


Improving Waters Program

Bureau of Conservation and Restoration

April 2014

Overview

- DEP's Improving Waters Program
- Classification of Waters
- Defining Improving Waters
- Assessment Methods
- Data Analysis
- Reporting

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What is the Improving Waters Program?

- **Define and document measurable improvements in water quality in streams, rivers and lakes that result in:**
  - **progress towards an impairment free condition**
  - **an increased value in the resource and quality of life for the surrounding community.**
- **Implement BMPs where most needed/and where most chance of success**
- **Report**

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What is the Improving Waters Program?

- **Improvements may be due to:**
  - **a period of natural healing**
  - **restoration efforts and enhancements**
  - **removal of threats to the health and/or integrity of a waterbody**
- **Implement Best Management Practices (BMPs) where most needed/and where most chance of success**

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Water Quality Status – Designated Uses

- **Aquatic Life Uses:** Warm Water Fishes (WWF
- **Water Supply Uses:** Potable Water Supply (PWS) Industrial Water Supply (IWS); Livestock; Water Supply (LWS); Wildlife Water Supply (AWS); and Irrigation (IRS);
- **Recreational Uses:** Boating (B); Fishing (F); Water Contact Sports (WC) and Esthetics (E).
- **Fish Consumption**

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Additional Designated Uses

- Cold Water Fishes (CWF)
- Trout Stocking Fishery (TSF)
- Migratory Fish (MF)
- High Quality Warm Water Fishes (HQ-WWF)
- High Quality Cold Water Fishes (HQ-CWF)
- High Quality Trout Stocking Fishery (HQ-TSF)
- Exceptional Value (EV)

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Integrated Water Quality Monitoring and Assessment Report

- **Category 1**: Waters attaining all four designated uses.
- **Category 2**: Waters attaining some, but not all, designated uses.
- **Category 3**: Waters with insufficient or no data to determine attainment or impairment.
- **Category 4**: Waters impaired for one or more designated uses but not needing a Total Maximum Daily Load (TMDL).
- **Category 5**: Waters impaired for one or more designated uses by any pollutant and requiring a Total Maximum Daily Load (TMDL) – used for 303(d) list of impaired waters.

Improving Waters on Integrated Report

Fully Restorative (Full Delisting)

- Meets all water quality standards and designated uses
- Waterbody moves from Category 5 to Category 1 or 2

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Improving Waters on Integrated Report

Partially Restorative (Partial Delisting)

- Meets some water quality standards and designated uses
- Waterbody moves from Category 5 to Category 2

State of the Waters 2000

Streams/Rivers

- 86,000 miles total
- 35,496 miles assessed
- 47,644 unassessed
- 28,235 attaining: 80%
- 7,261 miles impaired

Lakes

- 161,455 acres total
- 42,421 acres assessed
- 16,157 acres attaining: 38%
- 26,264 acres impaired

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State of the Waters 2012

Streams/Rivers

- 86,000 miles total
- 84,571 miles assessed
- 67,972 attaining : 80%
- 16,599 miles impaired
  - 9,801 require TMDL
  - 6,490 have approved TMDL
  - 62 under compliance agreement

Lakes

- 161,455 acres total
- 80,525 acres assessed
- 43,194 acres attaining: 53 %
- 37,331 acres impaired
  - 20,544 don't require TMDL
  - 11,366 have approved TMDL
  - 5,420 require TMDL

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How Many Delistings Since 1996?

- Lakes
  - –5545 acres
  - –14 lakes
- Streams and Rivers
  - –3295 miles
  - –407 segments

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Dollars Expended Since 1996

Primarily Non- Point Source Related

- AMD (non GG) – 56,000,000
- Federal (EPA 319) – 60,000,000
- Growing Greener 1 – 298,000,000
- Growing Greener 2 – 225,000,000
- Chesapeake Bay – 23,000,000

Total – 662,000,000

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Why Not More Improvement?

- **Significant lag time between removal or reduction of a pollutant source and the corresponding response in the waterbody.**
- **Lack of regulatory authority over many nonpoint sources of pollution.**
- **Reporting process that does not recognize incremental improvement.**

Defining Incremental Improvement

- **Measurable**
- **Technically defensible**
- **Positive change in the condition of water body where an improvement has been measured**
  - **If impaired - does not yet fully meet applicable water quality standards**
  - **If unimpaired – exceeds standards**

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ARE WE THERE YET !?!
MATT GROENING

Measurement of Incremental Improvement

- Can be accomplished in different ways
- Measurement method must be
  - scientifically sound
  - appropriately used
  - sensitive enough to generate data from which signal can be discerned from noise

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Measurable Parameters and Indicators

- **May include**
  - **Biological**
  - **Chemical**
  - **Physical properties**
  - **Other attributes of an aquatic ecosystem that can be used to reliably indicate a change in condition**

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Identification of Incremental Improvement in Streams/Rivers

- **At least one chemical parameter that shows improvement of 30% or greater over a three year period OR;**
- **Benthic macroinvertebrate metrics showing improvement over a three year period OR;**
- **An increase in visual habitat scores in combination with an increase in benthic macroinvertebrate metrics OR;**
- **Improvement in a combination of physical parameters OR;**
- **Photo documentation (before and after) that indicates visual improvement.**

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Identification of Incremental Improvement in Lakes

- **Improvement trends in Trophic Status Indices (TSI) OR;**
- **A single physical or chemical parameter shows improvement of at least 30% over a three year period OR;**
- **Photo documentation (before and after) that indicates visual improvement.**

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Assessment Methods

- **DEP ICE Protocol for Streams and Lakes**
- **DEP's Watershed Support Section's - Water Quality Monitoring Methods for Watersheds with Agricultural Impacts**
- **DEP's Watershed Support Section's - Water Quality Monitoring Methods for Abandoned Mine Drainage Impacts**
- **Water Quality Monitoring Methods as described in the *Pennsylvania Senior Environment Corps Water Quality Field Manual* and the *Pennsylvania Senior Environment Corps Statewide Volunteer Water Monitoring Quality Assurance Project Plan (2013).***

Data Analysis

- **Chemical Indicators**
- **Biological**
  - **Benthic Macroinvertebrates and Fecal Coliforms**
  - **Chlorophyll-a, Plankton and Macrophytes**
  - **Invasive Species**
  - **Riparian Buffers**
- **Physical**
  - **Dissolved Oxygen**
  - **Water Temperature**
  - **Erosion and Sedimentation – Pebble Counts**
- **Visual Habitat**

Reporting Template

- **Background on waterbody to include: waterbody name; watershed name (HUC 12 or smaller) county/ municipality; number of stream miles and/lake acres source/cause of impairment and summary of historical data**
- **Purpose of monitoring – incremental improvement goals for each parameter**
- **Monitoring Methods to include: protocols used; location (lat/long) and frequency of sampling; quality control measures**
- **Best management practices established to include funding sources and responsible groups**
- **Generalized results**

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Waterbodies with Incremental Improvement

Water-body Name	HUC 12 Water-shed	Source/ Cause of Impair-ment	BMPs	Funding Source	General Results	Stream miles or Lake acres	Respon-sible Groups

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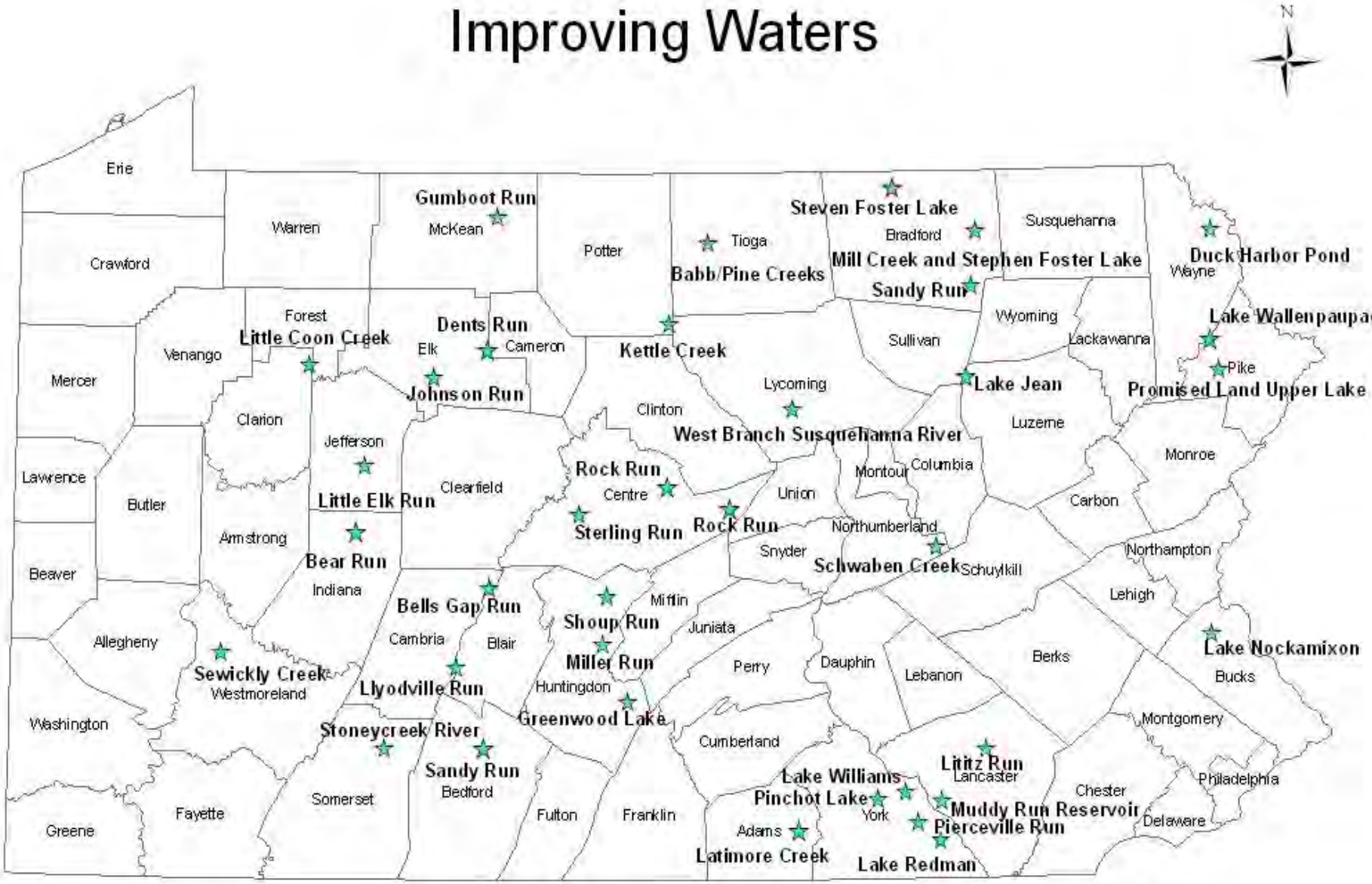
Improving Waters



Pierceville Run – York County
6.7 square mile agricultural watershed

- **Problem – 2002 List of Impaired Streams for:**
  - **Unstable stream banks**
  - **Severe erosion**
  - **Excessive nutrients**
  - **Suspended Solids**
- **Solution**
  - **Instream Restoration (Natural Stream Design)**
  - **Riparian Forest Buffers**



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