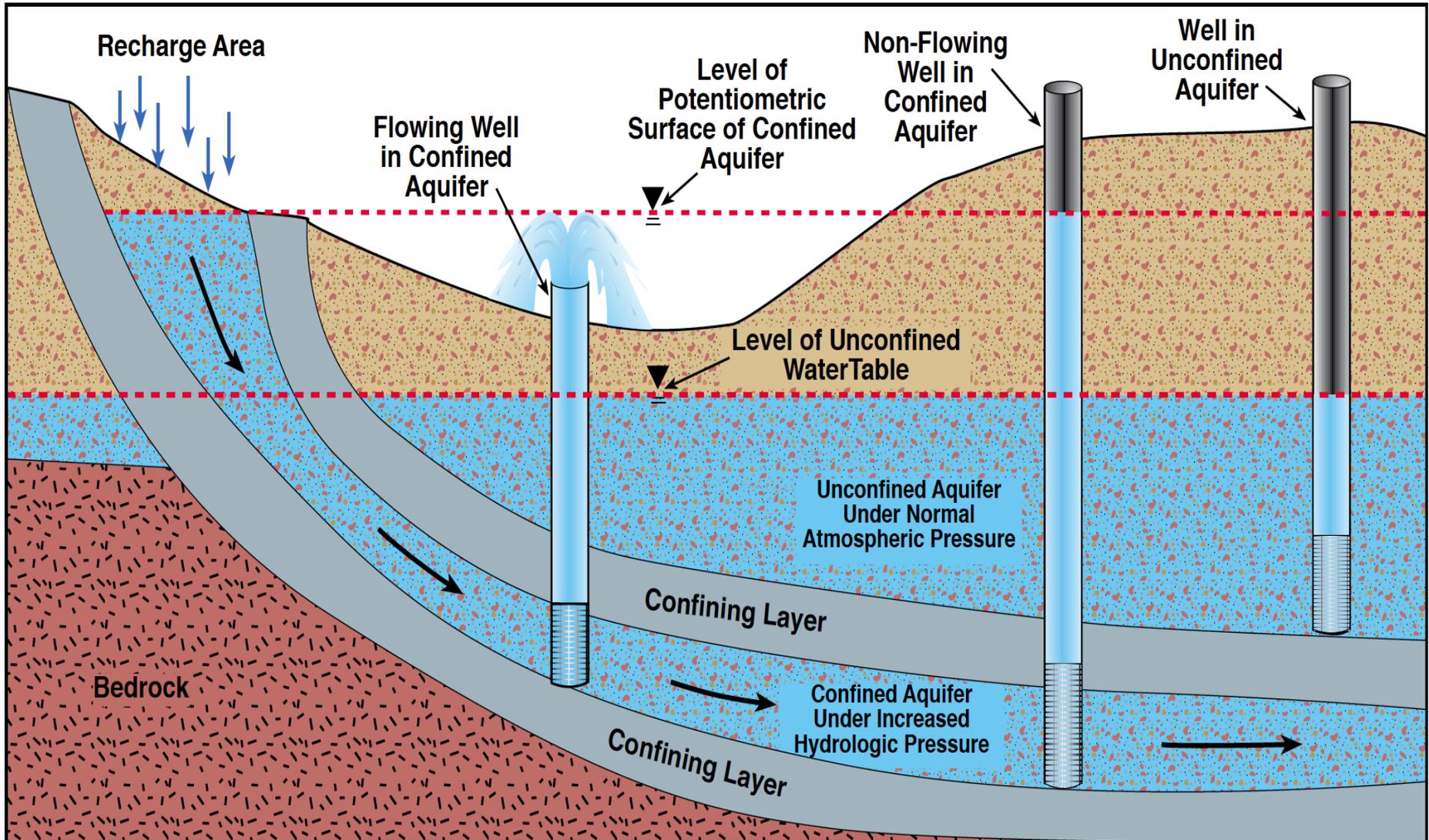


# **FLOWING WELLS IN OHIO**

**Jim Raab**

**ODNR Division of Soil and  
Water Resources**

# WHAT CAUSES A WELL TO FLOW?



# FLOWING WATER WELL



# Well Log Denoting a Flowing Well

## BAILING OR PUMPING TEST

(specify one by circling)

Test rate 100+ gpm      Duration of test 1 hrs

Drawdown NONE ft      Date 7-6-87

Static level (depth to water) FLOWS 60 G.P.M. @ 1' ABOVE GRADE ft

Quality (clear, cloudy, taste, odor) \_\_\_\_\_

Pump installed by WATSON WELL DRILLING, INC.

# Well Log Denoting a Flowing Well

## PUMPING TEST

Pumping rate 15 G.P.M. Duration of test 1 hrs.

Drawdown 12 ft. Date 1/30/54

Developed capacity 15 GPM

Static level—depth to water 1' 6" above ground <sup>ft</sup>

Pump installed by W. W. W. W. W.

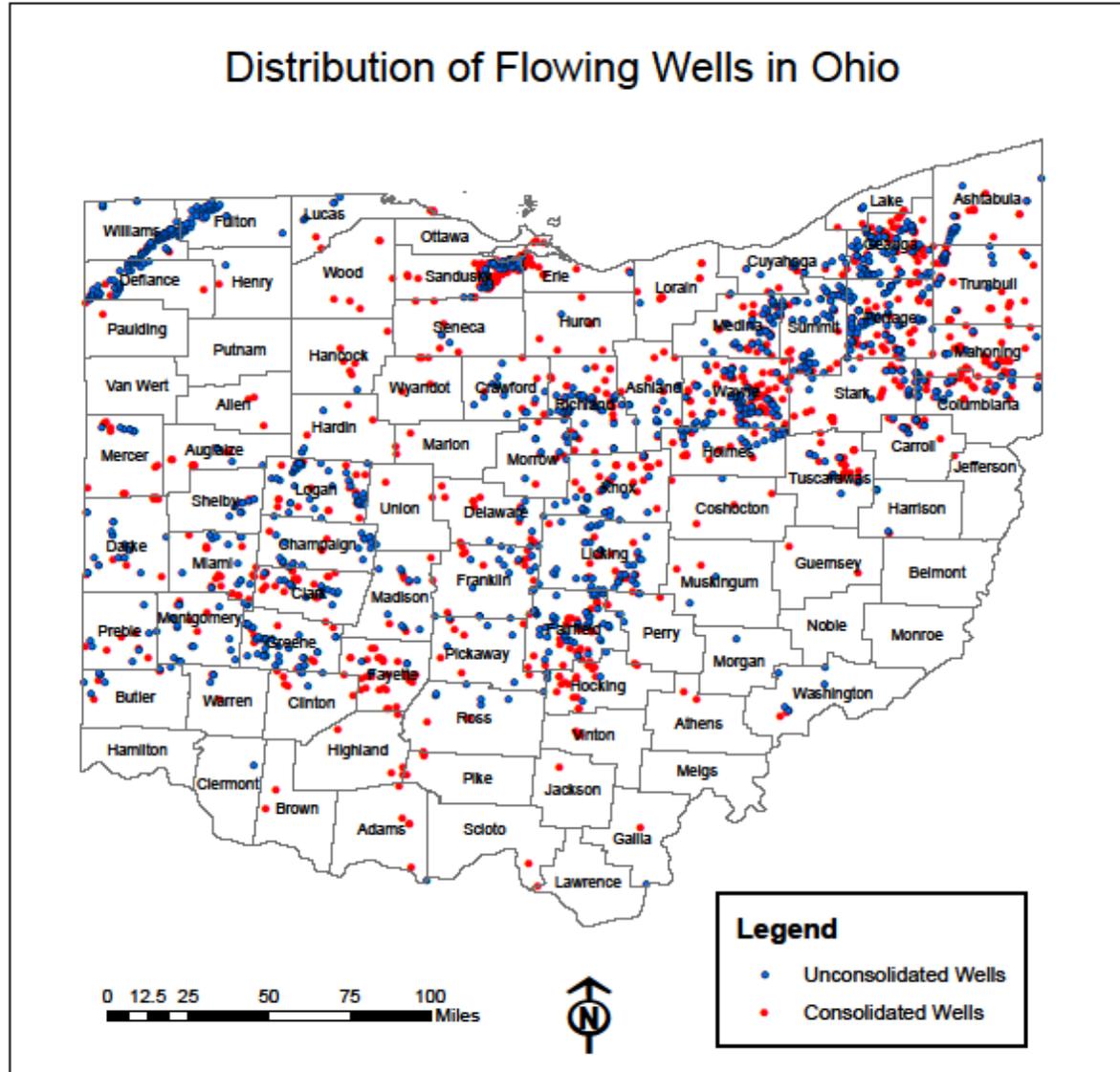
# Well Log Denoting a Flowing Well

South	
<b>WELL TEST*</b>	
Pre-Pumping Static Level <u>Flows</u> ft.	Date <u>4/25/03</u>
Measured from: <input type="checkbox"/> Top of Casing <input checked="" type="checkbox"/> Ground Level <input type="checkbox"/> Other _____	
<input type="checkbox"/> Air <input checked="" type="checkbox"/> Bailing <input checked="" type="checkbox"/> Pumping* <input type="checkbox"/> Other _____	
Test Rate <u>18-20</u> gpm	Duration of Test <u>2 1/2</u> hrs.
<u>40' at 19.20 GPM for 1 hour</u> Feet of Drawdown _____ ft.	Sustainable Yield <u>18-20</u> gpm
*(Attach a copy of the pumping test record, per section 1521.05, ORC)	
Is Copy Attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flowing Well? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Quality <u>clear</u>	
<b>PUMP/PITLESS</b>	

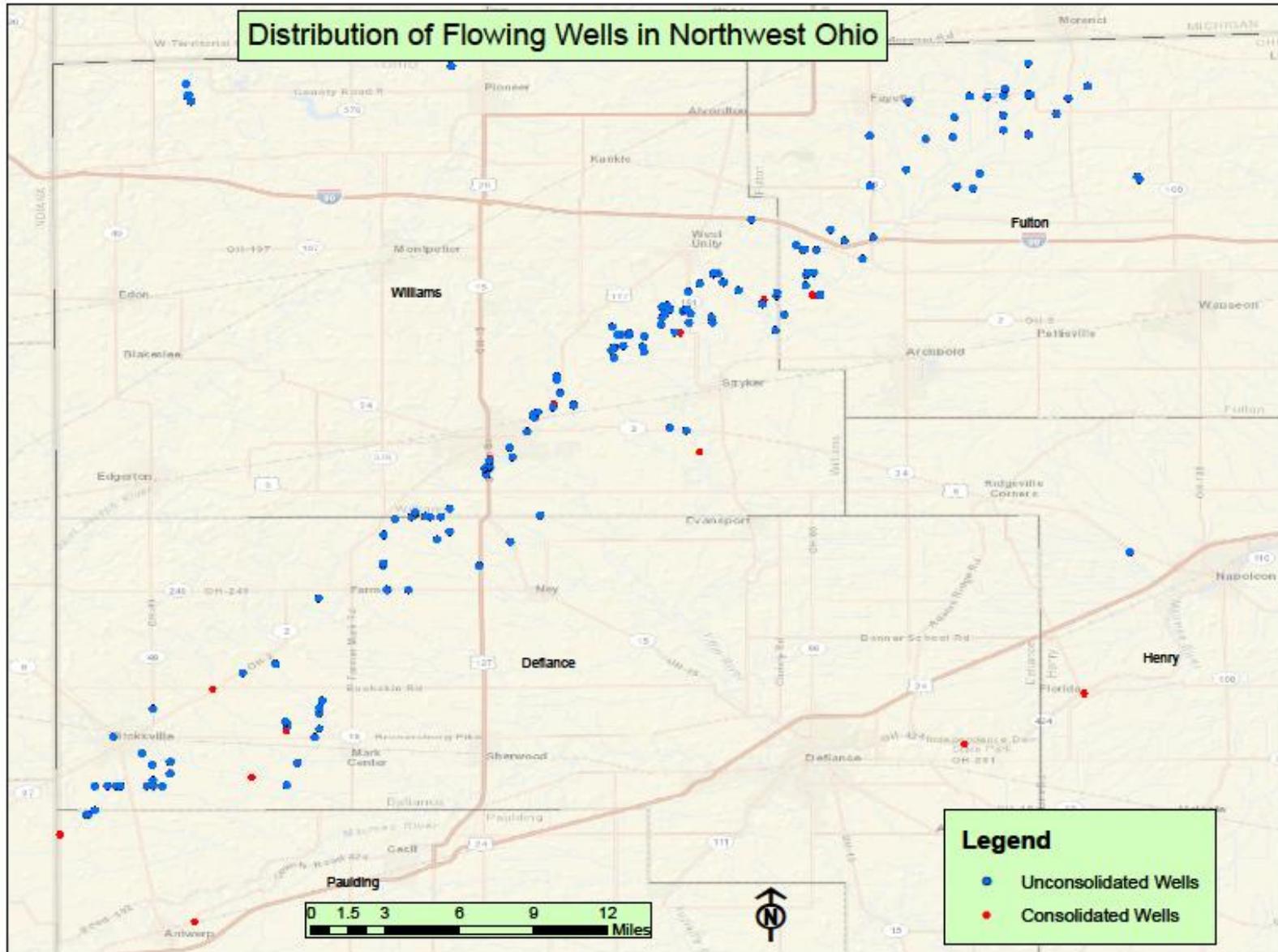
# Well Log Denoting a Flowing Well

Comments on water quality/quantity and well construction: - THE FLOW RATE OF THE WELL IS 10 GPM.	Feet Below Ground Level
<b>WELL TEST *</b>	
Pre-Pumping Static Level <u>0</u> ft.	Date <u>5/11/2007</u>
Measured from <u>GROUND LEVEL</u>	
Pumping test method <u>AIR</u>	
Test Rate <u>50</u> gpm	Duration of Test <u>1</u> hrs.
Feet of Drawdown <u>60</u> ft.	Sustainable Yield <u>50</u> gpm
*(Attach a copy of the pumping test record, per section 1521.05, ORC)	
Is Copy Attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Flowing Well? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>PUMP/PITLESS</b>	

# FLOWING WELL DISTRIBUTION

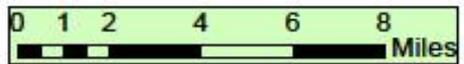
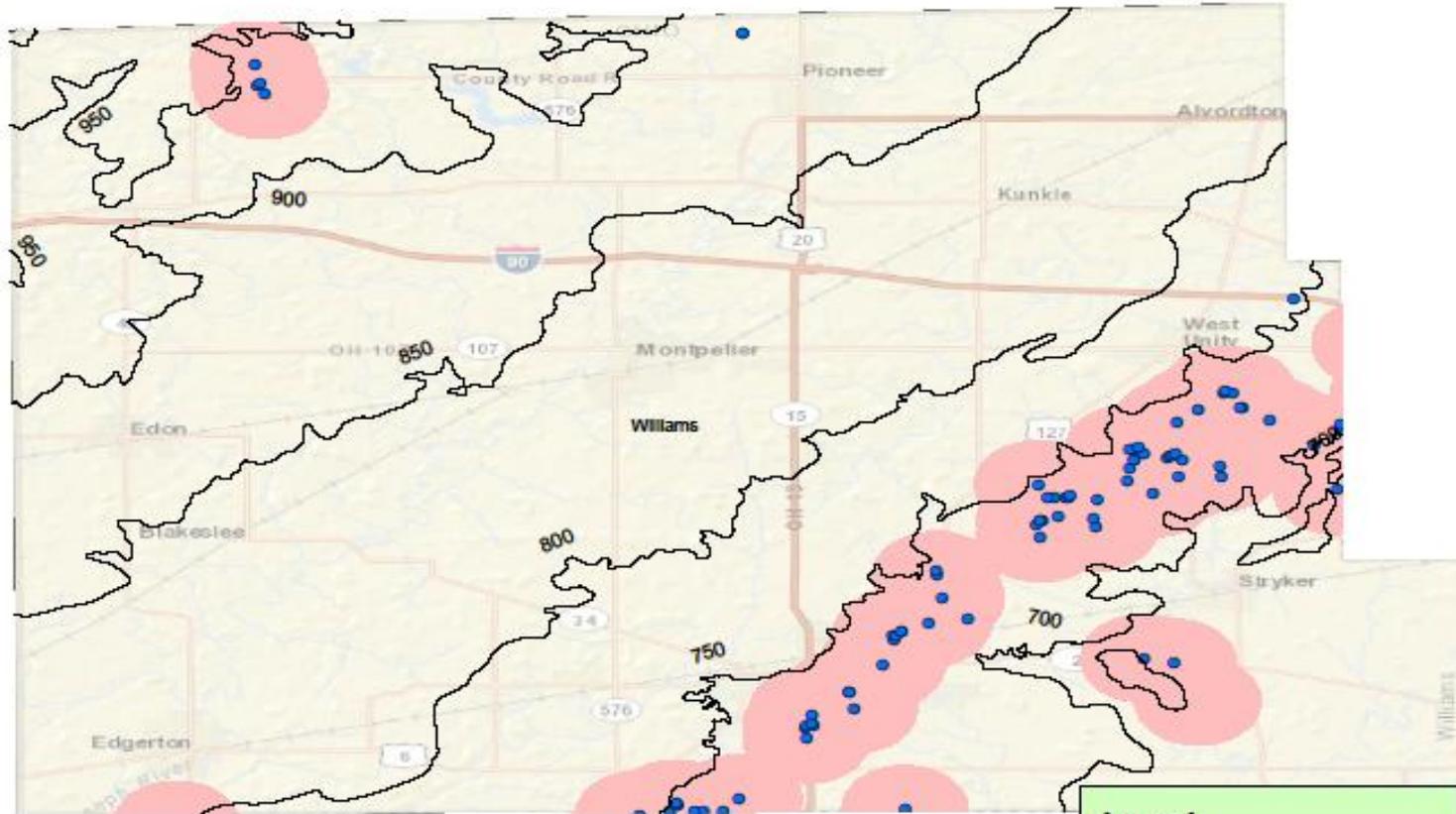


# Flowing Wells in NW Ohio



# Potentiometric Surface Map of Williams County

Potentiometric Surface Map with Flowing Wells of Williams County



**Legend**

- Potentiometric Surface Contours
- Unconsolidated Wells
- BUFF\_DIST**
- 5500

# Flowing Wells in NW Ohio

- Flowing wells concentrated in a 4-mile wide band trending NE-SW in Defiance, Williams, and Fulton Co.
- 94% of the wells are completed in the sand and gravel aquifer



# Flowing Wells in NE Ohio

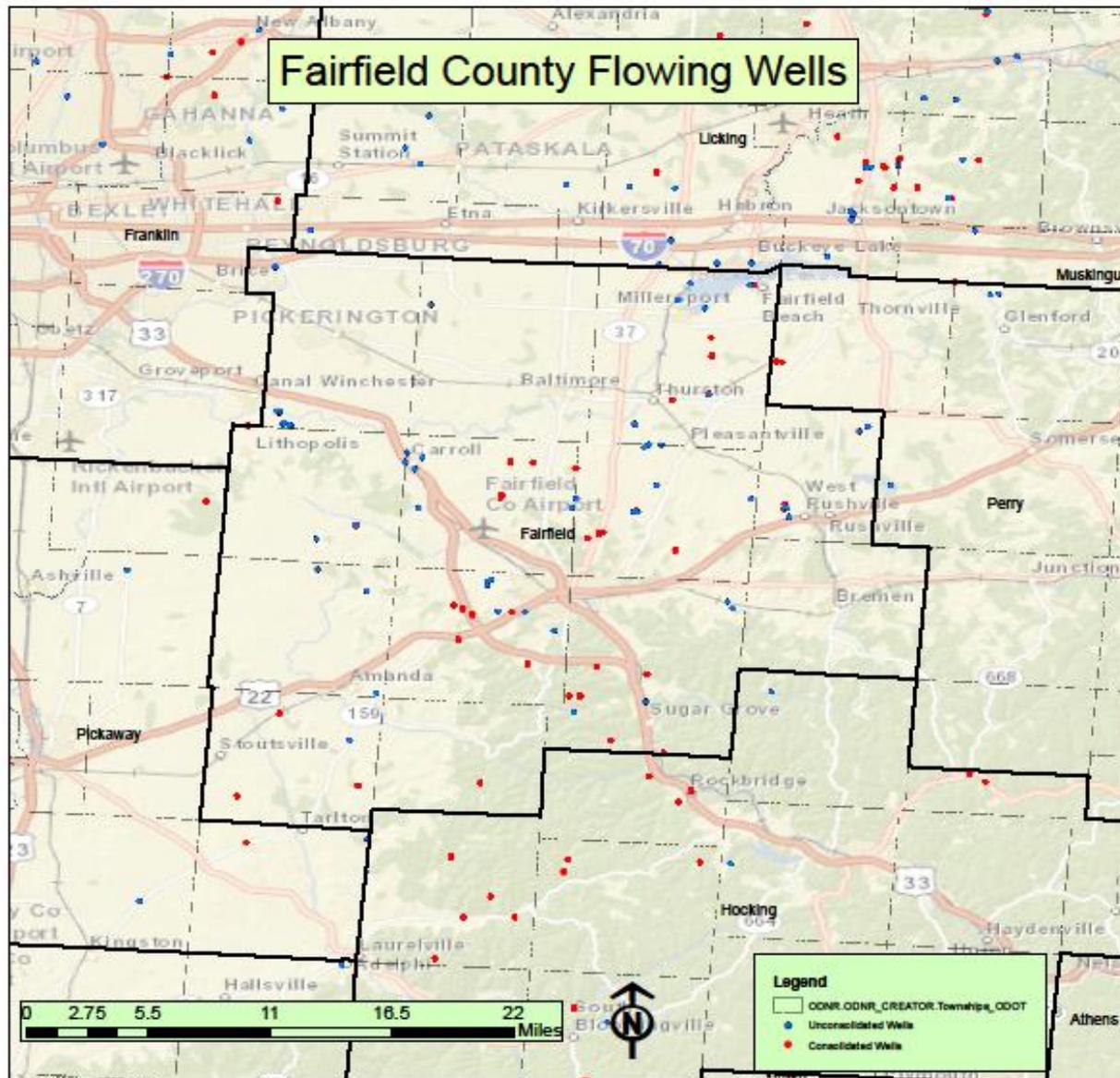
- Flowing wells found 12 county area
- 48% of wells completed in sand and gravel aquifers



# Flowing Wells in Logan County

- Flowing wells found on the east side of Indian Lake and near East Liberty
- 71% of the wells completed in the sand and gravel aquifers

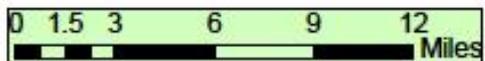
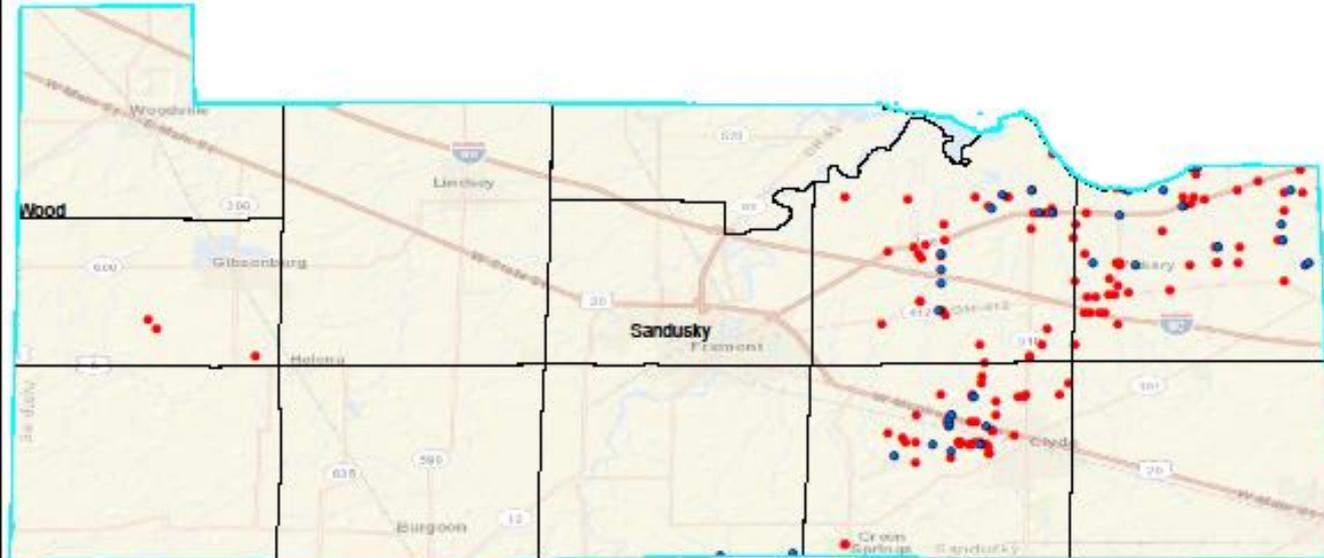
# Flowing Wells in Fairfield County



# Flowing Wells in Fairfield County

- Flowing wells concentrated from Buckeye Lake to South of Lancaster
- 55% of the wells completed in the sand and gravel aquifers

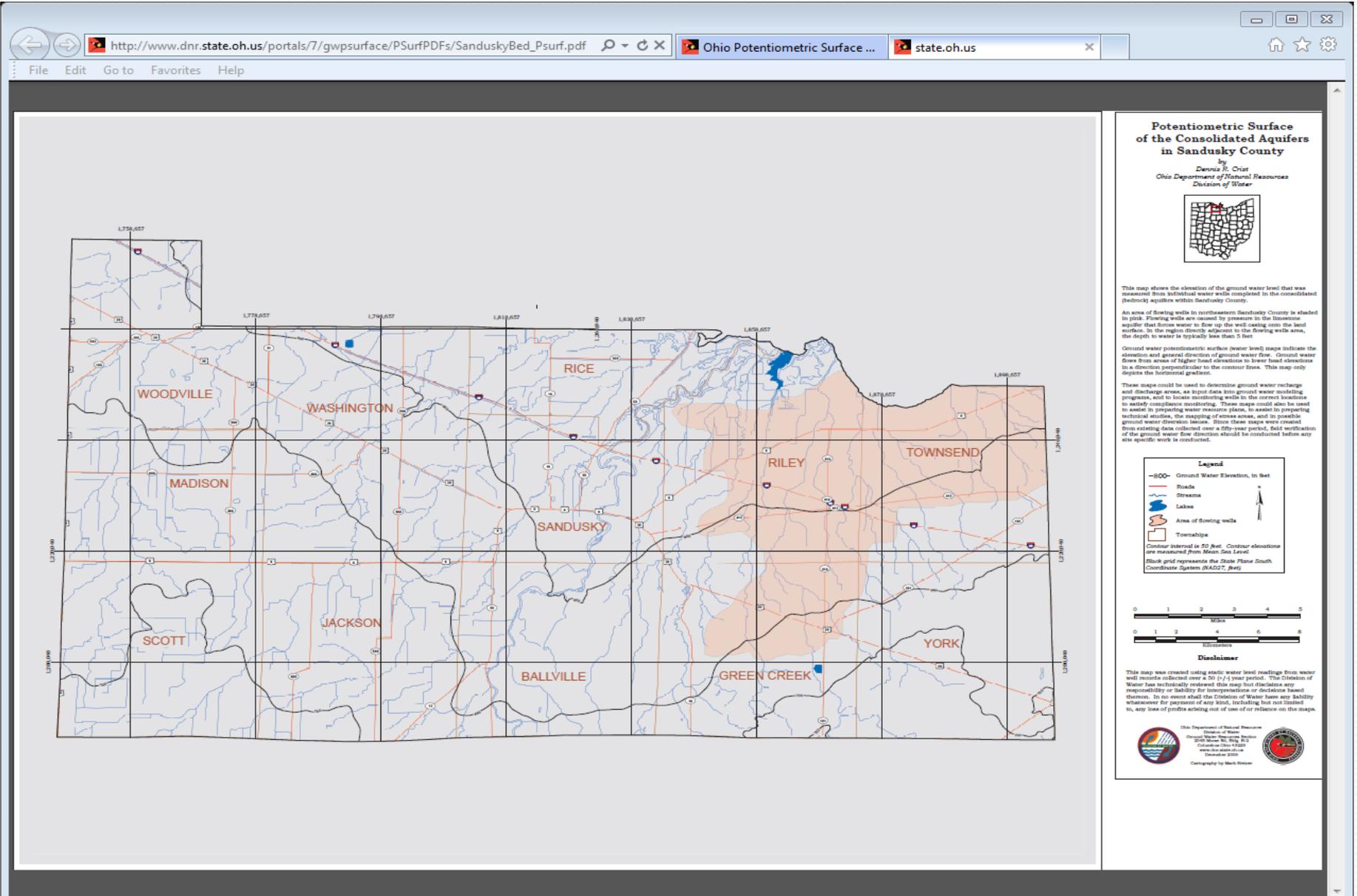
# Sandusky County Flowing Wells



## Legend

- ODNR.ODNR\_CREATOR.Townships\_ODOT
- Unconsolidated Wells
- Consolidated Wells

# POTENTIOMETRIC SURFACE MAP



## Potentiometric Surface of the Consolidated Aquifers in Sandusky County

by  
Dennis R. Orat  
Ohio Department of Natural Resources  
Division of Water



This map shows the elevation of the ground water level that was measured from individual water wells completed in the consolidated (bedrock) aquifers within Sandusky County.

An area of flowing wells in northwestern Sandusky County is shaded in pink. Flowing wells are caused by pressure in the limestone aquifer that forces water to flow up the well casing onto the land surface. In the region directly adjacent to the flowing wells area, the depth to water is typically less than 5 feet.

Ground water potentiometric surface (water level) maps indicate the elevation and general direction of ground water flow. Ground water flow from areas of higher head elevations to lower head elevations is in a direction perpendicular to the contour lines. This map only depicts the horizontal gradient.

These maps could be used to determine ground water recharge and discharge areas, as input data to ground water modeling programs, and to locate monitoring wells in the correct locations to satisfy compliance monitoring. These maps could also be used to assist in preparing water resource plans, to assist in preparing technical studies, the mapping of stress areas, and in possible ground water discharge issues. Since these maps were created from existing data collected over a 25-year period, field verification of the ground water flow direction should be conducted before any site specific work is conducted.

**Legend**

- 800- Ground Water Elevation, in feet
- Roads
- Streams
- Lakes
- Area of flowing wells
- Townships

Contour interval is 20 feet. Contour elevations are measured from Mean Sea Level.

Black grid represents the State Plane South Coordinate System (NAD83, feet)



**Disclaimer**

This map was created using static water level readings from water wells recorded over a 25 (1/3) year period. The Division of Water has technically reviewed this map but disclaims any responsibility or liability for interpretations or decisions based thereon. In no event shall the Division of Water have any liability whatsoever for payment of any kind, including but not limited to, any loss of profits arising out of use of or reliance on the maps.



# Karst Flooding of 2008



**Study Area Location**



**Looking Southeast**

**Ditch**



**Closure, SR-269**



**Culvert**



**Strecker Road**





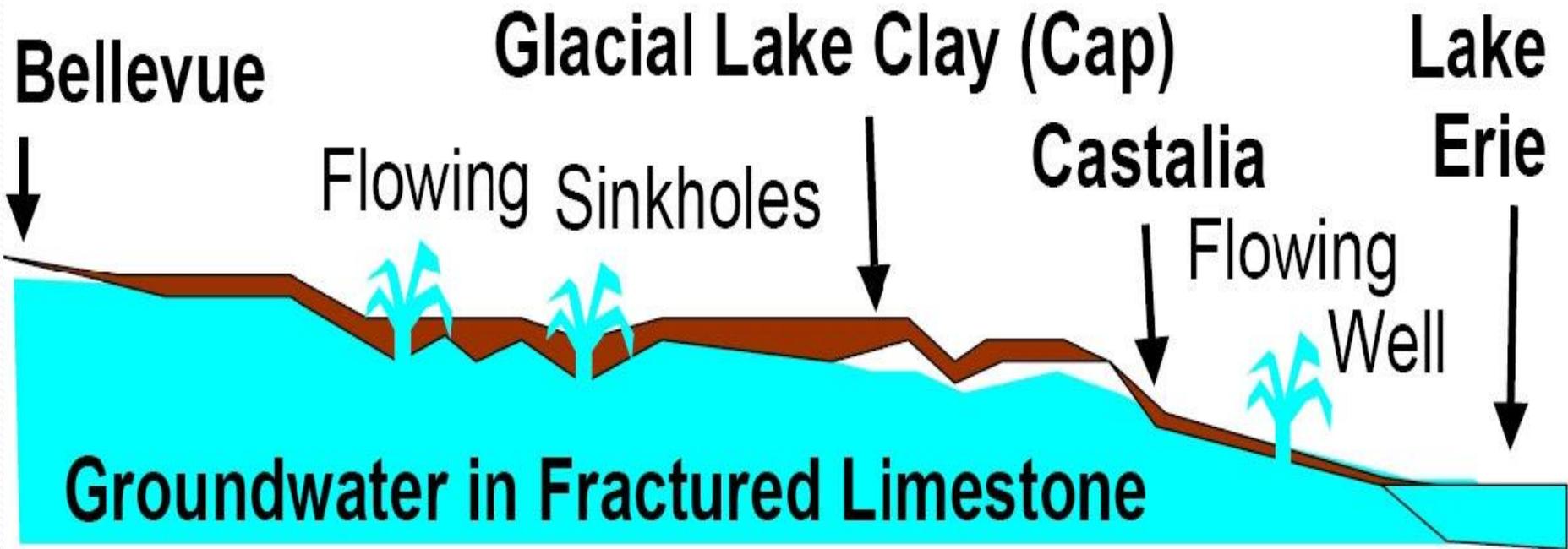


**See Picture 2; This is believed to be Riddle Road.**



# Bellevue Flooding Conclusions

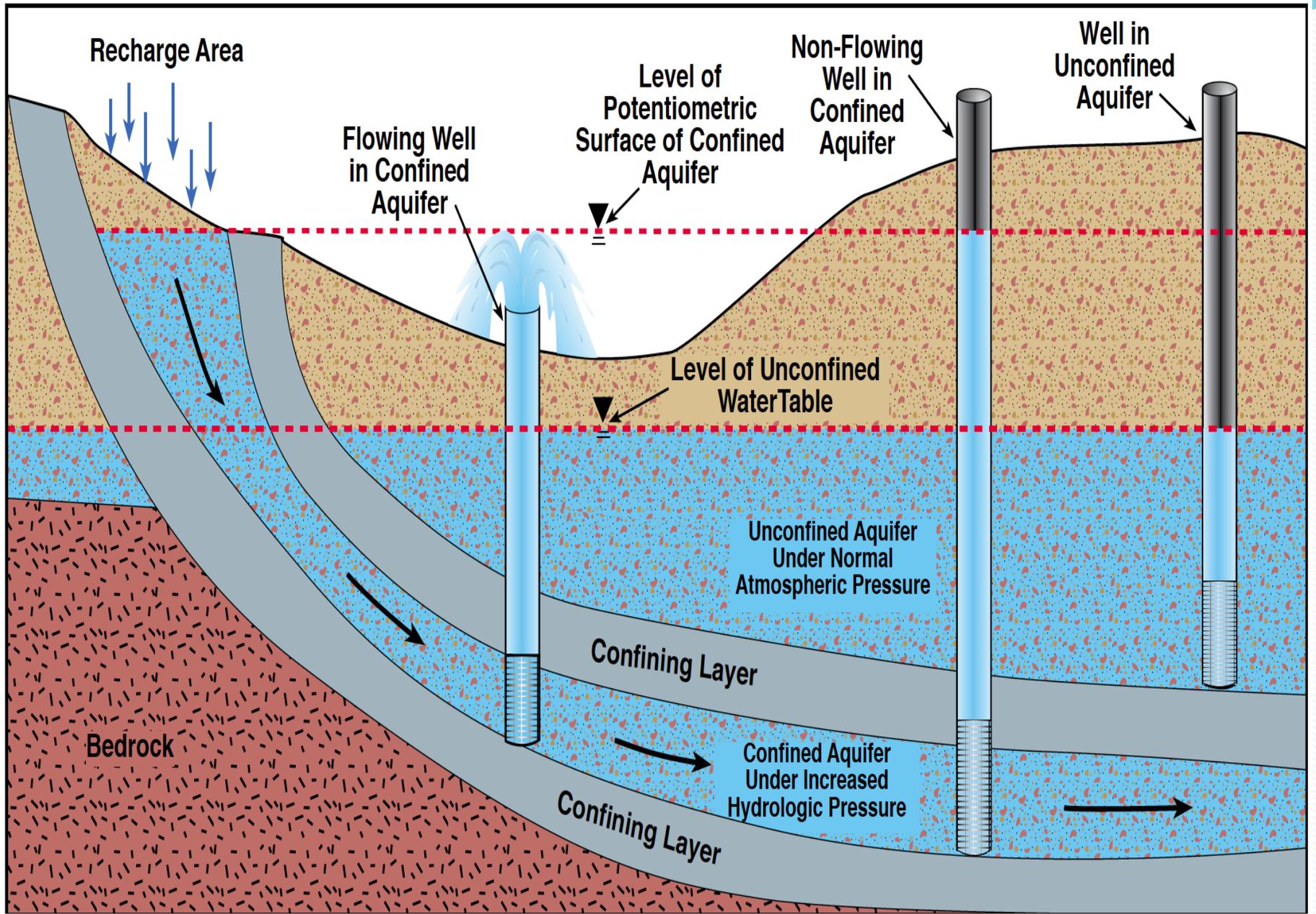
- **October – March precipitation was 23.55 inches - 2 in. more than previous record**
- **March rainfall was 5.61 inches**
- **Flooding of this magnitude last happened in 1969 and 1937**
- **In October 2008, ground water levels were 45-65 feet below March 2008 levels**
- **On average, ground water levels receded 3-4 inches per day from March to October 2008**



# AQUIFER TYPE OF FLOWING WELL

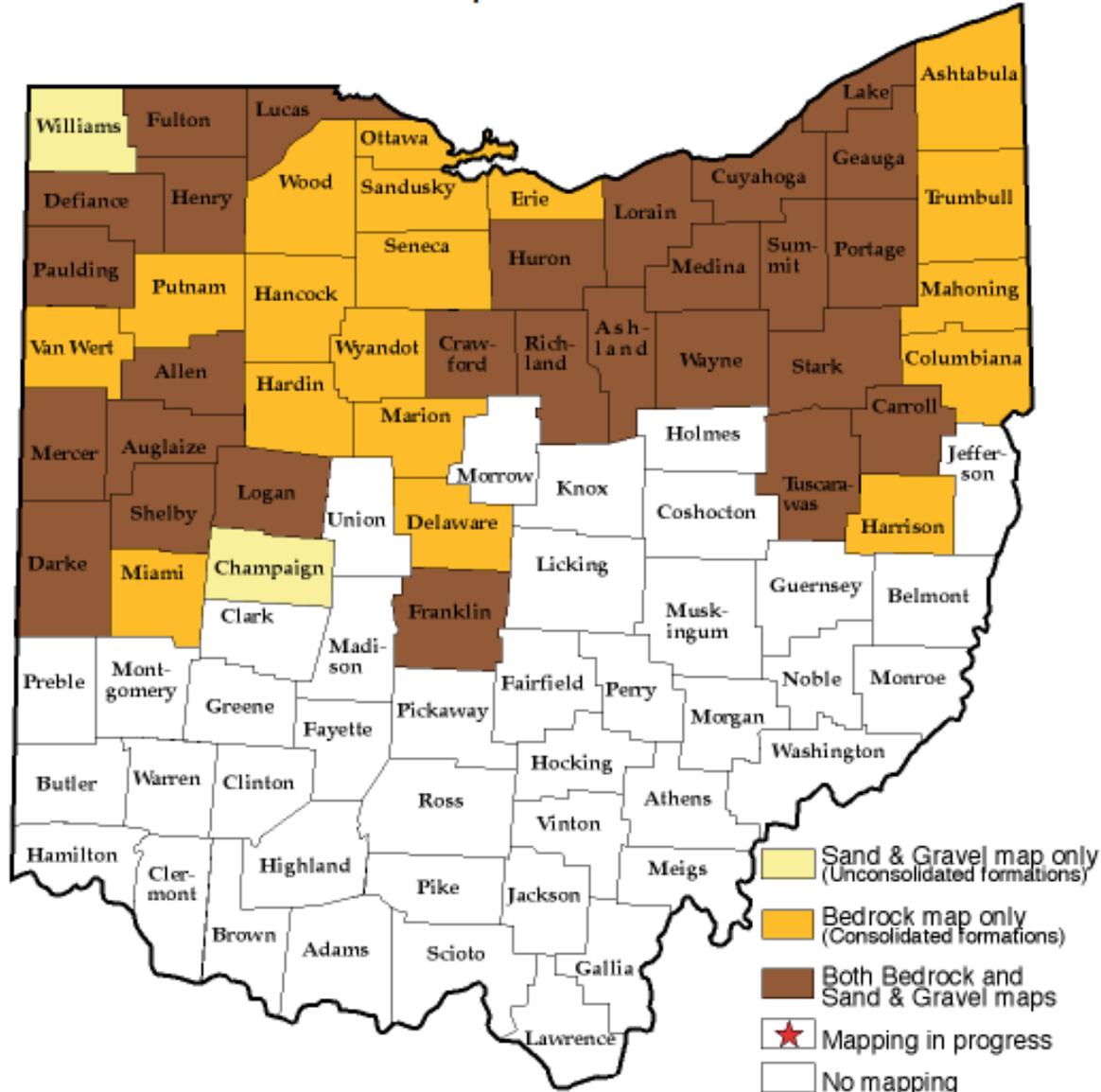
- **51% Sand and Gravel wells**
- **49% Bedrock wells**



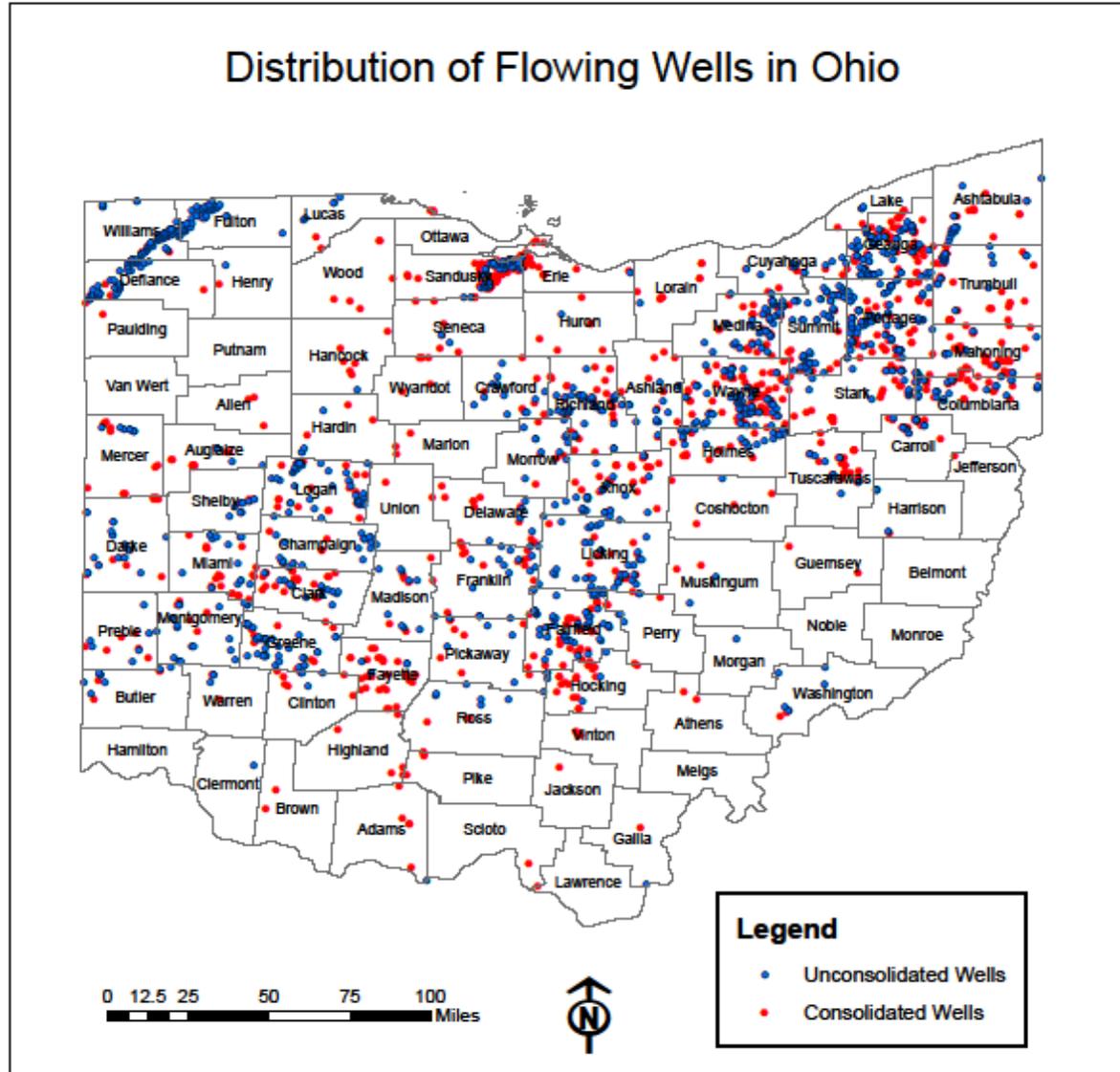


# POTENTIOMETRIC SURFACE MAPPING IN OHIO

Last Updated 07/05/2011



# FLOWING WELL DISTRIBUTION



# Questions?

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- [Jim.raab@dnr.state.oh.us](mailto:Jim.raab@dnr.state.oh.us)
- 614-265-6747

# Flowing Wells In Sandusky County

