Managing Hydromodification: The Next Generation

Eric Stein

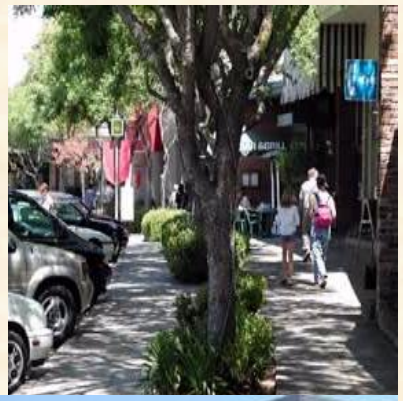
S. Ca. Coastal Water Research Project

“Traditional” Perspective

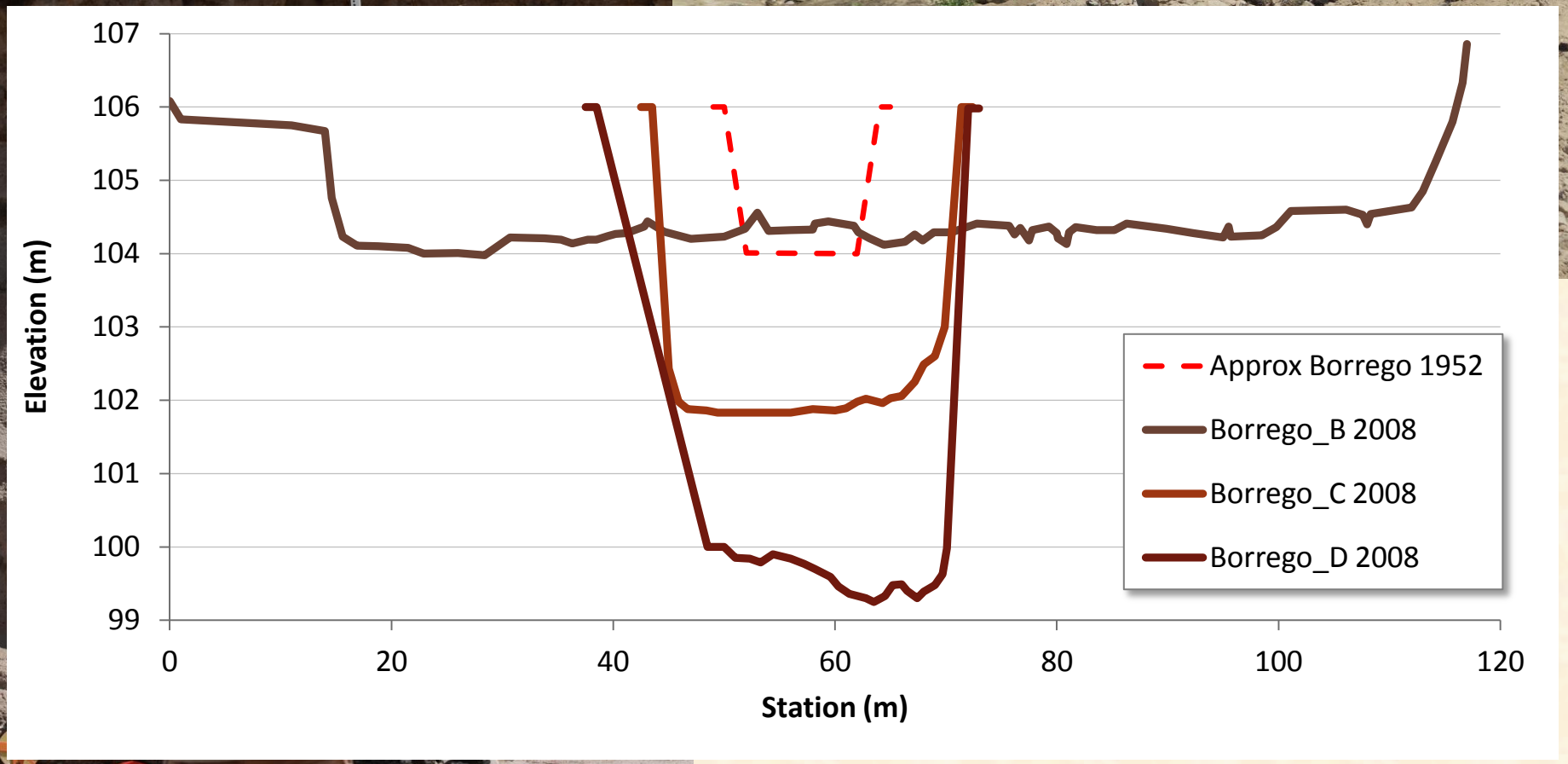
"Traditional" Management Approaches

- Management triggers based on impervious cover
- Focus on LID and flow-duration control (e.g. 10% Q2)
- Exemptions where hydromodification requirements don't apply

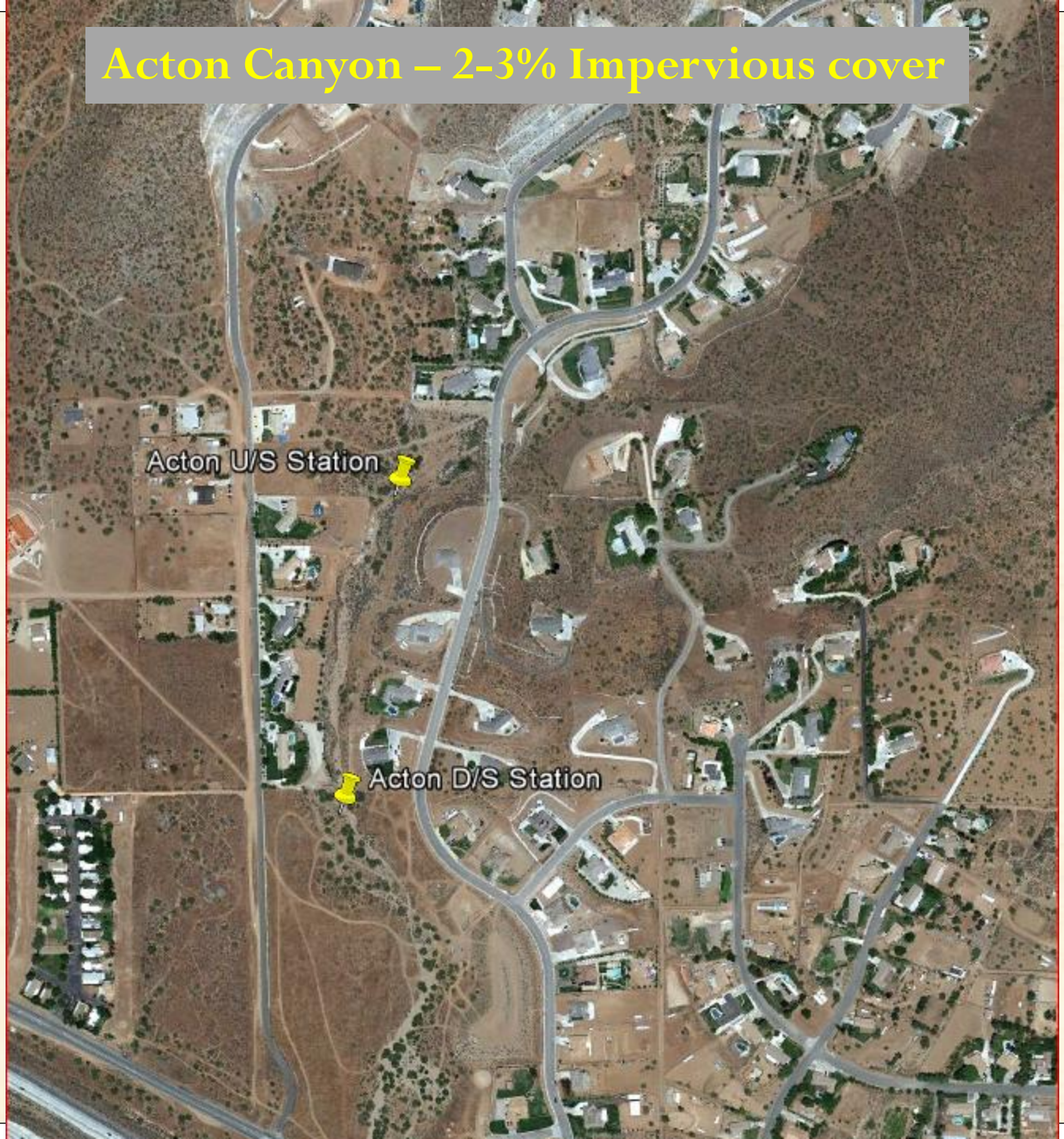


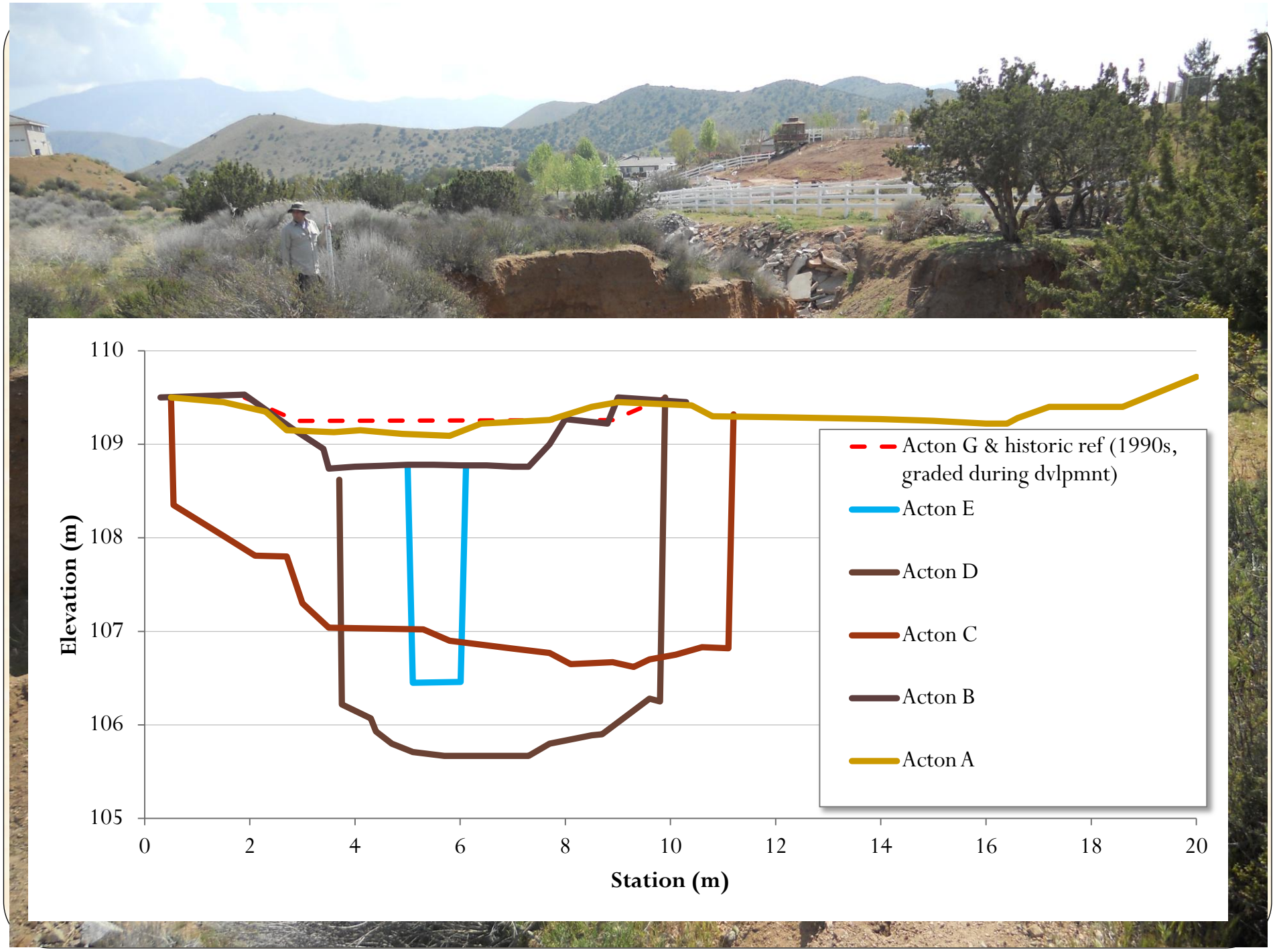




Borrego Canyon – 15% Impervious cover


107
106
105
104
103
102
101
100
99
Elevation (m)
0
20
40
60
80
100
120
Station (m)
Approx Borrego 1952
Borrego_B 2008
Borrego_C 2008
Borrego_D 2008

Acton Canyon – 2-3% Impervious cover




110
109
108
107
106
105
Elevation (m)
0
2
4
6
8
10
12
14
16
18
20
Station (m)
Acton G & historic ref (1990s, graded during dvlpmnt)
Acton E
Acton D
Acton C
Acton B
Acton A

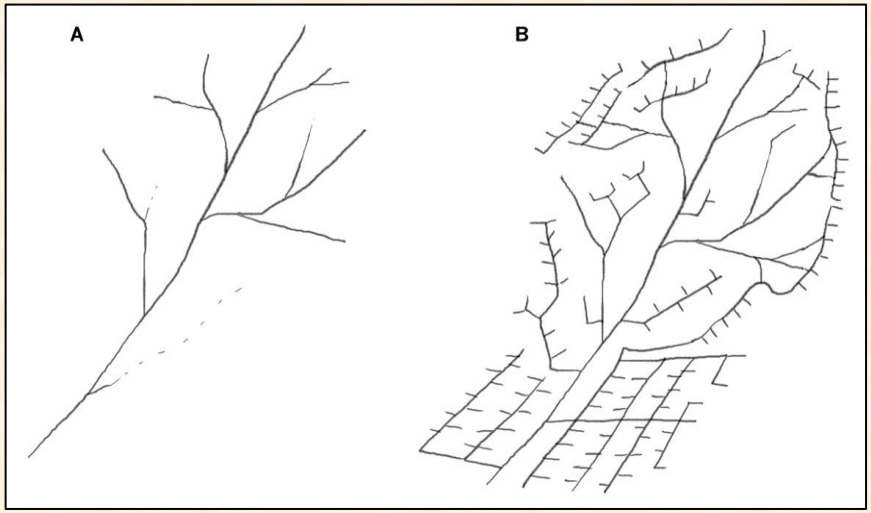
Is this the best approach?

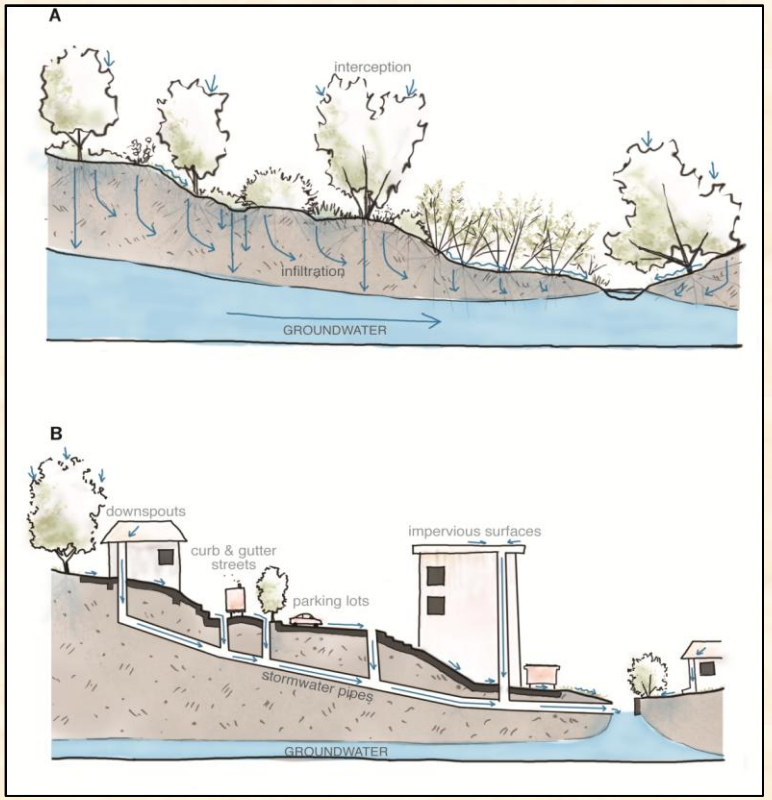
"Evolved" Perspective

- ***Hydromodification = Alteration of watershed structure and processes***

~~"Do I need to apply hydromodification management"~~

How and Where should I apply hydromodification management





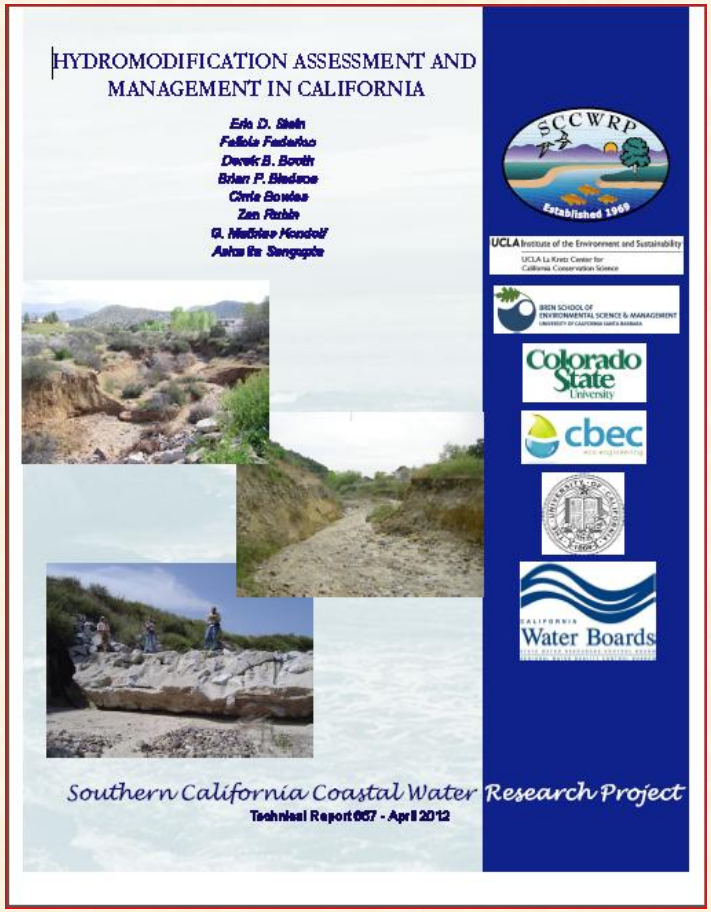
What Does this All Mean?

- It's not just about streams, its about protecting the watershed
- Relying solely on site-based flow control will not be effective at addressing all hydromodification effects
- Hydromodification management should evolve from narrowly-scoped, project-based actions to solutions within an integrated watershed strategy
- Hydromodification control measures cannot be driven solely by new development and redevelopment
  - Legacy effects must be remedied
- Success should be evaluated through systematic monitoring using physical and biological endpoints
  - Monitoring results should feed back to affect future management decisions

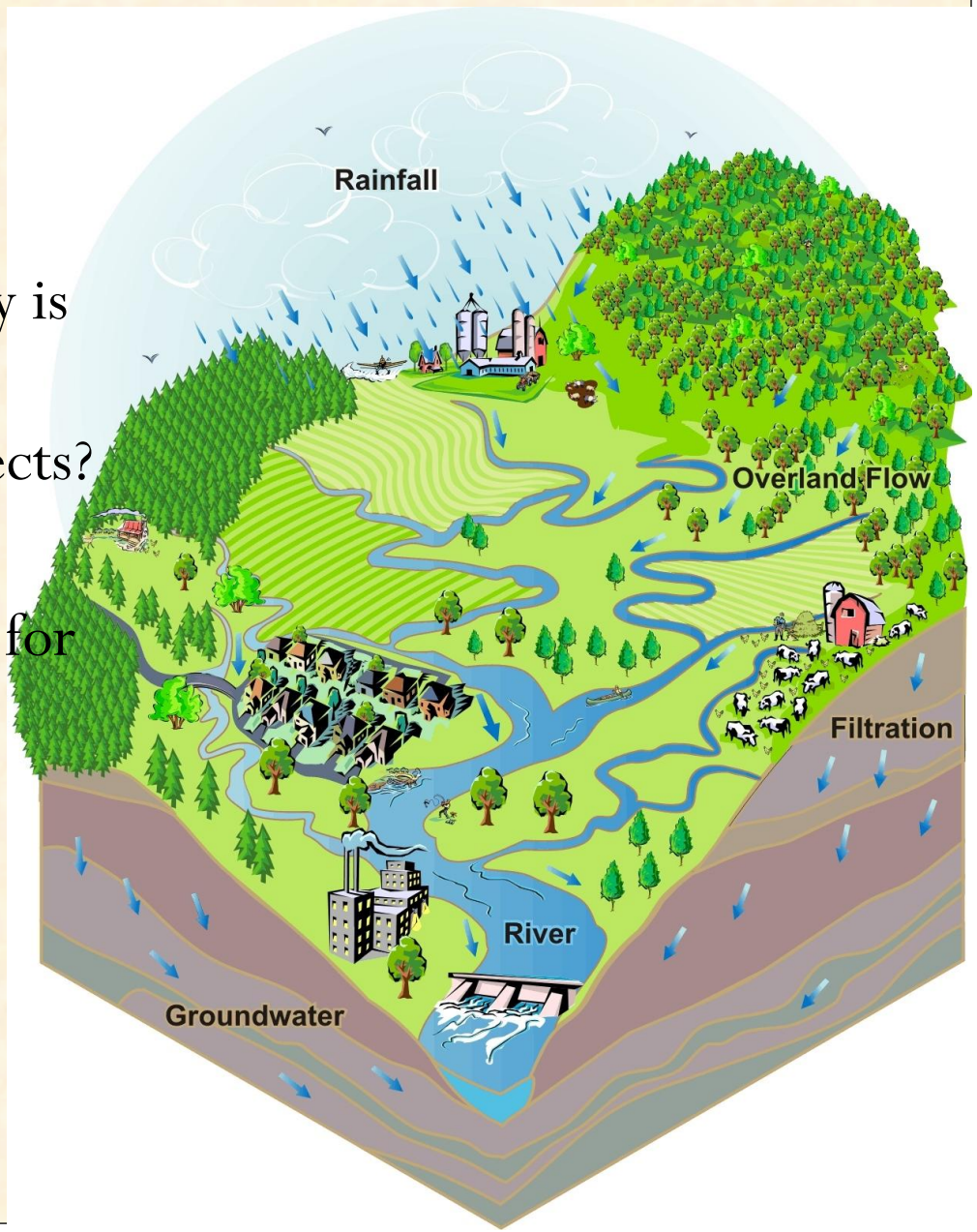
Framework for Hydromodification Management

Technical guidance on ***assessment*** of hydromodification impacts, development of strategies and approaches to ***management*** of hydromodification effects, and ***monitoring*** the effect of management actions.

SCCWRP Technical Report #667
http://www.sccwrp.org/Documents/TechnicalReports.aspx

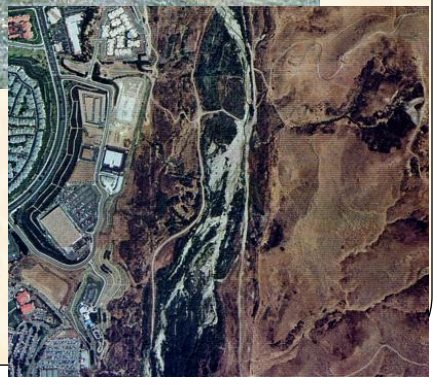


- Where in the watershed is the project?
- What type of stream/water body is the project discharging into?
  - What are the anticipated effects?
- What are the management goals for the receiving waterbody?
- What are the upstream and downstream opportunities?
  - Available land/resources
  - Greatest potential effect

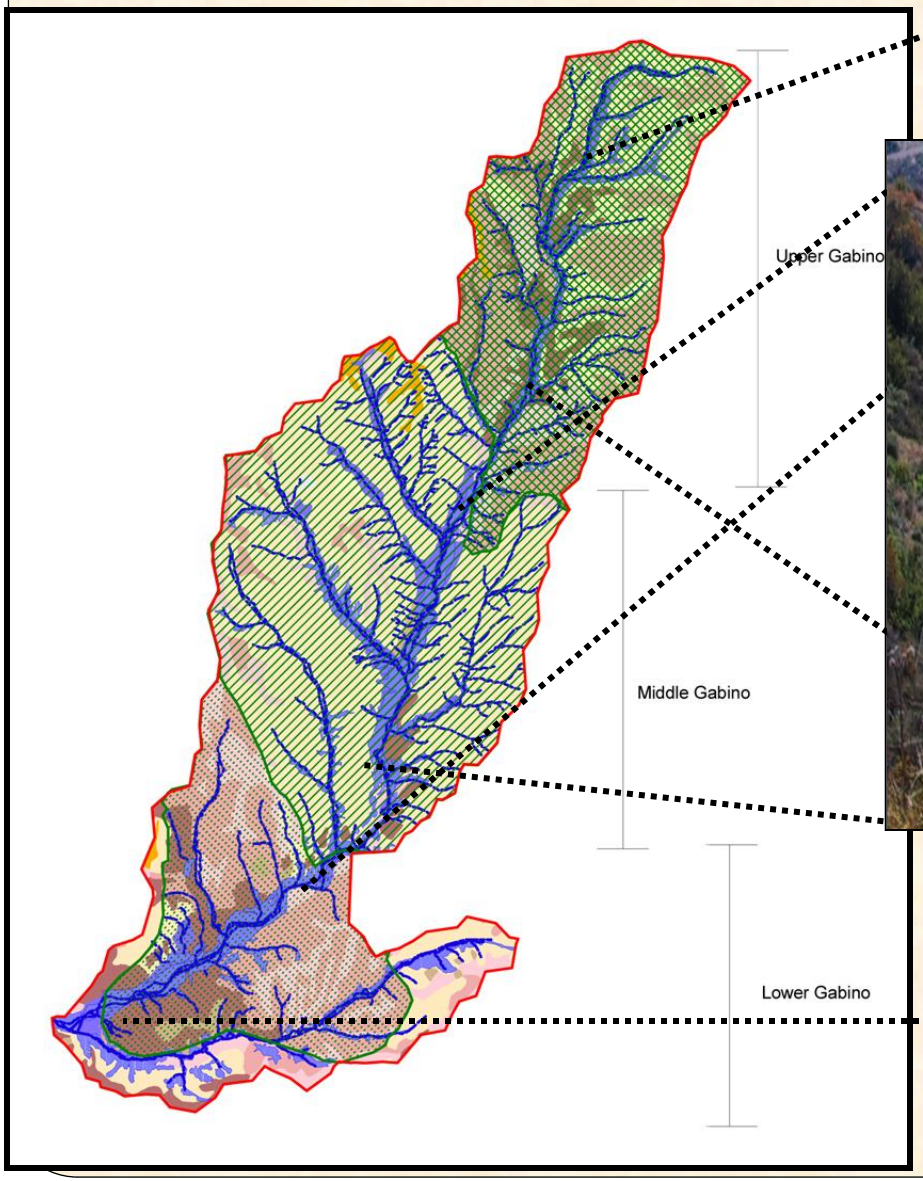


Multi pronged strategy

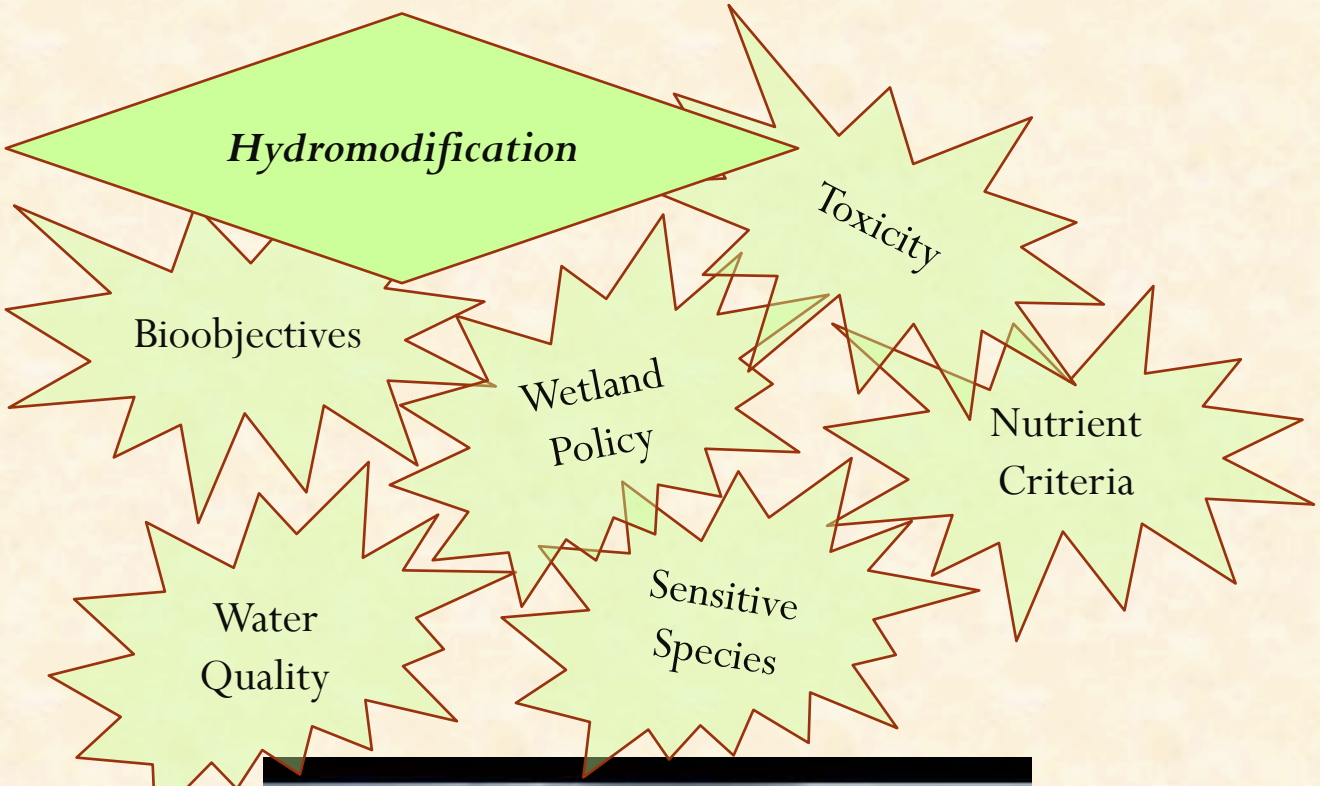
- Planning
  - Avoid course sediment yield areas
  - Upland restoration
  - Protect infiltration areas
- Site-based mitigation
  - LID
  - On-site basins
  - Regional basin (flow + sediment)
- Floodplain management
  - Buffers and setbacks
  - In-channel rehabilitation
  - Regional restoration

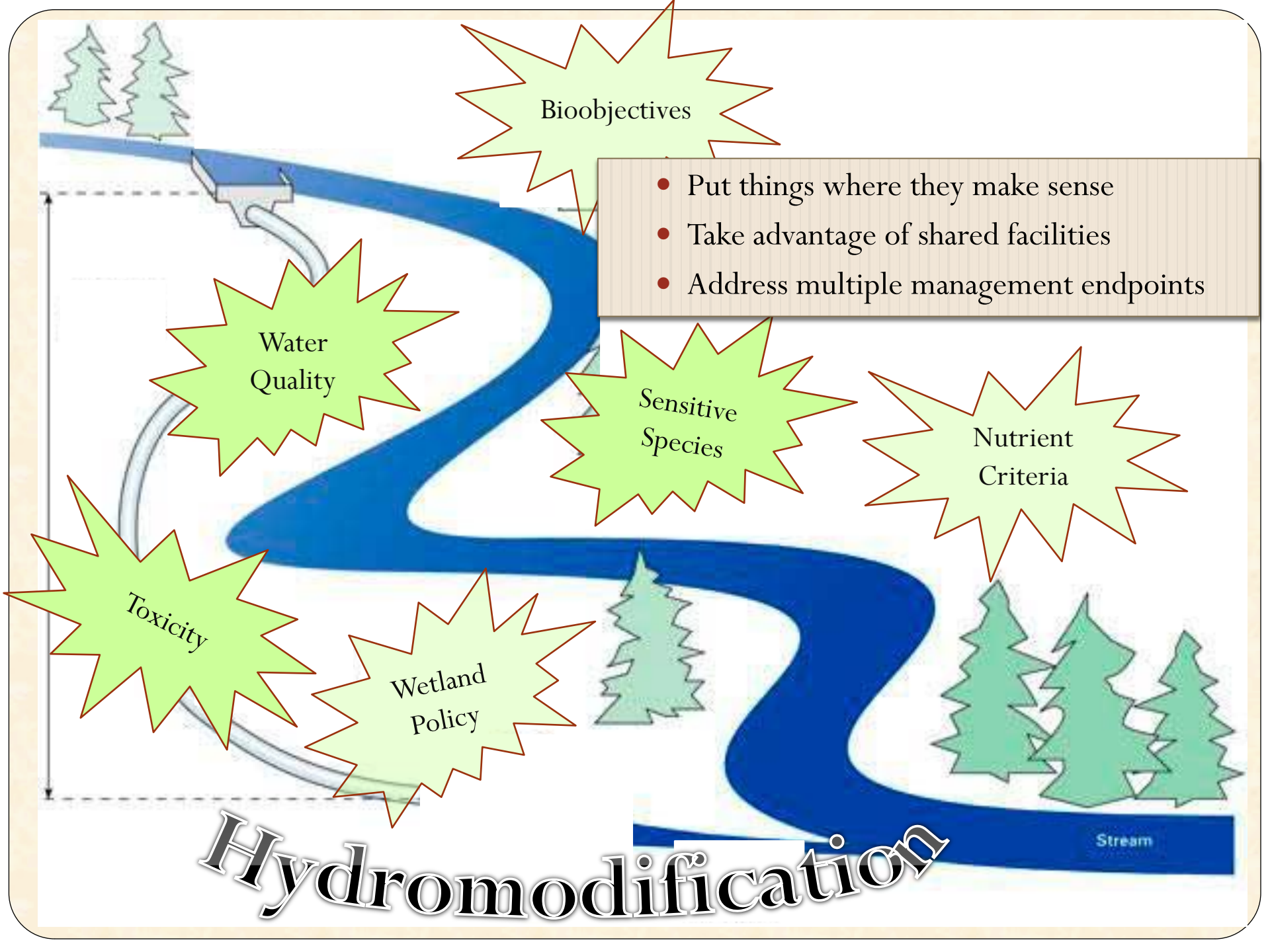


Watershed-based Mitigation



Floodplain Restoration & Protection


Hydromodification
Toxicity
Bioobjectives
Wetland Policy
Nutrient Criteria
Water Quality
Sensitive Species



- Put things where they make sense
- Take advantage of shared facilities
- Address multiple management endpoints

Hydromodification

Need for Monitoring

Severe lack of data on hydromodification responses

- **Performance**
  - How do specific BMPs or facilities function relative to their designs?
- **Effectiveness**
  - How well do specific management actions or suites of actions protect the condition or beneficial use of receiving waters?
- **Characterization**
  - What is the condition of target areas relative to specific benchmarks (e.g. standards, reference condition, ambient)?
- **Trends**
  - Are conditions improving or declining over time?

Monitoring should be question driven & adaptive with clear feedback to management action.

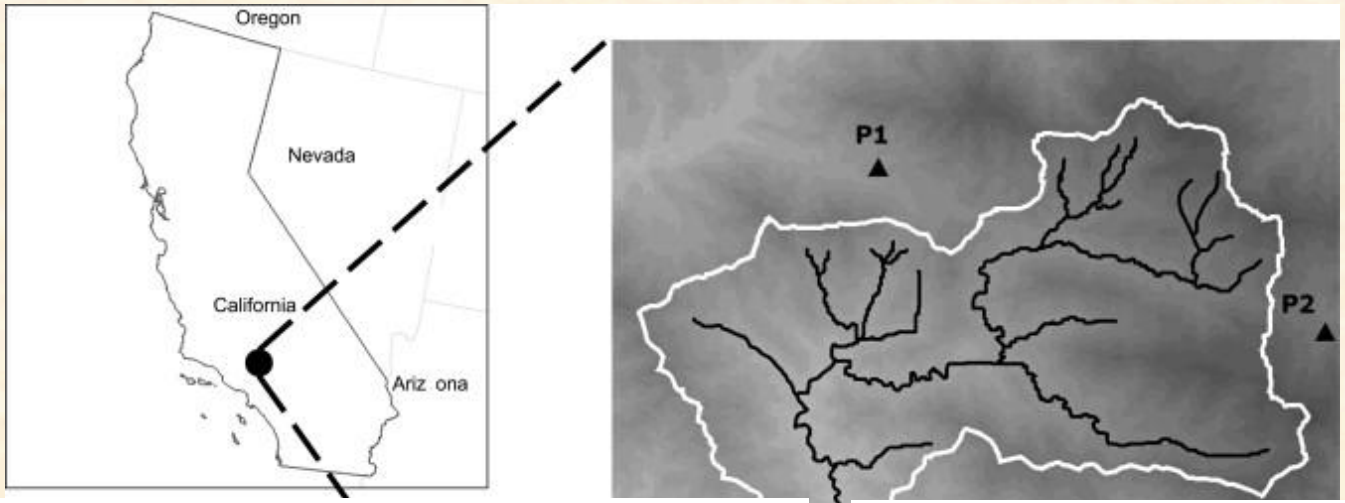
Monitoring with Multiple Assessment Endpoints

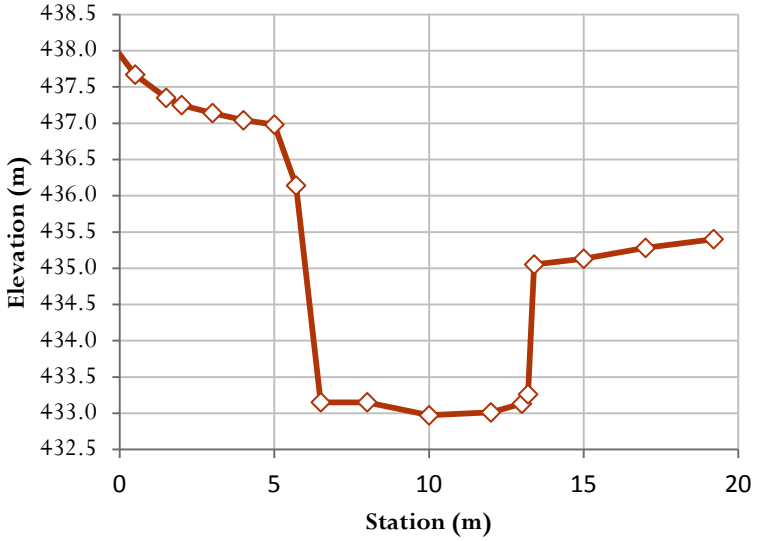
- Pressure
  - What is affecting the condition?

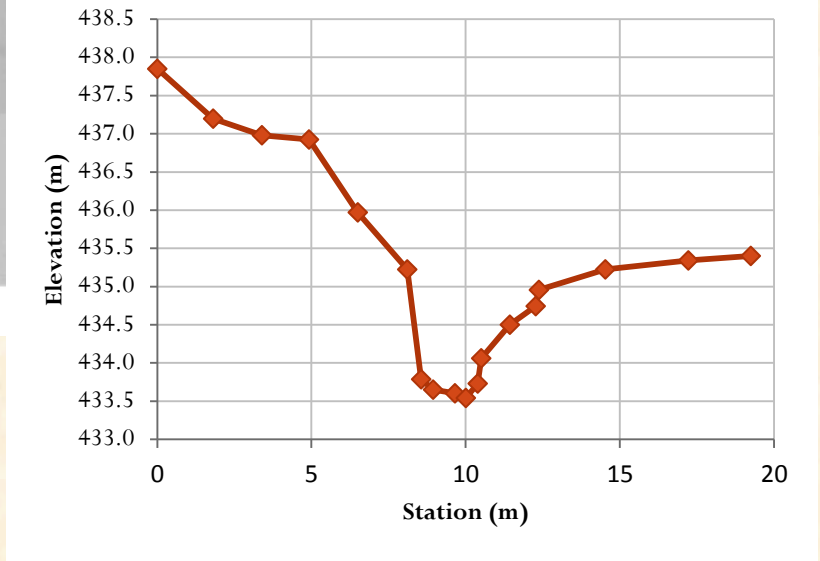
- State
  - What is the condition?

- Response
  - What is the status of a management or valued endpoint?

Establish Sentinel Sites







Summary of the Next Generation

- Uses watershed analysis as the foundation for all management actions
- Establishes management endpoints for stream reaches and upland areas based on watershed scale analysis
- Site-based control measures determined in the context of the watershed analysis / management endpoints
- Includes off-site compensatory mitigation measures
- Integrates hydromodification management across multiple programs
- Multi-faceted monitoring program that evaluates and informs adaptive hydromodification management

THANK YOU

Eric Stein
S. Ca. Coastal Water Research Project
erics@sccwrp.org 714-755-3233