ZEBRA MUSSEL IMPACTS, RAPID EXPANSION, AND STEPS TAKEN AT GAVINS POINT DAM

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PRESENTATION OVERVIEW

- Zebra Mussel History in the Missouri River
- Zebra Mussel Status within the Basin
- Hydropower for Dummies
- Impacts at Gavins Point

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MY KEY MESSAGES:

#1 NETWORK!

#2 PLAN EARLY

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BRIEF ZM HISTORY IN THE MISSOURI RIVER

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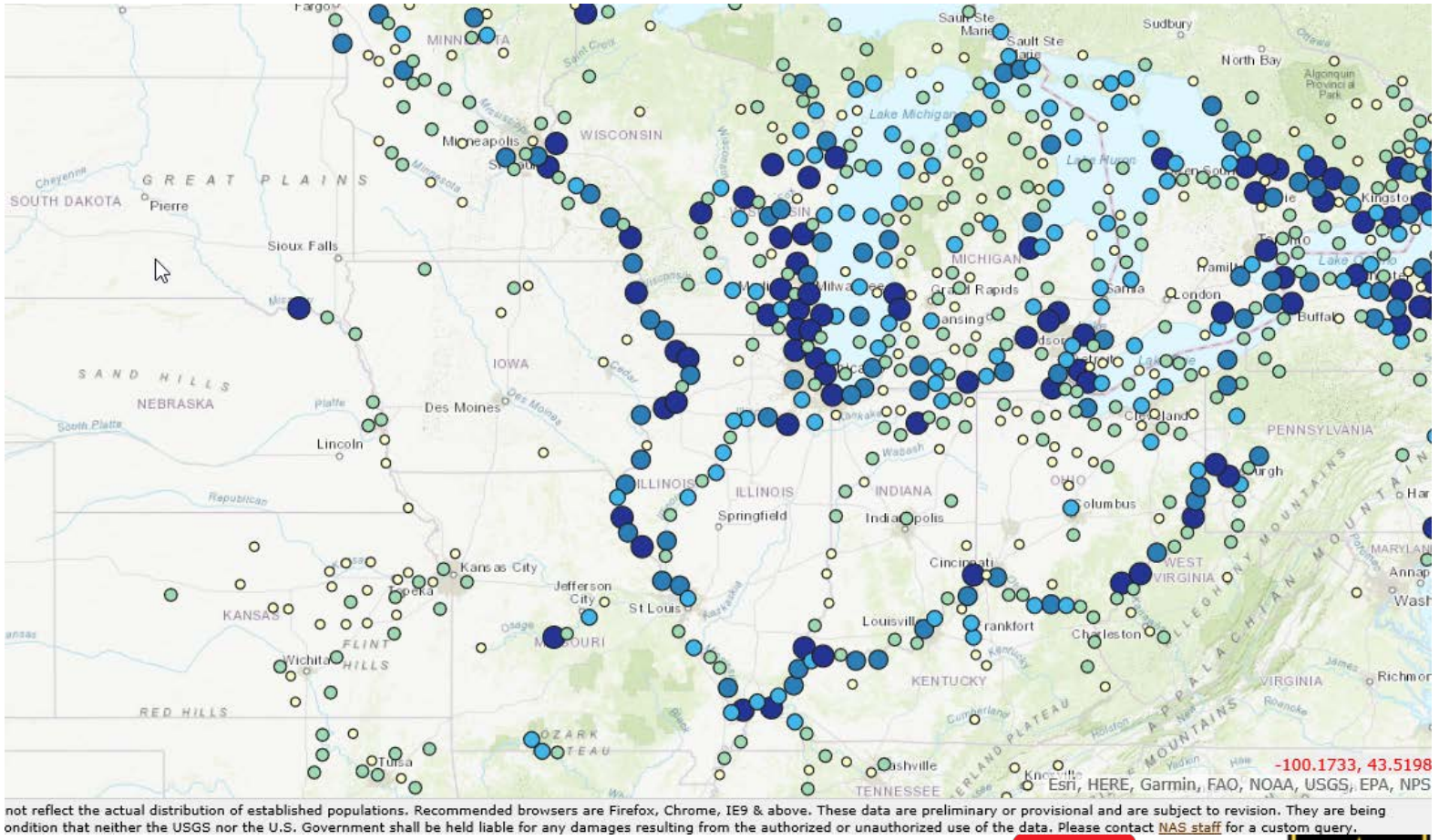
BRIEF ZM HISTORY IN THE MISSOURI RIVER

Early Detections (prior to 2013)

- A few early detections in the early 2000s
  - Missouri River by Sioux City
  - Downstream of Gavins Point (veliger)
  - Pool of Fort Randall (veliger)?
- Base Lake (Omaha)
  - Established population
  - Copper sulfate eradication attempt
    - Initial success, reestablished
- Zorinsky Lake (2010)
  - ZM discovery in 2010
  - Lake drained in fall to freeze/kill population
  - No adult ZM detected to date
    - May have had positive veliger sample collected by state.



not reflect the actual distribution of established populations. Recommended browsers are Firefox, Chrome, IE9 & above. These data are preliminary or provisional and are subject to revision. They are being ondition that neither the USGS nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the data. Please contact NAS staff for a custom query.

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BRIEF ZM HISTORY IN THE MISSOURI RIVER

Gavins Point Infestation 2013

- Adult found on dock being removed for winter
- Subsequent investigations found ZM in low numbers in lower reservoir bays
- Population noticeably increased in following few years
- Sparked both SD & NE to implement new regulations focused on reducing spread of ZM

Boatyard – Fall 2014
Spillway – Fall 2015
Pwr. Plant Piping – Summer 2016
Increasing In Amount Each Year

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BRIEF ZM HISTORY IN THE MISSOURI RIVER

Here we are today…

ZM prolific throughout lower 2/3rds of Lewis and Clark Lake

ZM within the MR below Gavins Point down to KS/MR border

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HYDROPOWER FOR DUMMIES (TRANSLATED BY A BIOLOGIST)

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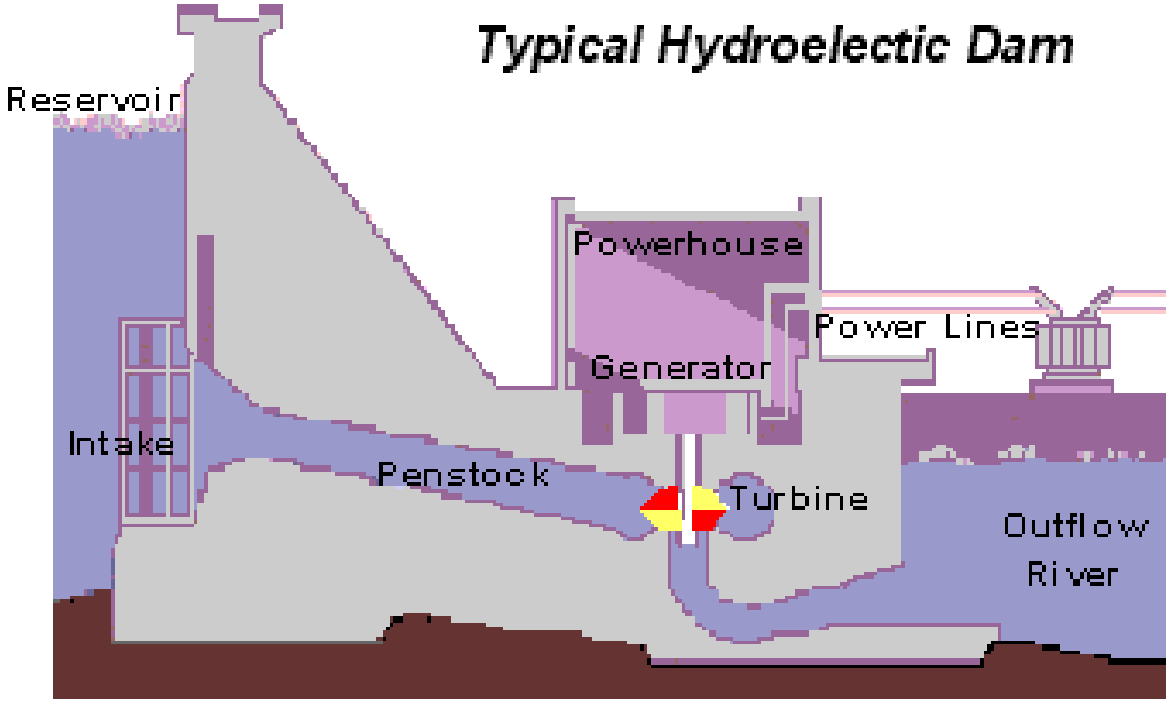
HYDROPOWER FOR DUMMIES (TRANSLATED BY A BIOLOGIST)

Facilities & Man-made Structures

Hydropower!



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HYDROPOWER FOR DUMMIES (TRANSLATED BY A BIOLOGIST)

Water is used in a Hydropower plant in two ways.

<u>First: Power generation</u>

- Water taken in via the penstock (huge tubes, lots of water)
- Force of flowing water drives the generator
- High volume, fast flowing, simple pathway, low internal retention time

<u>Second: Heat Dissipation (cooling)</u>

- Water used to remove heat from facility components (think car radiator)
- Circulated water within plant cools oil, components, used for fire suppression…
- Low volume (comparatively), complicated pathway(s), variable flow, longer retention time, flow-through systems

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HYDROPOWER FOR DUMMIES (TRANSLATED BY A BIOLOGIST)

Regarding ZM, USACE is primarily concerned w/ Cooling Water.

<u>Heat Dissipation (cooling)</u>

- Cooling water is critical to facility functions
  - Just like you car's engine, if the generator overheats it could be a catastrophic failure costing millions of dollars.
  - Cooling/Raw water is used in numerous subsystems that preform critical or important functions.
- The focus of USACE mitigation efforts is on protecting the Cooling/Raw water systems from ZM.

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HYDROPOWER FOR DUMMIES (TRANSLATED BY A BIOLOGIST)

Key Points on Impacts

Ecological
- Potential large scale impacts to food-web & lake ecology

Facilities and Hydropower
- Cooling & Raw water used in the interior power plant is the critical element for USACE

Recreation
- not mentioned but;
- Altered fisheries (+/-)
- Hassel of decontamination and compliance
- Beach impacts (shells are sharp)

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