

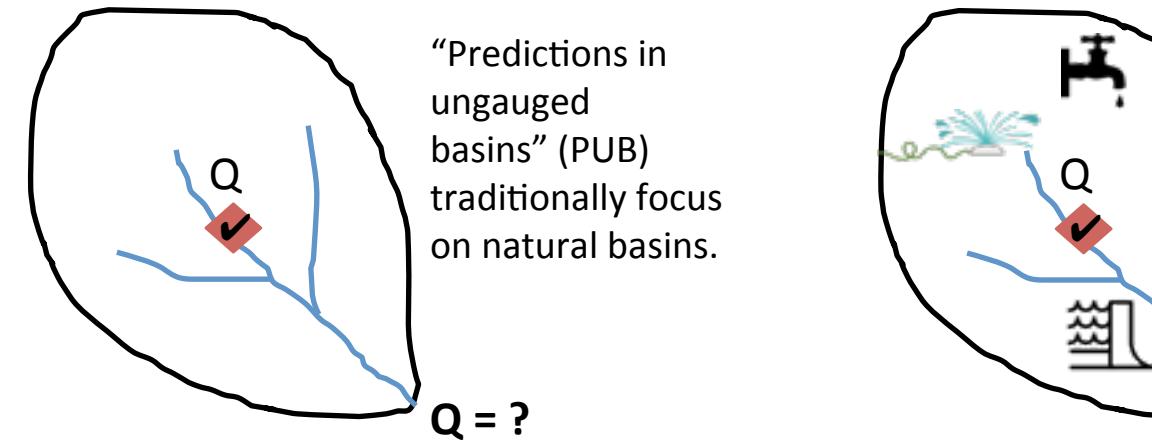


# Decoding Streamflow “Fingerprints” in Irrigated Basins



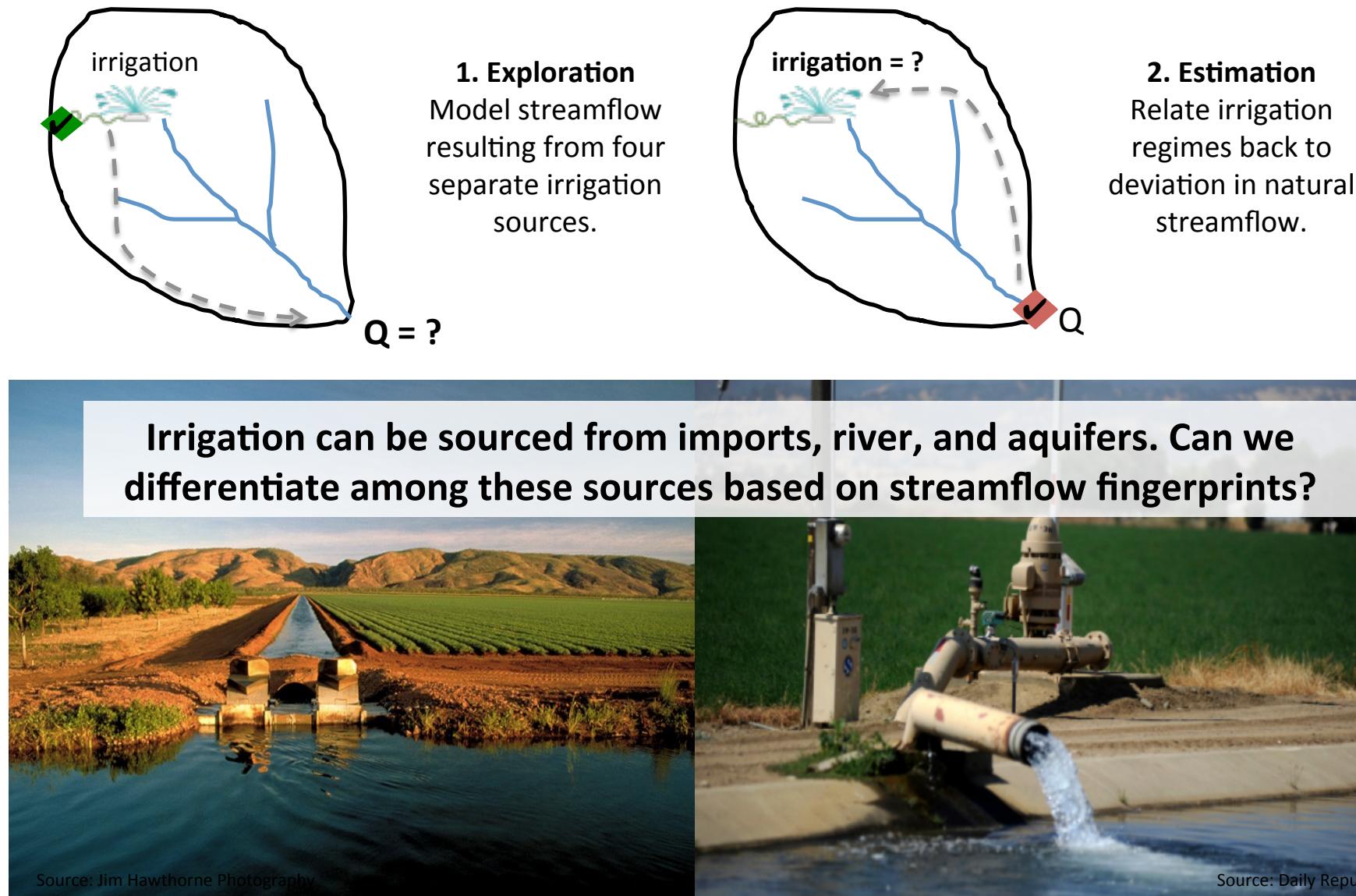
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## Human activity disrupts PUB efforts

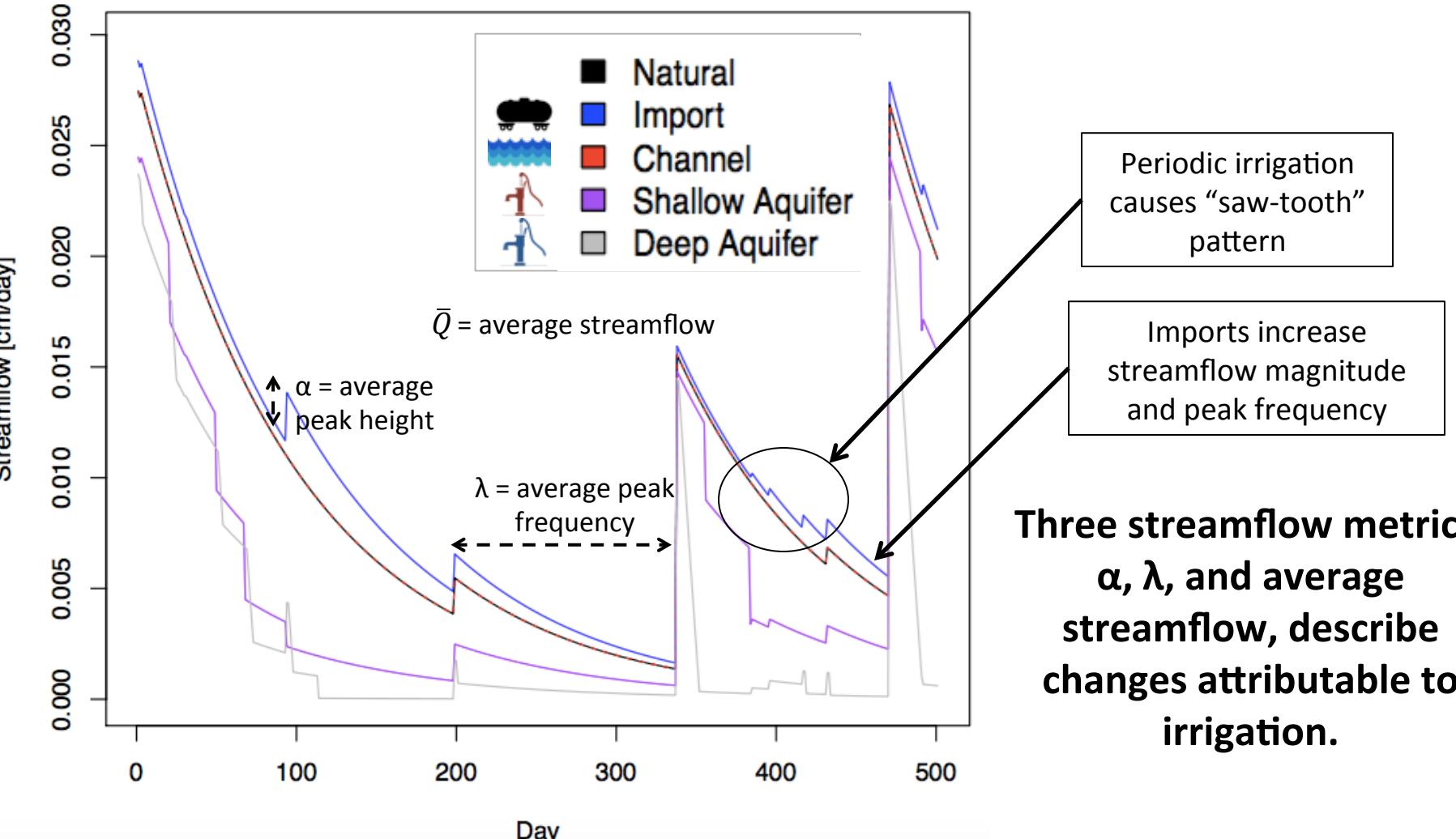


Deviations of streamflow from natural conditions provide clues about water management practices in the catchment.

## Expand PUB methods to irrigated basins



Modeled streamflow illustrates the fingerprints attributed to four irrigation sources.



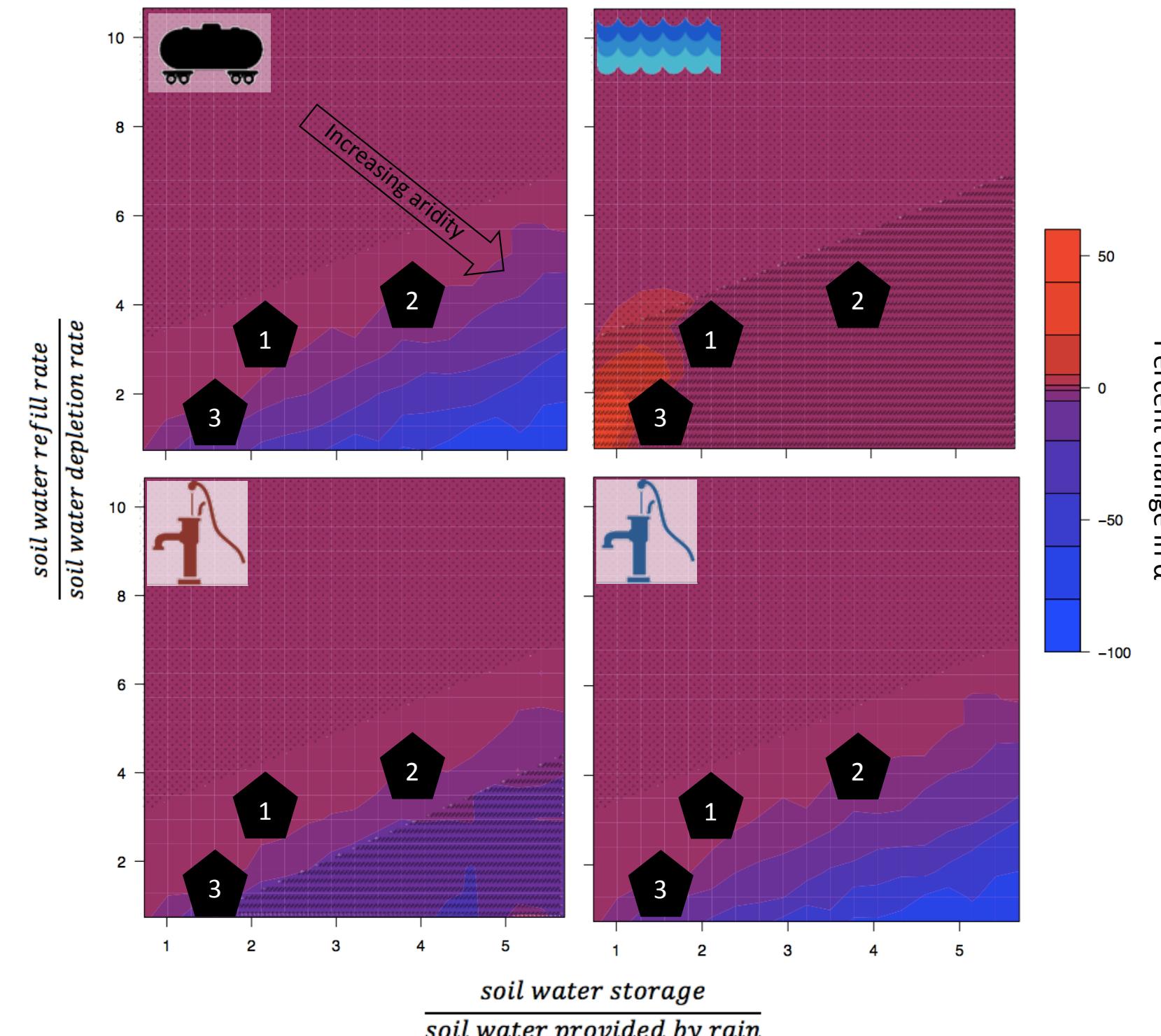
## Irrigation changes streamflow metrics

Percent change in streamflow metrics ( $\alpha$ ,  $\lambda$ , and average streamflow) serve as fingerprints that differentiate among irrigation sources. Fingerprints vary across catchment type and irrigation source.

Two scenarios allow us to eliminate certain source possibilities. Catchments that belong to these scenarios are unlikely to use that source.

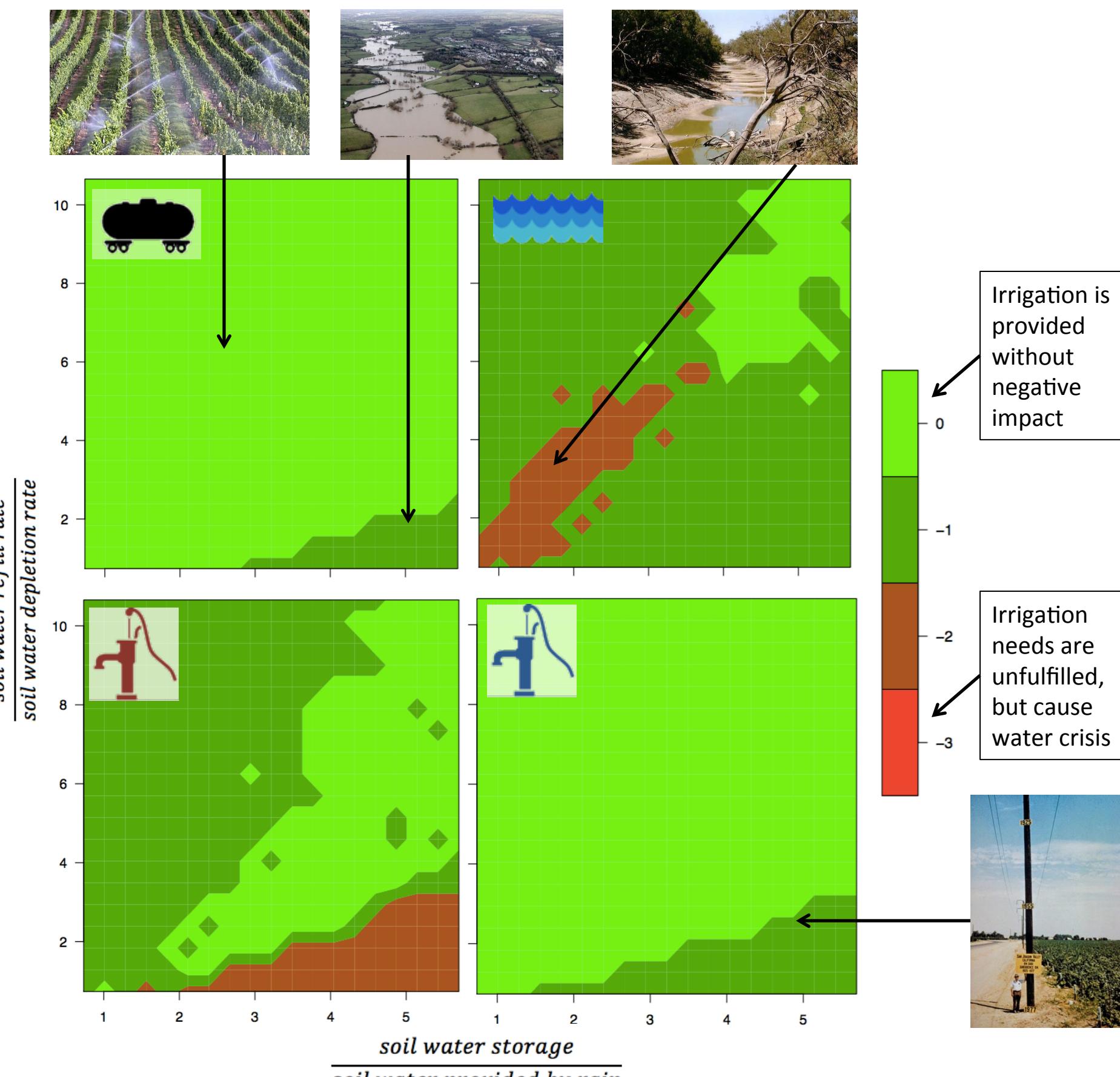
- [Hatched] Irrigation is needed but less than 50% is provided
- [Dotted] Irrigation is not required

Percent change from natural conditions



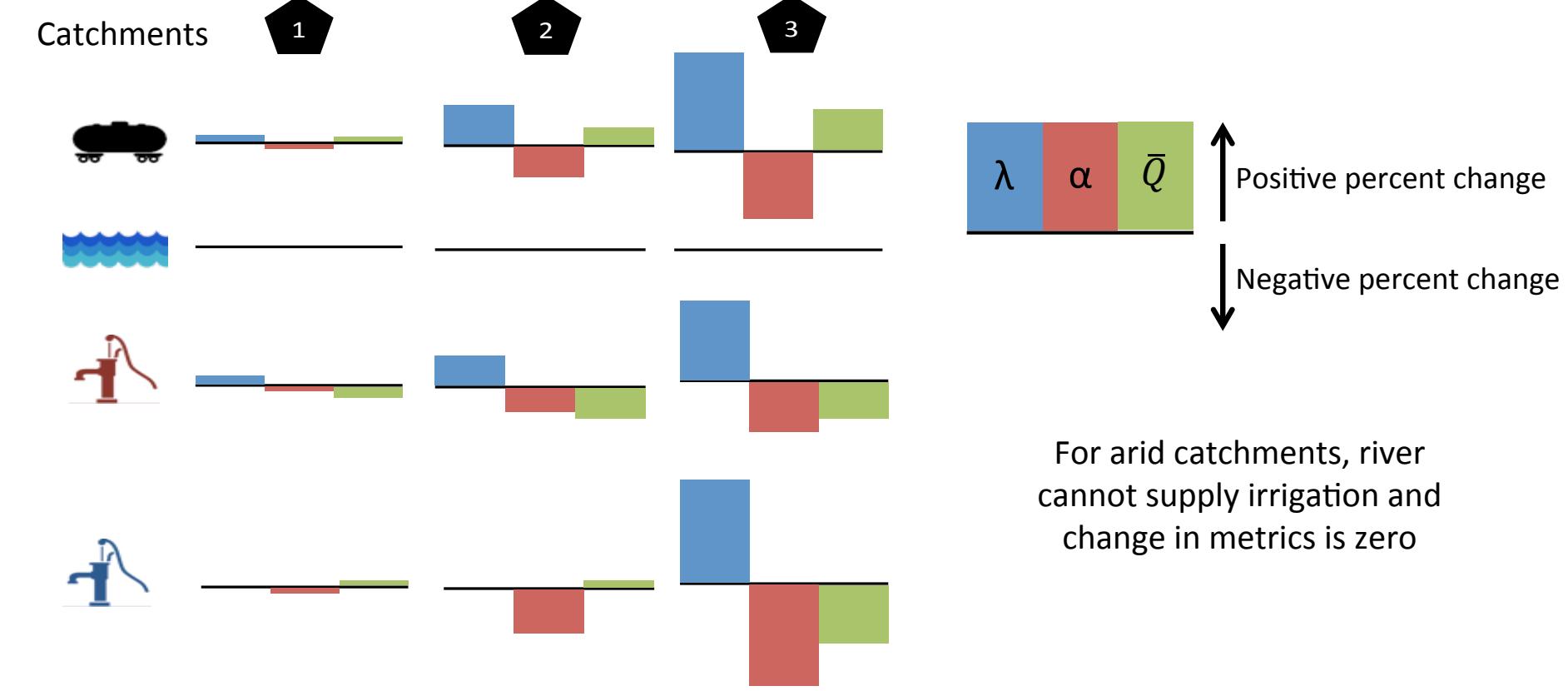
## Irrigation causes water crisis syndromes

Water crisis syndromes of: (1) unsustainability (aquifer depletion), (2) ecological destruction (perturbation of natural streamflow volume), and (3) social impact (irrigation needs unmet) are summed in the following plots.



### Conclusion 2:

The model predicts water crisis syndromes caused by irrigation.



Contour plots allow us to construct theoretical fingerprints for each source, to be compared to measured fingerprints. These fingerprints differentiate among irrigation sources.

## Model

