Minnesota Pollution Control Agency

Medicine Lake
Excess Nutrients
TMDL project:
Pollutant Load
Allocations
in TMDLs

*Steering Committee
Meeting #3
March 12th, 2009

Photo by: Terrie Christian—President, AMLAC
Presentation goals

Discuss:

What the TMDL really is and expectations for achieving goals

The major steps in developing an allocation formula

Connecting the modeling results to the TMDL
What is a TMDL

The TMDL is simply the maximum load (pollutant quantity per year or day) that cannot be exceeded in order to meet water quality standards.

- A TMDL is a load that is determined through a scientific process
- How that load is met is determined with the stakeholders and detailed in the implementation plan
- Depending on the water quality of the lake and watershed conditions achieving the required loading may take several years.
The heart of a TMDL study is the pollutant load allocation.

Formula–

\[ \text{LA(s)} + \text{WLA(s)} + \text{Margin of Safety} + \text{Reserve Capacity} = \text{Total Maximum Daily Load} \]

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA</td>
<td>Load allocations from nonpoint sources</td>
</tr>
<tr>
<td>WLA</td>
<td>Waste load allocations from point sources</td>
</tr>
<tr>
<td>Margin of Safety</td>
<td>To account for potential scientific error</td>
</tr>
<tr>
<td>Reserve Capacity</td>
<td>Set aside for future development</td>
</tr>
</tbody>
</table>
The pollutant load allocation process at a glance

1. Determine allowable load
2. Estimate actual pollutant load
3. Determine load reduction needed
4. Develop load reduction scenarios (WLAs and LAs)
5. Develop implementation strategies and plan
Step 1: Review water quality standards and determine allowable load

Determine allowable phosphorus load for lake:

1. **Estimation method**
   Use lake model calibrated to *estimated* actual loads

2. **Calculation method**
   Use lake model calibrated to *measured* actual loads
Step 1: Review water quality standards and determine allowable load

The Water Quality Standard (sometimes with a MOS included) determines the goal for the TMDL.

Lake water quality models determine allowable load (the TMDL) for lakes:
- BATHTUB has been selected to determine the allowable load for Medicine lake
- AMOUNT and QUALITY of measured loading data determine the accuracy of the lake model
Step 2: Estimate actual pollutant loads

Estimate actual pollutant load using monitoring data collected for TMDL study

- A large amount of high quality data exists for Medicine Lake (unusual for most TMDLs)
- Measured actual loads are being used to calibrate subwatershed loads in the P8 model
Step 3: Determine load reduction needed

This is done by comparing the current watershed load to the allowable load necessary to meet WQ standards (the TMDL).

Individual allowable loads may be specified – a reduction may or may not be needed for all subwatersheds.

The reduction needed is achieved through the activities laid out in the implementation plan.
Step 4: Develop load reduction scenarios

Quantify potential load reductions to meet water quality goals

Examples –
- Reductions of 35% for watershed load, 15% for internal load
- Reductions of 20% for watershed load, 30% for internal load
Step 4: Develop load reduction scenarios

Several load reduction scenarios will be developed.

Adaptive Management is a critical component to achieving water quality standards.

A timeframe for the various scenarios will also be included.
Step 5: Discuss potential restoration options

- Existing practices have been identified:
  - Loadings estimated from subwatershed
  - Subwatersheds with significant treatment of Phosphorus may already be meeting or exceeding necessary reductions
- Technical team will provide steering committee with a variety of options to consider

Develop implementation strategies and plan
Questions???

Photo by: Terrie Christian—President, AMLAC