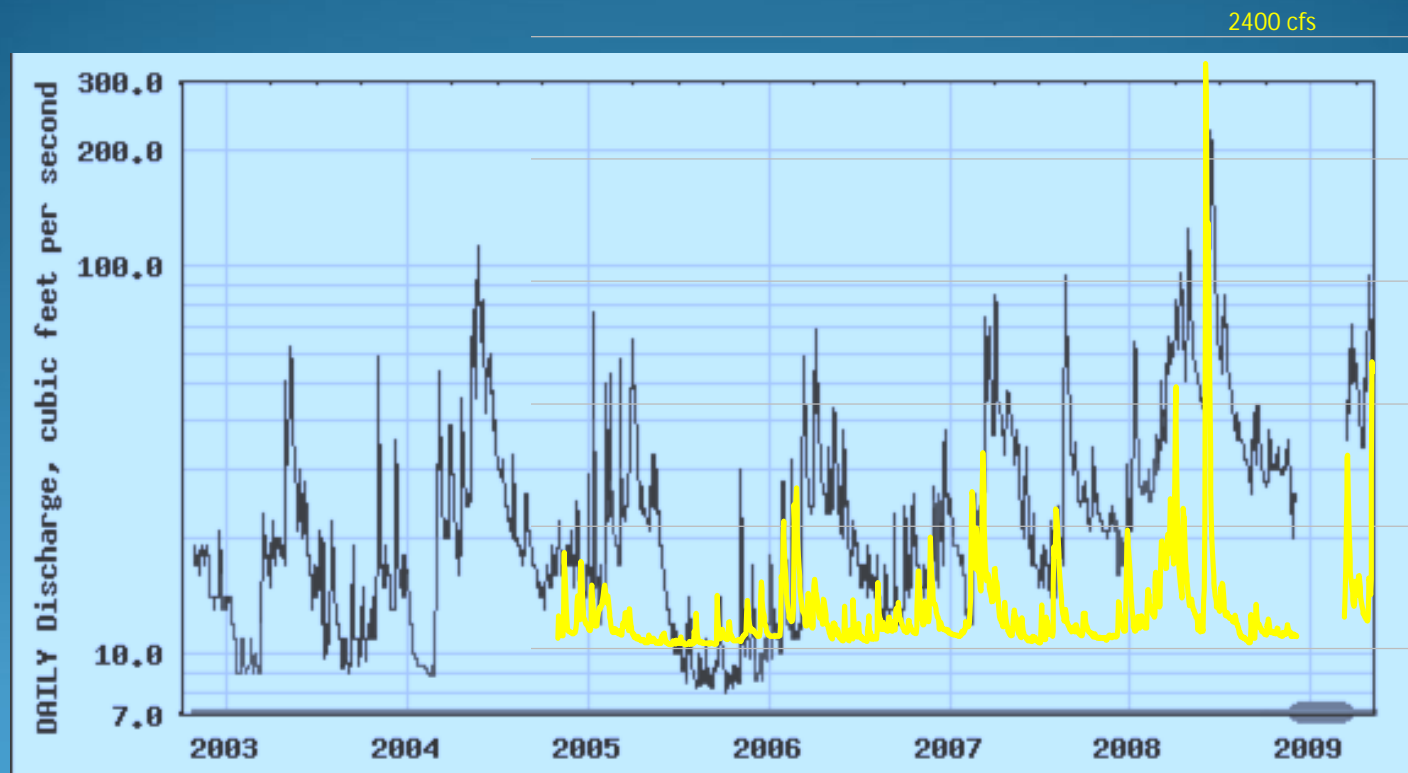
Waukesha County site map

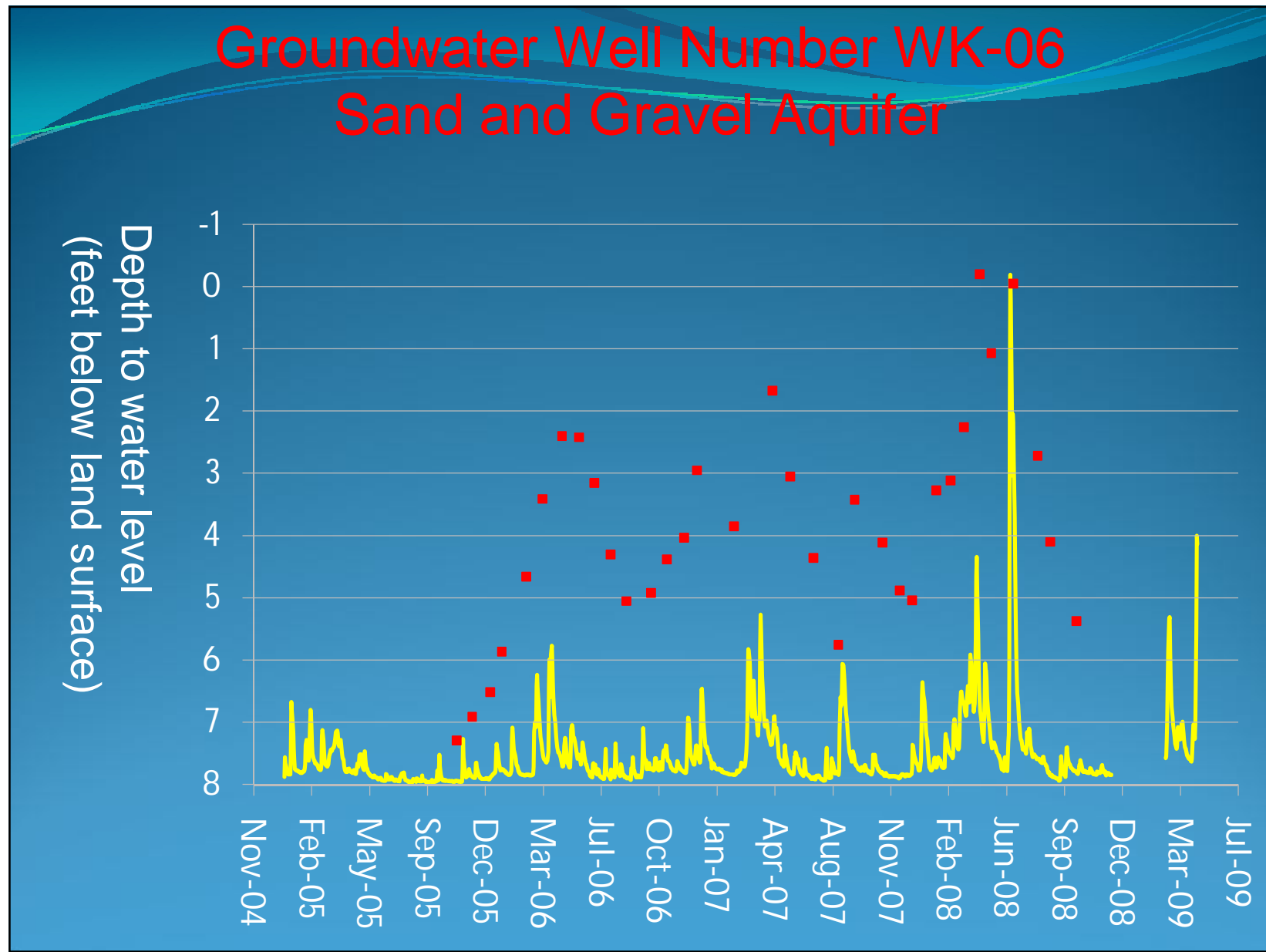


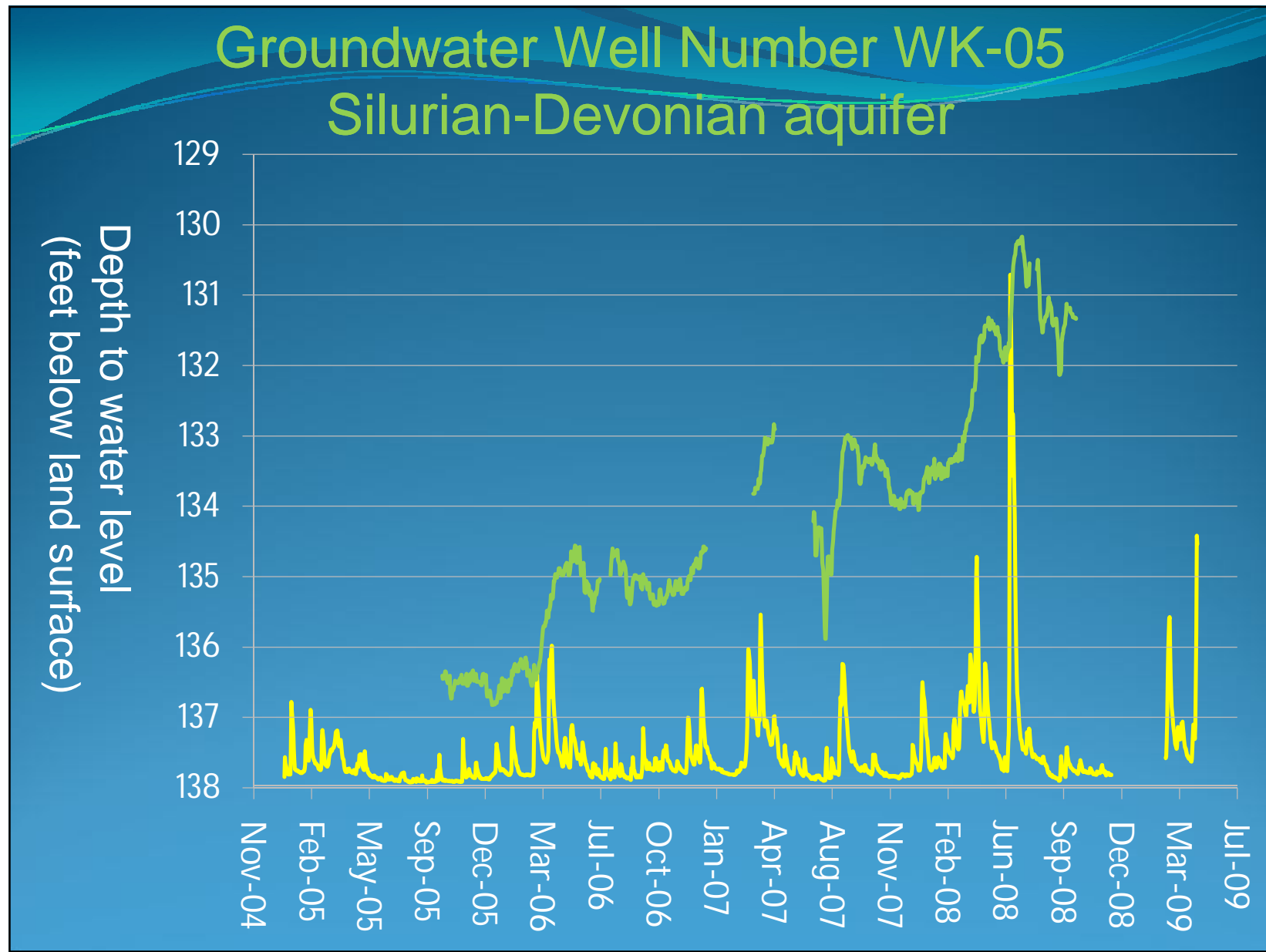


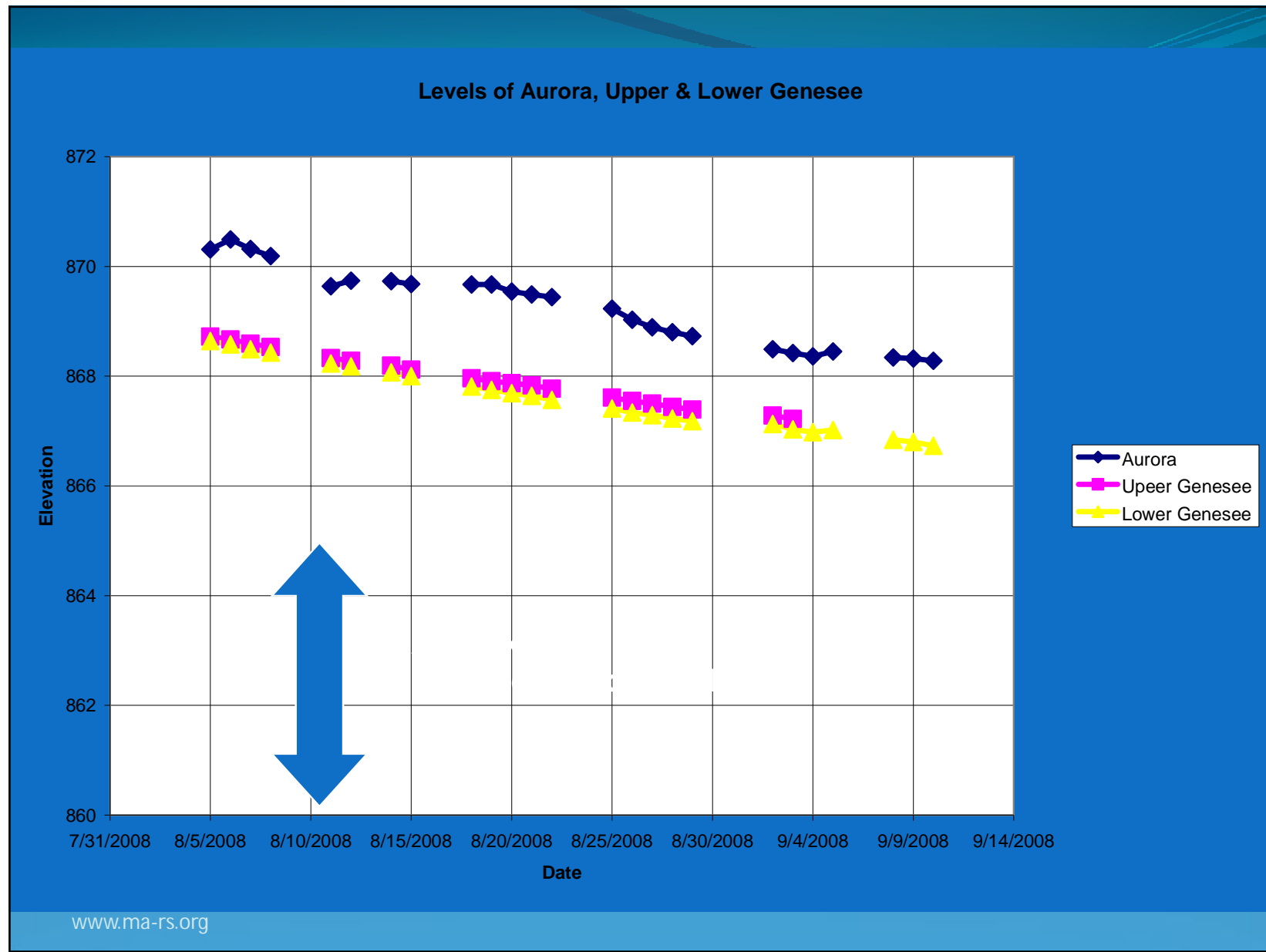


Stream Flow Hydrograph on Bark River at City of Delafield









Prognosis

Likelihood of further extreme events

5 of top 10 rainfalls have occurred since 2000

Top 10: 24-hour Precipitation Records

MKE Records: 1871-present

TOP 10 24 HOUR PRECIPITATION AMOUNTS AT MILWAUKEE...

VALUE	DATES
1. 6.84 INCHES	8/5/1985 TO 8/6/1986
2. 5.76 INCHES	6/22/1917 TO 6/23/1917
3. 5.70 INCHES	6/7/2008 TO 6/8/2008
4. 5.28 INCHES	9/7/1941 TO 9/8/1941
5. 5.24 INCHES	6/20/1997 TO 6/21/1997
6. 4.93 INCHES	6/7/2008
7. 4.69 INCHES	6/21/1940 TO 6/22/1940
8. 4.42 INCHES	7/2/2000
9. 4.35 INCHES	7/17/1959 TO 7/18/1959
10. 4.05 INCHES	7/31/1953 TO 8/1/1953

MSN Records: 1879-present

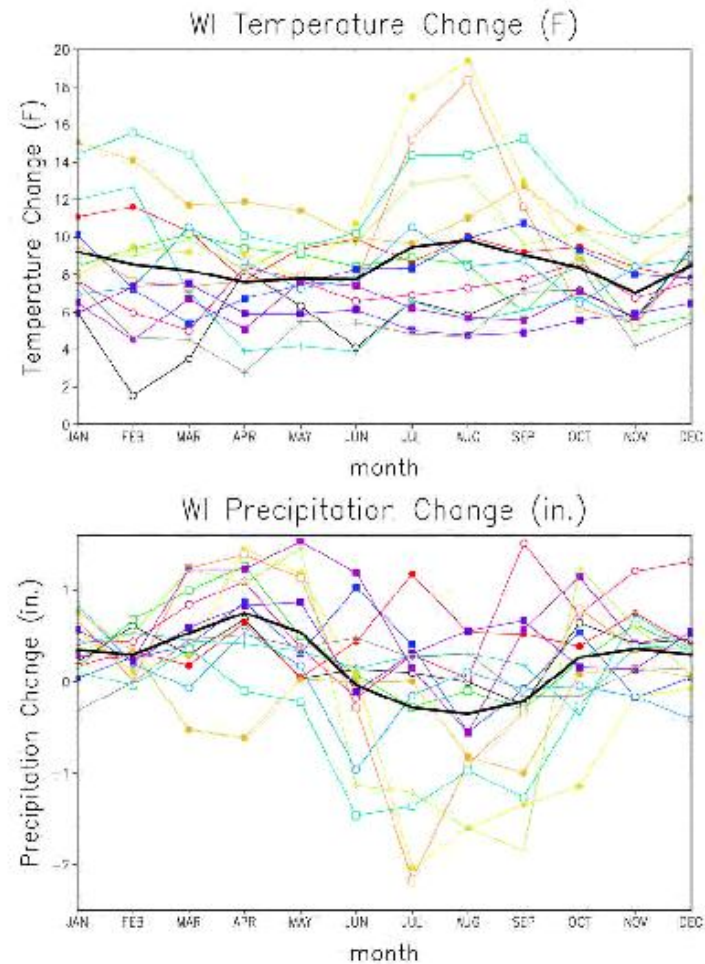
OUR PRECIPITATION AMOUNTS AT

VALUE	DATES
1. 5.31 INCHES	9/7/1941 TO 9/8/1941
2. 5.27 INCHES	6/7/2008 TO 6/8/2008
3. 5.20 INCHES	9/12/1916 TO 9/13/1916
4. 5.00 INCHES	8/18/2007 TO 8/19/2007
5. 4.51 INCHES	6/17/1996
6. 4.38 INCHES	5/21/2004 TO 5/22/2004
7. 4.32 INCHES	7/21/1881
8. 4.21 INCHES	7/15/1950 TO 7/16/1950
9. 4.11 INCHES	6/8/2008
10. 3.95 INCHES	6/1/2001 TO 6/2/2001

Aug 18, 2007
Vernon 11.75 INCHES
LaCrosse 10.95 INCHES

Change in Wisconsin
temperature and precipitation
predicted by 15 climate models
(2080-2099 minus 1980-1999).

(The average model change is
shown by the thick black line.)

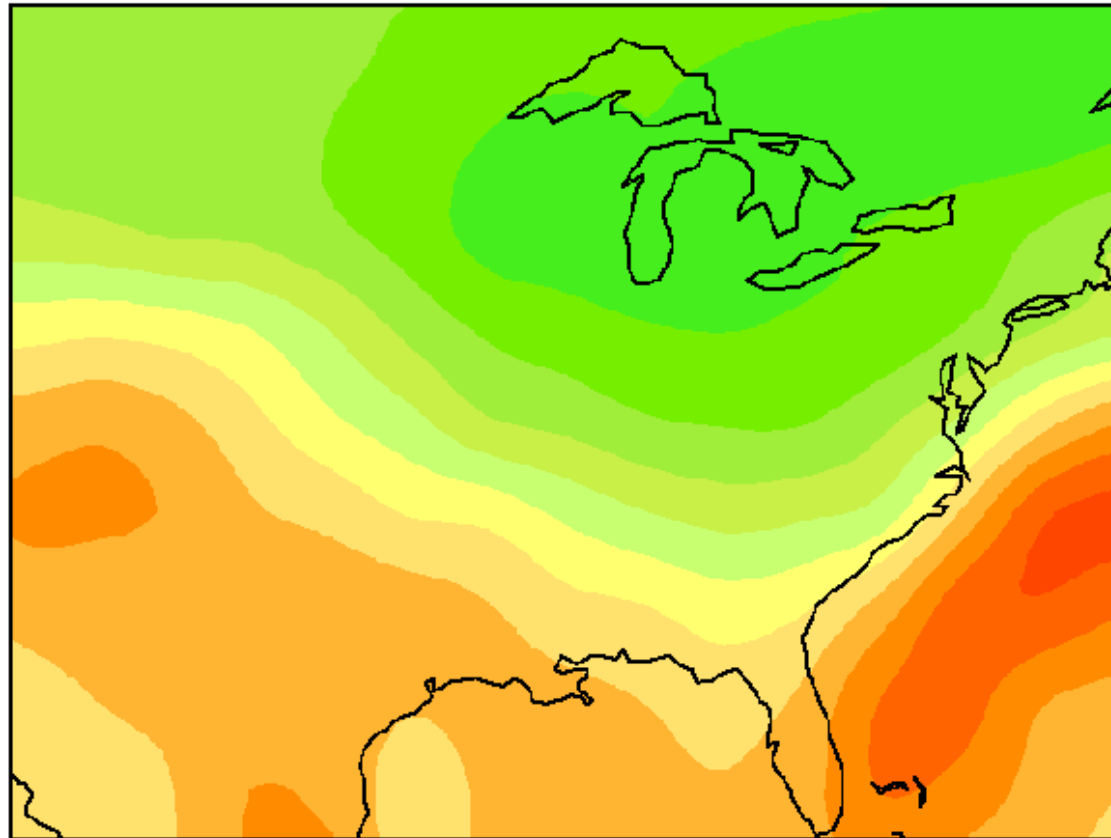


Courtesy of Dave Lorenz

Projected Spring Precipitation Change

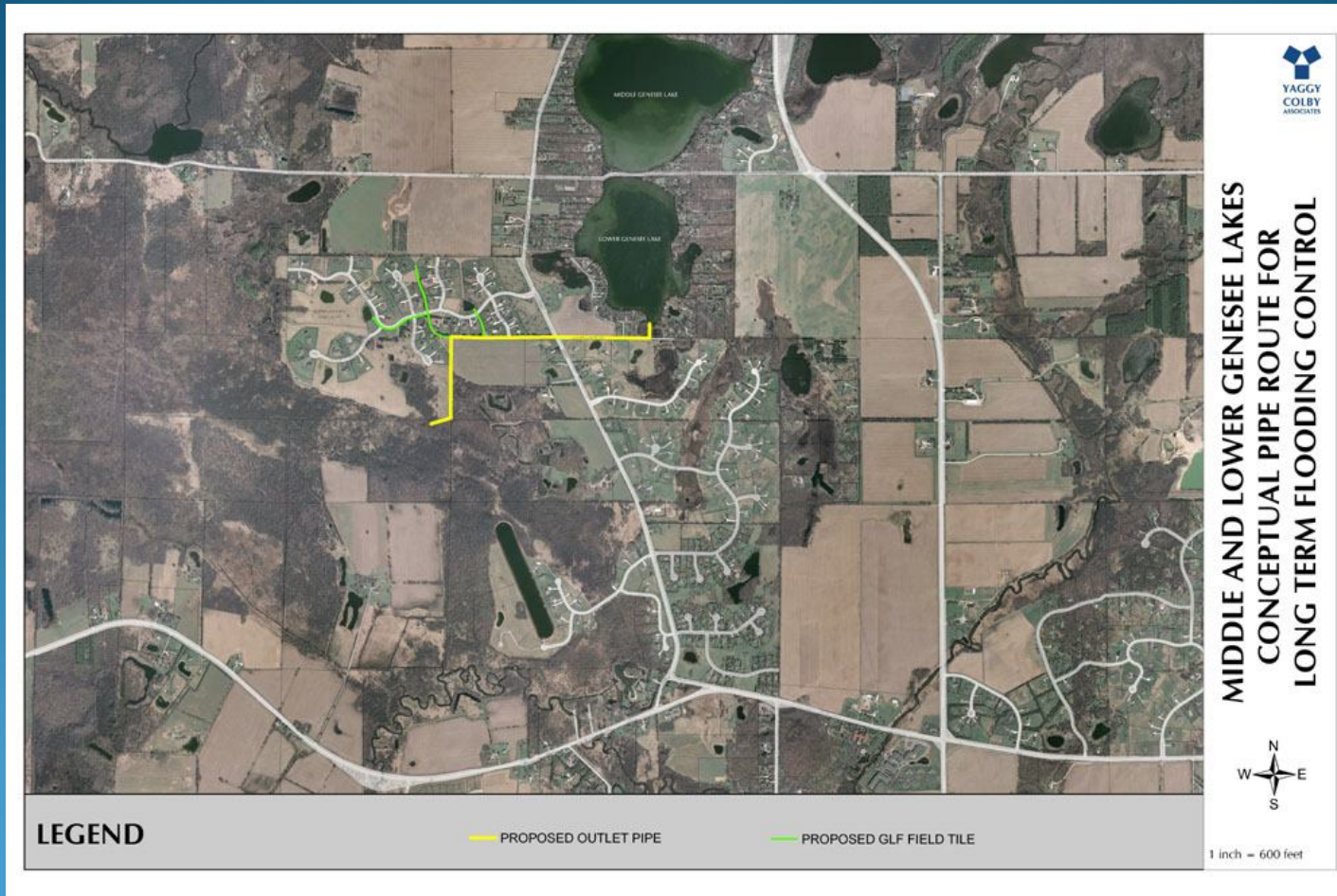
IPCC: Delta pr (mm/day) MAM, 20 Model Vecr

-0.50 -0.40 -0.30 -0.20 -0.10 0.00 0.10 0.20 0.30 0.40 0.50

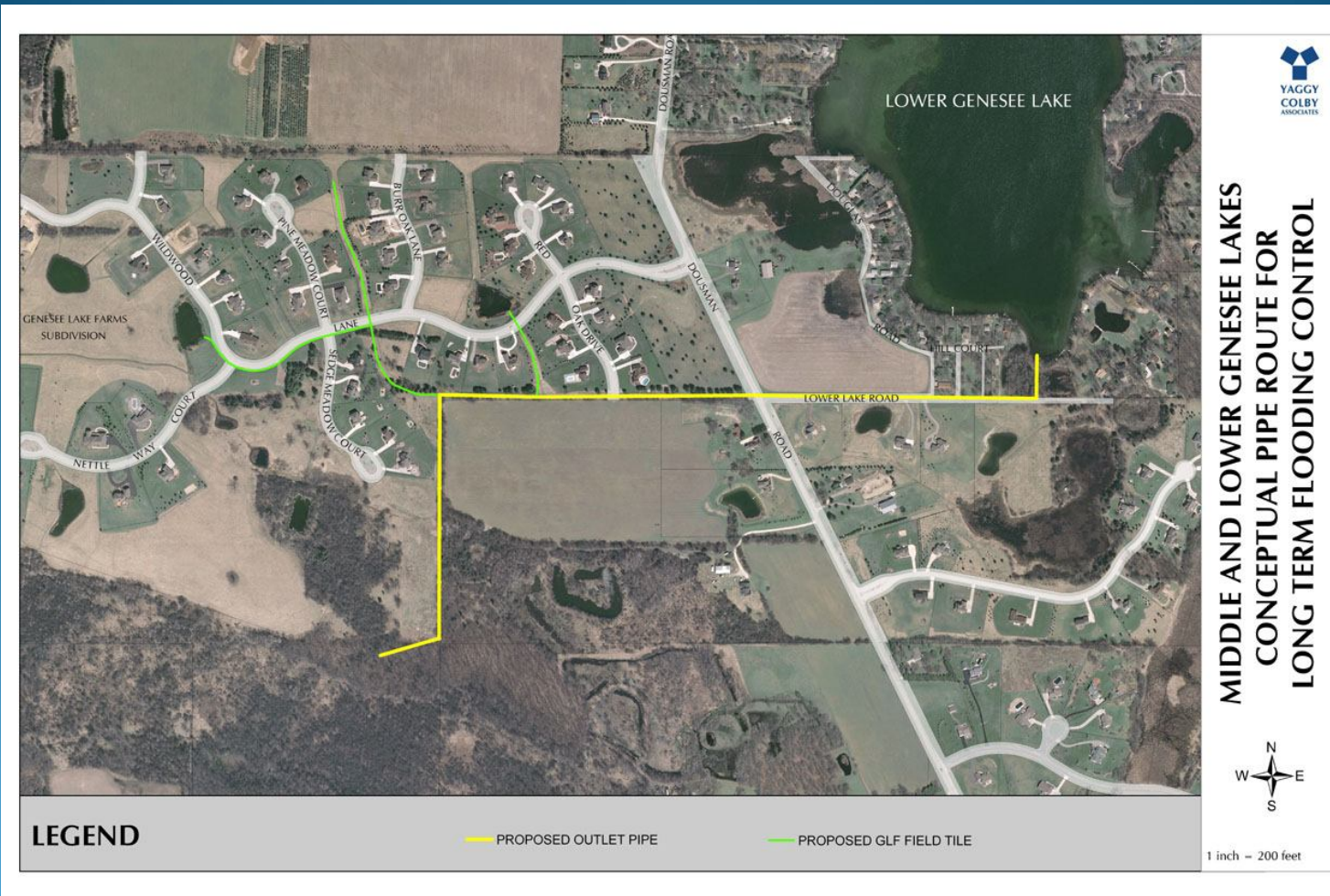


Proposed Response

Outlet Route Overall



Outlet Route



Opinion of Probable Cost

Lower Genesee Lake Outlet Project

8/28/2008

Town of Summit

OPINION OF PROBABLE COST

Genesee Lake Outlet - Primary Piping (from LGL to wetlands)

	AMOUNT	UNIT	DESCRIPTION	UNIT COST	TOTAL COST
Storm Sewer	2,900	LF	15" ABS STORM SEWER	\$65.00	\$188,500
	2,150	LF	18" ABS STORM SEWER	\$75.00	\$161,250
	10	EA	48" STORM MANHOLE	\$2,500.00	\$25,000
	1	EA	OUTLET STRUCTURE IN LOWER GENESSEE LAKE	\$7,500.00	\$7,500
	1	EA	18" END SECTION WITH ENERGY DISSIPATION	\$1,500.00	\$1,500
Pavement Restoration	1,400	SY	PAVEMENT RESTORATION	\$20.00	\$28,000
Easement Acquisition	1	EA	ADDITIONAL EASEMENTS NEEDED TO CONSTRUCT STORM SEWER	\$7,500.00	\$7,500

SUBTOTAL

\$419,250

Genesee Lake Farms Field Tile portion of project

Field Tile	2,900	LF	12" FIELD TILE	\$60.00	\$174,000
	5	EA	48" STORM MANHOLE	\$2,500.00	\$12,500
	1	EA	OUTLET STRUCTURE IN DETENTION BASIN & RESTORATION	\$5,000.00	\$5,000
Pavement Restoration	230	SY	PAVEMENT RESTORATION	\$20.00	\$4,600

SUBTOTAL

\$196,100

COMBINED PROJECTS

\$615,350

CONTINGENCIES/ENG/LEGAL (25%)

\$153,838

TOTAL OPINION OF COST

\$769,188

Grant Information

Grants applied for to aid in the cost of designing and constructing a long-term flood control system for the Genesee Lake System:

1. Pre-Application for the State of Wisconsin, Wisconsin Division of Emergency Management, Section 404-Hazard Mitigation Grant Program (HMGP);

- This program makes grants available to state and local governments to implement cost-effective and long-term mitigation measures following a major disaster declaration. The amount of funding available is a percentage of total disaster costs and therefore will vary with each disaster.
- Status – the Town submitted the grant in September, 2008. The Town received notification earlier this year that it had **not** received the grant.
- An approved hazard mitigation plan is required to be eligible for these funds (Waukesha County is in the process of obtaining this approval).
- There is an annual program that the Town could apply for but needs to wait until Waukesha County has an approved hazard mitigation plan.

2. Community Development Block Grant-Emergency Assistance Program (CDBG-EAP);

- This grant is administered and applied for by Waukesha County. The Town of Summit submitted their application to the County to be included in the overall submittal for funding.
- Status – This grant was submitted in March, 2009. The application is still under review by the Division of Housing and Community Development – Department of Commerce. The timeline for receiving notice is unknown.

Organizational Options

Organizational Alternatives for Water Resources Management



<http://www.uwsp.edu/uwexplakes>

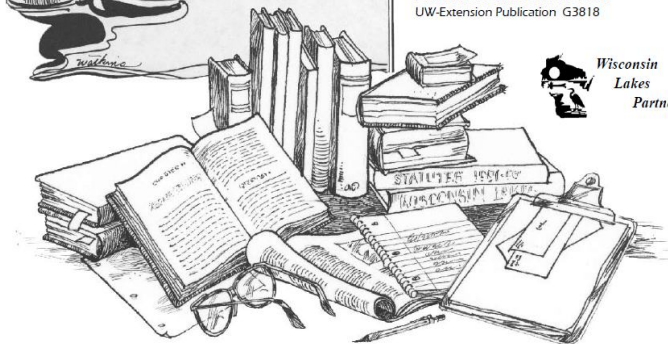
People of the Lakes A Guide for Wisconsin Lake Organizations



Lake Associations
& Lake Districts

11th Edition - 2006

DNR Publication PUB-FH-821-2006
UW-Extension Publication G3818



Institutional Options for Stormwater Management

- Town of Summit
- Alternatives
 - Town Sanitary District: Chapter 60, Subchapter IX, Stats.
 - Special Assessment District: Chapter 66, Subchapter VII, Stats.
 - Utility District: Chapter 66, Subchapter VIII, Stats.
- Role of Lake Districts
 - Lake Management District: Chapter 33, Subchapter IV, Stats.

Town Sanitary District: Chapter 60, Subchapter IX, Stats.

Establishment

- At least 51% of the persons owning land or the owners of at least 51% of the land within the limits of the territory proposed to be organized into a town sanitary district may petition the town board for the establishment of a town sanitary district. ...[60.71(2)]
- The town board may establish **one or more town sanitary districts** under this section. [60.71(1)]

Powers

- The commission may project, plan, construct and maintain a water, solid waste collection and sewerage system, including **drainage improvements**, sanitary sewers, **surface sewers or storm water sewers**, or all of the improvements or activities or any combination of them necessary for the promotion of the public health, comfort, convenience or welfare of the district. ...[60.77(4)]

Town Sanitary District: Chapter 60, Subchapter IX, Stats. (continued)

Governance

- If a town sanitary district is located entirely within one town, the town board shall determine how commissioners will be selected. The town board may appoint the commissioners, provide for their election or constitute itself as the commission. ...[60.74(1)]
- If the commissioners of a district have been appointed, a petition requesting that commissioners be elected may be submitted...to the town board responsible for the selection of commissioners....The petition shall be signed by qualified electors of the district equal to at least 20% of the vote cast for governor in the district at the last gubernatorial election. [60.74(4)]

Assessment District: Chapter 66, Subchapter VIII, Stats.

Establishment

- Every ordinance under this section shall contain provisions for reasonable notice and hearing. [66.0701.(2)]

Powers

- The amount assessed against any property for any work or improvement which does not represent an exercise of the police power may not exceed the value of the benefits accruing to the property. If an assessment represents an exercise of the police power, the assessment shall be upon a reasonable basis as determined by the governing body of the city, town or village. [66.0703(1)(b)]
 - A police power special assessment must benefit the property and be made on a reasonable basis. The degree, effect, and consequences of the benefit must be examined to measure reasonableness. Mere uniformity of treatment does not establish reasonableness; rather uniqueness of a property may be the cause for the assessment being unreasonable. *Lac La Belle Golf Club v. Lac La Belle*, 187 Wis. 2d 274, 522 N.W.2d 277 (Ct. App. 1994).
 - This section does not require the special assessment process be completed before any work is done. *Park Avenue Plaza v. City of Mequon*, 2008 WI App 39, 308 Wis. 2d 439, 747 N.W.2d 703, 06-2339.

Assessment District: Chapter 66, Subchapter VIII, Stats. (continued)

Governance

- The governing body of a town... may, by ordinance, provide that the cost of installing or constructing **any public work or improvement** shall be charged in whole or in part to the property benefited, and make an assessment against the property benefited in the manner that the governing body determines....[66.0701(1)]

Utility District: Chapter 66, Subchapter VIII, Stats.

Establishment

- Towns...may establish utility districts. [66.0827(1)]

Powers

- In addition to all other methods provided by law, a municipality may construct, acquire or lease, extend or improve any plant and equipment within or without its corporate limits for the collection, transportation, storage, treatment and disposal of sewage or **storm water and surface water**, including necessary lateral, main and interceptor sewers.... [66.0821(1)]
- All or a portion of the cost of exercising the authority under sub. (2) may be funded, to the extent applicable, from the municipality's general fund, by taxation, special assessment or sewerage service charges, by municipal obligations or revenue bonds or from any combination of these sources. [66.0821(3)]

Utility District: Chapter 66, Subchapter VIII, Stats. (continued)

Powers

- For the purpose of **making equitable [service] charges** for all services rendered by a storm water and surface water sewerage system to users, the property served may be classified, taking into consideration the volume or peaking of storm water or surface water discharge that is caused by the area of impervious surfaces, topography, impervious surfaces and other surface characteristics, extent and reliability of mitigation or treatment measures available to service the property, apart from measures provided by the storm water and surface water sewerage system, and any other considerations that are reasonably relevant to a use made of the storm water and surface water sewerage system. The charges [levied by the governing body of the municipality] may also include standby charges to property not yet developed with significant impervious surfaces for which capacity has been made available in the storm water and surface water sewerage system. [66.0821(4)]

Utility District: Chapter 66, Subchapter VIII, Stats. (continued)

Governance

- The governing body of a ...town may, provide for the nonpartisan management of a municipal public utility by creating a commission under this section. The board of commissioners, under the general control and supervision of the governing body, shall be responsible for the entire management of and shall supervise the operation of the utility. The governing body shall exercise general control and supervision of the commission by enacting ordinances governing the commission's operation. The board shall consist of 3, 5 or 7 commissioners. [66.0805(1)]

Lake Management District: Chapter 33, Subchapter IV, Stats.

Establishment

- Districts may be created for the purpose of undertaking a program of lake protection and rehabilitation of a lake or parts thereof within the district. [33.21]

Powers

- The board [of commissioners] shall be responsible for ... Adopting and carrying out lake protection and rehabilitation plans and obtaining any necessary permits therefor.... [and] Preparing the proposed annual budget for presentation at the annual meeting of the district.[33.29(1)]

Lake Management District: Chapter 33, Subchapter IV, Stats. (continued)

Powers

- **Special assessments** for the purpose of carrying out district protection and rehabilitation projects, or for other lake management or sanitary service activities undertaken by the district, may be levied by the commissioners as an exercise of the district's police powers.... The commissioners shall then apportion the special assessment within the district...on a reasonable basis. In apportioning the special assessment, the commissioners shall examine each parcel and determine the benefits to each parcel from the project, considering such factors as size, proximity to the lake and present and potential use of the parcel, including applicable zoning regulations. After benefits to each parcel are determined, assessments shall be made in an aggregate amount equal to the cost to the district of the project. [33.32(1)]

Lake Management District: Chapter 33, Subchapter IV, Stats. (continued)

Governance

- Every district shall have an annual meeting.... At **the annual meeting**, electors and property owners who attend the meeting shall ... Approve a budget for the coming year.... The budget shall separately identify the capital costs and the costs of operation of the district, ... and shall specify any item that has a cost to the district in excess of \$10,000..... At the annual meeting, electors and property owners may ... Vote by majority a tax upon all taxable property within the district... not exceed a rate of 2.5 mills of equalized valuation. [33.30]



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Questions and Discussion