Pollutant Load Allocations in TMDLs: An Overview

Minnesota Pollution Control Agency

TMDL Training Program for Local Government Leaders and Other Water Resource Managers

Session 12

Presentation Goals

Discuss:

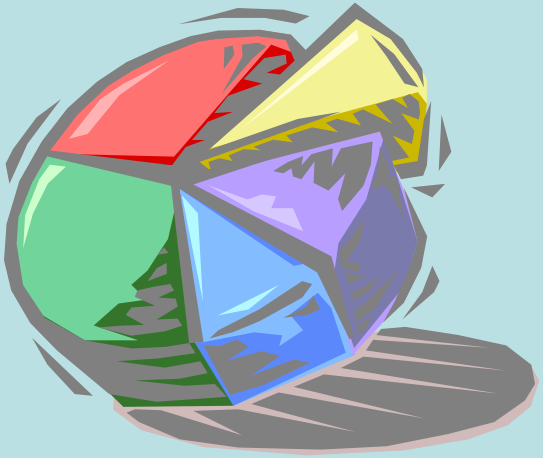
- The major steps in developing an allocation formula
- When to include stakeholders in the process
- Lessons learned from completed TMDL studies

Your TMDL Process So Far

- ✓ Conducted data inventory
- ✓ Reviewed data
- ✓ Identified data gaps
- ✓ Collected additional information
- ✓ Organized and analyzed data to determine causes and sources of impairment

Next Step…

Develop pollutant load allocations



The Heart of a TMDL Study is the Pollutant Load Allocation

Formula:

LA(s) + WLA(s) + Margin of Safety + Reserve Capacity =

Total Maximum Daily Load

Where:
LA = Load allocations from nonpoint sources

WLA = Waste load allocations from point sources

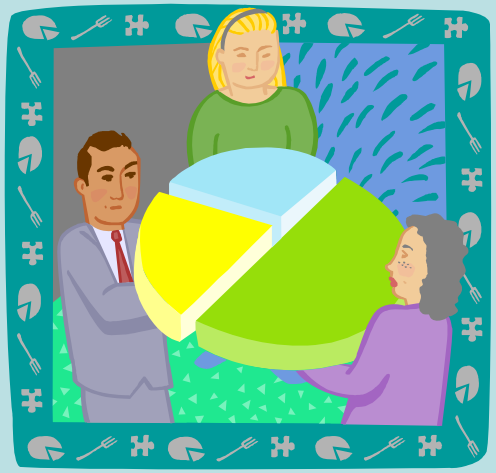
Margin of Safety = to account for potential scientific error

Reserve capacity = set aside for future development

The pollutant load allocation ensures that water quality standards will be maintained for a waterbody, while allowing for human development (present and future)

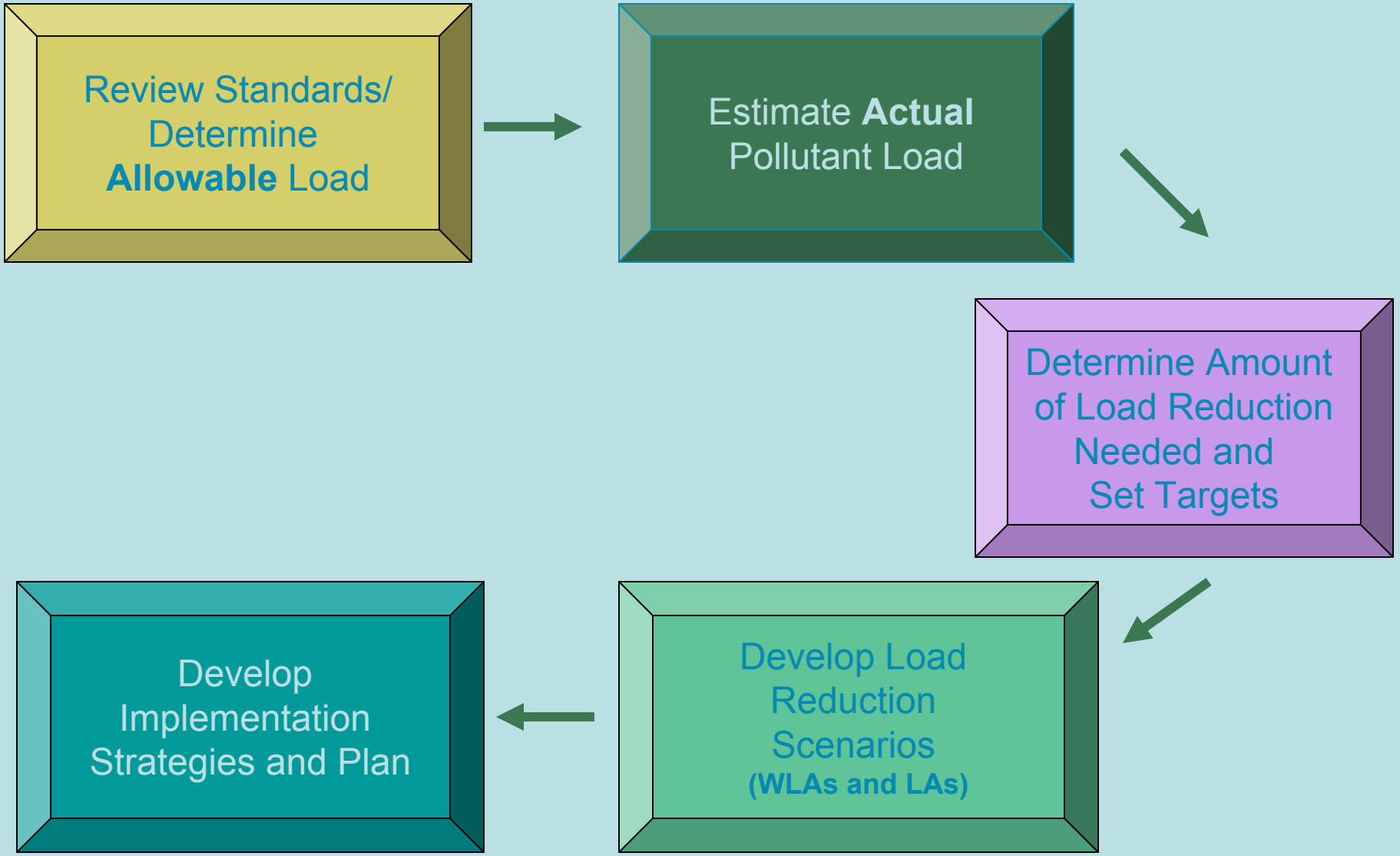
No Two Pollutant Load Allocations Are the Same

- Some TMDLs do not require intensive pollutant allocation negotiations
- Some have more limited stakeholder involvement processes



This slide show describes the process used for more complex projects with significant civic engagement

The Pollutant Load Allocation Process At a Glance



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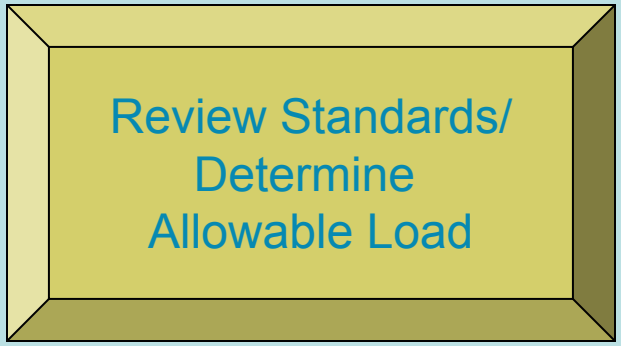
Step 1: Review Water Quality Standards and Determine Allowable Load



Calculate allowable pollutant load for your waterbody

To calculate allowable pollutant load:

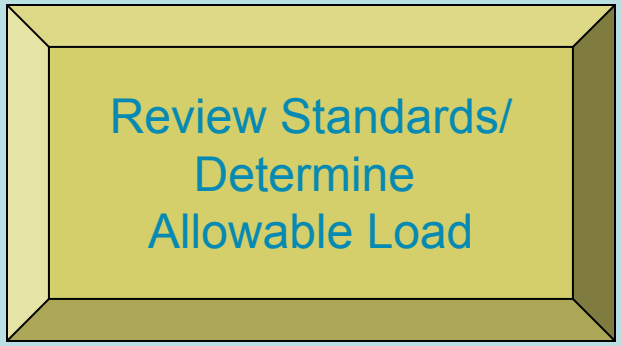
1. **Simple method:**

Critical flow x water quality criterion = allowable load

2. **Complex method**:

Determine using fully calibrated and verified model

Step 1: Review Water Quality Standards and Determine Allowable Load



If you use a model to determine allowable load, explain why you chose that specific model

- Explain how it meets the conditions of your TMDL
- Summarize how your model works
- Provide calibration/validation to show how well the model simulates the waterbody
- Provide a discussion of the strengths and weaknesses of the model

(Source: USEPA)

Step 2: Estimate Actual Pollutant Loads

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Estimate Actual Pollutant Load

Estimate actual pollutant load using monitoring data collected for TMDL study

(Module 9)

Step 3: Determine Amount of Load Reduction Needed and Set Targets

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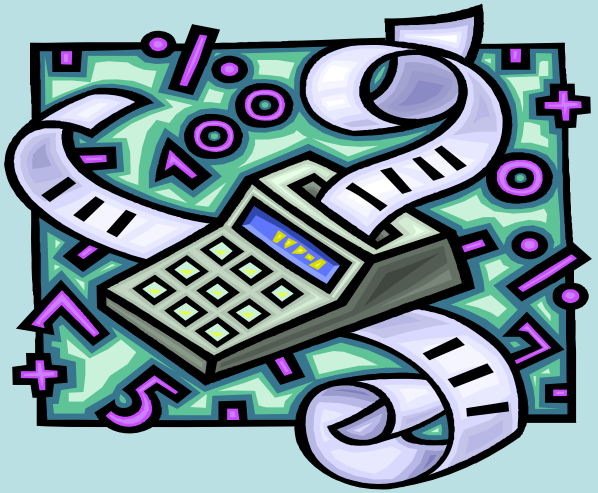
Determine Amount of Load Reduction Needed and Set Targets



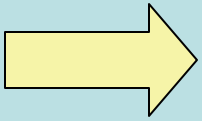
Use models, non-models (e.g., duration curves) or qualitative evaluations to define needed load reductions

Develop Load Reduction Scenarios- Example

Develop Load Reduction Scenarios **(WLAs and LAs)**

Quantify the amount a specific condition must change in order to meet water quality standards or other water quality goals

Example: Must achieve a 50% reduction in phosphorus loading to the Blue River to meet dissolved oxygen standards



Example: Blue River – Examine Existing Impairment

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Pounds of phosphorus discharged to Blue River	
Current Phosphorus Load = Nonpoint: 700 lbs. + Point: 300 lbs.	1000 lbs
Acceptable Phosphorus Load (that will allow water body to meet WQ standards)	500 lbs * Includes Margin of Safety and Reserve Capacity
Phosphorus Reduction Needed	500 lbs

Then, Develop Various Scenarios That Could Reduce P Loads

	Option I	Option II, etc.
Point sources (now 300 lbs.)	??	??
Nonpoint sources (now 700 lbs.)	??	??
Reserve & Margin of Safety	??	??
Total P Load (Allowable Load)	500 lbs.	500 lbs.

Develop a variety of options, as needed

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Possible Options to Reduce Pollutant Loads

1. Address nonpoint sources only (voluntary)

   Examples:

   -- Target sloped lands

   -- Plant perennial crops

   -- Improve feedlots

2. Address point source reductions only

   Examples:

   -- Permit WWTFs at 1 mg/L

   -- Address stormwater discharges

3. Require nonpoint and point source reductions

Examine Potential Load Reduction Options

	Option I	Option II
Point sources (now 300 lbs.)	200	
Nonpoint sources (now 700 lbs.)	250	
Reserve & Margin of Safety	50	
Total P Load	**500 lbs.**	

Possible Load Reduction Options

	Option I	Option II
Point sources (now 500 lbs.)	200 lbs.	150 lbs.
Nonpoint sources (now 500 lbs.)	250 lb	150 lbs.
Reserve & Margin of Safety	50 lbs.	200 lbs.
Total P Load	**500 lbs.**	**500 lbs.**

Or other options, as needed

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Margin of Safety

- You will need to explain why you have chosen a specific margin of safety and how it accounts for uncertainty
- Make sure to explain why you believe the MOS is conservative

Discuss Potential Restoration Options Among Experts

Develop Implementation Strategies and Plan

- Engage in dialogues about potential options with agency and local government staff as first step
- Determine how existing programs and authorities could be used to meet pollutant load reduction goals
- Have these conversation before working with Stakeholder Advisory Committee

Take Potential Restoration Options to Stakeholders

Develop Implementation Strategies and Plan

- Develop decision criteria for screening a list of potential restoration options
  - -- May take several meetings to accomplish
  - -- May decide to develop an economic analysis of each option
- Present a variety of options to stakeholders and test against decision criteria
- Generate additional options, if needed

Select Final Pollutant Reduction Option

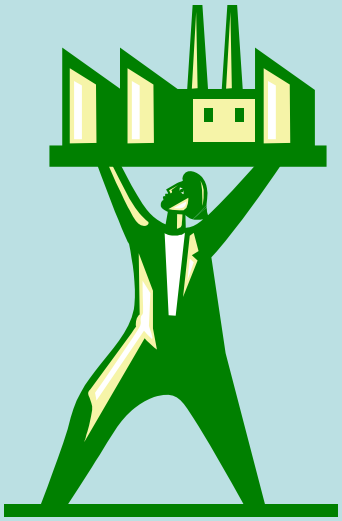
- Some suggested criteria for selecting load reduction options:

Sustainable over the long term
Technically sound
Politically feasible
Affordable
Achievable
Others?

Make Use of Opportunity to Share Information

- Meetings with stakeholders are opportunities to share ideas about:
  - Watershed science
  - Types of actions/options for restoring water quality
  - Socio-political issues
  - Local conditions that may affect implementation of selected option(s)
  - Benefits/costs of selecting specific options

Listen Carefully to the Public



- The public and stakeholders have to have ownership in the solutions
- Especially critical when planning for Best Management Practices implementation

Remember: Be truthful and transparent in discussing the strengths and weaknesses of various options for improving water quality

Verify Technical Soundness of the Selected Restoration Option

- Using calculation tools, verify that selected option will result in needed load reductions to meet water quality goals
- Finalize the allocation formula based on verified restoration plan

Lessons Learned from Completed TMDL Projects

1. Build an effective allocation team: stakeholders, facilitators, technical experts
2. However, carefully develop modeling work and options upfront before bringing stakeholders into the process
3. Carefully design your stakeholder meetings to make them more efficient and effective

Lessons Learned from Completed TMDL Studies

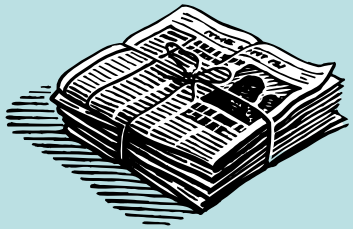
4. Have polished, clear presentations developed when presenting findings
5. Explain what you know about the sources of pollution causing impairment(s) and how you could prioritize those for implementation
6. Provide sound, realistic alternatives that participants can weigh against others to meet standards

Lessons Learned from Completed TMDL Studies

7. If models are used, develop a short primer on the model for stakeholders
8. You may have to develop an extensive outreach campaign to ensure that all critical parties receive and understand what you have developed

Lessons Learned from Completed TMDL Studies

9. Fact sheets and news releases may be needed to explain findings
10. A media tour may also be needed to present results



Contacts