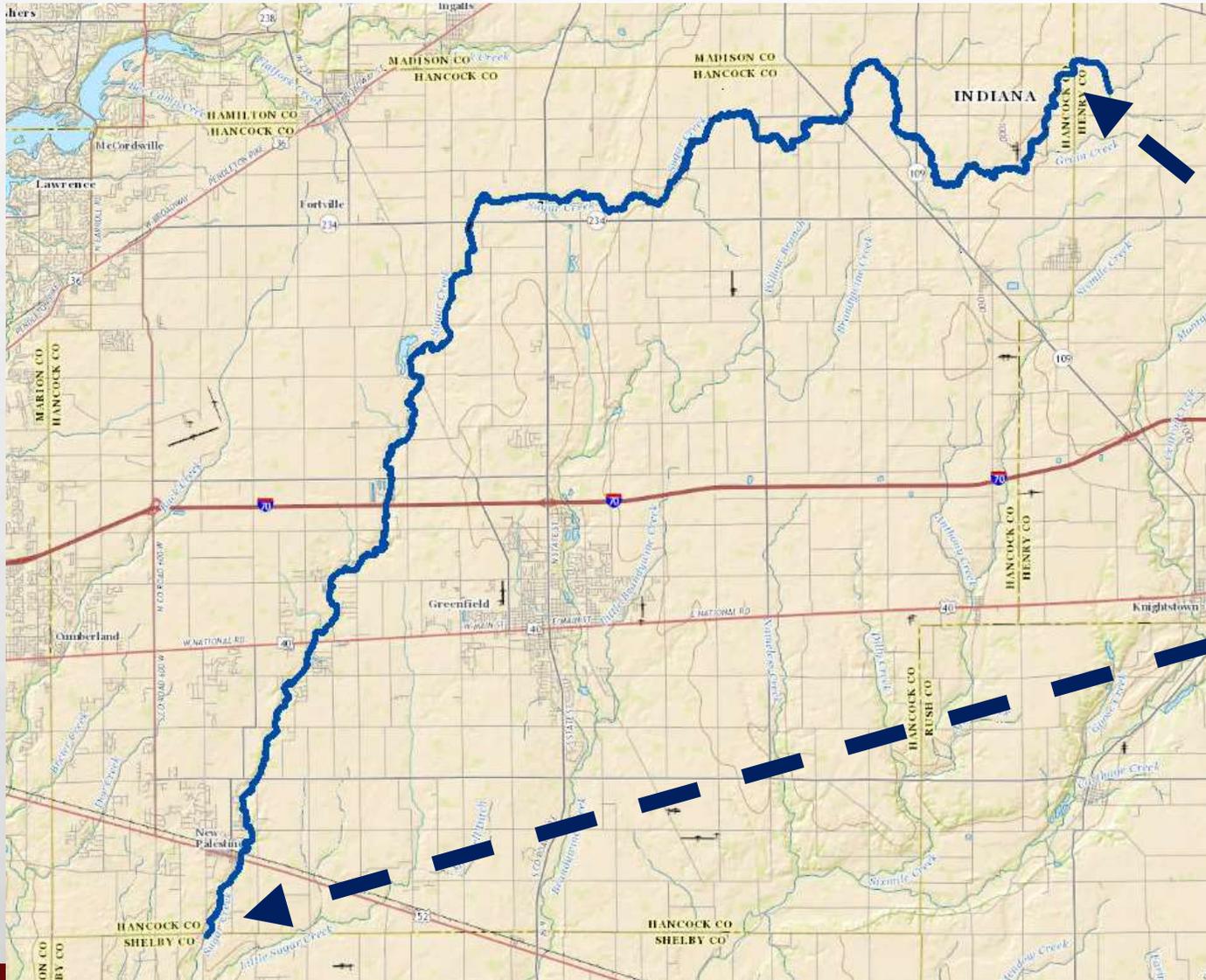


THE CASE OF THE MISSING SUGAR WATER





THE SCENE

Sugar Creek
Hancock County
Indiana

Hancock County

HANCOCK COUNTY SURVEYOR – FIRST ON THE CASE



Searching for clues, high ...

... and low



**I think we're
loosing water
somewhere!**

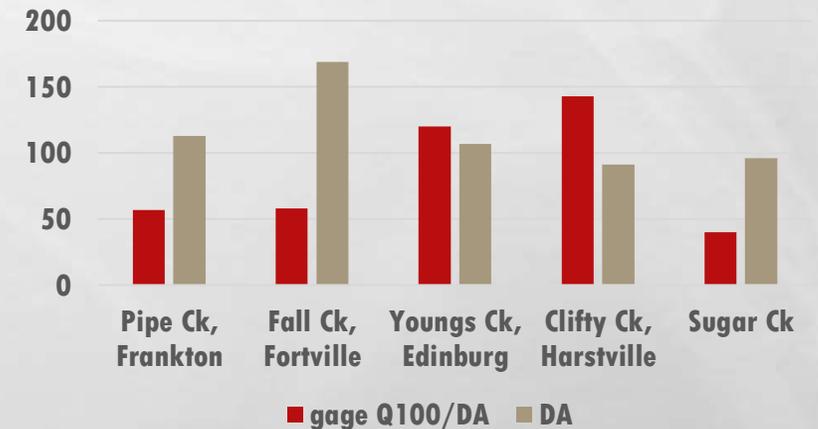
SUSPICIOUS ACTIVITY

- **RUMORS OF SUGAR CREEK WATER SKIPPING TOWN THE WATERSHED IN THE PAST**
- **SUGAR CREEK GAGE LABELED AS AN ANOMALY**
- **GAGE WITH DA OF 96 SQ. MI. NOT IN LAKE COUNTRY ONLY 2 PEAK DISCHARGES ABOVE 2,750 CFS IN 40 YEARS 100-YEAR OF ONLY 3,860 ?!!!**

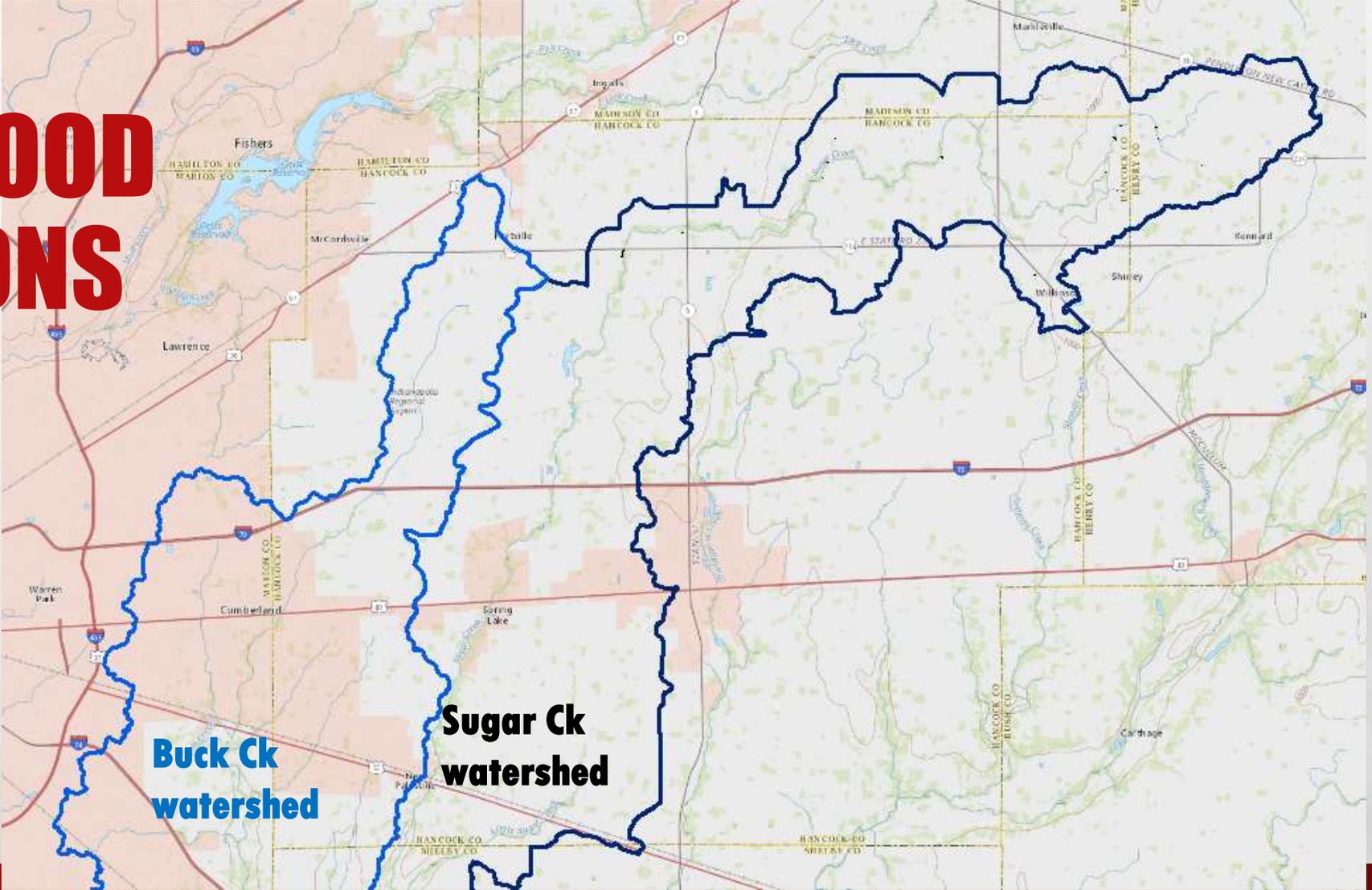
Table 5.3: Summary of 100-year discharges for Sugar Creek and Buck Creek

Gage No.	Name	DA (sq mi)	Q _(code) (cfs)	Q _(reg) (cfs)
03361650	Sugar Creek - New Palestine	93.9	2585	20800
03361850	Buck Creek near Astm	78.8	6644	14200

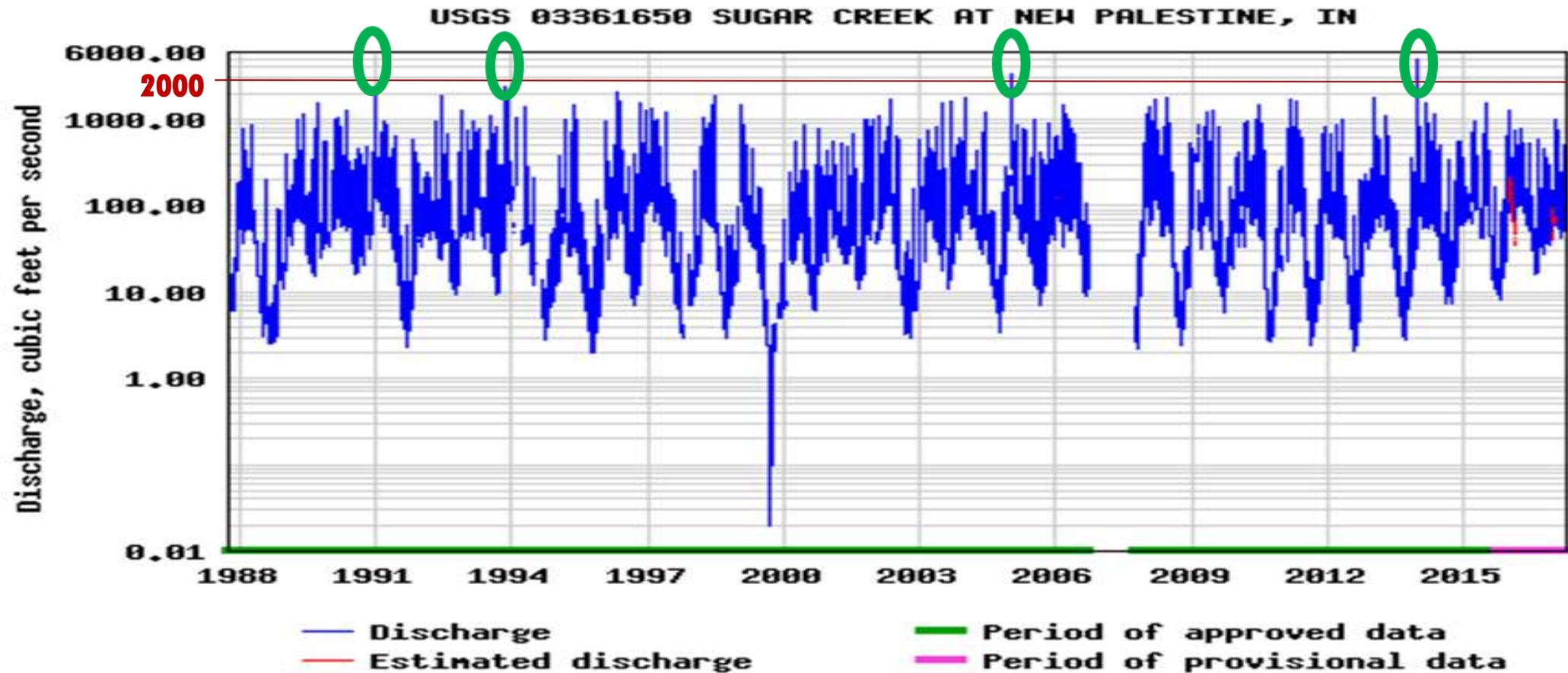
From the results in Table 5.3 it can be seen that the 100-year peak discharges predicted by the regression equations for these two gages (which are in Region 4) are much greater than the 100-year peak discharges calculated from the flood frequency curve for these gages. Western Hancock County is noted for having poor natural drainage, with small differences in relief and soils classified as silt loams or silty clay loams. Whatever the reason, this portion of Region 4 is noted as a local **anomaly** as compared with the majority of the region. Therefore, application of the predictor equations without further



NEIGHBORHOOD OBSERVATIONS

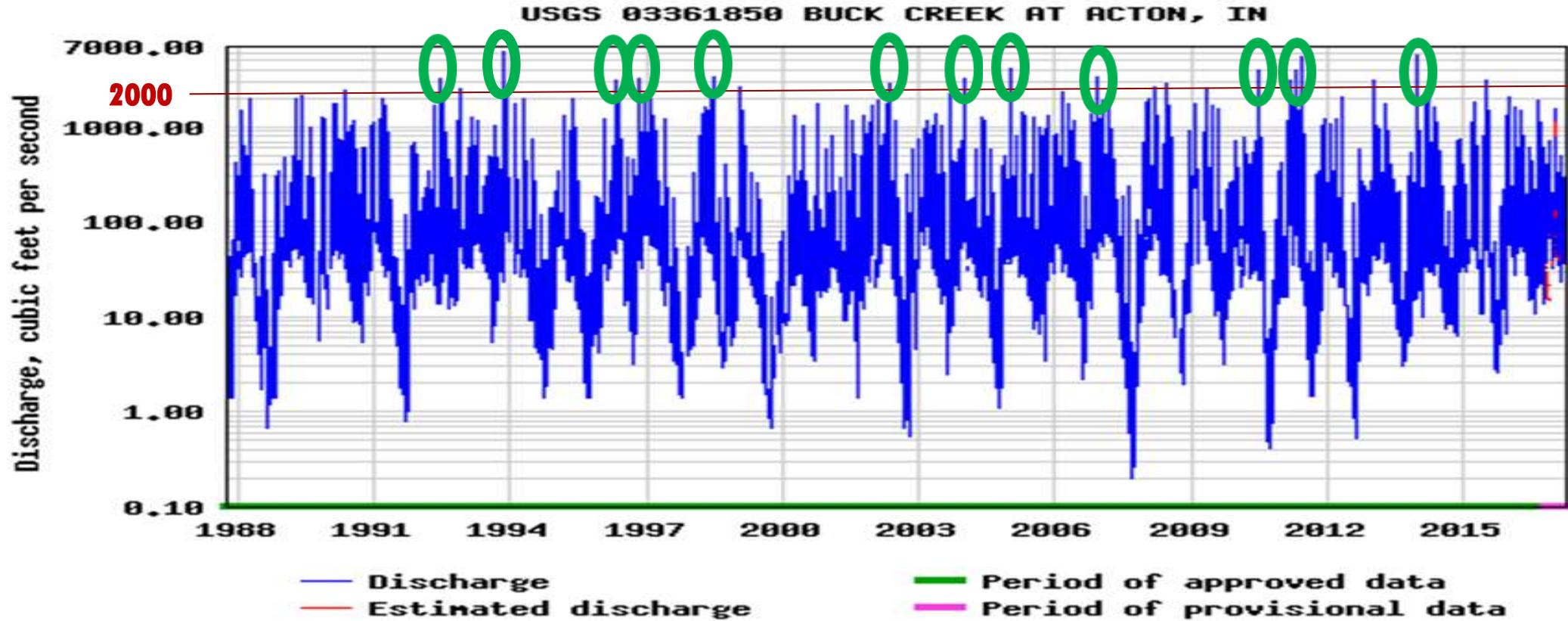


SUGAR CREEK STREAMFLOW DATA



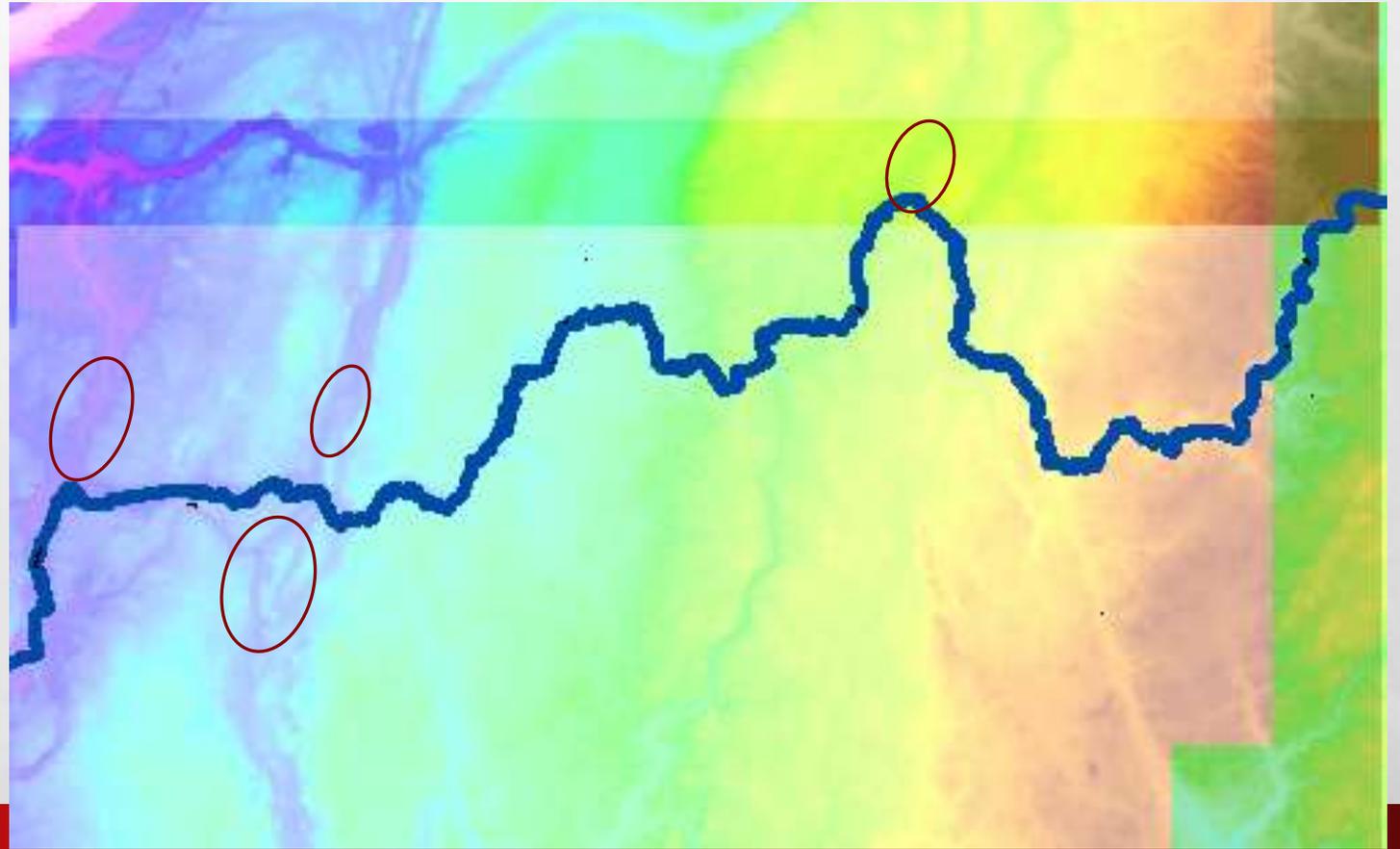
DA = 96 Sq. Mi.

BUCK CREEK STREAMFLOW DATA



DA = 79 Sq. Mi.

MAPS FOUND SHOWING POTENTIAL ESCAPE ROUTES





INNOCENT ?

“Cool” picture, isn’t it?

THE TIP – DEC. 2013

WATER ESCAPES, GAGE PEAKS AT 5,020 CFS, HIGH WATER MARKS ARE SET



RECONSTRUCTING THE SCENE

Did water leave the watershed?

**How much left?
Where did it go?**



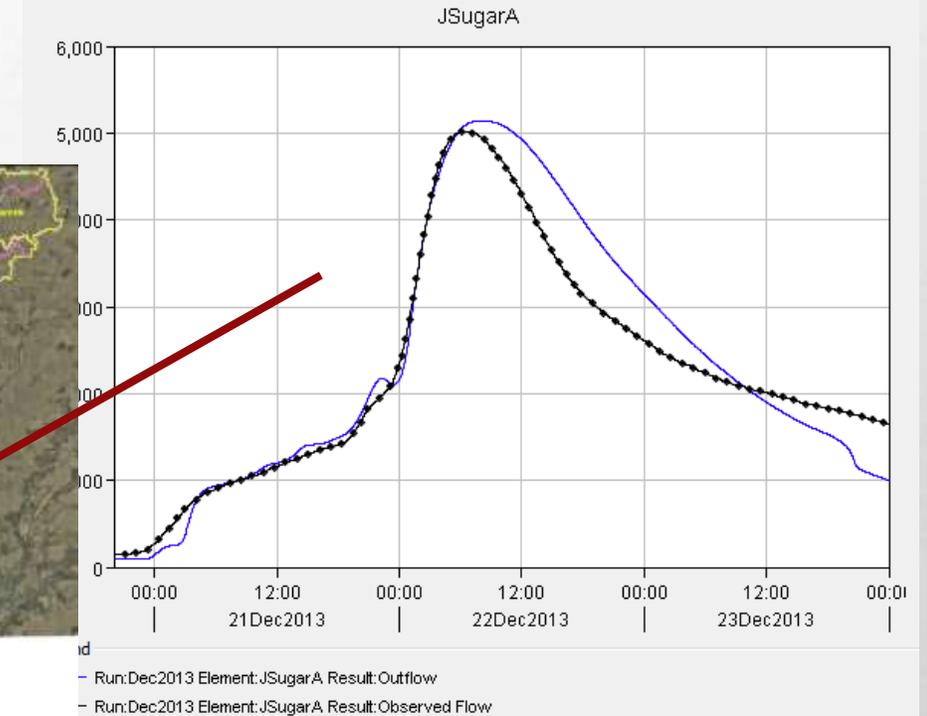
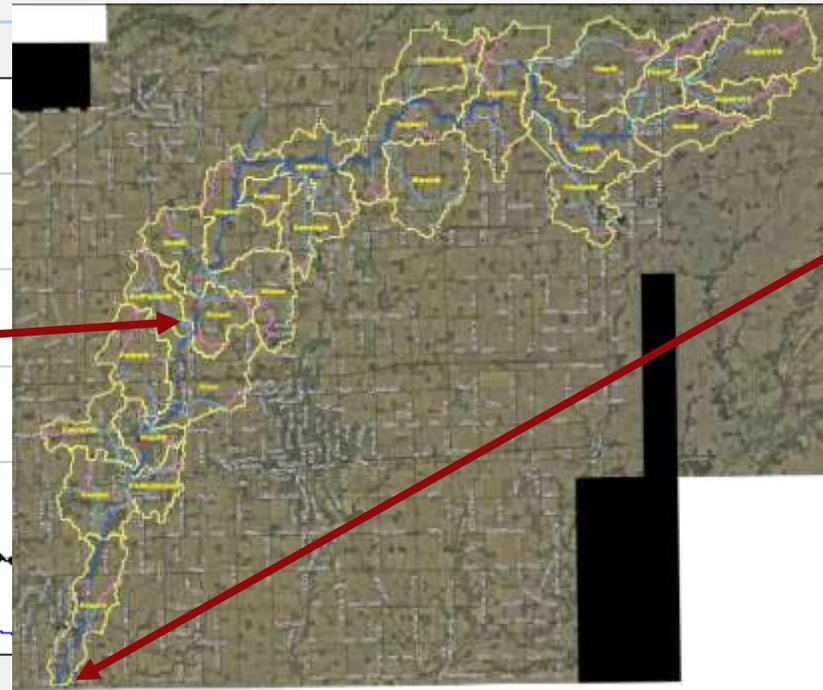
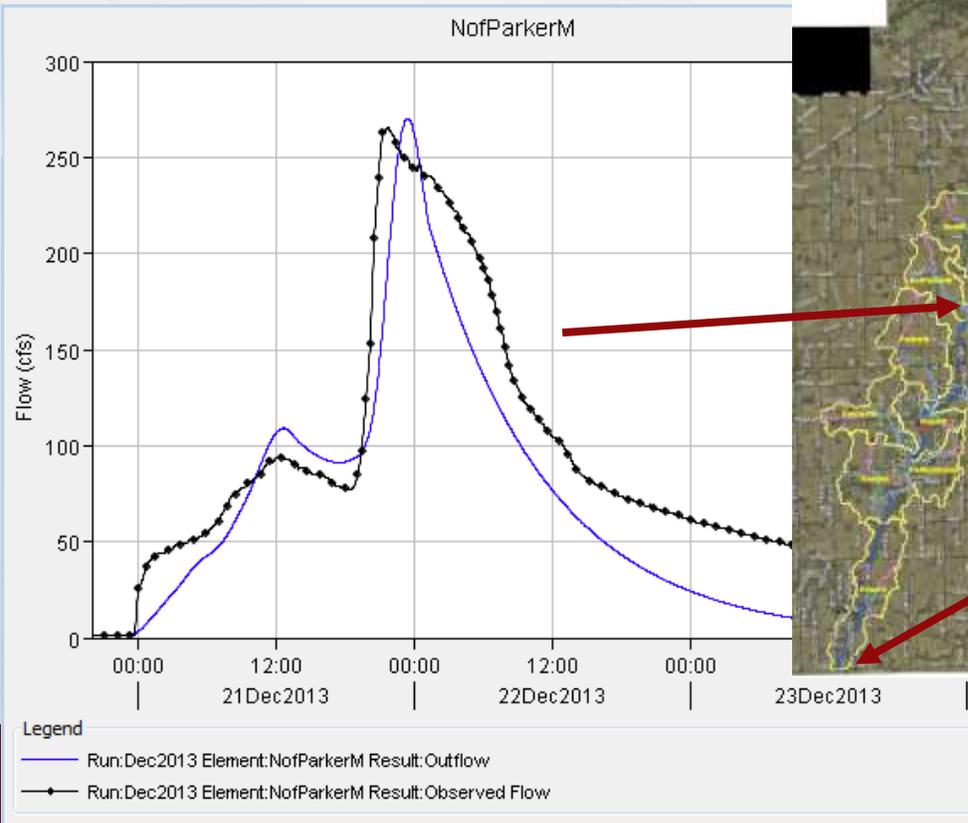
Is damage done by water leaving?

Should water be stopped the next time it tries to leave? Would anyone be hurt?

*** To protect the “innocent”, true location is not shown**

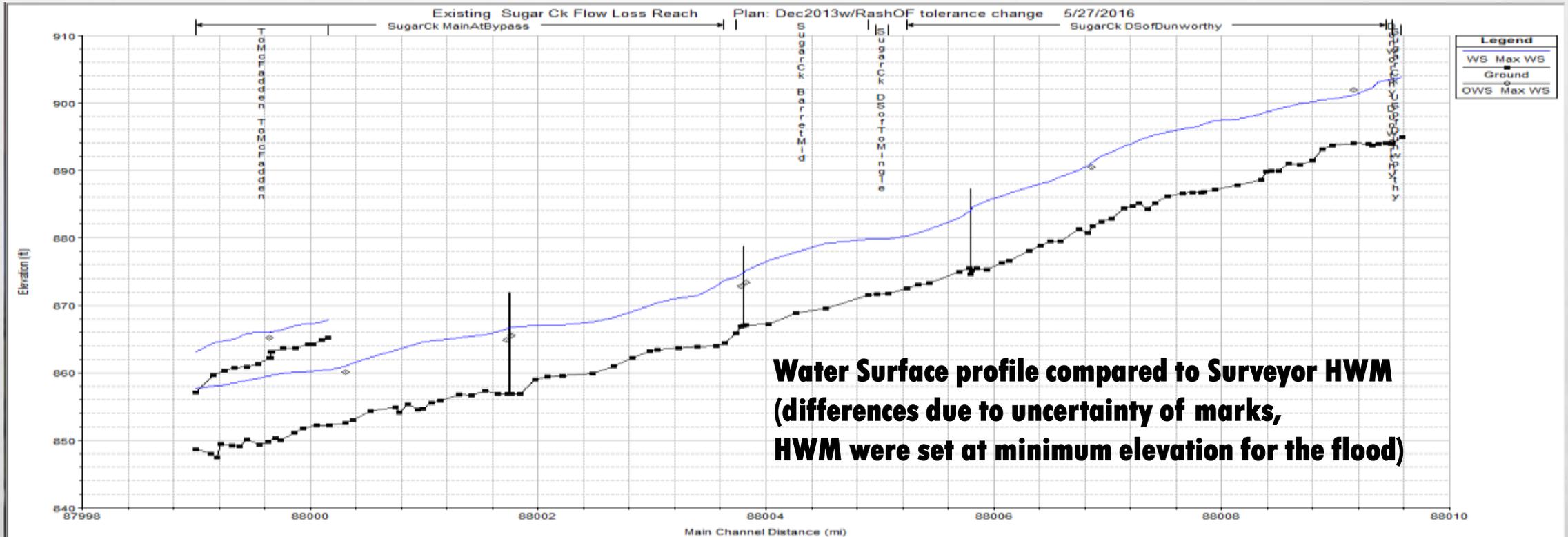
HYDROLOGIC SCENE RECONSTRUCTION

Leary-Weber D at Mohawk Dec 2013 gage compared to model results

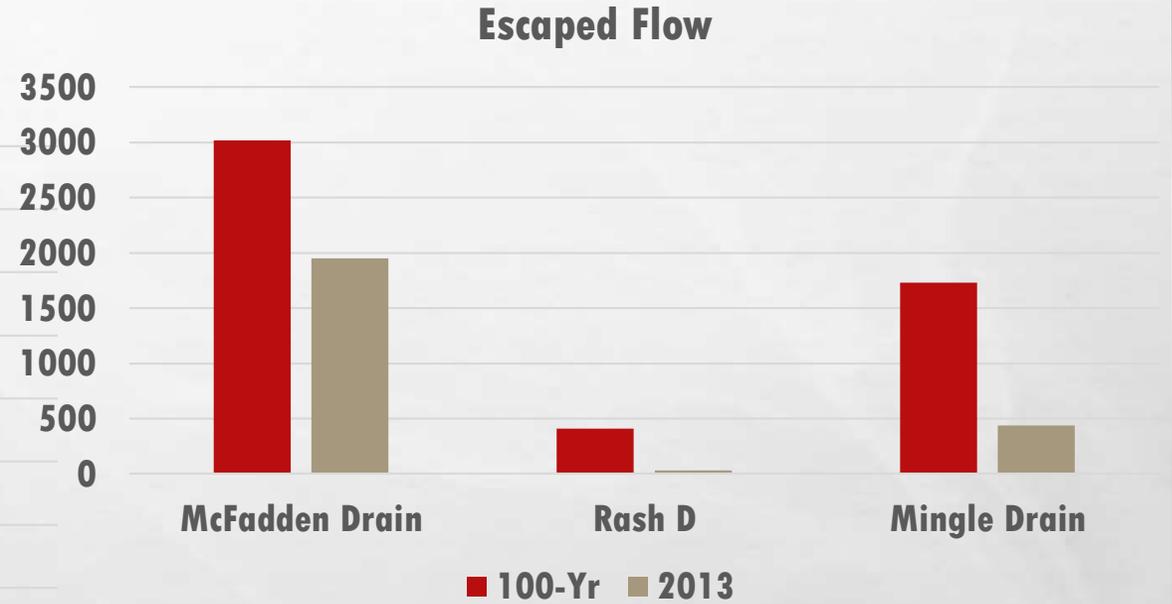
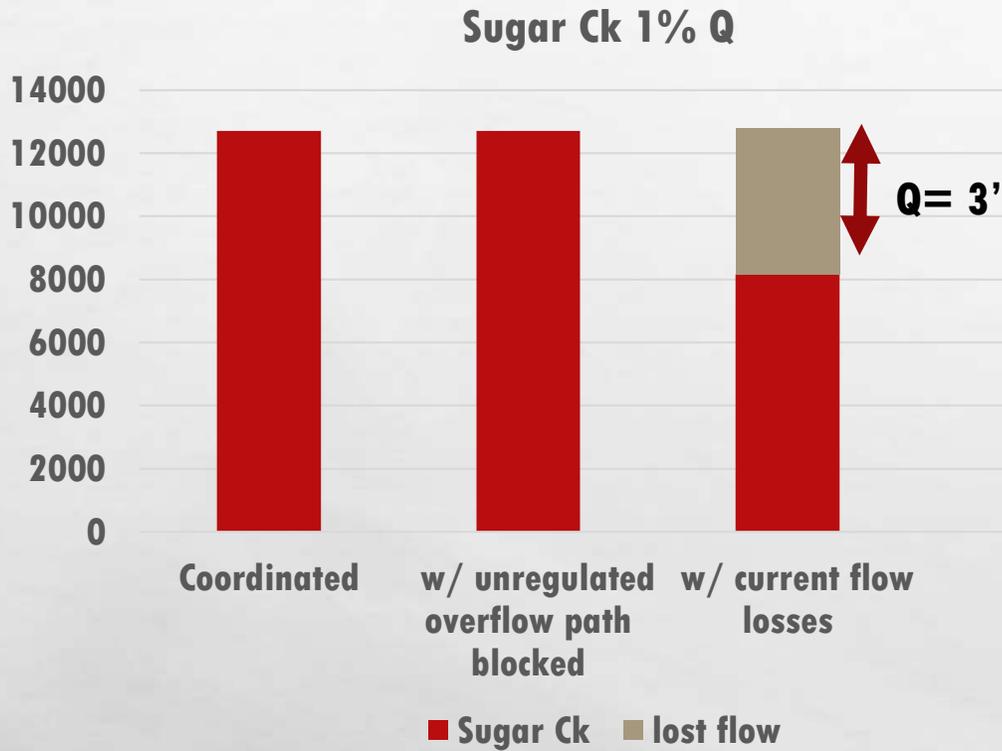


Sugar Ck at New Palestine Dec 2013 gage compared to model results

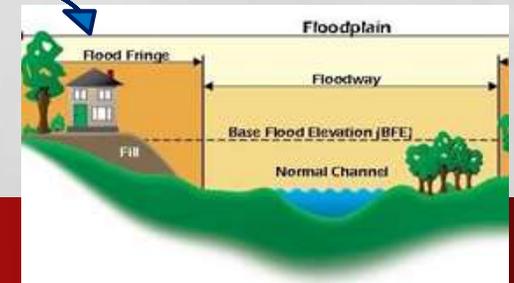
HYDRAULIC SCENE RECONSTRUCTION



INFORMATION TO THE AUTHORITIES



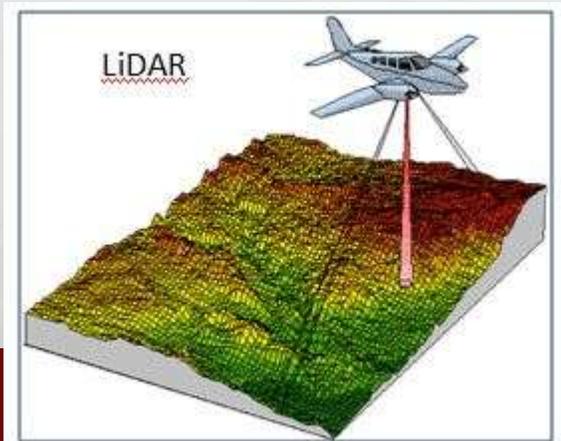
Escaping flow not included in receiving stream regulatory elevations



DNR

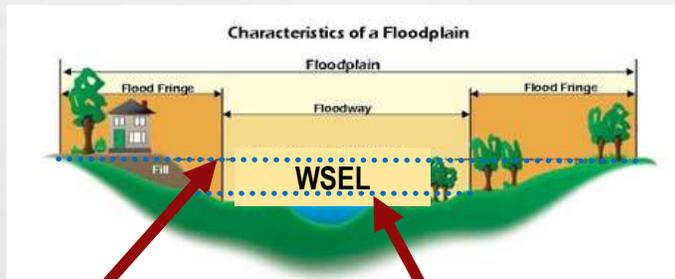
ADDITIONAL INFORMATION

- **SIMILAR CASES THROUGHOUT THE STATE (CAUGHT ON LIDAR)**
- **ON OTHER STREAMS, WATER HAS BEEN FOUND ESCAPING AND RETURNING TO THE SAME LOCATION**
- **RECONNAISSANCE BY ADDITIONAL STREAM GAGES WOULD HELP TELL THE REAL STORY**



CONSIDERATIONS FOR THIS CASE

1) Receiving stream - observed elevation

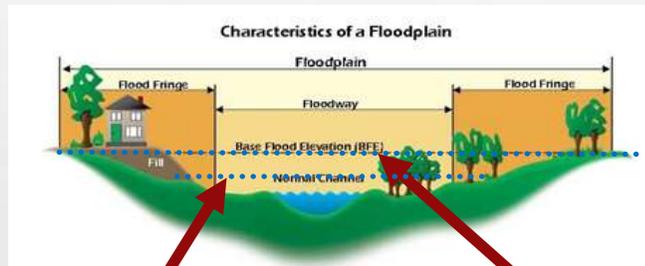


Current

Future w/ overflow blocked

- *Floods are higher than if overflow didn't exist*

2) Receiving stream – BFE

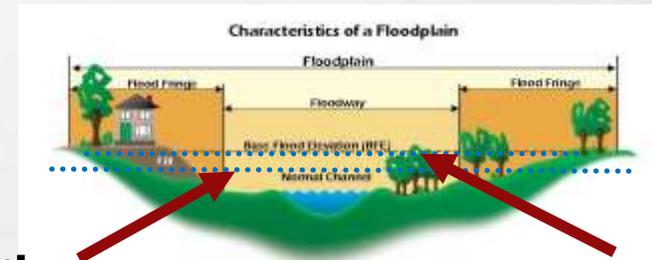


Current BFE & Future BFE w/ overflow blocked

Actual BFE

- *Greater flood risks than currently identified*

3) Sugar Ck –



Current observed

Current & Future BFE w/ overflow blocked

- *Flood risks less than currently identified*
- *Overflow paths could be blocked and increase observed flooding*
- *Regulatory elevations high enough to reflect blocked overflow condition*

CONSIDERATIONS FOR ALL CASES

- **WHAT PROCESS IS NEEDED TO WARN THOSE IN OTHER BASINS OF ADDITIONAL FLOW AND ITS IMPACTS?**
- **CAN THE CURRENT REGULATIONS HANDLE SUCH CASES?**
- **DO REGULATIONS NEED ADJUSTED?**
- **IS 2D MODELING NEEDED TO CATCH AND QUANTIFY IMPACTS OF FUTURE ESCAPES?**



1-2-3 Flood Control Act

The Flood Control Act (RC 14.22.11) regulates certain development activities (e.g., structures, obstructions, deposits, and/or excavations) within the floodway of any State waterway by requiring DNR approval prior to the beginning of the project. DNR authority under the Flood Control Act is further defined in 312RC13, Floodplain Management.

Flood Control Act Description:
Floodplain Management Rule Summary:
Regulated Activities:
Project Evaluation Criteria:
Controlled Activities:

A. Flood Control Act Description:

In the Flood Control Act's preamble, the General Assembly declared that "...the loss of lives and property caused by floods and the damage resulting from floods is a matter of deep concern to citizens affecting the life, health, and convenience of the people and the production of property". Furthermore, "...the channels and that part of the flood plain of rivers and streams that are the floodways should not be infilled nor should be kept free and clear of any fences or obstructions that will cause any undue restriction of the capacity of the floodway".

The Assembly created a permitting program under the Act to ensure that "...all flood control works and structures and the alteration of natural or present watercourses of all rivers and streams in Indiana ... be regulated ... according to sound and accepted engineering practices so as to best control and minimize the extent ... and reduce the height and volume of floods ...". The fundamental provisions of the Act's regulatory program are as follows:

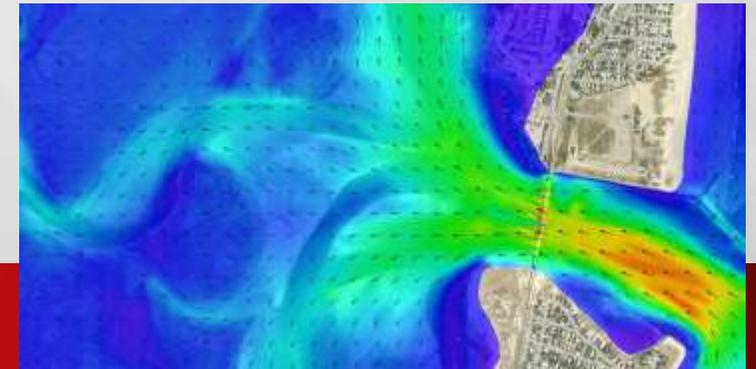
1. "... a person may not ... erect or on any floodway a permanent structure for use as an abode or place of residence ..."; and

2. "... a person who desires to ... erect, make, use, or maintain a structure, an obstruction, a deposit, or an excavation or other or permit a structure, an obstruction, a deposit, or an excavation to be erected, made, used, or maintained on or on a floodway ... must receive a permit from the director for the work before beginning construction ...". The term "director" is defined as the Director of the Department of Natural Resources.

The Regulatory Flood and the Floodway are key components of the Department's jurisdictional authority. These terms are defined as:

"regulatory flood" means "the flood having a peak discharge which can be expected to be equaled or exceeded on the average of once in a one hundred (100) year period, as calculated by a method and procedure which is acceptable and approved by the commission. This flood is equivalent to a flood having a probability of occurrence of one percent (1%) in any given year. This term is also sometimes referred to as the one hundred (100) year "frequency flood", "contingency" as used in the definition in part the National Resource Commission; however, in practice the Department makes the determination of acceptability.

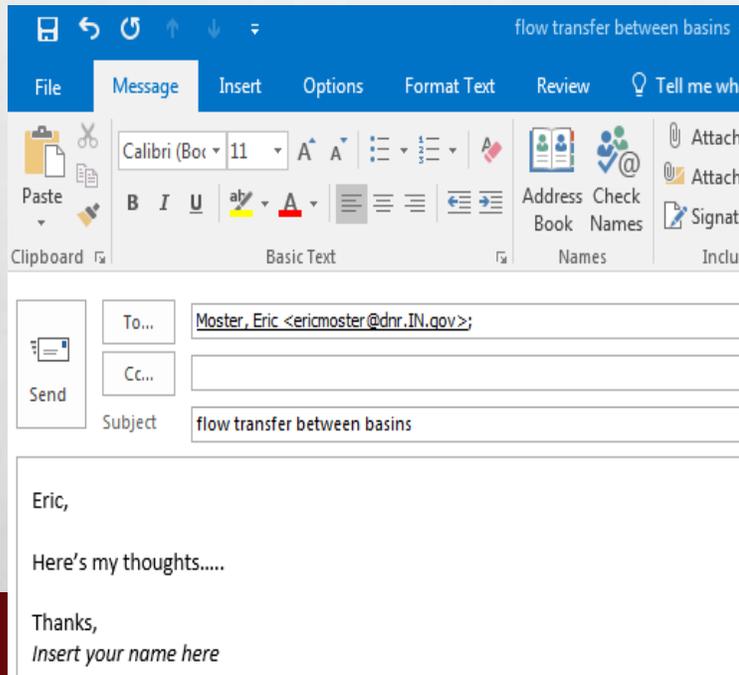
"floodway" means "the channel of a river or stream and those portions of the flood plain adjoining the channel which are necessary required to efficiently carry and discharge the



YOU CAN HELP...

• ~~CONTACT CRIME STOPPERS IDNR~~ WITH YOUR INPUT REGARDING:

- LOCATIONS
- REGULATORY IDEAS
- ISSUES/ PROBLEMS
- OBSERVATIONS



ERIC MOSTER ERICMOSTER@DNR.IN.GOV

QUESTIONS FOR THE BRIEFING TEAM ?



- **EYE WITNESS – SUSAN BODKIN, HANCOCK COUNTY SURVEYOR**



- **SCENE RECONSTRUCTION – PEGGY SHEPHERD, CBBEL**

- **AUTHORITY – ERIC MOSTER, IDNR DIVISION OF WATER**

