Why?

- **EPA 9 Minimum Elements**
  - Estimate pollutant reduction loads expected from implementation of plan recommendations

- **Additional/Optional RegionalCriterion**
  - Set target pollutant-load reductions for impaired waters taking into account both point and nonpoint source pollution
How Do We Start?

Evaluate Current Water Quality Conditions
Methods

Currently considering a combination of tools:

- Hydrological Simulation Program - Fortran (HSPF)
- Spreadsheet Tool for Estimating Pollutant Load (STEPL)
- Long Term Hydrologic Impact Assessment Tool (L-THIA)
What will we be modeling?

- Fecal Coliform
- Total Nitrogen
- Total Phosphorus
- Total Suspended Sediment/Solids
HSPF Model

- Fox River Study Group
- Illinois State Water Survey
- Simulates watershed hydrology and water quality
□ Annual nutrient loading is simulated based on:
   Runoff volume
   Pollutant concentrations
    ■ Land use distribution
    ■ Management practices

□ The annual sediment load is estimated based on:
   Universal Soil Loss Equation (USLE)
   Sediment delivery ratio
L-THIA

- Purpose of the model:
  - Estimate water quality impacts from land use change

- Uses land use and soil data to estimate:
  - Runoff
  - Nonpoint source pollution

- Does model Fecal Coliform
Regional Criterion # 2

Set target pollutant-load reductions for impaired waters taking into account both point and nonpoint source pollution
## US EPA Ecoregion Nutrient Recommendations

<table>
<thead>
<tr>
<th>Nutrient Parameter</th>
<th>Ecoregion Recommendation (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Phosphorus</td>
<td>0.0725</td>
</tr>
<tr>
<td>Total Nitrogen</td>
<td>2.461</td>
</tr>
</tbody>
</table>

**Draft Aggregations of Level III Ecoregions for the National Nutrient Strategy**

- I. Willamette and Central Valley
- II. Western Forested Mountain
- III. Xeric West
- IV. Great Plains Grass and Shrublands
- V. South Central Cultivated Great Plains
- VI. Corn Belt and Northern Great Plains
- VII. Mostly Glaciated Dairy Region
- VIII. Nutrient Poor Largely Glaciated Upper Midwest and Northeast
- IX. Southeastern Temperate Forested Plains and Hills
- X. Texas-Louisiana Coastal and Mississippi Alluvial Plains
- XI. Central and Eastern Forested Uplands
- XII. Southern Coastal Plain
- XIII. Southern Florida Coastal Plain
- XIV. Eastern Coastal Plain
## Guidelines for Identifying Potential Causes of Impairment of Aquatic Life Use in Illinois Streams

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Statistical Guidelines (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Phosphorus</td>
<td>0.61</td>
</tr>
<tr>
<td>Total Nitrogen</td>
<td>7.8</td>
</tr>
<tr>
<td>Total Suspended Solids</td>
<td>116</td>
</tr>
</tbody>
</table>

## Illinois Water Quality Standards

<table>
<thead>
<tr>
<th>Parameter</th>
<th>General Use Standard</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fecal Coliform</td>
<td>200 (count/100 mL)</td>
<td>Geometric mean based on a minimum of 5 samples taken over not more than a 30-day period.</td>
</tr>
<tr>
<td>Fecal Coliform</td>
<td>400 (count/100 mL)</td>
<td>Not to be exceeded by more than 10% of samples in any 30-day period.</td>
</tr>
</tbody>
</table>
### Guidelines for Identifying Potential Causes of Impairment of Aquatic Life Use in Illinois Streams

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Non-Standards Based Criteria (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Phosphorous</td>
<td>0.61</td>
</tr>
<tr>
<td>Total Suspended Solids</td>
<td>116</td>
</tr>
</tbody>
</table>

### Illinois Acute and Chronic General Use Water Quality Standards

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Acute Standard (mg/L)</th>
<th>Chronic Standard (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Ammonia Nitrogen</td>
<td>15.0</td>
<td>37.5</td>
</tr>
</tbody>
</table>

*Fecal Coliform is the same standard as in 2006*
# Summary Table

<table>
<thead>
<tr>
<th>Source</th>
<th>Total Nitrogen Guidelines/Recommendations (mg/L)</th>
<th>Total Phosphorus Guidelines/Recommendations (mg/L)</th>
<th>Fecal Coliform Standards (cfu/100 mL)</th>
<th>Total Suspended Solids Guidelines (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US EPA</td>
<td>2.461(^1)</td>
<td>0.0725(^1)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Illinois EPA</td>
<td>7.8(^2)</td>
<td>0.61(^2)</td>
<td>200-400(^3)</td>
<td>116(^2)</td>
</tr>
<tr>
<td>Lower DuPage Watershed Draft</td>
<td>3.2(^1)</td>
<td>0.0763(^1)</td>
<td>200(^3)</td>
<td>75(^4)</td>
</tr>
<tr>
<td>Hickory Creek Watershed Draft</td>
<td>2.461(^1)</td>
<td>0.61(^2)</td>
<td>400(^3)</td>
<td>116(^2)</td>
</tr>
<tr>
<td>CMAP Recommendations</td>
<td>2.46(^1)</td>
<td>0.61(^2)</td>
<td>400(^3)</td>
<td>116(^2)</td>
</tr>
</tbody>
</table>

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1 US EPA Ecoregion Recommendation  
2 Illinois EPA Guideline  
3 Illinois EPA Standard  
4 US EPA Fisheries Recommendation
## Load Reduction Required from Current Conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>HSPF % Reduction</th>
<th>L-THIA % Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Nitrogen (lb./year)</td>
<td>95 %</td>
<td>20%</td>
</tr>
<tr>
<td>Total Phosphorus (lb./year)</td>
<td>99%</td>
<td>30%</td>
</tr>
<tr>
<td>Total Sediment (lb./year)</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>Fecal Coliform (10^6 colonies/year)</td>
<td>90%</td>
<td>15%</td>
</tr>
</tbody>
</table>
How will we meet reduction goals?

IMPLEMENT THE WATERSHED PLAN!
EPA Criterion # 2

Estimate pollutant reduction loads expected from implementation of plan recommendations
For More Information…

- **HSPF Model**
  [http://ilrdss.sws.uiuc.edu/fox/](http://ilrdss.sws.uiuc.edu/fox/)

- **STEPL Model**

- **L-THIA**
  [https://engineering.purdue.edu/~lthia/](https://engineering.purdue.edu/~lthia/)

- **USEPA Ecoregion Nutrient Criteria**
  [http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/ecoregions_index.cfm](http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/ecoregions_index.cfm)

- **Illinois EPA Water Quality Standards**
  [http://www.epa.state.il.us/water/tmdl/303d-list.html](http://www.epa.state.il.us/water/tmdl/303d-list.html)
Questions or Comments?

Megan Elberts, E.I., CFM
melberts@cmap.illinois.gov
312-386-8794