

# Development of the Wyoming StreamStats application and other news

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2023 AWRA Conference

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- StreamStats national application
- Wyoming StreamStats development
  - Current capabilities
  - Future capabilities
- Montana StreamStats
  - Channel-width statistics
  - Updates to peak-flow statistics

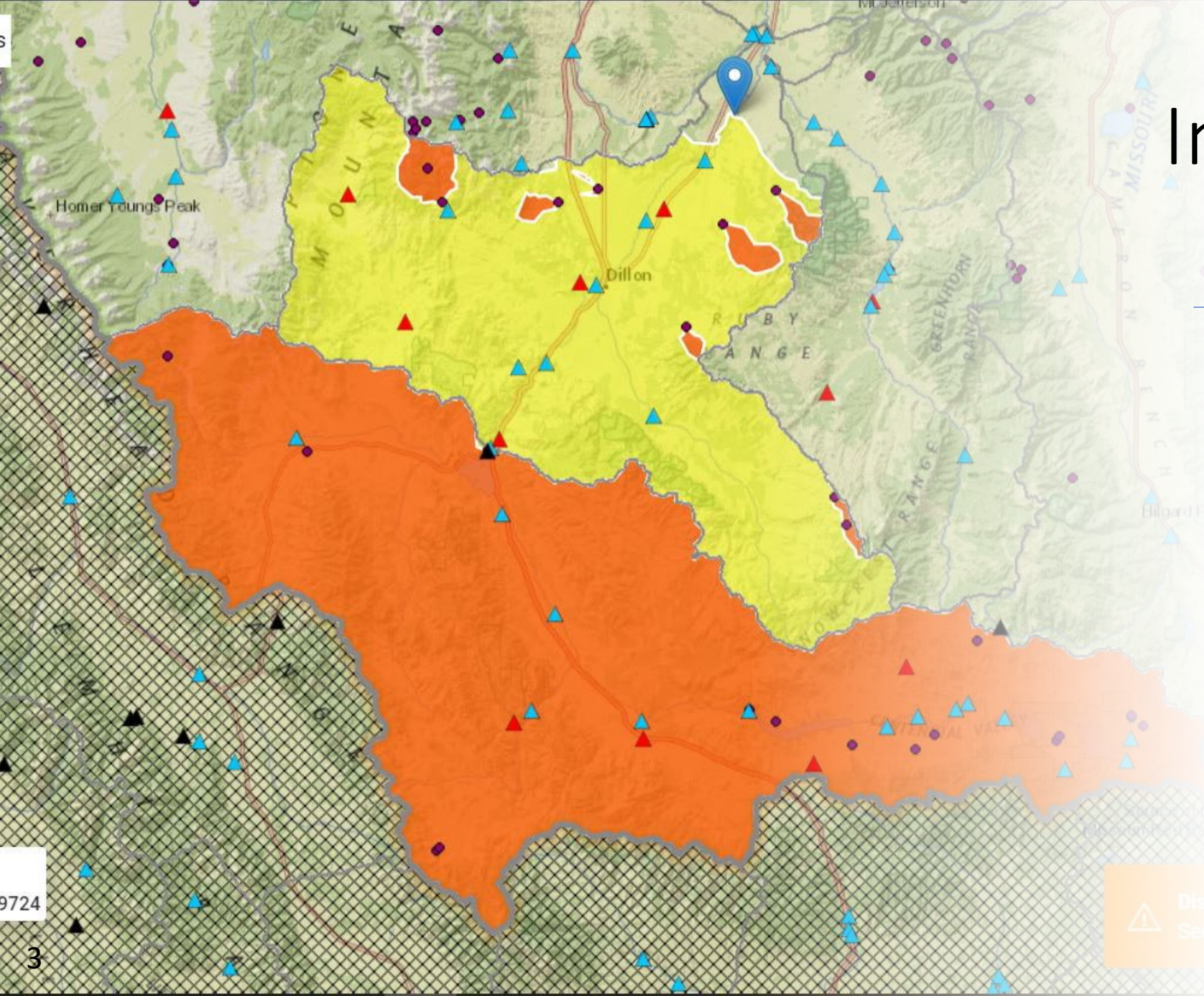
# Introduction to StreamStats

Web-enabled GIS application

Drainage areas

Basin characteristics

Streamflow statistics



# Introduction to StreamStats

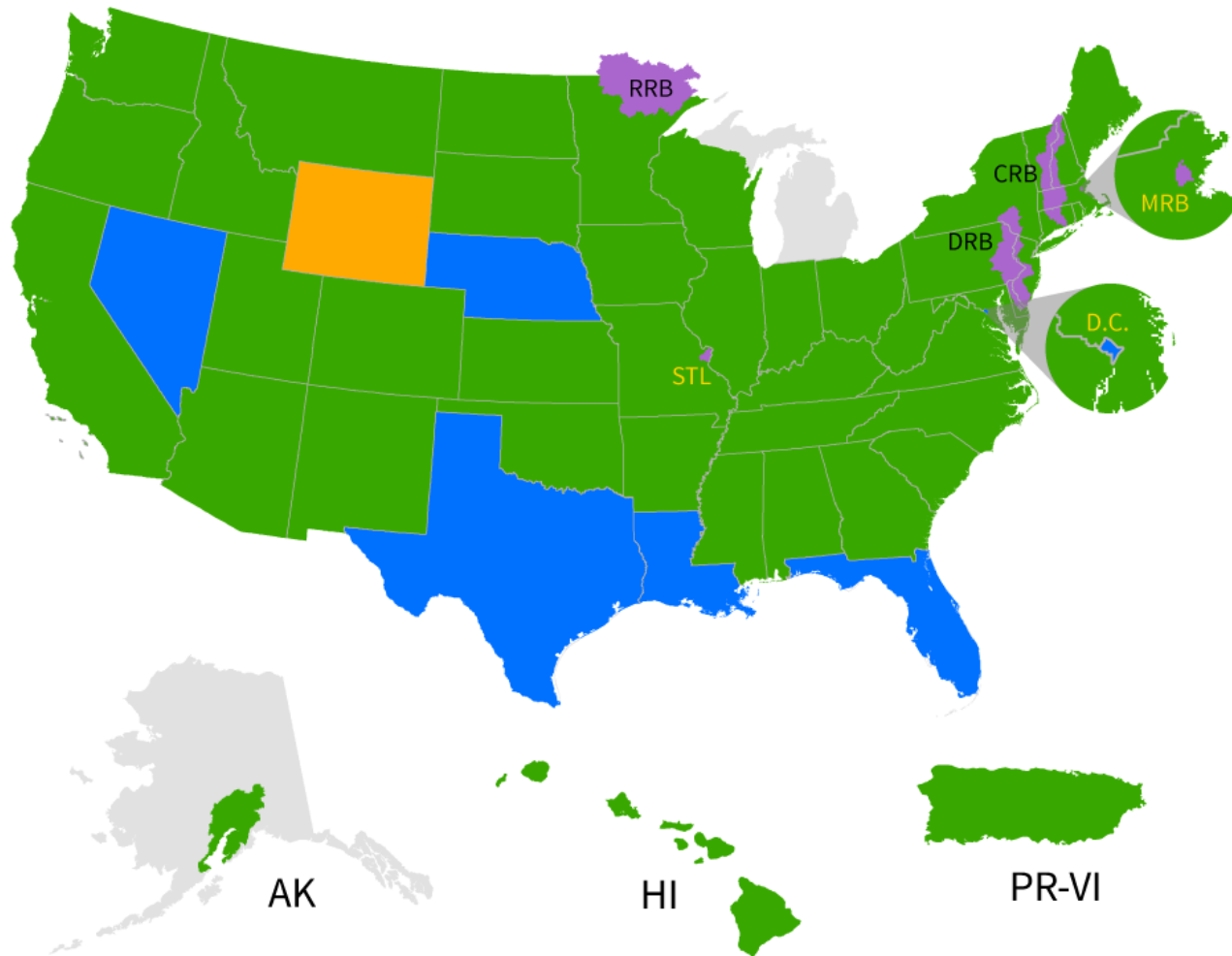
- What kind of information does it provide?

## At-site streamflow statistics

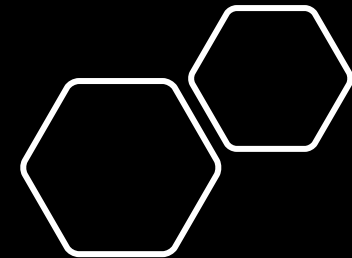
- Computed at select streamgages
- Links to National Water Information System
- Duration, high and low-flows, basic statistics
  - Peak-flows

## Regression Equations

- Streamflow duration
- Low-flow frequencies
- Flood frequencies



- Basins and **storm drain** implementation
- Fully implemented
- Delineation and basin characteristics only
- Undergoing implementation
- Not participating



**Developed with state cooperators based on their needs.**

**Different capabilities depending on the state.**

**Available for public use in most states.**

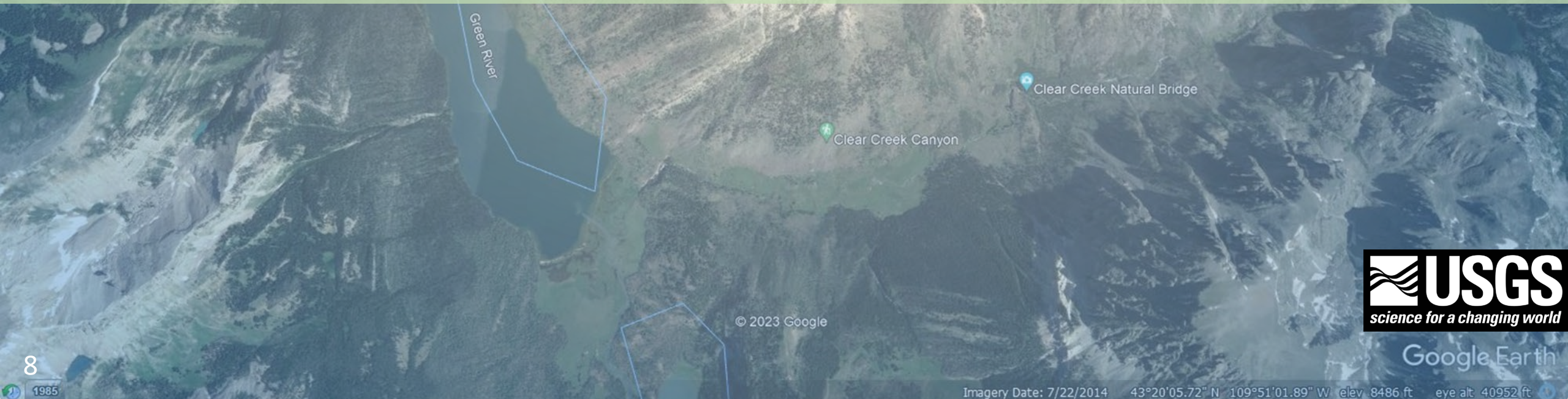
# Wyoming StreamStats

- Began as a discussion in 2015 with the WY Water Development Office.
- 2018 – Pilot project in the Upper Colorado River region
- 2019 – Statewide expansion begins



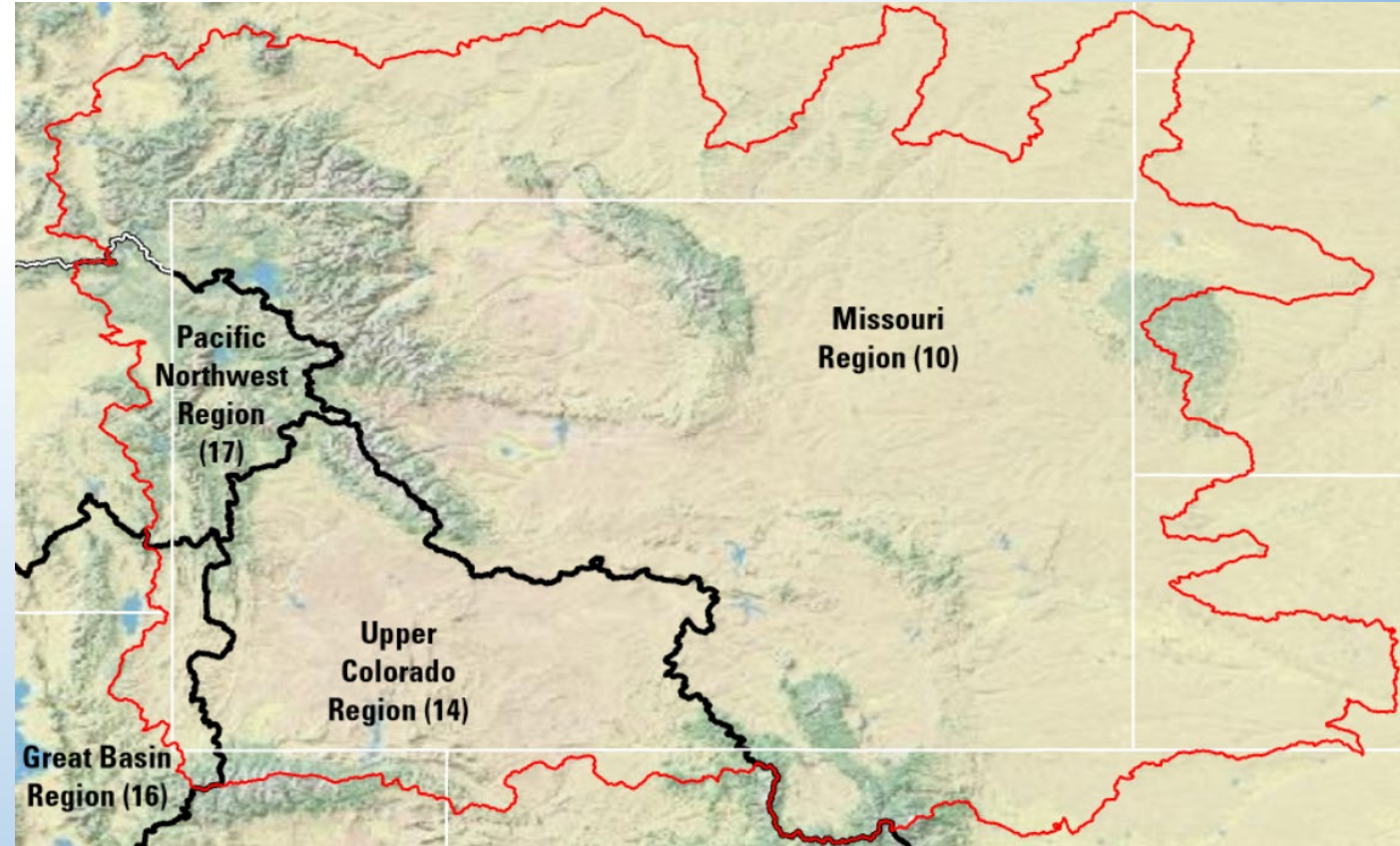
# Status of Wyoming StreamStats

- Previously published streamflow statistics, downscaled from statewide studies.
- Estimated channel characteristics and streamflow statistics.
- Downscaled from national studies.
  - Maximum probable flood estimate (Crippen and Bue, 1977)
  - Channel width estimates (Bieger and others, 2015)



# Wyoming StreamStats future capabilities

- Planned functionality
  - Streamflow statistics
    - Basic and seasonal
    - Flow-duration
    - High- and low-flow duration
    - Regressions
  - Peak-flow statistics



# Wyoming StreamStats – peak-flow statistics

- Instantaneous peak streamflows from crest-stage and continuous streamgages analyzed using Bulletin 17C methods.
- Bulletin 17C adds to the previous methods document, Bulletin 17B, by improving the handling of interval data, low outlier peak floods, and improved methods for determining confidence intervals.
- Consistent approach to analyze and better estimate peak-flow events.

# Status of Wyoming StreamStats

- Development of disturbance indices for streamgages in Wyoming

## Diversion disturbance index

$$DI_x = \frac{\sum_{i=1}^d (dQ_i)}{Q_x}$$

dQ=permitted diversion flow rate

Q=mean annual streamflow for location

## Dam disturbance index

$$DI_x = \frac{\sum_{i=1}^d (S_i * DA_i)}{P_x * DA_x^2}$$

S=storage

DA=drainage area

P=mean annual precipitation for basin

d =each dam in the basin

# Montana StreamStats

- Adding ability to use channel width as explanatory variable when estimating flow statistics at ungaged sites.
  - Evaluating different channel widths (bankfull, active channel, estimated from satellite imagery)

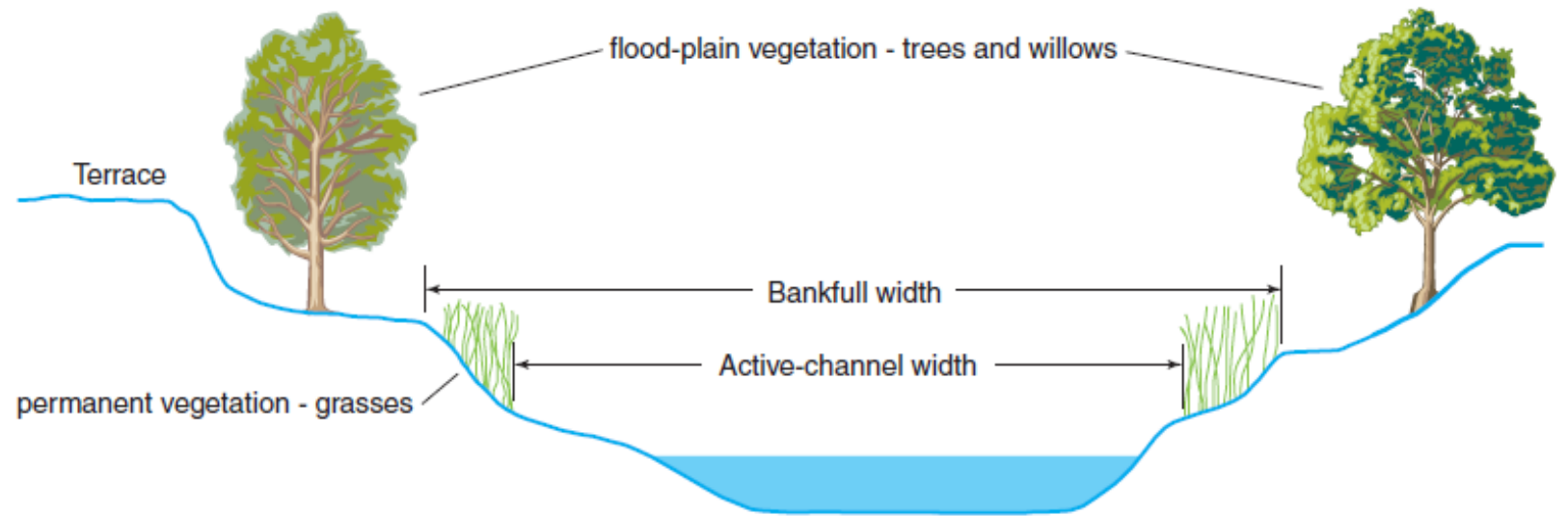
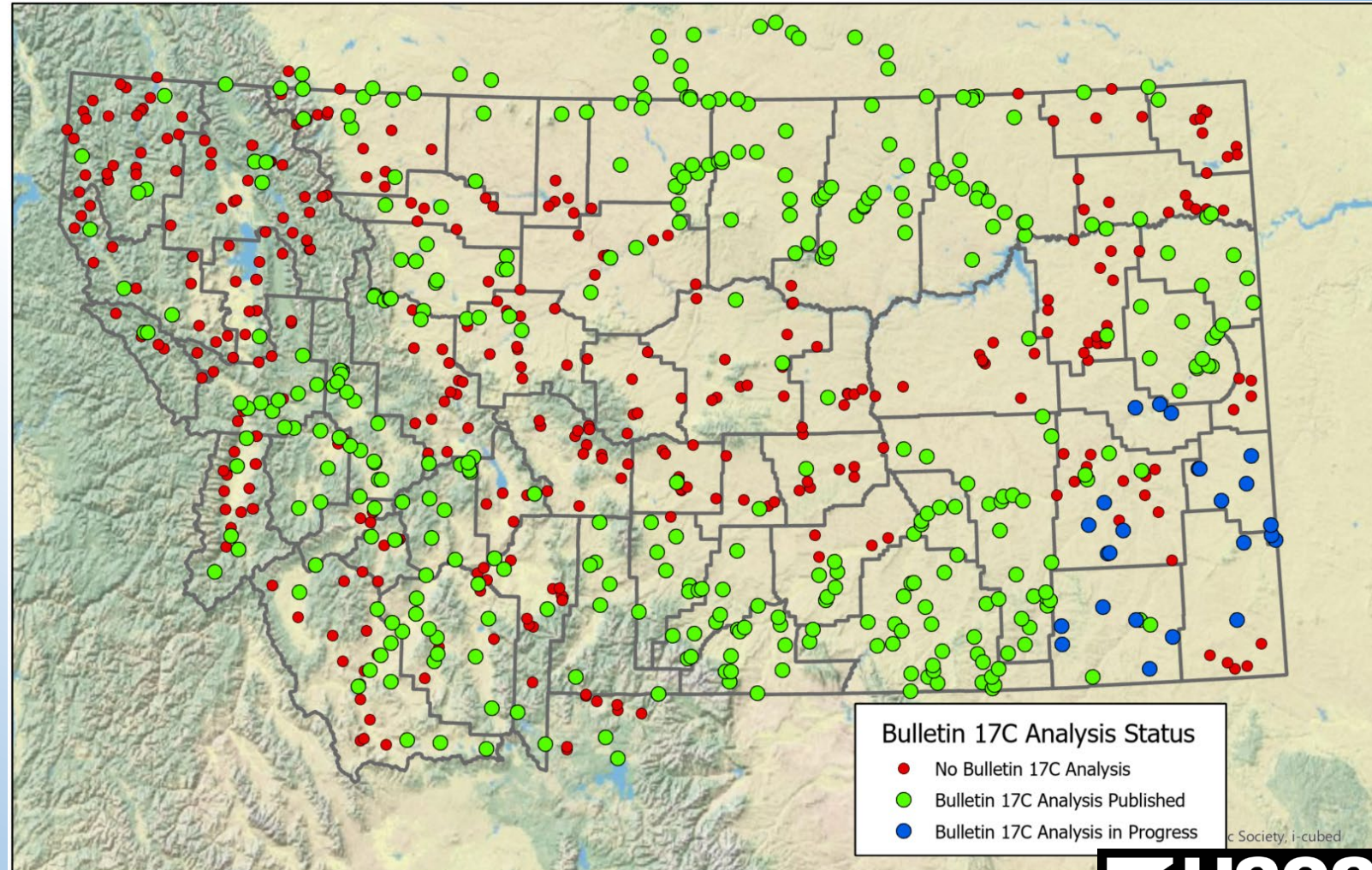


Figure 7. Typical stream cross section showing active-channel and bankfull widths.

# Peak-flow statistics are being updated for MT Streamgages

- Bulletin 17C methods
- Updated statistics can be accessed using Montana StreamStats.
- Publication of Upper Yellowstone sites.



# Summary

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- StreamStats and its application in the United States.
- Development of Wyoming StreamStats.
- Montana StreamStats updates.



Questions?

Special thanks to our Wyoming cooperator, the  
Wyoming Water Development Office  
and  
Our Montana cooperator, the Department of Natural  
Resources and Conservation

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