The Watershed Based Planning Approach

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- Tribal Training Session:
  National Water Quality Monitoring Council Conference
- Sheraton Downtown Hotel in Denver, CO
- Monday April 26th
- 8:00 am to 11:30 am
Watershed Management
Moving beyond the Same Old Cheese
AIR MANAGEMENT

POLITICAL BOUNDARY

WATER MANAGEMENT

LAND MANAGEMENT
Participation trends in Conservation

Trend of Ohio Fishing and Hunting License Sales

- Licenses sold to Ohioans

- Graph showing decline in license sales from 1980 to 2004
Something Needs to Change

From the Dilbert-2007 Calendar

MY URGE TO HURL HAS INCREASED A LITTLE BIT.

THAT’S WHAT CHANGE FEELS LIKE.
Using EPA's *Handbook for Developing Watershed Plans to Restore and Protect Our Waters*
Introduction

- Our hope is that this handbook will supplement existing guides.
- Provides assistance in developing the necessary details of effective plans.
- Serves as a starting point for an updateable document on planning across programs and levels of governance.
Value of Watershed Plan

Establishes baseline of existing conditions.
Identifies specific problems.
Develops solutions to problems.
Identifies potential implementers and costs.
Provides framework for evaluation.
Additional benefits of effective watershed plans

A well drafted plan recognizes the need to address multiple problems in a watershed, such as:

• Restoration & Physical Improvements
• Residential Nutrients
• Failing HSTS Units
• Stormwater Management & Urban NPS
Section 319: Nine Elements

a. Identify causes & sources of pollution
b. Estimate load reductions expected
c. Describe mgmt measures & targeted critical areas
d. Estimate technical and financial assistance needed
e. Develop education component
f. Develop schedule
g. Describe interim, measurable milestones
h. Identify indicators to measure progress
i. Develop a monitoring component

Source: US EPA 2004 319 Supplemental Guidelines
The nine elements work: why

- Quantifying pollutant sources to guide plan development
- Understanding what NPS management practices will achieve along with the point source controls
- Looking ahead to implementing and revising the watershed plan

(Watershed plans need to address more than the 9 elements – e.g. Protection, Drinking Water, Habitats, Fisheries, State Priorities permitted sources, solid waste, trading, etc.)
Watershed Management Plans Address Specific Restoration and Protection Actions. These Plans Document How, Who and When

The problem(s)

The goal
Reduce phosphorus loading to meet standard

How, who, when
Farmers & agencies cost share BMP’s, target 80% coverage by 2001
Local & state cost-share upgrade of treatment plant construction assistance grant $20 M by 2001
SET GOALS

That solve real problems
Treat the Right Problems with the Right Solutions in the Right Places

How do we get there?
Approaches to NPS Pollution

Social Systems

Biophysical Systems

This is Unacceptable!

Water Quality Degradation
Disproportionality
Disproportionality

**Biophysical Management**

**Low Impact**
- hydrologically-connected (e.g., upland location)
- minimal application of inputs
- greater residue cover (e.g., ridge or no tillage)
- greater organic matter
- fine-to-medium textured soils

**Greater Impact**
- hydrologically-disconnected (e.g., upland location)
- over-application of inputs
- minimal residue cover
- fine-to-medium textured soils
- greater organic matter

**Lesser Impact**
- hydrologically-connected medium-to-coarse textured soils
- low organic matter
- over-application + broadcasting
- minimal residue cover
- delayed incorporation of manure

**Vulnerable**
- hydrologically-disconnected (e.g., upland location)
- over-application of inputs
- minimal residue cover
- fine-to-medium textured soils
- greater organic matter

**Resilient**
- hydrologically-connected greater residue cover (e.g., ridge or no tillage)
- minimal application
- quickly-expedited incorporation of manure
- medium-to-coarse textured soils
- low organic matter
Critical and Priority Areas

Critical Areas (Red)
• Need treatment to improve existing poor water quality

Priority Areas (Yellow)
• Need protection to protect relatively good water quality

Based upon:
• historic water quality data,
• current water quality data,
• confirmed sources,
• projected future development,
• and causes of impairment.
NPS Watershed Management Strategies

- Restore
- Protect
- Reduce
High Quality Stream Strategy

- Restore
- Protect
- Reduce
Nutrient Impaired Stream Strategies

- Restore
- Protect
- Reduce
Watershed Process

- Identify Problems
- Develop Plan
- Implement Actions
- Monitor Progress
- Evaluate Results
Steps in the Watershed Planning and Implementation Process

1. **Build Partnerships**
   - Identify key stakeholders
   - Identify issues of concern
   - Set preliminary goals
   - Develop indicators
   - Conduct public outreach

2. **Characterize the Watershed**
   - Gather existing data and create a watershed inventory
   - Identify data gaps and collect additional data if needed
   - Analyze data
   - Identify causes and sources of pollution that need to be controlled
   - Estimate pollutant loads

3. **Finalize Goals and Identify Solutions**
   - Set overall goals and management objectives
   - Develop indicators/targets
   - Determine load reductions needed
   - Identify critical areas
   - Develop management measures to achieve goals

4. **Design an Implementation Program**
   - Develop implementation schedule
   - Develop interim milestones to track implementation of management measures
   - Develop criteria to measure progress toward meeting watershed goals
   - Develop monitoring component
   - Develop information/education component
   - Develop evaluation process
   - Identify technical and financial assistance needed to implement plan
   - Assign responsibility for reviewing and revising the plan

5. **Implement Watershed Plan**
   - Implement management strategies
   - Conduct monitoring
   - Conduct information/education activities

6. **Measure Progress and Make Adjustments**
   - Review and evaluate information
   - Share results
   - Prepare annual work plans
   - Report back to stakeholders and others
   - Make adjustments to program

**Characterization and Analysis Tools**
- GIS
- Statistical packages
- Monitoring
- Load calculations
- Model selection tools
- Models
- Databases

**Watershed Plan Document**
A Hierarchy of Implementation

Watershed

Community

Subwatershed

Parcel

It sounds SO simple!
Public participation in conservation is becoming “institutionalized”.

“Neither do environmentalists speak for soil and water resources. Degradation of resources is not as much a problem, but rather an opportunity to raise more funds and build up membership.”

Pete Nowak
The subversive conservationist
Journal of Soil & Water Conservation July/August 2008
Developing info/ed activities

- Define overall goal and objectives
- Identify and characterize target audience
- Create message(s) for target audience(s)
- Package the messages for distribution
- Distribute messages to the audiences
- Evaluate the information/education effort
Prioritizing management efforts

- Integrate assessment results across objectives
- Example factors to consider:
  - Highest threats to achieving objectives
  - Regulatory requirements
  - Where are existing management regulations, programs, policies, practices falling short
  - Stakeholder preferences
Debunking the myth about targeting

USDA funds are targeted just not for water quality or other environmental benefits

Targeted programming is critical to improving BMP effectiveness.
How do I know what other programs I should coordinate my watershed planning efforts with?
Integrated Watershed Planning

- WQS
- Source Water
- NPDES
- Nonpoint sources
- TMDL
- Wetlands
- EQIP/CRP
- Stormwater
- CSO/SSO
- Estuaries
- Superfund
- CAFOs
- RCRA
- Asses
- Plan
- Monitor
- Implement
Ac - counting we will go!

Dollars Spent  
Practices Contracted  
Loads (theoretically) Reduced  
 Millions and billions, oh my

Have we lost track of what is important???
## Worksheet 12-2

### Developing Criteria to Measure Progress in Meeting Water Quality Goals

[Note: Complete one worksheet for each management objective identified.]

Management Objective: Reduce nutrient inputs into Cane Creek by 20 percent

<table>
<thead>
<tr>
<th>Indicators to Measure Progress</th>
<th>Target Value or Goal</th>
<th>Interim Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Short-term</td>
</tr>
<tr>
<td>P load</td>
<td>44 t/yr</td>
<td>52 t/yr</td>
</tr>
<tr>
<td># of nuisance algae blooms</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>transparency</td>
<td>5.5 m</td>
<td>4.1 m</td>
</tr>
<tr>
<td>frequency of taste and odor problems in water supply</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>hypolimnetic DO</td>
<td>5.0 mg/L</td>
<td>2.5 mg/L</td>
</tr>
</tbody>
</table>
Measuring improvements: linking 106/319

- Document the parameter(s) you’re trying to impact (sediment, nutrients, etc.)
- Identify measurable criteria associated with the parameter(s)
- Develop the most cost-effective monitoring program possible
- Be selective! Don’t monitor everything! Monitor to answer questions
What can watershed plans provide?

- **Clear Purpose & a Roadmap** - needed to coordinate complex scientific, social, and economic activities

- **Accountability** – What indicators are we going to count and why are they important to watershed resources?

- **Program Integration thru Partnerships** - TMDLs, 319, NPDES, Source Water Protection, wetlands, Farm Bill Programs, local planning, private investment
Table 13-1. Comparison of Example Parameters in a Hypothetical Watershed Plan and 319 Work Plan

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Lake Fraser Watershed Management Plan</th>
<th>319 Work Plan #1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographic scope</td>
<td>180,000 acres</td>
<td>24,000 acres</td>
</tr>
<tr>
<td>Critical areas</td>
<td>52,000 acres</td>
<td>7,000 acres</td>
</tr>
<tr>
<td>Goal statement</td>
<td>Improve watershed conditions to support sustainable fisheries</td>
<td>Reduce sediment loadings from priority subwatershed X</td>
</tr>
<tr>
<td>Example objectives and key elements</td>
<td>• Increase the Index of Biotic Integrity (IBI) from 30 to 75</td>
<td>• Treat 5,000 acres of cropland with crop residue management (CRM) practices</td>
</tr>
<tr>
<td></td>
<td>• Identify causes and sources of sediment</td>
<td>• Install six terraces to treat 1,200 acres</td>
</tr>
<tr>
<td></td>
<td>• Identify load reduction expected</td>
<td>• Establish five buffer strips for a total of 8,000 feet</td>
</tr>
<tr>
<td></td>
<td>• Identify management practices needed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Identify critical areas</td>
<td></td>
</tr>
<tr>
<td>Implementation</td>
<td>• CRM: 2,000 acres of row crop/year into CRM</td>
<td>• Develop training materials on CRM in year 1</td>
</tr>
<tr>
<td></td>
<td>• Terraces: 4 fields/year, 40 fields total</td>
<td>• Hold two workshops each in years 2 and 3</td>
</tr>
<tr>
<td></td>
<td>• Buffers: restore 1 to 1.5 miles of riparian area/year, 8 miles total</td>
<td>• 2 terraces/year</td>
</tr>
<tr>
<td></td>
<td>• Field buffers: 100 fields total</td>
<td>• One buffer strip in first year and two each in years 2 and 3</td>
</tr>
<tr>
<td>Costs</td>
<td>$4.02 million over 10 years</td>
<td>$250,000 over 3 years</td>
</tr>
<tr>
<td></td>
<td>• $800,000 for information and education (I/E)</td>
<td>• $50,000 to prepare training materials and give 5 workshops on CRM</td>
</tr>
<tr>
<td></td>
<td>• $600,000 for monitoring and reporting</td>
<td>• $160,000 for management practice cost sharing</td>
</tr>
<tr>
<td></td>
<td>• $1,980,000 for buffers (18,000 acres at $110/acre)</td>
<td>• $40,000 for monitoring and reporting</td>
</tr>
<tr>
<td></td>
<td>• $140,000 for 40 terraces</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• $500,000 for CRM</td>
<td></td>
</tr>
<tr>
<td>Schedule</td>
<td>• Begin slowly and accelerate (build on successes)</td>
<td>• See above</td>
</tr>
<tr>
<td></td>
<td>• Establish interim milestones</td>
<td>• Annual progress reports</td>
</tr>
<tr>
<td></td>
<td>- Cropland: 2008 – reduce soil erosion by 80,000 tons/year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Streambanks: 2006 – stabilize 10,000 feet of eroding streambanks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 2010 – stabilize 30,000 feet of eroding streambanks</td>
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<tr>
<td></td>
<td>• Push I/E early and complete by year 6</td>
<td></td>
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<tr>
<td></td>
<td>• Annual reports that track progress</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Coordinate with partners</td>
<td></td>
</tr>
<tr>
<td>Monitoring</td>
<td>• Environmental – water quality, IBI, acres treated, tons of soil erosion reduced, feet of streambank stabilized</td>
<td>• Attendance at CRM training workshops</td>
</tr>
<tr>
<td></td>
<td>• Administrative – contracts approved, funds expended, and funds obligated</td>
<td>• Acres of cropland using CRM</td>
</tr>
<tr>
<td></td>
<td>• Social - landowners contacted</td>
<td>• Feet of stream buffers established</td>
</tr>
<tr>
<td></td>
<td>• Changes in public understanding resulting from I/E</td>
<td>• Feet of field buffers established</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Number of terraces</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Environmental: reduction in sediment loads</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Administrative: contracts approved and funds expended</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Social: landowners contacted</td>
</tr>
</tbody>
</table>

Extracting Program Workplans from the Watershed Plan
And finally ….

Practice Adaptive Management

Identify Problems  Develop Plan  Implement Actions  Monitor Progress  Evaluate Results
Finally…Make Adjustments

- Monitor water quality and BMPs
- Compare results to goals
- Are you making progress?
- Are you meeting your goals?
- If you aren’t meeting implementation milestones
- If you aren’t making progress toward reducing pollutant loads….

Then…do it all over again!
Things to consider

- Size
- Degree of uncertainty
- Plan to solve problems – not for funds
- Plan to make better decisions
Lost in the Jargon Fog

Roof Water Management Practices

Sounds like a gutter grant if you ask me.
Questions?

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www.epa.gov/nps/watershed_handbook/