Linking Nonpoint Source Management Practices to Water Quality Improvements

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Project Background
- Feasibility study
- Link water quality data and NPS project information
- Identify land treatment effects and trends

Research Questions
- What data were collected?
- How complete are the records?
- Do monitoring sites and dates correspond to BMP implementation?

Research Area
- 2 case study states
  - California
  - Illinois
- Both states have NPS projects
  - Monitoring programs
  - National Monitoring Program projects

Methodology: Monitoring
- Focused on large, statewide or regionwide databases
- Searched for sediment, nutrient, and biological results
- Included long-term ambient water quality monitoring programs

Methodology: BMP Data
- Grants Reporting and Tracking System (GRTS)
  - Tracks CWA Section 319 NPS implementation projects
  - Database designed to store
    - BMP category types
    - Watershed
    - Water body
    - Pollutant load reductions
    - File attachments
Methodology: BMP Data

- Grants Reporting and Tracking System (GRTS)
  - Performed database queries
  - Examined spreadsheet attachments
  - Did not contact individual project sponsors to obtain additional data

Methodology: Direct Measures

- National NPS Monitoring Program Projects
  - Integrated projects that directly measure the impacts of land treatments and BMP implementation

Important Factors

- What factors determine a successful evaluation?
  - Ample sampling history
  - Centrally located databases
  - Other activities in the watershed

Results: Monitoring Data

- National Databases
  - National NPS Monitoring Program
  - STORET
- California Databases
  - Central Coast Ambient Monitoring Program
  - International Stormwater BMP Database
  - Surface Water Ambient Monitoring Program
  - Klamath and Lost Rivers TMDL data set

Results: BMP Implementation Data

- California
  - 324 projects reported in GRTS
  - 223 projects linked to 8-digit HUC
  - 246 projects (77%) lack BMP information
Results: BMP Implementation

- Data

Illinois
- 350 projects reported in BMP
- 64% were linked to 8-digit HUC
- 185 projects (53%) lacked BMP information

Results: BMP Implementation

- Data Issues

- Lat/long field available for data entry but not for producing reports - manual access required
- In random search, few coordinates found - fields not populated
- Lat/long imprecise (<4 decimal places)
- 8-digit HUCs too large for analysis
- Reach codes lacking

Spatial Analysis

- Identify BMP locations and match them with monitoring data
- Focused on Illinois because sufficient BMP data were available
- Plotted BMP coordinates or subwatershed locations and searched for monitoring stations within 5 miles
- Monitoring sites were found but lacked data that would allow statistical comparisons

Spatial Analysis

- Example: Court Creek
  - Streambank Stabilization and Restoration Program sites completed in 2001 and 2002
  - Relevant STORET and ISWS CREP stations found
  - Spoon River STORET site data exists from 2005
  - ISWS CREP site was too far downstream (6 miles) from a rock riffle BMP

Conclusions

- Major data gaps
  - Lack of long-term monitoring data
  - Lack of monitoring data that can be tied to specific BMPs
  - Lack of a central repository for section 319 project-related monitoring data
  - BMP location and pollutant load reduction not in GRTS

Conclusions

- BMP location feature in GRTS is not user-friendly or readily searchable - needs improvement
- NPS projects are sometimes difficult to represent geographically - need reach codes
Recommendations

- An ideal framework for measuring BMP impacts
  - Multiple control and treatment watersheds
  - Upstream and downstream monitoring cited by coordinate and affected reach
  - Monitoring for parameters of interest: storm and base flows
  - Tracking of climatic patterns
  - Monitoring to straddle BMP implementation dates
  - Long enough record to eclipse lag time

- Require more specific location data for BMPs
- Provide guidance on how locations are determined
- Require project sponsors to identify monitoring stations that could be used to determine effects
- Sponsor more projects that directly measure BMP impacts

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