Members

Sen. Edward Charbonneau, Chairperson
Sen. Jean Breaux
Sen. James Buck
Sen. Mark Stoops
Rep. David Wolkins
Rep. James Baird
Rep. Sue Errington
Rep. Matt Pierce
Doug Meyer
Dave Wyeth
John Hardwick
Calvin Davidson
Thomas Easterly
Heather Hill
Kyle Hannon

ENVIRONMENTAL QUALITY SERVICE COUNCIL

Legislative Services Agency
200 West Washington Street, Suite 301
Indianapolis, Indiana 46204-2789
Tel: (317) 233-0696 Fax: (317) 232-2554

LSA Staff:

Craig Mortell, Attorney for the Council
Jessica Harmon, Fiscal Analyst for the Council

Authority: IC 13-13-7

MEETING MINUTES[1]

Meeting Date:	**September 13, 2013**
Meeting Time:	**9:00 A.M. Central Daylight Time**
Meeting Place:	**Indiana Dunes National Lakeshore Visitor Center**
Meeting City:	**Porter, Indiana**
Meeting Number:	**2**

Members Present: **Sen. Edward Charbonneau, Chairperson; Rep. James Baird; John Hardwick; Thomas Easterly; Kyle Hannon.**

Members Absent: **Sen. Jean Breaux; Sen. James Buck; Sen. Mark Stoops; Rep. David Wolkins; Rep. Sue Errington; Rep. Matt Pierce; Doug Meyer; Dave Wyeth; Calvin Davidson; Heather Hill.**

Senator Charbonneau, Chair of the Environmental Quality Service Council (EQSC), called the meeting to order at 9:07 a.m. Central Daylight Time. He recognized Garry Traynham, the acting superintendent of the Indiana Dunes National Lakeshore.

Mr. Traynham welcomed the EQSC and everyone in attendance to the Indiana Dunes National Lakeshore Visitor Center. He described the history of the Indiana Dunes National Lakeshore and its natural and economic importance.

---

[1] These minutes, exhibits, and other materials referenced in the minutes can be viewed electronically at http://www.in.gov/legislative Hard copies can be obtained in the Legislative Information Center in Room 230 of the State House in Indianapolis, Indiana. Requests for hard copies may be mailed to the Legislative Information Center, Legislative Services Agency, West Washington Street, Indianapolis, IN 46204-2789. A fee of $0.15 per page and mailing costs will be charged for hard copies.

Great Lakes-St. Lawrence River Basin Water Resources Compact

The first speaker to address the EQSC was Chris Smith, Deputy Director of the Indiana Department of Natural Resources (DNR), whose presentation was entitled "Great Lakes-St. Lawrence River Basin Water Resources Compact Update" (see Exhibit 1).

Mr. Smith:

- traced the history of the Great Lakes-St. Lawrence River Basin Water Resources Compact ("the Compact"), which Indiana ratified in 2008;
- summarized the Indiana Water Resources Management law (IC 14-25-7), which requires the owner of a "significant water withdrawal facility" (SWWF), i.e., a facility capable of withdrawing more than 100,000 gallons of ground water and/or surface water per day, to register the SWWF and annually report the amount of water withdrawn by the SWWF;
- presented data on the SWWFs located in Indiana within the Great Lakes basin and on the amount of water they withdraw;
- pointed out that the Compact prohibits new and increased diversions of water from the Great Lakes basin, with certain exceptions; and
- said that the Natural Resources Commission (NRC), as required by IC 14-25-15-5, is in the process of adopting a rule to implement water conservation and efficiency programs and a permit program for the implementation of Article 4 of the Compact.

In response to questions from Senator Charbonneau, Mr. Smith confirmed that IC 14-25-7 was enacted 25 years before Indiana ratified the Compact and that IC 14-25-7 applies throughout the state while the conservation and efficiency provisions of the NRC's proposed rule implementing Article 4 of Compact will apply only in the part of Indiana within the Great Lakes basin.

In reply to a question from Representative Baird, Mr. Smith said that the NRC's proposed rule implementing Article 4 of the Compact should have no effect on areas of Indiana outside the Great Lakes basin.

In answer to a question from Kyle Hannon, Mr. Smith explained that the owner of a new SWWF: (1) would be required under the NRC's proposed rule to meet the new water conservation and efficiency requirements if the SWWF is located within the Great Lakes basin; but (2) could be required under IC 14-25-4 to mitigate the harm to a neighbor whose well fails because of the SWWF's water withdrawals regardless of where in Indiana the SWWF is located.

In reply to a question from Commissioner Easterly, Mr. Smith said that the main idea of the Compact is to keep water that is within the Great Lakes basin from being removed from the basin.

Asian carp

The next speaker to address the EQSC was John Goss, the Asian Carp Director at the White House Council on Environmental Quality, who provided the EQSC with "an update on the progress of the Asian carp strategy" (see Exhibit 2).

Mr. Goss made these points:

- The Asian Carp Regional Coordinating Committee (ACRCC), an interagency task force made up of federal, state, and local agencies, is working to create a sustainable control program to prevent the establishment of a population of non-native Asian carp (especially bighead carp and silver carp) in the Great Lakes.

- The ACRCC control strategy has since 2010 included an electric barrier system, monitoring, and efforts to develop new control strategies and new long term solutions.
- The electric barriers are in the Chicago Area Waterway System, a known continuous connection between the Great Lakes and Mississippi River basins, at a point about 37 miles from Lake Michigan.
- The potential long term solutions being studied include bioactive microparticles that would be toxic to Asian carp, but would pass through the stomachs of other fish without effect and seismic technology "guns" that would create sound waves in the water to drive Asian carp away.
- Commercial fishers have removed over 1,000 tons of Asian carp from the Illinois River south of the electric barriers.
- In Indiana, large areas of the Wabash River, White River, Kankakee River, and Ohio River now have populations of Asian carp.
- A permanent barrier is being constructed at the Eagle Marsh wetlands preserve in Fort Wayne because the preserve has been identified as being at risk for the transfer of aquatic nuisance species between the Great Lakes basin and the Mississippi River basin.
- About $50 million per year in federal funds has been invested in Asian carp control efforts over the past four years.

The EQSC next heard from Attorney General Greg Zoeller who described the role of the attorney general in the Asian carp control effort as ensuring that the concerns of Hoosiers are heard and that Indiana bears a fair share of the cost. He then discussed the four-day trip he took by boat on the Wabash River in July.

Attorney General Zoeller's presentation included these points (see Exhibit 3):

- Asian carp, which are non-native to Indiana waters, have become established in the Wabash River, where they could disrupt the food chain and displace native fish species and thus harm recreational fishing.
- Asian carp can grow to four feet long and 90 pounds. Silver carp -- which tend to leap into the air when disturbed by motorboats -- can injure boaters.
- His trip was intended to highlight the Wabash River's economic and cultural importance, to focus attention on the Asian carp problem, and to encourage people to enjoy and appreciate the Wabash River.
- During the trip he met with mayors of cities located on the Wabash, members of the Wabash River Heritage Corridor Commission, Wabash River Defenders (volunteers who remove trash from the river), and other local leaders.

The next speaker to address the EQSC was Reuben R. Goforth, PhD., a professor in the Department of Forestry & Natural Resources of Purdue University who is engaged in studying Asian carp. Professor Goforth's presentation (see Exhibit 4) included these points:

- The term "Asian carp" includes four species:
    1. the bighead carp
    2. the silver carp
    3. the grass carp, and
    4. the black carp.
- The "bigheaded" Asian carp (the bighead carp and silver carp) escaped from fish farming enclosures in Arkansas in 1972 and 1973 and began making their way north in the Mississippi and other rivers. The economic and ecological consequences of their establishment in the Midwest are likely to be substantial. Considerable efforts are being made to prevent them from becoming even more widely established in the Midwest.

- Efforts to prevent, limit, or slow the advancement of bigheaded carp have met with only mixed results and may be limited by our underestimation of their ability to adapt to new environments. It had been thought that bigheaded carp could spawn only in large rivers and only during rainy periods in the spring and early summer, but it now appears that they can spawn under other conditions as well.
- His laboratory monitored bigheaded carp spawning activity in the Wabash River through an entire summer and detected the presence of eggs on 19 of 25 sample dates, in water temperatures varying from 18.5 °C to 29.7 °C, and as late as September 1.
- His laboratory also experimented with the use of electricity to kill aquatic nuisance species, but determined that the voltage needed to produce a significant effect was so great that this probably is not a feasible control option.

Following Professor Goforth's presentation, Senator Charbonneau asked all three speakers who had discussed Asian carp to take questions from EQSC members. The questions and answers that followed concerned the following:

- The extent to which other fish species prey upon Asian carp.
- Whether Asian carp have potential value in the human diet.
- Whether success in stopping the advance of Asian carp has been achieved through any means other than electric barriers.
- The potential development of a market for Asian carp products or value-added products.
- The funding of efforts to stop the advance of Asian carp.
- The feasibility of eradicating Asian carp or at least limiting the spread of Asian carp and the effect they have on the environment.

Backflow Prevention

The EQSC then heard from the meeting's final speakers, James Probst, the President of the Indiana American Backflow Prevention Association, and Sean Cleary, the Director of the International Association of Plumbing and Mechanical Officials. They addressed the subject of backflow prevention.

Mr. Probst made the following points (see Exhibit 5):

- Backflow occurs when drinking water supplied by a plumbing system flows in the direction opposite of the direction it is intended to flow. When this occurs, the water may become contaminated and unsafe to drink.
- In Indiana, an approved backflow prevention assembly that meets certain standards must be installed in each new plumbing system to prevent the backflow of drinking water.
- Authority to enforce backflow prevention requirements is held by the Indiana Department of Environmental Management, which has authority over the drinking water system, and the Indiana Department of Homeland Security through the Indiana plumbing code.
- Backflow may occur when a backflow prevention assembly fails or is installed improperly, when a plumbing "cross-connection" between drinking water and contaminated water is made by mistake, or under other circumstances.
- When backflow occurs in a water utility's system, the utility is required by administrative rule to notify its customers and issue a "boil water" advisory. However, a boil water advisory may not reach all water users in time, and some water users may ignore the notice.

Mr. Probst advocated the passage of legislation in 2014 to do the following:

1. Require the owner of a plumbing system that includes a backflow prevention assembly to test the backflow prevention assembly annually and to maintain it in working order.
2. Require individuals who are registered backflow testers to obtain at least two hours of continuing education every two years.
3. Require the State of Indiana to adopt and make available to the public a standard electronic backflow test report form.

Mr. Cleary added that there is greater need for registered backflow testers to obtain continuing education now than in the past because plumbing systems are changing. New systems that incorporate rain water or differ in other ways from traditional systems are increasing in number, he said, and registered backflow testers need to learn about these new systems.

John Hardwick commented that he is the chair of the Indiana Section of the Water Utility Council of the American Water Works Association and that his organization supports the legislative recommendations made by Mr. Probst and Mr. Cleary. His organization, he said, believes that there is currently a gap in Indiana's backflow prevention regulations in that backflow prevention devices are tested when installed and, perhaps, never tested again.

Senator Charbonneau thanked Kay Nelson, the Director of Environmental Affairs of the Northwest Indiana Forum, for making the arrangements for the meeting to be held in Porter, Indiana. He also thanked the Indiana Dunes National Lakeshore staff for their hospitality and thanked everyone who had attended the meeting. He adjourned the meeting at 11:37 a.m. Central Daylight Time.

Great Lakes_St. Lawrence River Basin Water Resources Compact Update

Great Lakes Compact
A look back

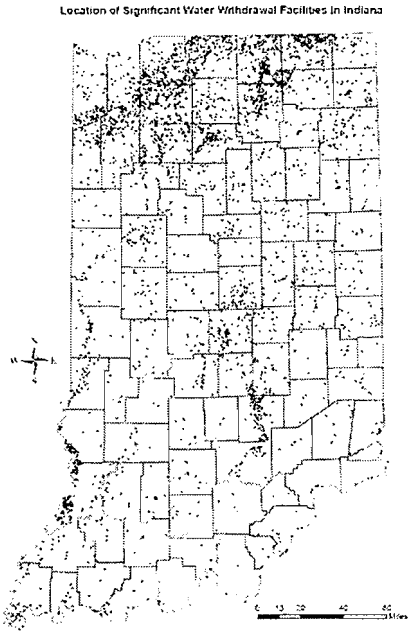
- **1909 Boundary Waters Treaty IJC**
- **1985 Great Lakes Charter**
- **1986 WRDA**
- **2001 Annex**
- **Agreement among the Parties 12/13/2005**
- **Indiana Approach to passage**

  Summer/fall 2007
  - development of implementing legislation with stakeholder outreach and input
  - Commitment to enact implementing legislation in conjunction with Compact
  - Legislative Study Committee Meetings
  - Legislation drafted Late Fall

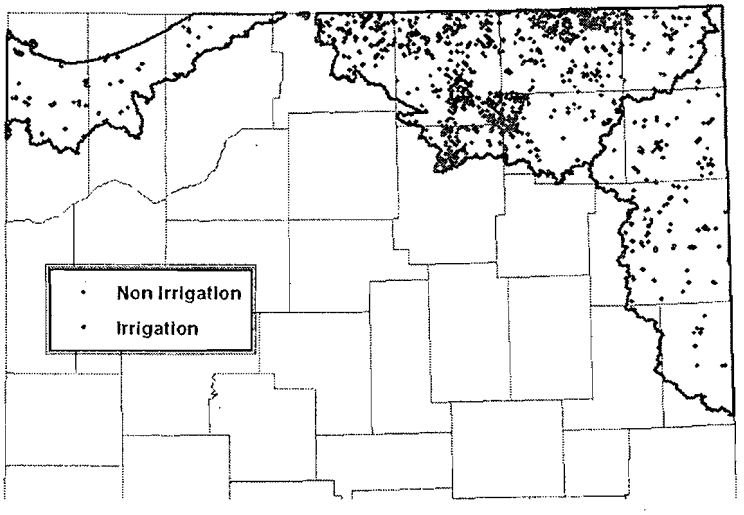
  2008 session
  - introduce and pass a bill
- **Compact became effective 12/8/2008**

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



Locations of Registered Wells & Intakes within the Great Lakes Basin



INDIANA/GREAT LAKES BASIN DATA

Water Use Code	Number of Facilities		Number of Wells		Number of Intakes	
	Indiana	GL Basin	Indiana	GL Basin	Indiana	GL Basin
EP						
IN						
IR						
MI						
PS						
RU						
TOTAL						

INDIANA/GREAT LAKES BASIN DATA

	GL Basin Withdrawals in 2012 (BG)		GL Basin Current Capacity (MGD)		Current Number	
	Total (BG)	As MGD	Total	%	Indiana	GL Basin
Surface Intakes	801.08		5,116.06		1374	
Wells	51.03		1,148.03		6789	
TOTAL	852.10		6,264.09		8163	
Facilities					3832	

GREAT LAKES BASELINE FACILITY DATA

Water Use Code	Number of Facilities	Capacity (MGD)	Consumptive Use (MGD)	Diversions (MGD)
EP	18	2,406.79	60.41	0
IN	99	3,821.66	960.33	35.14
IR	496	692.58	614.13	0
MI	44	50.88	5.28	0
PS	148	676.84	82.57	104.69
RU	5	16.35	7.28	0
TOTAL	810	7,665.70	1,729.99	139.84

Compact Purposes

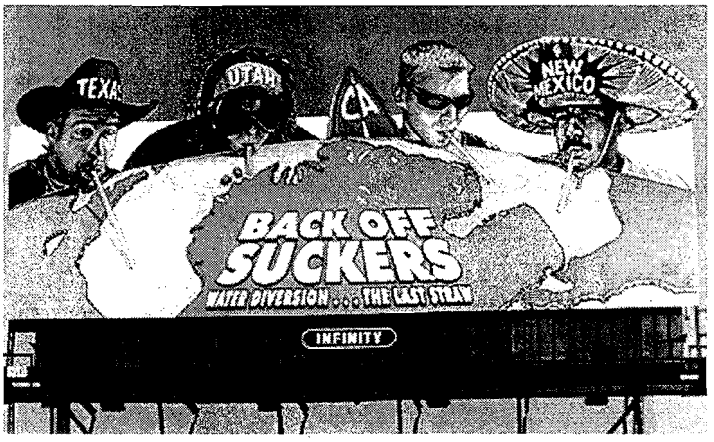
Effective consistent water resource management

- **Remove causes of present and future controversies;**
- **Provide for cooperative planning and action;**
- **Facilitate consistent water management approach;**
- **Facilitate data exchange and scientific information base for decision making;**
- **Prevent significant adverse impacts of water withdrawals and losses;**
- **Promote interstate and state-provincial comity; and**
- **Promote adaptive management approach to conservation and management of basin waters.**

Real Purpose of Great Lakes Compact

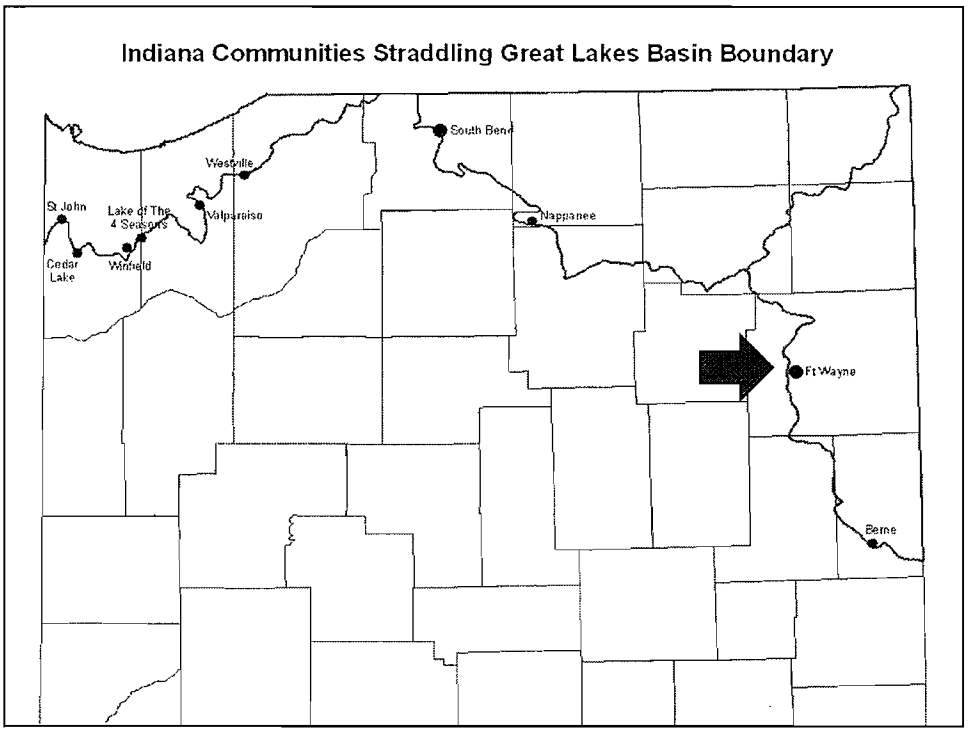
Section 4.8. *All new or increased diversions are prohibited except as provided for in the compact.*

Section 4.9. *Exceptions to the prohibition for straddling communities, straddling counties and intra-basin transfers.*



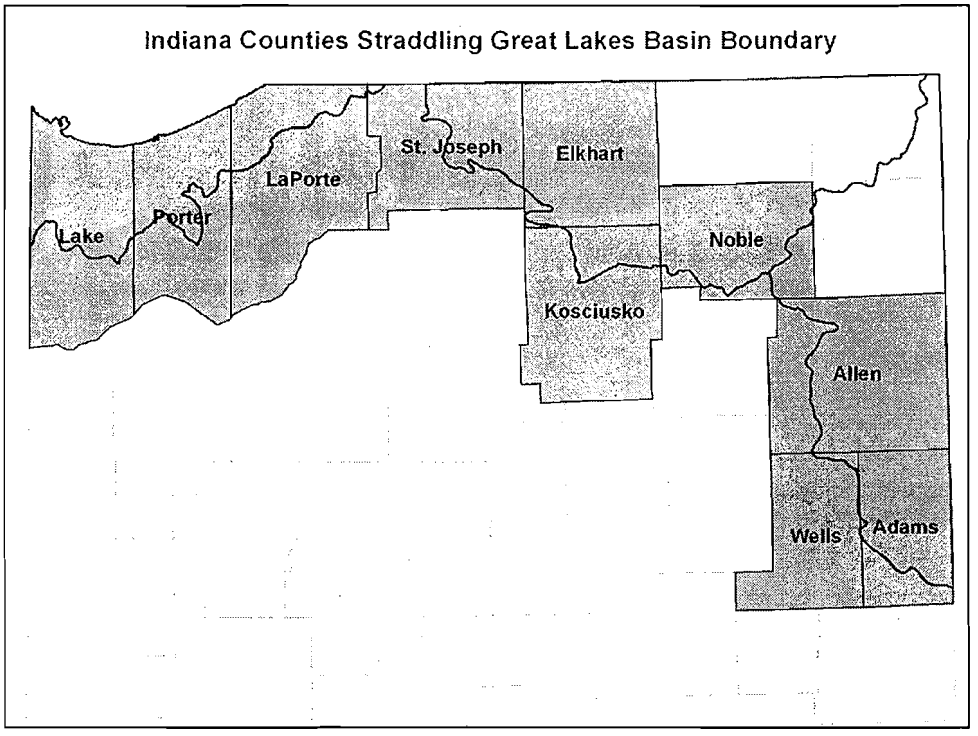
Water Resource Compact Diversions - Exceptions

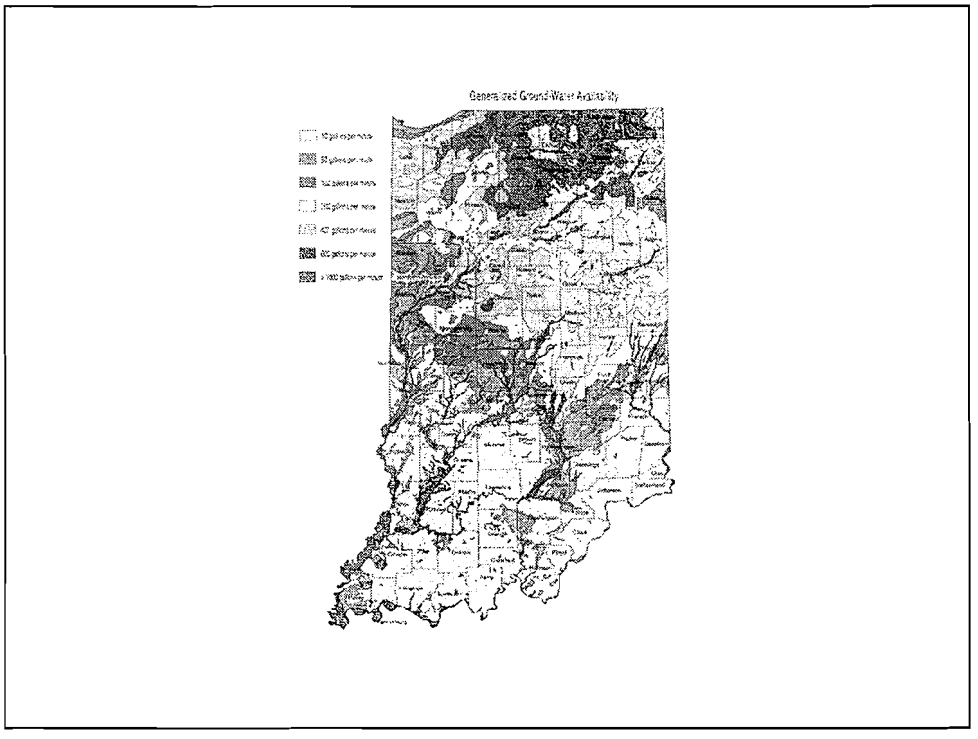
- **Straddling communities** **any incorporated city, town or the equivalent thereof, wholly within any County that lies partly or completely within the Basin, whose corporate boundary existing as of the effective date of this Compact, is partly within the Basin or partly within two Great Lakes watersheds.**
- **Requires Return Flow**
- **Meets Exception Standard > 100,000 gpd**
- **Requires Regional Review if > 5 MGD**



Water Resource Compact Diversions - Exceptions

- **Communities in straddling counties** any incorporated city, town or the equivalent thereof, that is located outside the Basin but wholly within a County that lies partly within the Basin and that is not a Straddling Community.
  - **Requires Regional Review**
  - **Need can not be met in community's basin**


Indiana Counties Straddling Great Lakes Basin Boundary
Lake
Porter
LaPorte
St. Joseph
Elkhart
Noble
Kosciusko
Allen
Wells
Adams



Water Resource Compact Diversions - Exceptions

- **Intra-Basin Transfers**
  - **State discretion < 100,000 gpd**
  - **Between 100,000 gpd & 5 MGD**
    - **Exception Standard**
    - **Notice to other parties**
    - **No feasible alternative in the receiving Great Lake Basin**
  - **Requires Regional Review if > 5 MGD**

Diversion Inquiries

1. Chester, Inc.- Valparaiso, Porter Co.

- *Straddling County*
- *Four 12 unit multi-family buildings*
- *Sufficient gw resource available in area*

2. Grand Oaks LLC.- Valparaiso, Porter Co.

- *Straddling County*
- *400 unit housing development*
- *Sufficient gw resource available in area*

3. Twin Lakes Utilities, Lake Co.

- *Straddling Community*
- *Proposed wells to supply Lake of the Four Seasons*
- *Diversion volume established by existing baseline*

4. Mineral Springs Bottling Facility, Porter Co.

- *Straddling County*
- *Water shipped to Asia*
- *Diversion must be for short-term "humanitarian purpose"*

Diversion Inquiries (continued)

5. Fort Wayne Utility – Allen Co.

- *Straddling Community*
- *Potential Diversion of Water from GL Basin*
- *Baseline Diversion of 25.039 MGD Applicable*

6. Enbridge Griffith Pipeline Terminal

- *Intra-basin Transfer*
- *Pipeline Testing (28.6 MG)*
- *Discharge Water Remains in GL Basin*

IC 14-25-15-5

Responsibilities and powers of the natural resources commission

Sec. 5. The natural resources commission:

.....

(3) shall adopt rules under IC 4-22-2 that implement voluntary water conservation and efficiency programs; and

(4) shall adopt rules under IC 4-22-2, which may provide for general permits, for the implementation, administration, and enforcement of article 4 of the compact.

As added by P.L.4-2008, SEC.5.

Rule Status

Rules

- Temporary Rule (#12-586(E)) for Permitting and C&E enacted on 11/1/12
- Preliminary adoption of Permanent Rules for Permitting and C&E by Natural Resources Commission on 11/20/12
- Final adoption of Permanent Rules expected by 4/1/14

RULE ADOPTION TIMELINE

LSA Document #13-335

• Preliminary Adoption	November 20, 2012
• Proposed Rule Submitted to Publisher	November 2013
• Public Hearing(s)	January 2014
• Final Adoption	March 2014
• Review by:	
– Attorney General	
– Governor	
• Effective	June 2014

Voluntary Water Conservation & Efficiency Programs

- Outreach & Education
- Establishing Baseline Conservation
- Conservation & Efficiency Website:

www.in.gov/dnr/water/6364.htm

Water Conservation and Efficiency Efforts

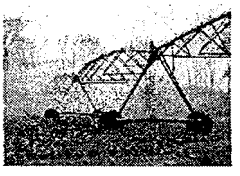
DIVISION OF WATER

Irrigation Management Practices
For Conserving Water, Nutrients & Energy

Knowledge of irrigation management practices allows you to take a more scientific approach to the irrigation process, achieve greater control, and begin to conserve water without compromising crop yield. Basic to this knowledge is understanding your system's capacity to deliver water. All irrigators need to know the net water application rate of their system, the irrigation guidelines for the specific crop being grown, and how to measure soil moisture levels. Good irrigation management requires one to know how much water the irrigation system delivers to a crop's roots over a given period of time, allowing adjustments to be made to the duration and frequency of applications in order to maintain a balance between water and nutrients added to the soil, and the amount plants actually use.

Management Practices for Conservation

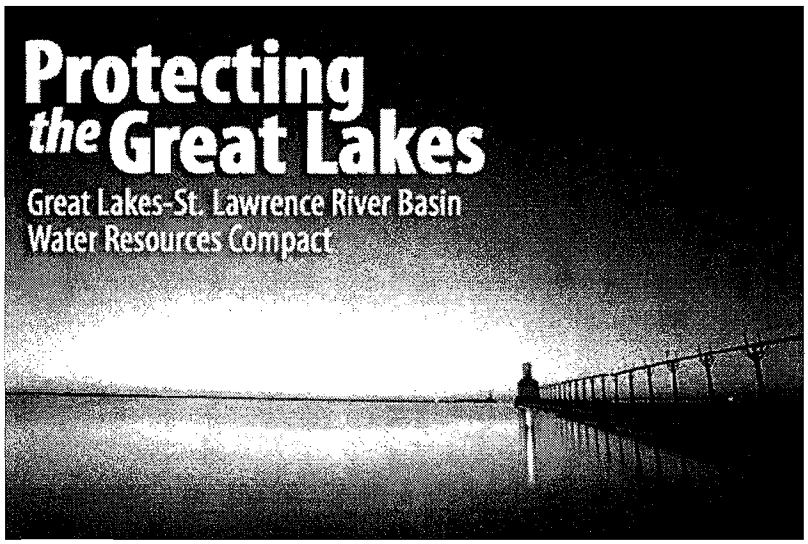
- Whole Systems Maintenance—Identification of leaks in delivery and distribution, preservation of optimal operation pressure, maintaining gauges in good working order, testing regularly for application uniformity, system calibration, identification and repair of pressure and nozzle problems.
- Consistent Scheduling—Effective timing of applications for reducing evaporation rates.
- Utilize low pressure or low volume irrigation techniques with more efficient application practices.
- Utilize low elevation spray and larger drops settings to prevent drift and evaporation.
- Soil Management—Moisture measurement and monitoring to reduce run off and increase crop water & nutrient utilization.
- Track seasonal crop water use.
- Repair or replace insufficient pumping plants.
- Provide sufficient soil storage capacity in the event rainfall follows irrigation.
- Know your crop's water needs at different stages of development and irrigate accordingly.



For more information regarding water conservation & energy savings visit the Division of Water website at:

www.in.gov/dnr/water/7113.htm

IDNR, Division of Water
Great Lakes Compact Webpage at:
http://www.in.gov/dnr/water/5216.htm

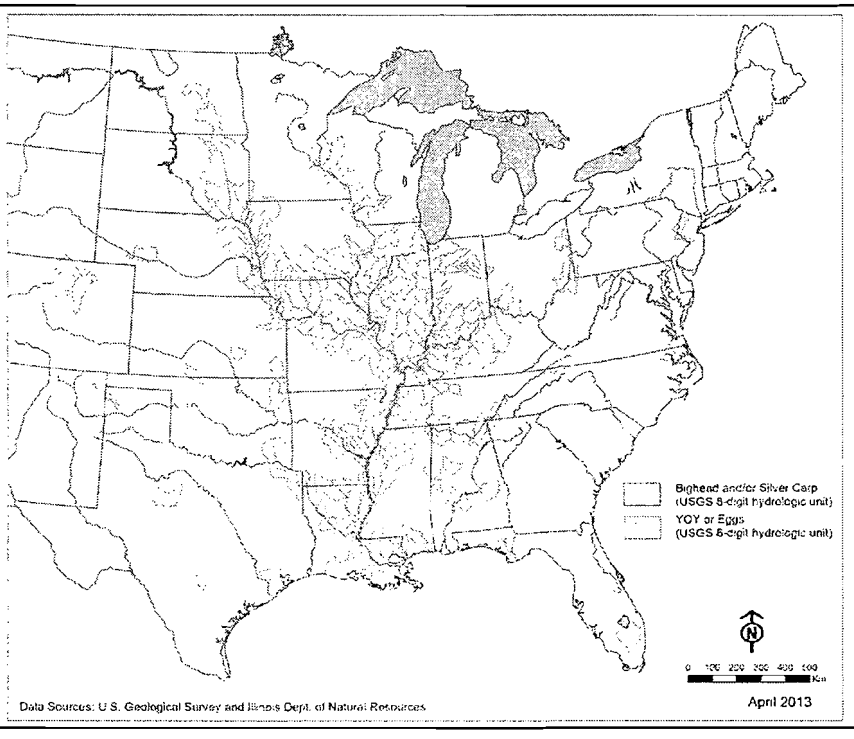


Asian Carp Regional Coordinating Committee

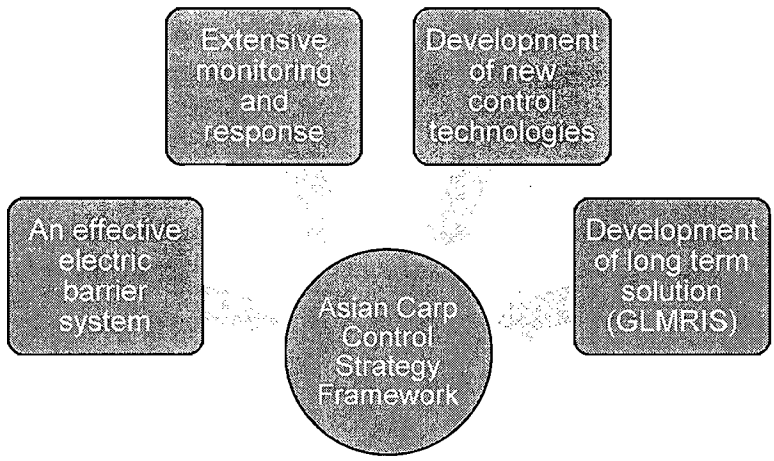
The ACRCC, with support from Federal, state, and local agencies, and private stakeholders and citizens, are creating a sustainable Asian carp control program to prevent the establishment of an Asian carp population in the Great Lakes.

ACRCC

Great Lakes RESTORATION

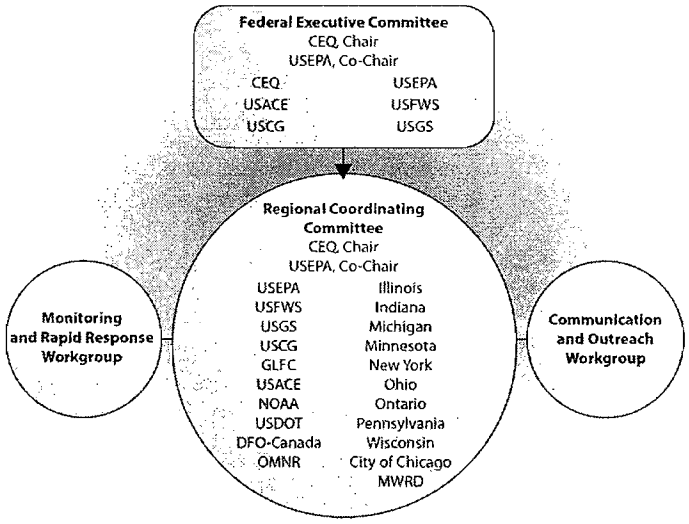


Response to the Threat



ACRCC 3

Asian Carp Regional Coordinating Committee



ACRCC

ACRCC Control Actions

Accomplishments

- Asian carp not established in Chicago or the Great Lakes
- All Great Lakes States, Ontario and Canada as partners
- Only CAWS a high risk pathway for Asian carp
- Redundant and effective electric barriers
- New nets, gear and sampling techniques for Asian carp

Ongoing Actions

- Best GLMRIS control options identified in 2013
- eDNA and fish sampling Great Lakes basin wide
- Testing new technologies like water guns and toxicants
- Harvest Asian carp below the electric barrier
- Refining eDNA technology and identifying vectors

ACRCC 5

2013

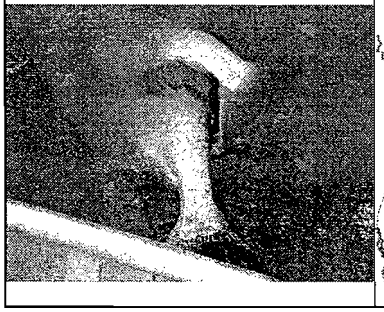
Characterizing Risk

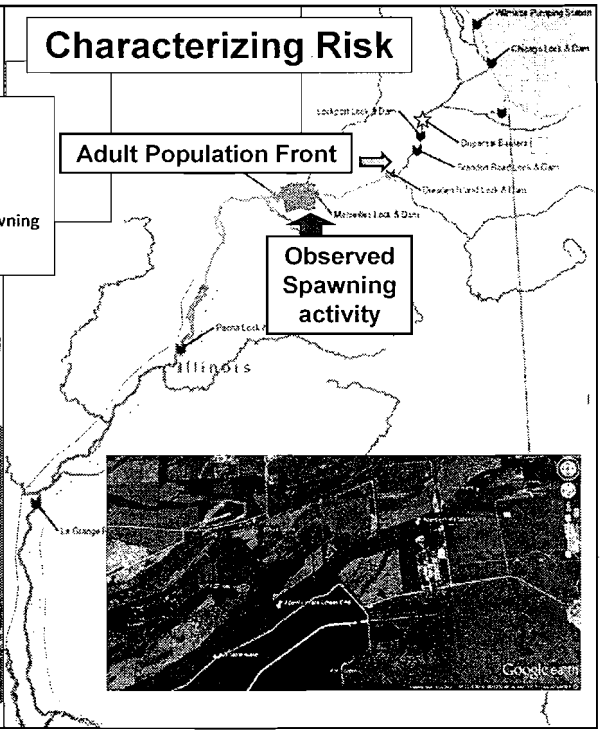
Distances from Lake Michigan

37 miles	Dispersal barriers ☆
55 miles	Adult Population Front
62 miles	Presence of Adults/Potential Spawning
62 miles	Verified Spawning

Areas of Concern

1) Verified Spawning Marseilles Pool
2) Verified Identification of AC eggs and larvae near Henry Illinois



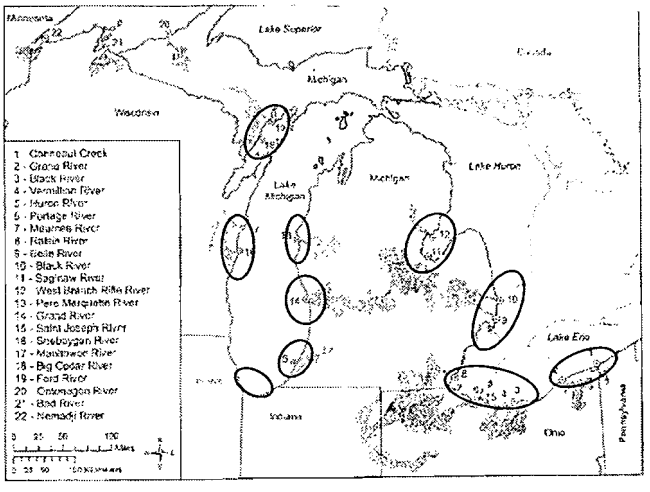


2012/13 Asian Carp Removal

- In 2013 (as of August 1st), contracted commercial fishers removed almost 140 tons of fish, 7,315 were bighead carp, 15,908 were silver carp, and 146 were grass carp (Starved Rock, Marseilles, and Dresden Island Pools).
- These efforts are in additio to the almost 1,000 tons o Asian Carp removed in previous years.

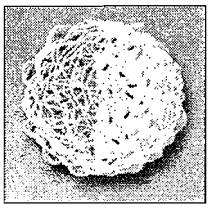
ACRCC

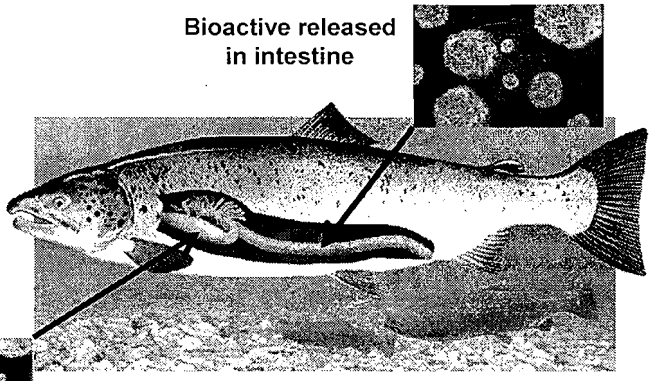
Great Lakes Monitoring Efforts



ACRCC

Toxic Microparticles



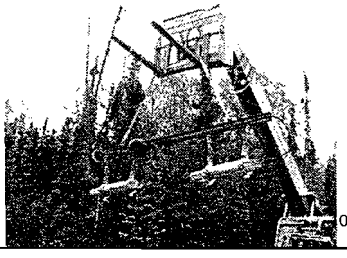


ACRCC

9

Seismic Technology/Watergun

- Use of seismic technology to divert invasive Asian carp
- Progress: Data analyses on trout, pike and carp studies have been completed
- Next Steps: Conducting structural effects study in CAWS (USACE collaboration)
- Test different size guns
- Observe fish behavior i.e.
  - Will it keep fish away?
  - How many guns needed?

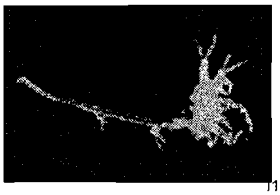


ACRCC

10

Great Lakes Mississippi River Interbasin Study (GLMRIS)

- The USACE is studying the full range of options and technologies to prevent the spread on Aquatic Nuisance Species (ANS) through the Great Lakes and Mississippi River Interbasin Study (GLMRIS)
- GLMRIS is evaluating the CAWS and the 18 other pathways along the 1,500 mile Great Lakes and Mississippi River basins divide for 38 species

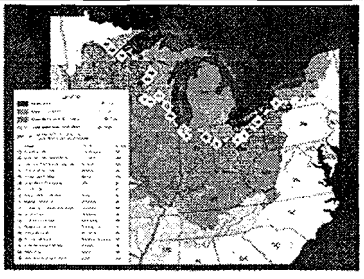


ACRCC

11

GLMRIS Risk Assessment - Results

GLMRIS: Other Pathways



- No pathways given high ratings due to Asian carp
- Eagle Marsh high due to VHSv toward MRB; medium for Asian carp
- Two other locations in Ohio with medium ratings for Asian carp
  - Little Kilbuck
  - Ohio and Erie Canal at Long Lake

- 12 ANS of Concern*
  - Rated either H, M risk
- Four categories to control
  - Fish
  - Plants
  - Algae
  - Crustaceans

1 Location Rated High
7 Locations Rated Medium
10 Locations Rated Low

ACRCC

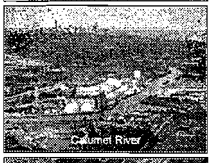
* Currently evaluating VHSv

12

BUILDING STRONG®

GLMRIS Report – Alternatives

- No New Federal Action
- Non-Structural Alternative
  - Best-management practices to address ANS of Concern
- Technology Alternatives
  - Utilizes refined list of ANS Controls from screening process
  - Combines control technologies to develop preliminary alternatives
  - Develop conceptual designs or treatment trains & delivery platforms
- Hydrologic Separation Alternatives
  - Lakefront – Hydrologic, Water Quality & Navigation modeling underway
  - Mid-System – Hydrologic, Water Quality & Navigation modeling underway
- Hybrids
  - Combine/mix physical barriers and technologies to optimize effects

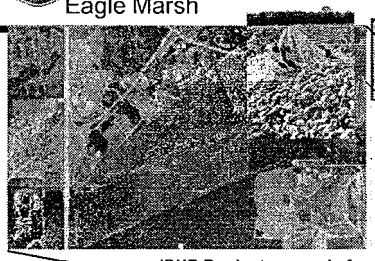


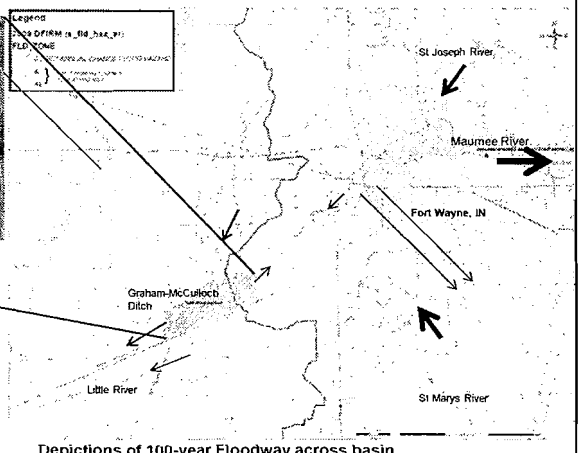
13

BUILDING STRONG®

GLMRIS Focus Area 2 Background
Eagle Marsh, Fort Wayne, IN

Eagle Marsh





IDNR Barrier to spread of adult Asian carp

Bighead carp retrieved from Wabash River at base of Roush Dam in 2004, approximately 25 river miles from basin divide

Depictions of 100-year Floodway across basin divide at Eagle Marsh

INDIANA - Interbasin Surface Water Connections

ACRCC

14

GLRI and Asian Carp Funding

- Over a billion dollars invested in Great Lakes
- Asian carp an Administration priority
- Majority of funding is GLRI dollars
- Increasing sustainability of program

FY	Base	GLRI	Total
2010	$26,604,846	$38,583,000	$65,187,846
2011	$14,741,122	$24,900,756	$39,641,878
2012	$32,275,000	$19,389,717	$51,664,717
2013	$35,223,180	$16,010,800	$51,233,980
Total	**$108,844,148**	**$98,884,273**	**$201,728,421**

ACRCC

15

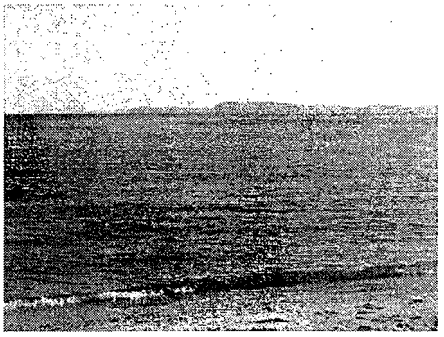
National Asian Carp Control Plan

- Prevent new introductions
- Prevent continued spread
- Population control
- Minimize adverse effects
- Research
- Education
- Implementation

Commercial fisherman with a boat full of Asian carp showing where the water line was hitting his boat.

ACRCC

THANK YOU



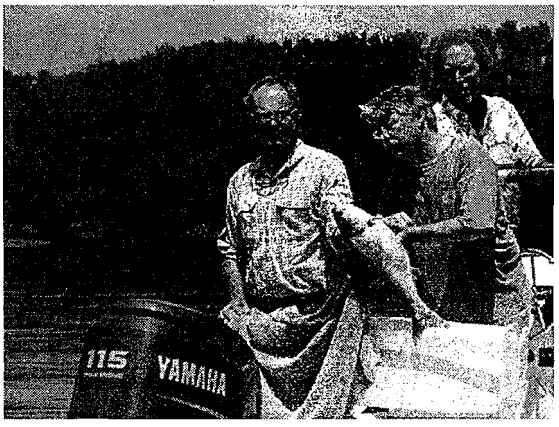
For more information

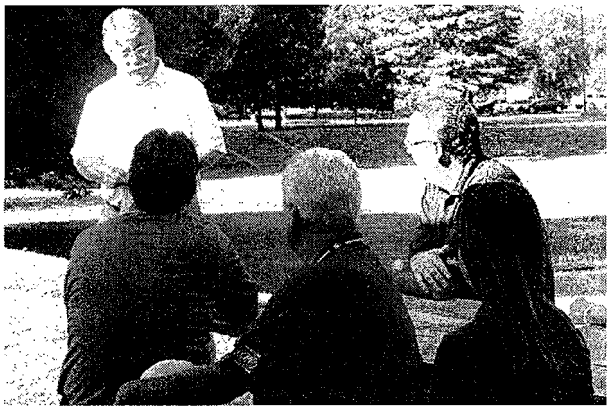
Please visit www.asiancarp.us

ACRCC

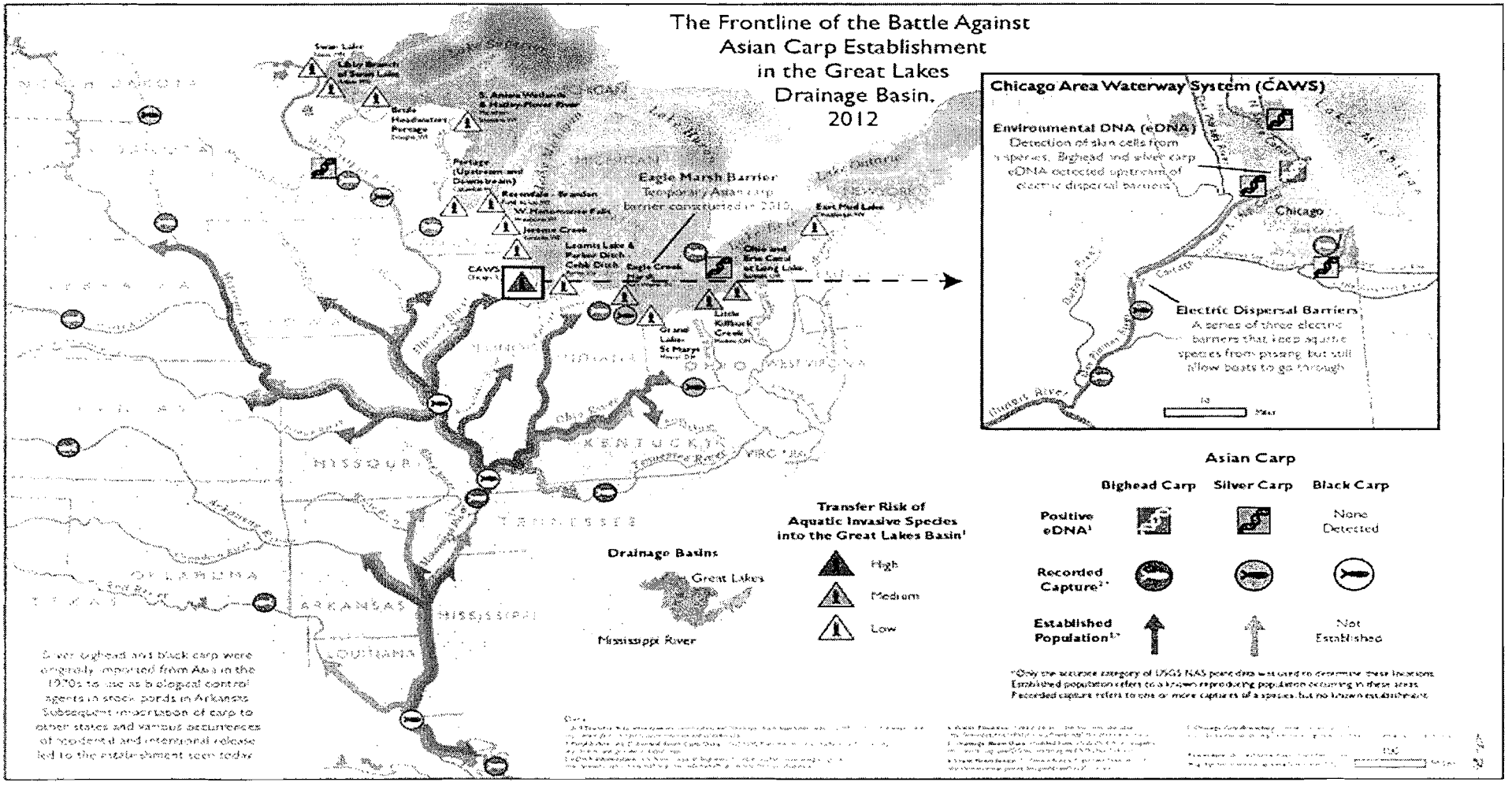
Great Lakes RESTORATION

Asian Carp and the Wabash River





The Problem with Asian Carp



First Day of River Tour
Wabash-Peru-Logansport

- White House Asian Carp Director John Goss and Senior Environmental DAG Tim Junk
- Highlighted the river's economic and cultural importance
- Met with mayors, members of Wabash River Heritage Commission Corridor, Wabash River Defenders, and local leaders.

Second Day
Lafayette- Clinton- Terre Haute

- Larger numbers of Silver Carp active during this part of the trip
- WLFI-TV crew on hand to film
- Purdue Professor Reuben Goforth addressed problems and solutions
- Clinton Mayor Jack Guiford, Jr. & local citizen Brendan Kearns, local carp follower

See Brendan's adventures with carp at www.youtube.com/watch?v=qfG4vsJ5_xI

Third Day
Terre Haute- Merom- Vincennes

- Terre Haute Mayor Duke Bennett and the "Year of the River"
- Merom -- one of the best views, overlooking the river and seeing 100 miles into IL
- Vincennes Mayor Joe Yochum expressed concern about the Carp and encouraged the community to enjoy the Wabash recreationally

New Harmony, IN

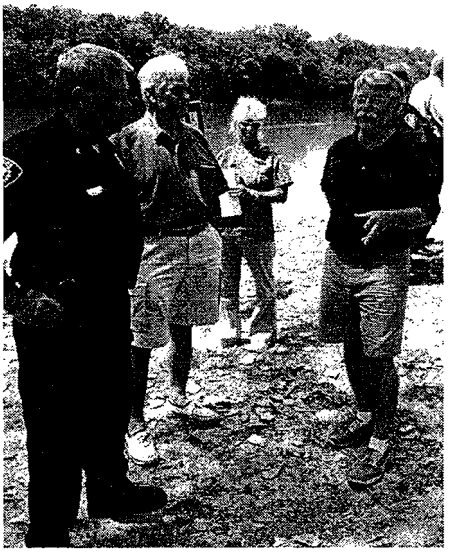
Last stop of the 4 day Tour

The Problem with Carp

- They are non-native to our waters
- Have spread northward up the Mississippi River.
- They could disrupt the food chain and displace native fish species
- Could harm the recreational and commercial fishing industries.
- The largest of the Asian carp can grow to four feet long and 90 pounds
- Can injure boaters when jumping out of water

Role of the Attorney General

- Environmental litigation on the State's behalf
- Represent state agencies IDEM and DNR
- Filed an amicus brief in the Supreme Court in Michigan's legal dispute with the Illinois over Asian carp control methods.
- Proposal to separate Lake Michigan from Chicago waterways to halt the northward advance of the fish
- Ensure that the concerns of Hoosier stakeholders are heard by the federal government and that Indiana does not face an unfair cost burden in the process.



Asian Carps: Invasive Fishes Impacting Indiana and the Midwest

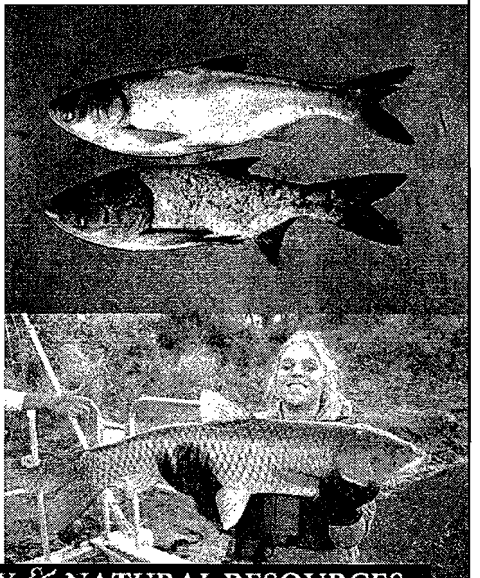
Reuben Goforth, Ph.D.

Department of Forestry & Natural Resources, Purdue University, West Lafayette, IN
E-mail: rgoforth@purdue.edu
Voice: 269-967-7620

PURDUE UNIVERSITY | FORESTRY & NATURAL RESOURCES | PURDUE AGRICULTURE

Quick Background

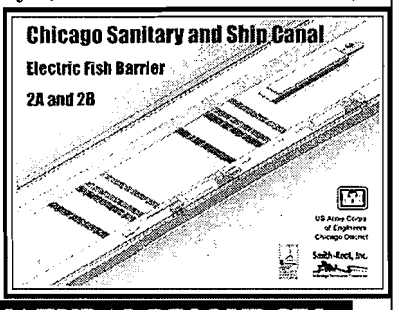
- **"Asian carp"**
  - **Bighead carp,** ***Hypophthalmichthys nobilis***
    - **Zooplanktivore**
  - **Silver carp,** ***H. molitrix***
    - **Phytoplanktivore**
  - **Grass carp** ***Ctenopharygodon idella***
    - **Macrophytes**
  - **Black carp** ***Mylopharygodon piceus***
    - **Molluscivore**



PURDUE UNIVERSITY | FORESTRY & NATURAL RESOURCES | PURDUE AGRICULTURE

Quick Background

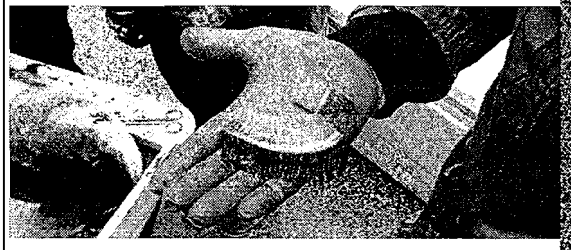
- Bigheaded carp (*Hypophthalmichthys* spp) invasion history well-known (started in Arkansas 1972 & 1973)
- Invasion of Great Lakes Basin considered imminent (Jerde et al. 2011)
- Substantial economic & ecological consequences of invasion & establishment very likely (Cudmore et al. 2012)
- Considerable effort expended to prevent additional introductions that could lead to establishment and wider distribution (e.g., electric barriers)

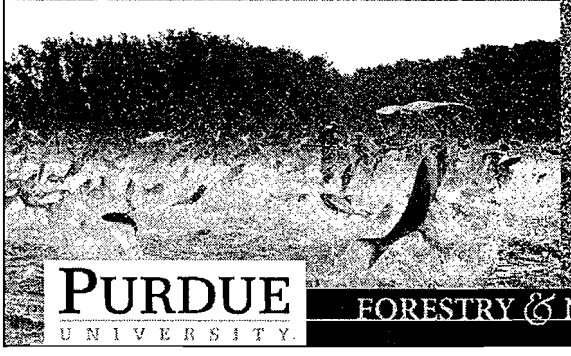


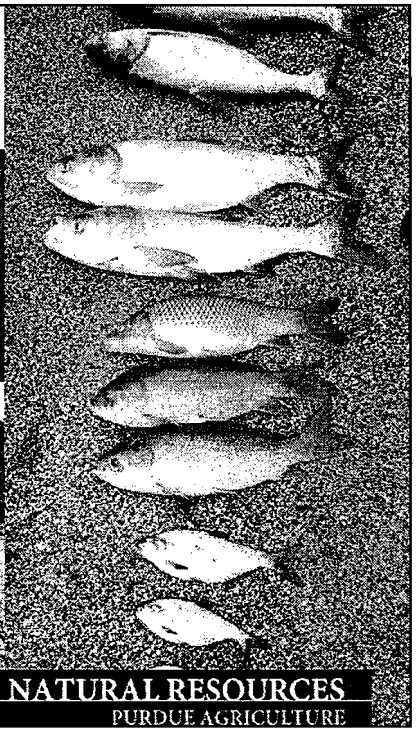
PURDUE UNIVERSITY
FORESTRY & NATURAL RESOURCES
PURDUE AGRICULTURE

Quick Background

- Ecosystem effects







PURDUE UNIVERSITY
FORESTRY & NATURAL RESOURCES
PURDUE AGRICULTURE

Quick Background

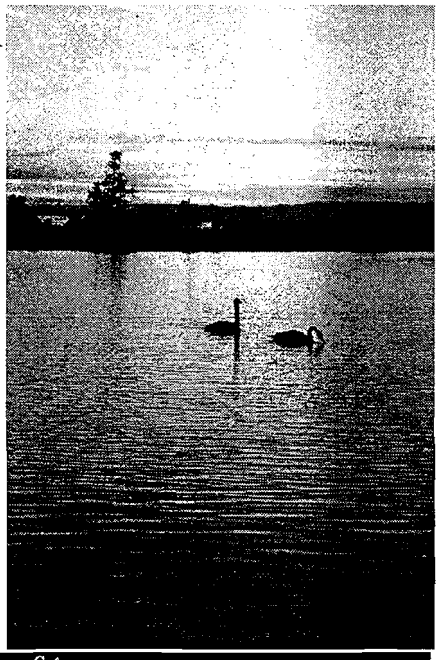
- **Danger to humans**

PURDUE UNIVERSITY

FORESTRY & NATURAL RESOURCES
PURDUE AGRICULTURE

Quick Background

- **Economic effects**



PURDUE UNIVERSITY

FORESTRY & NATURAL RESOURCES
PURDUE AGRICULTURE

Assessing/Predicting Threats

- **Prevent new introductions; halt, limit, slow dispersal**
- **Multiple efforts based on:**
  - Life history, habitat requirements, invasion histories, & human uses (Kolar & Lodge 2002; Cudmore et al. 2012)
  - Ecological niche & habitat suitability models (Chen et al. 2007; Herborg et al. 2007; Cudmore & Mandrak 2011; Cudmore et al. 2012; Kocovsky et al. 2012)
  - Bioenergetics modeling (Cook & Hill 2010)
- **Mixed results**
- **Constrained by knowledge of their ability to adapt to novel environments?**

PURDUE UNIVERSITY | FORESTRY & NATURAL RESOURCES PURDUE AGRICULTURE

Key Ecological Factors (Native)

- **Typically lentic & need "large" rivers to spawn**
- **80-100 km undammed river/channel (Kolar et al. 2007)**
  - BUT, eggs known to develop in static conditions
- **Rising hydrograph/water temps ≥18 °C**
  - Water velocity ≥0.7 m/s (Abdusamadov 1987)
  - Precipitation & discharge as proxies (e.g., Kocovsky et al. 2012)
  - BUT, reproductive needs may not be as restrictive in new environments (e.g., Kara Kum Canal, Turkmenistan, Wabash River, IN (Coulter 2013))
- **Spring/early summer spawning**
  - BUT, spawning may occur multiple times throughout summer (Rasmussen 2002; Papoulias et al. 2006; Schrank & Guy 2002)

PURDUE UNIVERSITY | FORESTRY & NATURAL RESOURCES PURDUE AGRICULTURE

Plasticity

- **Sufficient anecdotal/preliminary/recently published evidence exists to suggest that bigheaded carps more plastic in novel systems**
- **Spawning habitats in native range different from North America (e.g., Missouri River, Deter et al. 2012)**
- **Bigheaded carps likely to be able to acclimate to a wide range of conditions ("adaptable," Kocovsky et al. 2012)**
- **Relatively little ecological info on bigheaded carps in North American waters**
- **More quantitative understanding of ecology in North American waters could improve management strategies**

PURDUE UNIVERSITY | FORESTRY & NATURAL RESOURCES | PURDUE AGRICULTURE

Continuous Summer Spawning, Wabash River

- **2011**
  - Eggs detected on 19 of 25 sample dates
  - Some hydrological variability early, but largely stable from mid-July – September
  - Eggs detected @ water temps from 18.5 – 29.7 °C
  - Eggs detected as late as 01-Sep

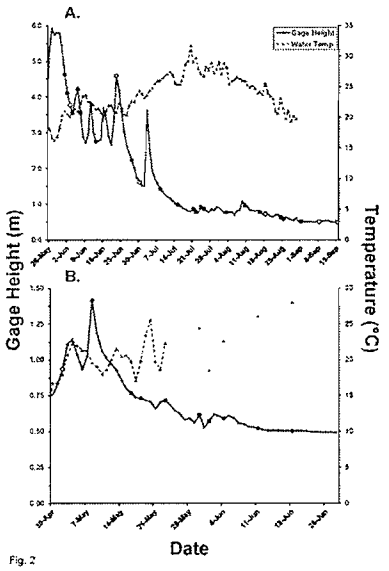
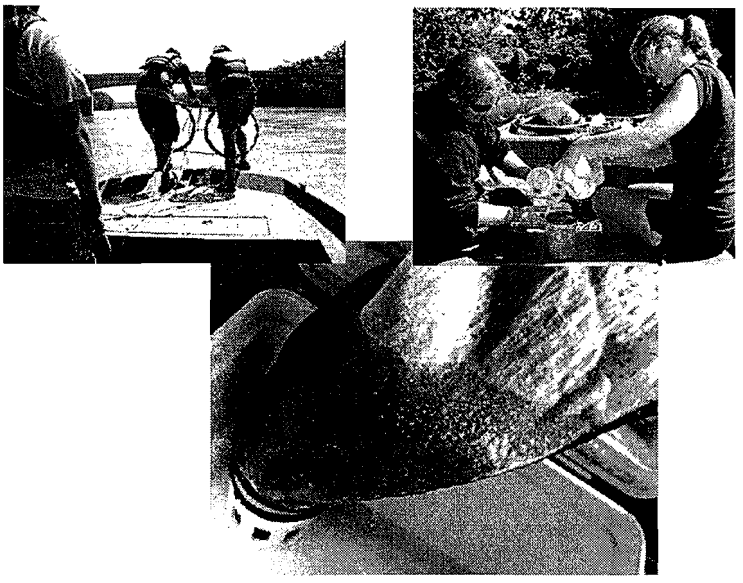


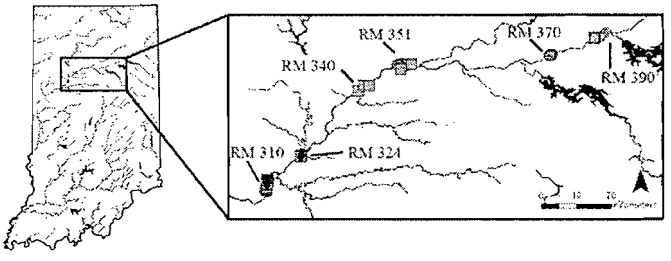
Fig. 2

PURDUE UNIVERSITY | FORESTRY & NATURAL RESOURCES | PURDUE AGRICULTURE

Unprecedented Spawning in the Wabash River



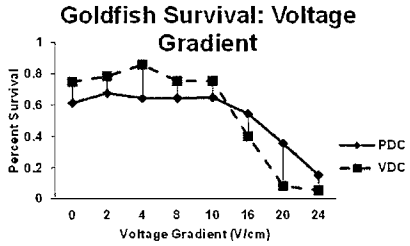
Expanded Range for Spawning in the Wabash

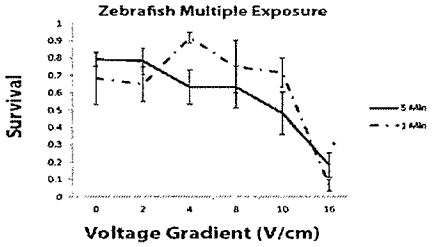


PURDUE UNIVERSITY
FORESTRY & NATURAL RESOURCES
PURDUE AGRICULTURE

Control of Early Life History

- Voltage gradients ≥16 V/cm necessary to significantly impact mortality of all three model species
  - Stages during epiboly particularly sensitive
- Multiple exposures had no effect on survival of zebrafish embryos
  - Survival related to voltage gradient alone





PURDUE UNIVERSITY FORESTRY & NATURAL RESOURCES PURDUE AGRICULTURE

Implications

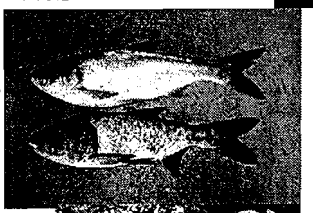
- **Bigheaded carps can likely invade a wider range of habitats than originally thought**
- **Continued success in Indiana and Midwest likely to result in substantial negative economic and environmental outcomes**
- **Control currently difficult and no "silver bullet" apparent to eliminate these species at this time**
- **Freshwaters of Indiana and the Midwestern US are critical resources that need management and protection from invasive species to maintain recreational, commercial, and ecosystem services**

PURDUE UNIVERSITY FORESTRY & NATURAL RESOURCES PURDUE AGRICULTURE

Acknowledgements

Goforth Lab:

Beth Bailey, Lab Coordinator
Conor Keitzer
Jay Beugly
Sam Nutile
Caleb Rennaker
Allison Lenaerts
Colleen Rennaker
Kristen Ruhl
Preston Sipe
Tess Thoren
Megan Gunn
Kevin Leet

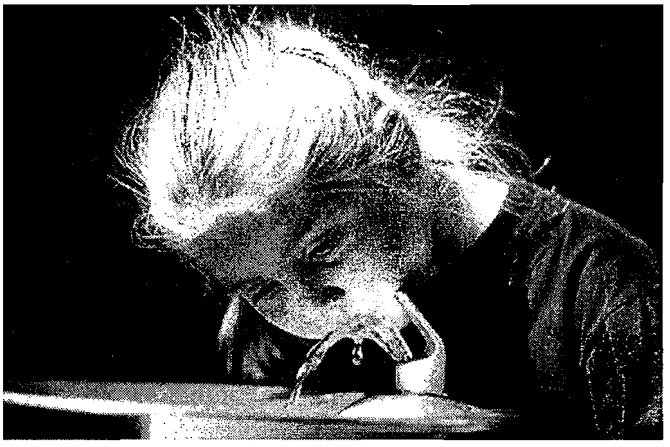


Questions?

Reuben R. Goforth

Department of Forestry and Natural Resources
Purdue University
West Lafayette, Indiana 49707 USA
269-967-7620 rgoforth@purdue.edu

Indiana Public Water Safety



Presenter
James Probst

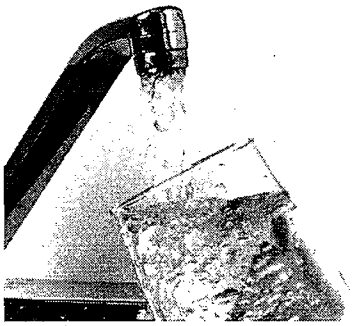
President of Indiana American Backflow Prevention Association

Proposed Backflow Protection Legislative Elements

1. **Require owners with installed backflow assemblies to test them annually and maintain them in working order within their plumbing systems.**
2. **Continuing educational credit requirements every 2 years for State Registered Backflow Testers.**
3. **Require the State of Indiana to adopt and make available to the public a standard electronic backflow test report form.**

What is Backflow Contamination?

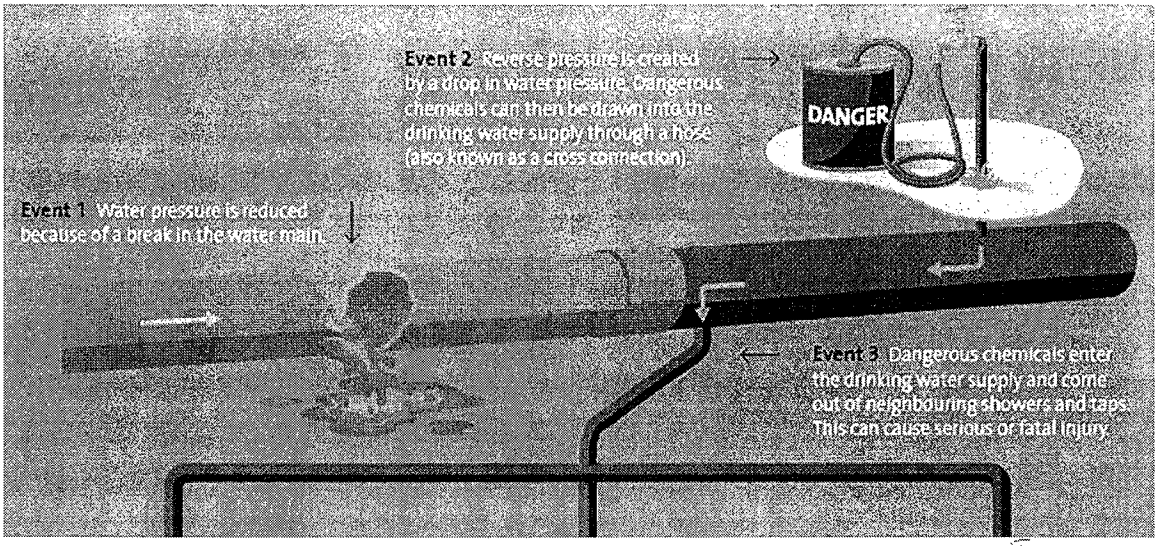
When drinking water supplied by a plumbing system flows in the reverse direction the water may become contaminated and unsafe to drink. This is called Backflow Contamination.



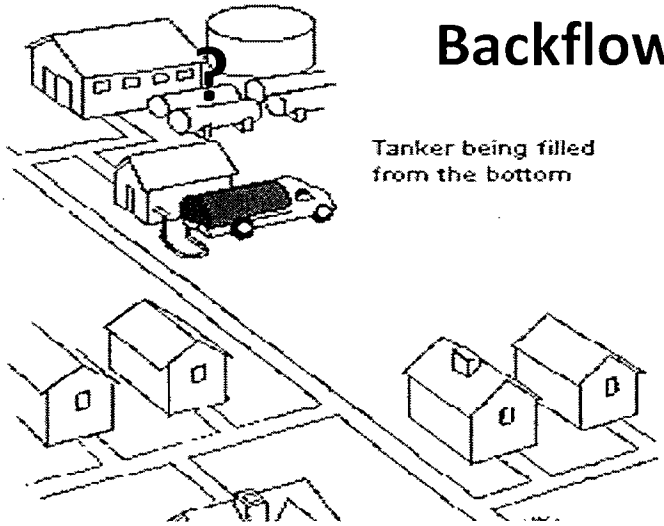
How is Drinking Water Protected from Backflow Contamination?

Drinking water is protected from backflow contamination by means of installing an approved backflow prevention assembly. Only approved backflow prevention assemblies adhering to recognized standards (ASSE, AWWA, USC) are legally allowed to be installed on Indiana plumbing systems.

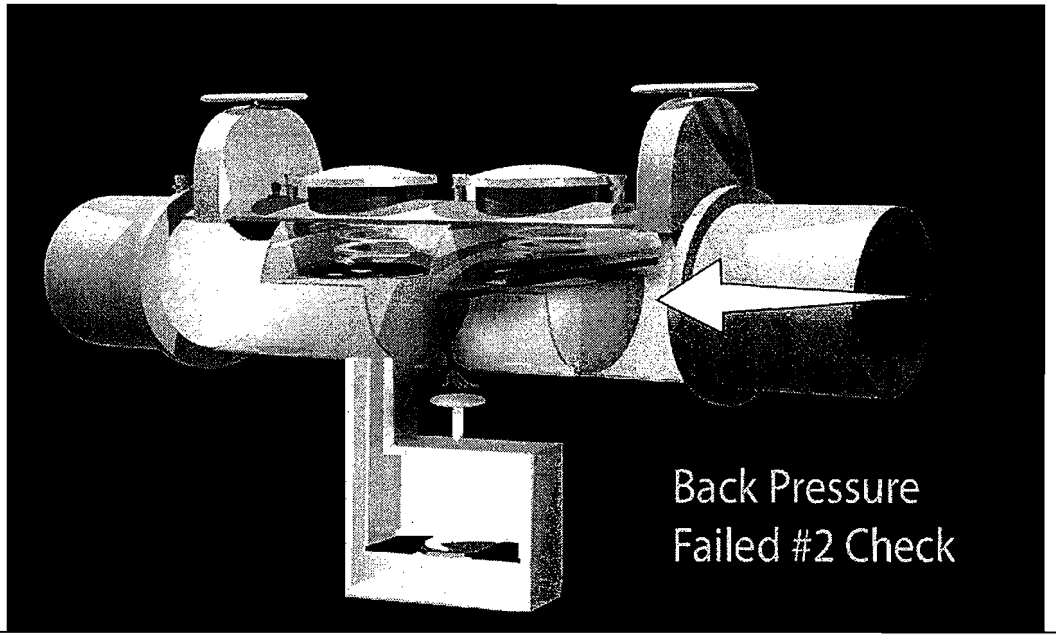
Backflow Contamination



Backflow Illustration



What Does a Backflow Assembly Look Like?



UNCLASSIFIED//FOR OFFICIAL USE ONLY

ROLL CALL RELEASE

In Collaboration with the ITACG

13 October 2011

(U//FOUO) Backpressure Contamination of Water Distribution Systems: A Potential Terrorist Tactic

(U//FOUO) Backpressure, the reverse flow of contaminated water into a potable water distribution system, has the potential to affect the public health of a community by using residential, commercial, or industrial connections in water distribution systems as a pathway for contamination. A water contamination incident using an effective contaminant and delivery method would cause immediate public health effects, require costly cleanup, and cause lasting economic and psychological impact. The amount of toxicity depends on many factors, including the type of contaminant, dilution and solubility of the contaminant, and the proximity of the consumer to the point of entry.

(U//FOUO) Over the last decade, violent extremists have expressed aspirational interest in contaminating unspecified water supplies, and as recently as July 2011 specifically raised backpressure as a means of contamination. Minimal technical expertise or equipment is needed to introduce contaminants into the water system, and general information on backpressure processes is available to the public.

Indiana Court Ruling on Backflow Protection

The duty to install protective devices and inspect was set out by the Indiana Appellate Court in the Lincoln Trust cross connection case of 1929: Pennsylvania Railroad Company vs. Lincoln Trust Company, Admr., 167 NE 721, or 91 Ind. App 28.

In this case, the Indiana water utility was **held liable for the death of a customer**. The customer had consumed tap water polluted with river water introduced into the city main through a cross connection with the railroad's main. The railroad main was carrying polluted water from the river as a secondary source. **The court said: "The City having permitted the railroad company to connect its water main with the water main of the City, was duty-bound to exercise reasonable care to see that no polluted and impure water was allowed to enter its mains through the water main of the railroad."**

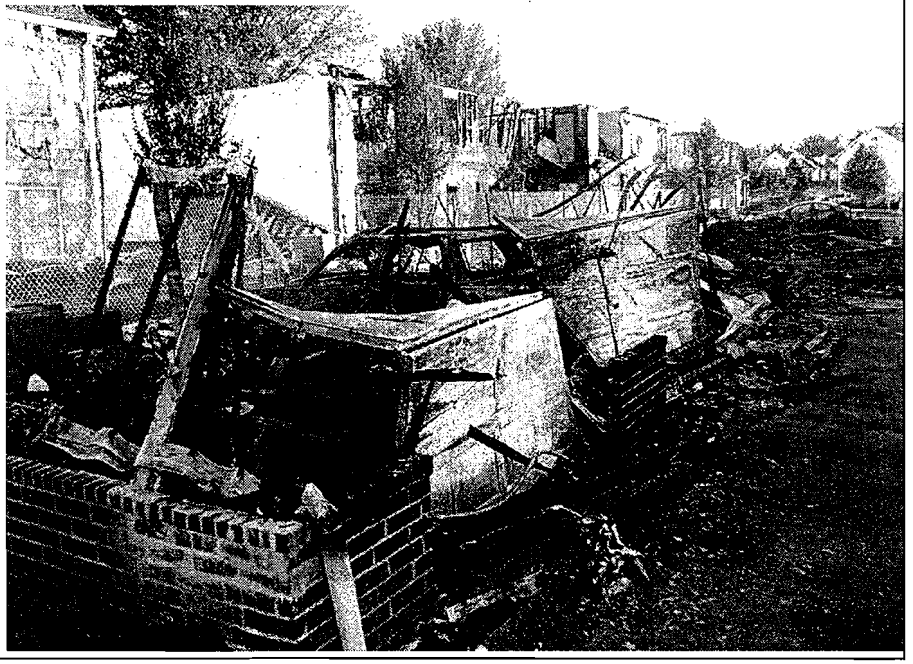
Note that the court established a duty to inspect and the use of reasonable preventive devices. Specifically, it said that **the duty of inspection does not end with installation, but continues during use. With regard to devices, the court said the water company should use every reasonable effort to adopt and use all proper means readily known to science for the prevention of accidents**.

$2.5 million Lawsuit Filed for Partially Closed Valve on Fire Service Line

June 2012

A massive fire at a Noblesville apartment complex sparked a class action lawsuit.

When the fire department arrived at the fire June 10, they said they found some of the water valves to the hydrants partially closed.



Indiana Cross Connection Contamination Occurrence 2011

Boil advisory in effect for Utility Water System
Posted March 14, 2011 at 4:55 p.m.

The utility's workers at their filtration plant noticed the smaller of two finished drinking water tanks overflowing onto the floor about 12:30 p.m. Monday. That 1.1 million-gallon tank was disconnected and a boil water advisory issued.

Some area restaurants shrugged off the boil advisory as a nuisance.

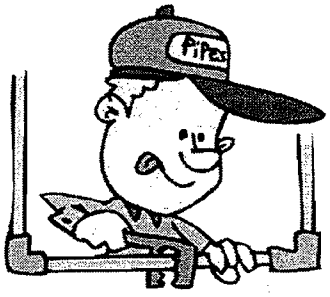
At a local Pizzeria & Brewery, manager Tommy said his restaurant already sells bottled water. And the only drink that uses water is tea. "And that masks the flavor anyway," he said, adding he did not believe the advisory would affect the soft drink fountain. "It just cramps everyone's style."

Amanda Lewis, hostess at the another local restaurant, said water for her restaurant already is treated through a filtration system, so no problems are expected.

Though the utility did notify the local school corp. and others about the advisory, there is no way it could alert every affected restaurant, The Utility said. "We try to get the word through media," he said. "There are just so many."

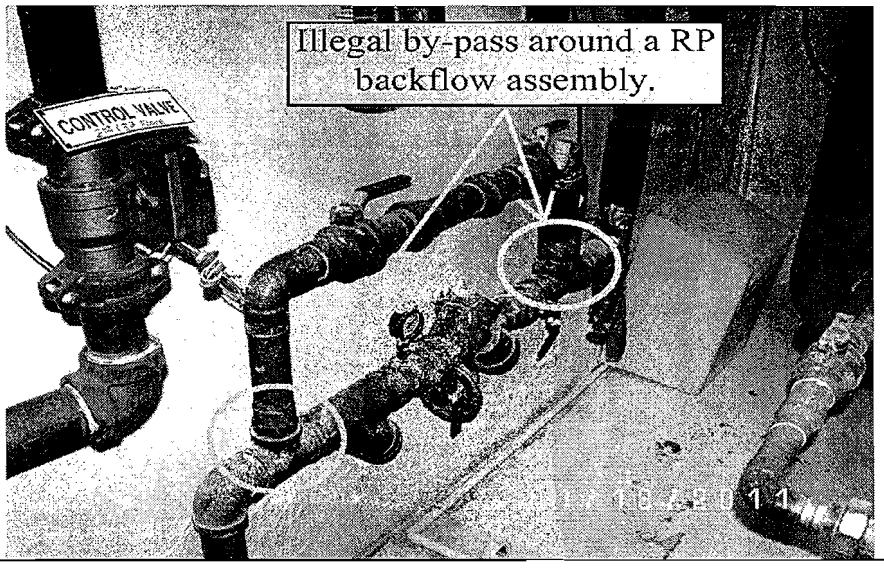
Local Hospital spokesman said "So for someone who drank the water now, it could take up to three weeks for them to show signs of being sick."

Cross Connection Causes Contamination In Indiana



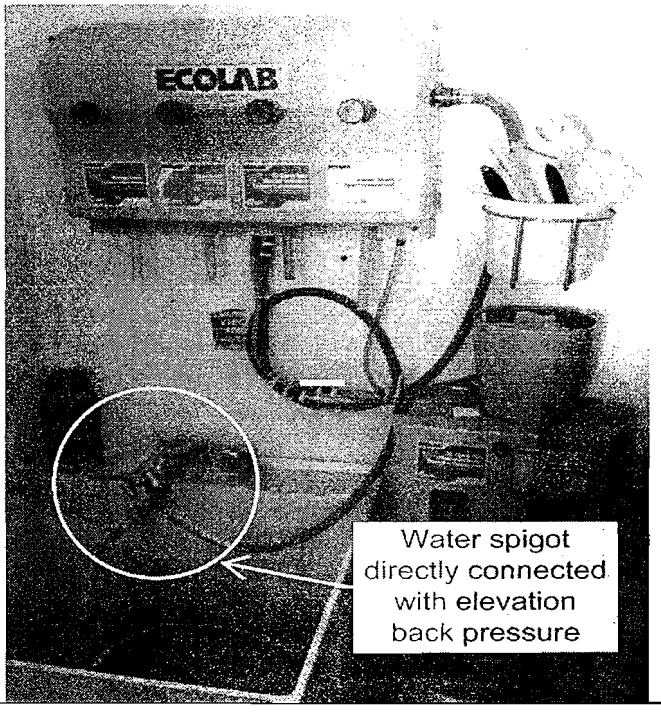
Posted: Thursday, September 13, 2012
Perry County Indiana was under a boil-water order since Sept. 6, as an accidental cross-connection between two pipes caused the community's water source to be contaminated. The president of the Service Company said "**The water was cross-connected with another hook-up and the water is contaminated. As of right now, all area's of water service are under a boil water order.**" The utility that services the area's water needs, said a cross-connection occurred, not at the hands of Service Company, but of a private contractor who mistakenly hooked up an incorrect pipe to another.

2011 Indiana Facility Discovered With an Illegal By-pass Around a Backflow Protection Assembly

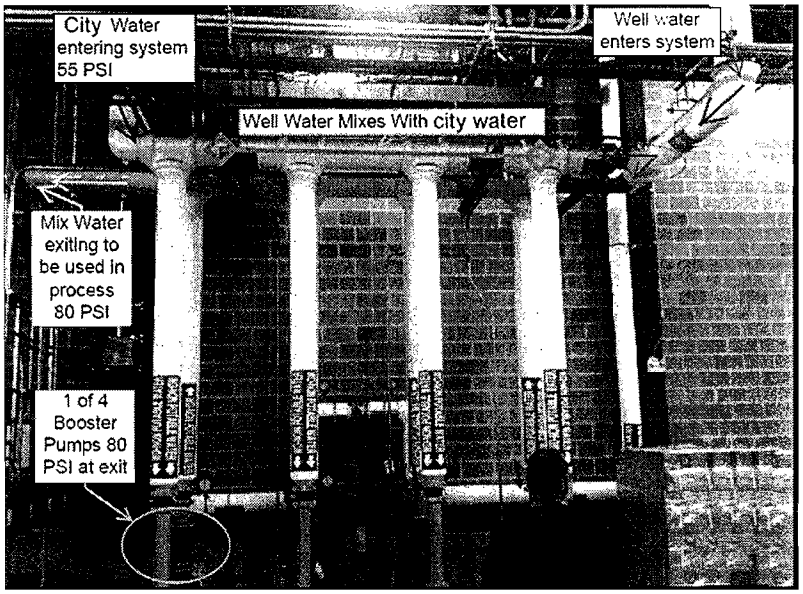


Backflow Contamination at a Local Indiana Restaurant

The backflow assembly failed because it was was not installed properly.



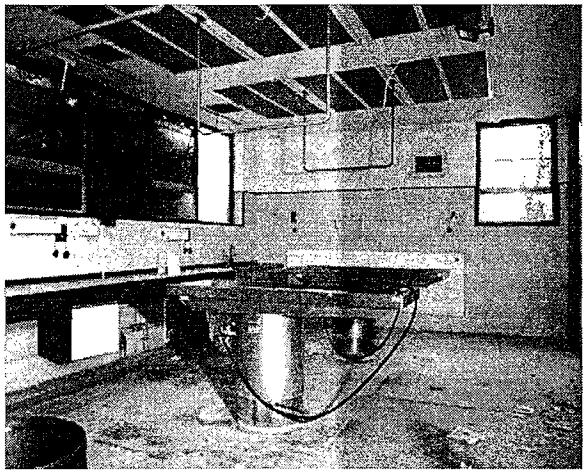
Indiana Factory Interconnected a Non-Potable Water Source with City's Drinking Water Supply



15

Funeral Homes Morgues Hospitals

Arterial embalming is begun by injecting embalming fluid into an artery while the blood is drained from a nearby vein or from the heart. The two gallons or so needed is usually a mixture of formaldehyde or other chemical and water. Once the embalming fluid begins to flow into the arterial system, pressure begins to build up in the entire vascular system. This helps the fluid reach all parts of the body and penetrate into the tissues.



For some time, nurses at a Michigan hospital complained about rusty water coming from a hospital drinking fountain. When maintenance personnel finally looked into the matter, they discovered it was actually blood that the nurses were encountering at the drinking fountain. This blood had back flowed into the hospital's potable water system from an autopsy table.

16

EPA Total Coliform Rule

EPA Total Coliform Rules

- The Total Coliform Rule (TCR) was published in 1989 and became effective in 1990. The rule set both health goals (Maximum Contaminant Level Goals, or MCLGs) and legal limits (Maximum Contaminant Levels, or MCLs) for the presence of total coliform in drinking water.
- On February 13, 2013, EPA published revisions to the 1989 TCR. EPA anticipates greater public health protection under the Revised Total Coliform Rule (RTCR) requirement

Revised Total Coliform Rule (RTCR) requirement

RTCR requires systems that have an indication of coliform contamination in the distribution system be assessed for the problem and corrective action take place to fix the problem.

Sanitary Defects

- "Sanitary defect is a defect that could provide a pathway of entry for microbial contamination into the distribution system or that is indicative of a failure or imminent failure in a barrier that is already in place. " Examples of sanitary defects include: Cross Connection

Best Available Technology (BAT)

The water treatment(s) that US EPA certifies to be the most effective for removing a contaminant.

- Cross connection control was added to the BAT Distribution system maintenance activities

Current Indiana Backflow Protection Enforcement Authority

327 IAC 8-10 Indiana Department of Environmental Management

- IDEM Authority from water plant up to the customer service connection at the water meter.

675 IAC 16-1.4 Indiana Department of Homeland Security

- IDHS has authority over the Indiana plumbing code from 5 feet outside the building perimeter and inside the building.
- IDHS only has Authority to enforce plumbing code rules during construction or when changes are made to the owners plumbing system.

Previously Proposed Backflow Protection Legislation

2010 -HB 1384 (Passed Environmental Affairs Committee 24-1)
R- Wolkins R-Neese D-Niezgodski D-Stemler

2011-HB 1096
D- Niezgodski D-Stemler

2012 - SB358
R-Senator Delph R-Senator Waltz

2012- HB1204
D-Niezgodski

Boil Water Advisories are Reactive

Whenever the pressure drops in a plumbing system, there is a possibility contamination will enter drinking water systems by means of backflow. Per IDEM rules water utilities are required to issue a boil water advisory and notify customers that a potential water contamination incident occurred. A Boiled Water Advisor is REATIVE to a potential contamination event. The delay that happens before customers are notified allows people to drink contaminated water. Installed Backflow Preventers inspected annually, maintained and tested are proactive means of stopping hazards from entering drinking water systems regardless of downstream pressures.

Boil Water Advisory Requirements

327 IAC 8-2.1-7 "Public notification of drinking water violations" requires PN (TV, radio, newspaper, posting - depending on the size of the user base - etc...) by the PWS to all its affected customers for all violations of drinking water regulations. There are three (3) tiers of requirements based on the severity of the violation. Tier 1 is the tier to which this document applies. Tier 1 PN is based on:

1. A violation of the maximum contaminant level (MCL) for total coliform when fecal coliform or E. coli are present;
2. Failure to test for fecal coliform or E. coli when any repeat sample tests positive for coliform;
3. A violation of MCL for nitrate;
4. A violation of maximum allowable turbidity limit;
5. An occurrence of a waterborne disease outbreak; or
6. Other violation or situation with significant potential to have adverse effects on human health as a result of short term exposure, such as water pressure drop or confirmed total coliform.

<u>The Provider of Water Service has 24 hours to notify all customers of all Tier 1 PN</u>

2012 Violations Summary for Indiana Public Water Supplies

The Safe Drinking Water Act and the Indiana Public Water Supply Supervision Program mandate the monitoring and reporting of various bacteriological and chemical contaminants found in drinking water.

2012 Indiana Water Suppler Compliance Report

There are 4,151 active public water suppliers in Indiana

- **Total of 1945 Violations for Monitoring & Reporting**
- **Total of 377 Violations for Maximum Contaminant Level**

SOURCE: Indiana Department of Environmental Management 2012 Annual Compliance Report for Indiana Public Water Supply Systems

2013 Indiana Plumbing Code

PROTECTION OF POTABLE WATER SUPPLY

60S.1 General. A potable water supply system shall be designed, installed and maintained in such a manner so as to prevent contamination from non-potable liquids, solids or gases being introduced into the potable water supply through cross-connections or any other piping connections to the system. Backflow preventer applications shall conform to Table 60S.1

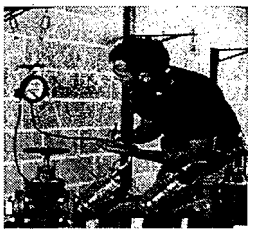
60S.6 Cross-connection control. Cross connections shall be prohibited, except where approved protective devices are installed. (Failed backflow Per IDEM Definitions is a Cross Connection)

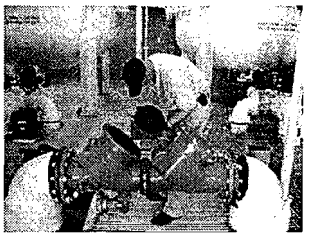
Amend Section 608.14.1 to delete the text and insert as follows: Location of backflow preventers. Access and clearance shall be **provided for the required testing**.

Amend Section 312.9.1 to read as follows: **Delete "annual"** and insert "**at the time of installation".**

Add Section 608.1.1 to read as follows: The owner of the structure shall have the **backflow prevention assembly tested at the time of installation** and after relocation.

Justification for Backflow Testing and Maintenance Requirement





At issue is that people drink water downstream from the customer service connection where backflow assemblies which are not required to be tested are installed per Indiana Plumbing code rules. The Sprit of the rule to install backflow assemblies as required by the Indiana Plumbing code, was to ensure backflow contamination does not occur and cause harm or death to human beings. Backflow assemblies are mechanical devices with working internal pieces. A piece of debris or the calcification of water can cause the device to stop working. **Manufacturer and industry standard organizations require testing intervals be accomplished annually, semi-annually, or more frequently based on risk for ensuring proper operation to protect against a potential backflow contamination occurrence.**

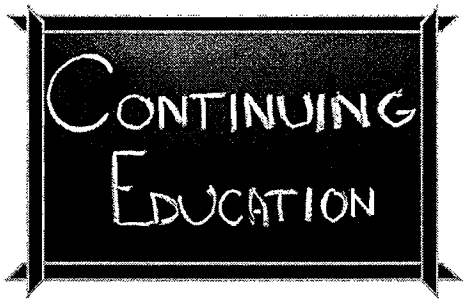
Why do we need backflow testing requirements?

The short answer is to help ensure the public drinking water is protected from backflow contamination.

The Indiana Plumbing code requires backflow assemblies be installed on the customer's plumbing systems to protect the drinking water from backflow contamination. Unfortunately there is no further testing required once building occupancy is granted by the authority.

IDEM Regulations 327 IAC 8-10 (Page 296) only require backflow assemblies be installed, tested and maintained at the customer service connection to protect the water in he public distribution system.

Why do we need a backflow tester continuing education requirement?

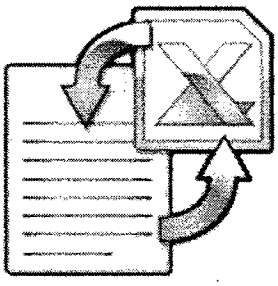


Continuing education is important for ensuring backflow testers stay current on changes within the backflow industry.

Indiana code requires that backflow testers follow the University of Southern California backflow testing procedures. There have been many changes over the years to testing procedures. Some reasons testing procedures change is that backflow manufactures are always coming out with new product lines and procedures have to be updated to ensure these products are tested correctly. The State of Indiana revises backflow code and backflow testers must be knowledgeable of these new codes changes. Without continuing education previously certified testers would never learn of these procedures or code updates.

Why do we need to adopt a standard backflow test report form in Indiana?

A State adopted backflow test form report would bring continuity and efficiency to backflow testing thus lessen confusion for everyone involved in the process



Backflow Testers are required to send backflow test report forms to Water Utilities with 30 days of testing a backflow assembly. There are several hundred water utilities throughout the State of Indiana. Many of these Water utilities require testers to use the utilities' own backflow test report form and refuse to accept other backflow report forms. Backflow testers test backflow assemblies throughout Indiana making it very confusing as to which utilities requires which form. Test forms are developed with varying information required on the backflow test report.

Follow Up Questions

James Probst
317-698-8977
Email InABPA@ymail.com