

# Who does the monitoring?



- State agency staff
- University/Extension
- Consultant
- Volunteer/citizens' groups
- Soil & Water Conservation District,  
Irrigation District
- Federal agencies (e.g., USDA-NRCS,  
USGS)



|                    | Pros   | Cons   |
|--------------------|--|--|
| State agency staff | <ul style="list-style-type: none"><li>•Resources</li><li>•Expertise</li><li>•Knowledge</li></ul> | <ul style="list-style-type: none"><li>•Budgetary restrictions</li><li>•Shifting priorities</li></ul> |

|                         | Pros  | Cons   |
|-------------------------|---|--|
| University<br>Extension | <ul style="list-style-type: none"><li>• Technical expertise</li><li>• Laboratory</li><li>• Graduate student labor</li></ul> | <ul style="list-style-type: none"><li>• May be more interested in research than sustained long-term monitoring</li></ul> |

|             | Pros   | Cons   |
|-------------|--|--|
| Consultants | <ul style="list-style-type: none"><li>• Technical expertise</li><li>• Clear contracts and deliverables</li></ul> | <ul style="list-style-type: none"><li>• May lack flexibility to respond to changing situations</li><li>• Dangerous to contract out monitoring as separate effort</li></ul> |

|                                    | Pros   | Cons   |
|------------------------------------|--|--|
| Volunteers<br><br>Citizens' groups | <ul style="list-style-type: none"><li>• Site-specific knowledge</li><li>• High level of interest</li><li>• Locally based and available</li></ul> | <ul style="list-style-type: none"><li>• Lack technical training</li><li>• Lack laboratory capability</li></ul> |

|      | Pros  | Cons  |
|------|---|---|
| SWCD | <ul style="list-style-type: none"><li>• Local contacts</li><li>• Experience working with producers</li><li>• Land use and management data</li></ul> | <ul style="list-style-type: none"><li>• May have limited water quality, monitoring, and data analysis expertise</li></ul> |

|                  | Pros  | Cons   |
|------------------|---|--|
| Federal agencies | <ul style="list-style-type: none"><li>• Specialized expertise<ul style="list-style-type: none"><li>USGS – hydrology</li><li>USDA – BMP design, land treatment contracting</li><li>USFWS – habitat restoration</li></ul></li></ul> | <ul style="list-style-type: none"><li>• May be expensive</li><li>• Constrained by program requirements</li></ul> |

# Key points

- All relevant players should be involved; use their respective strengths
- Coordination is essential
- Advisory committee structure can be useful
- Significant participation by local stakeholders generally improves project success

# Key points

- **WHOEVER DOES THE MONITORING MUST BE A PARTICIPANT IN ALL ASPECTS OF THE PROJECT, NOT A SEPARATE ISOLATED ACTIVITY**
  - Exchange knowledge about what's going on
  - Feedback between monitoring and implementation
  - Effective data analysis and reporting

**What works?**  
**What doesn't work?**

# What do we mean “works”?

## Monitoring

- Can/cannot detect change/response in WQ
- Can/cannot relate WQ change to implementation
- Monitoring system succeed/fail to adapt to changing circumstances
- Data and conclusions were/were not analyzed and reported

# What do we mean “works”?

Monitoring may “work” fine, but project may fail because:

- Implementation insufficient
- Treatments poorly designed/installed
- Treatments applied to wrong sources
- Treatments ineffective
- Report(s) not prepared or distributed

Without good monitoring, we can't distinguish very well between failure of monitoring and failure of implementation.

| Works  | Doesn't Work  |
|--|---|
| Monitoring designed on the basis of watershed characterization, identification of sources/causes, and appropriate implementation | Monitoring of "standard" list of water quality variables based on assumed causes, at location(s) selected outside project context |
| Monitoring designed and conducted to suit goals of project (i.e., planning vs. implementation)                                   | Monitoring conducted for purposes unrelated to the project  |

| Works   | Doesn't Work   |
|---|--|
| Monitoring according to a design that allows conclusions about the effects of treatment   | Monitoring that is inadequate to detect change or to attribute that change to implementation |
| Statistical analysis plans clearly outlined before monitoring begins and reassessed annually, e.g., to ensure that sampling frequencies are adequate. | Samples collected according to "the way it's always been done"                               |

| Works  | Doesn't Work   |
|--|--|
| Monitoring in small watersheds with clearly defined implementation program, appropriate monitoring designs, and effective land use/land treatment tracking | Monitoring in large watersheds where multiple BMPs are gradually implemented at multiple sites, especially without land use/land treatment monitoring and a solid experimental design. |
| Habitat and biological monitoring included in projects where in-stream practices are implemented   | Reliance on physical or chemical monitoring alone to evaluate response in stream biota   |

| Works   | Doesn't Work  |
|---|---|
| Effective land use/land management monitoring to corroborate water quality monitoring | Land use/land management monitoring lacking               |
| Monitoring integrated into conduct of entire implementation project                   | Monitoring contracted out as a separate isolated function |

| Works  | Doesn't Work  |
|--|---|
| Monitoring data frequently evaluated and reported to detect problems early and provide feedback for implementation | Monitoring data evaluated and analyzed only at the end of the project                 |
| Monitoring with adequate budget to accomplish goals and to sustain monitoring effort over needed time period       | Monitoring on a severely restricted budget "because something is better than nothing" |

| Works   | Doesn't Work  |
|---|---|
| Monitoring plan includes dedication of funds and responsibility for data analysis and reporting, coordinated with overall project | Monitoring assigned to overloaded personnel not given sufficient time or resources to follow-up with analysis and reporting |