

# Assessing the Nation's water quality

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2. How has it changed over time?
3. What will be its condition in the future?

# Assessing the Nation's water quality

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3. What will be its condition in the future?

Environmental Drivers

Climate Variability  
"Natural Factors"

Land and Water Use  
"Human Activities"

Stressors

Contaminants

Streamflow alteration

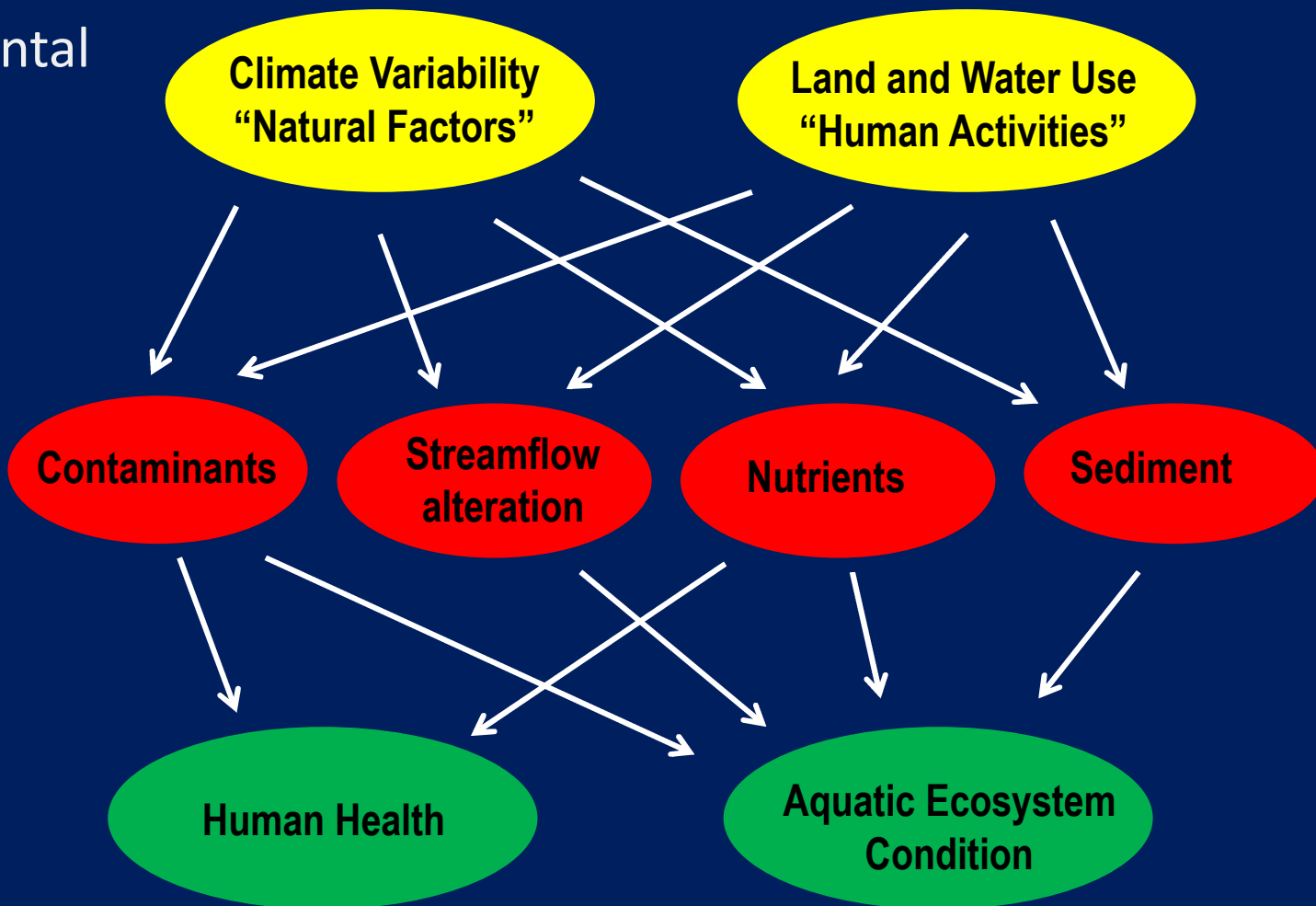
Nutrients

Sediment

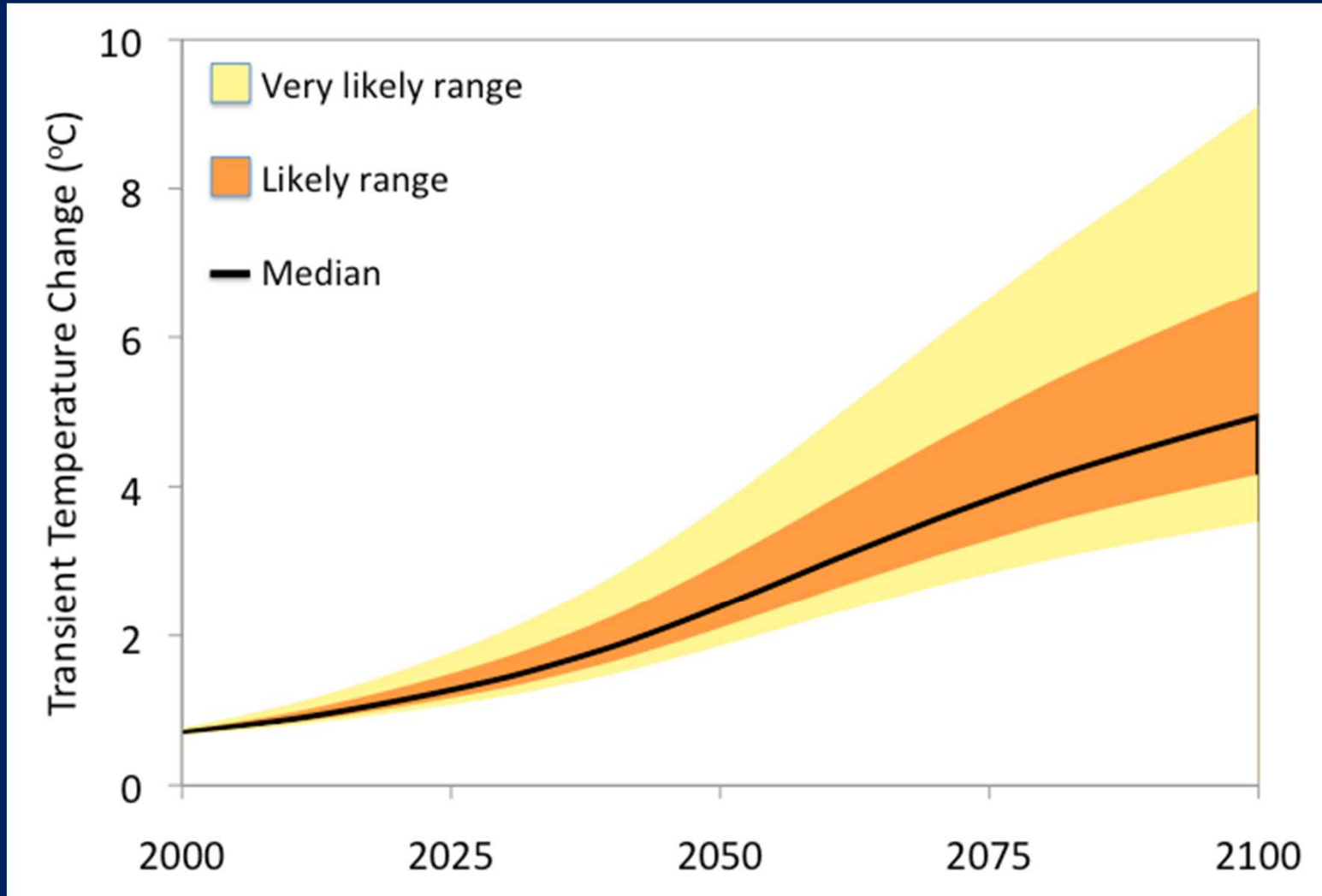
Receptors

Human Health

Aquatic Ecosystem Condition

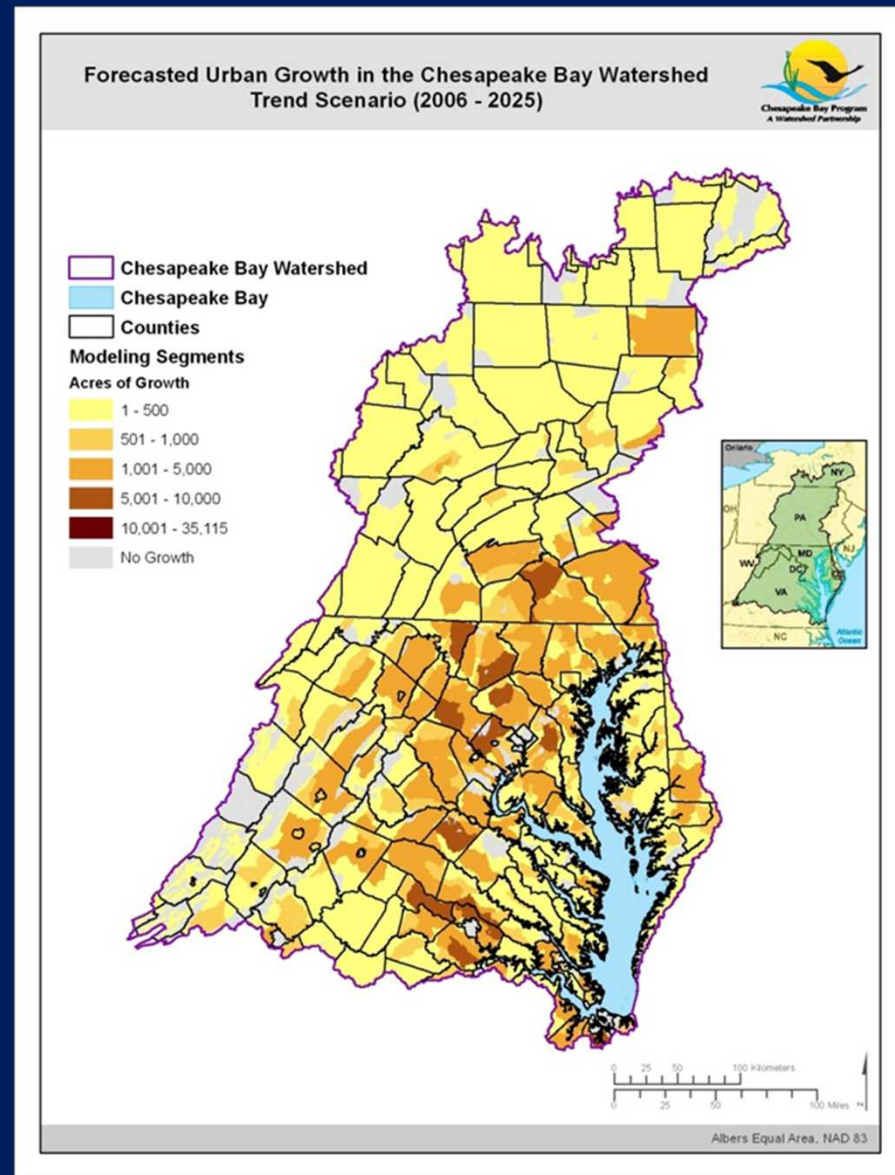


# Drivers of change: **Climate**



Source: Figure from K. Hayhoe

# Drivers of change: Land use



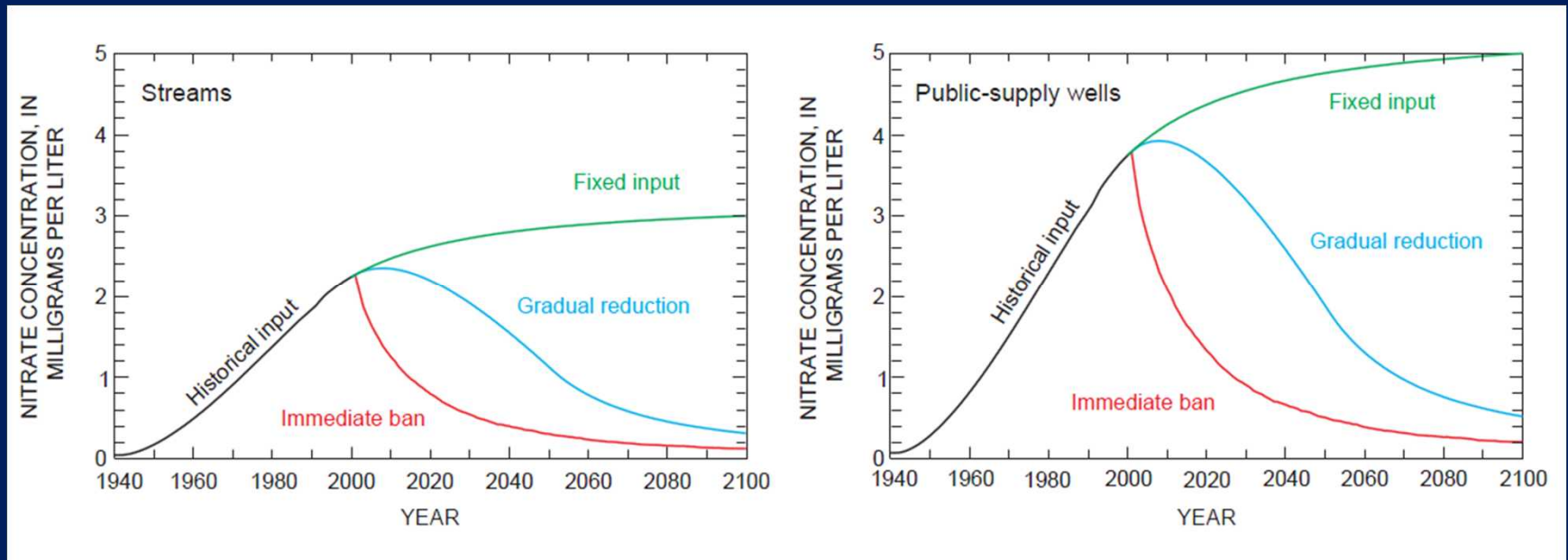
# Drivers of change: **Management practices**



# NAWQA Cycle 3 forecasting products

- **Models** that predict how natural factors and human activities may affect future water quality and ecosystem conditions
- **Model-based decision-support tools** for scientists, managers and policy makers

# Models provide estimates of change in water-quality conditions and lag times



Source: Kauffman, 2001



# Models that predict the suitability of water resources for human and aquatic ecosystem needs

Groundwater

Streams and rivers

Stressors

- Physical
- Chemical

Spatial scales

- National
- Regional
- Watershed and aquifer

# Decision-support tools

- Target audience
  - Policy makers
  - Water resource managers
  - Scientists
- Scales range from national to single aquifer or watershed
- Functionality ranges from simple to complex



## SPARROW Decision Support System MRB07 Nitrogen

<< Home

Display Results   Downstream Tracking   Change Inputs

Find a reach...   Export Data...   Session ▾   Layers

Hide Header/Footer   SPARROW Model / Videos ▾

Map the model results by reach or catchment.

### 1. Select a Data Series

#### Data Series

Total Load ▾

#### Comparison To Original Model

Do Not Compare ▾

### 2. Select a Model Source

#### Model Source

All ▾

Map Units:    Mass    Percent

### 3. Select the map display options

Display:    Reaches    Catchments

Calibration Sites  

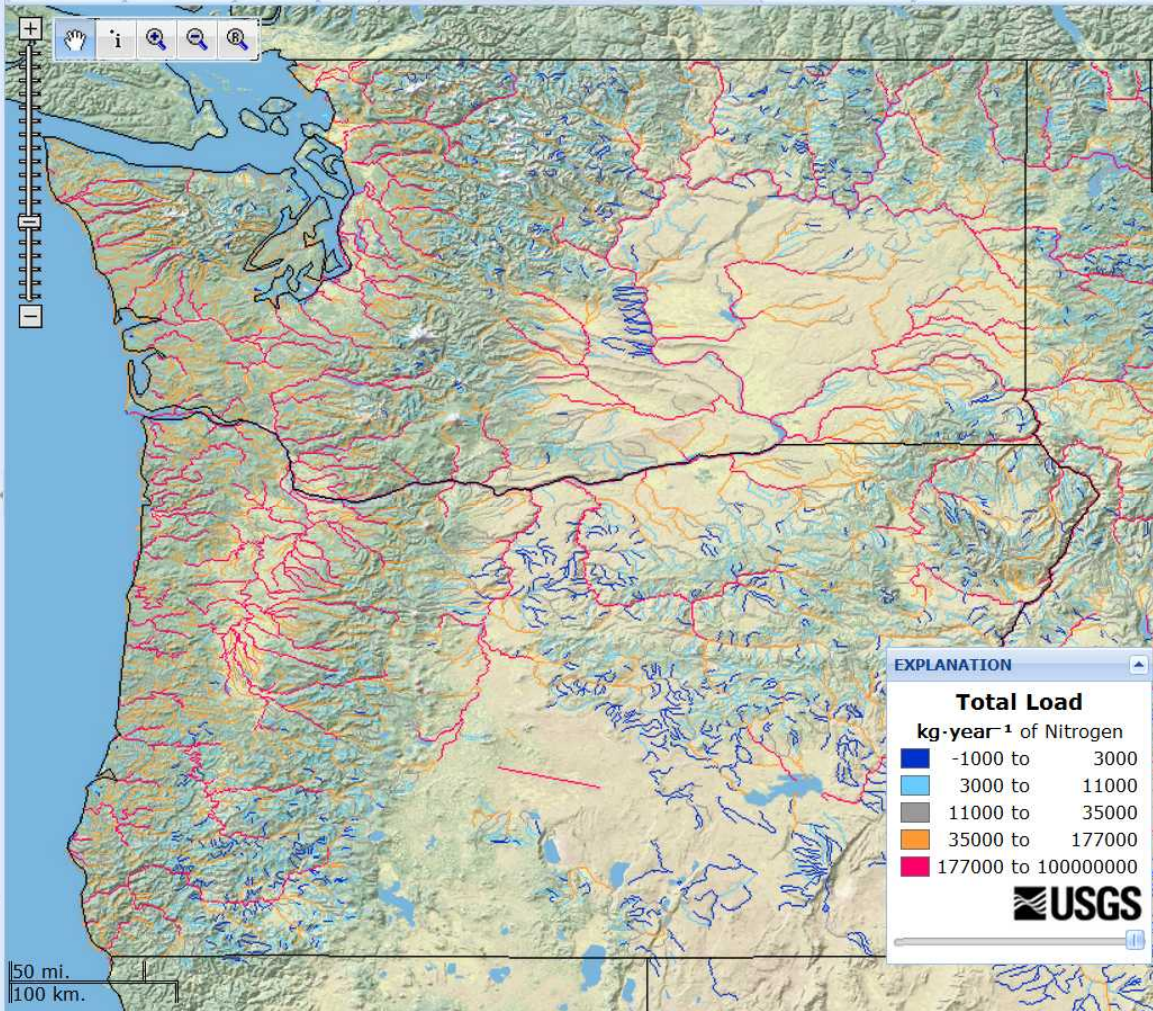
Reach Overlay  

HUC8 Overlay  

#### Binning for Map Color and Legend

5 Custom Bins

Auto binning  



Currently mapping **Total Load**.  
The map is up to date.

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URL: <http://water.usgs.gov/nawqa/sparrow/dss/>

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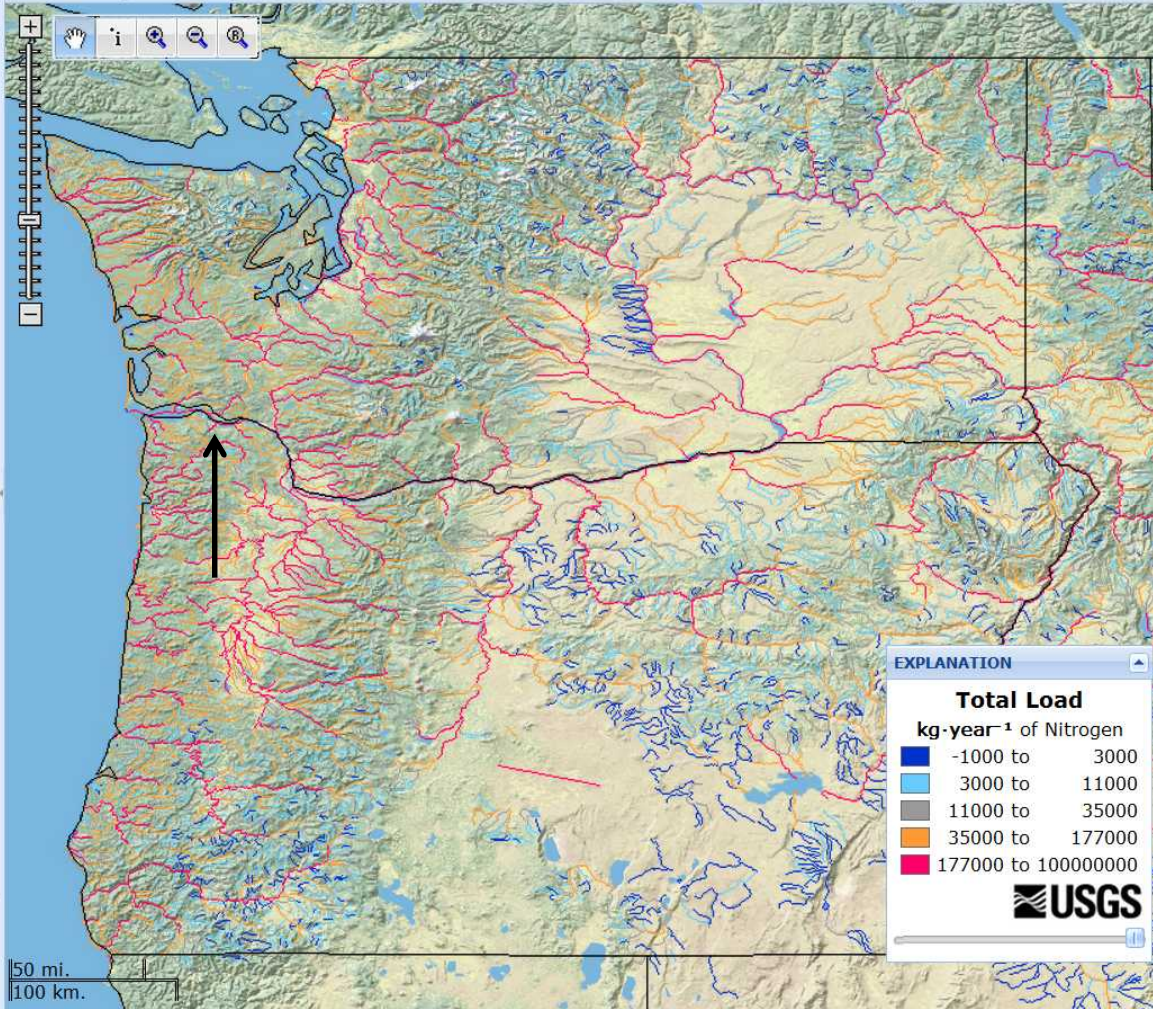
Reach Overlay  

HUC8 Overlay  

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EXPLANATION	
Total Load	
kg·year <sup>-1</sup> of Nitrogen	
<span style="color: blue;">■</span>	-1000 to 3000
<span style="color: lightblue;">■</span>	3000 to 11000
<span style="color: gray;">■</span>	11000 to 35000
<span style="color: orange;">■</span>	35000 to 177000
<span style="color: red;">■</span>	177000 to 100000000

Currently mapping **Total Load**.  
The map is up to date.

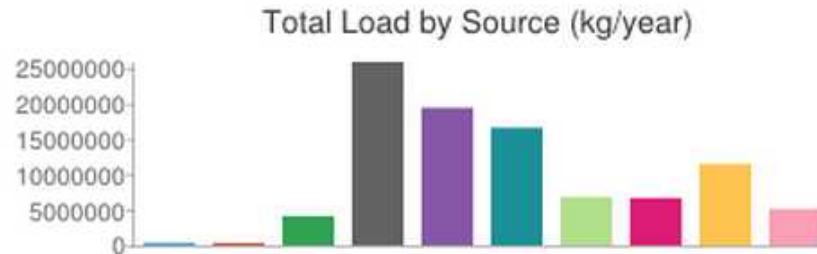
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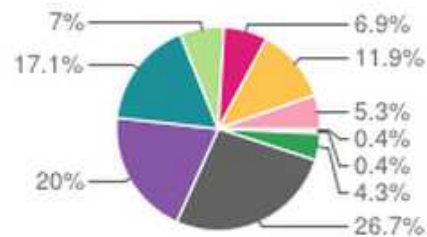
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Share of Total Nitrogen Load by Source



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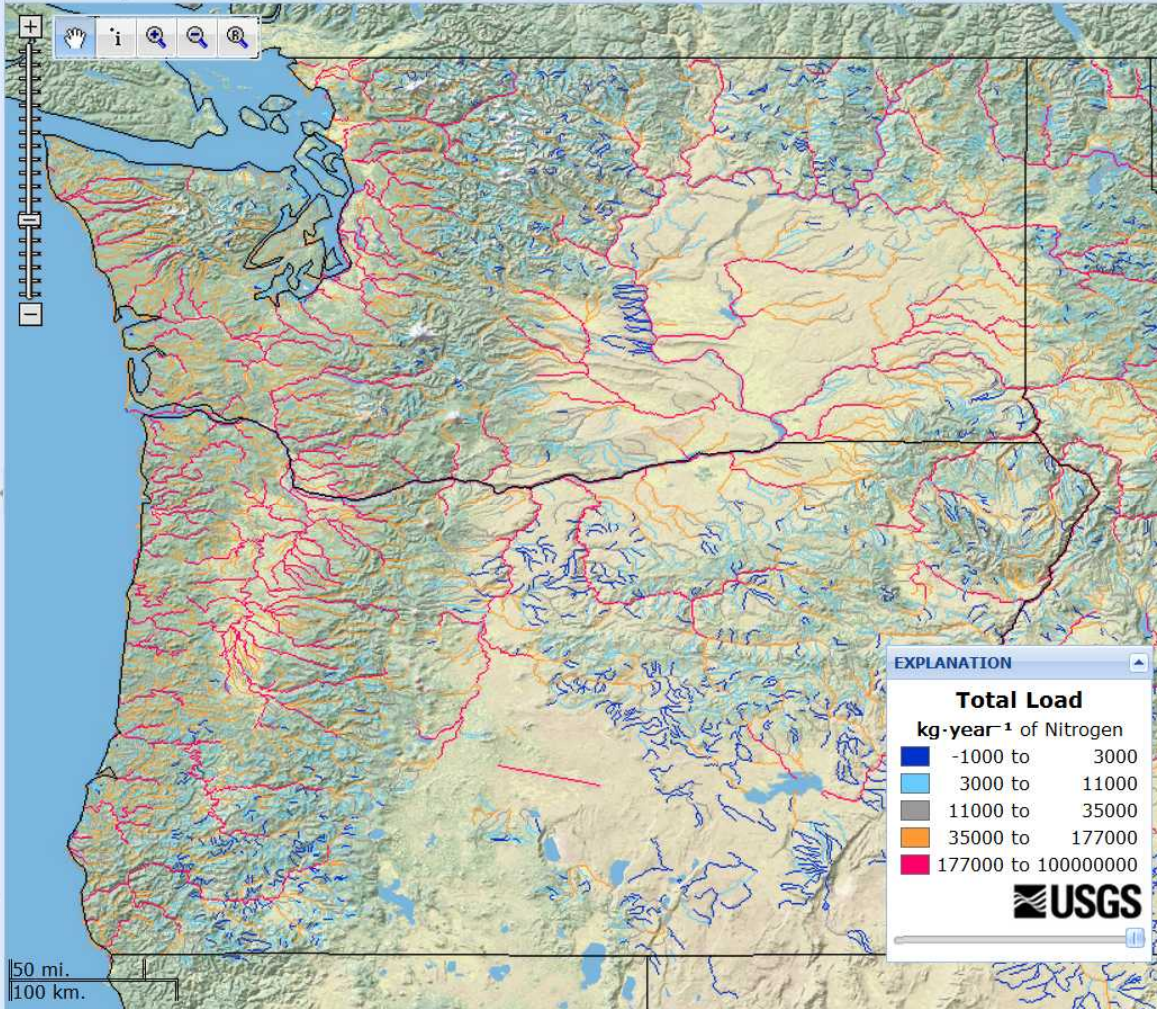
Reach Overlay  

HUC8 Overlay  

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**EXPLANATION**

**Total Load**  
kg·year<sup>-1</sup> of Nitrogen

Blue	-1000 to 3000
Light Blue	3000 to 11000
Grey	11000 to 35000
Orange	35000 to 177000
Red	177000 to 100000000

**USGS**

Currently mapping **Total Load**.  
The map is up to date.

50 mi.  
100 km.

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## Related sessions during the week

- Tue, C6: Dam removal
- Tue, C9: Decision-support systems
- Wed, D4: Climate change impacts on water quality
- Thu, I6: Dam removal





