

# Christina Basin EPA Targeted Watershed Grant in Delaware and Pennsylvania

*Presentation to:*

*Delaware River Basin Commission*

*West Trenton, NJ May 6, 2009*

Jan Bowers

Chester County Water Resources Authority

West Chester, Pa.

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Newark, Del.

# Delaware River Basin



# Christina River Basin



# The Historic Christina Basin

- 1638, first permanent European settlement in Delaware Valley at Christina River.
- 1777, Battle of the Brandywine, largest battle of the Revolution.
- 1802, DuPont Brandywine mills, hydropower head greater than Niagara Falls.
- 1945, Brandywine Valley Association, USA's first small watershed organization.
- 2000, White Clay Creek National Wild and Scenic River, one of two in USA designated on a watershed basis.
- 2008, CBCWP completes \$1 million USEPA TWG, tops in USA among 170 watersheds.

# The Unique Christina Basin

- Only interstate watershed in Delaware River Basin
- Provides 100 mgd drinking water for 600,000 people
- Water supply for 60% of Delaware's population
- HQ trout streams in PA and only 6 trout streams in Delaware
- Largest concentration of mushroom farms in USA
- Wilmington largest U.S. banana port, 1 million tons per year
- 40 deg N, world's most productive gardens at Longwood
- International headquarters of DuPont, Gore, Disney...

# Christina Basin Clean Water Partnership



# Christina Basin Clean Water Partnership Mission

Protect and restore the Brandywine, White Clay, Red Clay, and Christina Creeks in Delaware and Pennsylvania to fishable, swimmable, and potable status by 2015.

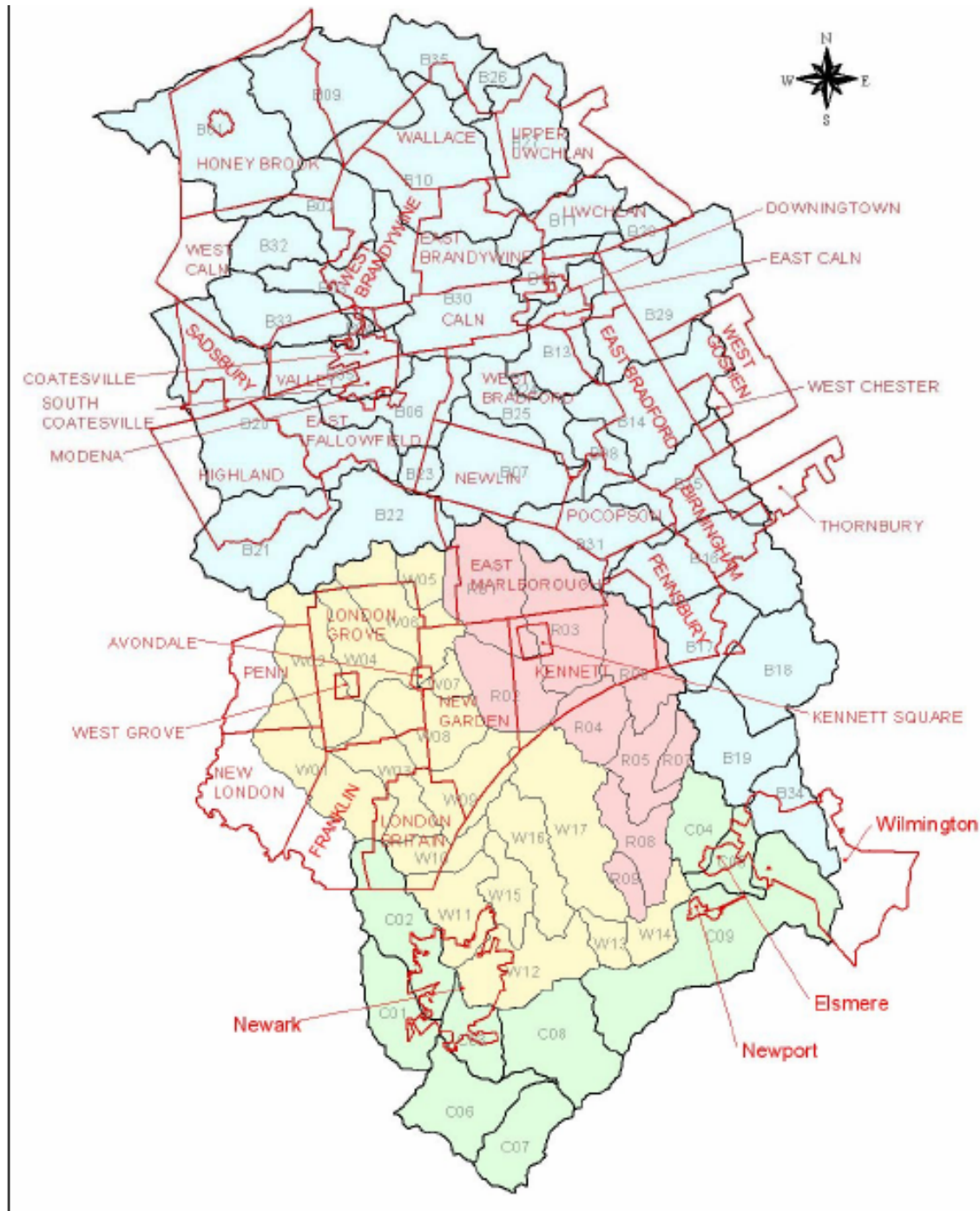
# Christina Basin Phased Approach

<u>Phase</u>	<u>Tasks</u>	<u>Milestones</u>
I	DRBC/USEPA Mediation/Problem Assessment	1994 - 1996
II	GIS Watershed Characterization	1997 - 1998
III	Water Quality Monitoring/Implementation	1999 - 2000
IV	TMDL Modeling/Implementation	2001 - 2003
V	TMDL Promulgation and Implementation	2004 - 2005
VI	Targeted Watershed Grant Implementation	2004 - 2007
VII	Implementation of Pollution Control Strategy	2008 - 2015

# Christina Basin TMDLs

- *Low Flow TMDL*, rev. Sep 2006
  - 8 wastewater dischargers reduce CBOD5, NH3-N), and TP
  - Being implemented at permit renewals
- *High Flow TMDL*, rev. Sep. 2006
  - TN and TP reductions up to 75%
  - Bacteria reductions 29% to 93%
  - Sediment reductions over 50%
  - To be implemented through municipal NPDES stormwater permits

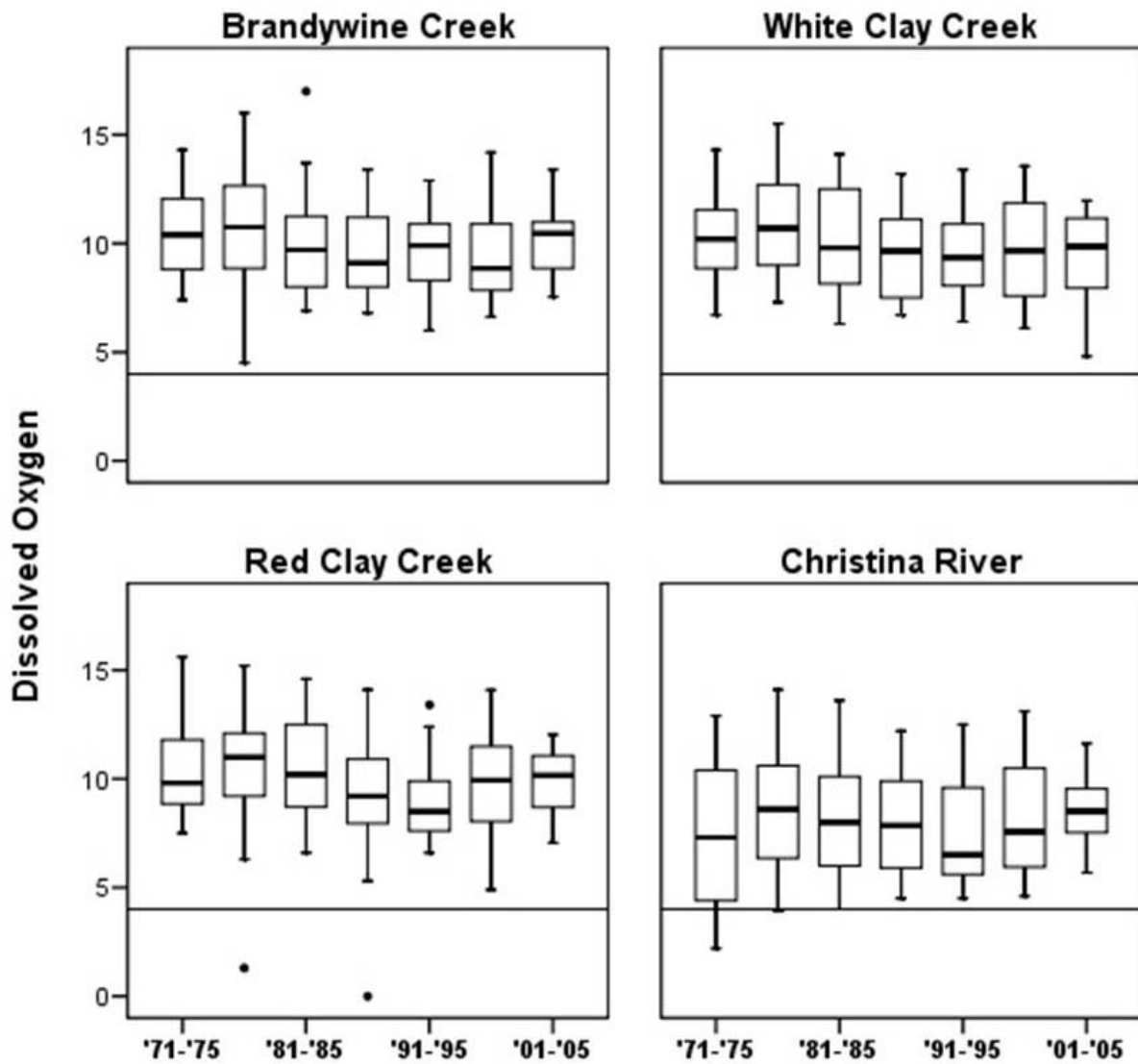




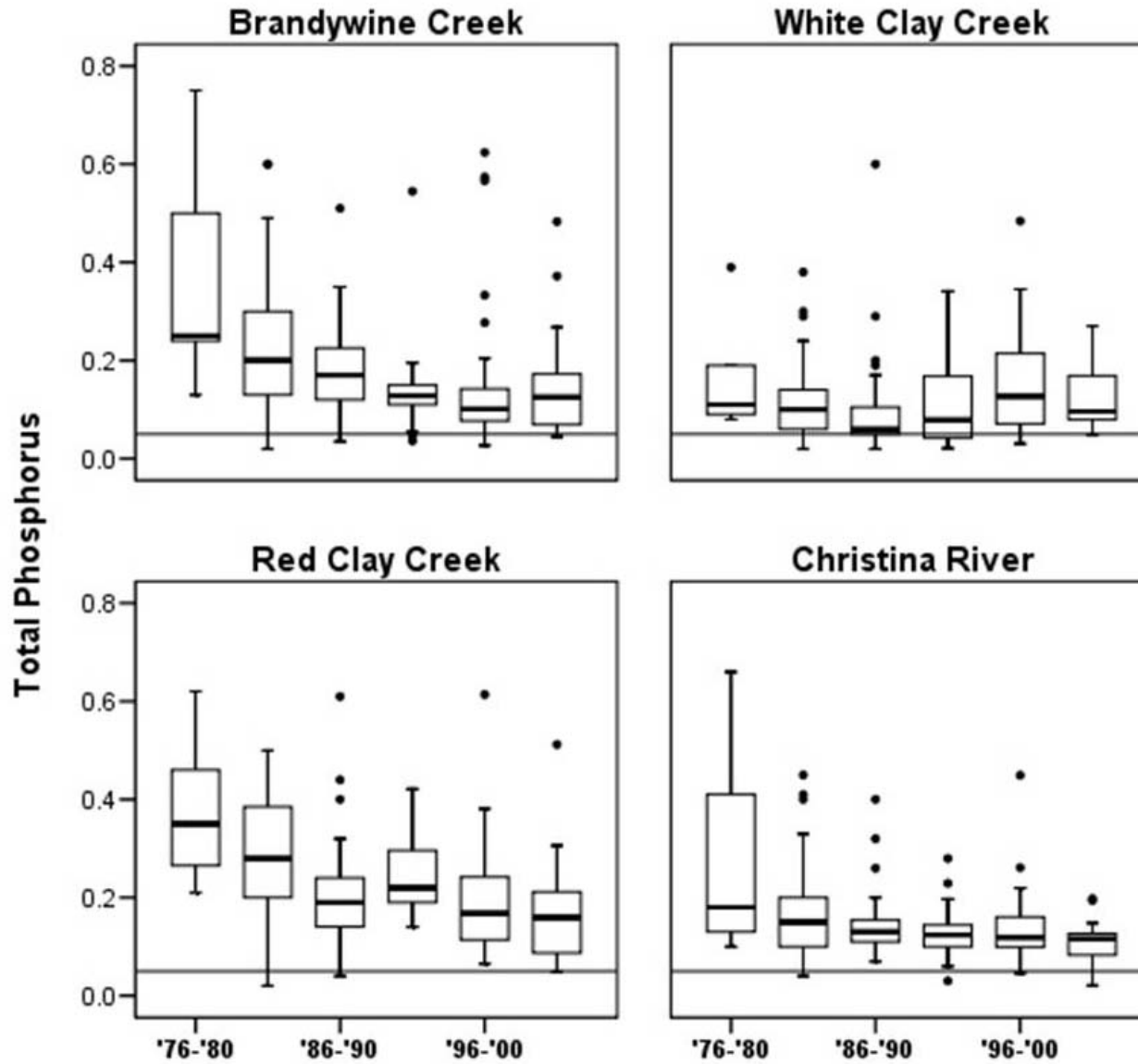
# Municipalities with MS4 permits

Figure 2-2. Municipalities with MS4 permits in Christina River Basin

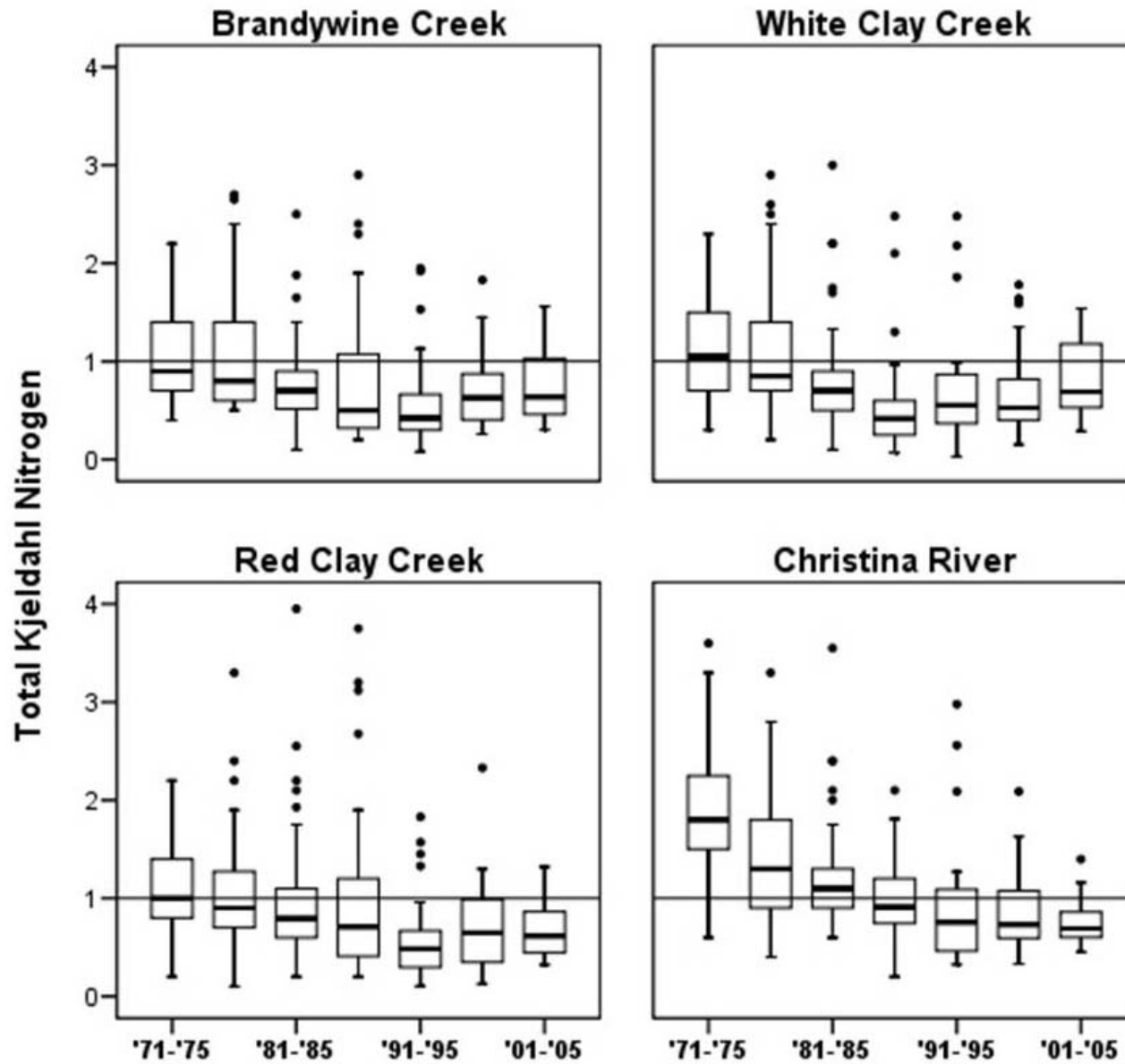
# DO trends



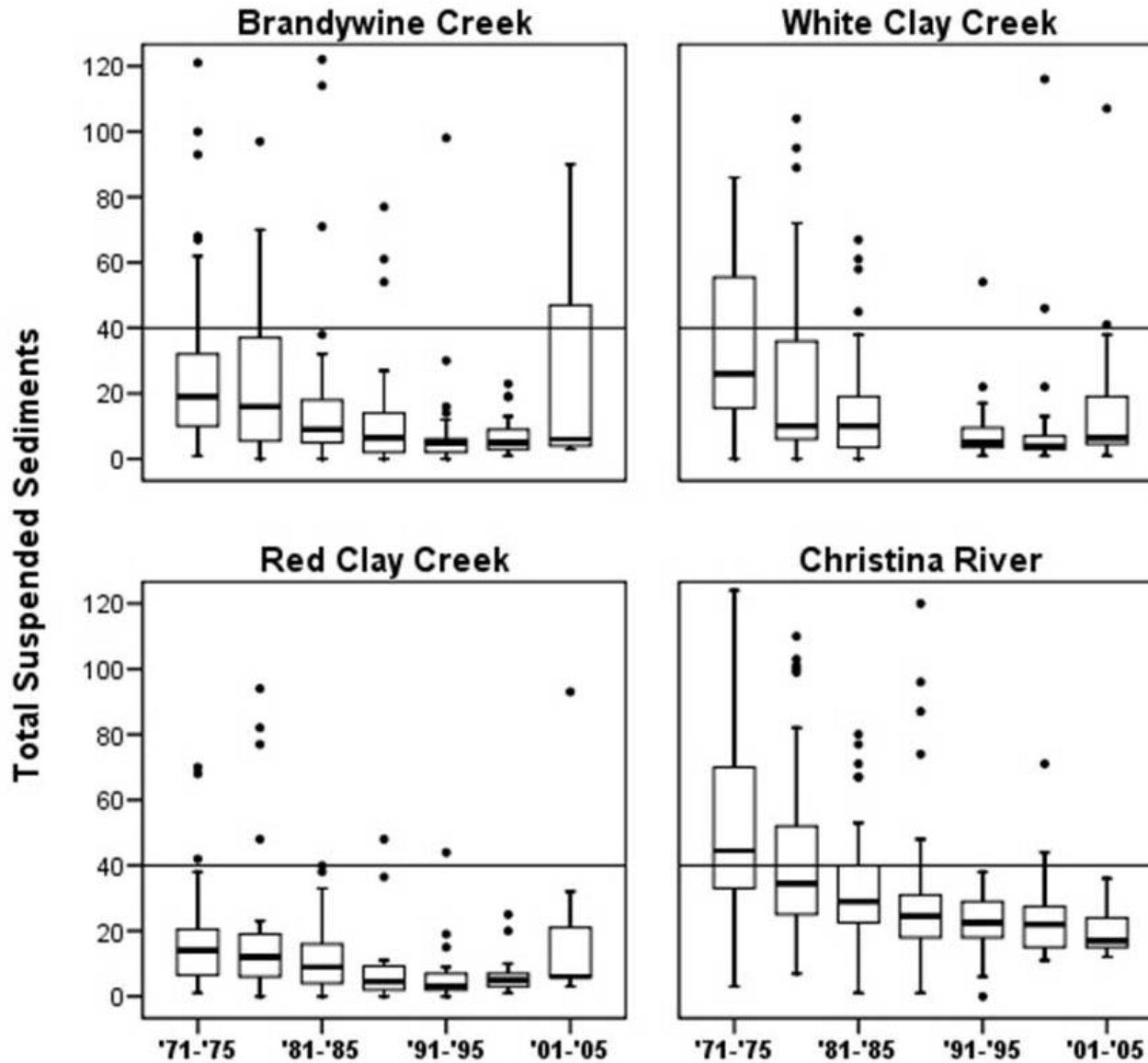
# Total P trends



# Kjeldahl N trends



# TSS trends

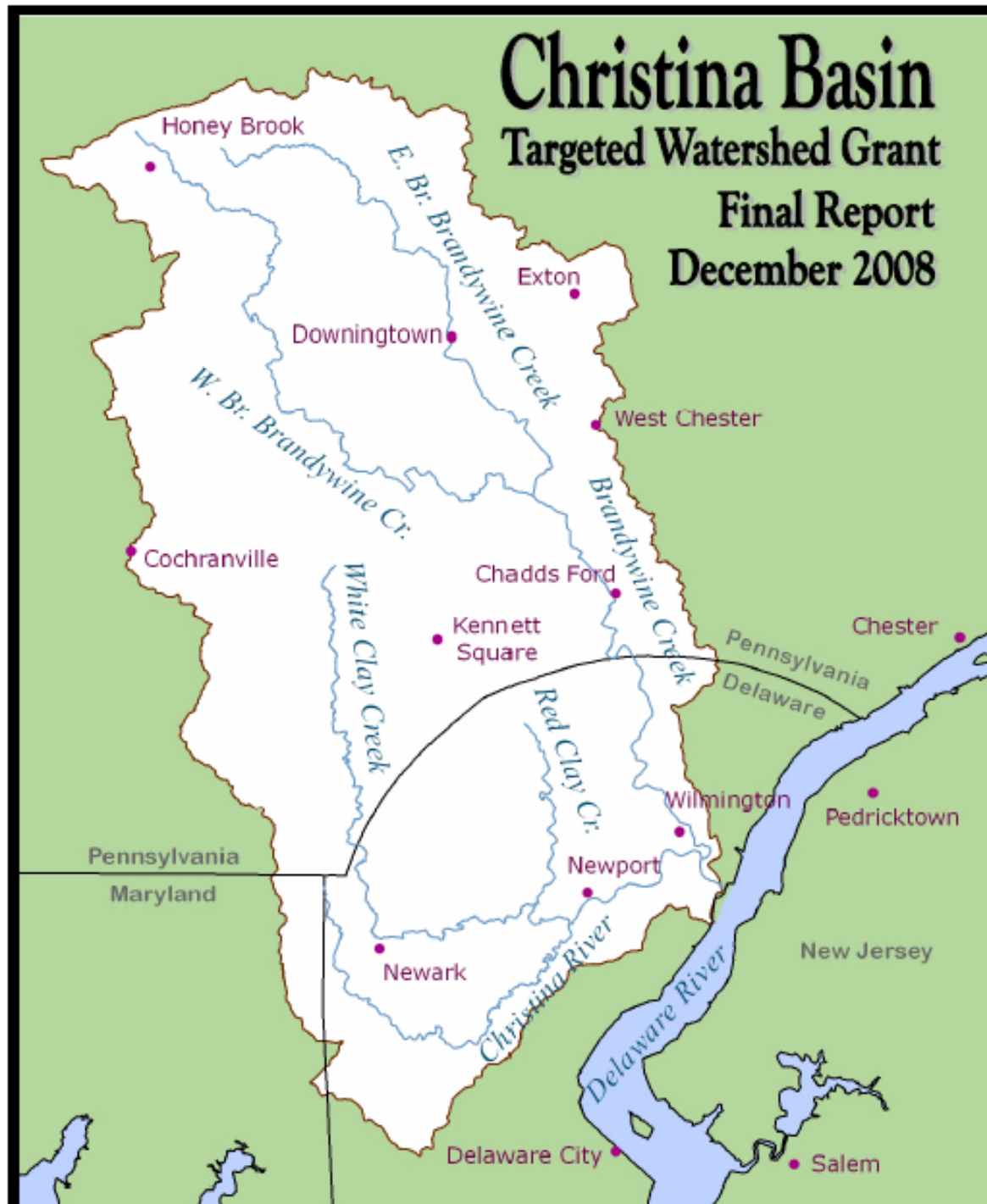


# Christina Basin

## Targeted Watershed Grant

### Final Report

### December 2008





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III- OFFICE OF PUBLIC AFFAIRS  
1650 Arch Street Philadelphia, Pennsylvania 19103-2029  
Phone - 215/814-5100 Fax - 215/814-5102

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## EPA Environmental News

Contact: David Stenberg (215) 814-5548, [stenberg.david@epa.gov](mailto:stenberg.david@epa.gov)

### **Report Shows Progress Exceeding Plans in Christina River Basin**

**(PHILADELPHIA, February 5, 2009)** – The U.S. Environmental Protection Agency, announced today that the Christina River Basin Clean Water Partnership in Pennsylvania and Delaware has made significant progress in reducing pollution from storm water runoff to the Christina River basin.

A recent report by the University of Delaware and the Delaware River Basin Commission shows that, throughout the past four years, the Partnership, with the assistance of a \$1 million EPA grant, has implemented numerous projects to reduce the harmful effects of stormwater runoff pollution on drinking water supplies, recreation, fisheries, and wildlife.

For every federal dollar invested in the project, the Partnership leveraged more than two dollars, allowing them to exceed the original goals, some by more than 50 percent.]

# Christina Basin

## Targeted Watershed Grant

- \$1 million awarded in 2003
- One of 20 watersheds with federal funding.
- No. 1 rated watershed of 176 applications in USA
- Leveraged TWG funds by a 2 to 1 margin
- Budget = \$3,679,778, \$1,000,000 TWG, \$339,000 by DE and PA local match, 2,340,778 in leveraged funds
- Every federal dollar invested, over two local dollars were raised.
- Original restoration goals exceeded by 150% to 200%.
- Along Del. streams, 5,000 ft stream reforestation/restoration proposed, 8,920 feet delivered.

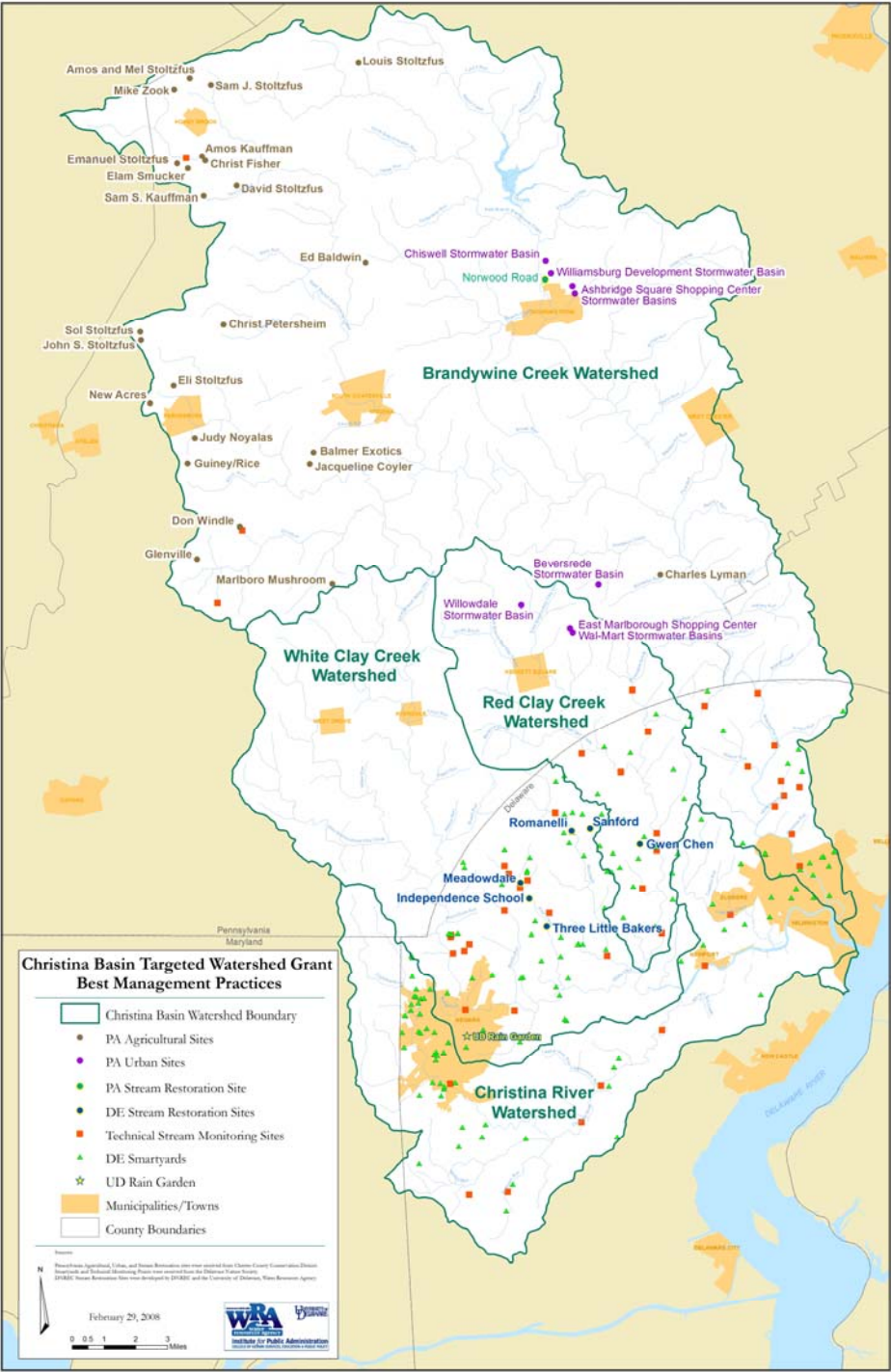


# Christina Basin TWG

## Deliverables exceed goals!

<b>Task</b>	<b>Action</b>	<b>Original Deliverable</b>	<b>Final Result</b>
3.1C	PA Soil Conservation Practices	500 acres	>725 acres
3.1D	PA Waterway Diversions	2,000 feet	2,250 feet
3.1E	PA Water Control Structures	4 structures	6 structures
3.1F	PA Stream Fencing	1,000 feet	8,025 feet
3.1G	PA Stream Reforestation	6,000 feet	9,148 feet
3.2	DE Smartyards and Rain Barrels	150 rain barrels	204 rain barrels
4.1	DE Stream Restoration/Reforestation	5,000 feet	8,920 feet

# Christina Basin Targeted Watershed Grant Projects



*Christina Basin Clean Water Partnership Awards Ceremony:  
A Celebration of Success  
February 29, 2008  
Red Clay Room • Kennett Square, Pennsylvania*

10:00 AM

**REGISTRATION**

COFFEE, TEA, AND JUICE WILL BE SERVED

10:30 AM

**PROGRAM**

♦ MASTER OF CEREMONIES

*ROBERT STRUBLE, EXECUTIVE DIRECTOR, BRANDYWINE VALLEY ASSOCIATION AND RED CLAY VALLEY ASSOCIATION*

**WELCOME AND INTRODUCTIONS**

♦ DELAWARE RIVER BASIN COMMISSION

*ROBERT TUDOR, DEPUTY EXECUTIVE DIRECTOR*

♦ UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION III

*JON CAPACASA, DIRECTOR, WATER PROTECTION DIVISION*

**RESULTS OF THE TARGETED WATERSHED GRANT**

♦ CHESTER COUNTY CONSERVATION DISTRICT

*CHOTTY SPRENKLE, WATERSHED COORDINATOR/SPECIALIST*

♦ DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

*STEVE WILLIAMS, ECOLOGICAL RESTORATION COORDINATOR*

♦ DELAWARE NATURE SOCIETY

*JOHN HARROD, BACKYARD HABITAT COORDINATOR*

**PRESENTATION OF AWARDS**

♦ U.S. REPRESENTATIVE MICHAEL CASTLE (DELAWARE)

**DELAWARE AWARD RECIPIENTS:**

- ♦ NICK AND HUGO IMMEDIATO, THREE LITTLE BAKERS GOLF COURSE
- ♦ THE INDEPENDENCE SCHOOL
- ♦ MARY ANN CAPRIA

♦ U.S. REPRESENTATIVE JAMES GERLACH (PENNSYLVANIA)

♦ U.S. REPRESENTATIVE JOSEPH PITTS (PENNSYLVANIA)

**PENNSYLVANIA AWARD RECIPIENTS:**

- ♦ JOSEPH AND DYANNE DELANEY
- ♦ MATT BALMER, M. BALMER EXOTICS
- ♦ THE LAFFEY FAMILY, GLENVILLE FARMS

**FUTURE PLANS**

♦ PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

*CATHY CURRAN MYERS, DEPUTY SECRETARY*

♦ DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

*DAVID SMALL, DEPUTY SECRETARY*

**ADJOURN AND ACKNOWLEDGEMENTS**

♦ DELAWARE RIVER BASIN COMMISSION

*ROBERT TUDOR, DEPUTY EXECUTIVE DIRECTOR*

12:00 PM

**LUNCH**

Congressman Joe Pitts (PA)  
presents award at  
Christina Basin TWG event,  
Feb 29, 2008



Congressman Mike Castle (DE)  
presents award at  
Christina Basin TWG event,  
Feb 29, 2008

Floodplain forest restoration,  
confluence of Bucktoe and Red Clay Creeks (PA)



# Nutrient management control system M. Balmer Exotics Mushroom Farm, PA





# Stream bank fencing at Glenville Farms, PA



# Smartyard Native Garden in the Christina Basin, DE.





# Smartyards in Christina Basin



## Christina Basin

SMARTYARDS  
and  
Monitoring Locations

### Map Key

- Christina Basin Stations
- Technical Monitoring
- ▲ SMARTYARD Round 3
- ▲ SMARTYARD Round 2
- ▲ SMARTYARD Round 1
- Christina Watershed

SMARTYARD locations were geocoded using the ESRI 2005 StreetMap USA layer.

Note: 18 Donald Preston Rd., Newark could not be located.



# Sanford School riparian corridor planting, DE



Before

After

# Three Little Bakers stream restoration project along Pike Creek, DE







Three Little Bakers  
pre-construction.



post-construction

# Red Clay Creek Tributary stream restoration, DE



Before



After

# Independence School along Pike Creek, DE

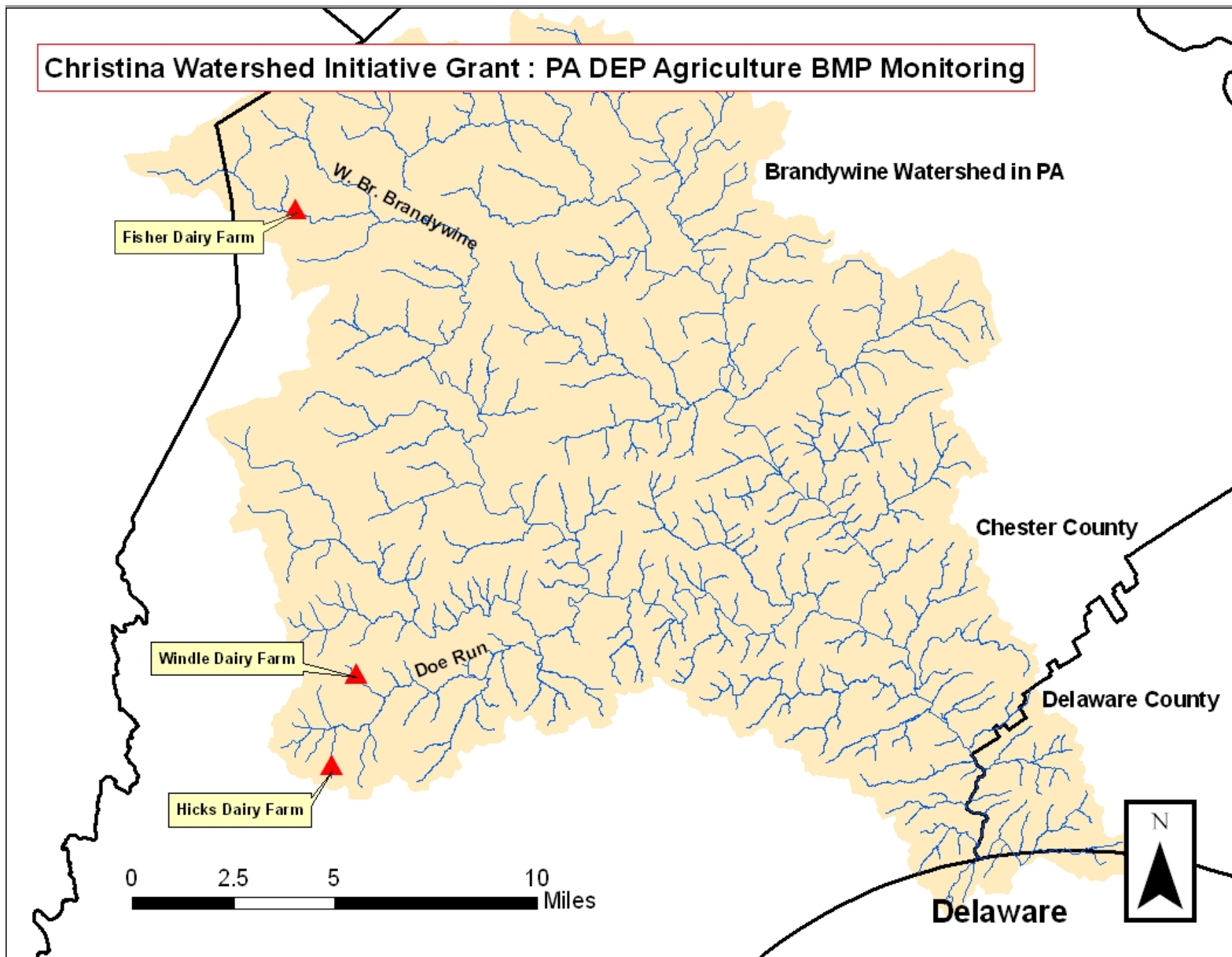




# UD Rain Garden, DE

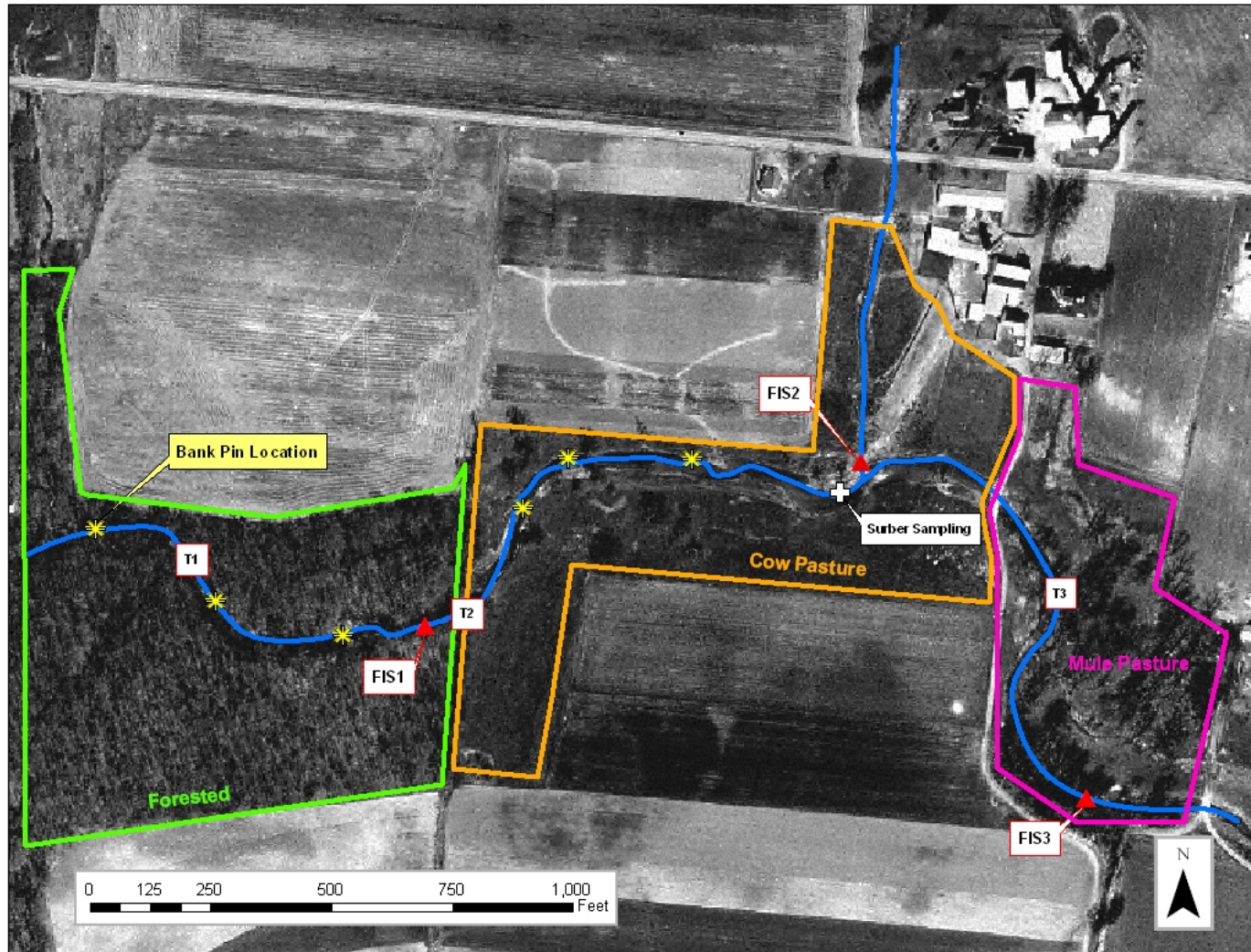


**Christina Watershed Initiative Grant : PA DEP Agriculture BMP Monitoring**





# Fischer Farm Agriculture Conservation, PA



Lower Fisher farm  
pasture pre-BMP  
(May 18, 2004).



Lower Fisher farm  
pasture post-BMP  
(September 19, 2007).



# Future Actions:

- Implement interstate watershed strategy.
  - Stormwater
    - Open Space
    - Wastewater
    - Agriculture
    - Education
- Employ fulltime watershed governance.
- Develop sustainable watershed funding.
- Pilot watershed based permitting (TMDL, MS4)
  - National Acad. of Sciences recommendation



**Proposal**  
**Recovery Act - Christina Basin NOAA Coastal Habitat Restoration**  
**Grant**  
**(Delaware and Pennsylvania)**

*“A \$3.9 million NOAA grant funded by the American Recovery and Reinvestment Act of 2009 to restore coastal habitat and fund 125 green jobs in the Christina Basin in Delaware and Pennsylvania”*

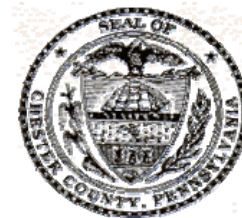
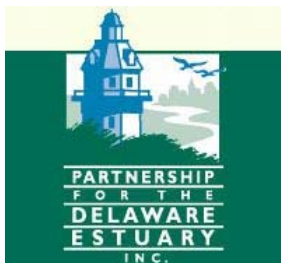
April 6, 2009

*Submitted by:*

*On behalf of the Christina Basin Clean Water Partnership:*

*Submitted to:*

National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), U. S. Department of Commerce



## **Project Outputs/Outcomes**

The Christina Basin Coastal Habitat Restoration Grant is designed to stimulate the regional economy, fund 125 jobs, and restore green infrastructure through a number of bundled project including:

- Reforest 130 acres of riparian buffer in coastal watersheds,
- Restore 11,855 feet of stream buffer habitat,
- Restore 8 miles of White Clay Creek for American shad/diadromous fish migration
- Restore 16 ac of wetlands in coastal watersheds, and
- Deliver a public outreach program to the 600,000 residents of the Christina Basin.

## **Project Timeline**

Start grant and commence shovel ready projects	Jun 2009
Complete projects	Jun 2011

# What's Next ?

- All Partners continuing implementation with existing program resources
  - DE - “Christina Basin Pollution Control Strategy”
  - DE – Implement MS4 NPDES permits for New Castle Co., DELDOT, and City of Newark.
  - DE – Wilmington implement CSO abatement plan.
  - PA – “Watersheds” plan
  - Chester Co – pursuing a “targeted” Stormwater TMDL Implementation Strategy for use with MS4s
  - BVA – “Red Streams Blue” program (PADEP G2\$)
- City of Wilmington completing Brandywine Cr source water protection plan
- Explore watershed-based implementation of stormwater TMDLs within PA NPDES MS4 permitting program ?

# Greatest Challenges ??

- 1) Maintaining momentum of bi-state partnership**
- 2) How to implement stormwater TMDLs within PA regulatory and governance structure?**
- 3) Future funding**
  - Remaining work in excess of \$50 million
  - Sustainable funding and staff/delivery systems needed
  - Partnership will be “brainstorming” for potential long-term
    - inter-state funding mechanisms
    - coordinate in-state funding mechanisms
  - Meanwhile, continue pursuit of grant funds
- 4) Water quality monitoring to track TMDL progress**