Establishing Indiana's Volunteer Water Monitoring Network

(and a few other updates)

INDIANA DEPARTMENT OF NATURAL RESOURCES

INDIANA DEPARTMENT OF NATURAL RESOURCES · DIVISION OF WATER ·

House Bill 1319:

- Distressed Utilities Bill; Incorporated provisions of SB 473 authored by Senator Ed Charbonneau (2015)
- Includes Volunteer Monitoring of Indiana's Water Resource (GW & SW)
- Requires DNR and USGS to: *1)train volunteers; 2) determine locations; and 3) conduct independent monitoring for quality control*
- Priority areas for data collection shall include*: 1) past water rights issues; and 2) potential for withdrawals to exceed recharge capability of Water Resource*

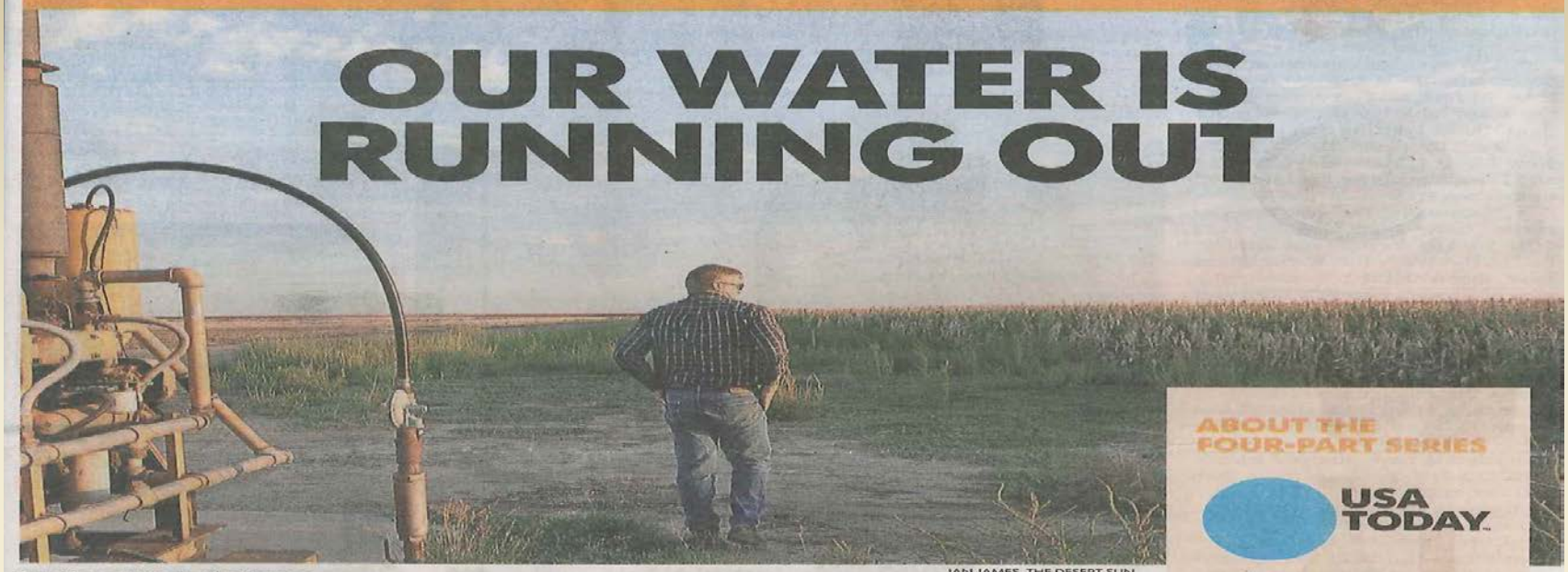
Recommendations for Increased Monitoring of Indiana's Water Resource

- "Evaluate the adequacy of existing monitoring" - *Water Utility Resource Report; IURC (2013)*

- "Create a robust system for monitoring water resources" – *Modernizing the State's Approach to a Critical Resource; Indiana Chamber (2014)*

- "Utilities believe that the state should invest in water resource data collection and analysis"- *Evaluation of Water Utility Planning in Indiana; IFA (2015)*

OUR WATER IS RUNNING OUT



IAN JAMES, THE DESERT SUN

Jay Garetson looks into a cornfield next to a pump on his family's farm in Kansas. He said contemplating the challenges ahead "leaves you gasping for air."

In areas where aquifers are being severely depleted, new wells are being drilled hundreds of feet into the earth at enormous cost.

NOW SHOWING AT USATODAY.COM
Watch footage of water crisis around the world.

MANY U.S. AQUIFERS IN DECLINE

Ian James and Steve Reilly

SUBLETTE, KANSAS

Just before 3 a.m., Jay Garetson's phone buzzed on the bedside table. He picked it up and read the text: "Low Pressure Alert."

He felt a jolt of stress, and his chest tightened. He dreaded what that automated message probably meant: As the water table dropped, another well on his family's farm was starting to suck air.

The Garetson family has farmed in the plains of southwestern Kansas for four generations, since 1902. Now they face a hard reality. The groundwater they depend on is disappearing. Their fields could wither. Their farm might not survive for the next generation.

At dawn, Garetson was out among the cornfields at the well, trying to diagnose the problem. The pump hummed as it lifted water from nearly 600 feet underground. He turned a valve and let the cool water run into his cupped hands. Just as he feared, he saw fine bubbles in the water.

"It's showing signs of weakening," he said. "It's just a question of how much time is left."

The High Plains Aquifer, which lies beneath eight states from South Dakota to Texas, is the lifeblood of one of the world's most productive farming economies.

▶ STORY CONTINUES ON 2B

ABOUT THE FOUR-PART SERIES

USA TODAY

The Desert Sun
DESERTSUN.COM

Pulitzer Center

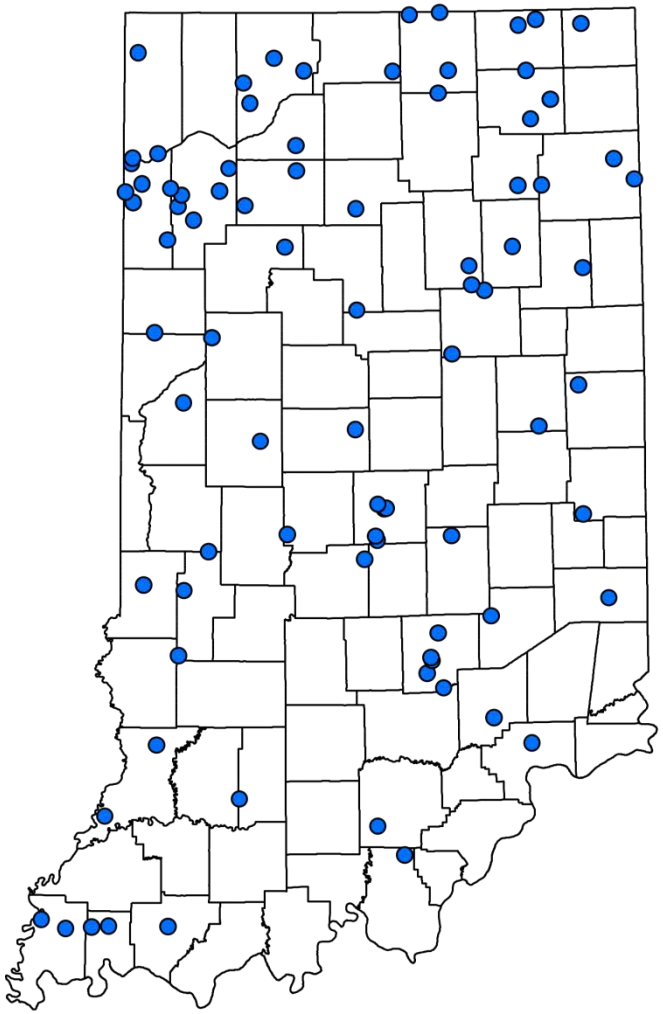
In places around the world, supplies of groundwater are rapidly vanishing. As aquifers decline and wells begin to run dry, people are being forced to confront a growing crisis.

USA TODAY and **The Desert Sun** of Palm Springs, Calif., spent nearly a year investigating the consequences of the emerging crisis. Using a grant from the **Pulitzer Center on Crisis Reporting**, our journalists traveled to the world's hot spots of groundwater depletion on four continents.

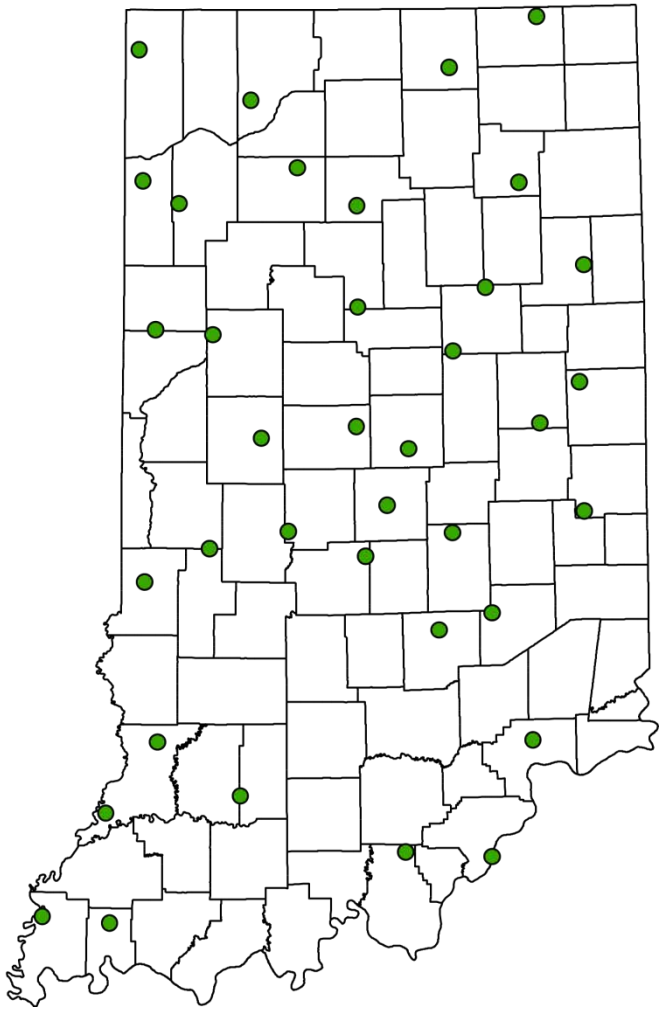
In this four-part series, they tell the stories of people forced to confront questions of how to safeguard aquifers for the future — and in some cases how to cope as the water runs out.

USGS IDNR Groundwater Monitoring Wells

2001

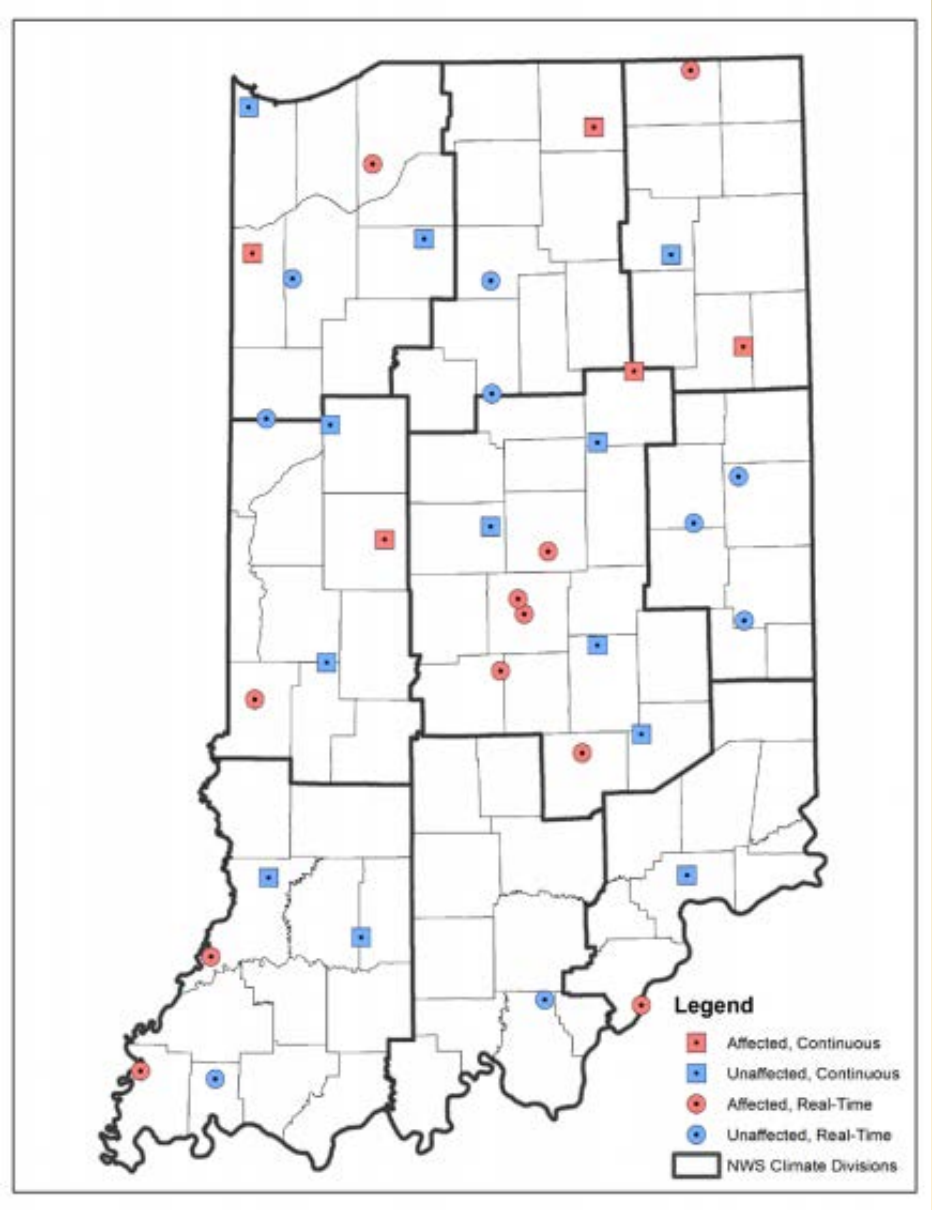


2015



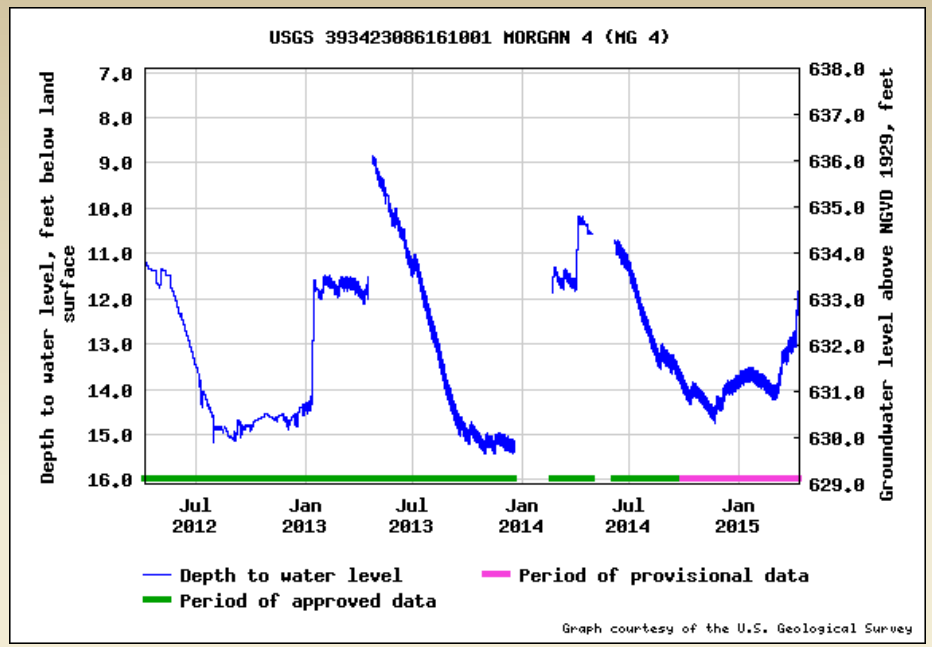
Existing Groundwater Observation Wells

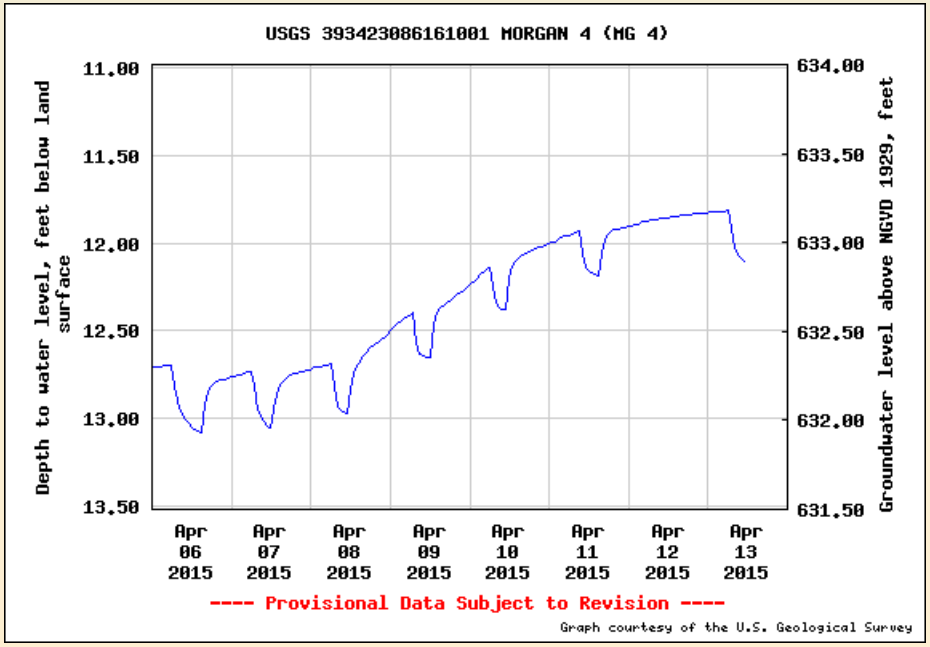
- 37 continuously recording GW Obs. Wells
- 20 sites with hourly satellite updates
- Obs. Wells Include both bedrock and glacial aquifers



USGS Observation Well Network:

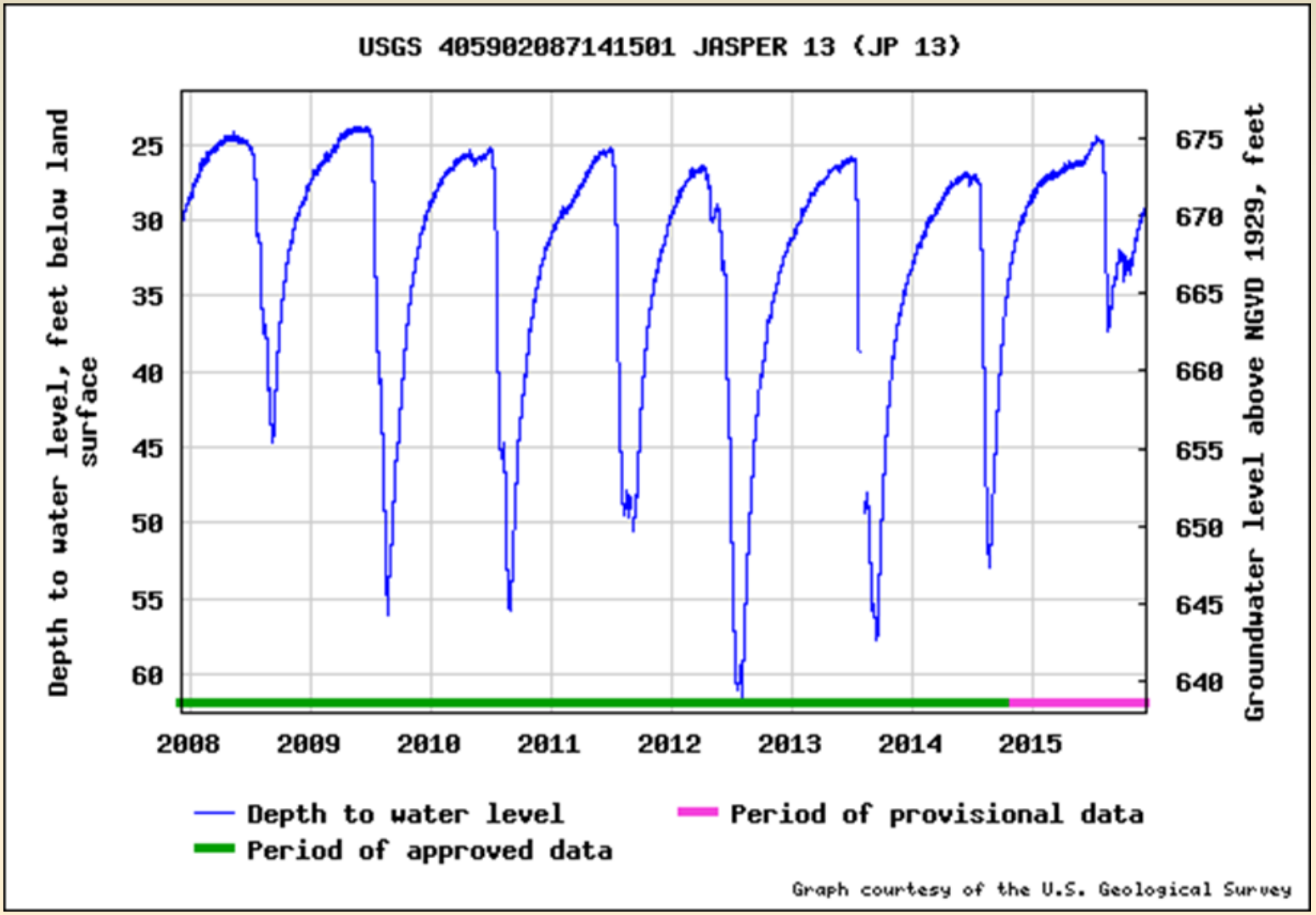
Short-Term Ground Water Level Evaluation





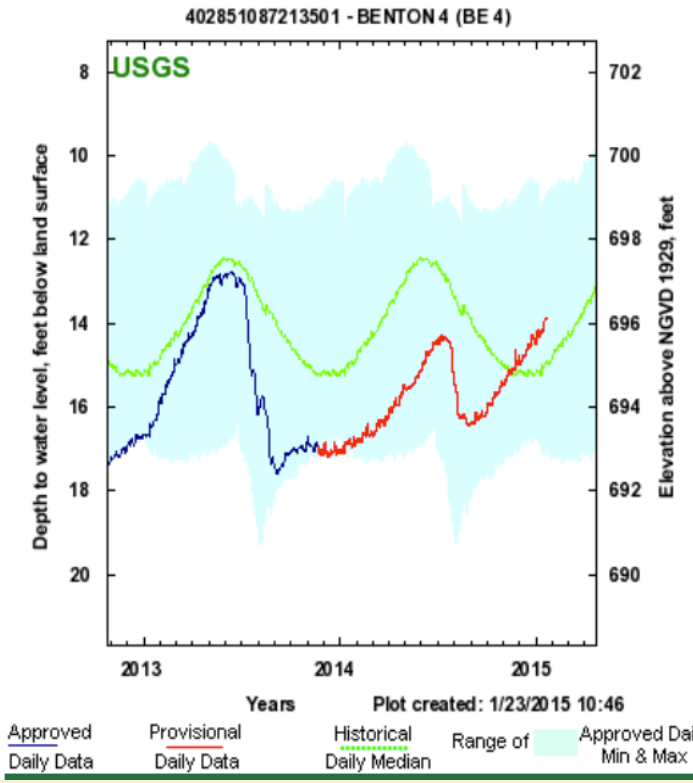
USGS Observation Well Network:

Long-Term Ground Water Resource Evaluation



Comparison of Current Water Levels with Minimum and Maximum Levels

Daily Groundwater Data



Most recent Provisional daily data value: 13.90 on 01/22/15

Summary for Period of Continuous Record
Depth to water level, feet below land surface
Approved Daily Maximum Values Data Used in Analysis

Begin Date	End Date	Days	% Complete
10/15/84	11/20/13	10,302	96

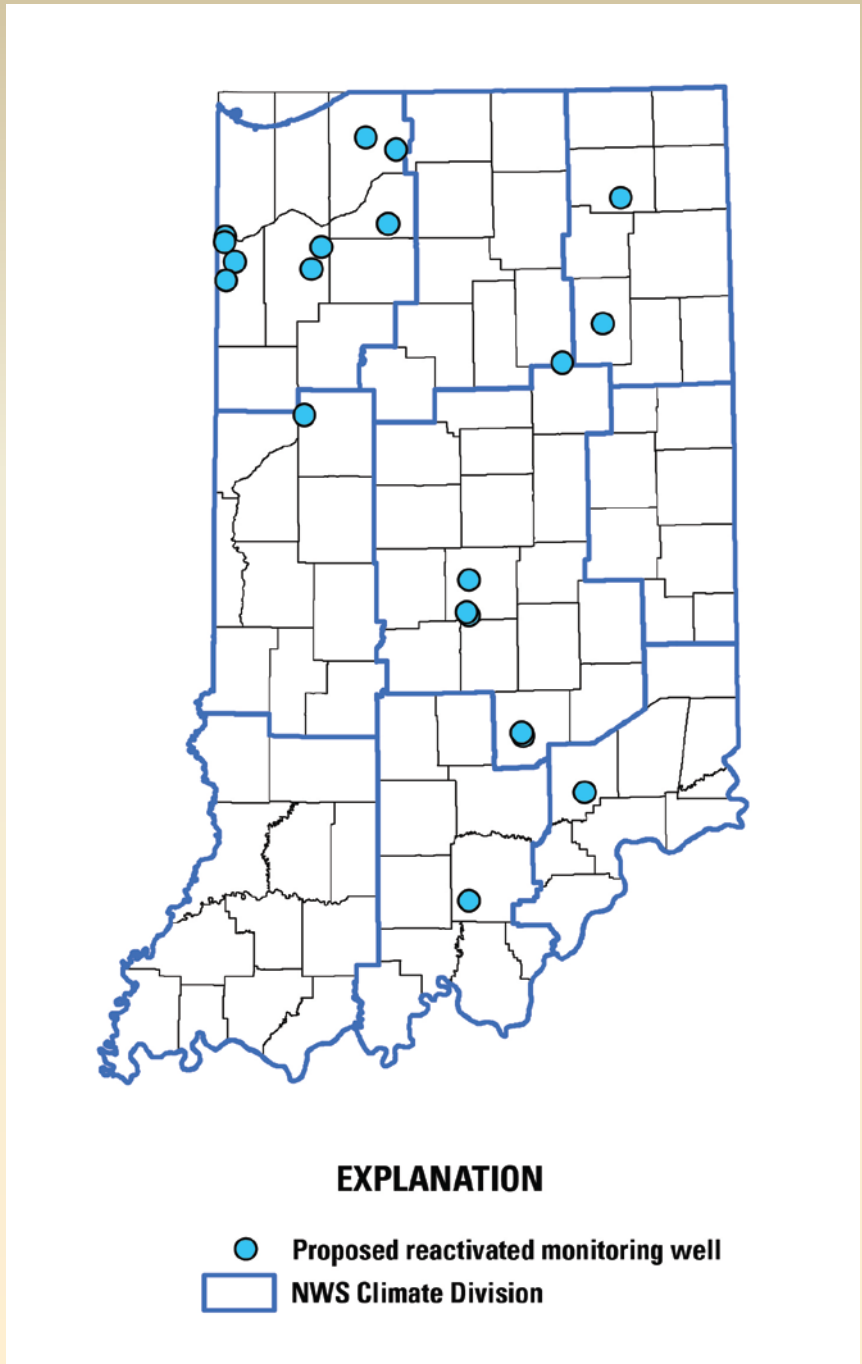
Lowest Level	5th %ile	10th %ile	25th %ile	50th %ile	75th %ile	90th %ile	95th %ile	Highest Level
19.29	16.63	16.02	15.18	14.10	12.74	11.76	11.23	9.66

Daily Data Options

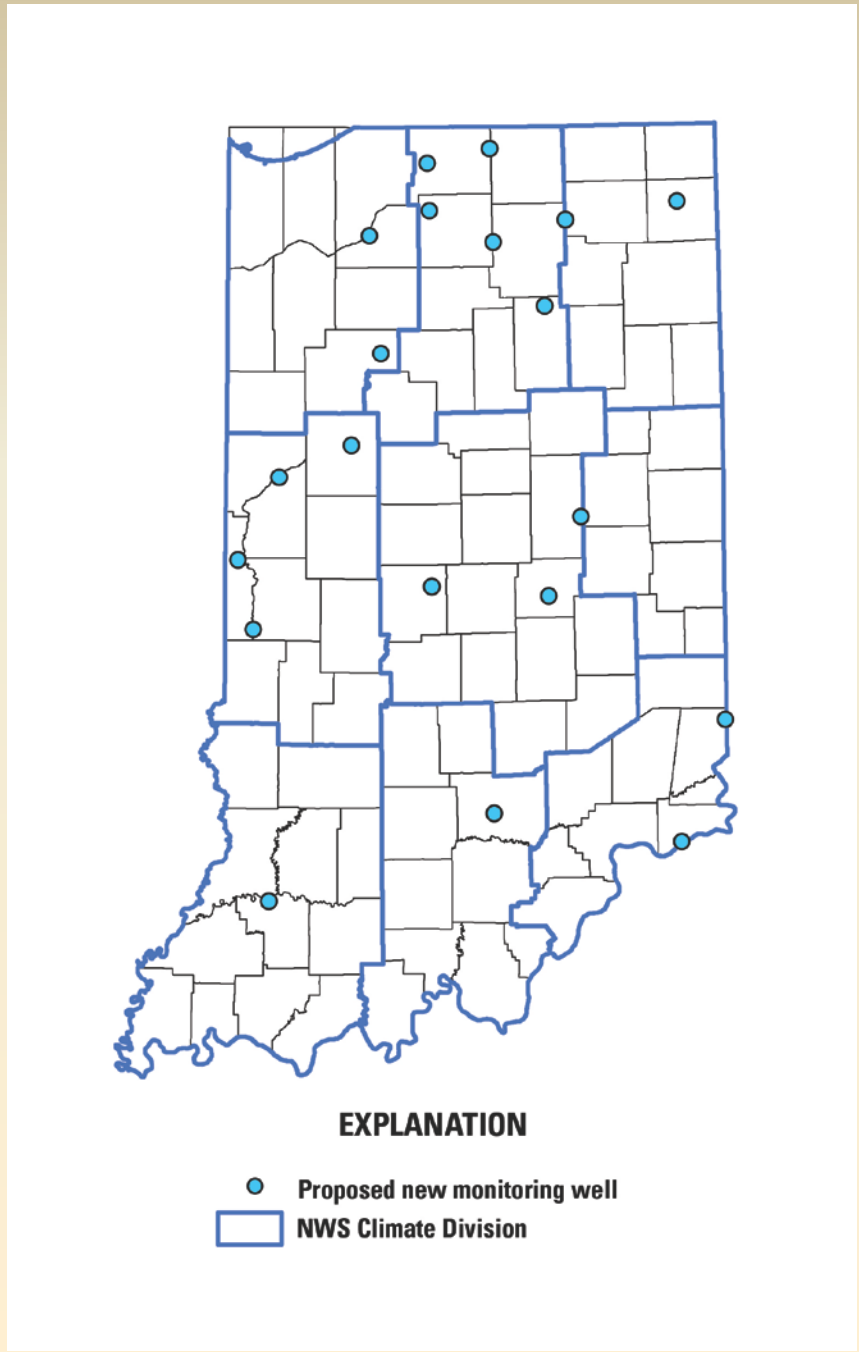
- View latest data on NWISWeb
- View data in calendar format
- Download data in text format
- View daily medians
- View Daily Value Moving Averages

http://groundwaterwatch.usgs.gov

Proposed Reactivated Ground-Water Monitoring Wells (20+ Total)



USGS Proposed Locations of New Ground-Water Monitoring Wells (20 Total)

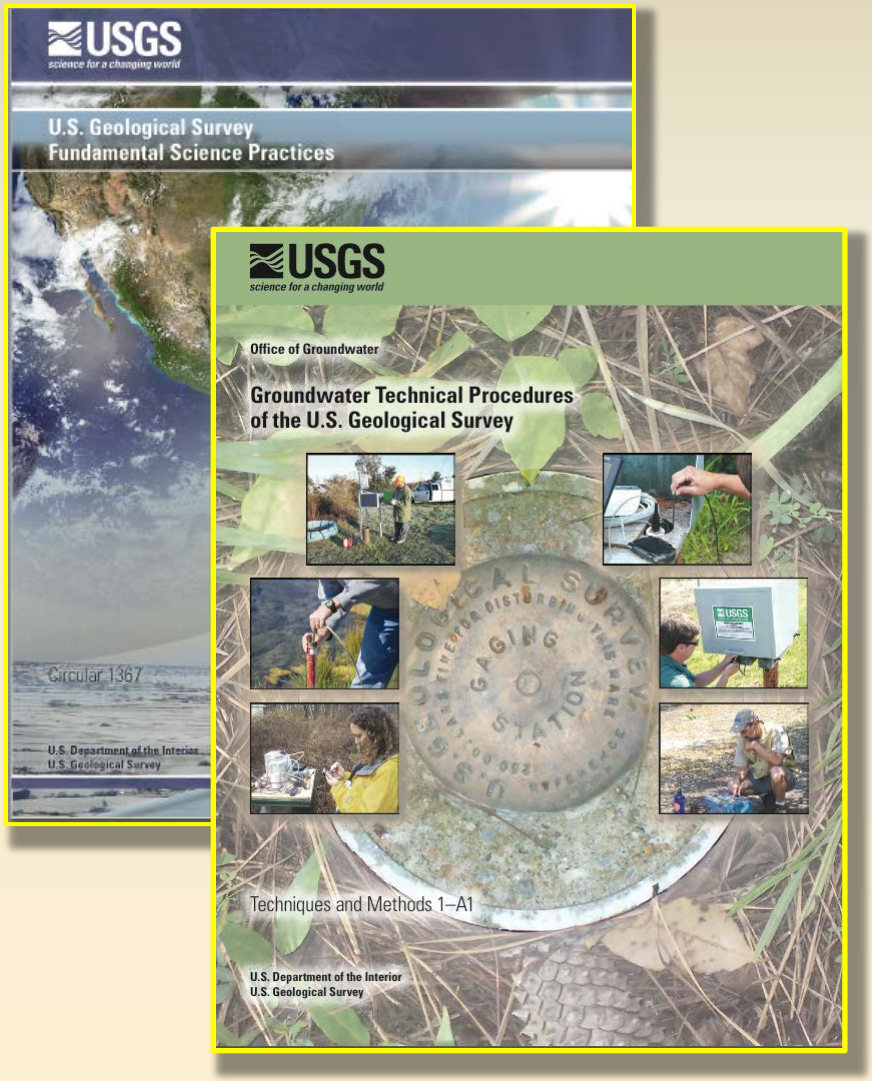


Volunteer Monitoring Wells

- 2 to 6 inch diameter wells, 20 to 100's feet deep
- Only purpose is to collect Water Level data. Not pumped.
- Can be measured occasionally or continuously

Quality Assurance and USGS Fundamental Science Practices

- Standard methods — calibration, measurement and quality assurance
- Field checks and peer data review
- Consistent reporting across network
- Public availability — equal release to all



USGS Circular 1367 and Techniques and Methods Report 1-A1

Volunteer Water Level Network

- **Quality assured and archived data** — *available for future studies and evaluations of water resources.*

- **Assist farmers, businesses, water utilities and individual property owners to manage their water resources** — *data and plots available online*

- **Create potential long-term groundwater-level datasets in underrepresented regions of Indiana** — *helps answer future questions regarding long term water availability and use.*

IDNR Public Outreach Efforts

- Indiana Section AWWA/IRWA: Brownstown, Peru, Fort Wayne, Schererville, Columbus & Carmel
- AWWA Water Utility Council
- WHP Committees: Bartholomew, Johnson & Spencer Counties
- IRWA Continuing Education Programs (water, wastewater, drillers, pump installers)
- Michiana Irrigation Association
- Indiana Mineral Aggregate Assoc. (upcoming)

Current Ground Water Monitoring “Volunteers”

1) Citizens Water
2) Marion Water
3) Columbus Water
4) Town of Colfax Water
5) Indiana-American Water
6) Mineral Aggregate Facilities
7) Misc. Homeowners
8) AG Irrigators
9) AquaSource

Water Level Transducers

(Re-equip existing USGS Wells)

20 purchased @

$33,000.00

(three installed to date)

Water Level Meters

(Volunteer Network)

6 currently being purchased @

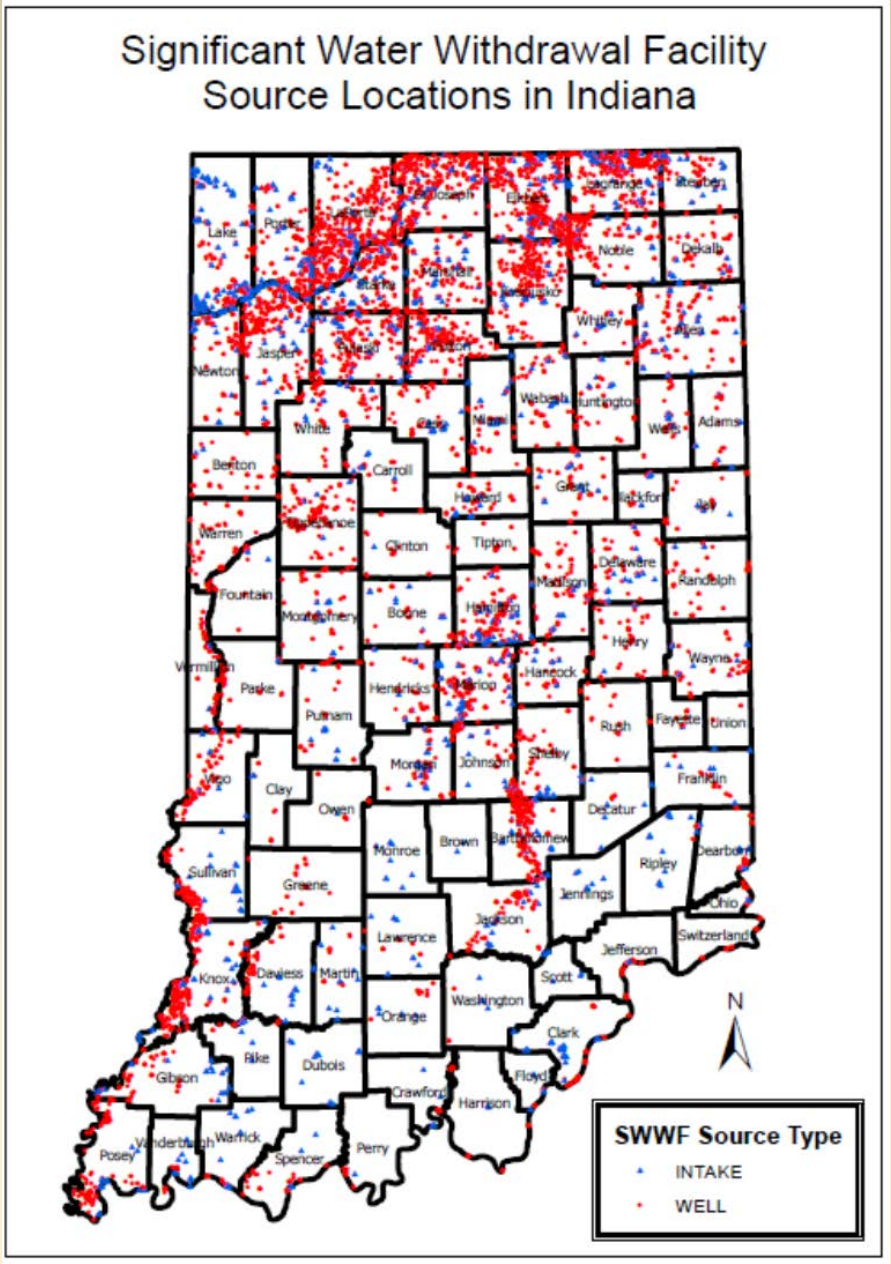
$2,500.00

100+ anticipated to be purchased @

$40,000.00 to $50,000.00

IC 14-25-7: Water Resources Management Act

- Enacted in 1983
- Requires registration of all SWWF (gw & sw)
- Facility defined as greater than 100,000 gpd capability
- Capability is aggregate of all wells & intakes
- Annual water use reporting
- Approximately 4060 SWWFs currently registered

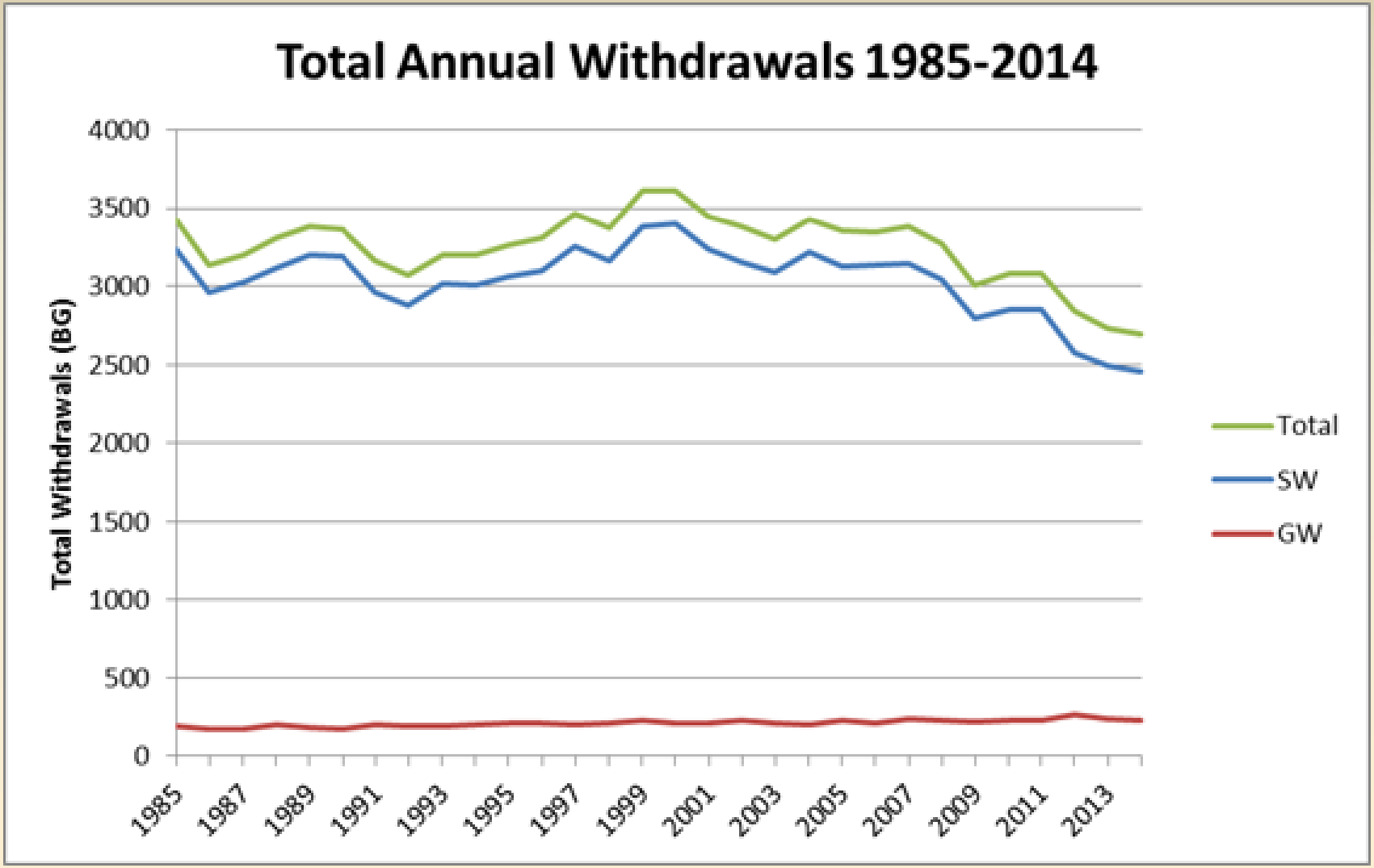


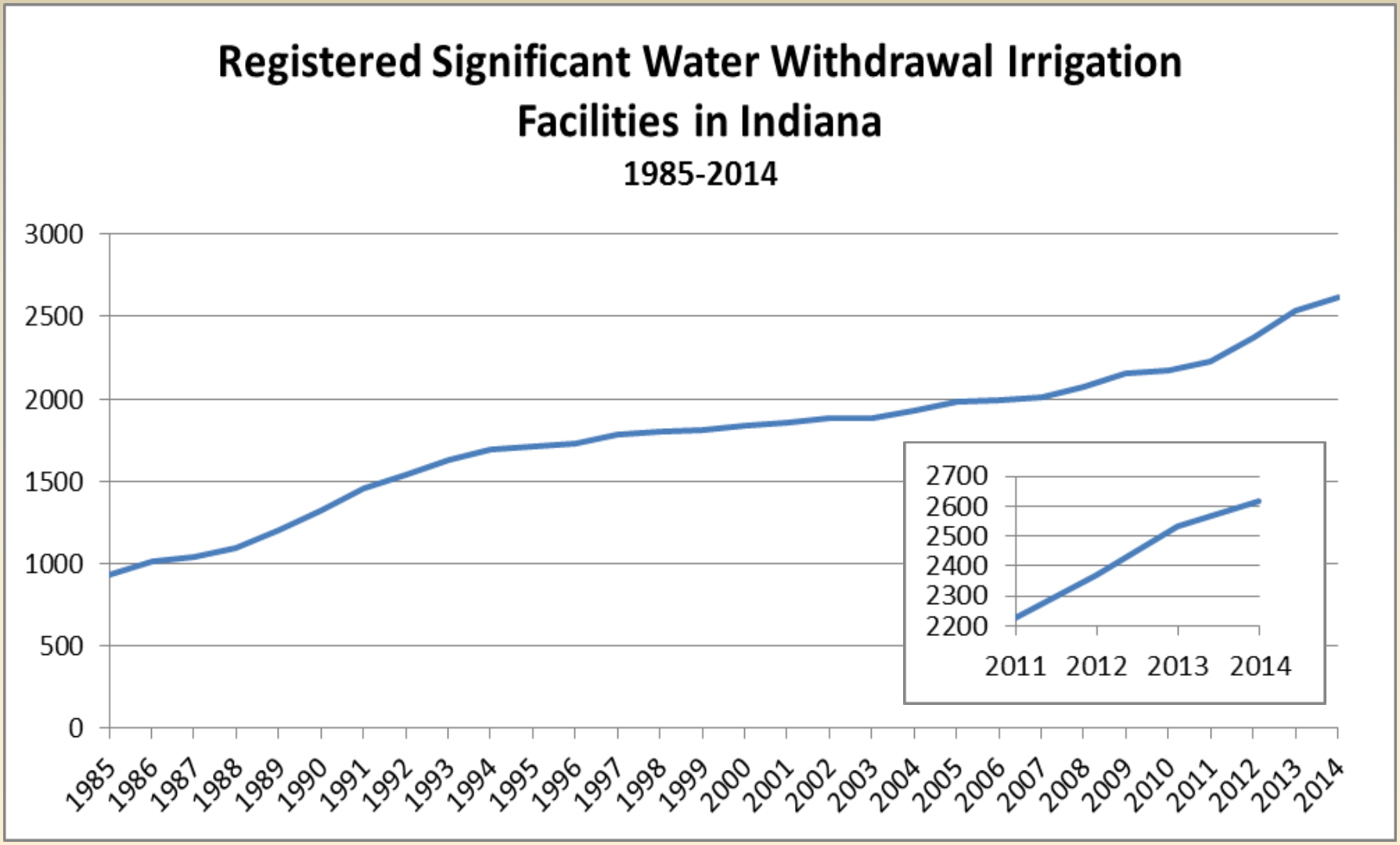
2014 Indiana Registered SWWFs

Water Use Code	*Number of Facilities*	*Number of Wells*	*Number of Intakes*
EP	105	266	112
IN	381	704	288
IR	2646	3592	831
MI	144	246	56
PS	721	2205	70
RU	63	167	14
TOTAL	4060	7180	1371

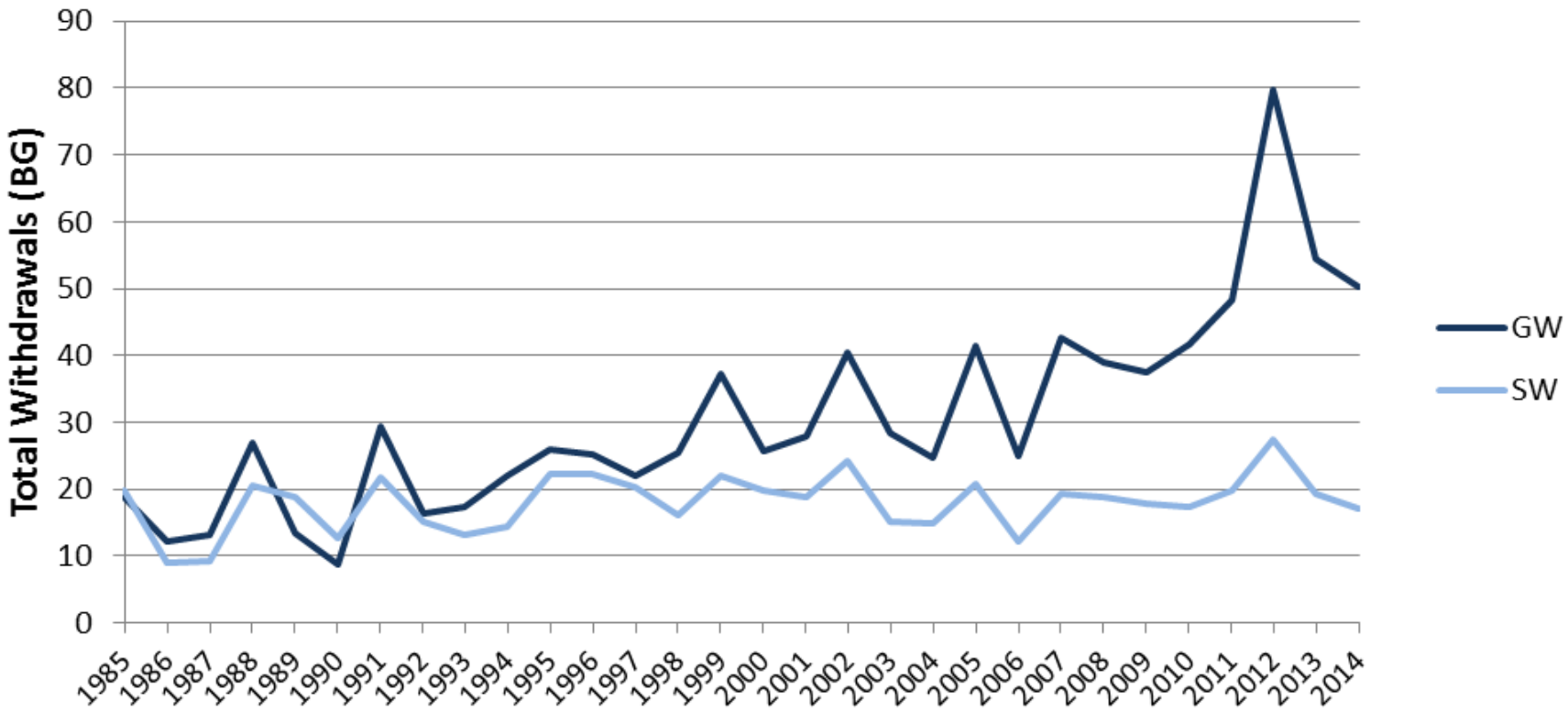
SWWF Water Use Reporting

2014 STATE TOTALS				
	Withdrawals (BG)	*Capacity (MGD)*	*Withdrawals vs Capacity*	*Total Number*
Surface Intakes	2460	17306	38.9%	1371
Wells	230	5872	10.7%	7180
TOTAL	2690	23178	31.8%	8551
Facilities				4060

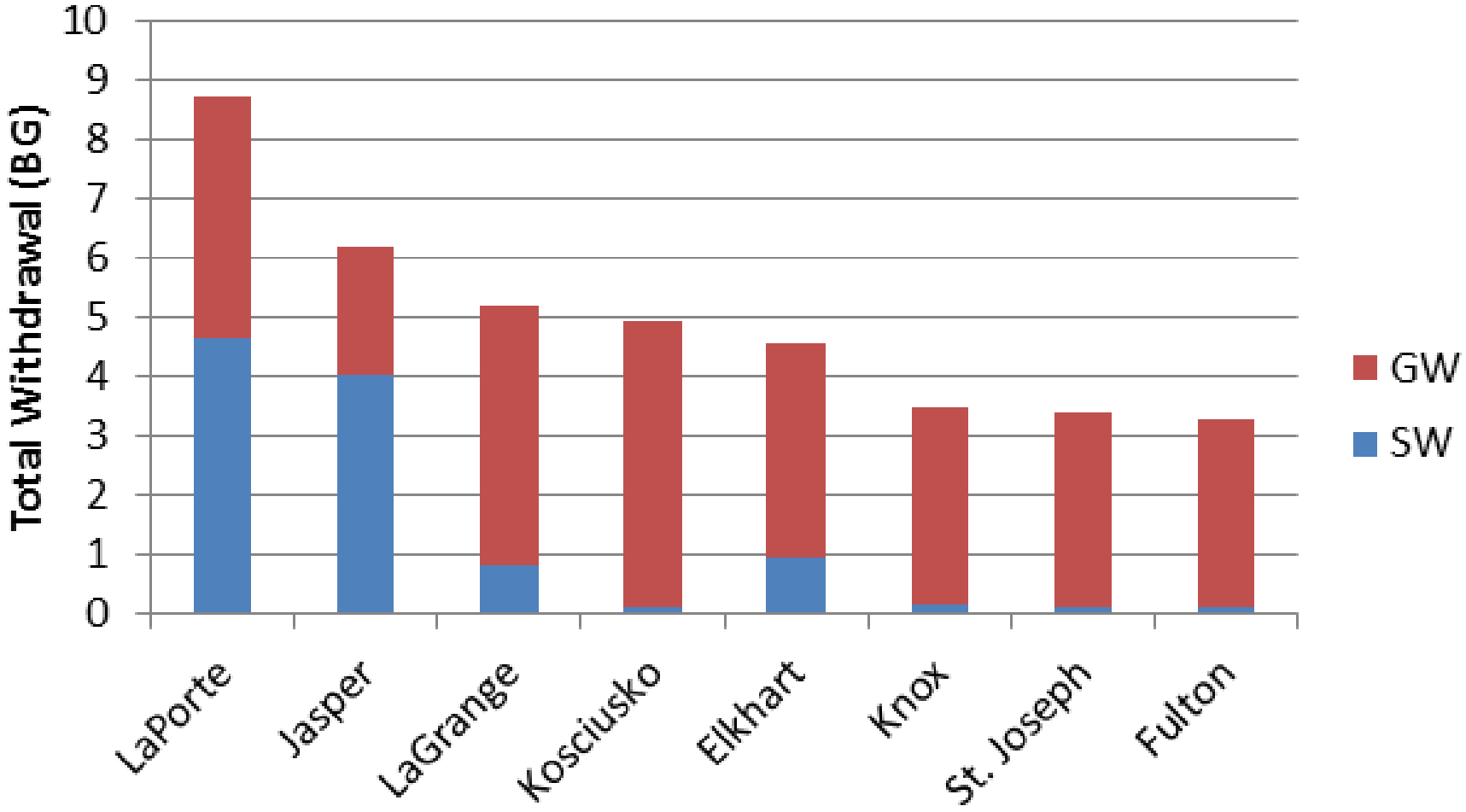

Total Annual Withdrawals 1985-2014
Total Withdrawals (BG)
4000
3500
3000
2500
2000
1500
1000
500
0
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
Total
SW
GW


Registered Significant Water Withdrawal Irrigation Facilities in Indiana
1985-2014
3000
2500
2000
1500
1000
500
0
1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014
2700
2600
2500
2400
2300
2200
2011 2012 2013 2014

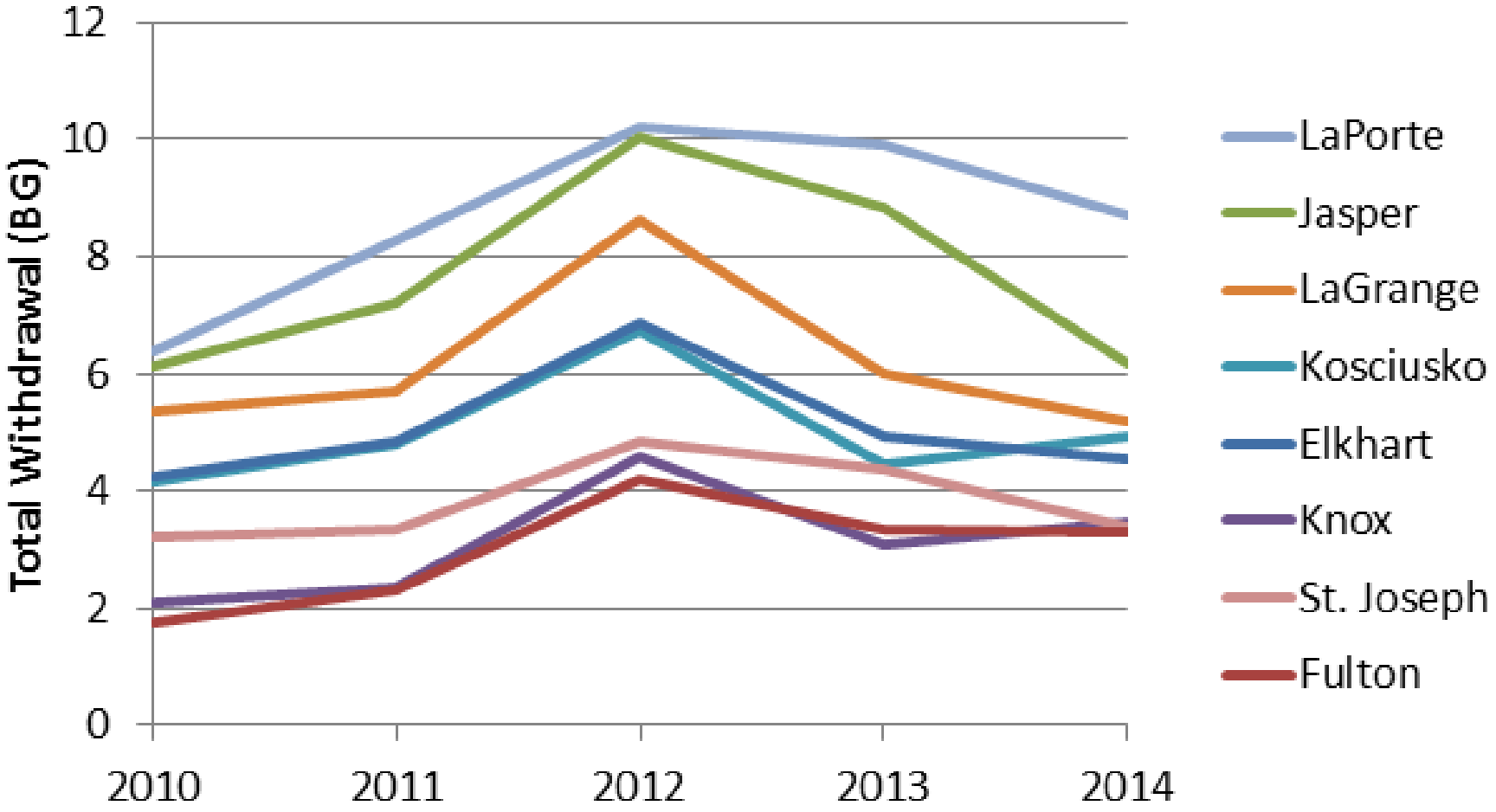
Annual Ground and Surface Water Withdrawals for Irrigation Facilities in Indiana 1985-2014



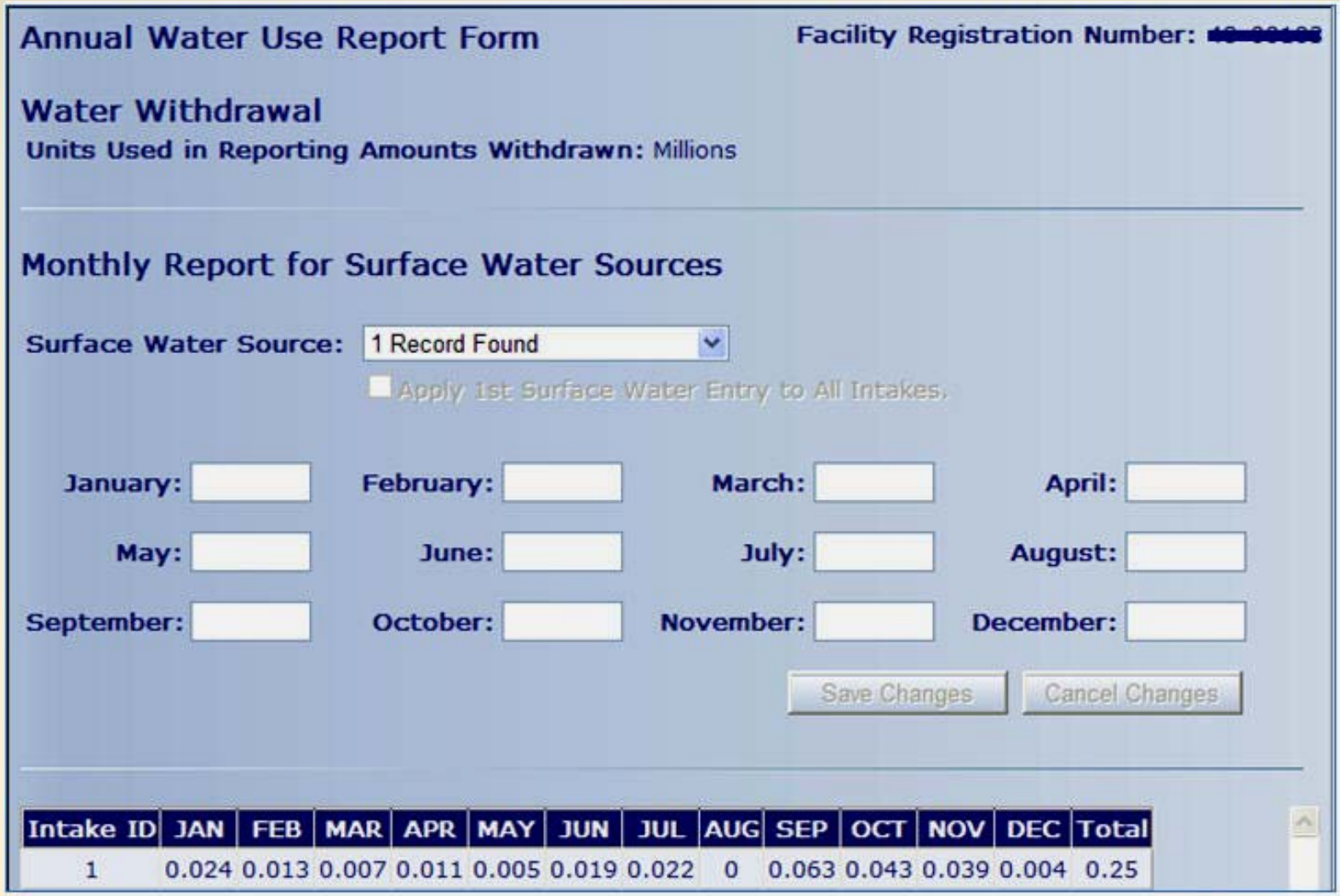
Top 8 Counties for Irrigation Water Use in Indiana 2014



Water Use Trends for Top 8 IR Counties in Indiana 2010-2014



Online Submittal of Annual Water Use Data



Annual Water Use Report Form

Facility Registration Number: [redacted]

Water Withdrawal

Units Used in Reporting Amounts Withdrawn: Millions

Monthly Report for Surface Water Sources

Surface Water Source: 1 Record Found

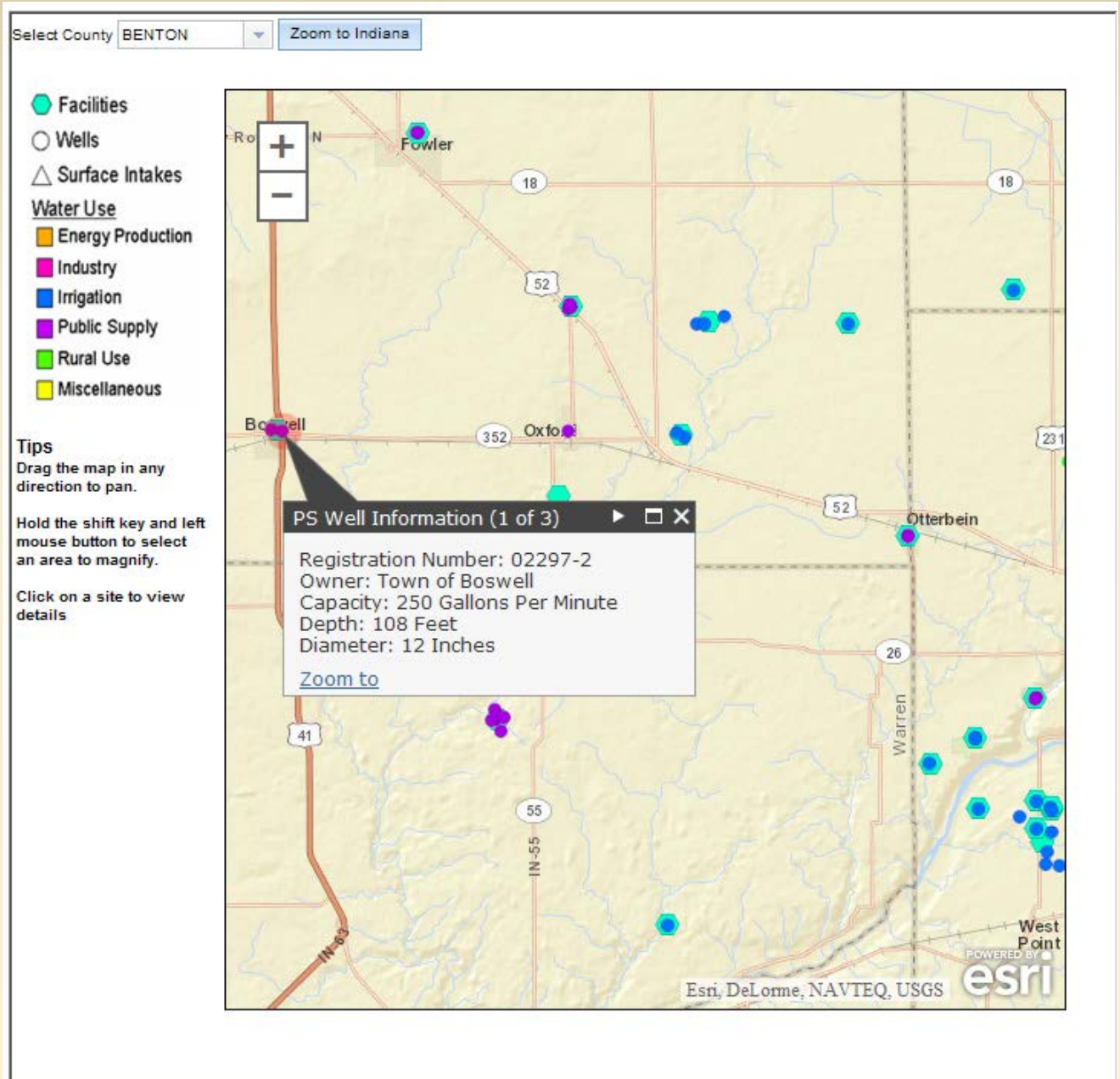
Apply 1st Surface Water Entry to All Intakes.

January:		**February:**		**March:**		**April:**						
May:		**June:**		**July:**		**August:**						
September:		**October:**		**November:**		**December:**						

Save Changes | Cancel Changes

Intake ID	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total
1	0.024	0.013	0.007	0.011	0.005	0.019	0.022	0	0.063	0.043	0.039	0.004	0.25

SWWF Location Map

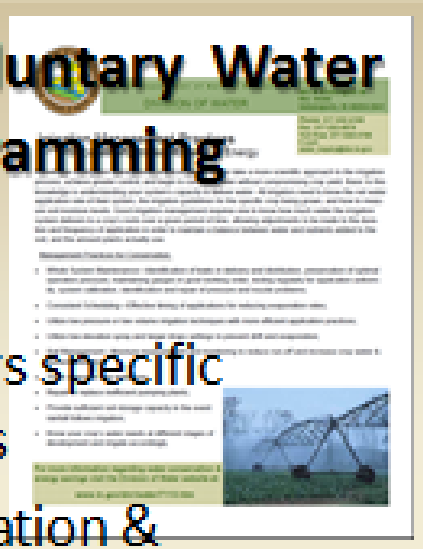


IC 14-25-15: Indiana's Implementation of Great Lakes_St. Lawrence River Basin Water Resources Compact

Petition to Change GLC Rule 312 IAC 6.2
(Administrative Cause #15-076W)

- Definition of “Baseline Volume Abandonment”
- Expand List of Salmonid Streams in Indiana
- Facility Sale of Transfer of Baseline Volume
- Identify Conservation and Efficiency Objectives

Great Lakes Compact Webpage & Voluntary Water Conservation & Efficiency Programming



- Outreach & Education
  - Water Use Management outreach fliers specific to water use categories– to all facilities
  - Provides Great Lakes Compact Information & Suggests Best Management Practices for Conservation & Efficiency for each Water Use category
  - Water Management Planning Framework for each Category
- Conservation & Efficiency "Clearinghouse" Website: www.in.gov/dnr/water/6364.htm

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