

# Lake Tahoe TMDL

California Regional Water Quality Control Board  
Lahontan Region

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**November 6, 2008**



# What is the Lake Tahoe TMDL?

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





# What pollutants are causing Lake Tahoe's clarity loss?

## Lake Tahoe Clarity Model

- 10+ years of research and development
- A Process Based Numerical Model
- Several Models Combined Into One:
  - Hydrodynamic/Thermodynamic Model
  - Biological/Ecological Model
  - Particle Fate Model
  - Optical Model

# What pollutants are causing Lake Tahoe's clarity loss?

- Suspended fine sediment particles
- Floating algae – fed by nutrients
- Fine sediment particle (<20 micrometers) accounts for ~2/3 of the clarity conditions



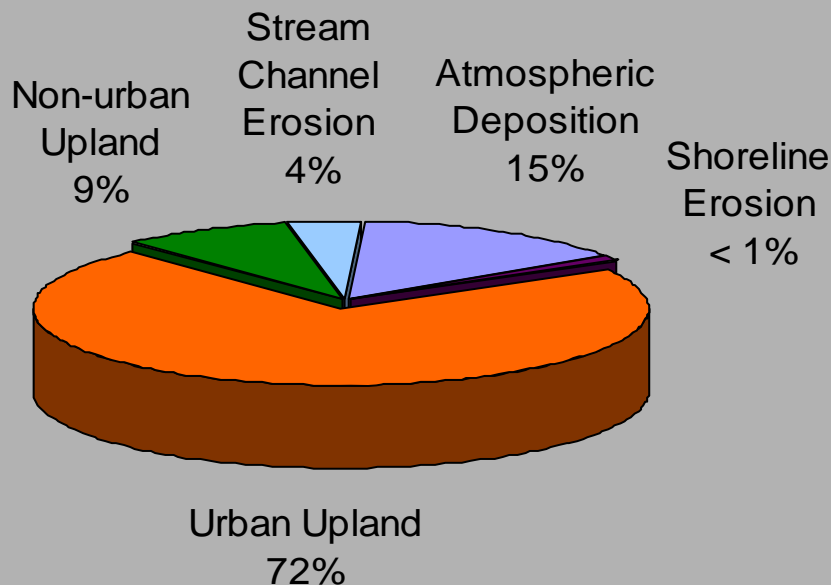
# How much of each pollutant is reaching Lake Tahoe?

**\$6M research effort to quantify current loads**

- Lake Tahoe Watershed Model
- National Sed. Lab Stream Channel Erosion
- USACE Groundwater study
- CARB/UC Davis Atmospheric Deposition

# How much of each pollutant is reaching Lake Tahoe?

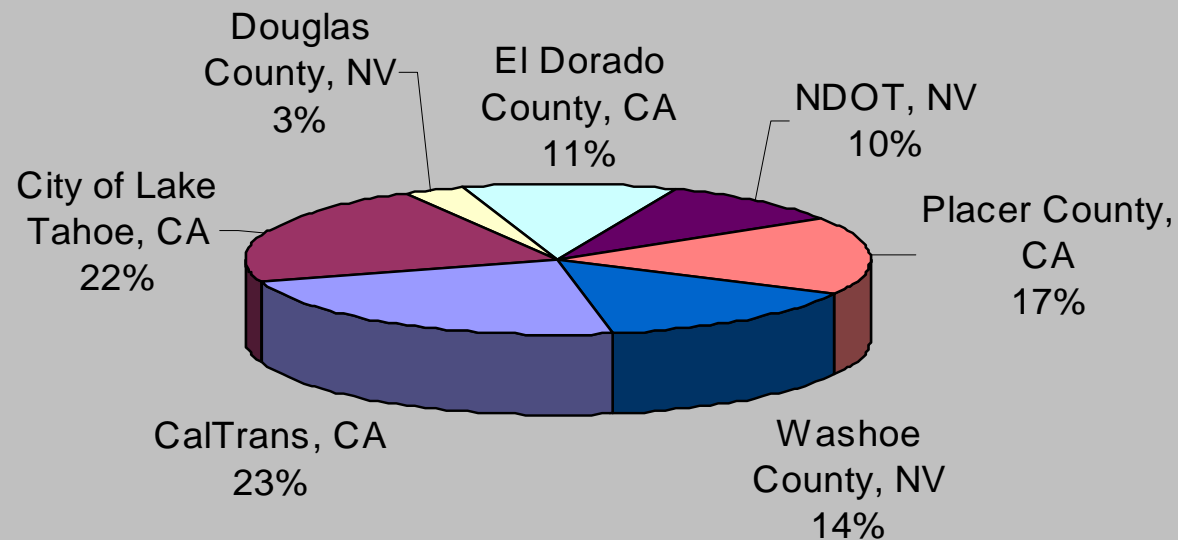
## Fine Sediment Particle Number Estimates (particles less than 20 micrometers): Percent Contribution per Source Category



Total Fine Particle Load:  $481 \times 10^{18}$  Particles

# Urban Particle Loads – How the 72% is Distributed

## Urban Fine Sediment Particle Number Estimates - Percent by Jurisdiction



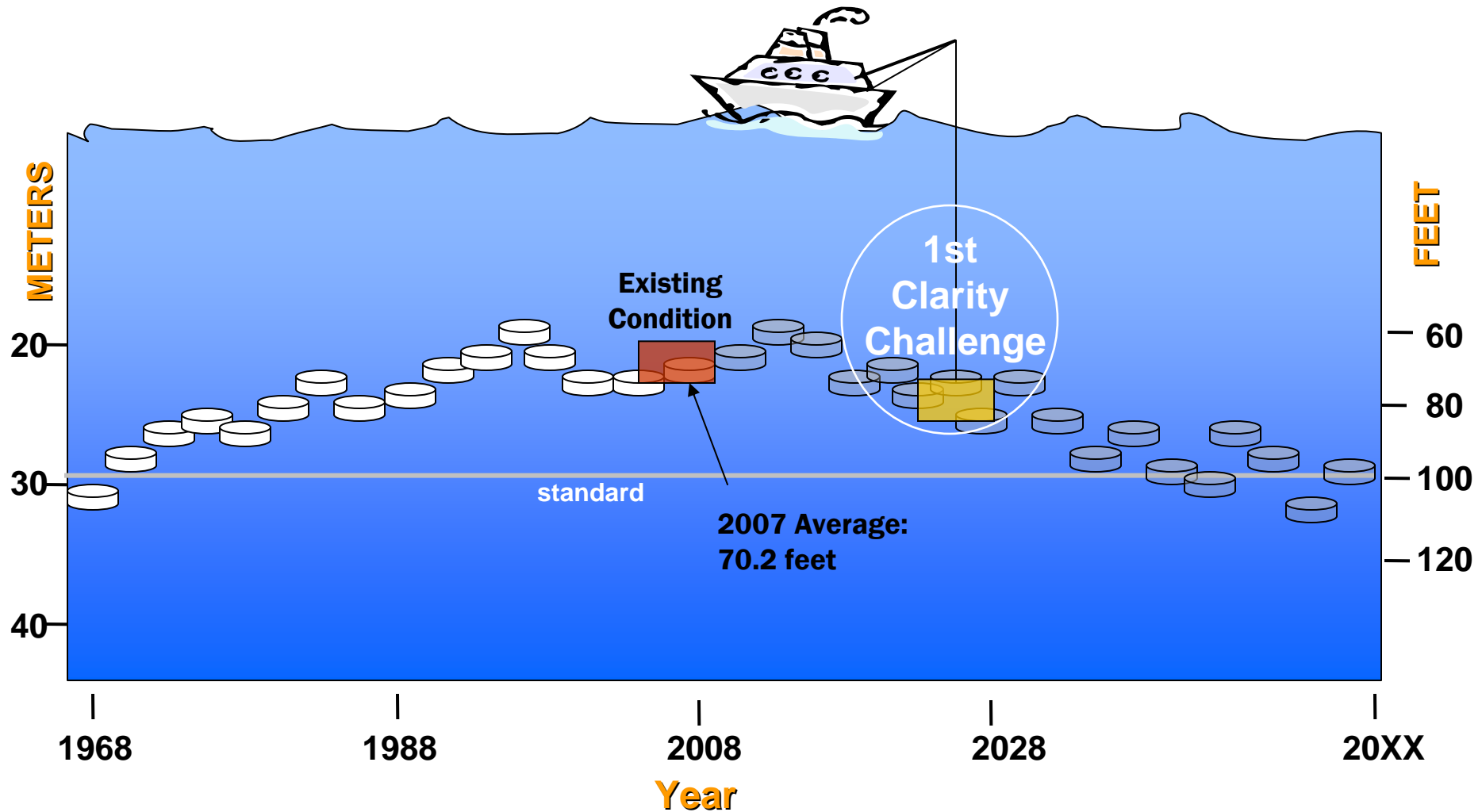
# What is a reasonable interim target?







# The Clarity Challenge: Reverse clarity decline and measurably improve clarity



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





# Pollutant Reduction Opportunity Project

Four Source Category Groups

Assessed different levels of effort (Tiers)

Evaluated site scale and basin-wide implementation (Settings)

Provided average load reductions and costs

Estimates offer relative benefit comparisons

# Forest Uplands Recommended Strategy

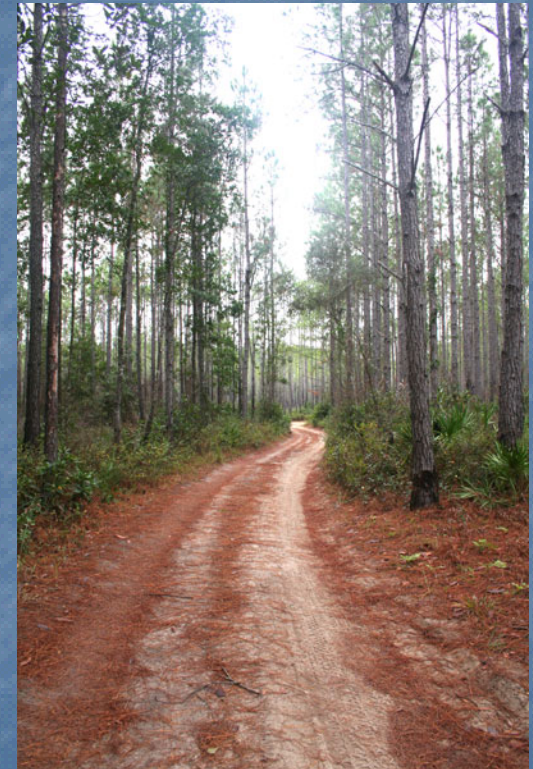
Restore/maintain roads as planned

Revegetate/treat disturbed lands

Treat forest fuels

Achieve ~1% reduction in total fine  
particle budget (12% of Forest load)

Estimated Cost: \$120M Capital,  
\$4.5M Annual O&M



# Stream Channel Restoration Recommended Strategy



Continue current restoration activities on the UTR, Blackwood and Ward Creeks

Support monitoring and research

Achieve ~2% reduction in total fine particle budget (53% of Stream source)

Estimated Cost: \$40M Capital

# Atmospheric Deposition Recommended Strategy

Focus on dust control measures

Continue VMT reduction efforts

Achieve ~5% reduction in total fine  
particle budget (31% of  
Atmospheric source)

Estimated Cost: \$45M Capital,  
\$0.4M Annual O&M



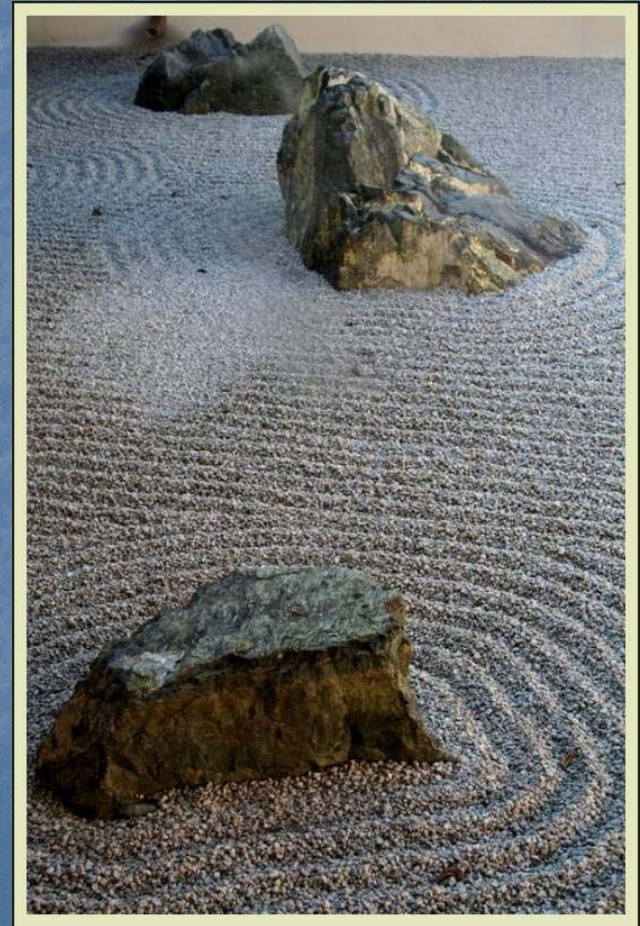
# Urban Uplands Recommended Strategy

Continue to implement known technologies

Move toward more innovative practices and intensive operations and maintenance

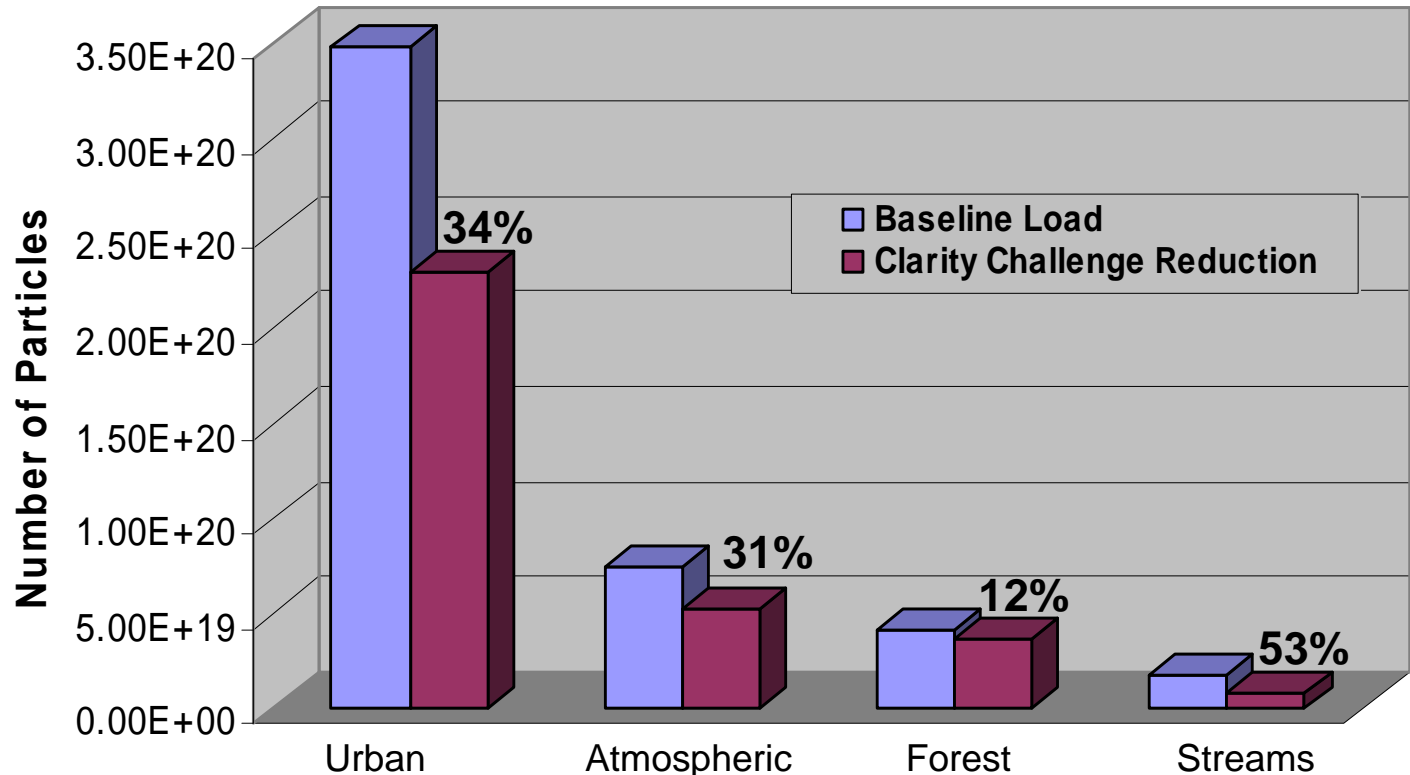
Achieve ~25% reduction in total fine particle budget (34% of Urban Source)

Estimated Cost: \$1.3B Capital, \$6M Annual O&M



# Recommended Strategy

## Particle Load Reductions by Source Category



**Current Particle Load and Percent Reduction Target**



# What do we need to do differently?

- Focus on fine sediment particles
- Implement innovative stormwater treatment measures
- Enhance storm water facility operations and maintenance practices
  - Sweeping
  - Inspections

# Crediting, Tracking, Accounting

## Water Quality Crediting Goals

- Provide consistent water quality benefit assessment for the urban source
- Motivate action & focus on effectiveness to improve water quality
- Create incentives for innovation
- Increase flexibility for and cooperation between permitted entities
- Define permit requirements & progress towards meeting load reduction milestones

# Crediting, Tracking, Accounting

## Related Projects

- Pollutant Load Reduction Model
- Rapid Assessment Projects
  - Water Quality Improvement projects
  - Stormwater facilities maintenance assessment
- Pollutant Load Reduction Accounting and Tracking

# Schedule

- Draft to State of CA Peer Review: January 2009
- Public Draft: June 2009
- Anticipated Water Board Adoption: October 2009
- State Water Board and EPA Approval: January 2010

A scenic landscape photograph of a large lake, likely Lake Tahoe, with mountains in the distance. The foreground is filled with dense green trees and bushes. The water is a deep blue, and the sky is clear and bright. The word "Questions?" is overlaid in large red font in the center of the image.

**Questions?**



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