Nutrient Concentrations by Sub-basin and Ecoregion

Prepared for the Prioritization and Nutrient Criteria Workgroup Meetings
April 15 & 16, 2014
Nutrient Results

- Total nitrogen and total phosphorus
- NDDoH and USGS river and stream data collected during the last 10 years (January 1, 2004 through December 31, 2013)
- Includes ambient river and stream monitoring data, USGS high-low flow network, Section 319 watershed assessment and implementation project, and TMDL development project data
- Results presented as box and whisker plots
Box and whisker plots
Box and whisker plots

- Maximum
- 75th percentile
- Median (50th percentile)
- 25th percentile
- Minimum

Total P Conc. (mg/L)
Subbasin (8-digit) hydrologic unit codes from the U.S. Geological Survey/NRCS hydrologic unit boundaries map of 1990 (1:250,000-scale).

- County Boundary
- 1:250K Subbasin Boundary

NORTH DAKOTA DEPARTMENT OF HEALTH
Total Phosphorus by Sub-basin

Data for 39 of 50 HUCs
Thresholds Used to Evaluate the Data

• EPA Nutrient Ecoregion Thresholds
  – Published 2000 and 2001
  – Based on ecoregions
  – 1990 to 2000 data
  – “Reference condition” based on 25th percentiles of aggregate data

• Western EMAP Pilot “Thresholds”
  – Based on aggregate level III ecoregions
    • Rangeland Plains and Cropland Plains
  – Reference condition based on 25th percentile of aggregate “reference site” data
Nutrient Ecoregions

Nutrient Ecoregion IV
Level III Ecoregion 43

Rangeland Plains Ecoregion

Nutrient Ecoregion V
Level III Ecoregion 42

Nutrient Ecoregion VI
Cropland Plains Ecoregion

Level III Ecoregion 46

Level III Ecoregion 48
# EPA Nutrient Ecoregion Thresholds for Rivers and Streams

<table>
<thead>
<tr>
<th>Nutrient Ecoregions</th>
<th>Total N (mg/L)</th>
<th>Total P (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td>0.56</td>
<td>0.023</td>
</tr>
<tr>
<td>V</td>
<td>0.88</td>
<td>0.067</td>
</tr>
<tr>
<td>VI</td>
<td>2.18</td>
<td>0.076</td>
</tr>
</tbody>
</table>
## EMAP Nutrient Thresholds for Rivers and Streams

<table>
<thead>
<tr>
<th>Aggregate Ecoregions</th>
<th>Total N (mg/L)</th>
<th>Total P (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rangeland Plains</td>
<td>0.886</td>
<td>0.07</td>
</tr>
<tr>
<td>Cropland Plains</td>
<td>1.525</td>
<td>0.228</td>
</tr>
</tbody>
</table>
Nutrient Ecoregion IV
Level III Ecoregion 43
Rangeland Plains Ecoregion

Nutrient Ecoregion V
Level III Ecoregion 42

Nutrient Ecoregion VI
Cropland Plains Ecoregion

Level III Ecoregion 46
Level III Ecoregion 46

Rangeland Plains Ecoregion
Total N – Level III Ecoregions in ND

- Nutrient Ecoregion IV = 0.56 mg/L
- Nutrient Ecoregion V = 0.88 mg/L
- Nutrient Ecoregion VI = 2.18 mg/L
- Rangeland Plains Threshold = 0.886 mg/L
- Cropland Plains Threshold = 1.525 mg/L
Total P - Rangeland Plains Sub-basins

Threshold=0.070 mg/L
Total N - Rangeland Plains Sub-basins

Threshold = 0.886 mg/L

Sub-basin
Total P – Cropland Plains/
Level VI Ecoregion Sub-basins

Cropland Plains = 0.228 mg/L
Nut Eco VI = 0.076 mg/L
Total N – Cropland Plains/
Nutrient Ecoregion VI Sub-basins

Cropland Plains=1.525 mg/L
Nut Eco VI=2.18 mg/L
Questions?

Questions?
Total P – Nutrient Ecoregion IV Sub-basins

Rangeland Plains=0.070 mg/L
Nut Eco IV=0.023 mg/L
Total N – Nutrient Ecoregion IV Sub-basins

Rangeland Plains = 0.886 mg/L
Level IV = 0.56 mg/L
Total P – Nutrient Ecoregion V Sub-basins

Rangeland Plains=0.070 mg/L
Nut Eco V=0.067 mg/L
Total N – Nutrient Ecoregion V Sub-basins

Rangeland Plains = 0.886 mg/L
Nut Eco V = 0.88 mg/L