

*In the Bay Area*  
**Watershed Management**  
**(Watershed Health Care)**

REQUIRES:

*LOCALLY INTENSIVE*  
*EMPIRICAL STUDIES*  
*OF SEDIMENT AND WATER*  
*SUPPLIES*

TO SET LOCAL GOALS  
FOR WATERSHED SERVICES

# ***Why locally intensive?***

**FINE-GRAIN VARIABILITY  
IN GEOLOGY, CLIMATE, AND  
LANDUSE**



**PATCHY DISTRIBUTION OF  
WATERSHED GOODS AND  
SERVICES**

# ***Why empirical?***

NUMERICAL MODELS  
DO NOT NOW ACCOUNT  
FOR SIGNIFICANT LOCAL  
VARIABILITY



UNCERTAINTY  
OF TMDL'S, BMP'S, ETC.

# ***Why water and sediment?***

**WATER/SEDIMENT RELATIONS**

**STRONGLY AFFECT:**

**POLLUTION LOADS,  
FLOOD MANAGEMENT,  
ECOLOGICAL SERVICES**

***Why involve  
watershed residents?***

**PRACTICAL REASON:**  
***WATERSHED HEALTH CARE  
REQUIRES DATA***

**ETHICAL REASON:**  
***WATERSHED HEALTH CARE  
CONNECTS CITIZENS TO  
GOVERNMENT***

GOALS STATE HOW MUCH  
OF WHAT KINDS OF  
SERVICES ARE REQUIRED  
WHERE AND WHY

**Major trends in  
environmental planning  
as changing context for  
environmental science**

FROM COMMAND-CONTROL TO  
PARTNERSHIPS  
(*GROUP THINK*)

FROM REACTIVE REGULATION TO  
ADAPTIVE MANAGEMENT  
(*SHARED GOALS, RISK, PROGRESS*)

FROM END POINTS TO  
CAUSE-AND-EFFECT  
(*ACCOMODATING UNCERTAINTY*)

## **Some US examples**

**NCCP's, HCP's, CRMP's  
AND INDUSTRIAL ECOLOGY**



# **Some Bay Area examples**

**BAY AREA ALLIANCE FOR  
SUSTAINABLE DEVELOPMENT**

**BLUEPRINT FOR A SUSTAINABLE  
BAY AREA**

**SF ESTUARY PROJECT**

**BAY AREA WETLANDS ECOSYSTEM  
GOALS PROJECT**

**SF BAY ECOSYSTEM DEMONSTRATION  
PROJECTS**

**REGIONAL MONITORING PROGRAMS**

**CALFED**

**BAY AREA HABITAT JOINT VENTURE**

**THE NAPA LIVING RIVER**

# **The role of science**

**STREAM OF DATA FROM FIELD  
TO OFFICE**



**ADVANCE PUBLIC DEBATE  
DEFINE POSSIBILITIES  
MONITOR PROGRESS**

# MONITOR RISKS

**What might the COE do?**

START AT THE BEGINNING

ASK MORE QUESTIONS

ENTERTAIN MORE ANSWERS

# **Some scientific results**

STORM-SPECIFIC RUN-OFF  
COEFFICIENTS BY STREAM ORDER

SEDIMENT YIELD ESTIMATES FOR  
HILLSIDES, TERRACES, BANKS, BEDS

ASSESSMENTS OF INFRASTRUCTURE  
AND WILDLIFE HABITATS

NETWORK OF REFERENCE REACHES  
AND RAINFALL AND FLOW GAGES

MODELS OF STREAM RESPONSE TO  
CLIMATE AND LAND USE

(HOW WATERSHEDS WORK)

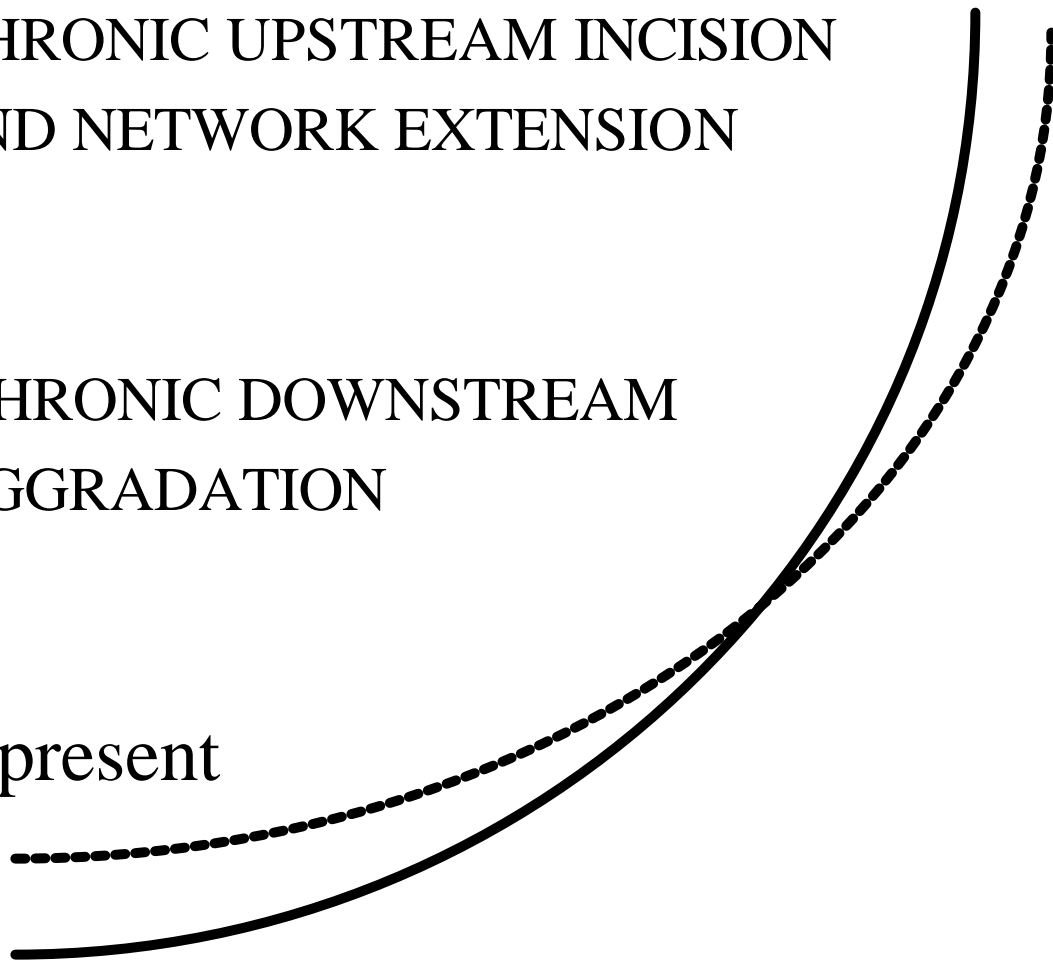
# Longitudinal Response

CHRONIC UPSTREAM INCISION  
AND NETWORK EXTENSION

CHRONIC DOWNSTREAM  
AGGRADATION

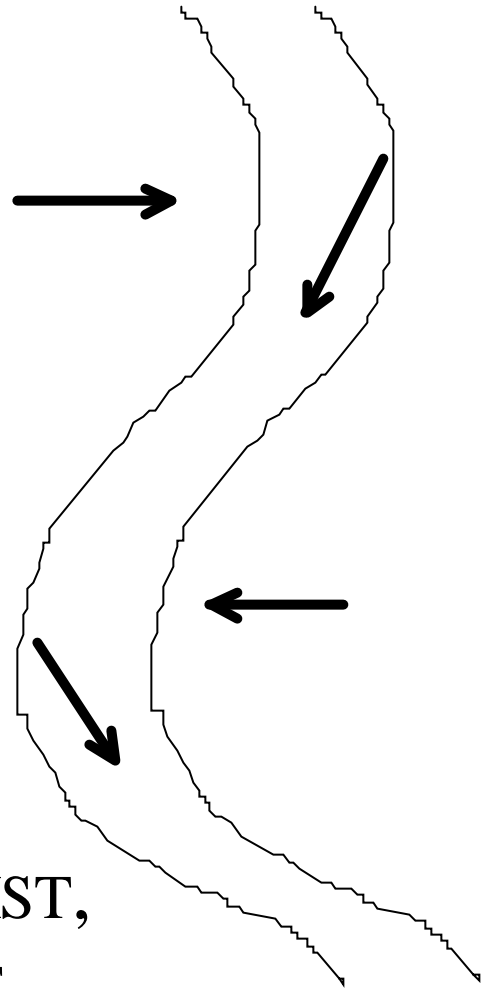
present

past



# Plan Form Response

***DURING DROUGHT***  
TREES ENCROACH  
ON BARS, AND  
WOODY DEBRIS  
ACCUMULATES



***DURING DELUGE***  
VEGETATED BARS PERSIST,  
LANDSLIDE TOES ERODE,  
DEBRIS JAMS BLOW OUT, AND  
SEDIMENT PULSES GO DOWNSTREAM