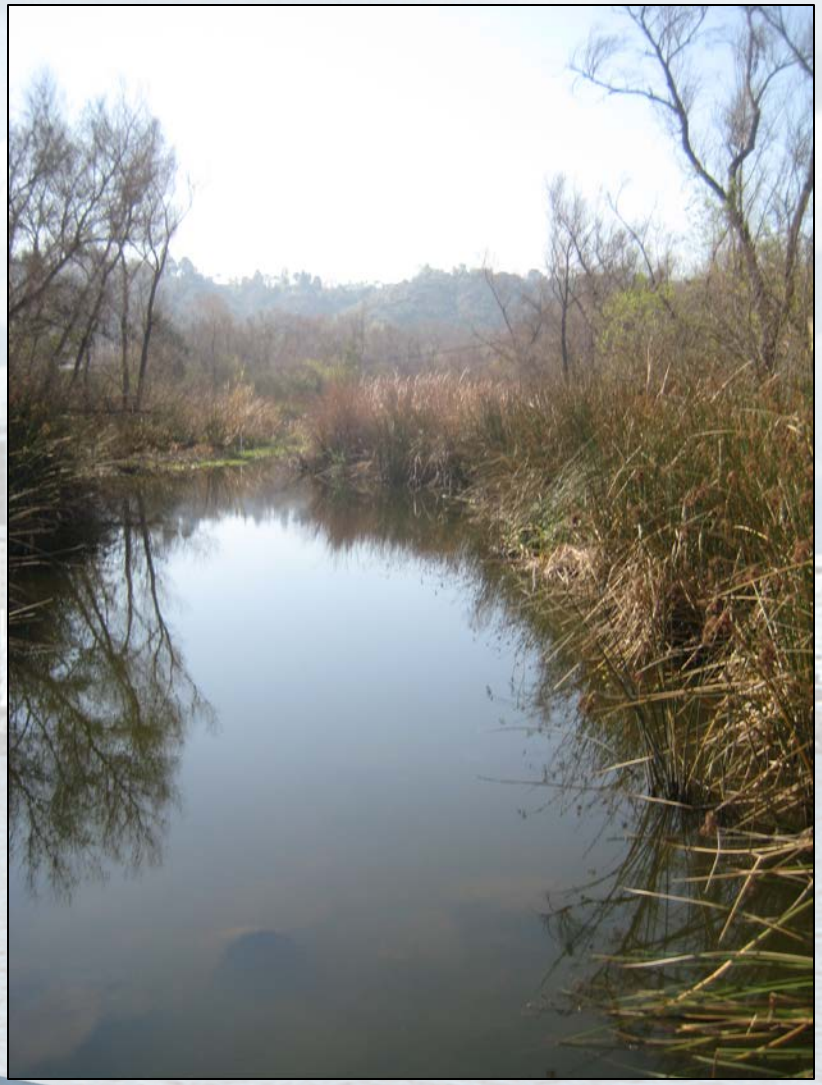
Challenges and Opportunities of Multi-Indicator Assessments:

San Diego River Watershed

- Chad Loflen
- Senior Environmental Scientist
- State of California Water Quality Control Board – San Diego Region

Project Goals

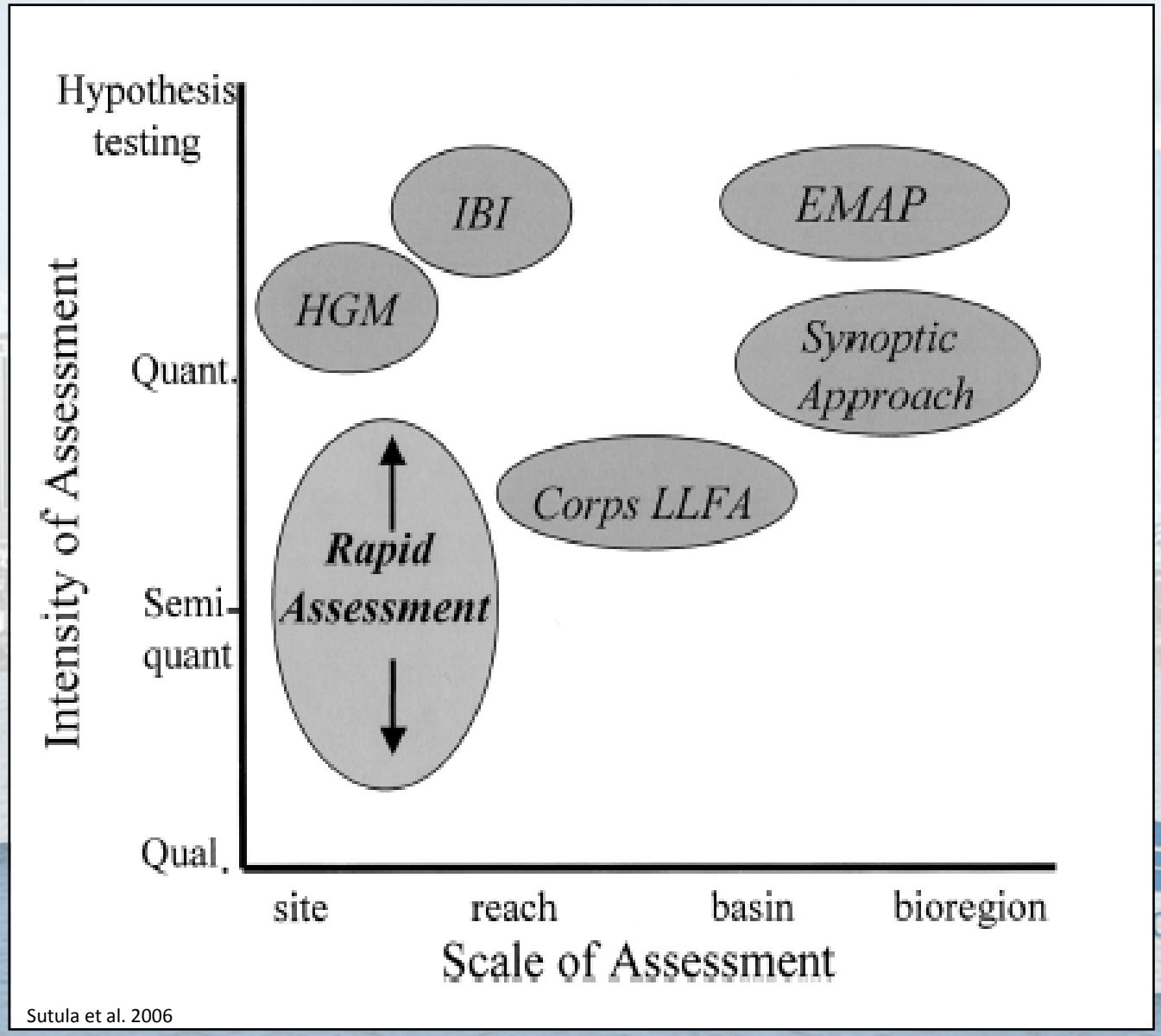
- Safe to Swim?
- Safe to Drink?
- Safe to Eat?
- Ecosystem Health?



Project Goals

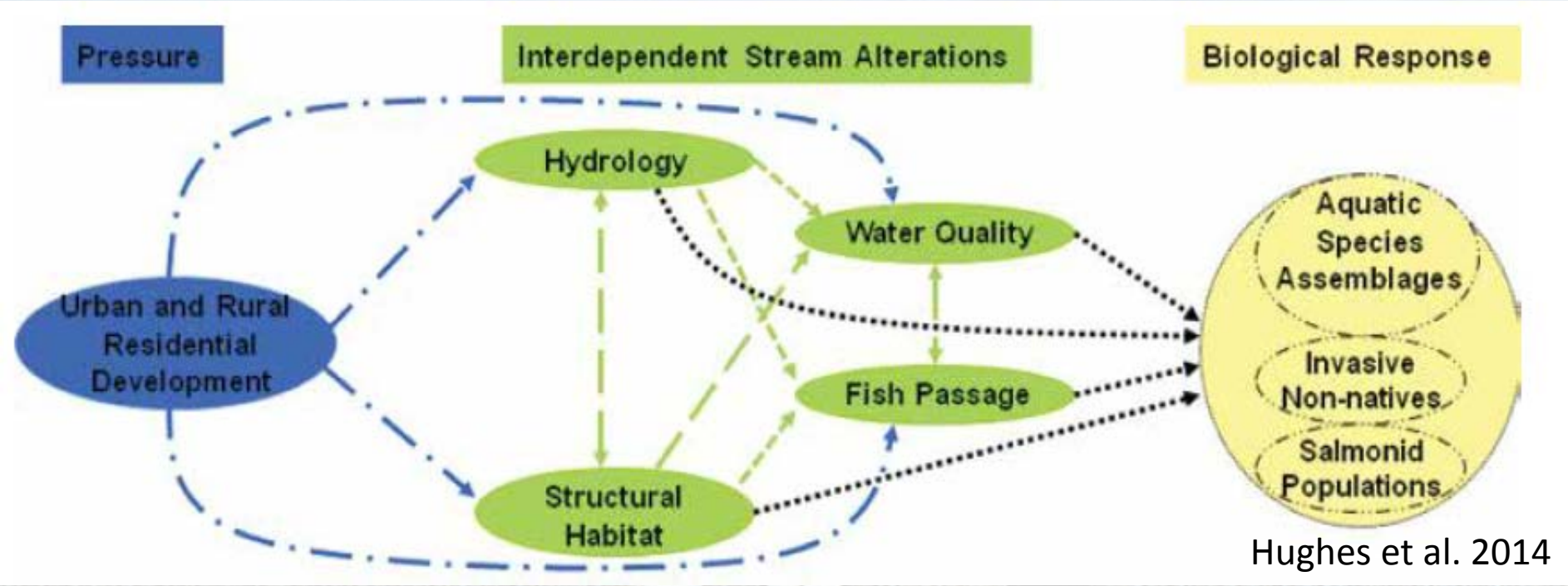
- Ecosystem Health: Streams

Multi-Indicator?



Sutula et al. 2006

Alteration and Response Metrics



Hughes et al. 2014

Chris Brown

Aquatic Ecosystem Design

Metrics: Probabilistic and Targeted

Alteration

1) PHAB
2) Aquatic Chemistry
3) Invasive species
4) Trash

Response

1) Benthic Macroinvertebrates
2) Algae
3) Fish Communities
4) Aquatic Dependent Wildlife

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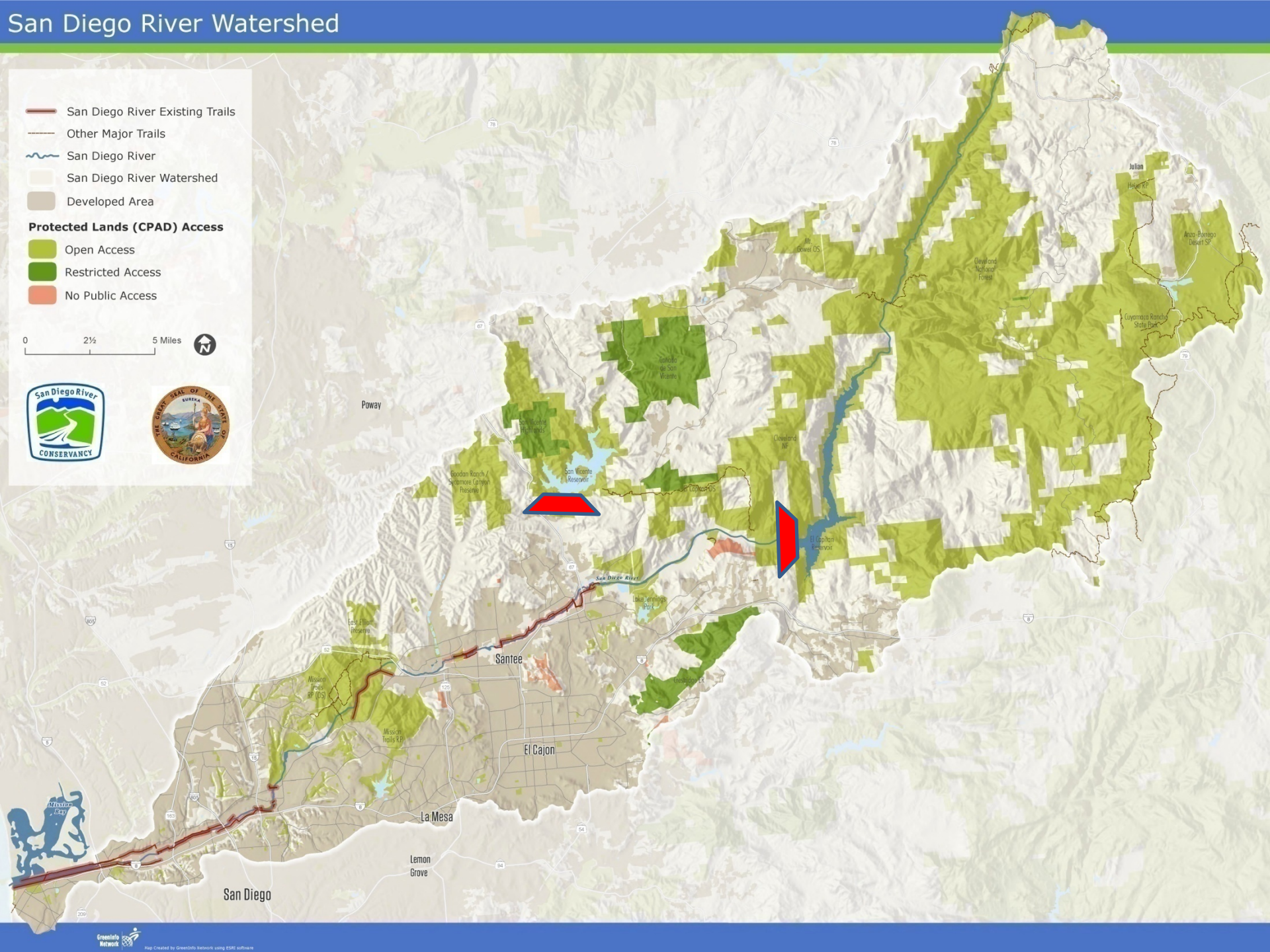
Scaling: A Sub-Watershed Approach

The ultimate goal of a river restoration should be to decrease the degradation of the river system as much as possible and to create and support ecological conditions within the ***regional context of the specific system***
(Palmer et al. 2004)

CALIFORNIA
Water Boards

San Diego River Watershed



San Diego River Watershed

San Diego River Existing Trails
Other Major Trails
San Diego River
San Diego River Watershed
Developed Area

Protected Lands (CPAD) Access

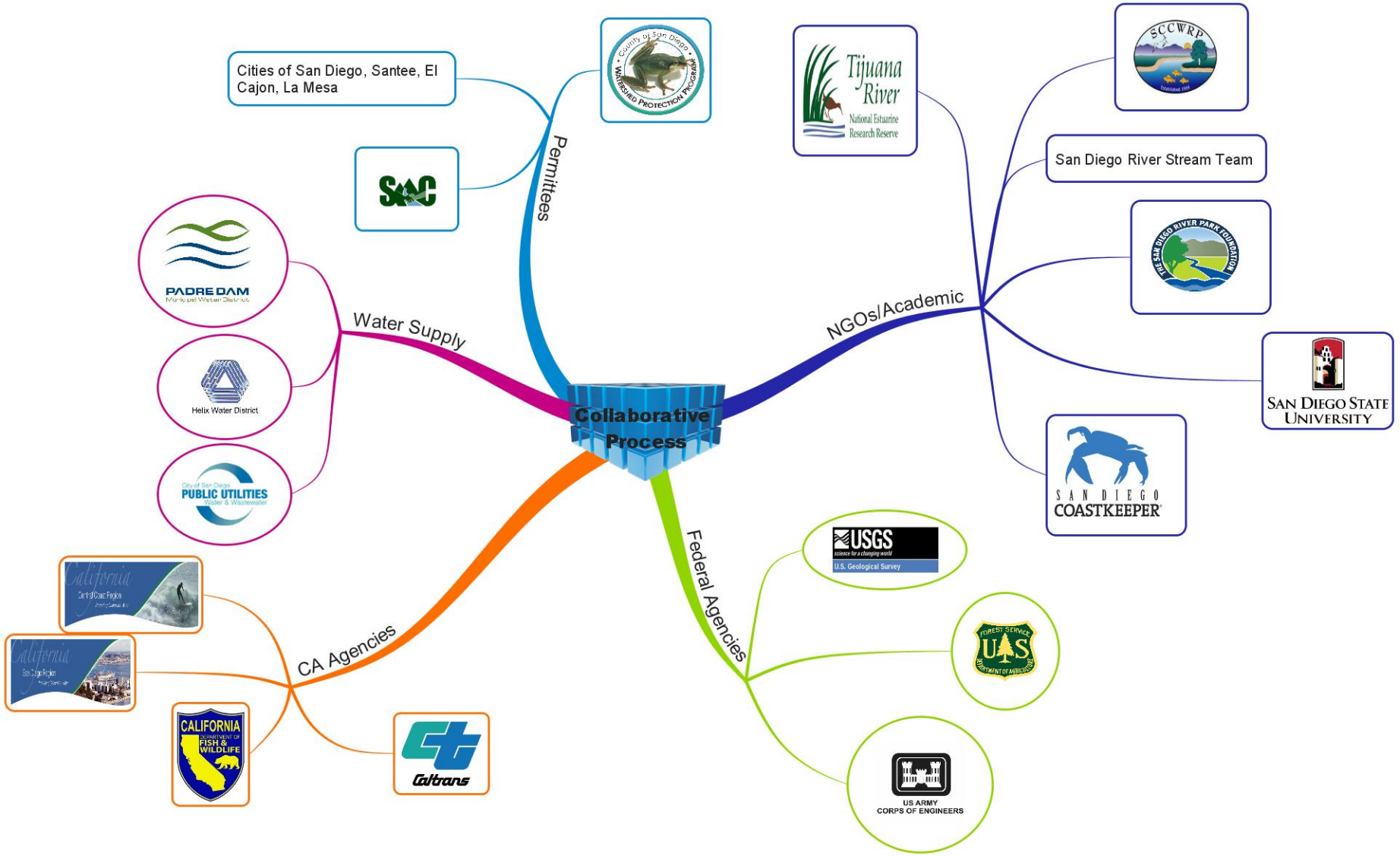
Open Access
Restricted Access
No Public Access

0 2½ 5 Miles

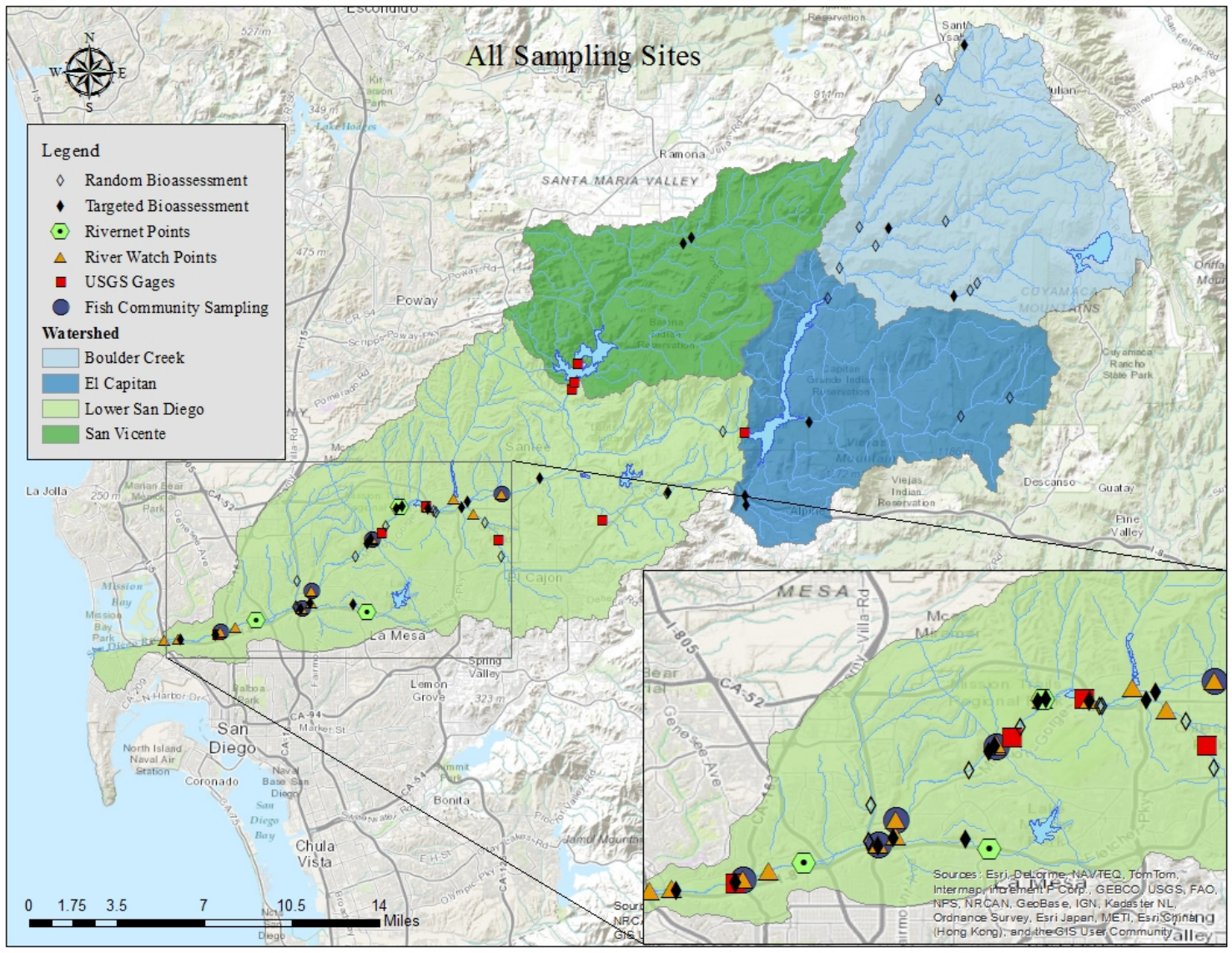
San Diego River Conservancy

Santee
El Cajon
La Mesa
Lemon Grove
San Diego

Aquatic Ecosystem: Opportunities



Aquatic Ecosystem Design



Aquatic Ecosystem Design

URBAN LOWER WATERSHED

Alteration

1) PHAB (Good)
2) Aquatic Chemistry (Extensive)
3) Invasive species (Good*)
4) Trash (Good)

Response

1) Benthic Macroinvertebrates (Good)
2) Algae (Good)
3) Fish Communities (Good*)
4) Aquatic Dependent Wildlife (Limited)

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Urban Challenges:

Aquatic Ecosystem Design

UPPER WATERSHED

Alteration

1) PHAB (Limited)
2) Aquatic Chemistry (Very Limited)
3) Invasive species (Limited-None)
4) Trash (None)

Response

1) Benthic Macroinvertebrates (Limited)
2) Algae (Limited)
3) Fish Communities (Limited)
4) Aquatic Dependent Wildlife (Good)

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Upper Watershed Challenges:

Progress

R9 SWAMP Funds to Start Upper Watershed Efforts

Start Working with Dischargers to Modify Permit Monitoring

Incorporation of USGS Survey Protocols into Sampling/Recon Efforts

Sampling coordination with CADFW and NGOs

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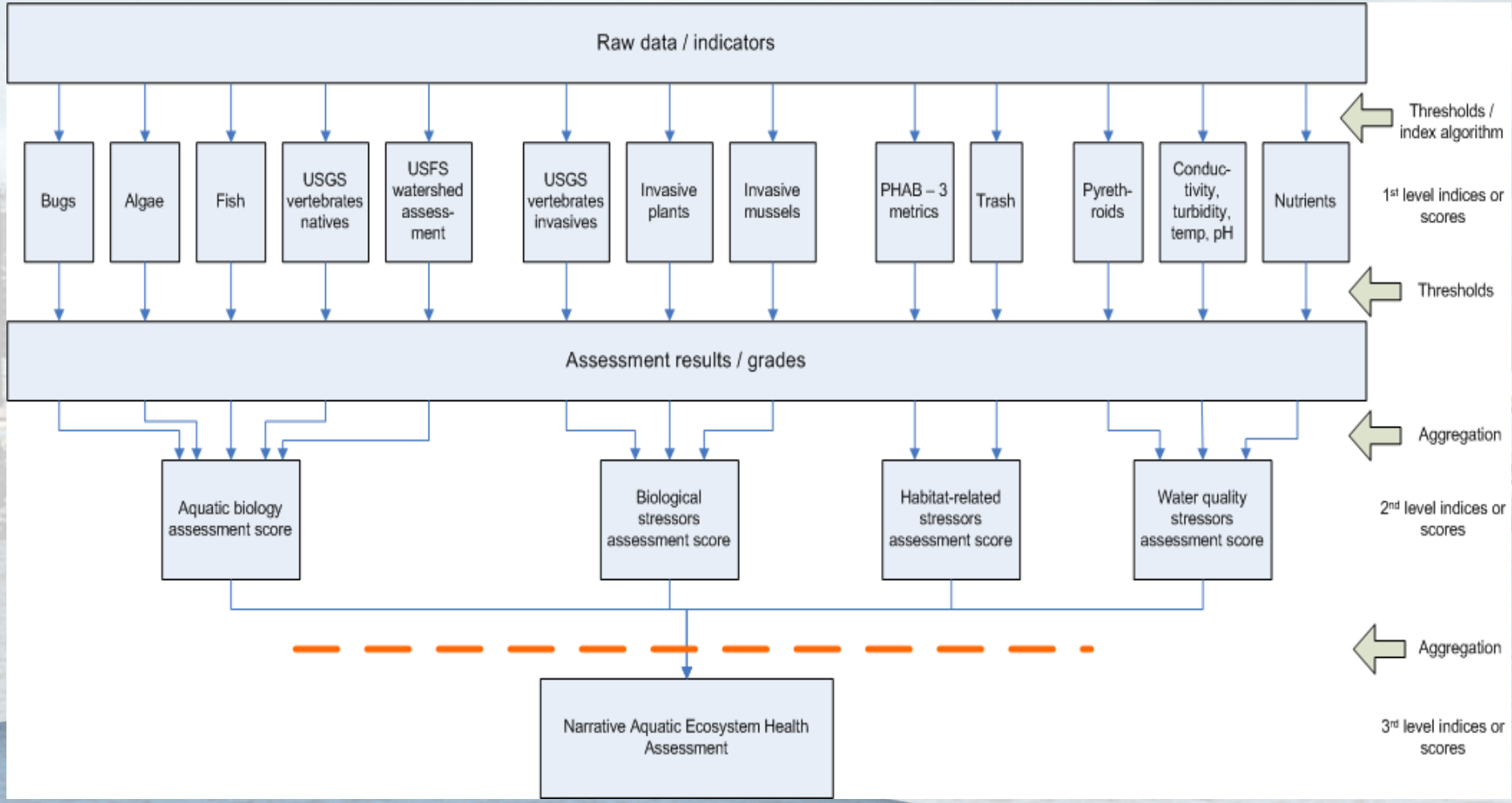
End Product: Multi-Metric Assessment




Questions