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STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS


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Presentation Outline

Tahoe Total Maximum Daily Load

- What is a TMDL
- What has been done?
- What we are doing now?
- What is next?

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Lake Tahoe TMDL

California Regional Water Quality Control Board, Lahontan Region

Nevada Division of Environmental Protection

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TMDL Program Overview

A science-based plan to restore Lake Tahoe's clarity

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Central TMDL Questions

1. What pollutants are causing Lake Tahoe's clarity loss?
2. How much of each pollutant is reaching Lake Tahoe?
3. How much of each pollutant can Lake Tahoe accept and still achieve the clarity goal?
4. What are the options for reducing pollutant inputs to Lake Tahoe?

What has been done

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1. What pollutants are causing Lake Tahoe's clarity loss?

a. Floating algae – fed by nutrients

b. Very fine sediment (<20 micrometers) accounts for ~2/3 of the clarity conditions

What has been done

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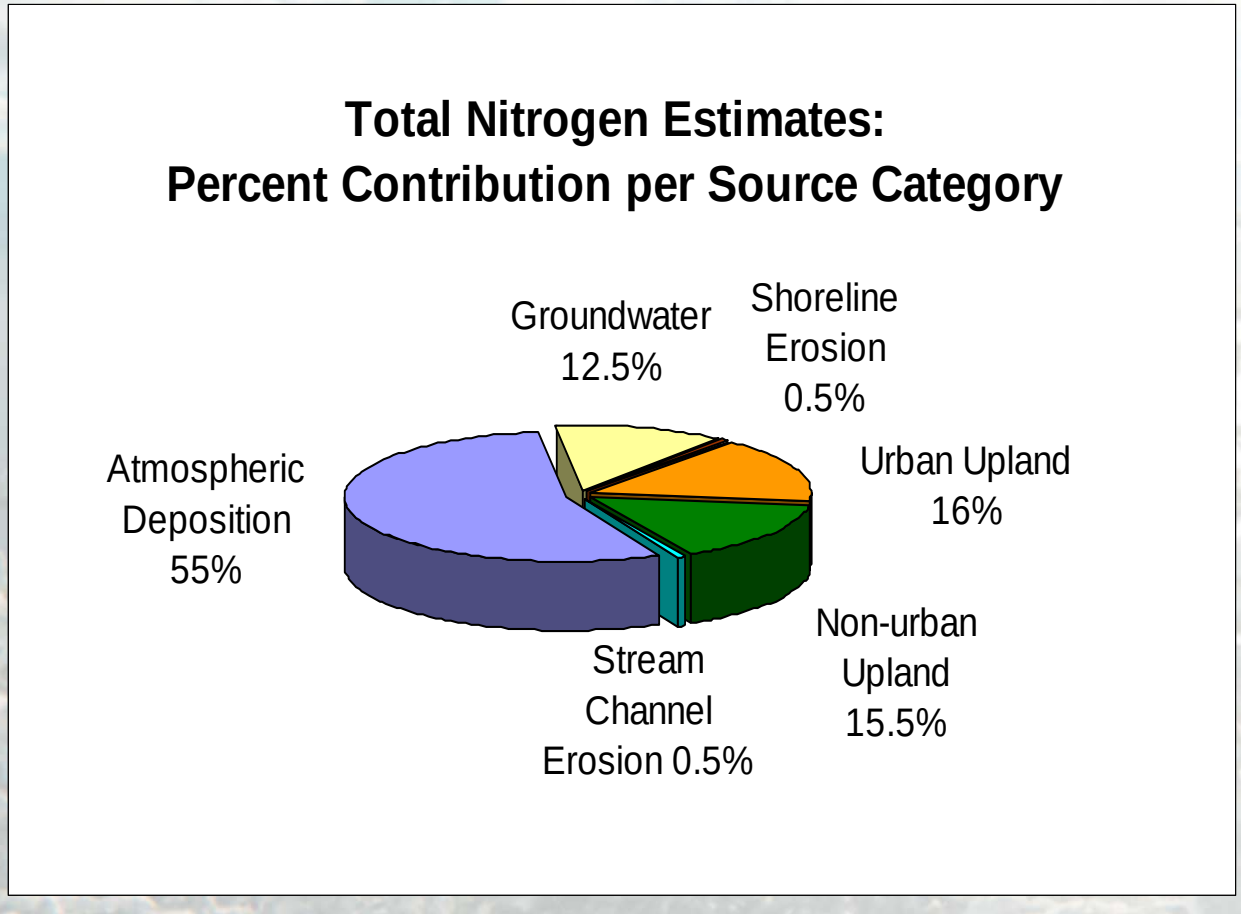
2. How much of each pollutant is reaching Lake Tahoe?



What has been done

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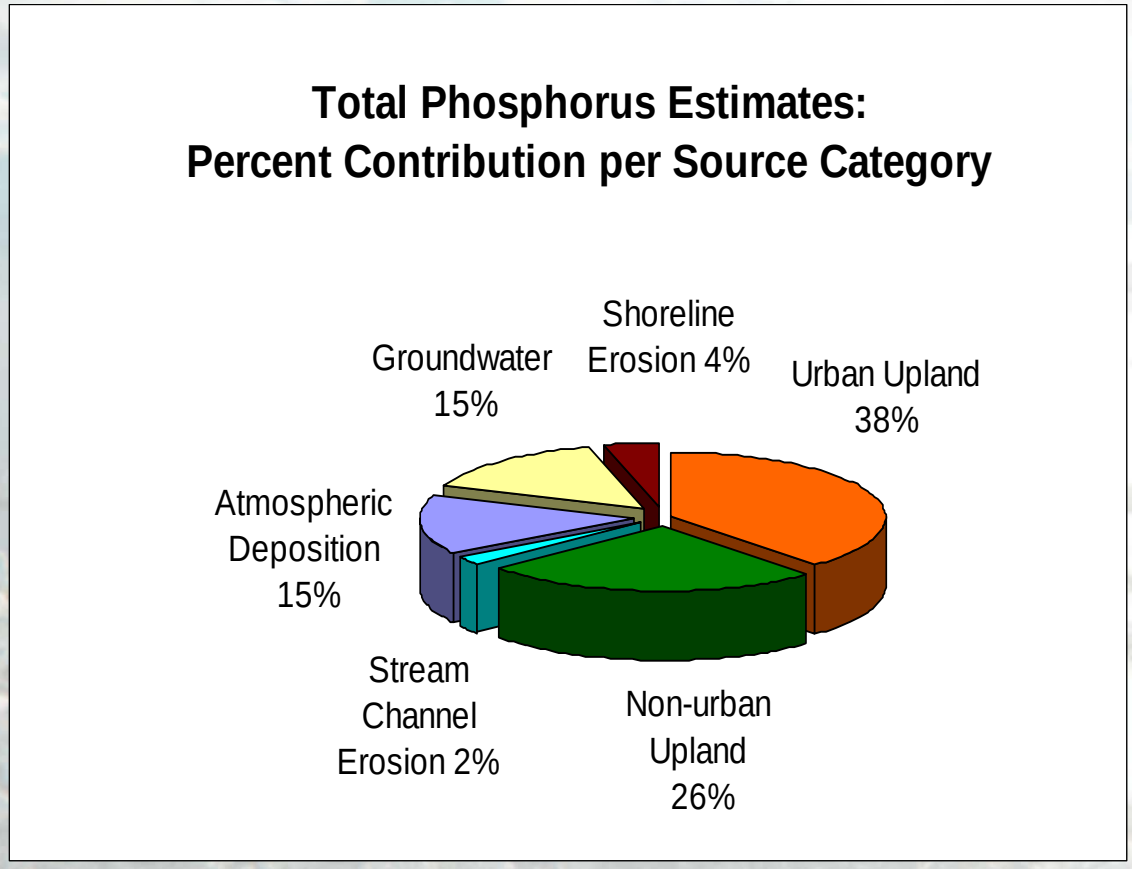
2. How much of each pollutant is reaching Lake Tahoe?



What has been done

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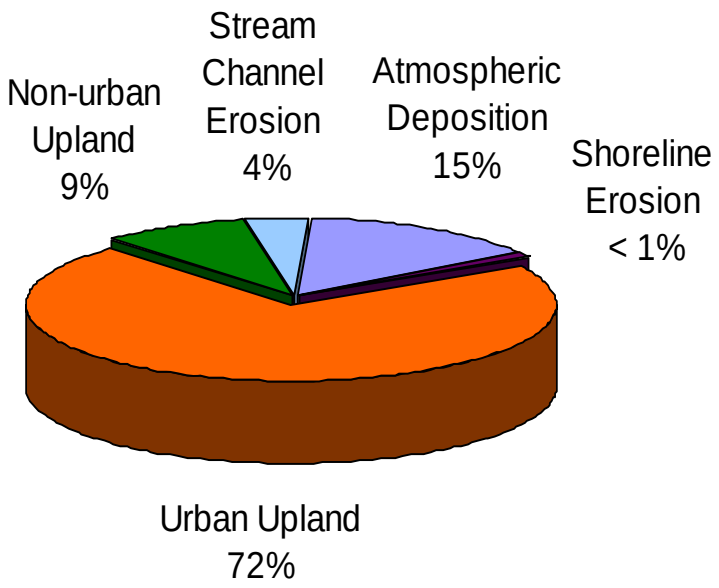
2. How much of each pollutant is reaching Lake Tahoe?

Fine Sediment Particle Number Estimates (particles less than 20 micrometers): Percent Contribution per Source Category



What has been done

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3. How much of each pollutant can Lake Tahoe accept and still achieve the clarity goal?

a. The Lake Clarity Model provides estimates of clarity response to load reductions

b. Reducing fines (not nutrients) has a greater potential to improve clarity

c. Model output indicates significant reductions will be needed to achieve historic clarity

What has been done

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4. What are the options for reducing pollutant inputs to Lake Tahoe?

a. Quantifiable options

b. Basin-wide load reduction estimates

c. Relative load reduction opportunity among source categories

d. Consistent methods to evaluate future pollutant control options

What has been done

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4. What are the options for reducing pollutant inputs to Lake Tahoe?

- Urban sources
  - Largest load and largest opportunity
- Stream channel restoration
  - Small reductions, cost effective
- Forest management
  - With appropriate BMPs and restoration, fuel reduction work can reduce loads
- Atmospheric Deposition
  - Dust reductions are feasible

What has been done?

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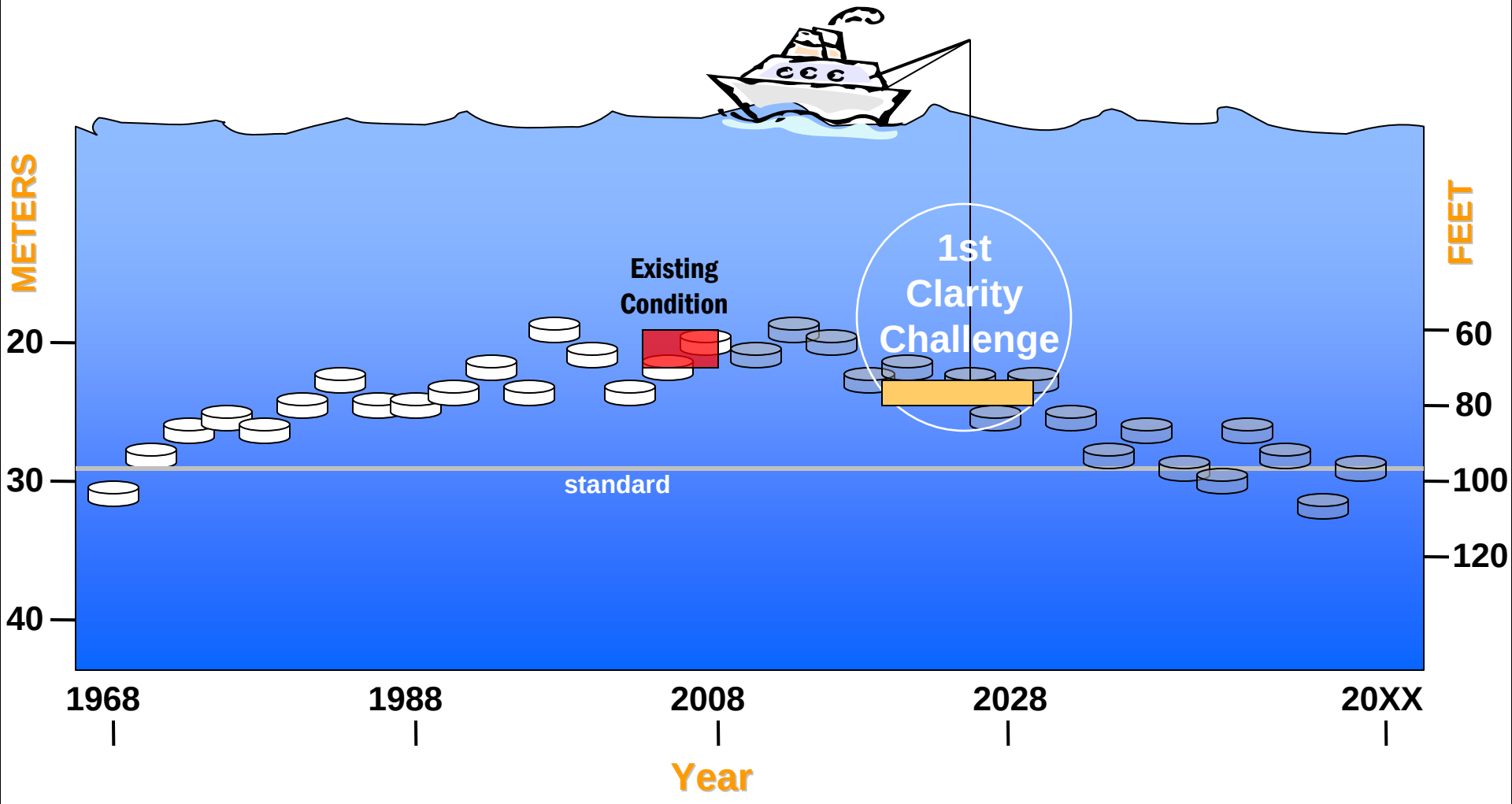
The Clarity Challenge: Reverse clarity decline and measurably improve clarity



Central TMDL Questions

5. What strategy should we implement to reduce pollutant inputs to Lake Tahoe?

What has been done?

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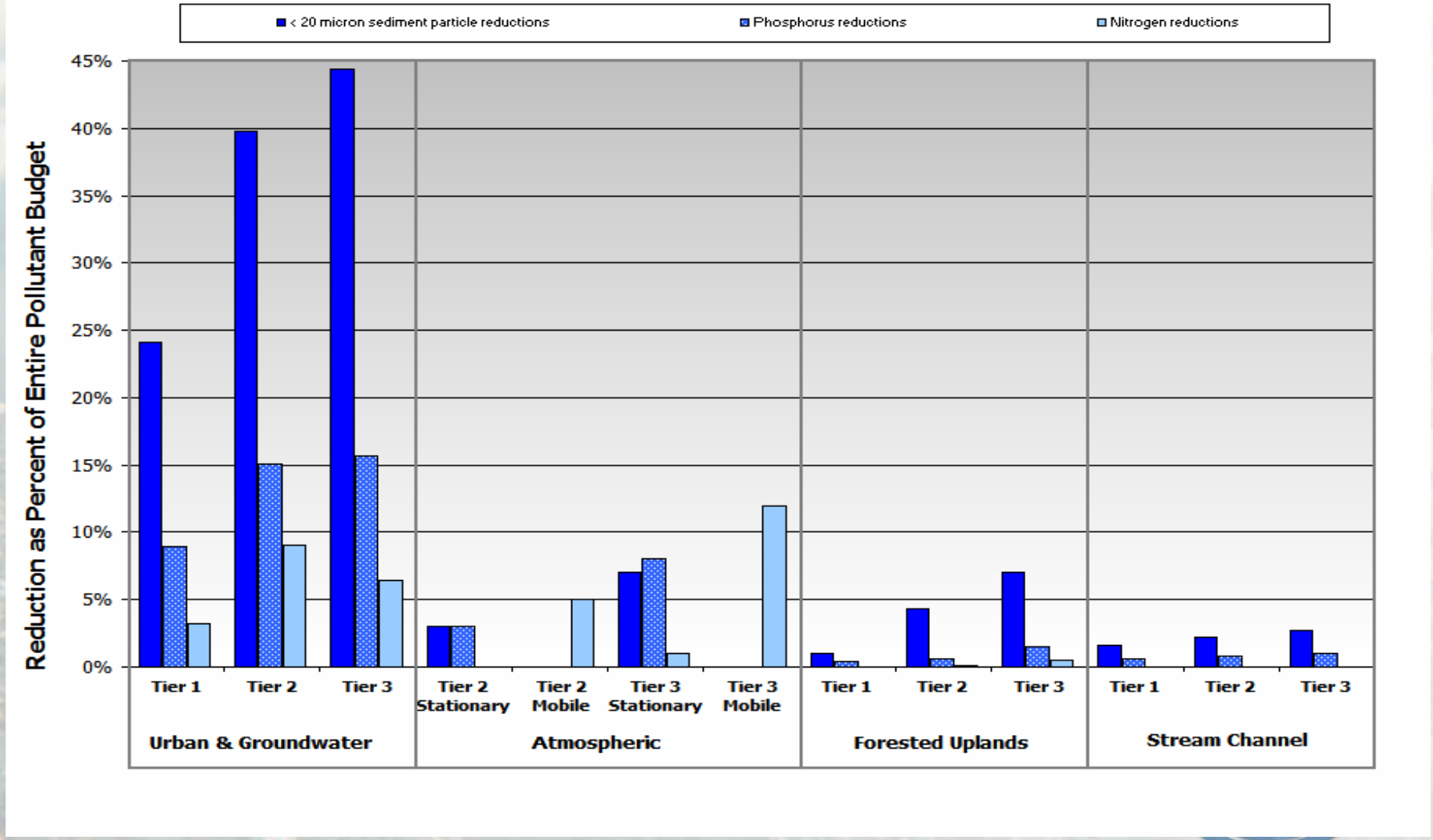
Load Reduction Opportunities



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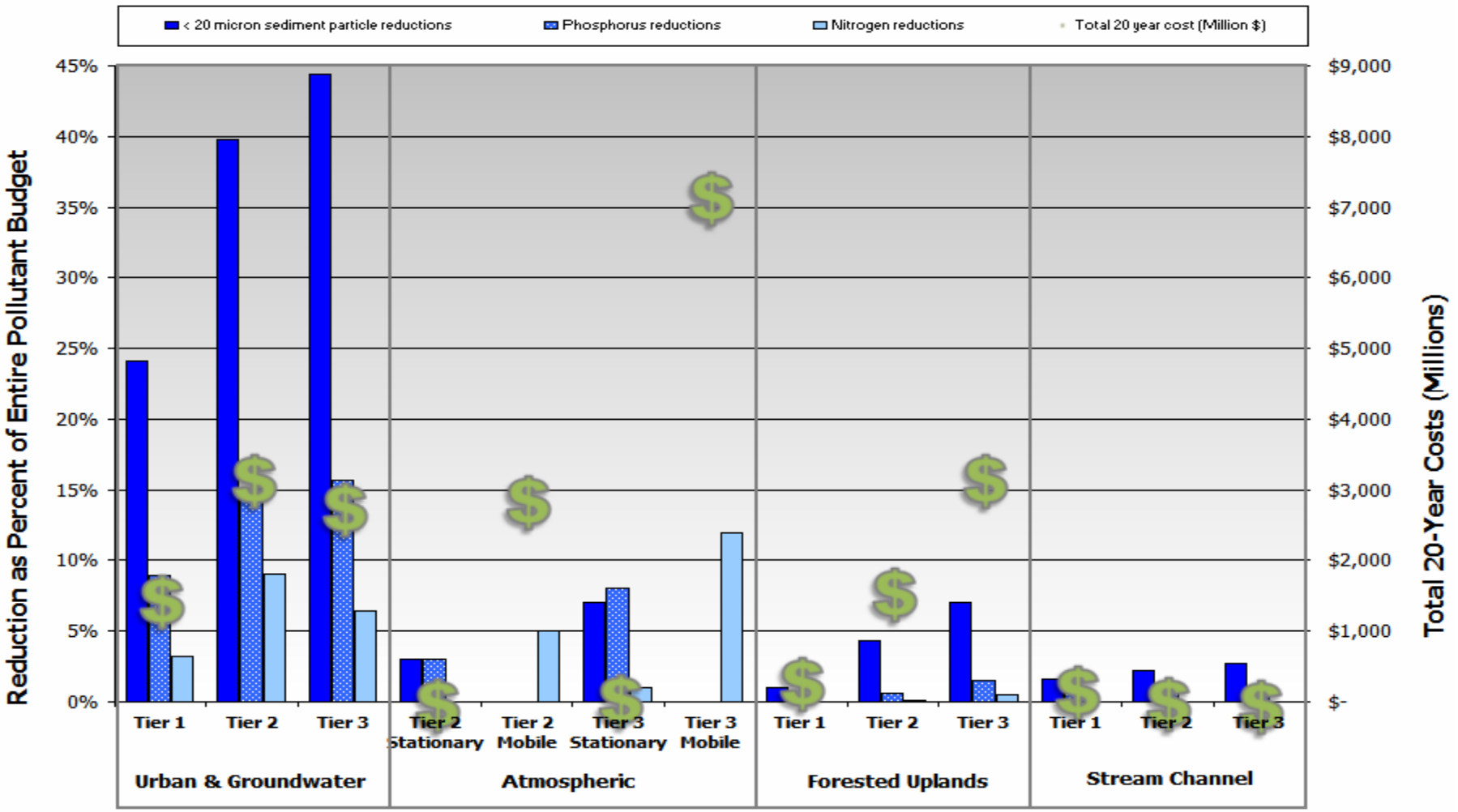
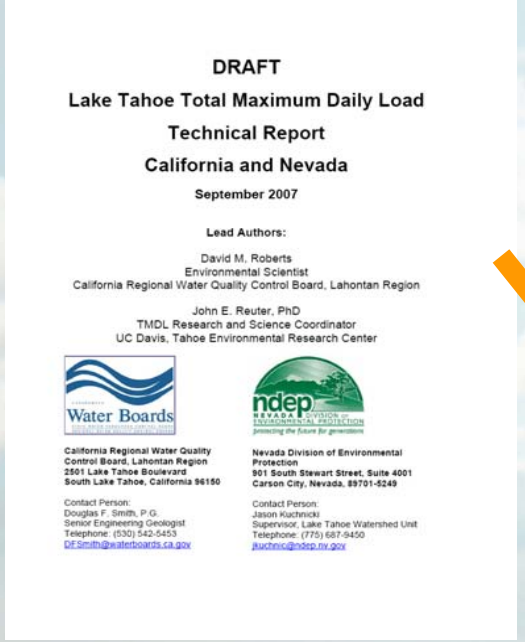
Combined Load Reductions & Costs





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Lake Tahoe Total Maximum Daily Load

Technical Report

California and Nevada

September 2007

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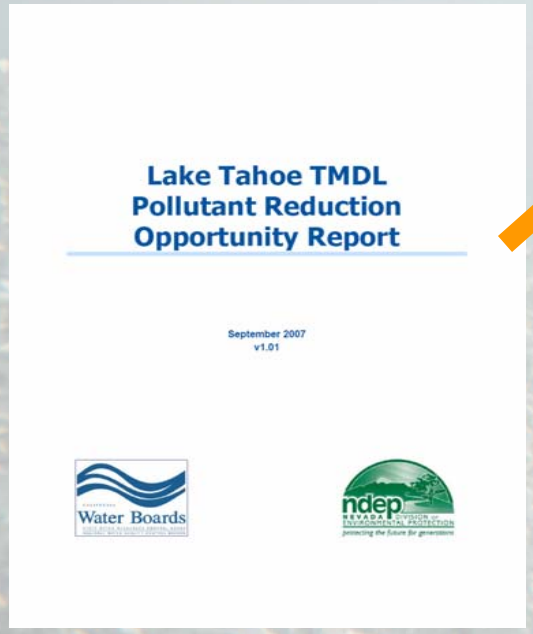
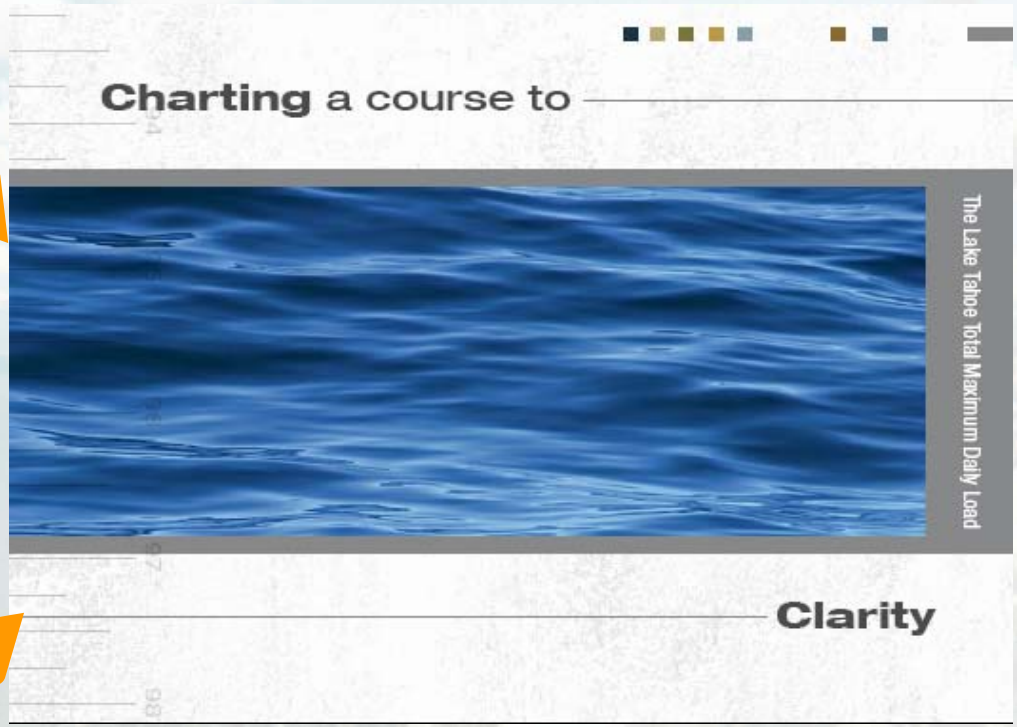


Lake Tahoe TMDL
Pollutant Reduction
Opportunity Report

September 2007
v1.01



http://www.waterboards.ca.gov/lahontan

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Urban Uplands Strategy

- Continue to implement known technologies
- Move toward innovative practices and intensive O&M

- Achieve ~25% reduction in total fine particle budget
- Estimated Cost: $1.3B Capital
  $6M Annual O&M

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Atmospheric Deposition Strategy

- Focus on dust control measures
- Continue VMT reduction efforts
- Achieve ~5% reduction in total fine particle budget
- Estimated Cost: $45M Capital, $0.4M Annual O&M

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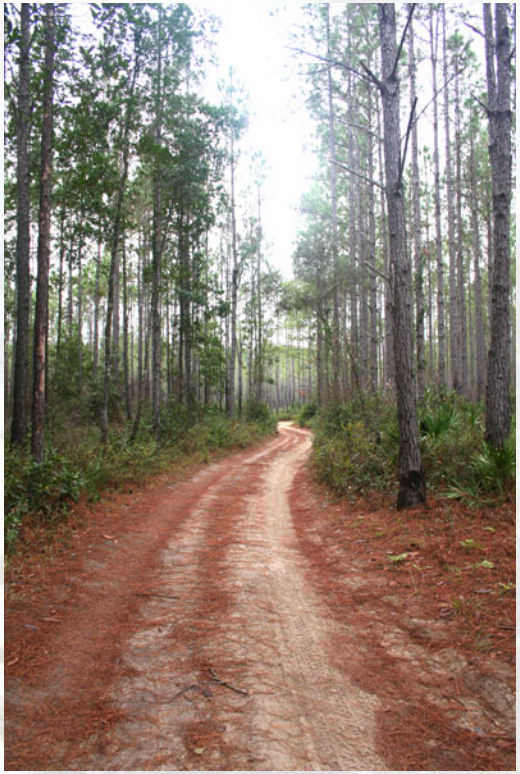
Forest Uplands Strategy



- Restore/maintain roads as planned
- Revegetate/treat disturbed lands
- Treat forest fuels
- Achieve ~1% reduction in total fine particle budget
- Estimated Cost: $120M Capital, $4.5M Annual O&M

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Stream Channel Restoration Strategy

- Continue current restoration activities
- Support monitoring and research
- Achieve ~2% reduction in total fine particle budget
- Estimated Cost: $40M Capital

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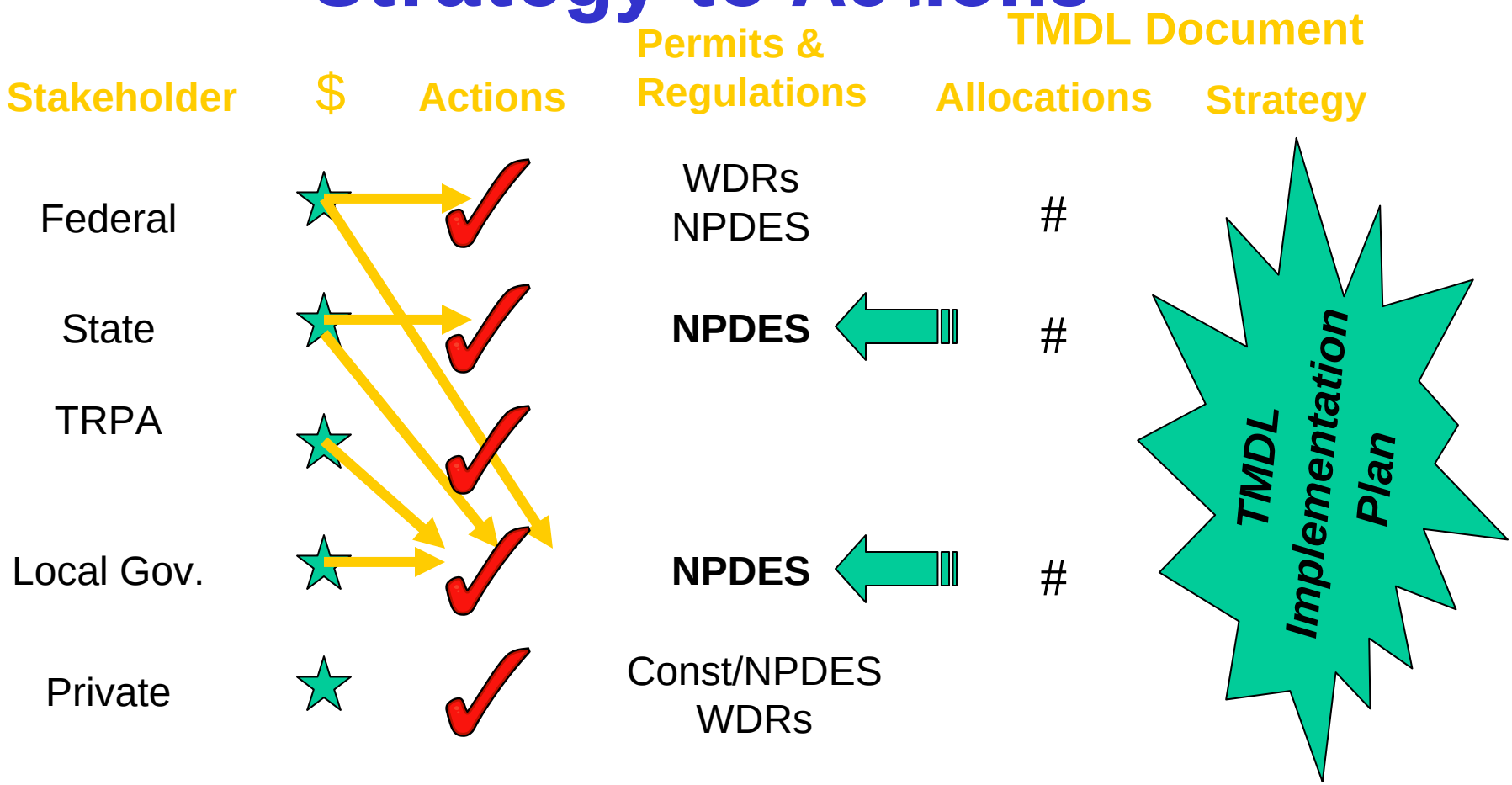
Connecting the TMDL Strategy to Actions



How do all the TMDL pieces fit together?

Strategy

- Demonstrates the "Clarity Challenge" is achievable
- Provides implementation cost estimates
- Offers one approach for "assigning" load reductions
- Does not prescribe specific actions
- Opportunities for innovation remain

What we are doing now?

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Pollutant Load Allocations

- Allocation = allowable numeric loads to achieve water quality goals
- Required by US EPA TMDL process
- Defines “who” is “responsible” for reducing current loads
- Implemented via NPDES Permits and other regulatory programs

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Allocation Approach Options

Total Load	Anthropogenic Inputs
Equal Reduction by Source	Recommended Strategy
Basin-wide	Jurisdiction-specific

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Total Load vs. Anthropogenic Inputs

- Acknowledges a portion of the load is "background"
- Emphasizes the "human caused" loading
- Bulk of the Total Load **is** Anthropogenic

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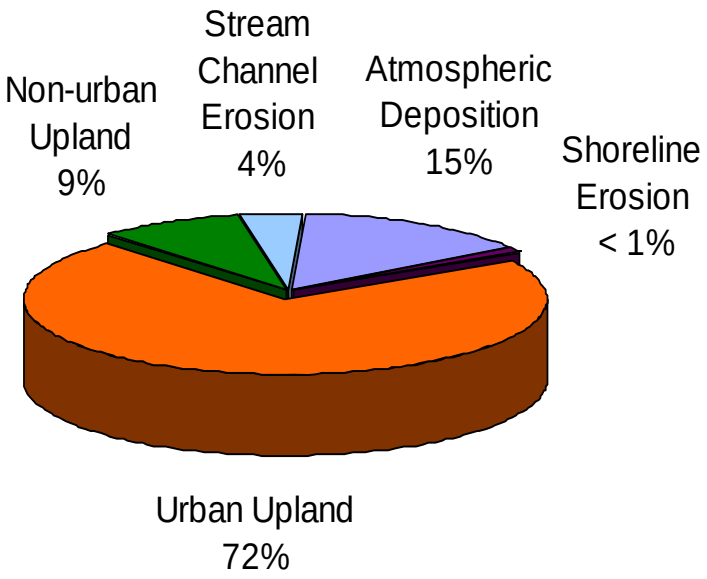
Source Contributions

Fine Sediment Particle Number Estimates (particles less than 20 micrometers): Percent Contribution per Source Category



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Allocations based on Recommended Strategy

Source percentages = the needed percent reduction (at 15 years) divided by the percent contribution

Forest Uplands: 1%/9% = **12%**
Stream Channel Erosion: 1.8%/3% = **53%**
Atmospheric Deposition: 4.6%/15% = **31%**
Urban Uplands: 24.5%/72% = **34%**

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Allocations based on Equal Source Reductions

Source percentages = the needed percent reduction (at 15 years) divided by the percent contribution

Forest Uplands: 2.9%/9% = **32%**
Stream Channel Erosion: 1.3%/3% = **32%**
Atmospheric Deposition: 4.8%/15% = **32%**
Urban Uplands: 23.0%/72% = **32%**

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Equal Source Reductions vs. Recommended Strategy

Percent Reduction of **Basin-wide** Particle Load

	Recommended Strategy	Equal Source Reduction
Forest Uplands	1.0%	2.9%
Stream Channel	1.8%	1.3%
Atmospheric	4.6%	4.8%
Urban Uplands	24.5%	23%

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Equal Source Reductions vs. Recommended Strategy

Allocations - Recommended Strategy:

- Provides reasonable assurance
- Considers ability to reduce
- Provides identified, cost effective solutions

Allocations - Equal Source Reductions:

- Perception of fairness and equity
- Does not account for ability to reduce
- Relies on implementation community to determine most cost effective reduction opportunities

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Basin-wide vs. Jurisdiction-specific Allocations

Urban Uplands allocations are often Jurisdiction-specific to facilitate regulation

Load allocations could be basin-wide

- Forest Uplands
- Stream Channel Erosion
- Atmospheric Deposition

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Next Steps

- Range of alternatives for EIS scoping
- Implementation Strategy input to TRPA Regional Plan development efforts
- Draft load reduction allocations
- TRPA Regional Plan
- Tahoe TMDL

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