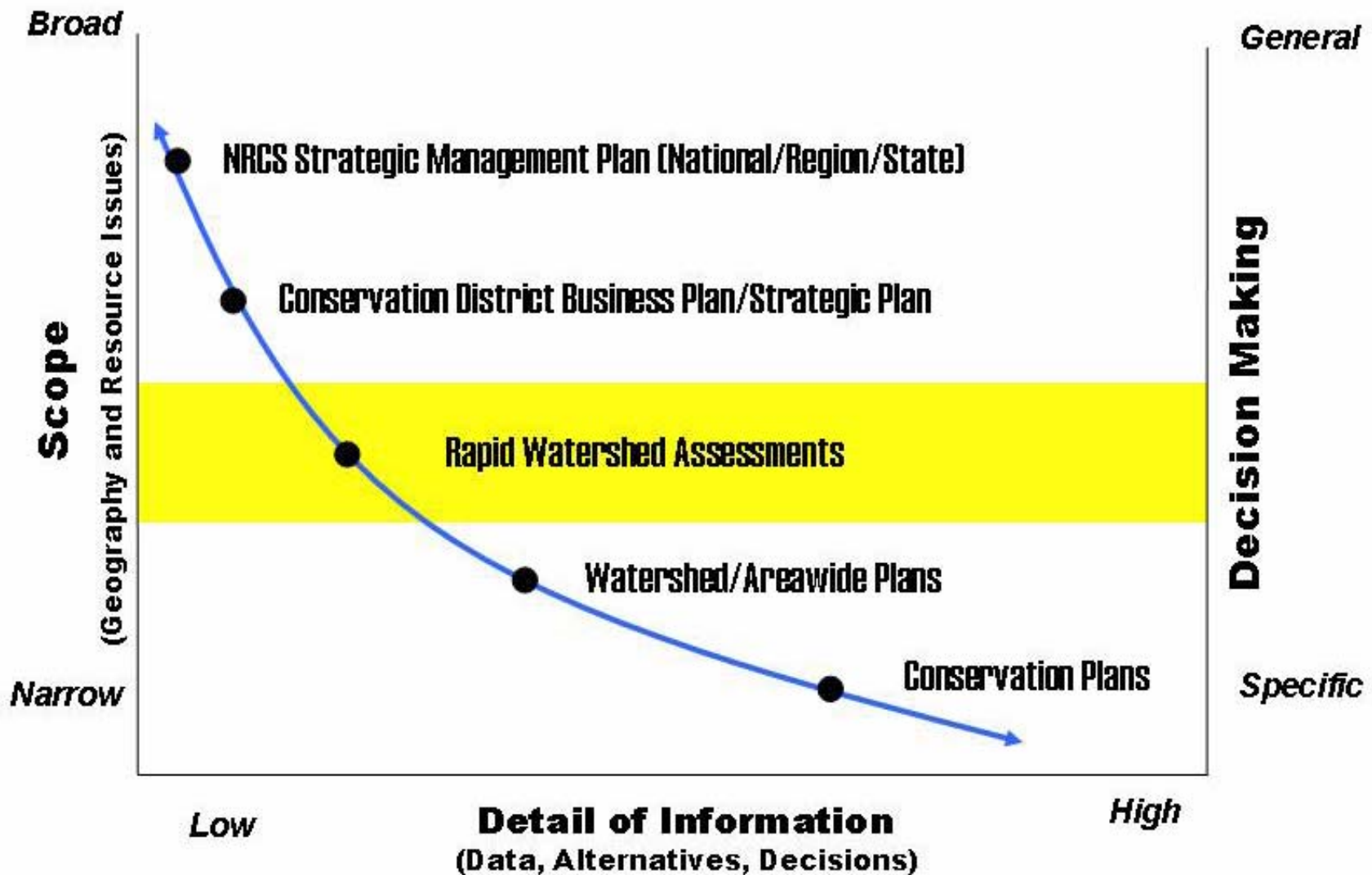# ADDING VALUE TO THE RWA PROCESS

Tim Sweeney
Water Resource Planning Specialist
National Water Management Center
Tim.Sweeney@ar.usda.gov

# NRCS Planning Continuum

# RWA Process

1. Select a watershed
   a. 8 digit Hydrologic Unit or smaller

2. Develop Profile
   a. Identify Concerns

3. Quantify Needs

# SIMPLE ASSESSMENT TOOLS

- KISS – Keeping it Simple
- AGWA2 – Automated Geospatial Watershed Assessment
- GIS NLEAP – Nitrogen Leaching and Economic Analysis Package
- GIS DISPLAY OF NRCS PRS DATA

# KISS Approach

- Resource Concerns
  - Cause & Effect Relationships
    - Causes (Risk Factors)

# KISS Approach

- Soil Data Viewer – Terri Aho WNTC

- SWAPA/CPPE MATRIX/QUALITY CRITERIA
  – Risk Factors

# KISS Concept Application

- EXAMPLES

# CPPE Concern

- Soil Erosion (Sheet & Rill) Risk Factors
  - Rainfall (PRISM, Eng. Storm Event)
  - Soil hydrologic group (SURGO/STATSGO)
  - Slope (SURGO/STATSGO)
  - Land use (USGS, CLU)

# Risk Matrix

| Rainfall within HUC | Low -1 | Medium – 2 | Highest - 3 |
|---|---|---|---|
| Soil Hydrologic Group | A-1 | B-2 | C&D-3 |
| Slope | A – 1 | B – 2 | C&D - 3 |
| Land Use | Forest/ Wetland – 1 | Pasture/ Rangeland - 2 | Crop - 3 |

# Risk Matrix

| Rainfall within HUC | Low -1 | Medium – 2 | Highest - 3 |
|---|---|---|---|
| Soil Hydrologic Group | A-1 | B-2 | C&D-3 |
| Slope | A – 1 | B – 2 | C&D - 3 |
| Land Use | Forest/ Wetland – 1 | Pasture/ Rangeland - 2 | Crop - 3 |

# Precipitation Zones

Providence County

Kent County
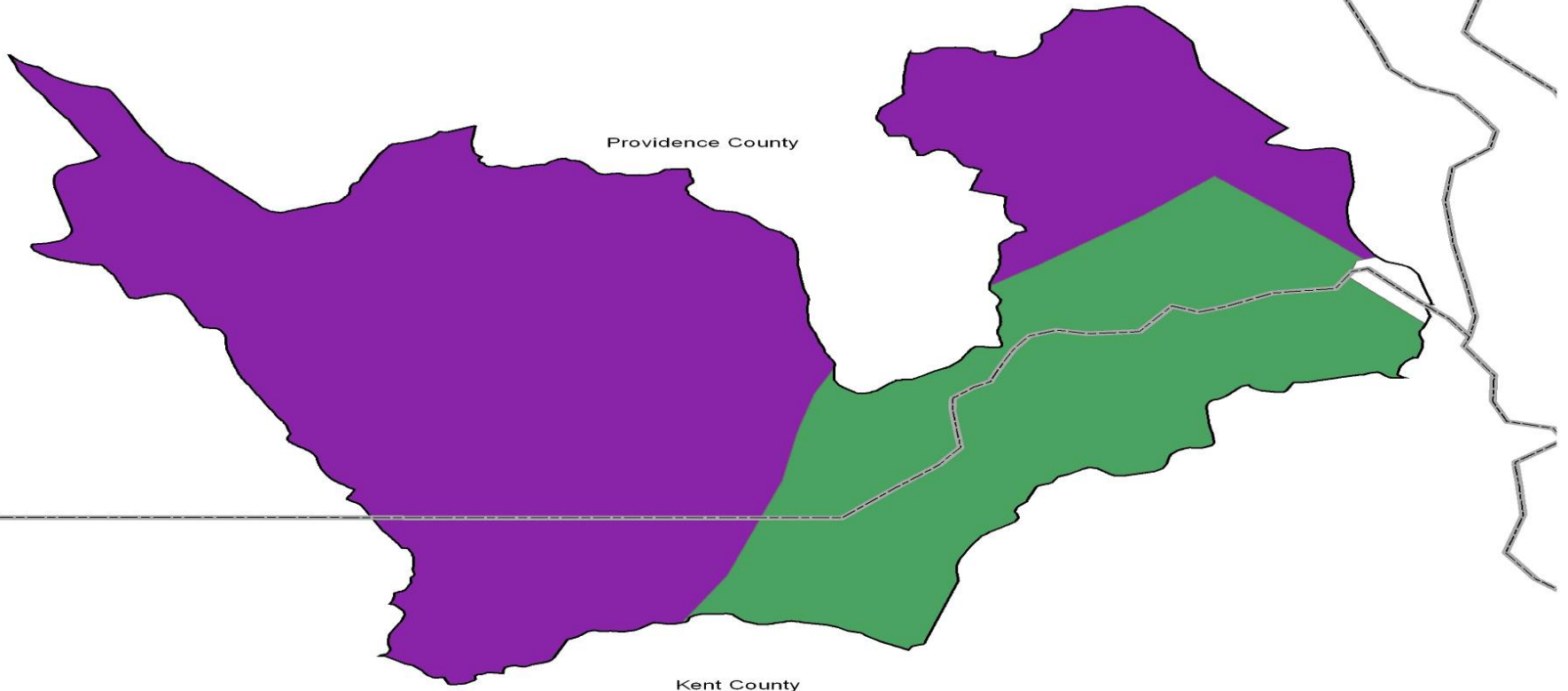
**Range**

45 inches

47 inches

N

# Risk Matrix

| Rainfall compared to state range | Low -1 | Medium – 2 | Highest - 3 |
|---|---|---|---|
| Soil Hydrologic Group | A-1 | B-2 | C&D-3 |
| Slope | A – 1 | B – 2 | C&D - 3 |
| Land Use | Forest/ Wetland – 1 | Pasture/ Rangeland - 2 | Crop - 3 |

# Hydrologic Study Area Land Use

Providence County

Kent County

## Land Use

| | |
|---|---|
| 🟨 | Pasture |
| 🟩 | Forest |
| 🟧 | Cropland |
| 🟪 | Brushland |

N

# Risk Matrix

| Rainfall compared to state range | Low -1 | Medium – 2 | Highest - 3 |
|---|---|---|---|
| Soil Hydrologic Group | A-1 | B-2 | C&D-3 |
| Slope | A – 1 | B – 2 | C&D - 3 |
| Land Use | Forest/ Wetland – 1 | Pasture/ Rangeland - 2 | Crop – 3 |

# Sheet and Rill Risk Areas on Cropland
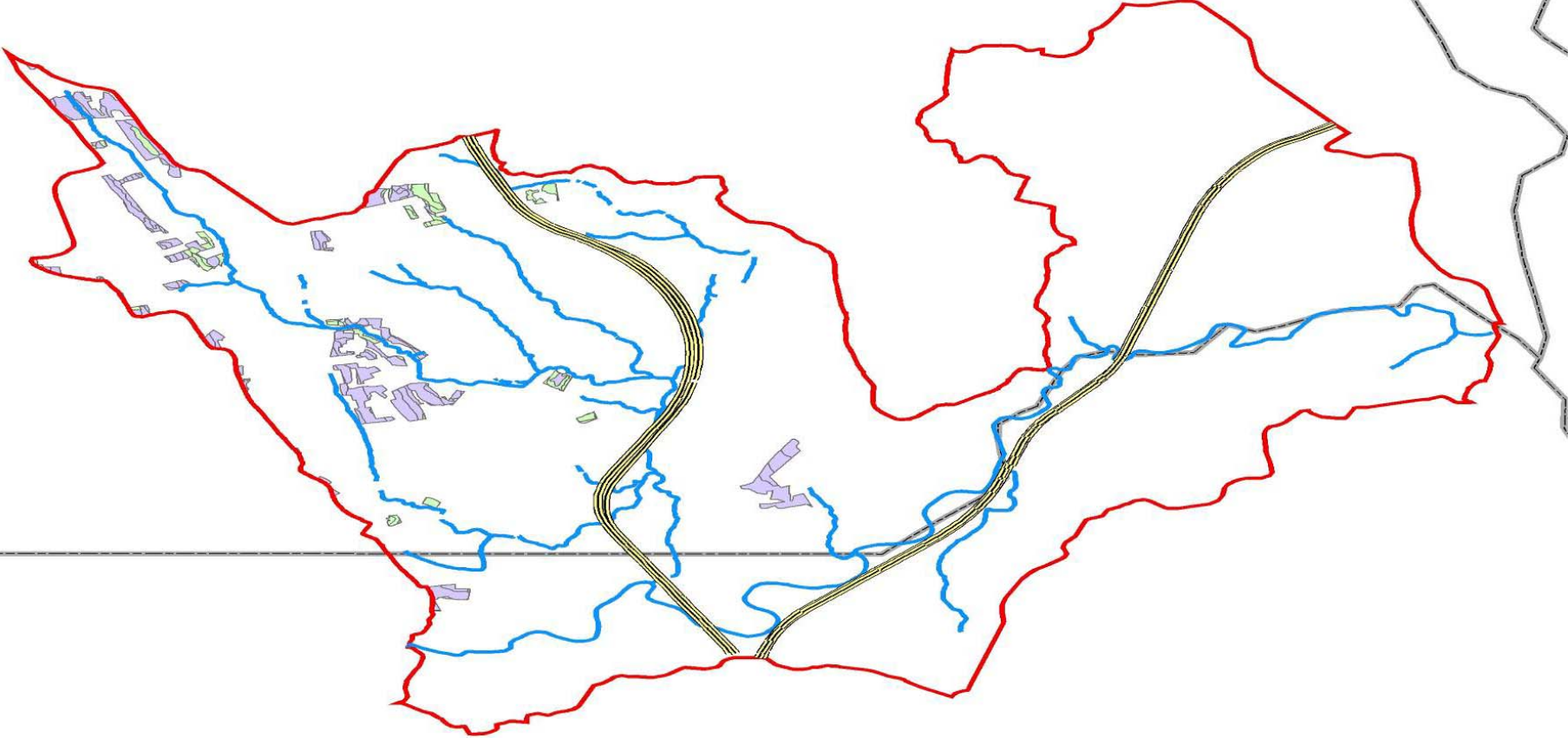
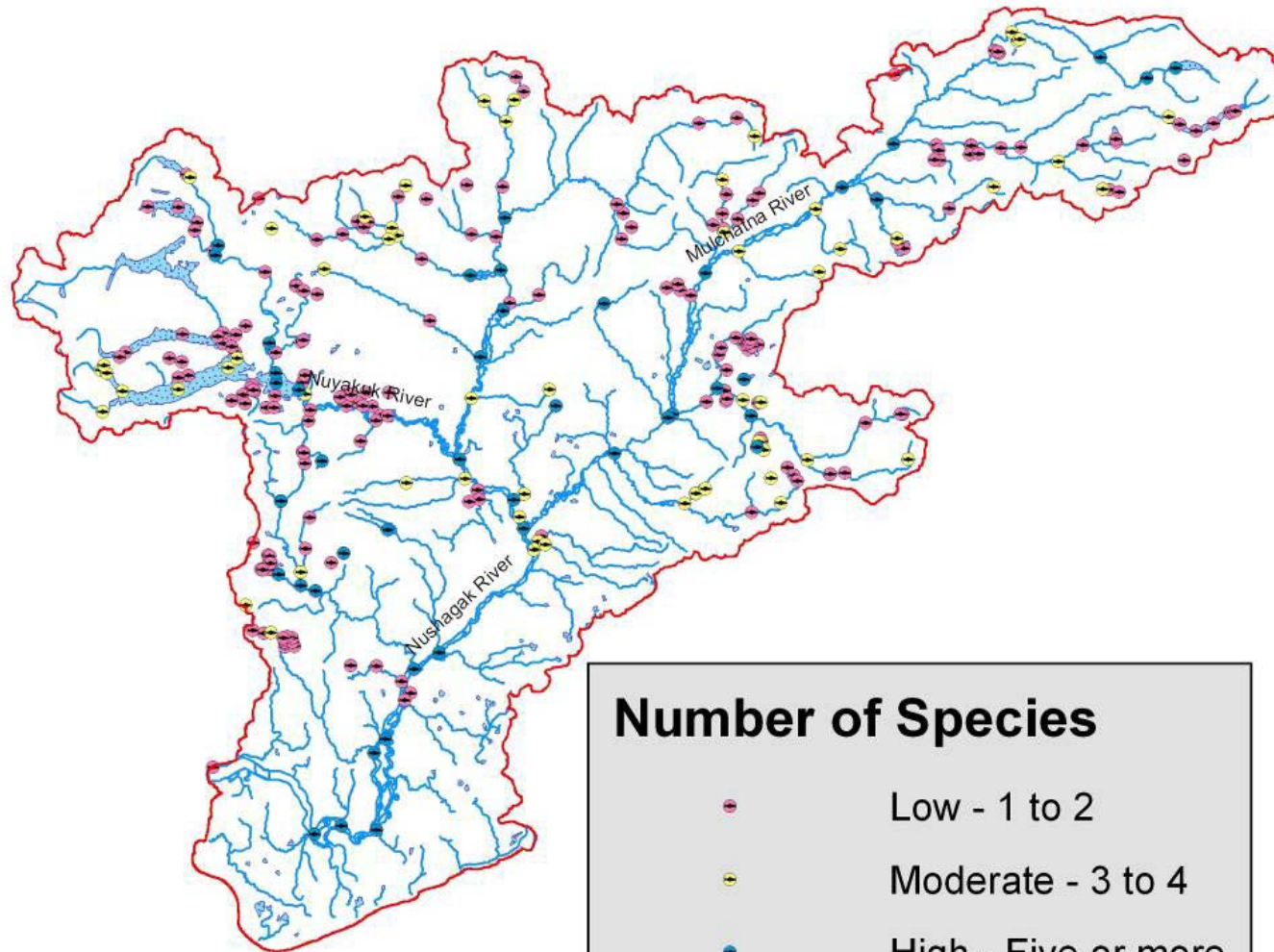**Risk**

- High Risk
- Moderate Risk

N

# Stream Fisheries Matrix

|  | Low | Moderate | High |
|---|---|---|---|
| **Slope Class** | Slight | Moderate | Steep |
| **Species Frequency** | 1 | 2 | 3 |

# Frequency of Salmonoid Fisheries



Salmon Species

Number of Species
- Low - 1 to 2
- Moderate - 3 to 4
- High - Five or more

# Stream Fisheries Matrix

|  | Low | Moderate | High |
|---|---|---|---|
| **Slope Class** | Slight | Moderate | Steep |
| **Species Frequency** | 1 | 2 | 3 |

# Nushagak Hydrologic Unit
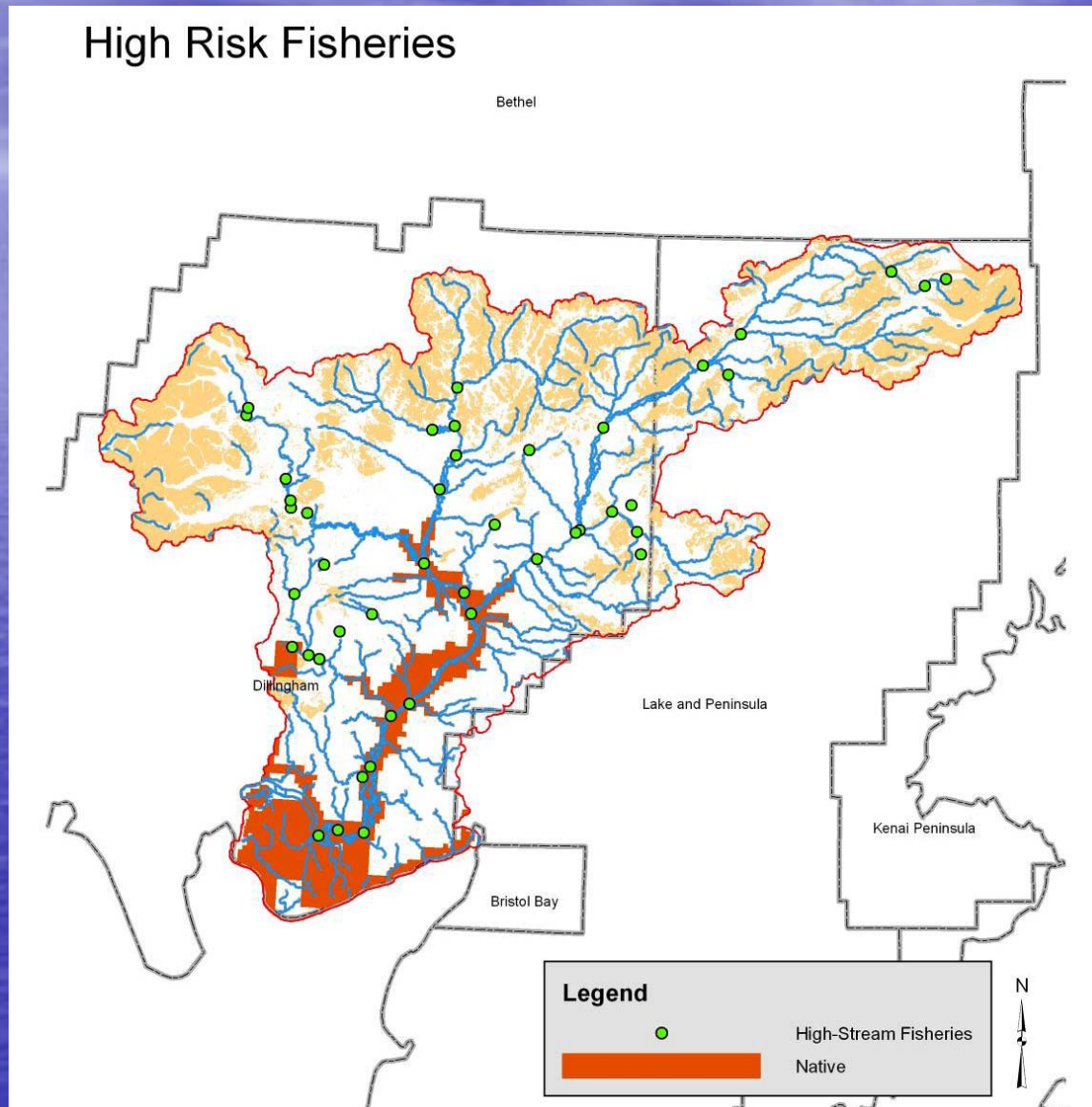
# Surface Water Quality (animal waste)

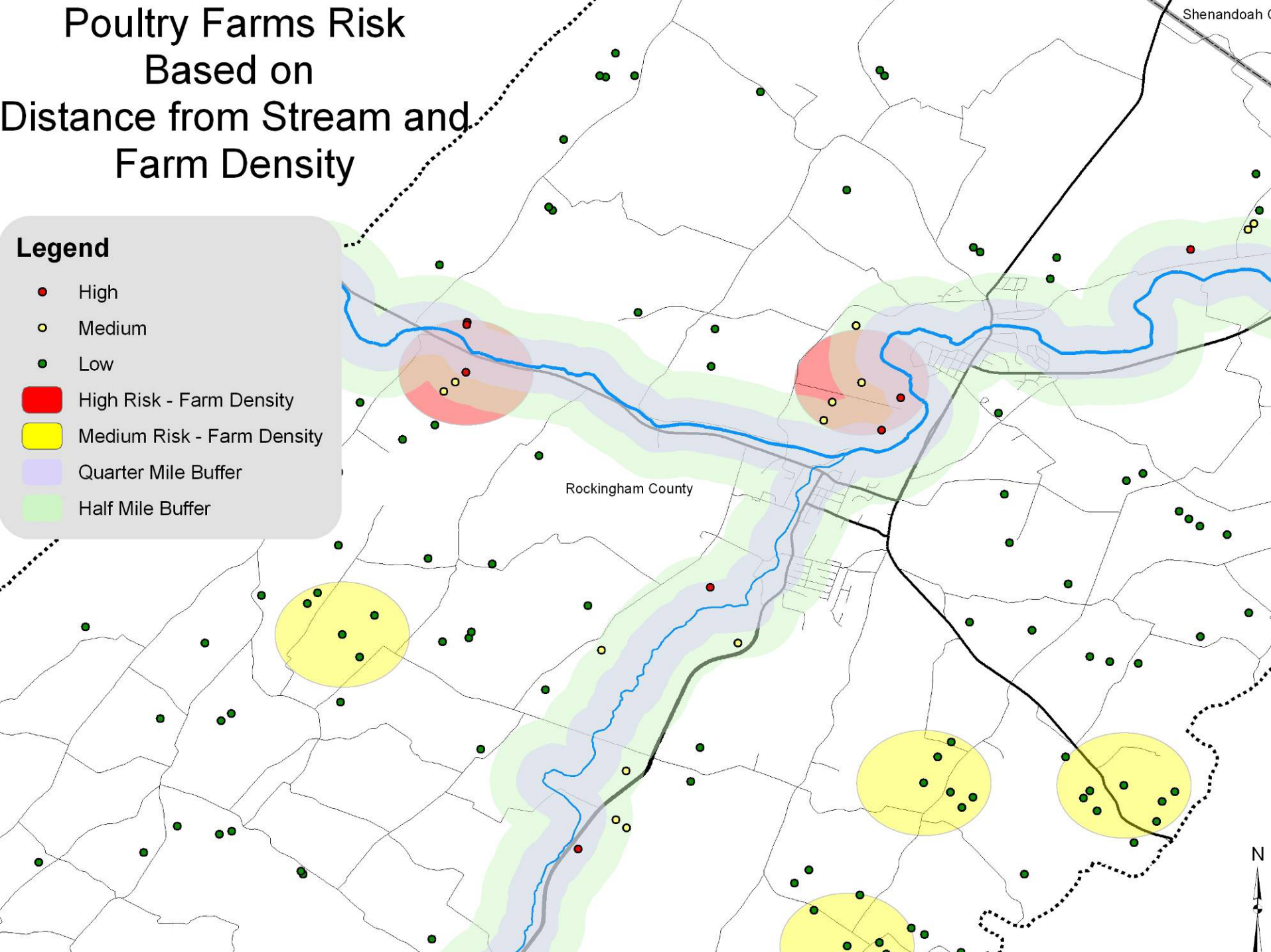|  | 1 | 2 | 3 |
|---|---|---|---|
| **Distance to Major Stream** | >.5 Mi. Low Risk | >.25 Mi. <=.5 Mi. Medium Risk | <=.25 Mi. High |
| **Number in Cluster** | <=2 | >2 and <5 | >=5 |

Poultry Farms Risk
Based on
Distance from Stream and
Farm Density

**Legend**

- High (red dot)
- Medium (yellow dot)
- Low (green dot)
- High Risk - Farm Density
- Medium Risk - Farm Density
- Quarter Mile Buffer
- Half Mile Buffer

Shenandoah C

Rockingham County

N

# KISS Added Values

- Spatially identifies the extent of resource concerns within a RWA watershed

- Qualitatively defines resource needs using a science based approach

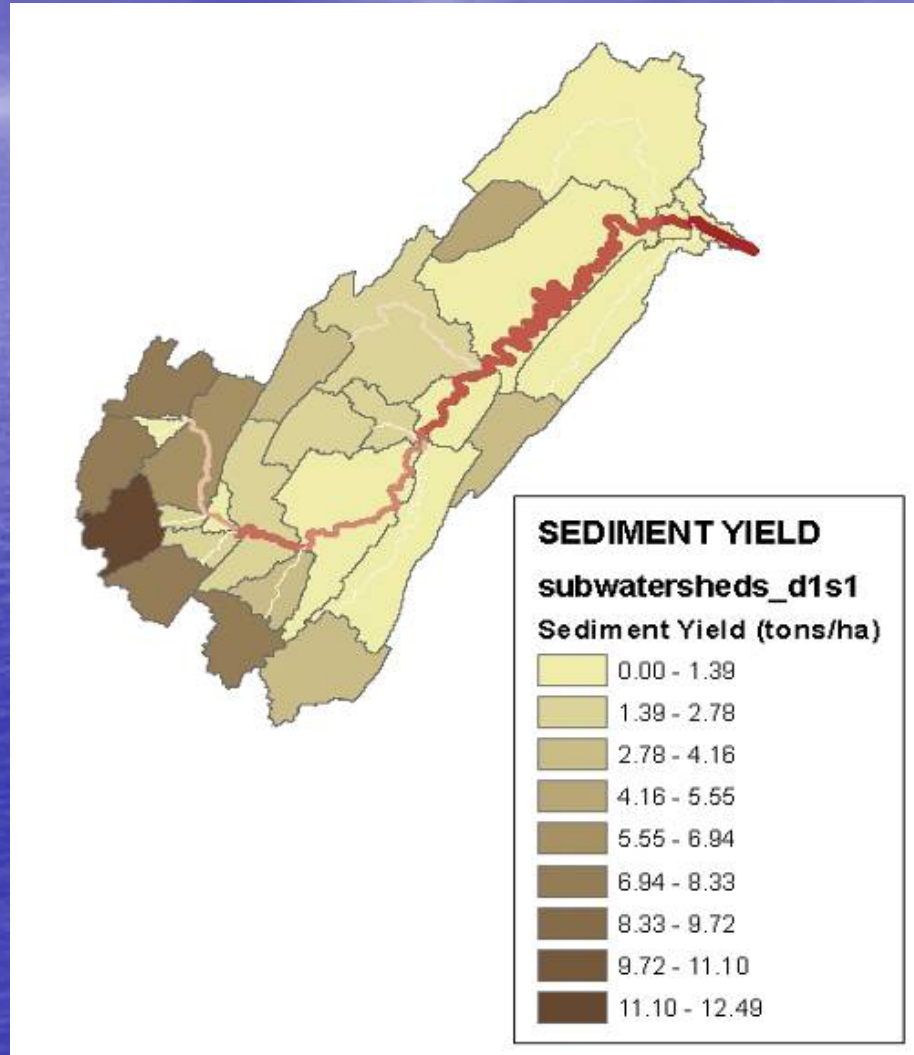- Can Enhances the effectiveness of program delivery

# AGWA2

- TOOL COMPONENTS
  - SWAT – Continuous Simulation Model
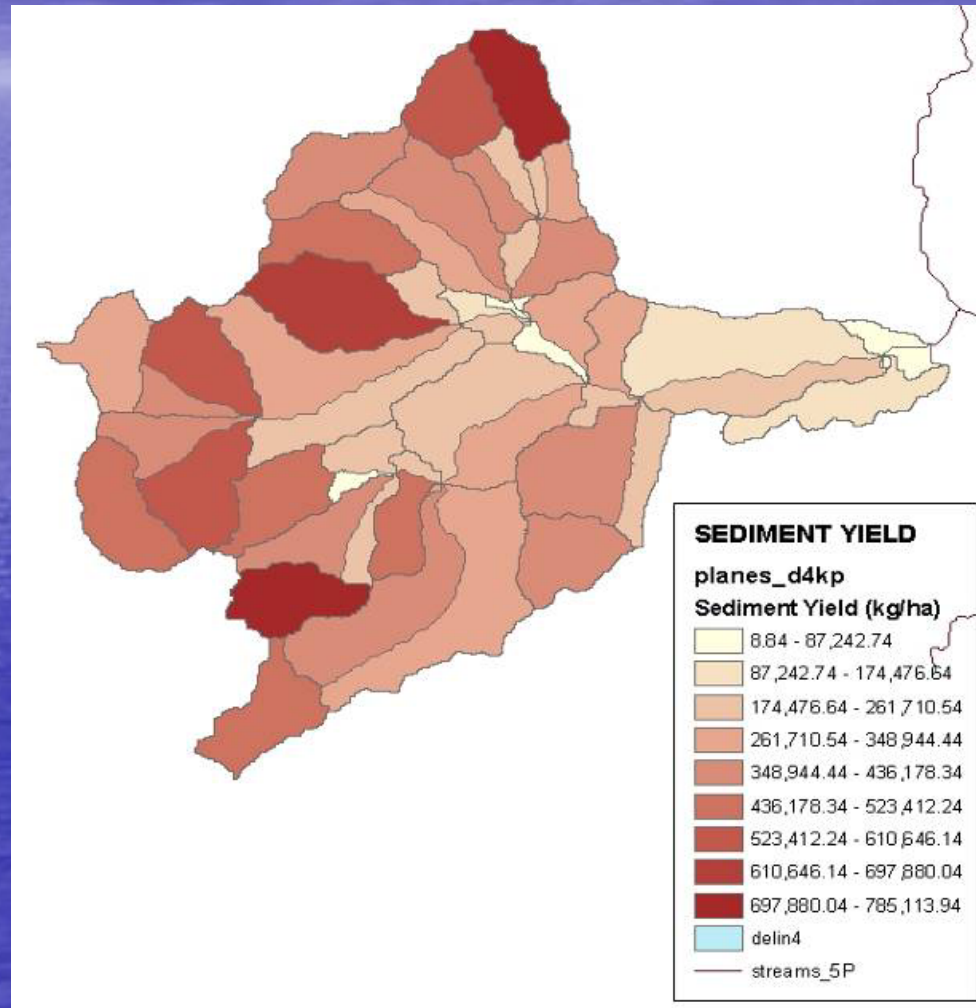  - KINEROS – Event Based Model

# AGWA2 Outputs

- RWA MAPS

# Virginia SWAT Sediment
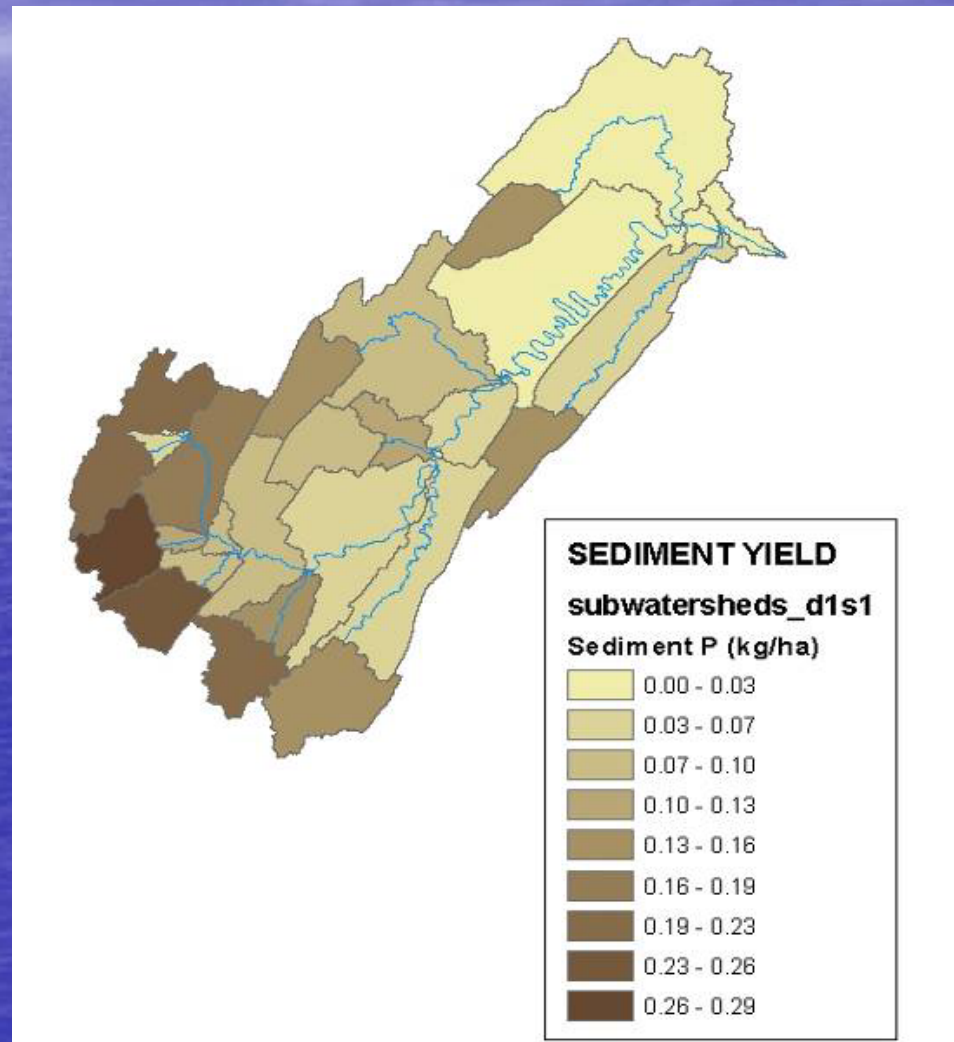## North Fork Shenandoah River Sediment Yield

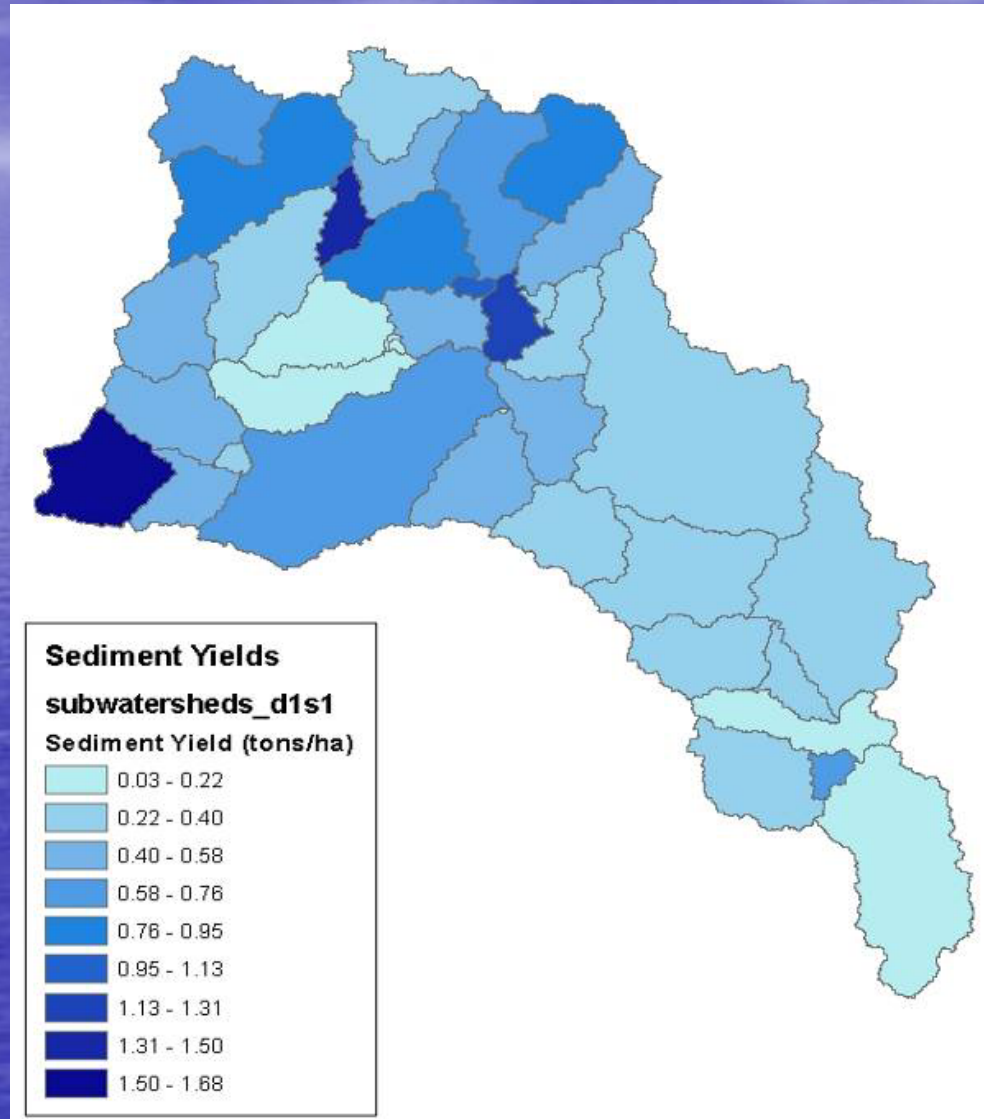# KINEROS Sediment Yield

## North Fork Shenandoah River Sediment Yield

# SWAT Sediment "P"
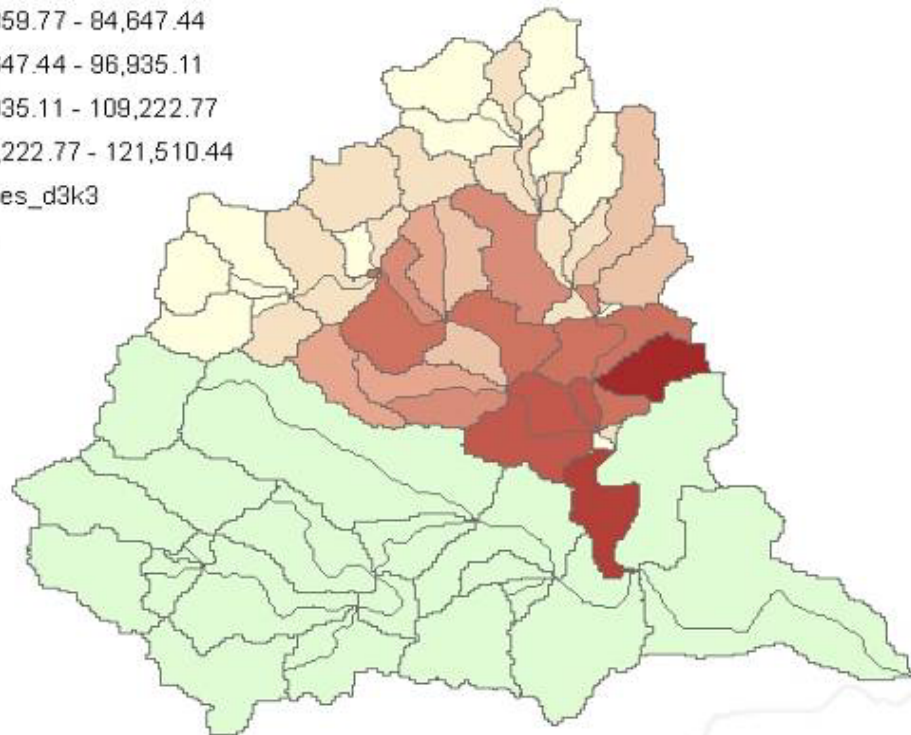## North Fork Shenandoah River Sediment Yield



SEDIMENT YIELD

subwatersheds_d1s1

Sediment P (kg/ha)

- 0.00 - 0.03
- 0.03 - 0.07
- 0.07 - 0.10
- 0.10 - 0.13
- 0.13 - 0.16
- 0.16 - 0.19
- 0.19 - 0.23
- 0.23 - 0.26
- 0.26 - 0.29

# Missouri Watershed

# Missouri KINEROS



**Sediment Loading**

**planes_d4k1**

Sediment Yield (kg/ha)

- 10,921.43 - 23,209.10
- 23,209.10 - 35,496.77
- 35,496.77 - 47,784.43
- 47,784.43 - 60,072.10
- 60,072.10 - 72,359.77
- 72,359.77 - 84,647.44
- 84,647.44 - 96,935.11
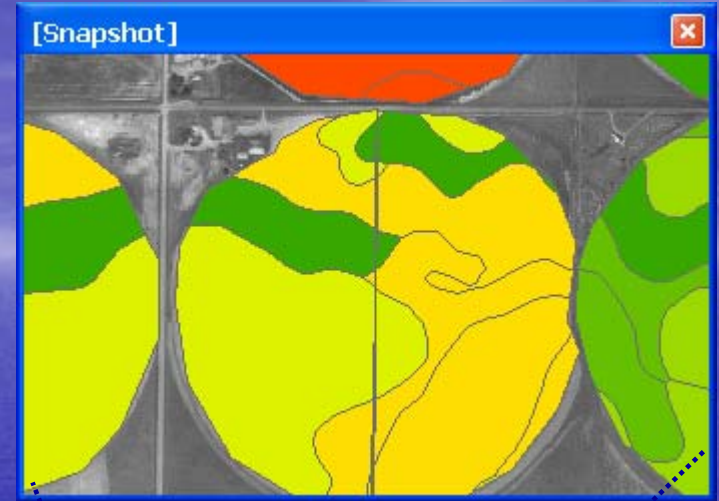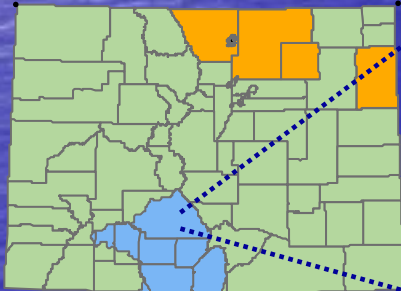- 96,935.11 - 109,222.77
- 109,222.77 - 121,510.44
- planes_d3k3
- 0.0

# NLEAP GIS

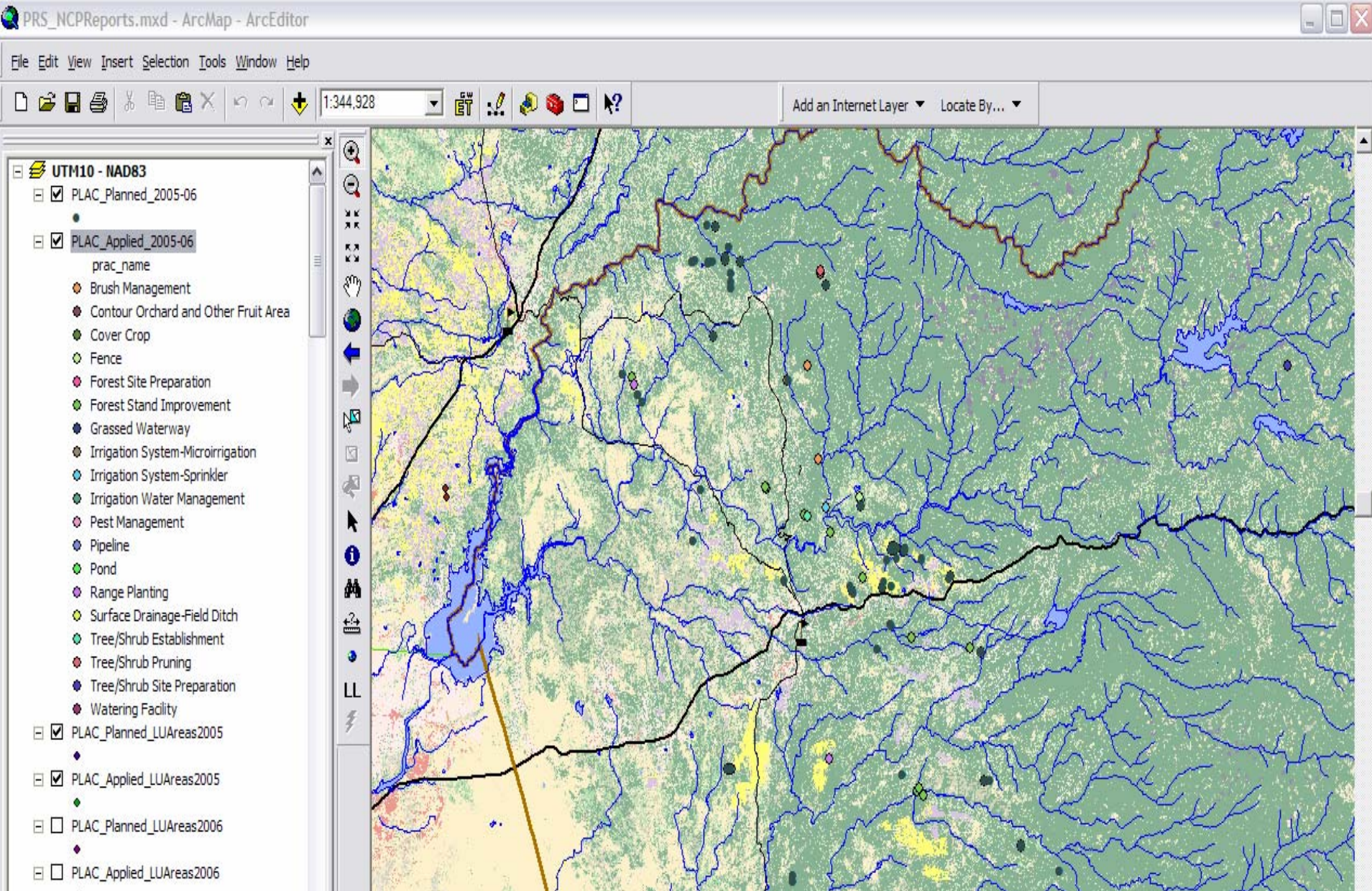- CENTER PIVOT IRRIATION ANALYSIS

# NLEAP-GIS 4.1 J.A. Delgado and M.J. Shaffer
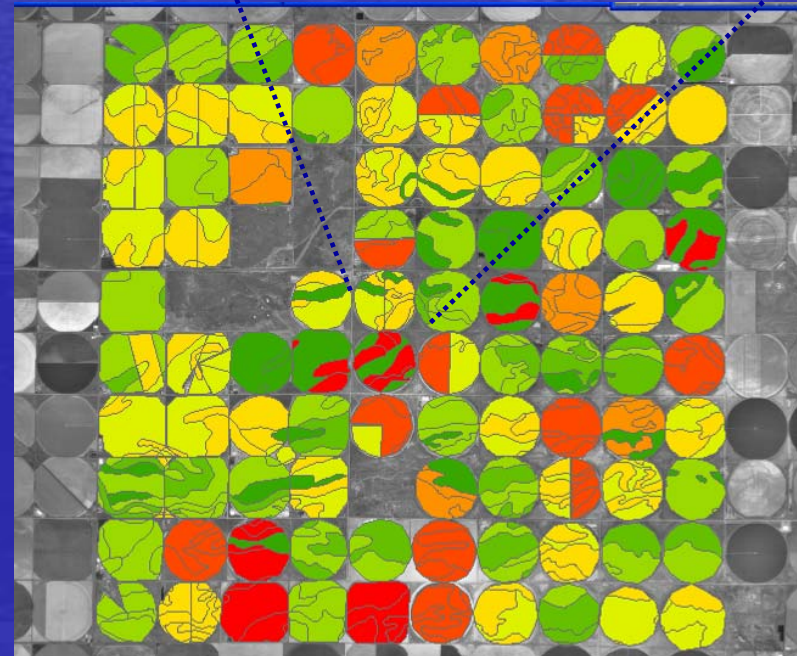
# PRS Data

- GIS DISPLAY

# Applied Practices layer symbolized by Practice Name by FY for a selected Service Area

# Some Final Notes on the Assessment Tools

- AGWA2 model is used primarily as an indexing tool to compare predicted current conditions to results that would occur if there was a change in the landscape. It is being used in some states in conjunction with the EPA's 319 program to rate project proposals.

- Changes to the SWAT and KINEROS default values used to reflect management can be made to better reflect expected results. It is not CCE certified at this time but the NWMC is evaluating it to see if we want to recommend it for certification. If there are states that want to participate in the evaluation we will be happy to run the model for them on their particular project and provide the training in how to use the model.

# Additional Final Notes on the Assessment Tools

- The NLEAP-GIS model is also in the evaluation mode and the NWMC would be glad have states volunteer to participate in the evaluation.

## The NWMC is willing to assist states in their RWA efforts!

# Efficient Conservation—Purpose with Passion