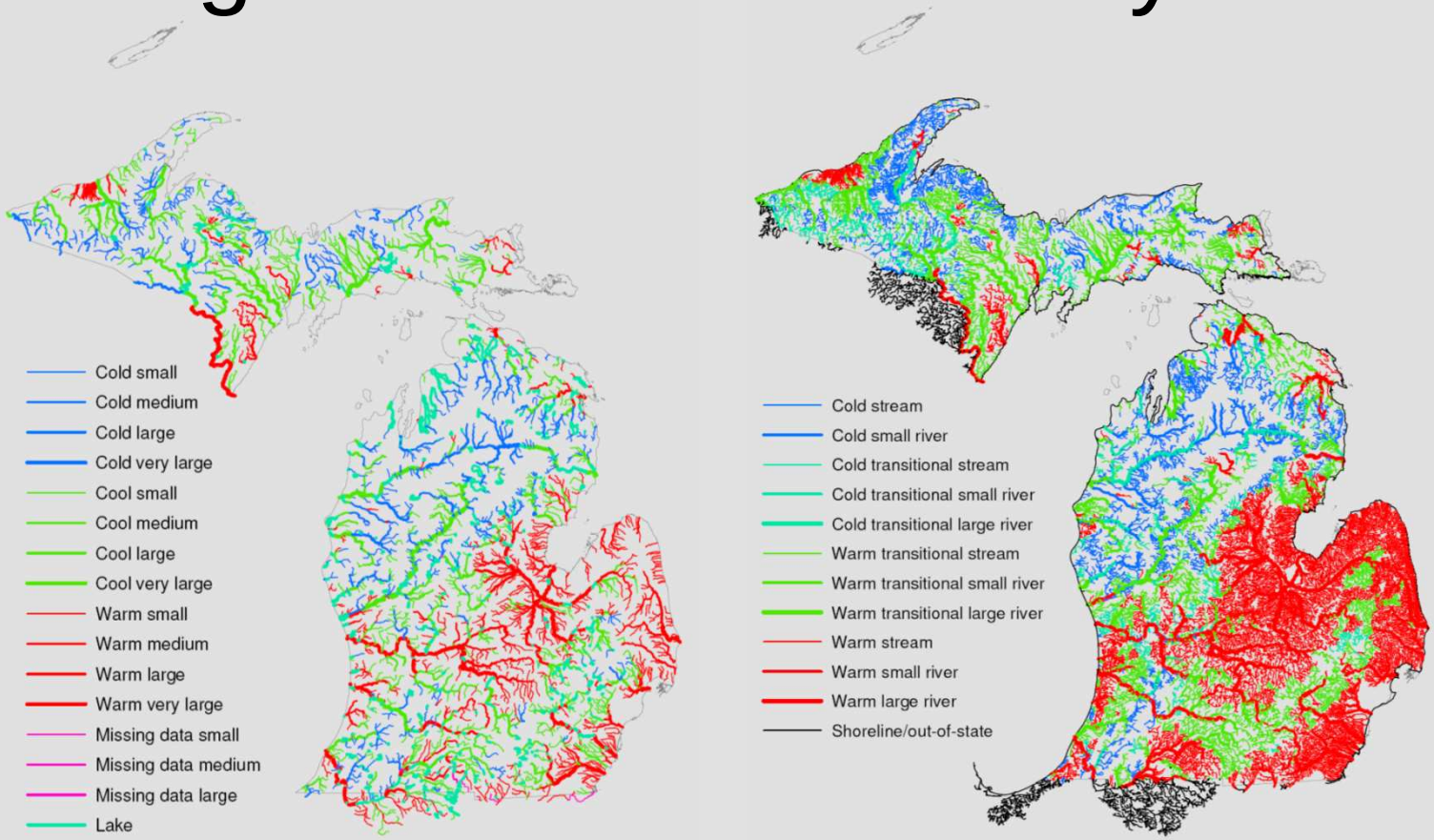
Michigan's Valley Segment Ecological Classification System



Todd Wills

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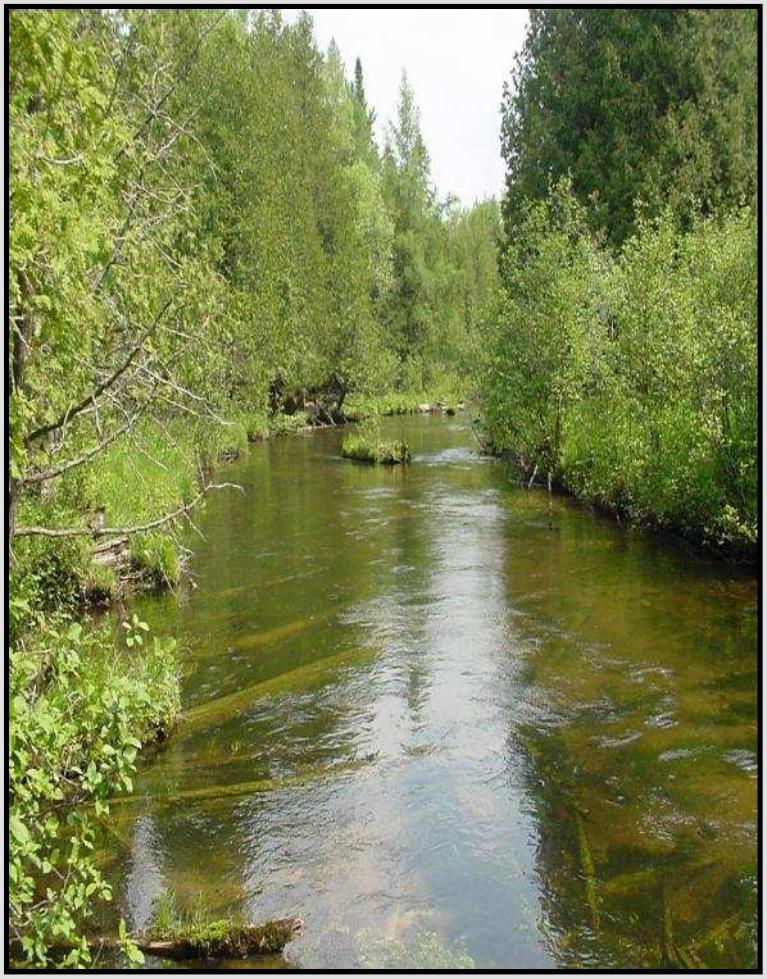
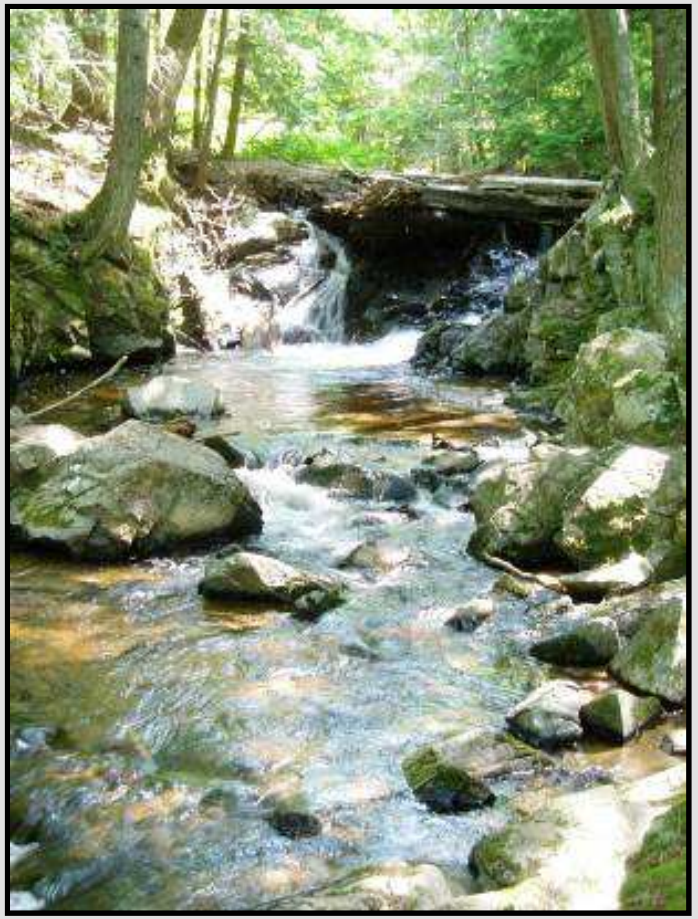
Outline

- What is it?
- Why classify?
- How is it done?
- History in Michigan
- Latest classification
- Uses



What is ecological classification?

- Framework for organizing and extrapolating information
- Integrates physical *and* biological elements
- Educational and communication value
- Management tool

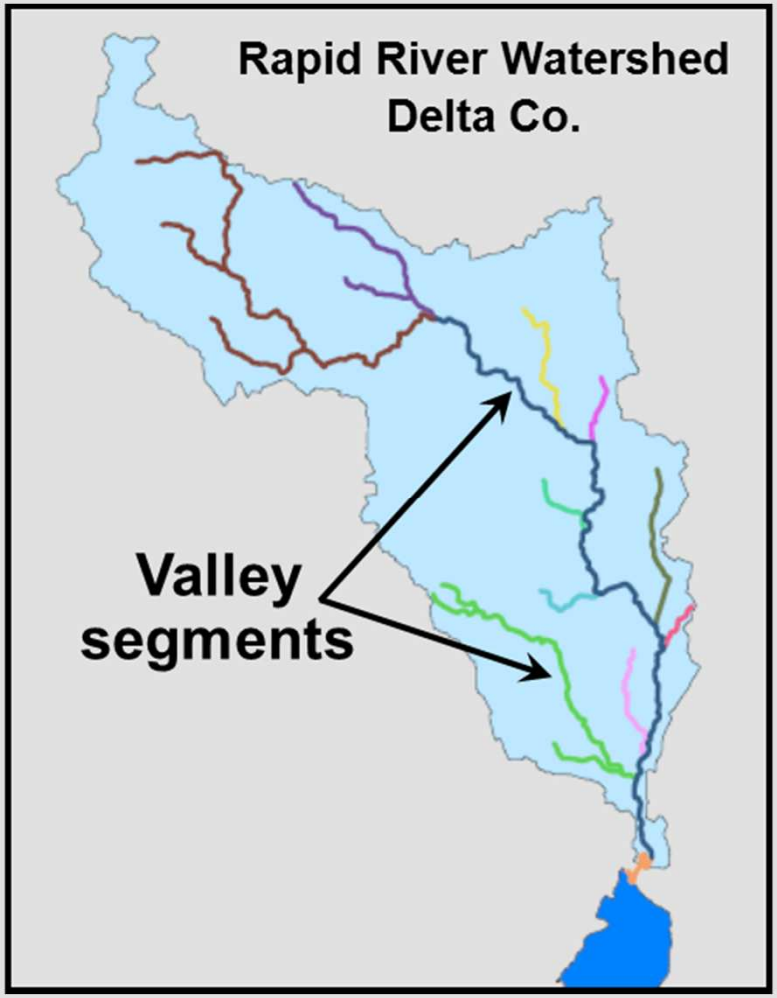


Why do we classify streams?

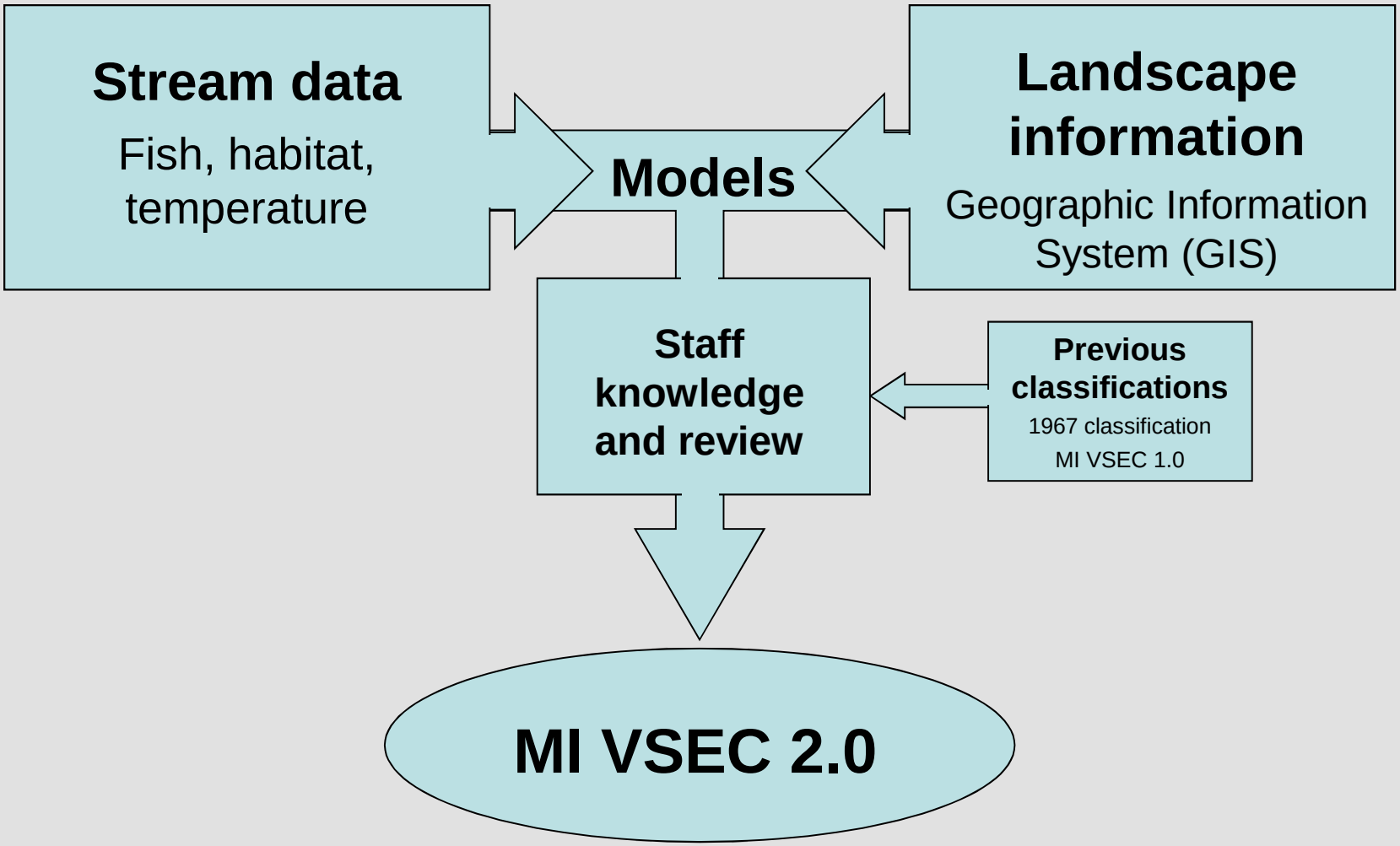
- Difficult to generalize natural resources
- Need to identify and describe naturally-occurring, ecologically-distinct, spatial units

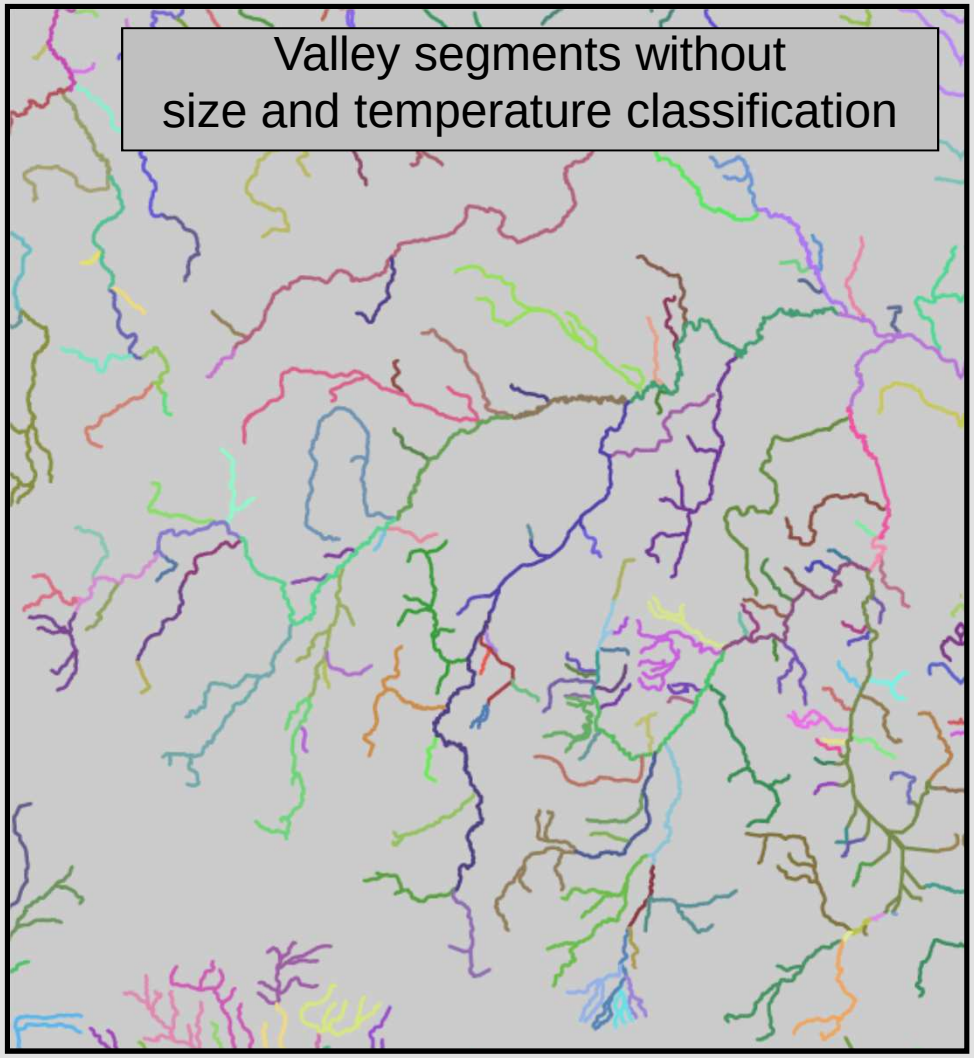
Valley Segments

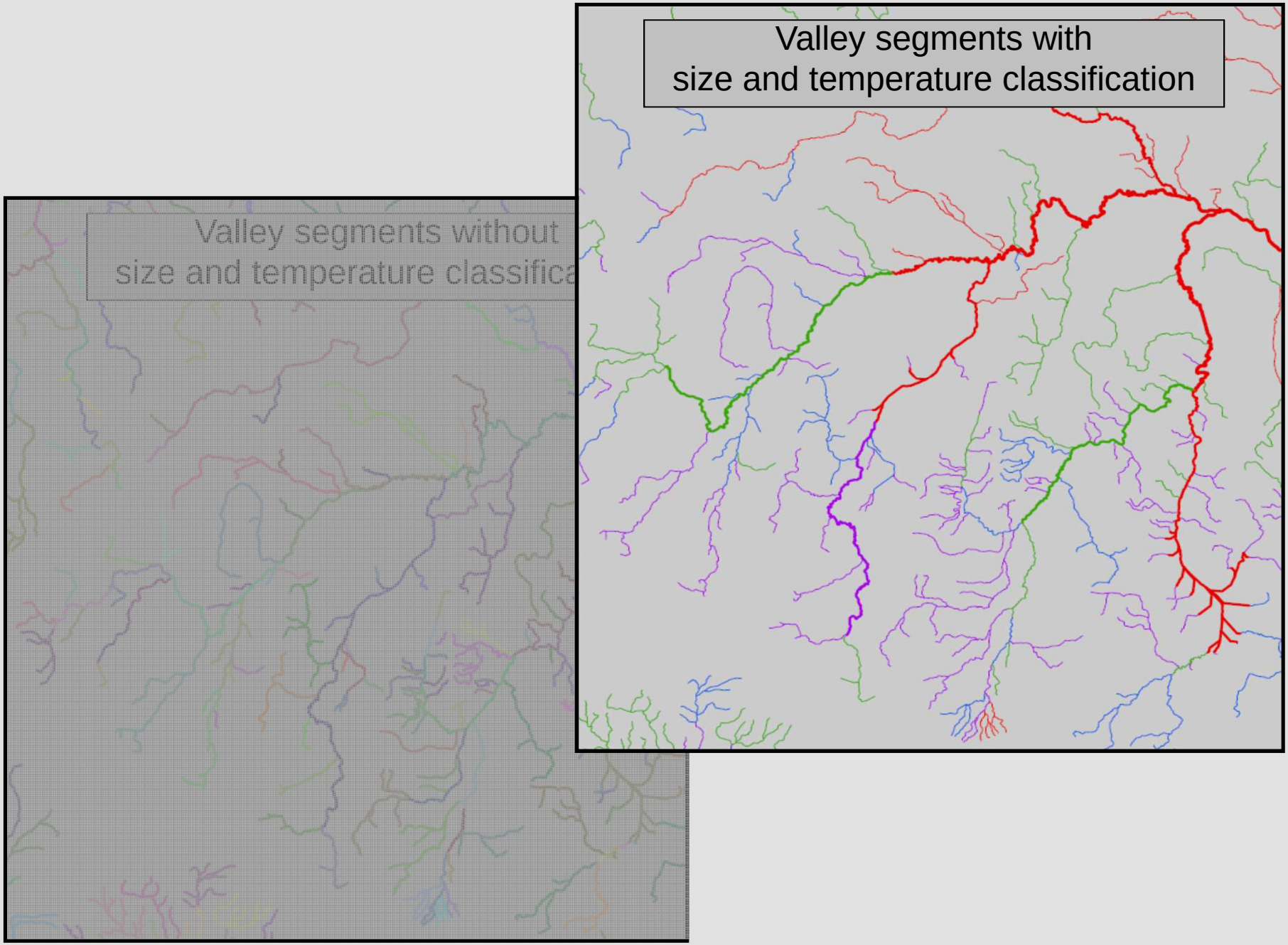
- Landscape-based
- Naturally-occurring
- Management-relevant scale
- Foundation



How are valley segments classified?




Valley segments without
size and temperature classification


Valley segments without
size and temperature classifica
Valley segments with
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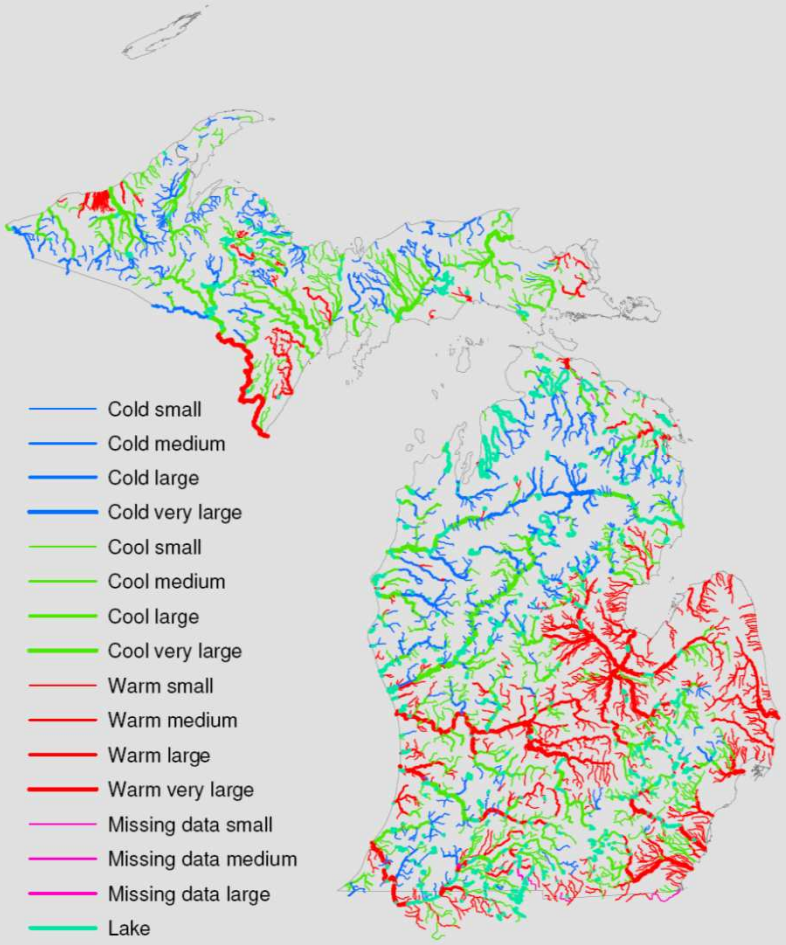
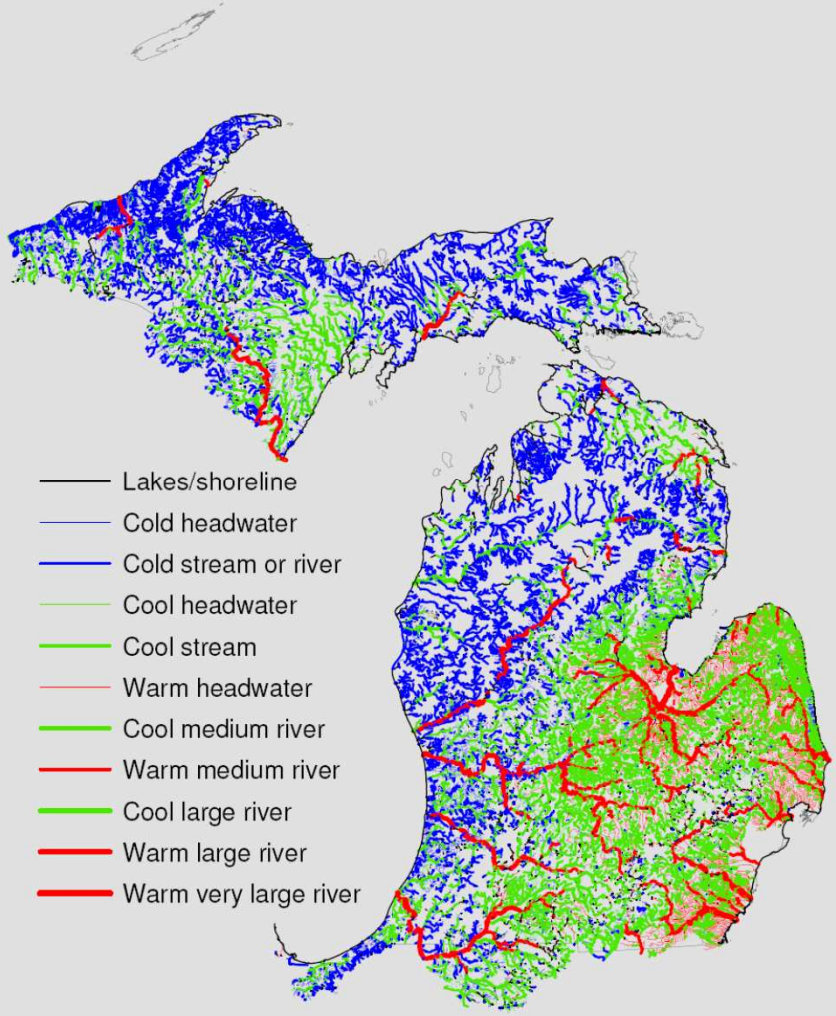
Stream Classification In Michigan

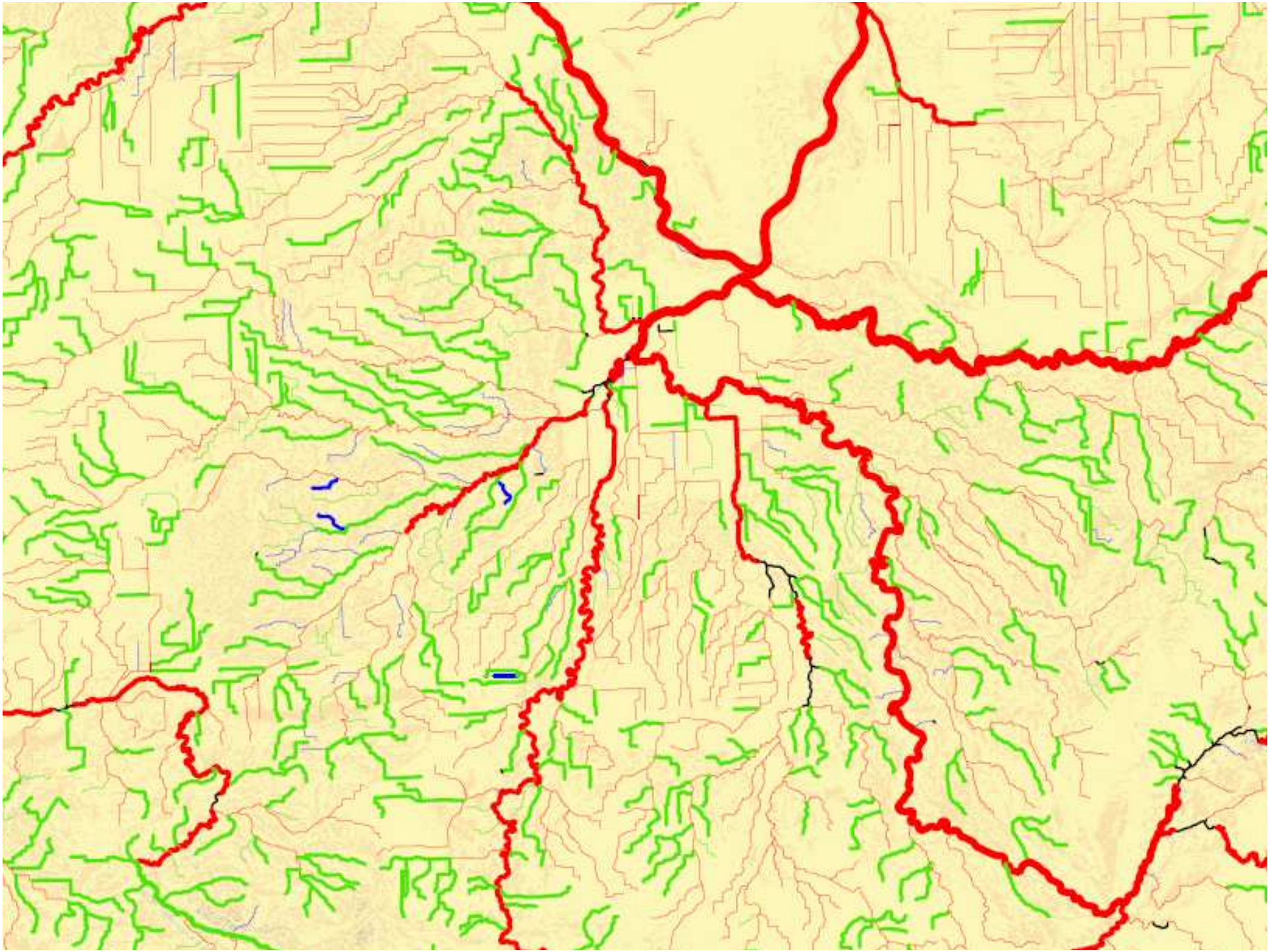
- 1st classification:1967
- 2nd classification:
  - 1997, 2006
  - MI VSEC 1.0
  - Developed from field data, multiple map layers, expert knowledge
  - Headwater/small tributaries excluded



Developing MI VSEC 2.0

- 3rd classification:
  - Multi-state effort
  - GIS and statistical models
  - VAST
  - Headwater/small tributaries included



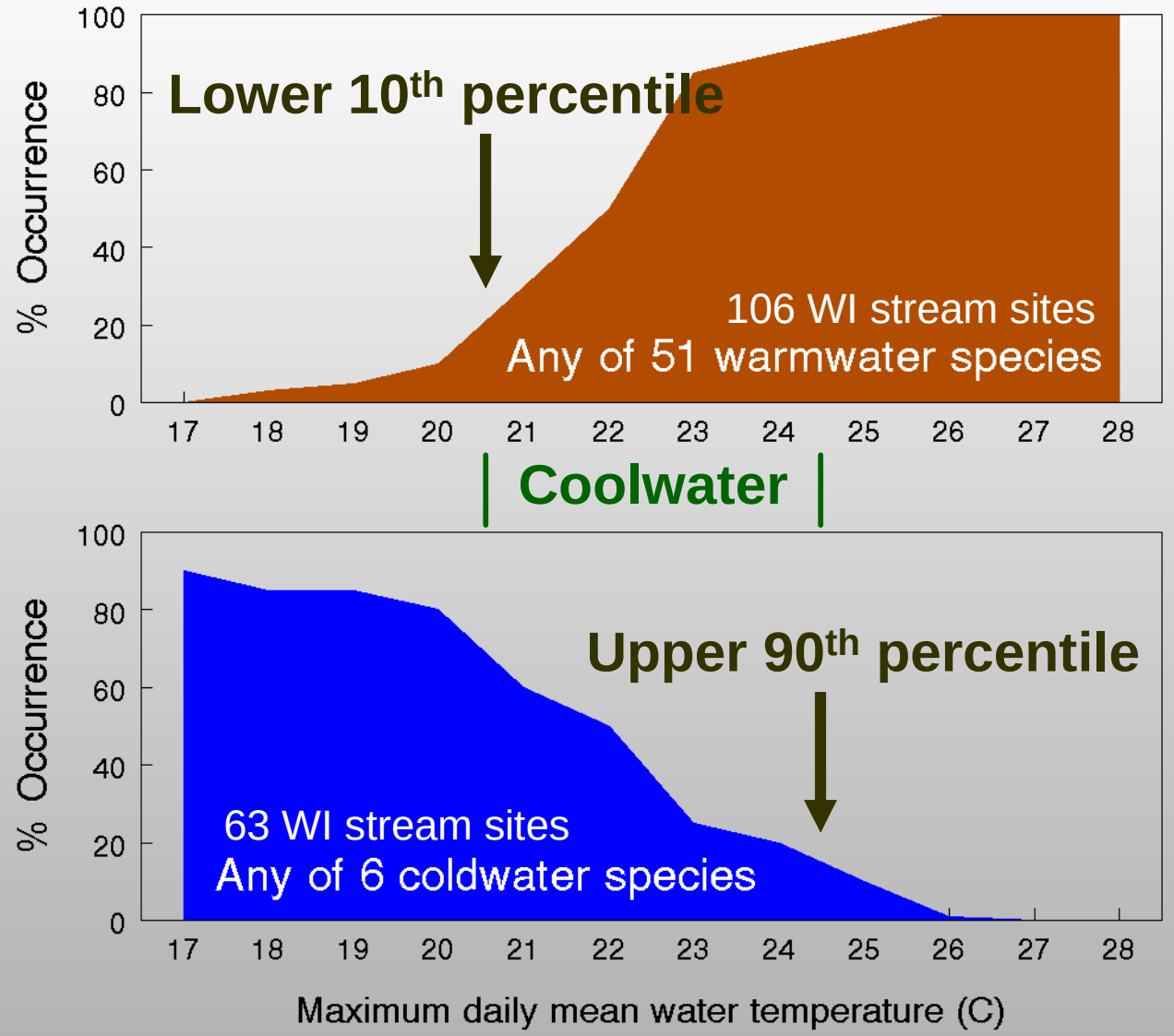


Developing MI VSEC 2.0

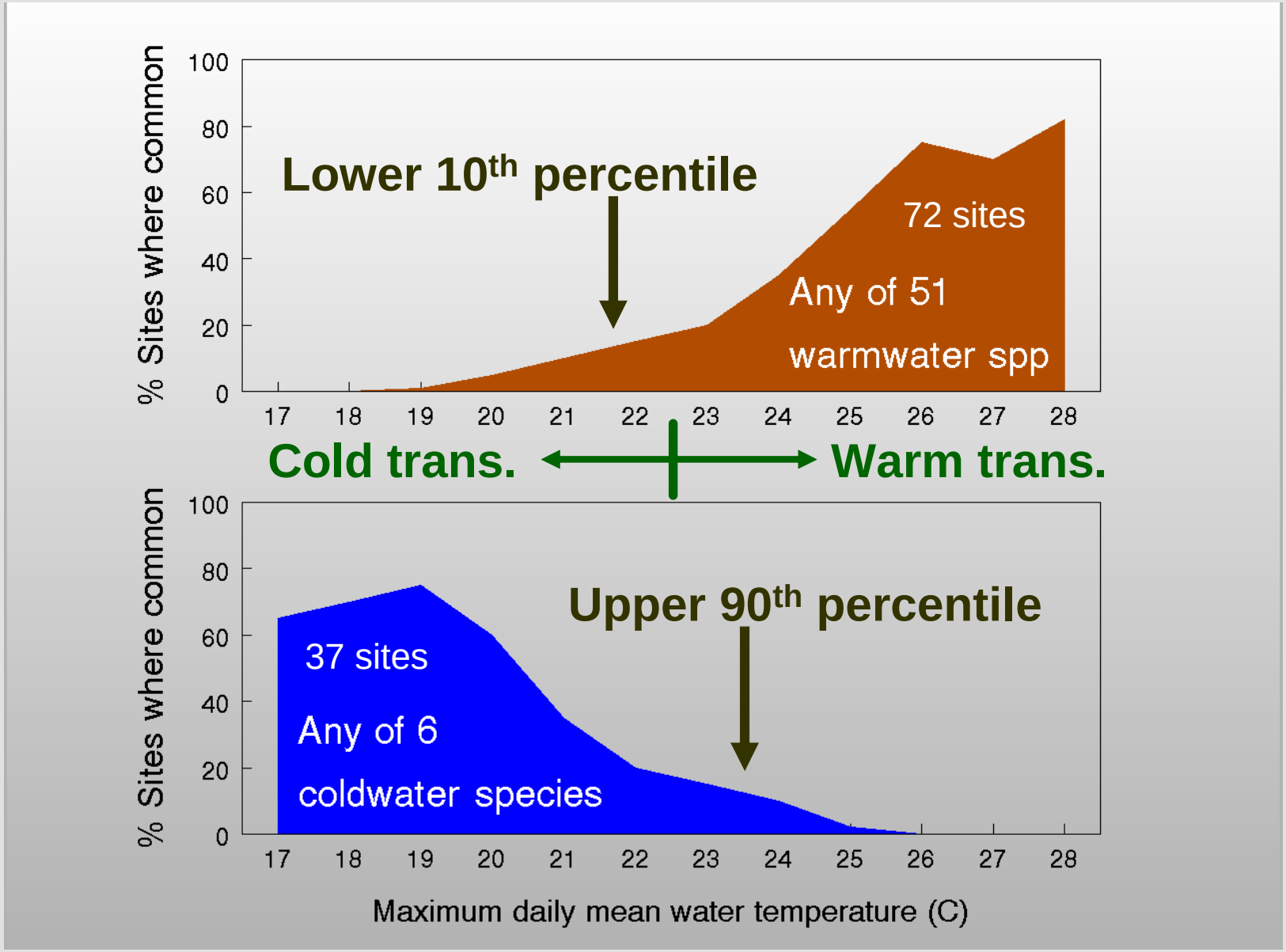
- Review
  - Temperature classes
  - Size of headwater segments
- Incorporate and classify lake reaches
- Reclassify sizes (Zorn et al. 2008)
  - Small: ≤ 80 sq mi
  - Medium: > 80 sq mi and ≤ 300 sq mi
  - Large: > 300 sq mi
- Reclassify temperature categories

Defining Coolwater

(Lyons et al. 2009)



Shift In Coolwater Assemblage



Redefining Coolwater

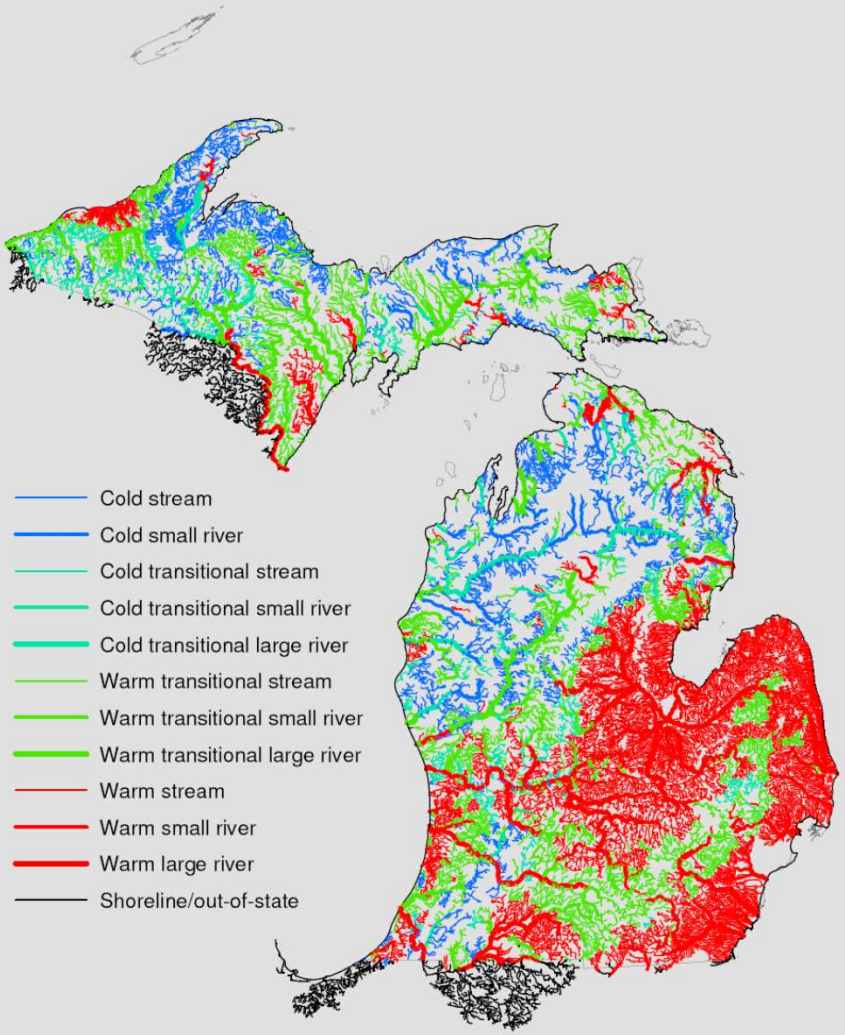
Thermal class	Temp	Coldwater gamefish	Warmwater gamefish
Cold	≤ 63.5℉	Common	Absent
Cold-transitional	> 63.5℉ ≤ 67.1℉	Common	Present
Cool (WT)	> 67.1℉ ≤ 69.8℉	Present	Common
Warm	> 69.8℉	Absent	Common

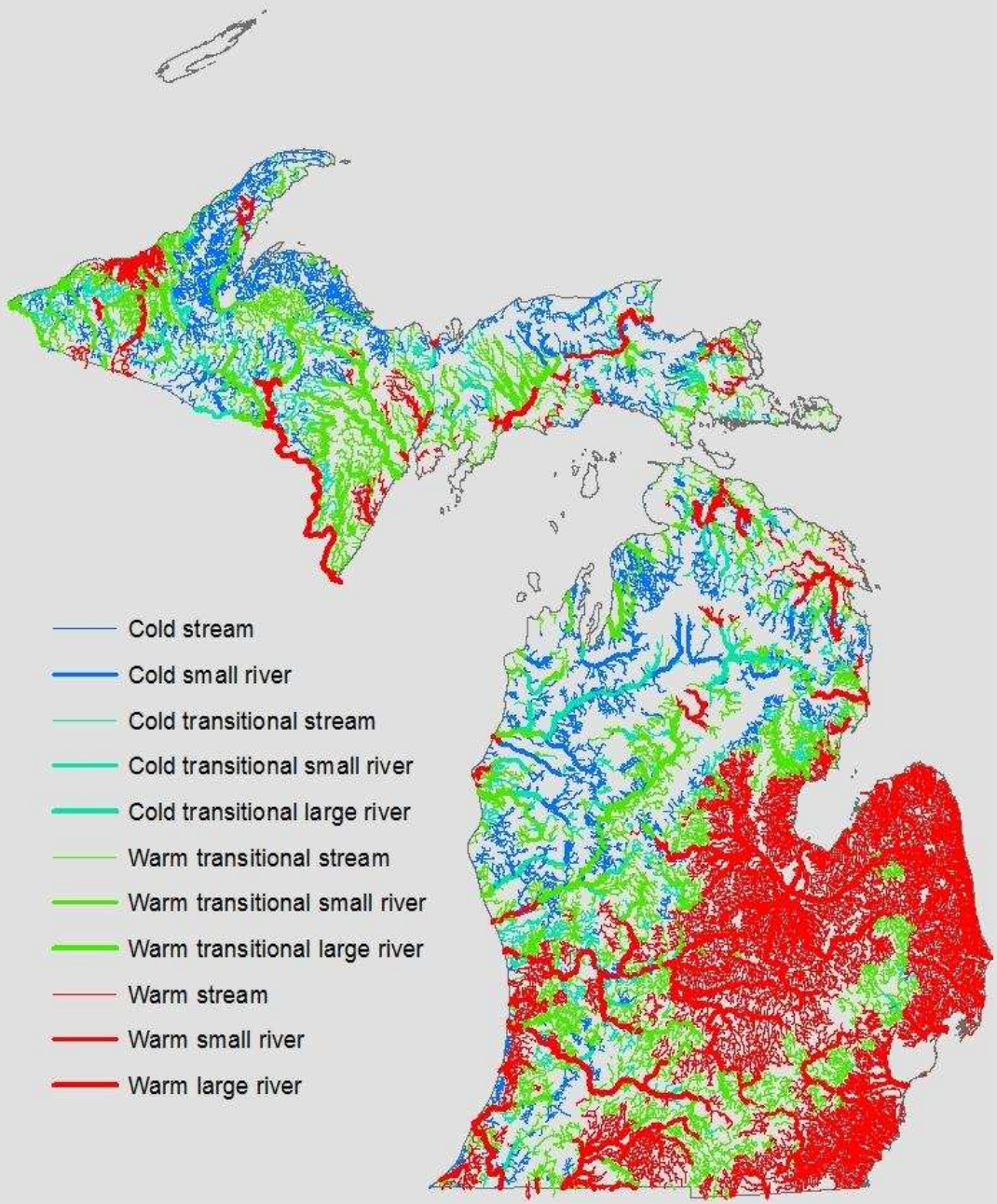
Summary Statistics

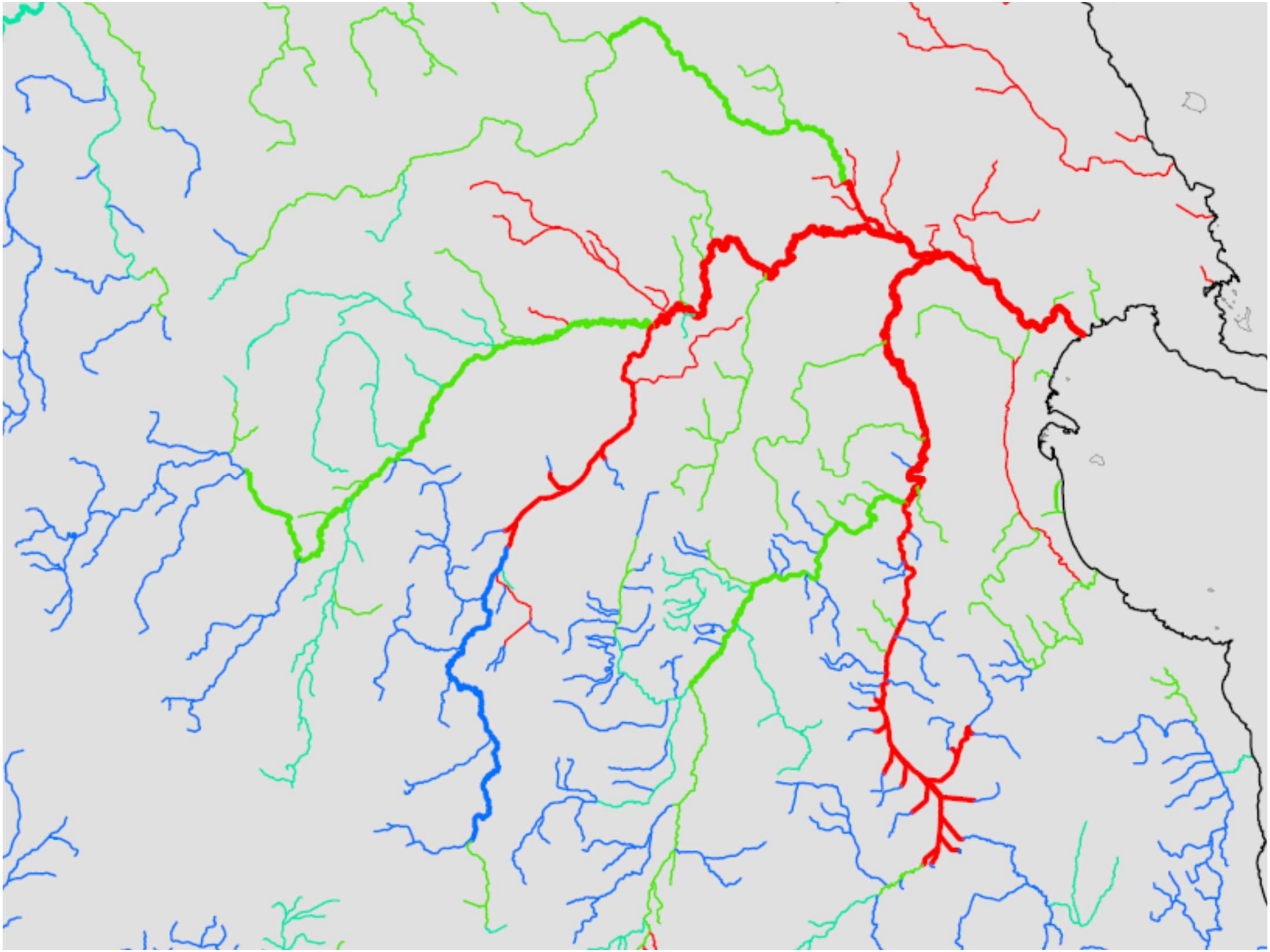
	% of total miles		
Temperature	Streams	Small rivers	Large rivers
Cold	18	1	0
Cold-transitional	6	1	1
Cool (WT)	24	3	2
Warm	39	3	3

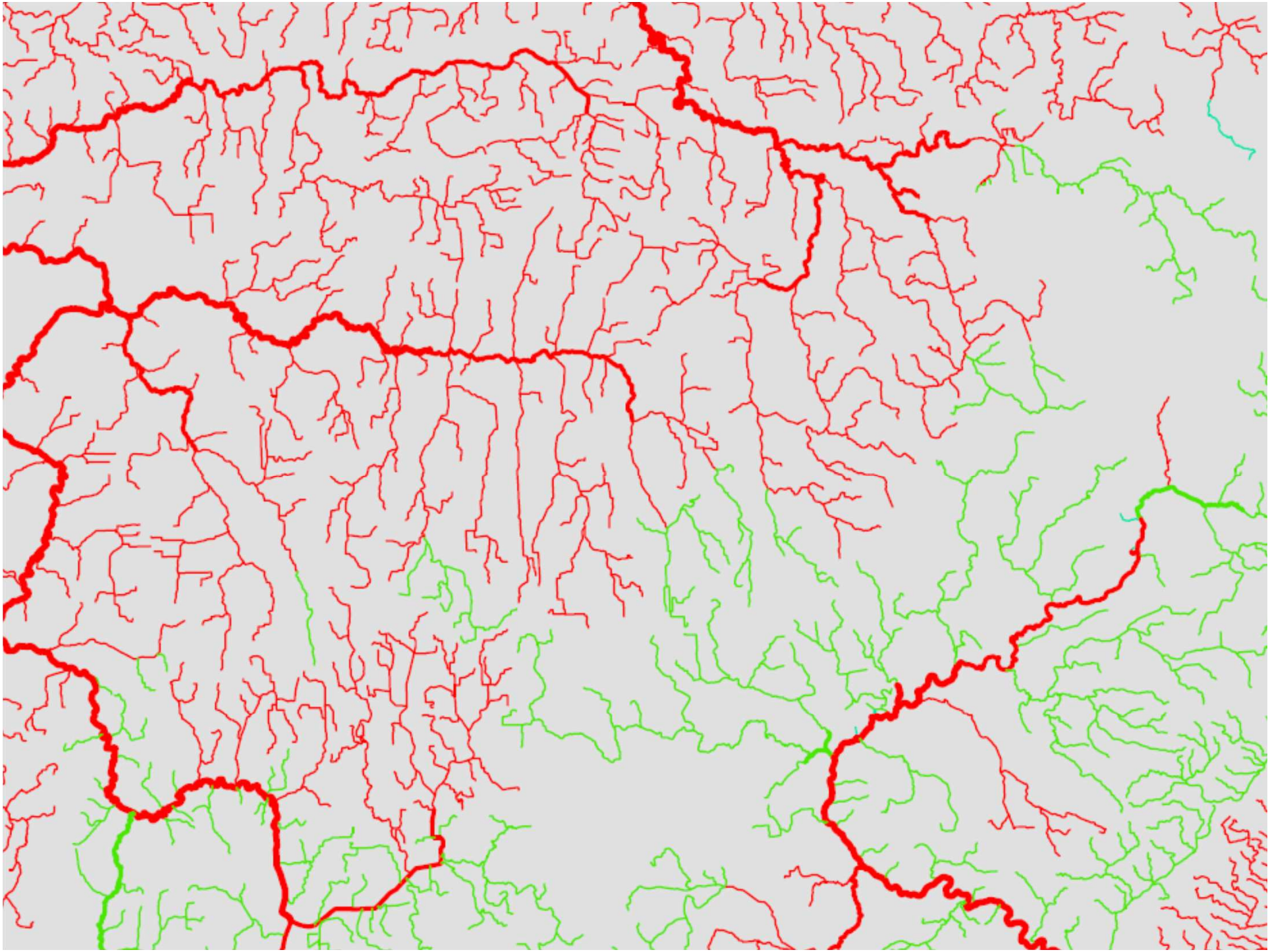
MI VSEC 2.0

- Fisheries staff review
  - 2008
  - 8 FMUs
- Ground-truth classification vs. field data



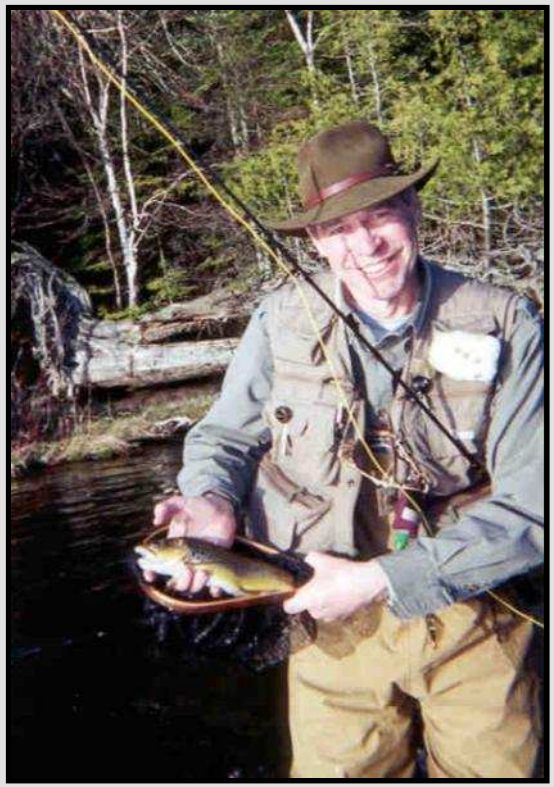

Cold stream
Cold small river
Cold transitional stream
Cold transitional small river
Cold transitional large river
Warm transitional stream
Warm transitional small river
Warm transitional large river
Warm stream
Warm small river
Warm large river

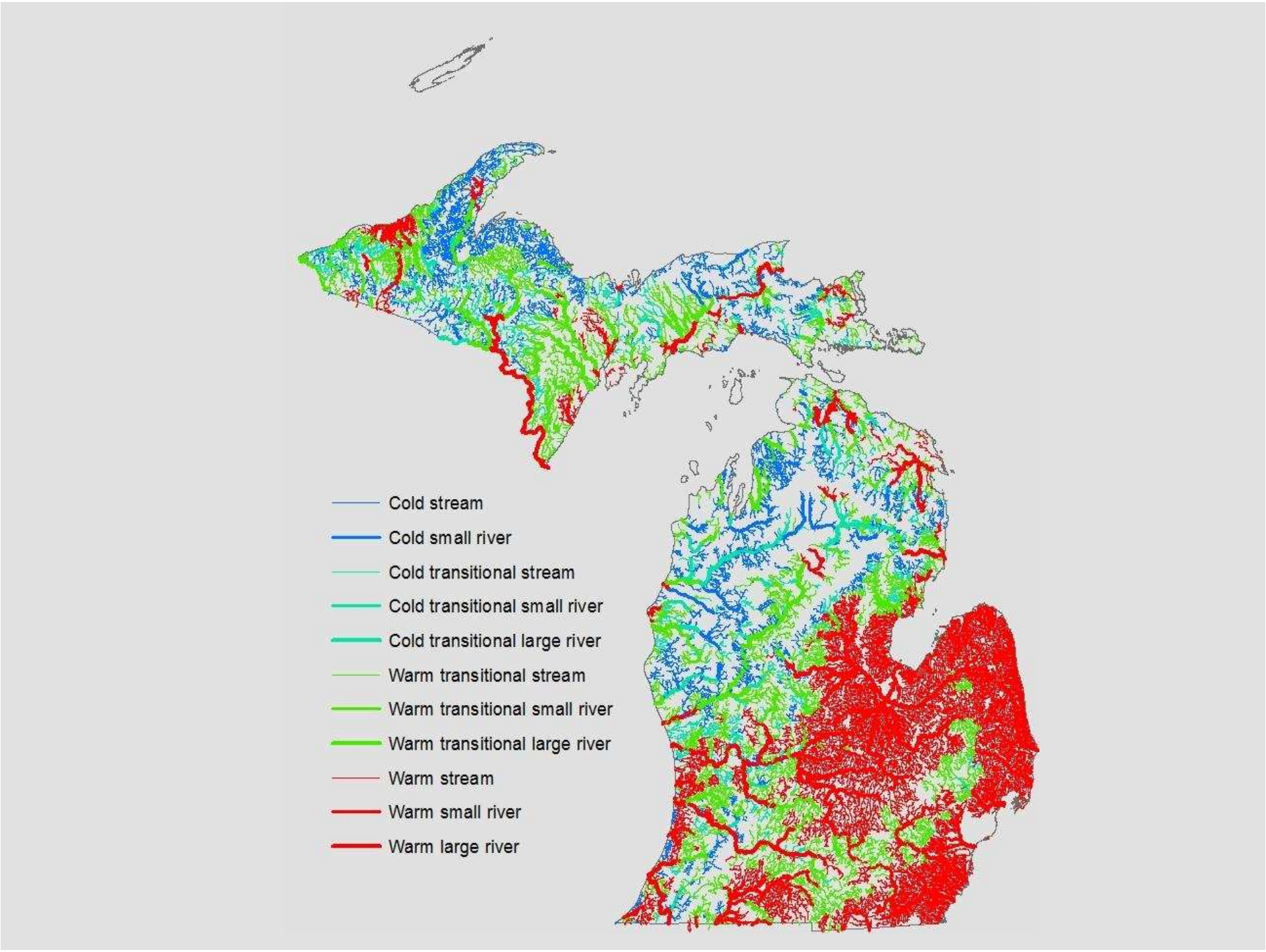




How is classification used?

- Now
  - Water Withdrawal Assessment Tool
  - River assessments
- Future
  - Resource inventory
  - Fisheries regulations
  - Stocking
  - Water quality criteria

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STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

RR2089 November 2008

A Regional-scale Habitat Suitability Model to Assess the Effects of Flow Reduction on Fish Assemblages in Michigan Streams

Troy G. Zorn, Paul W. Seelbach, Edward S. Rutherford,
Todd C. Wills, Su-Ting Cheng, and Michael J. Wiley

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FISHERIES DIVISION

RESEARCH REPORT 2089