Managing for an Outcome: Development of a Measurement-Based Watershed Management Process

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Issues

DECLINE OF WATER CLARITY AT LAKE TAHOE



Watersheds-ecosystems

Infinitely variable

Infinitely complex

Not fully predictable

Add: climate change....



Proces



What is the restoration management objective?





- Meet regulations?
- Install BMPs?
- Desirable model output?
- Physical outcomes?

Issue

Vision

Process

Results

Future

What is the process of managing watershed issues?

Actions based on:

- Science: a *piece* of the puzzle
- Models: what we think we know
- Monitoring: assessment of what IS
- Building a *bridge*...



Process

Results

Future

Management

- Management can be defined as human action to facilitate the production of useful
 - outcomes from a system.
- Managing to OUTCOMES not process
- Modeling is not managing, modeling is predicting
- Predicting is not managing, it is predicting
- There is a difference ("A plan is not a project...")



Issue

Vision

Linking science to management



Results: Projects



Process

20 years of adaptive (outcome-based) management

Mill Creek diversion levee – BEFORE – Ponderosa Ranch - Incline Village, CA

It's about the soil...

Mill Creek diversion levee – AFTER – Ponderosa Ranch - Incline Village, CA

Highway 267 at Highlands View Drive

Extreme steep slope revegetation – BEFORE – Cave Rock, NV

Extreme steep slope revegetation – AFTER – Cave Rock, NV

Results: the data



Issue

Process

Results

Future

Hydrograph rising limb sediment yields at HMR Cr. during spring snowmelt periods in 2010 & 2011



How we do, How we CAN DO: Inputs to and feedback from ACTIONS



Where is the money going? The Lake Tahoe Restoration Act

- "S. 432 would cost \$234 million over the 2012-2017 period and \$231 million after 2017" <u>www.govtrack.us/congress/bills/112/s432</u>
- We need to get a known return on that investment
- We must know more about watershed and ecosystem responses to investment
- Monitoring is an investment in knowledge
- Implementation without monitoring is a form of Ponzi investment ...
- "Success" without monitoring/assessment is not possible to substantiate...
- To the future !

Issue