

# Modified Streams

# Context

- Stakeholders commented that the wadeable stream science plan was silent on “modified channels”
- State Water Board is determining how to proceed
  - Consulting with both regulatory and stakeholder advisory groups
- Starting the conversation today to get your input on how to define “modified”

# What is the Issue?

- California has many modified streams
- Modified streams should have different expectations
- Expectations should be established based on the best reasonable condition that a modified channel can be expected to achieve, without substantial changes to the physical structure of the stream
  - i.e. what is the best expectation by just managing water quality)
- How “modified” is defined may vary based on the source of the modification (e.g. agriculture vs. urban)

# Key Questions

- What are the different types of modified streams?
- How can we define/identify each “class” of modified streams?
- How can we map each class of modified streams?

1<sup>st</sup> Phase

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- What is the range of biological conditions that occur within each class?
  - What management actions can be used to maximize biological condition within the range of expectations?

2<sup>nd</sup> Phase

# Possible “Classes” of Modified Streams

- Structurally modified (i.e. channelized)
- Modified due to agricultural practices
- Modified due to forestry practices
- Hydrologically modified
- Others??

# Modified - Urban



# Modified – Agriculture/Grazing



# Modified - Timber







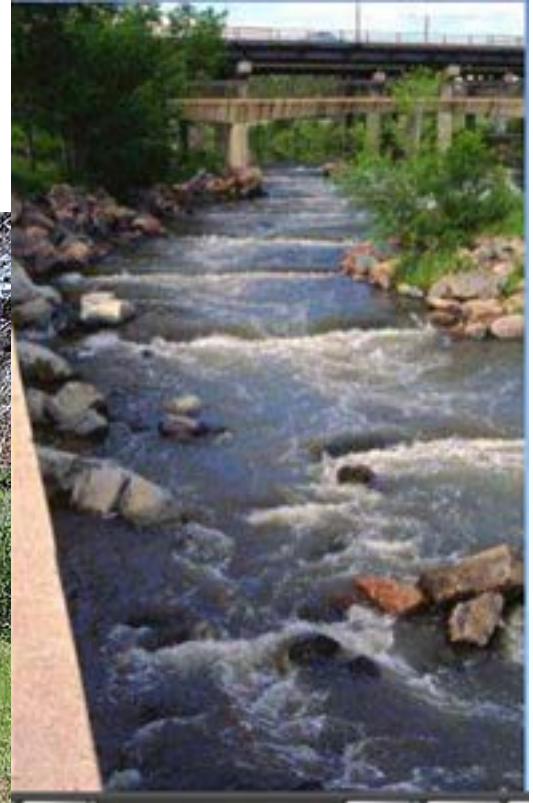
# Modified – Floodplain/Armored



# What About These?



# Are These Modified?

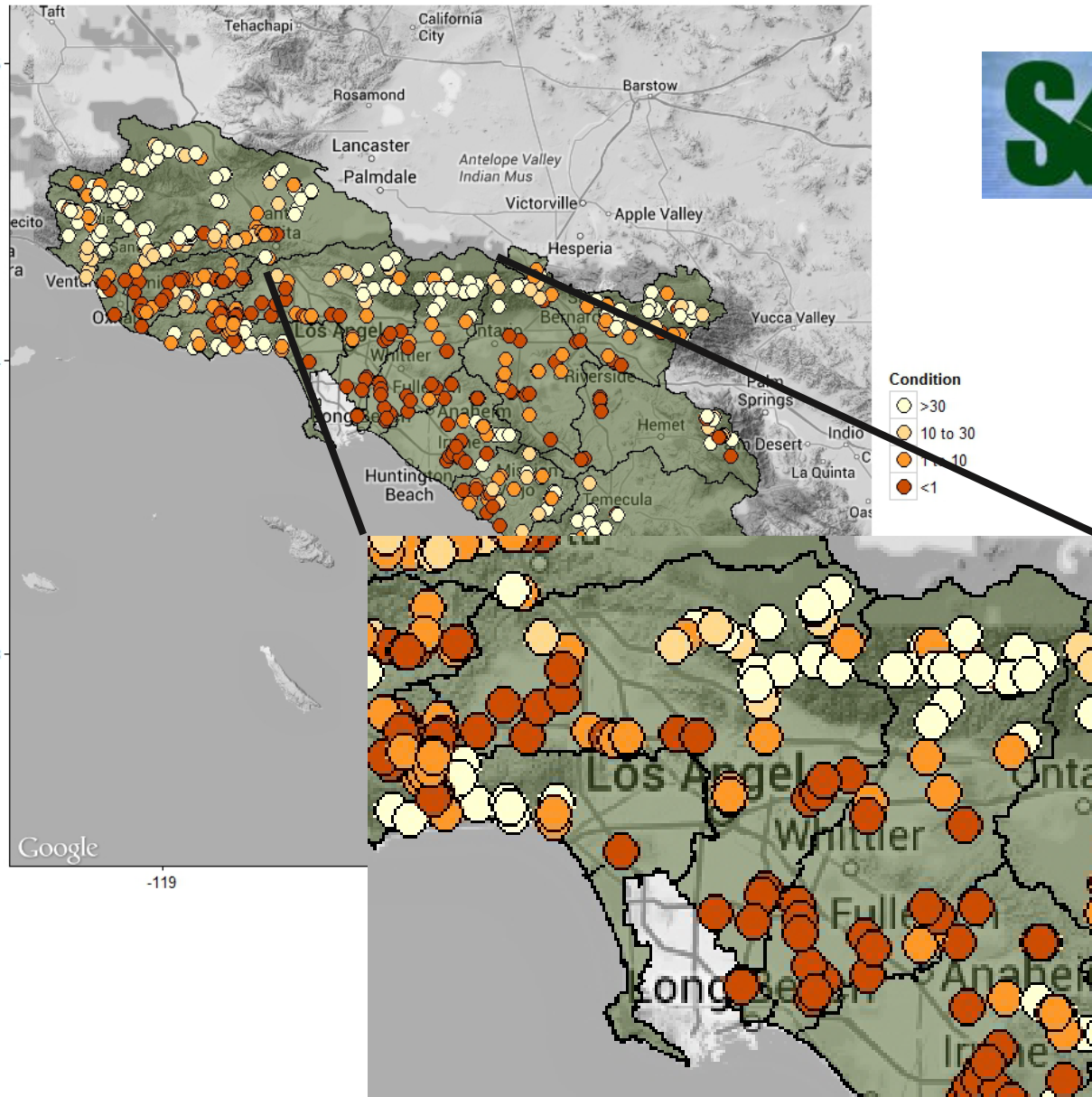


# Approaches for Identifying and Mapping Modified Streams

- Direct observation
  - Most reliable
  - Unlikely to be comprehensive
- Extrapolation from monitoring programs
  - Based on observations
  - Requires extrapolation to areas not visited
- GIS modeling
  - Can provide comprehensive coverage
  - Requires most assumptions
  - Accuracy heavily dependent on calibration data



# Extrapolation for Monitoring Locations

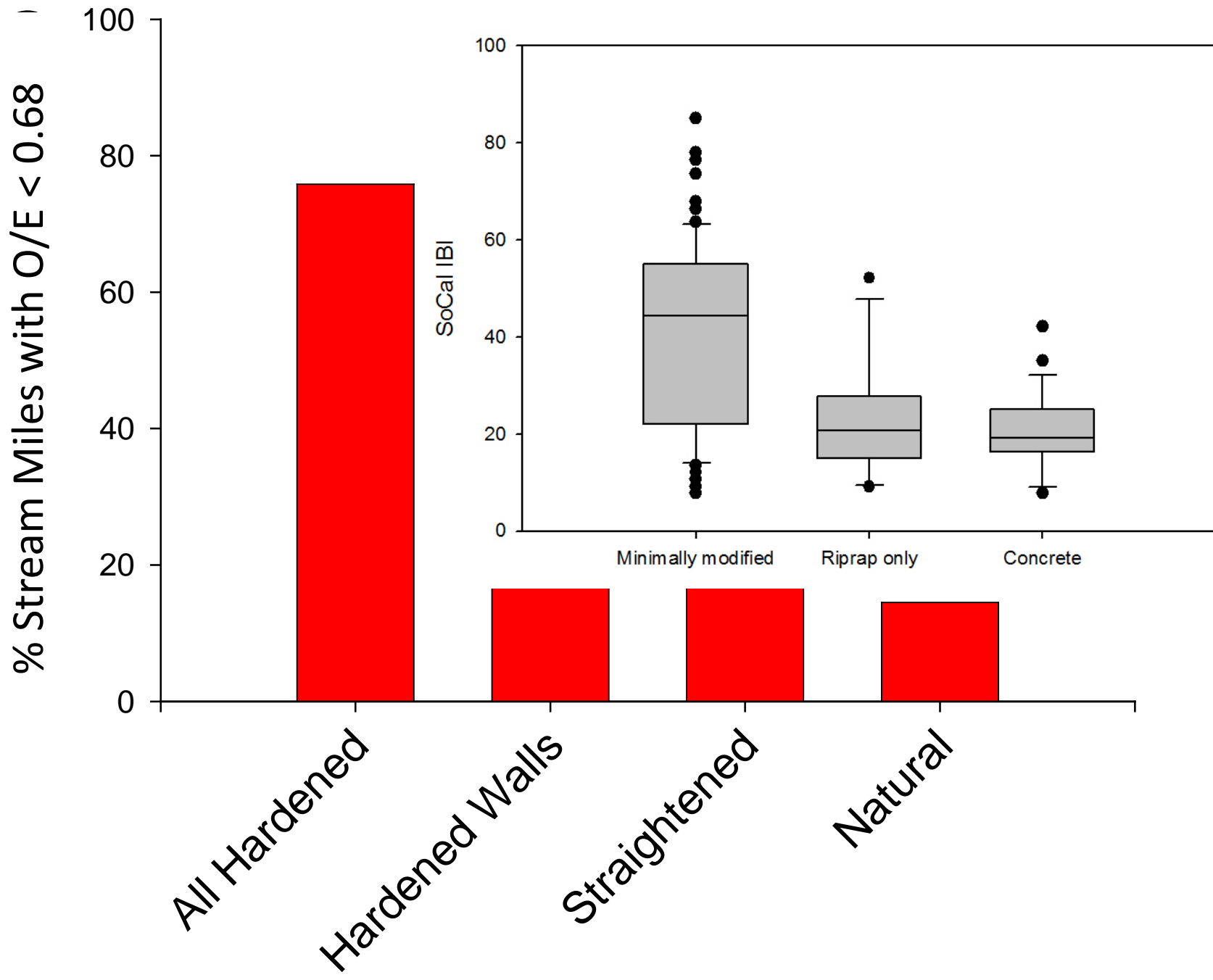


# SMC Pilot Study



## Hardened Channel Inventory Based on Probability Sites

<b>Hardscape Classification</b>	<b>All Stream</b>	<b>SMC Mountain</b>	<b>SMC Xeric</b>
Concrete Walls and Bottom	5%	0%	7%
Concrete Walls, Soft Bottom	5%	0%	7%
Unlined, But Straightened	14%	1%	20%
Natural Watercourse	77%	99%	66%





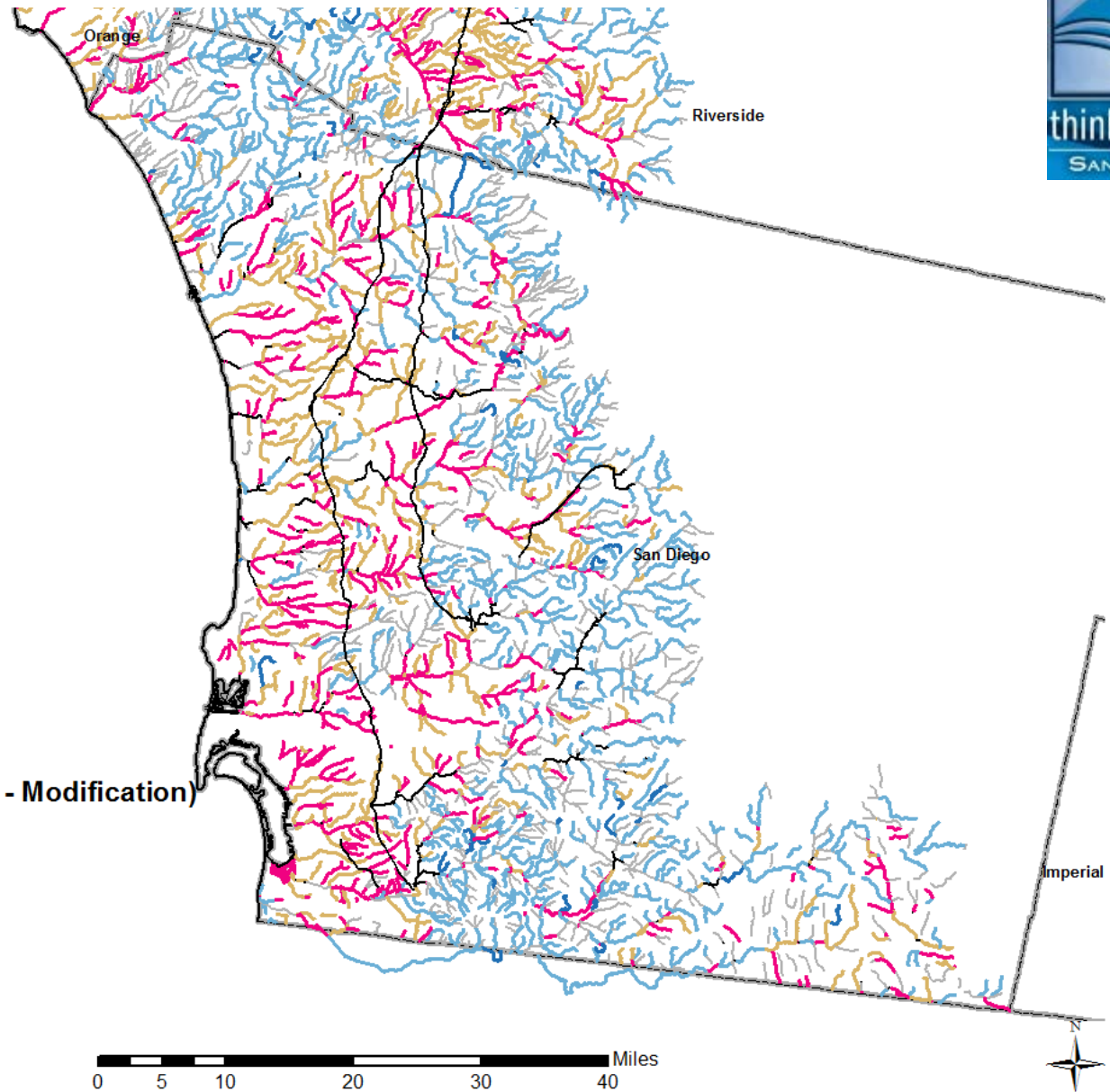


# GIS Modeling

Sinuosity (stream order 1-3)	Sinuosity (stream order 4-6)	Land Cover in 20m buffer	Modification Status	# Stream km
> 1.5	> 1.3	>= 50% natural	Natural	303
		>= 25% natural & < 25% ag or heavily developed	Likely Natural	6
		Other	Unknown	285
> 1.1 and <= 1.5	> 1.1 and <= 1.3	>= 50% natural	Likely Natural	4,896
		>= 50% ag or heavily developed	Likely Modified	4,328
		Other	Unknown	78
<= 1.1	<= 1.1	>= 50% ag or heavily developed	Modified	3,531
		>= 25% ag or heavily developed & < 25% natural	Likely modified	33
		Other	Unknown	2,685

Data Sources: NHD Plus version 2; National Land Cover Database, 2006

# Modification Status

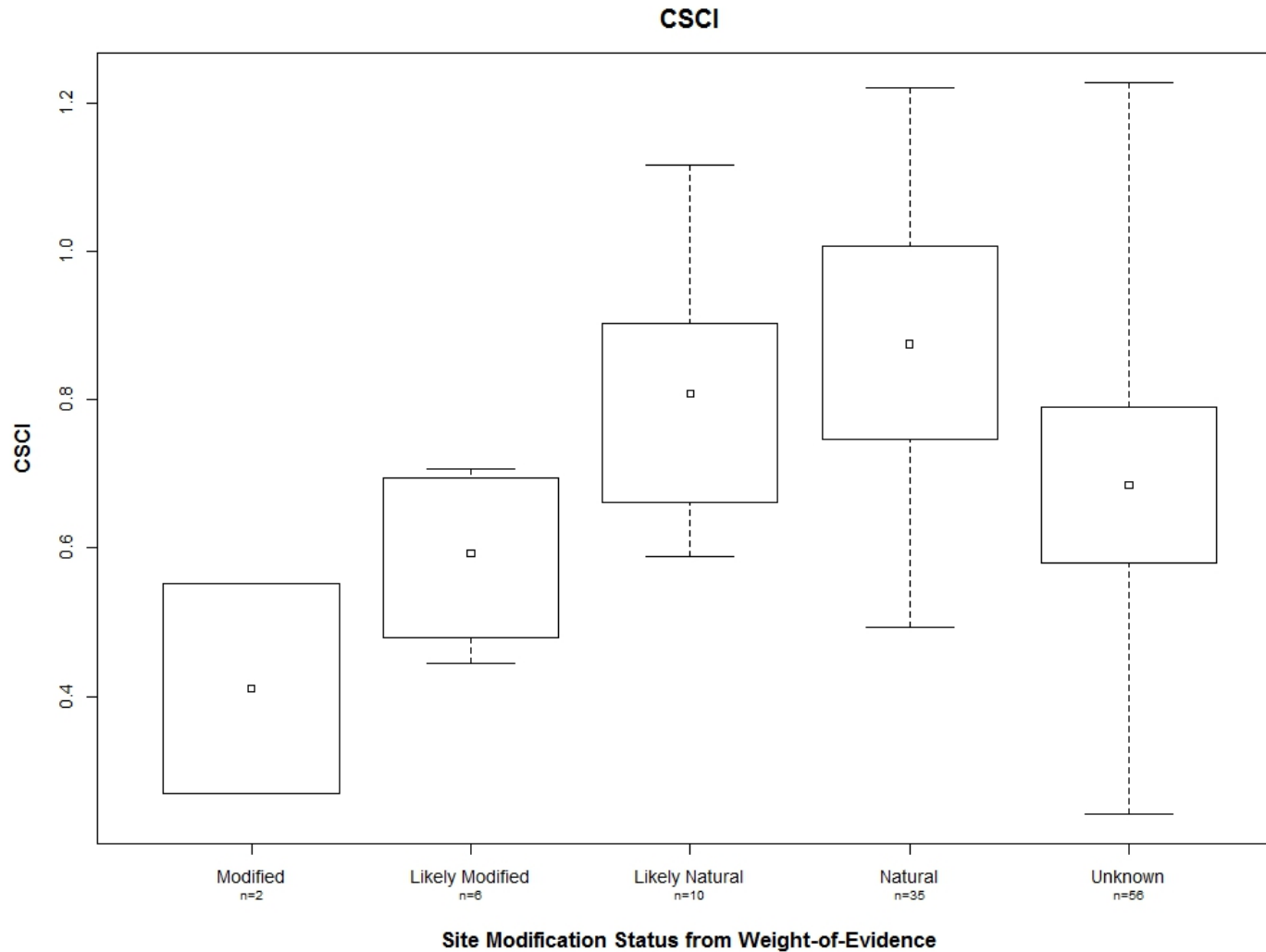


## Legend

### NHD+ v2 Flowline (Status - Modification)

- Natural
- Likely Natural
- Likely Modified
- Modified
- Unknown
- Excluded
- County

# Modification Status and CSCI scores



# Questions for Your Feedback Today

- What are the different types of modified streams?
  - Subclasses of interest?
- What is the best approach to defining/identifying each “class” of modified streams?
- At what level should these issues be addressed?
  - State or regional?

# Discussion

