

# Nutrient Management Categories

Revisions and Discussion

# Why different categories?

## Scientific Rationale

- ❖ Less known about “natural” conditions among valley sites and Great Salt Lake
  - *Interpretation of indicators potentially differs*
  - *Greater uncertainty for numeric indicators*
- ❖ Unalterable conditions modify nutrient responses
  - *Need site-specific endpoints among sites with extensive habitat modification*

# Why different categories?

## Socioeconomic Rationale

- ❖ Significant economic costs should require greater scientific certainty
  - *Limited resources, so efficiency is important*
- ❖ Different sources of nutrients require different management solutions
- ❖ Headwaters warrant greater protection
- ❖ Iterative progress!

# Numeric Standards and Indicators: Purpose

- ❖ Optimize monitoring resources
  - *Tiered Monitoring*
- ❖ Identify sites with nutrient-related problems
  - *Assessment*
- ❖ Establish Clear and Objective Endpoints
  - *Water Quality Based Effluent Limits (WQBELs)*
  - *TMDL goals and objectives*
  - *More efficient resource management*

# Tiered Monitoring



## Start With

- ❖ less resource-intensive data
- ❖ From many places

## Then

- ❖ Follow-up with more difficult or expensive monitoring efforts



## Before

- ❖ Making more expensive and costly management decisions



## Which leads to

- ❖ Better Science
- ❖ More defensible management decisions

# Tiered Monitoring: Different Immediate Goals

## Headwaters

- ❖ Maintain high water quality
- ❖ Easily and inexpensively identify sites with nutrient-related problems

## Intermediate Waters

- ❖ Maximize limited resources
- ❖ Account for site-specific modifications to nutrient responses

## Habitat-Limited Waters

- ❖ Identify best attainable conditions
- ❖ Develop site-specific interpretations of indicators

## TMDL Waters

- ❖ Accurately quantify sources and loads

## Great Salt Lake

- ❖ Basic research

# Tiered Monitoring

## What have we accomplished?

- ❖ Developed new and innovative approaches
  - Field SOPs
  - Analytical Methods

## What remains?

- ❖ Logistics
  - What specifically to collect in each tier?
  - How should this vary among nutrient management categories?
- ❖ Ongoing Investigations
  - What additional methods should be evaluated?

# Assessment: Different Approaches

## Headwaters

- ❖ Focus on water chemistry
- ❖ Modify criteria with indicators, if appropriate, via TMDL process

## Intermediate Waters

- ❖ Use both chemistry and ecological responses to make assessment decisions
- ❖ Permit limited based on readily achievable technology, unless site-specific standards or TMDLs suggest otherwise

## Habitat-Limited Waters

- ❖ Regional N&P indicators are not applied until confirmed
- ❖ List cause as “unknown” until all causes are quantified
- ❖ Permit limited based on readily achievable technology, unless site-specific standards or TMDLs suggest otherwise

## TMDL Waters

- ❖ Regional N&P indicators are not applied until confirmed
- ❖ Phased implementation schedules, with “Straight to Implementation” approaches
- ❖ Establish appropriate ecological goals with site-specific

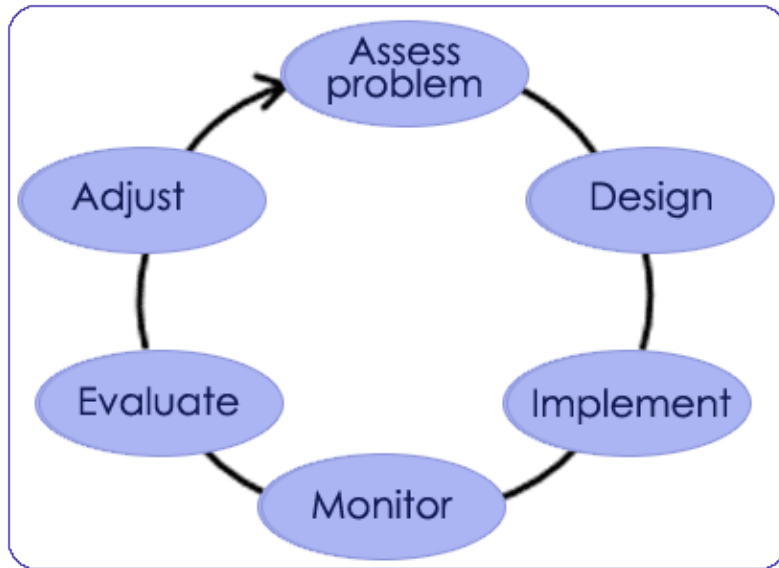


# Prioritization



- ❖ Preliminary analyses suggest that many sites will indicate the potential nutrient-related problems.
- ❖ Site-specific modifications are both technically challenging and resource intensive.
- ❖ Prioritization schemes are needed to ensure continual progress toward solving anthropogenic eutrophication problems.

# Adaptive Management



- ❖ Central Tenet: Management and Science involves continual learning, therefore uncertainty is inevitable.
- ❖ Process allows progress toward solutions despite scientific uncertainty.

# Straight to Implementation: Common to all Categories

## ❖ **Convene Stakeholders**

- Establishes Cooperation and Collaboration

## ❖ **Immediately Implement Easiest Nutrient Reductions**

- Proactive and Adaptive

## ❖ **Establish Ecological Goals**

- Provides flexibility toward solutions

## ❖ **Monitor Progress**

- Accountability

## ❖ **Address Scientific Uncertainty**

- Improves technical defensibility
- Ensures efficient allocation of resources (the expensive stuff comes later)