# Economic and Water Quality Effects of Multiple Conservation Practices in Three Midwest Watersheds

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# Objectives

1.  Assemble data to adapt and calibrate models to represent the water quality and economic responses of common and potential conservation practices

2.  Calibrate SWAT for baseline conditions to estimate the water quality effects of typical Midwest practices

# Objectives

**3.** **Compare SWAT results to a groundwater-surface water model (GFLOW) and a GIS sediment delivery model based on MUSLE**

**4.** **Determine combinations of practices and placement that achieve local water-quality goals, and estimate required conservation budget to meet goals**

**5.** **Extend findings to watershed and community groups, and other interested parties**

# Location of Three (Five) Watersheds in Iowa
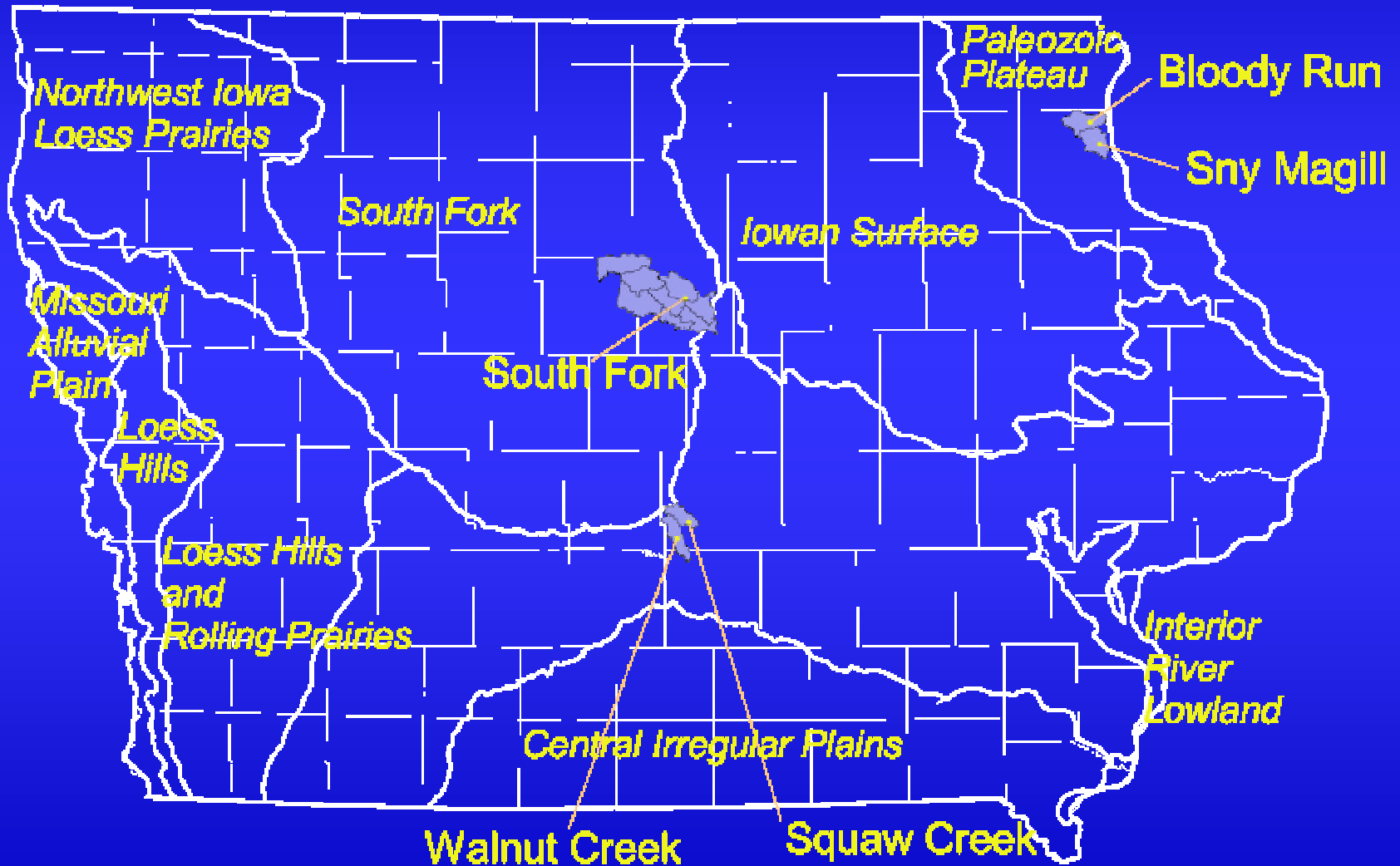
# Watershed Characteristics

| Characteristic | Walnut Creek | South Fork | Sny Magill |
|---|---|---|---|
| Area (ha) | 5,000 | 78,000 | 9,000 |
| Agric. Systems | row crop | row crop & CAFO | row crop & dairy |
| Monitoring Stations | 3 since 1995 | 1 since 1995 3 since 2001 | 1 at outlet: 1992 - 2001 |
| WQ Parameters | nutrients, sediment, & bacteria | | |

# Conservation Practices

| | Walnut Creek | South Fork | Sny MaGill |
|---|---|---|---|
| Riparian buffers | 🔴 | 🔴 | 🔴 |
| In-field buffers | 🟢 | 🟢 | 🔴 |
| Waterways | 🔴 | 🟢 | 🔴 |
| Wetlands | | 🟢 | |
| Terraces | 🔴 | | 🟢 |
| Strip Cropping | 🟢 | | 🟢 |
| Contouring | 🔴 | | 🟢 |
| Cons. Tillage | 🟢 | 🔴 | 🟢 |
| Set aside | 🔴 | 🔴 | 🔴 |
| Rotations | | 🟢 | 🟢 |
| Manure management | | 🟢 | 🟢 |
| Nutrient management | 🟢 | 🟢 | 🟢 |

🔴 potential

🟢 in place

# South Fork (Iowa River) Land Use
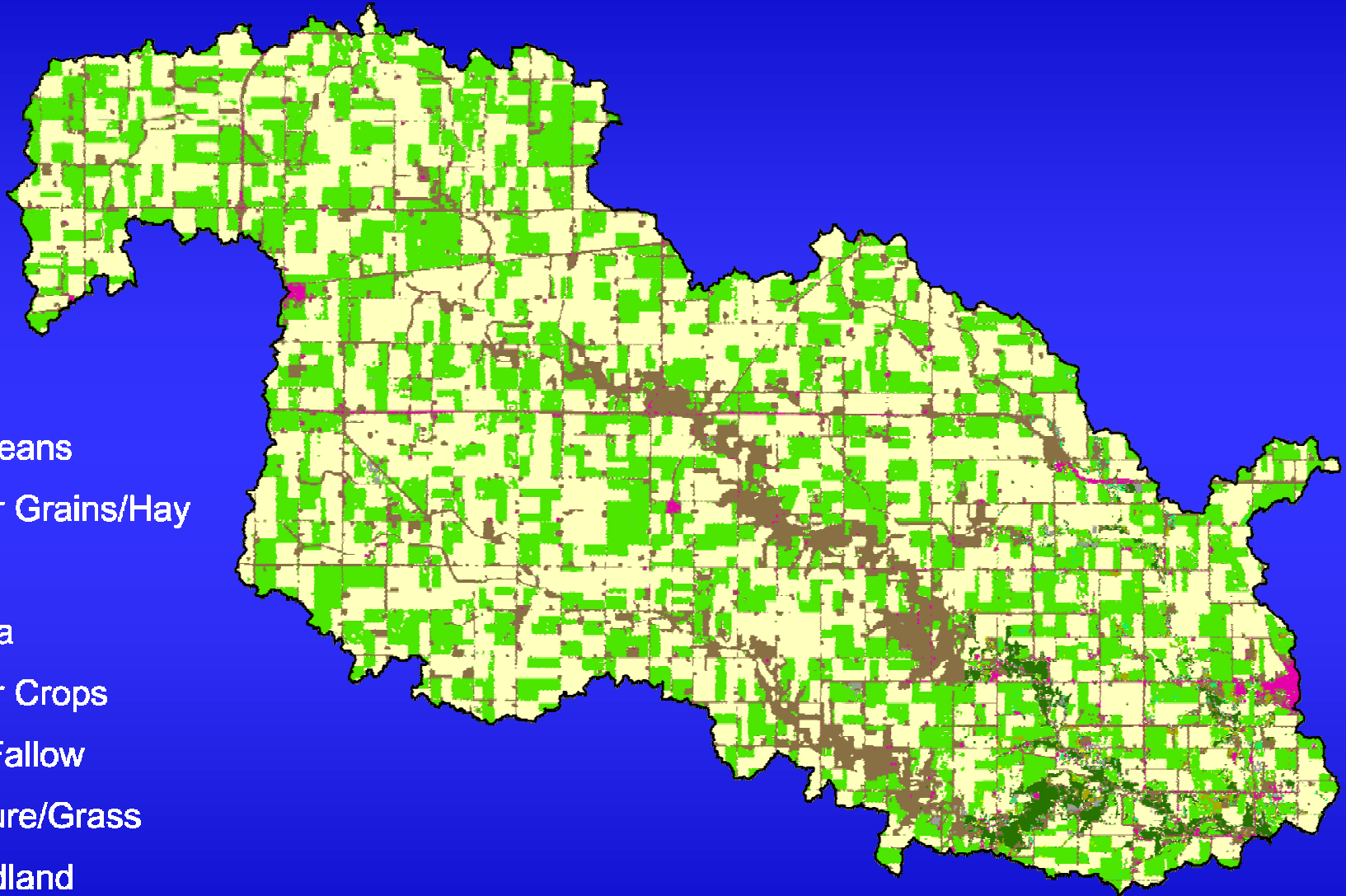


**Land Use**

- Corn
- Soybeans
- Other Grains/Hay
- Oats
- Alfalfa
- Other Crops
- Idle/Fallow
- Pasture/Grass
- Woodland
- Urban

Walnut Creek & Squaw Creek Land Use
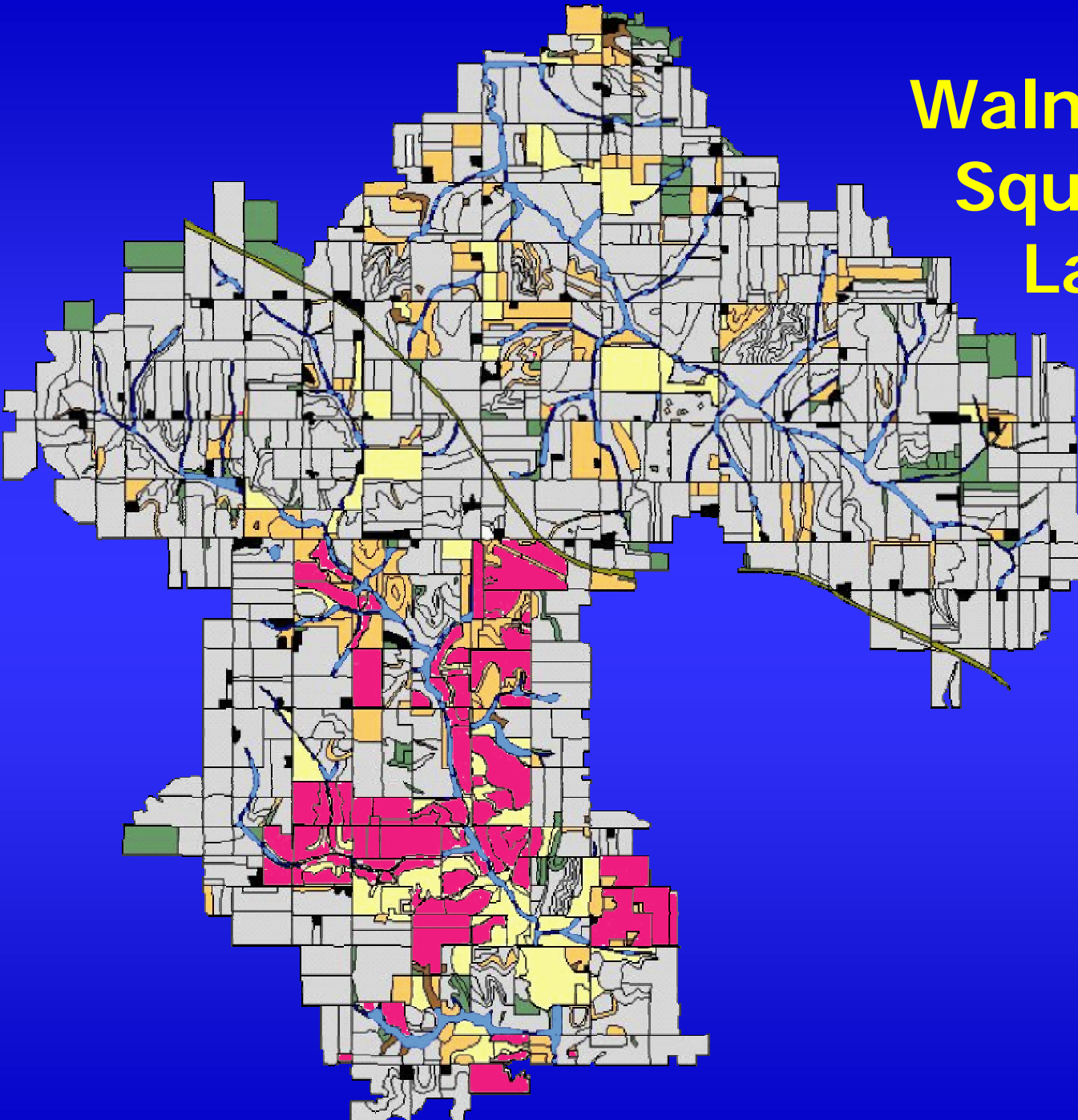
Legend:
- Prairie
- Pastures
- Row crop
- Grass
- Developed
- Railroad
- Unknown
- Water
- Woods

# Sny Magill and Bloody Run Land Use



| | |
|---|---|
| water | |
| wetland | |
| forest | |
| ungrazed grassland | |
| grazed grassland | |
| CRP grassland | |
| alfalfa | |
| corn | |
| soybeans | |
| other rowcrop | |
| commercial industrial | |
| residential | |