NPS Program Perspectives

Dov Weitman
Chief, Nonpoint Source Control Branch

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Weitman.dov@epa.gov
www.epa.gov/nps

Watershed-Based Plans

- Required by EPA guidelines for all 319-funded watershed projects that are designed to remediate 303(d)-listed waterbodies

- Goal is to identify and quantify sources contributing to impairment; identify and quantify potential solutions; and implement

- Add monitoring and feedback mechanisms

Watershed Planning Paradigm Shift

- The traditional paradigm for 319, EQIP, etc. has not enabled us to achieve our WQ goals

- Until you have quantitative knowledge of
  - (a) the nature and source of the WQ problem,
  - (b) the pollutant load reductions needed to meet WQS,
  - (c) the BMP's that will achieve that pollutant load reduction,

  you're not ready to implement BMP's that will solve the problem.

  - (unless you are very lucky)

9 Components of a Watershed – Based Plan

A. Identify and quantify causes and sources of the impairment(s) at the subcategory level (e.g., X dairy cattle, Y acres needing nutrient management, Z miles of streambank needing remediation)

B. Estimate needed load reductions, by subcategory, to achieve WQS

C. ID BMP's needed to achieve the load reductions, and ID the critical areas for implementing the BMP's

Nine Elements (cont.)

D. Estimate needed technical & financial resources

E. Information/ Education component

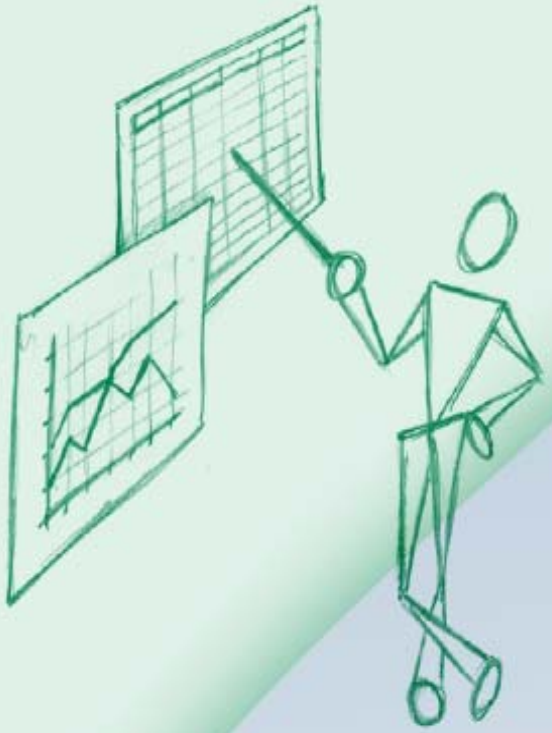
F. Schedule (who does what, when)

G. Describe measurable milestones for implementation

H. Establish criteria to determine if loadings/ targets are being achieved

I. Monitoring component for above criteria

Handbook for Developing Watershed Plans to Restore and Protect Our Waters



Mill Creek, PA
"Watershed Implementation Plan"

- 56 sq. miles, 76 stream miles, in "Amish Country"
- Mostly agricultural, some of the highest concentration of dairies in PA
- Stream bank erosion, unrestricted cattle access; little or no riparian zone
- Listed for siltation, nutrients

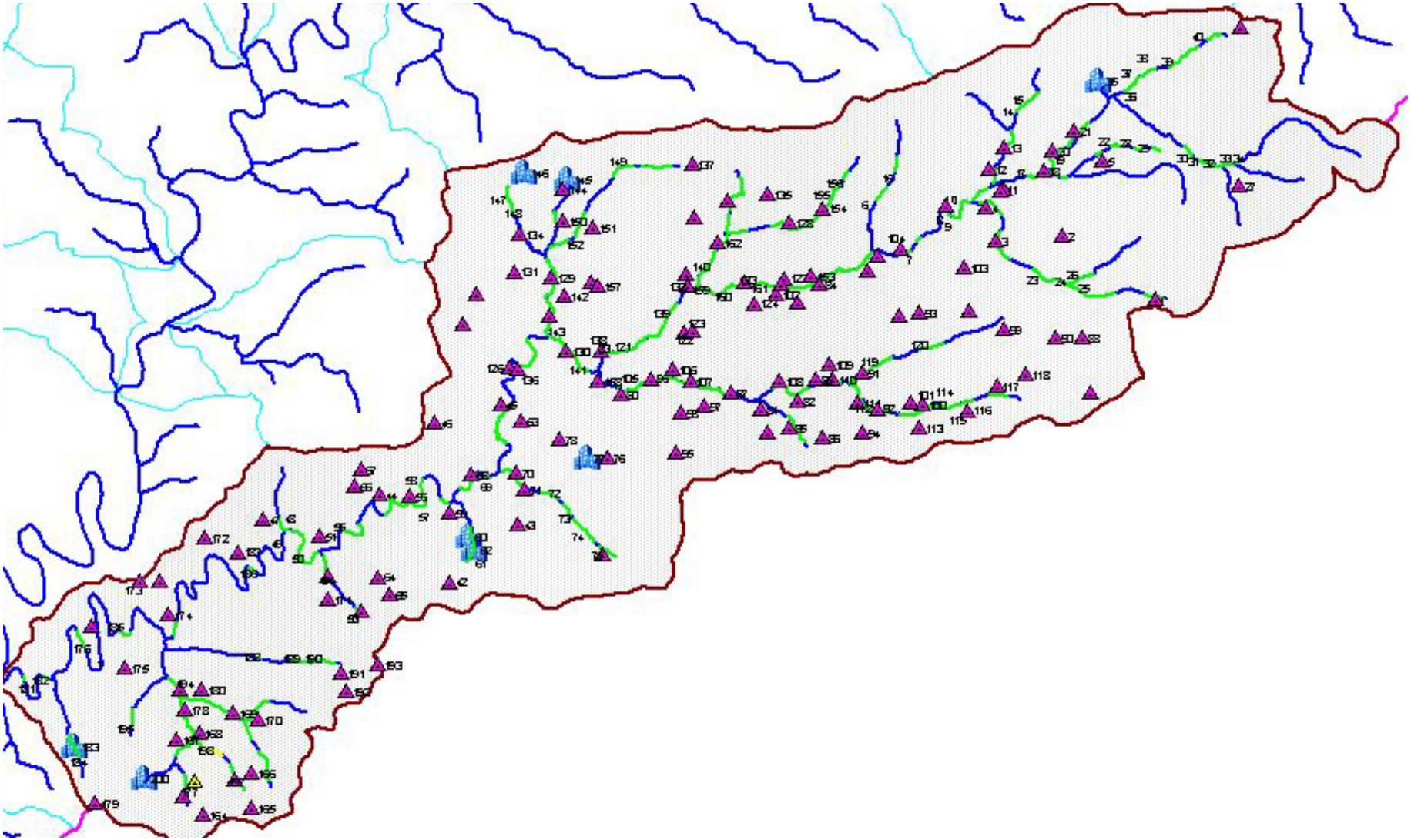
Much Work Had Been Done

- 319 National Monitoring Program (Pequea/Mill Creek) project reduced nutrients. Lots of monitoring
- USGS/NRCS participated
- 2001 Tetratech completed a “TMDL Plan”
- 2004, a second TMDL for a tributary
- TMDL had reasonably good detail

Source	Area (ac)	Unit Area Loading Rate (lbs/ac/yr)	Annual Average Load (lbs/yr)	Load Allocation (annual average) lbs/yr)	% Reduction
PHOSPHOROUS					
Hay/Past	2,792	0.89	2,496	1,630	34.6%
Cropland	2,649	5.33	14,118	3,076	78.2%
Coniferous	30	0.01	0	0	0.0%
Mixed For	20	0.01	0	0	0.0%
Deciduous	25	0.02	0	0	0.0%
Lo Int Dev	42	0.10	4	4	0.0%
Hi Int Dev	62	1.26	78	78	0.0%
Groundwater			425	424	
Septic Systems			24	24	
TOTAL	**5,619**	**3.05**	**17,147**	**5,237**	**69%**
SEDIMENT					
Hay/Past	2,792	344.17	960,998	787,850	18.0%
Cropland	2,649	2,447.10	6,482,058	3,584,828	44.8%
Coniferous	30	5.97	177	177	0.0%
Mixed For	20	4.90	97	97	0.0%
Deciduous	25	5.08	126	126	0.0%
Lo Int Dev	42	246.47	10,354	10,354	0.0%
Hi Int Dev	62	110.53	6,828	6,828	0.0%
TOTAL	**5,619**	**1,327.76**	**7,460,637**	**4,390,259**	**41%**

The Watershed Plan Adds More Detail

- The plan picks up where the TMDL's leave off.
- Exceptionally detailed information was obtained through ground surveys, conservation plan reviews, and personal interviews, then entered into ArcView GIS and into the AVNPS tool and AVGWLF model.
- PREDICT (a scenario analysis tool integrated with AVGWLF) was used to calculate load reduction values.



20 Pages, 200 sites, over 600 BMP's

- Sites ranked (by Conservation District staff, NRCS staff, and feedback from Millcreek Preservation Assoc.) in priority order, based on:

  - Severity of pollution problem
  - Proximity to stream
  - Slope
  - Complexity of project
  - Location in the watershed

- And all 200 sites have been mapped

Number	Rank	Total Acres	Acres/Feet Treated	Installed BMP's	Acres/Feet Proposed	Proposed BMP's	Estimated Cost/Unit	Total Cost
1	1	83	68.2	Conservation Crop Rotation	68.2	Cover Crop	$ 18.50	$ 1,261.70
			24.5	Contour Farming	68.2	NMP	$ 8.00	$ 545.60
			800'	Grassed Waterway	1	Barnyard Control	$18,000.00	$ 18,000.00
			10	Prescribed Grazing	1	Waste Storage System	$40,000.00	$ 40,000.00
			43.7	Stripcropping, Contour	2600	Stream bank Fencing	$ 2.00	$ 5,200.00
			800'	Diversion	2600	Riparian Buffer	$ 1.70	$ 4,420.00
					2600	Stream bank Stabilization	$ 30.00	$ 78,000.00
2	3	28.3	450'	Diversion	23.2	Conservation Crop Rotation	$ 5.00	$ 116.00
			0.5	Grassed Waterway	23.1	Contour Farming	$ 7.50	$ 173.25
					23.2	Cover Crop	$ 18.50	$ 429.20
					23.1	Stripcropping, Contour	$ 10.00	$ 231.00
					27.1	NMP	$ 8.00	$ 216.80
					3.7	Pasture/Hayland Planting	$ 200.00	$ 740.00
3	2	59.7	1	Waste Storage Facility	45	Stripcropping, Contour	$ 10.00	$ 450.00
			1	Barnyard Control	4000	Riparian Buffer	$ 1.70	$ 6,800.00
4	2	27	13.1	Conservation Crop Rotation	13.1	Residue Management, No-Till	$ 15.00	$ 196.50
			13.1	Cover Crop	3600	Riparian Buffer (trib)	$ 1.70	$ 6,120.00
			13.1	Stripcropping, Contour	2400	Riparian Buffer	$ 1.70	$ 4,080.00
			1400'	Stream bank Fencing	2400	Stream bank Fencing	$ 2.00	$ 4,800.00
			200'	Stream bank Stabilization	2400	Stream bank Stabilization	$ 30.00	$ 72,000.00
5	2	90	490'	Stream bank Fencing	62.3	Conservation Crop Rotation	$ 5.00	$ 311.50
					48.7	Residue Management, Seasonal	$ 17.00	$ 827.90
					13.6	Residue Management, No-Till	$ 15.00	$ 204.00
					62.3	Cover Crop	$ 18.50	$ 1,152.55
					1	Grassed Waterway	$ 3,700.00	$ 3,700.00

Another Example, from Virginia

- Estimated need of fencing: 272,250 ft for Beaver Creek and 74K ft for Little Creek
- Maps created for all potential streamside fencing sites on various streams in the Beaver Creek and Little Creek watersheds
- Tables show location (by sub-watershed), date, and extent of each fence already installed & “acres benefited”

Table 5.3 **Estimation of streamside fence, number of full exclusion systems, and number of hardened stream crossings required in the Beaver Creek and Little Creek subwatersheds.**

Impairment	Subwatershed	Existing Cost-Share Fence (ft)	Fence Needed (ft)	SL-6 Systems (#)	WP-2T Systems (#)	Hardened Crossings (#)
Beaver Creek						
	B1	0	0	0	0	0
	B2	0	0	0	0	0
	B3	0	0	0	0	0
	B4	0	0	0	0	0
	B5	0	0	0	0	0
	B6	0	2,920	3	0	2
	B7	0	9,590	9	0	2
	B8	0	0	0	0	0
	B9	0	18,840	17	0	5
	B10	0	0	0	0	0
	B11	400	12,920	12	0	2
	B12	0	62,880	53	2	17
	B13	0	12,140	11	0	4
	B14	1,150	5,220	5	0	2
	B15	1,750	87,890	74	3	40
	B16	4,050	59,850	51	2	25
	B17	0	0	0	0	0
	B18	0	0	0	0	0
Beaver Creek Subtotal		*7,350*	*272,250*	*235*	*7*	*99*

Targeting of sub-watersheds based on ratio or animals per fence length

Table 6.7 **Targeting subwatershed order for streamside fencing on Beaver Creek.**

Beaver Creek Subwatershed Priority	Livestock Exclusion Streamside Fencing
1st	B6
2nd	B14
3rd	B11
4th	B7
5th	B13
6th	B9
7th	B16
8th	B15
9th	B12
10th	B3
11th	B10
12th	B5
13th	B2
14th	B4
15th	B1
16th	B8
17th	B17
18th	B18

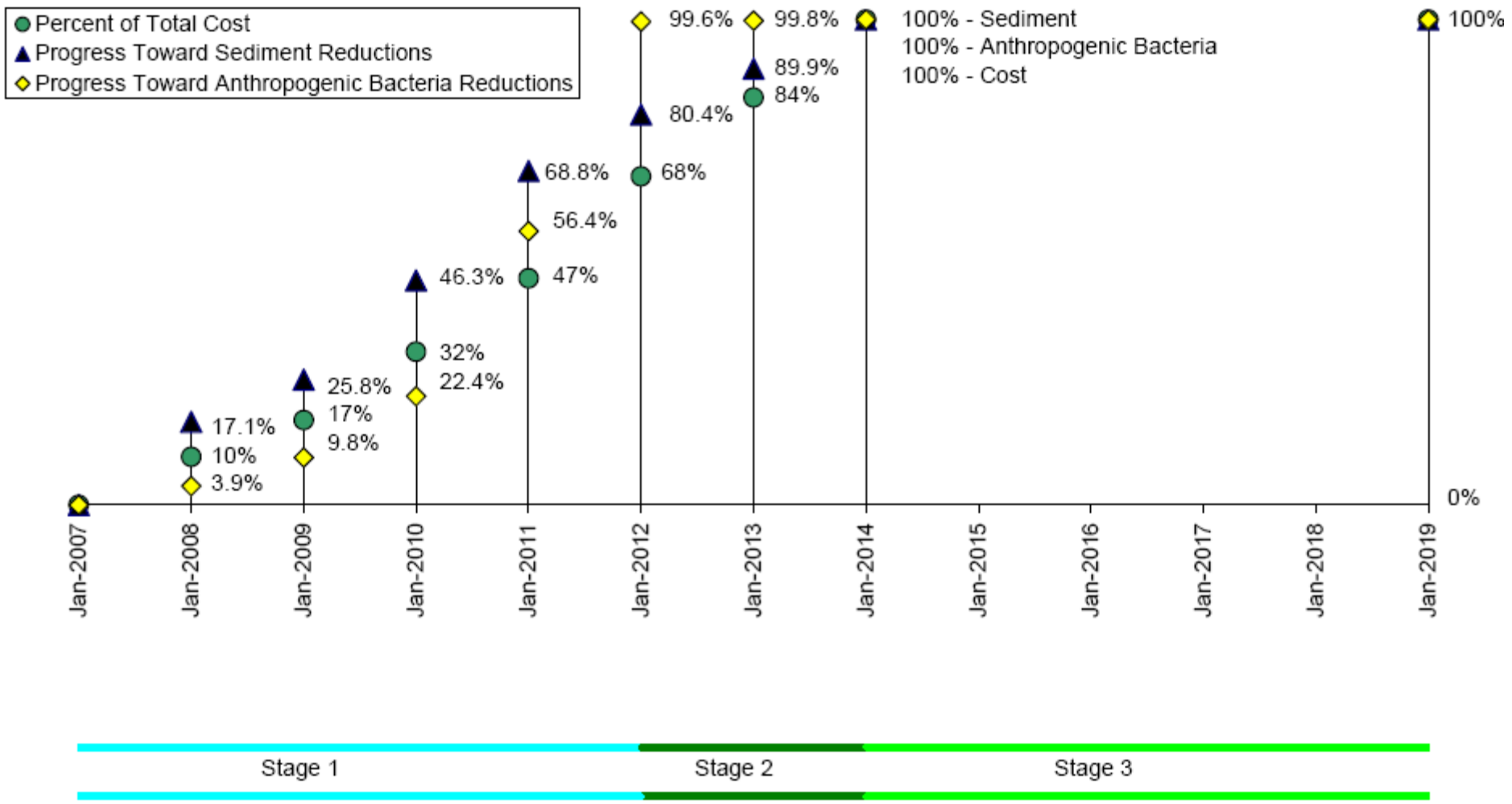


Figure 6.1 Timeline for implementation in the Beaver Creek watershed.

Issues

- Replicating this process thousands of times
- Improving the quality
- How do we get them implemented?

How do we get TMDL's Implemented?

- 319 Funds are limited:
  - Need increased USDA Support; How?
    - Use the "T$_{argeting}$" Word?
  - Increase 319?
  - Promote better alignment of SRF with TMDL's?

The “R” Word?