ARS CEAP Watershed Assessment Studies (WAS): Elements of Watershed Research Design
Roles of ARS Benchmark Watersheds in CEAP

- Assess individual conservation practices and cumulative effects of multiple practices
- Support and improve the national model of water-quality effects
- Support development of regional models.
- Provide access for research collaboration
- Provide public demonstration of conservation practices and programs.
Objectives of WAS

• Implement a system to compile and manage water, soil, management and economic data from all watersheds.

• Measure water quality, water quantity, soil and ecosystem effects of conservation practices.

• Quantify uncertainties of predicted effects.

• Develop planning tools for selection and placement of conservation practices.

• Develop and verify regional watershed models to quantify environmental effects.
Water Quality Measures

- Dissolved Oxygen
- Nitrogen (nitrate, total, organic)
- Phosphorus (total, dissolved, available?)
- Sediment (concentration, particle size, suspended, bed)
- Pathogens (E. Coli)
- Pesticides
- Annual, event, and seasonal loads
- Temperature
Water Management Measures

- Baseflow and runoff discharge
- Artificial drainage discharge
- Temporal discharge variability
- Precipitation/discharge relationships
- Soil moisture distribution
- Groundwater recharge
Soil Quality Measures

• Aggregate stability
• Available water holding capacity
• Carbon mineralization potential
• Microbial biomass carbon
• Nitrogen and mineralization potential
• Phosphorus
• Electrical conductivity
• Microbial activity and diversity
Ecosystem Measures

- Community structure
- Species diversity
- Habitat quality
- Native vegetation cover
- Patchiness index
- Species richness
- Soil flora and fauna
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<tr>
<th>Location</th>
<th>Water Quality</th>
<th>Water Conservation</th>
<th>Soil</th>
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Conservation Practice Categories Emphasized

- conservation buffers
- channel management
- drainage management
- manure management
- nutrient management
- pest management
- tillage management
- land conversion and range
## Conservation Practices

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Anticipated Interaction with Teams

- Data Management
  - list of variables
  - database and metadata structure
  - OCIO support
- Model Validation, Evaluation, and Uncertainty
  - data access
  - modeling support for each watershed
- Economic Analysis
  - analysis in selected watershed
  - long-term plans
- Data Quality and Assurance
  - identify standard methods and QA/QC practices