

A tool for identifying constraints on stream biointegrity

Presentation to Stakeholder Advisory Group

October 26, 2018

Recap

- We created a landscape model that predicts likely ranges of CSCI scores for nearly all stream segments in California
- Local watershed groups have applied models to prioritize management decisions (restoration, protection, monitoring)
 - Interactive, online tools help visualize outcomes of priorities
- We will briefly review the development of this tool
- Advisory groups can identify potential ways to use these models in biointegrity programs and related management applications

What's the purpose of the tool?

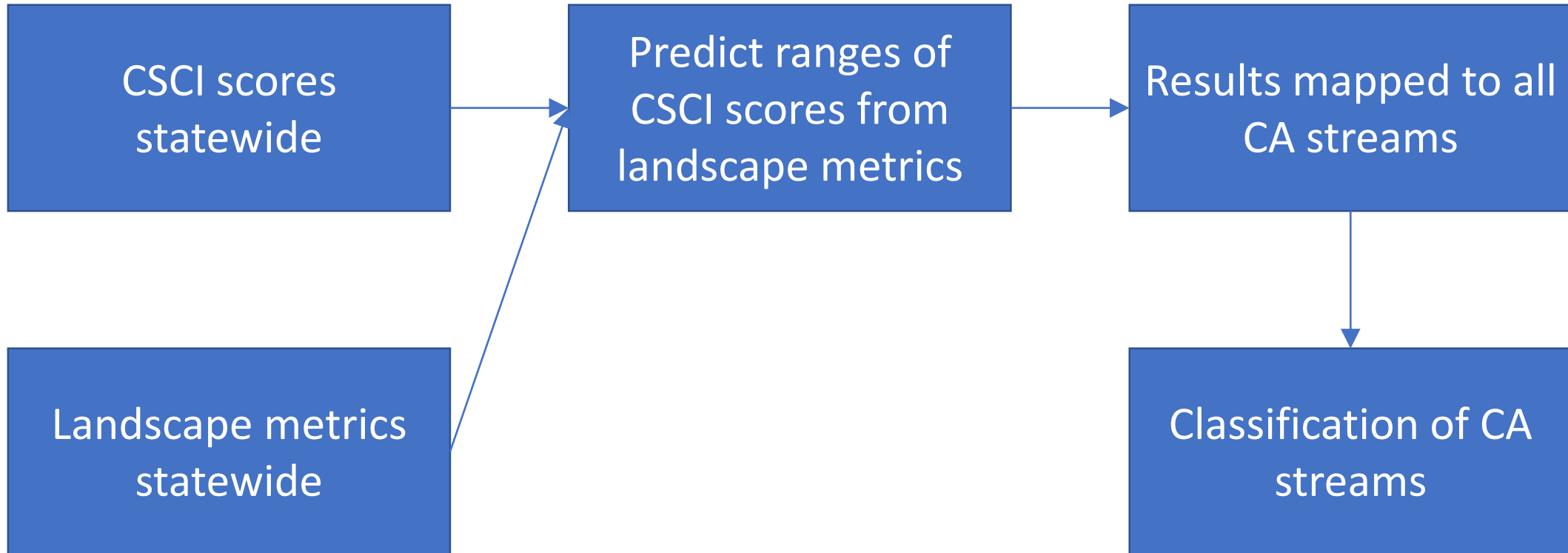
- WB staff wanted a tool to help identify streams where constraints (development, channel modification) create challenges for maintaining bio-integrity
 - They recognize that constrained streams may need different treatment and implementation options
- WB staff is evaluating ways to (formally or informally) incorporate into biointegrity-biostimulatory policy
- With or without formal incorporation, the tool is intended to help regulated community comply with policy
 - It provides a technical foundation for discussions with regulators about goals
 - It can support the setting of priorities in watershed plans (e.g., WQIPs, EWMPs), conservation planning

Caveats on purposes and goals

Many comments were concerned about potential misuses of the tool

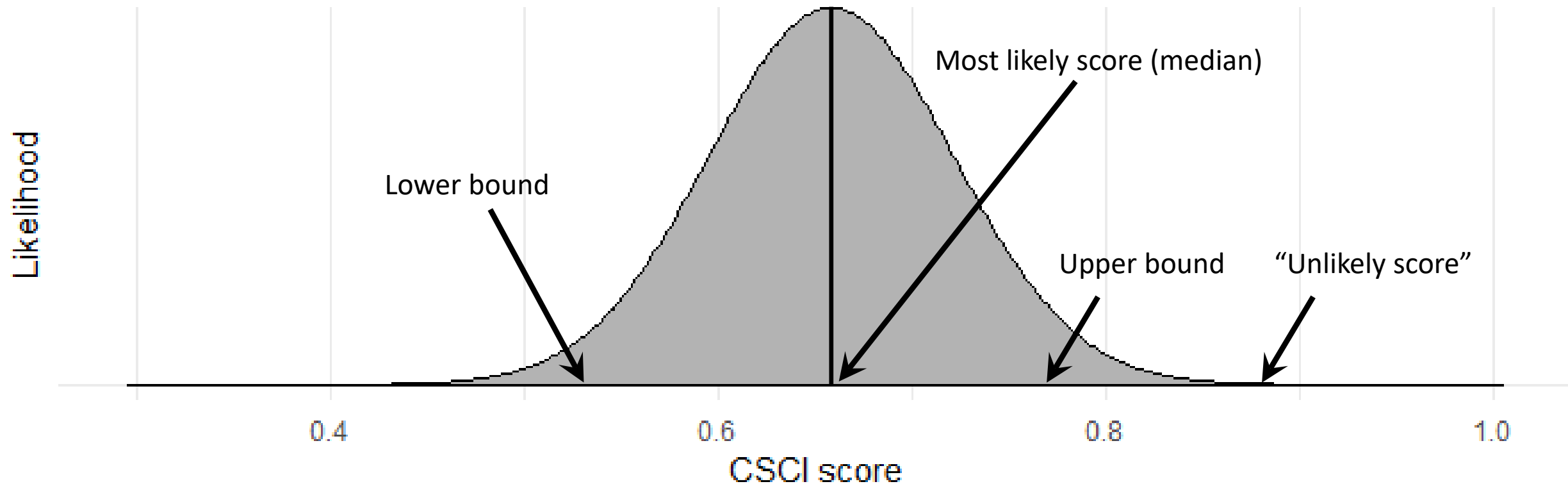
- We set out to create maps and models to provide a **screening tool** that starts a conversation, **not to create a regulatory designation**.
- The maps and models alone are **not a UAA** but may help **prioritize where they may be needed**.
- Analyses are **associative** and based on **observed** condition, and they can only indirectly inform constraints, restoration potential, or impacts of future management.
- More interest in **predicting condition**, not **explaining mechanisms of impairment**
- We are trying to predict **biological condition**, not locations where **channel modification** has occurred.

Approach

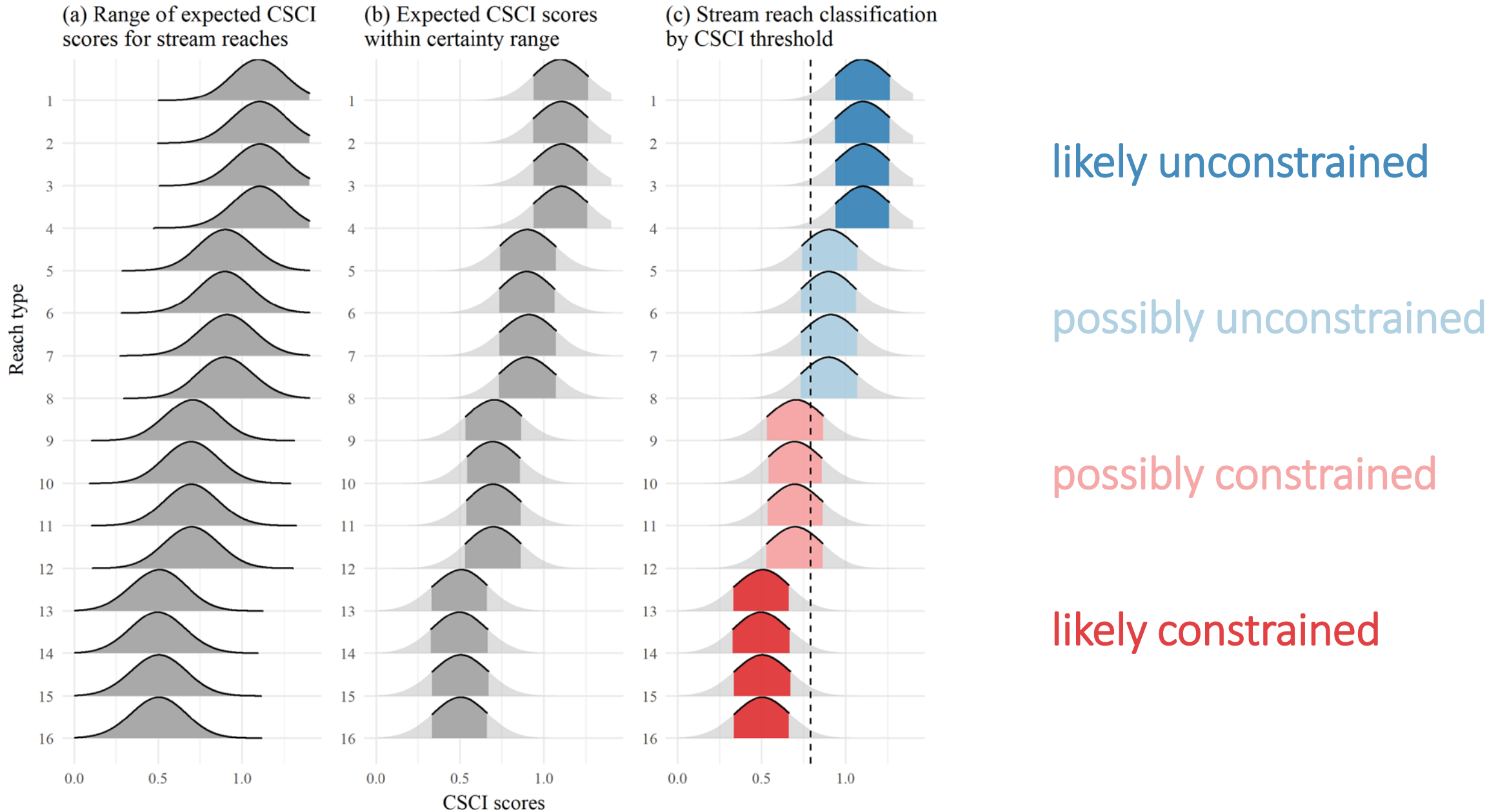


What we get from the model:

- For each stream reach, a range of modelled biological expectations
- Expectations from distribution of scores at calibration sites with similar levels of disturbance

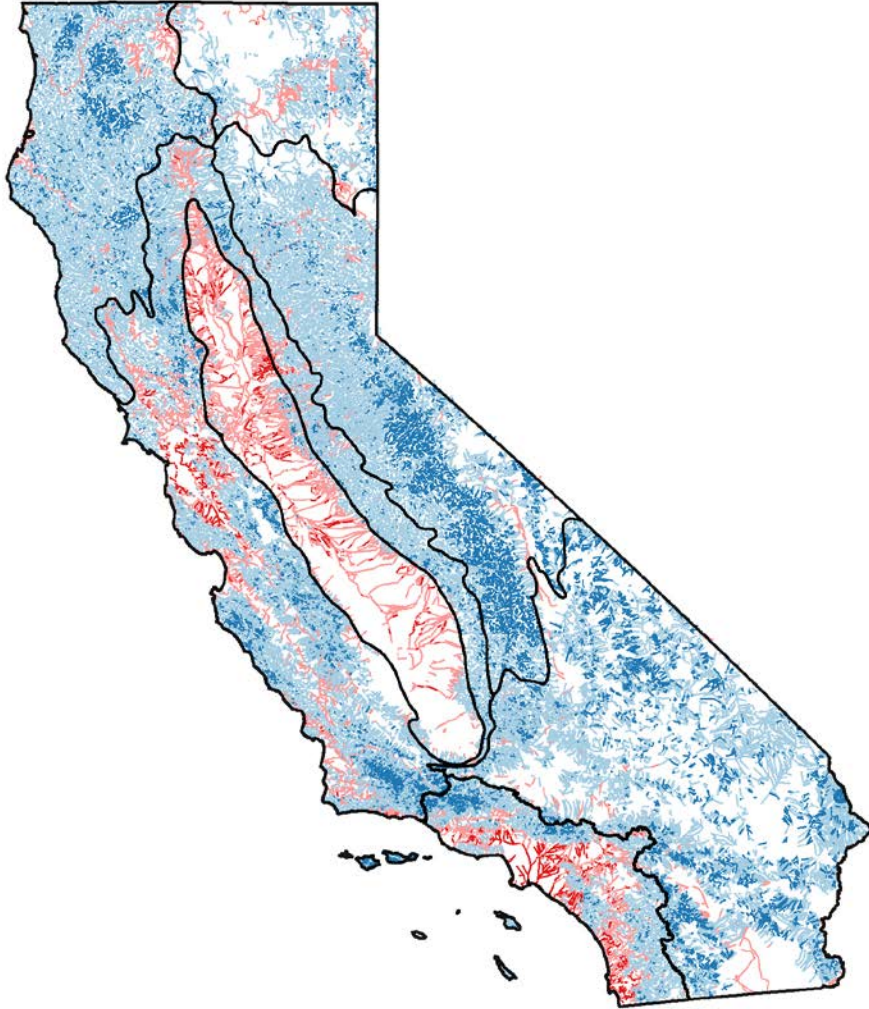


How are reaches classified using the model?



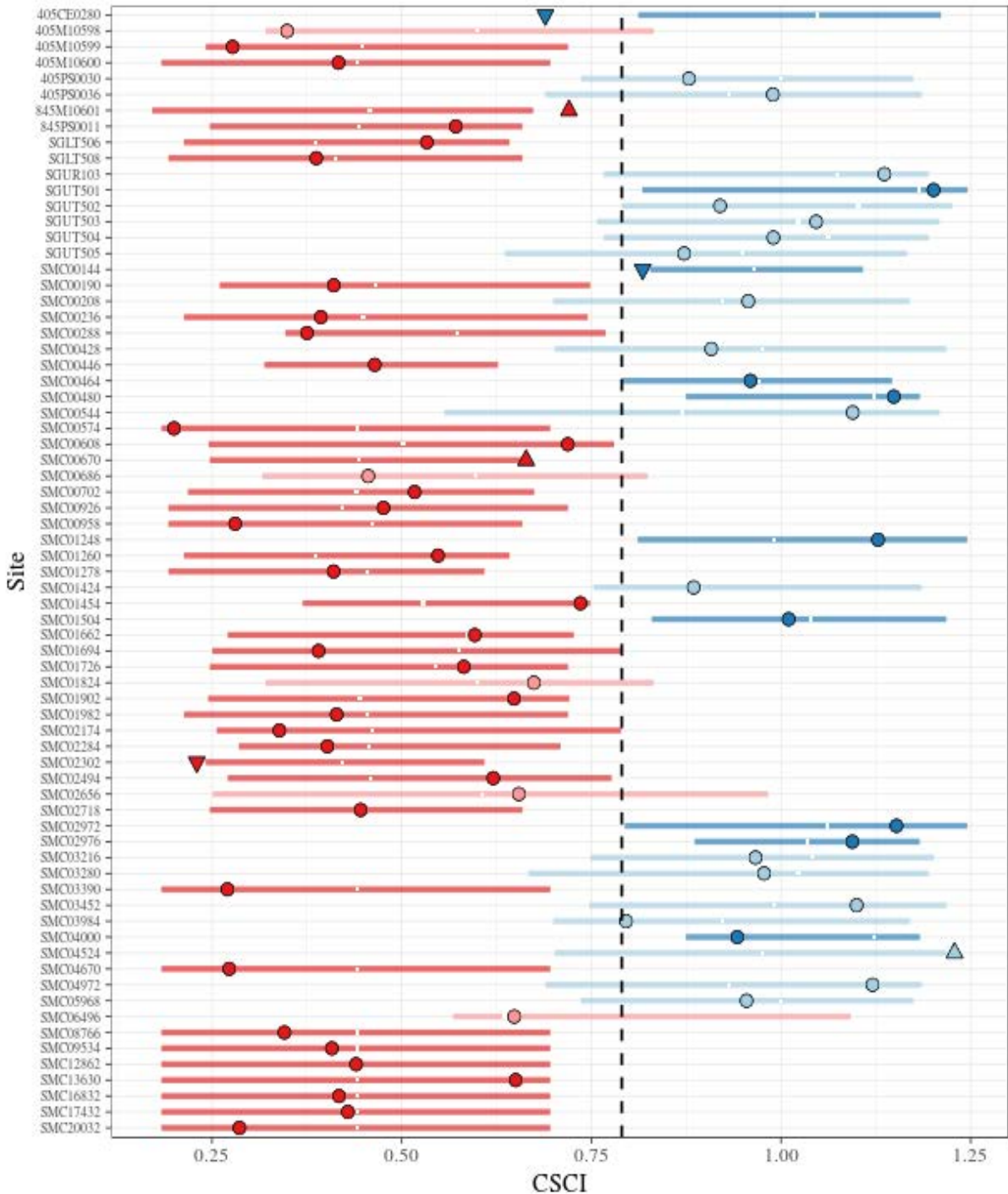
Reach classification

— likely unconstrained — possibly constrained
— possibly unconstrained — likely constrained



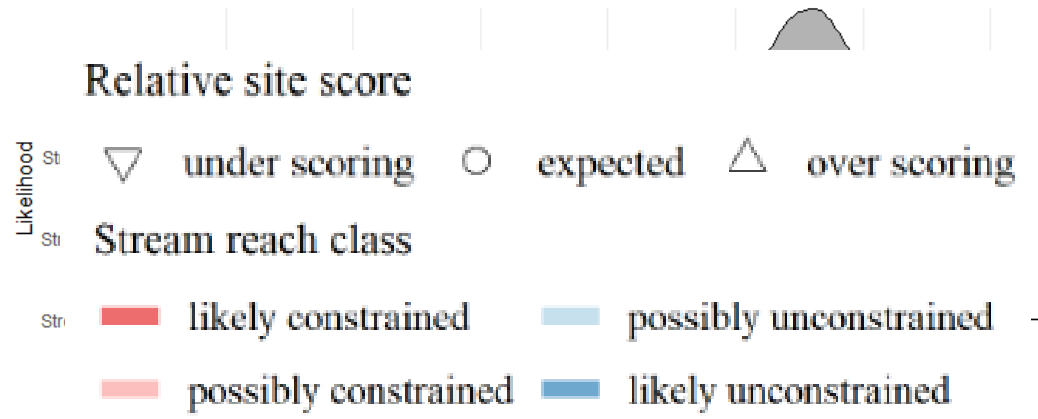
Statewide classifications

- Likely constrained: 3%
- Possibly constrained: 23%
- Possibly unconstrained: 67%
- Likely unconstrained: 7%



Models provide context to help set priorities

- Lots of sampling
- Many low-scoring sites
- Which ones to fix?



Prioritizing actions based on observed scores and landscape context

An applied example from the San Gabriel watershed

Action	Example activity	Example high-priority site	Example low-priority site
Investigate	Higher frequency of sampling. Evaluate additional data (e.g., habitat).	Sites scoring outside prediction interval	Sites scoring as expected
Protect	Extra scrutiny for proposed impacts.	Unconstrained sites	Constrained sites
Restore	Make funding recommendations. Prioritize TMDL development.	Low-scoring unconstrained sites.	Low-scoring constrained sites. (high priority for UAA?)

What are the impacts and outcomes of key decisions?

- Developed an online application for selected watersheds – transparent and exploratory

SCAPE: Stream Classification And Priority Explorer



CSCI reference threshold:



Confidence range (+/-):



Show individual samples at each site:

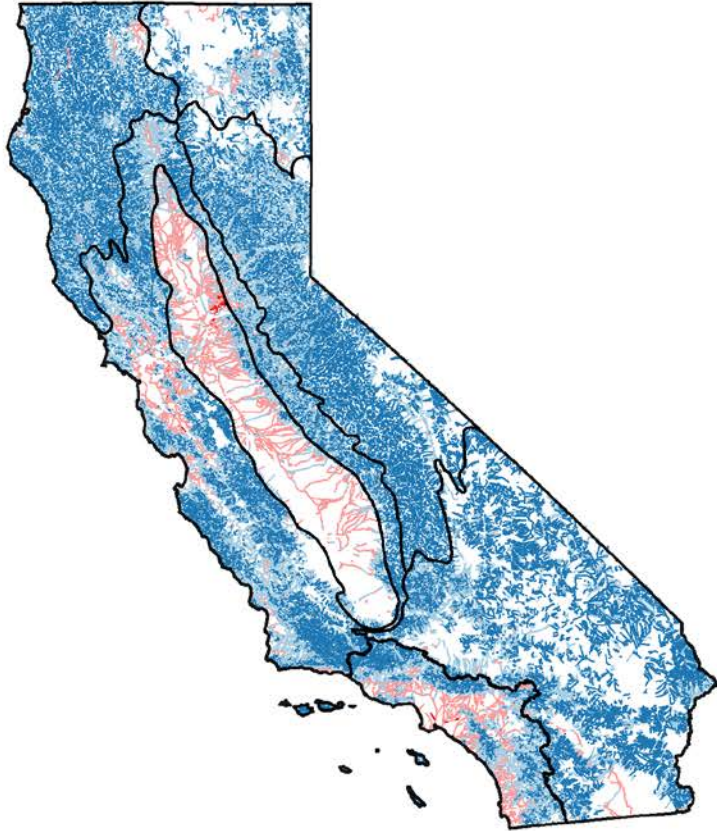


Instructions (1) View maps (2) View reach summary (3) Tabulate reach summary (4) Set reach priorities (5) View priorities

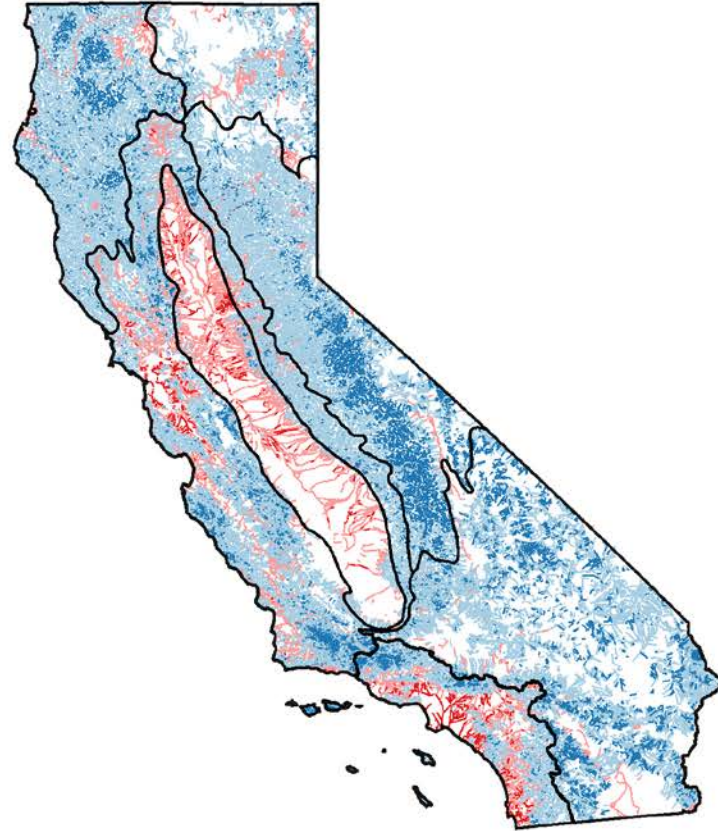
These maps show stream reach classifications and CSCI scores at monitoring stations. The **left map** shows the predicted median CSCI score for a reach and observed CSCI score at a station from field data. The **right map** shows the CSCI score expectation for a reach and the relative CSCI score at a station for the expectation (over scoring as **up triangle**, expected as **circle**, under scoring as **down triangle**). See the plot tab (step 2) for more details on how expectations and relative site scores are determined. The toggle switch controls how the CSCI scores at the stations (points) on the left map are displayed. The observed scores from field samples are shown when the switch is off and the differences between the observed scores and the stream reach median expectations are shown when the switch is on.

<http://shiny.sccwrp.org/scape/>

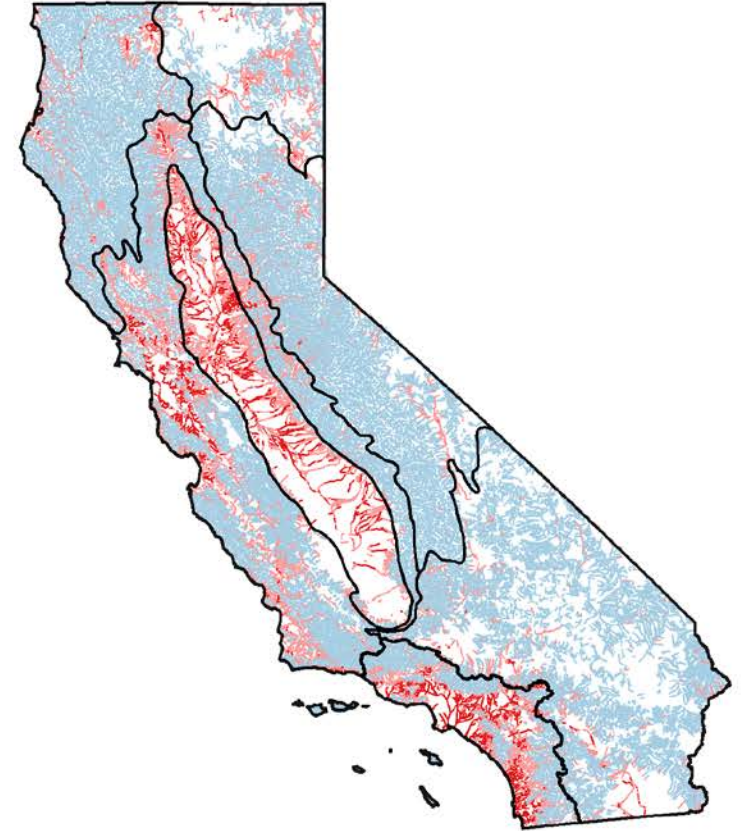
Explore how decision-points affects outcomes



Streams constrained
below CSCI 0.63



Streams constrained
below CSCI 0.79



Streams constrained
below CSCI 0.92

Current status

- Manuscript completed EPA internal review, and has been submitted to *Freshwater Science*
- Review by advisory groups requested concurrently with journal review

Questions?

