

# Mercury Sampling in the Blackfoot River

Josh Schultz  
Water Quality Scientist

# Outline

- Introduction
- Toxicity
- Cycling
- Sources
- Sampling
- Data
- Future plans

# Introduction

- Naturally occurring metallic element
  - Air, soil and water
- Persistent
- Bioaccumulative
- Toxic
- Released through anthropogenic activity
  - 50-75% of atmospheric mercury
  - Coal
  - Mining

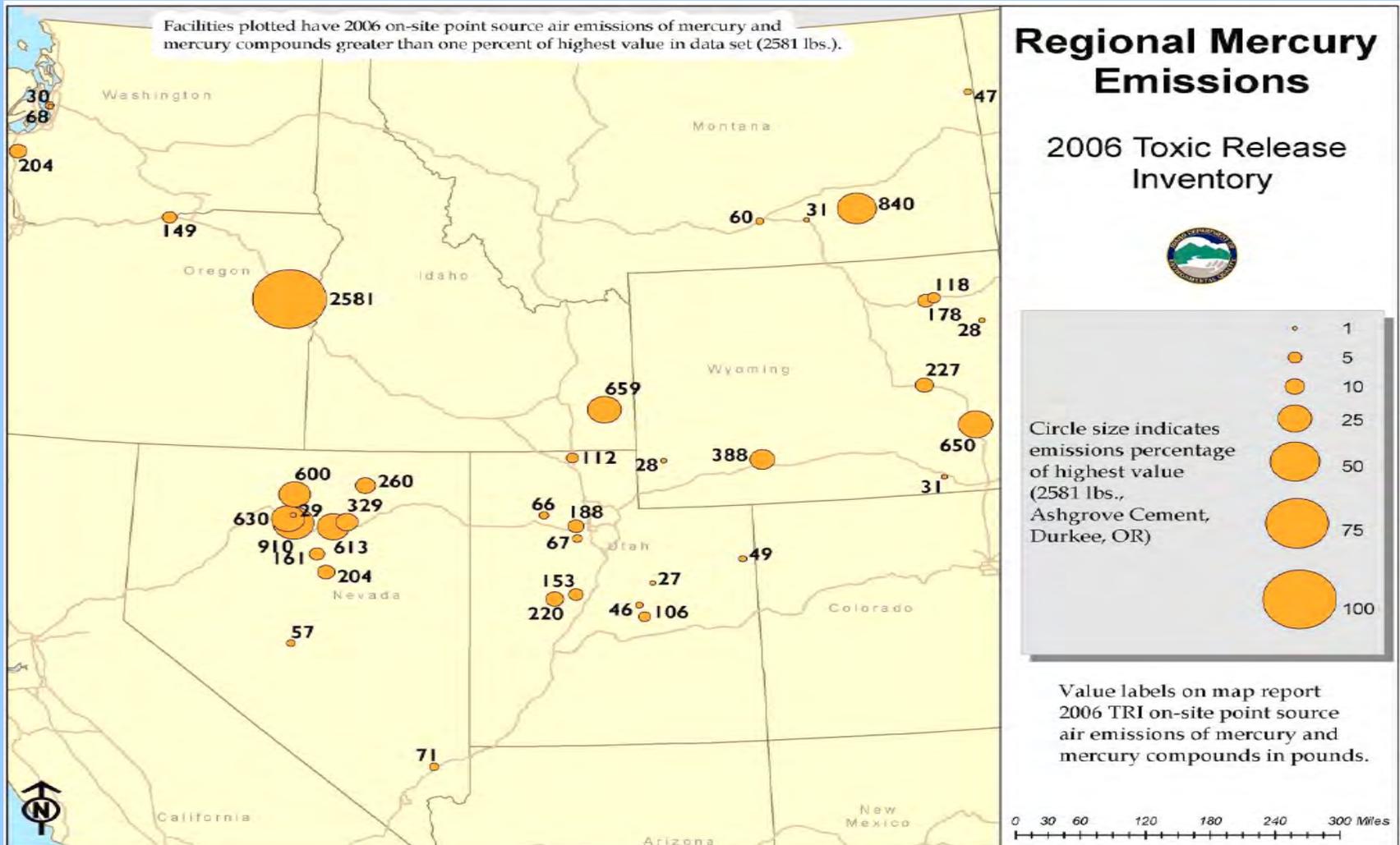
# Mercury Toxicity

- All forms are toxic
  - Metallic mercury
  - \*Methyl mercury
- Exposure
  - \*Air
  - Water
  - Food
    - \*contaminated fish
- Toxicity depends on
  - Time of exposure
  - Length of exposure

# Mercury Releases

- Released
  - Gaseous
  - Particulate
- Residence time
  - Mean atmospheric residence time of ~1 year (global)
    - Hours (local deposition, particulate Hg) (local)
    - Days and months (regional to global deposition)
- Deposition
  - Wet
  - Dry
  - Dependant on meteorology, temperature, humidity, stack height
- Transformation

# Sources of Mercury



Map prepared by Sara Strachan, DEQ Technical Services

# Mercury Sampling

- Part of a larger project
- Global, national push
- MOU with Utah, Nevada and EPA
- Statewide mercury survey
  - *Arsenic, Mercury, and Selenium in Fish Tissue from Idaho Lakes and Reservoirs: A Statewide Assessment (2008)*
- Local picture

# Water Sample Locations

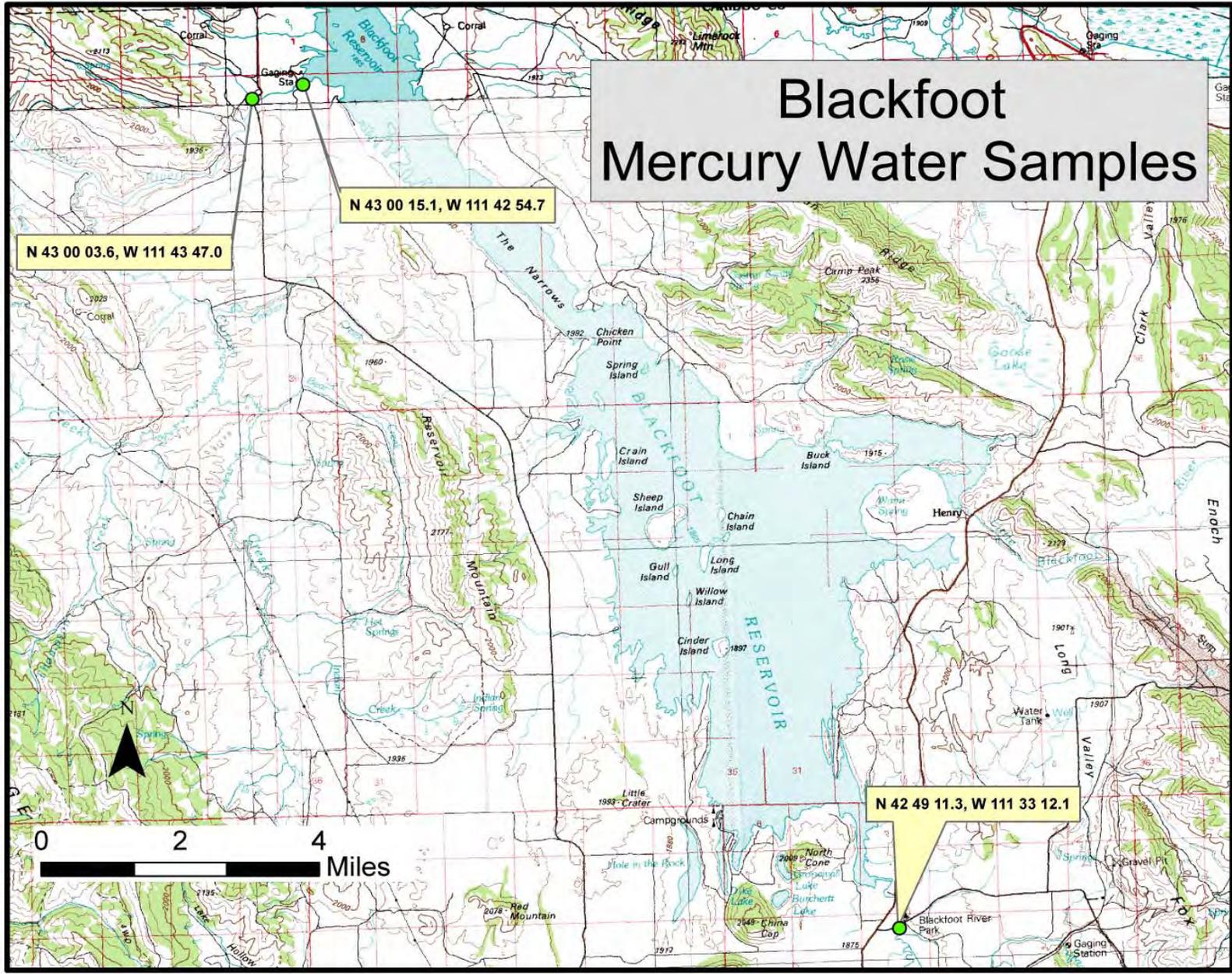
- Blackfoot River
  - Above
  - Below
- Blackfoot Reservoir
  - Upstream of dam

# Blackfoot Mercury Water Samples

N 43 00 15.1, W 111 42 54.7

N 43 00 03.6, W 111 43 47.0

N 42 49 11.3, W 111 33 12.1



# Sampling Protocol

- Water samples
  - Clean hands/dirty hands
  - Facing upstream, upwind
  - Triple rinse and cap under water
  - Double bag
  - Special fluorinated sample bottles





# Water Chemistry

- Cycles
  - Daily
  - Annually
- Susceptible to contamination
  - Atmosphere
  - Personnel
  - Equipment
- May not be indicative of actual risk
  - Environment
  - Human health

# Fish Tissue

- Mercury fish tissue standard
  - 300 ng/g (ppb)
  - .3 mg/Kg (ppm)
- Less contamination
- More precise
- 90% methyl mercury

# Fish Tissue Sampling

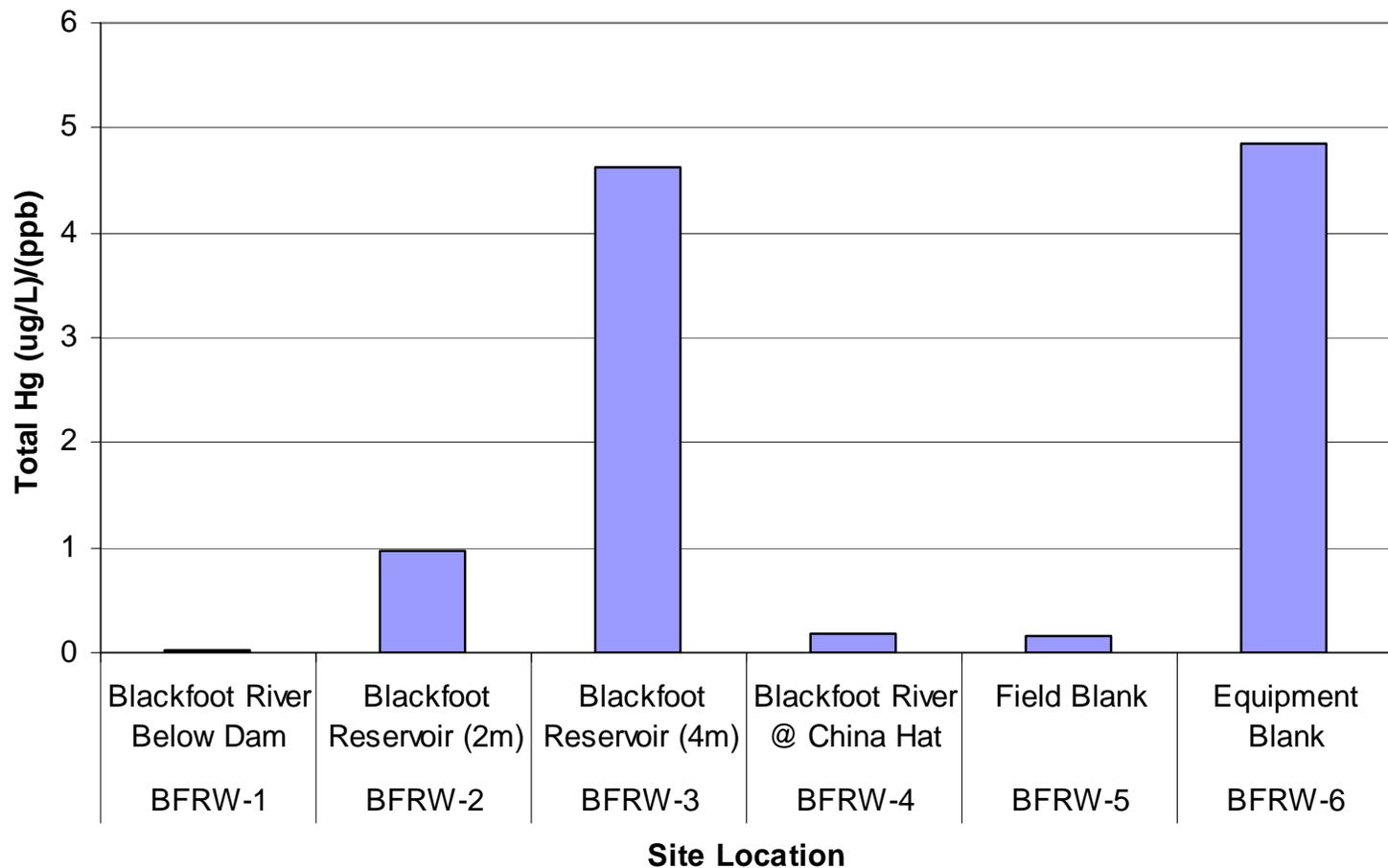
- Blackfoot River
  - 10 Yellowstone cutthroat
  - 9 Utah suckers
  - 1 yellow perch

# Sample Preparation

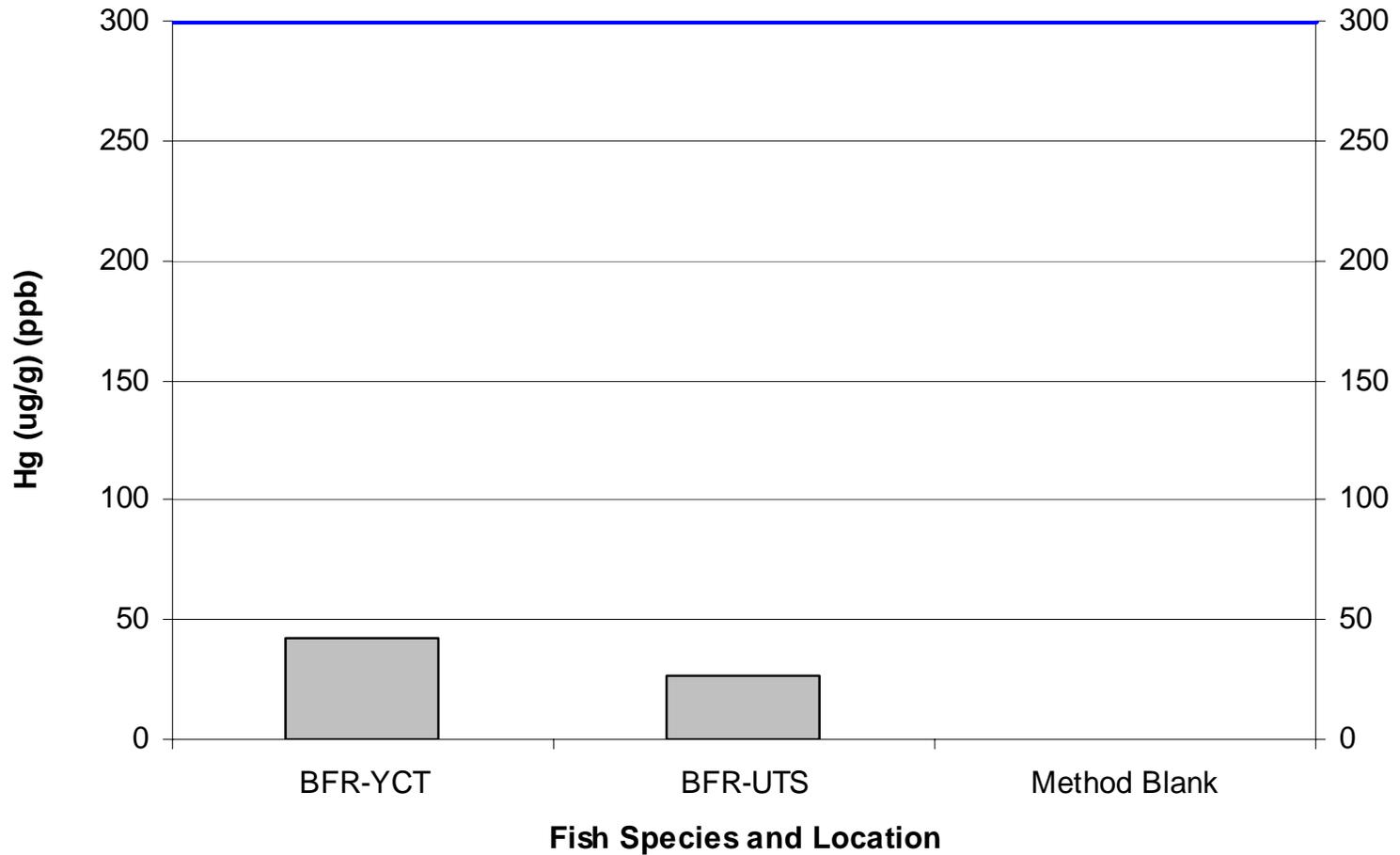


# Water Quality Results

## Total Mercury



# Fish Tissue Total Mercury



# Conclusions

- Mercury is present
  - Water column
    - Inconclusive
  - Fish tissue
    - Not impaired if concentrations below 240 ppb
- Preliminary
- More data
  - Further monitoring

# Next Steps

- Further data collection
  - Fish
  - Water ?
- Better understanding
  - How widespread
  - Trends
    - stable
    - rising

# Questions

