

# PROTECTING NEW YORK CITY'S WATER SUPPLY WITH THE CONSERVATION RESERVE ENHANCEMENT PROGRAM

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**Project Coordinator**  
**USDA NRCS**

CRP: PLANTING FOR THE FUTURE  
JUNE 8, 2004  
FT. COLLINS, CO

# ***NEW YORK CITY WATERSHED***

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- Largest surface water supply system
- Serves 9,000,000 residents
- Exceeds 1,000,000 acres of land in 8 counties
- Primary Ag - dairy farming

# *New York City Watershed Agricultural Council (WAC)*

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- Surface Water Treatment Rule - EPA
- NYC proposed rules and regs for Watershed
- Ad Hoc Task Force formed to negotiate
- Voluntary program with funding from NYC to plan & implement whole farm plans on 85% of farms in watershed

# *Watershed Ag. Council*



- Locally-led
  - 19 members
  - farmers/ag. business
  - NYC DEP
- Funded by New York City
- PL-566 Tech Asst Funding
- USFS Funding
- Whole Farm Plans
- Partnerships



# *Partners*

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- Watershed Agricultural Council
- NYC DEP
- Cornell Cooperative Extension
- Soil & Water Conservation Districts
- USDA/NRCS
- Delaware DCAP
- NYS Ag & Markets
- NYS DEC
- NYS DOH



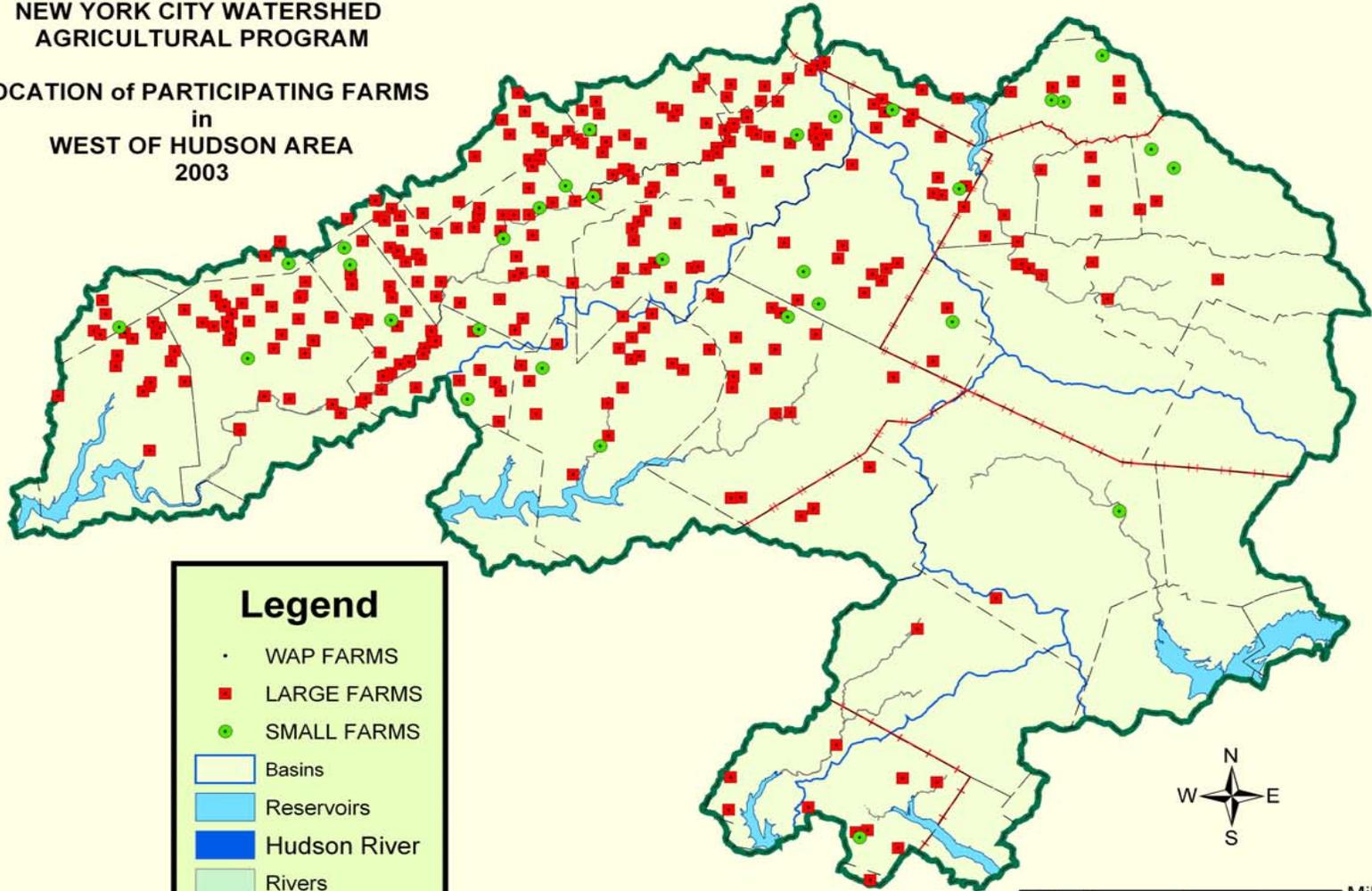
# *Partners*

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- Cornell University
- USDA ARS
- USGS
- EPA
- USDA FSA
- NYS WRI

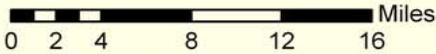
**NEW YORK CITY WATERSHED  
AGRICULTURAL PROGRAM**

**LOCATION of PARTICIPATING FARMS  
in  
WEST OF HUDSON AREA  
2003**



**Legend**

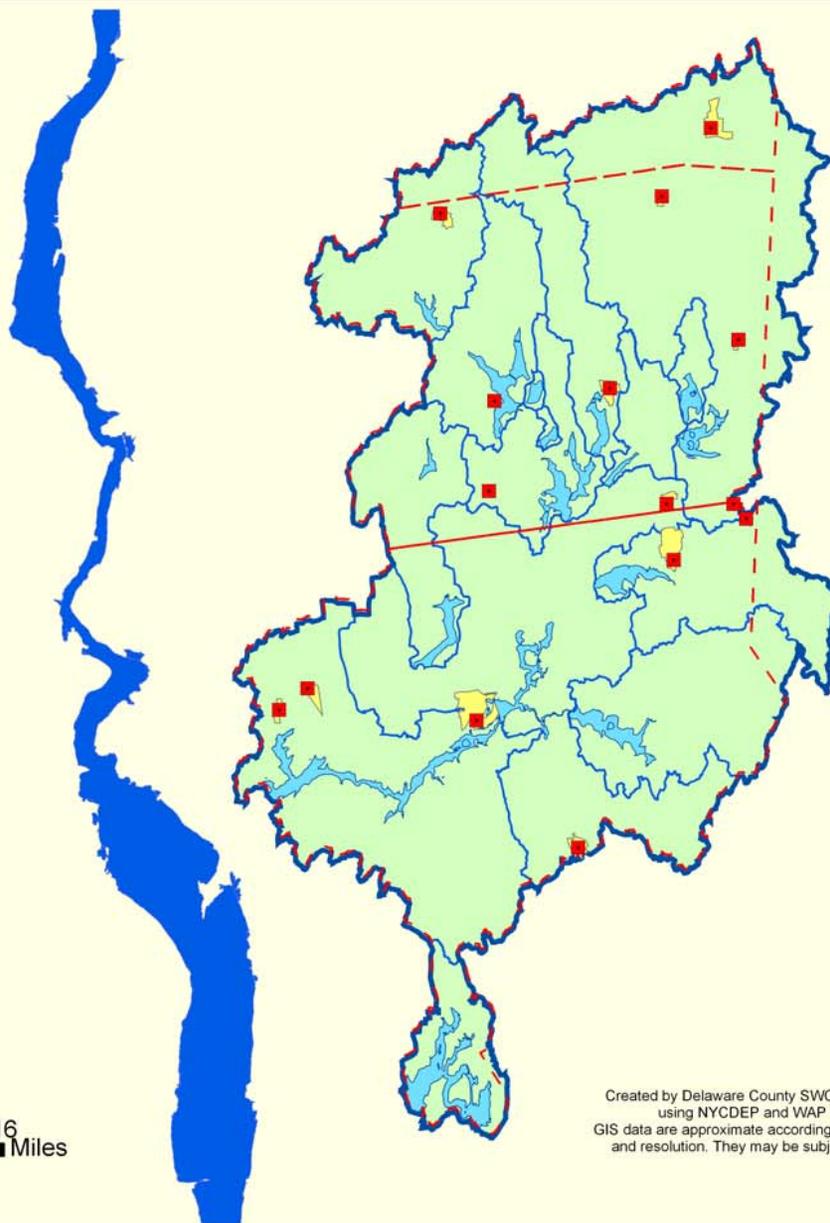
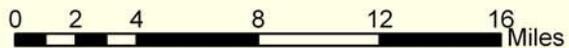
- WAP FARMS
- LARGE FARMS
- SMALL FARMS
- Basins
- Reservoirs
- Hudson River
- Rivers



Created by Delaware County SWCD - 12/2003  
using NYCDEP and WAP data  
GIS data are approximate according to their scale  
and resolution. They may be subject to error.

**NEW YORK CITY WATERSHED  
AGRICULTURAL PROGRAM**

**LOCATION of PARTICIPATING FARMS  
in  
EAST OF HUDSON AREA  
2003**



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# *Watershed Ag. Program*

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## LARGE FARM PROGRAM

- ENVIRON. REVIEW/PROBLEM DIAGNOSIS

# *Pollutant Categories*

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- I. Parasites & Phosphorus: Animal Waste Storage
- II. Pesticides: Mixing/Loading Areas
- III. Phosphorus: Fertilizer Storage
- IV. Parasites: Animal & Manure Management
- V. Nutrient Management
- VI. Nutrients: Concentrated Sources
- VII. Sediment: Diffuse
- VIII. Sediment: Concentrated
- IX. Pesticides: Field & Animal Application
- X. Fuel Storage
- XI. Other: Toxic Materials

# *Watershed Ag. Program*

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## LARGE FARM PROGRAM

- ENVIRON. REVIEW/PROBLEM DIAGNOSIS
- MULTIPLE BARRIER APPROACH

# *Watershed Ag. Program*

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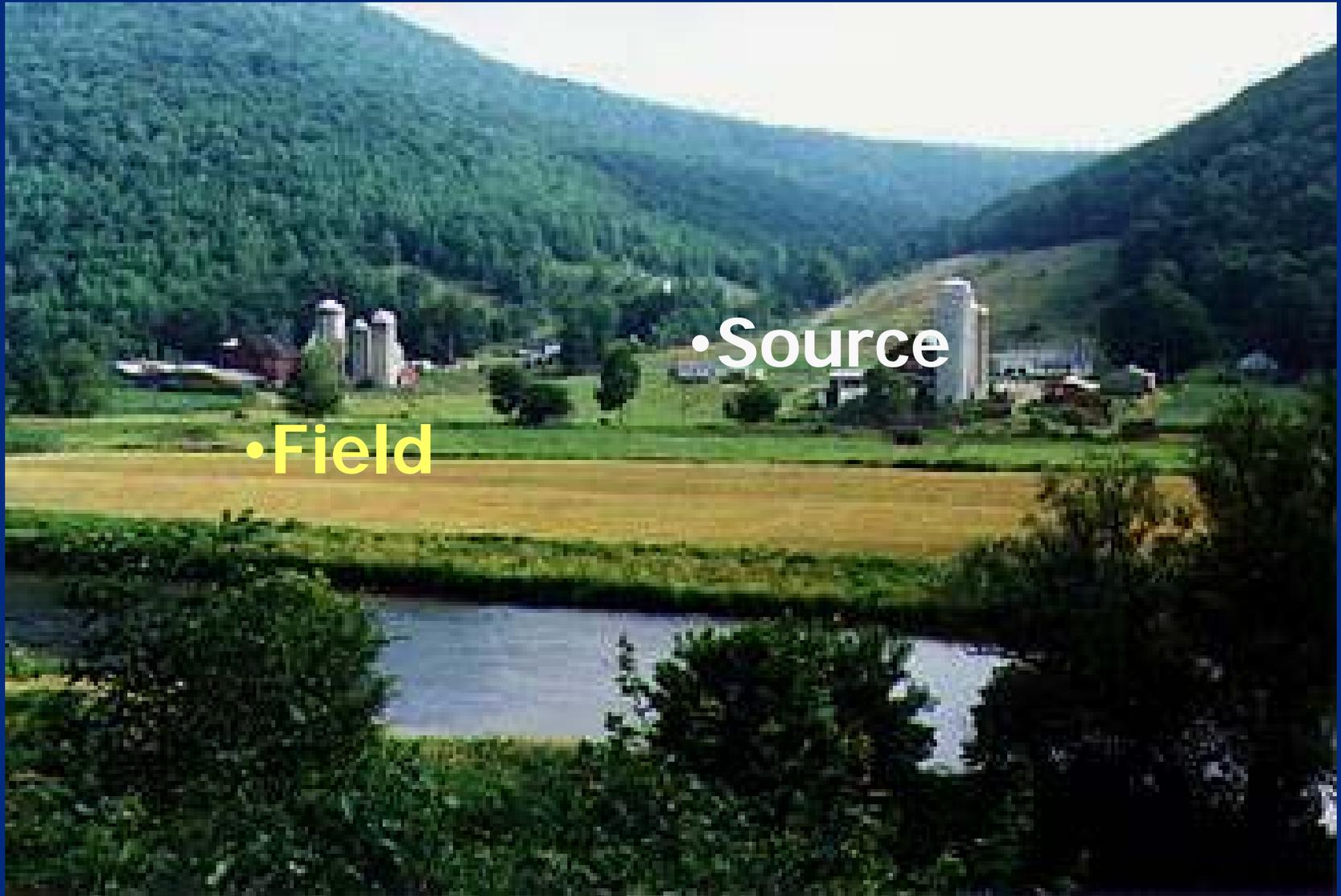






# *Watershed Ag. Program*

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•Field

•Source

# Soil Erosion





Strip Crops  
Cover Crops

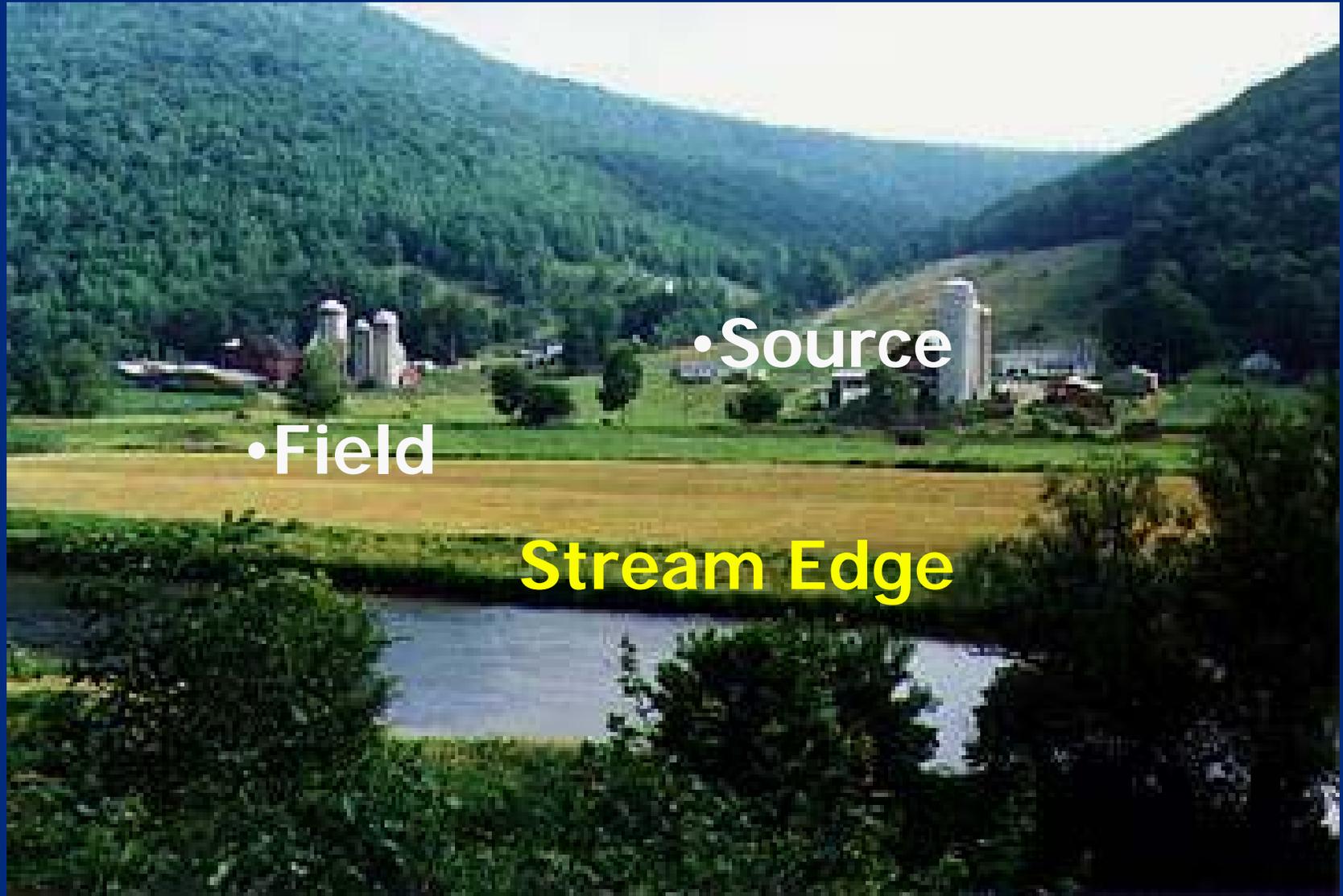


# Nutrient Management



# *Watershed Ag. Program*

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# *Watershed Ag. Program*

## LARGE FARM PROGRAM

- ENVIRON. REVIEW/PROBLEM DIAGNOSIS
- MULTIPLE BARRIER APPROACH
- STAFFING
  - 3 TEAMS
    - COOP EXT
    - NRCS
    - SWCD
  - ENGINEERING ASSISTANCE
    - NRCS
    - WAC
  - Nut. Mgt Team
  - CREP Team

# ***WATERSHED AG. PROGRAM***

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- Approximately \$2.4 million per year on BMP's
  - Barnyards
  - Milkhouse waste
  - Manure storage
  - Silage leachate control
  - Water management practices
  - Alternative watering facilities
  - Fencing
  - Riparian forest buffers (CREP)
  - Roof runoff management
  - Agronomic practices

# *Watershed Ag. Program*

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- Long Term Follow-up on Watershed Farms
- Increased Emphasis On Behavioral Change
  - Nutrient Management Plans
  - Precision Feeding
  - Education
  - Improved Forage Mgt



# *Watershed Ag. Program*

## LARGE FARM PROGRAM

### ACCOMPLISHMENTS

- 241 WHOLE FARM PLANS
- \$18,300,000 OF BMP IMPLEMENTATION \*\*
- >60,000 ac. AG. LAND COVERED BY WFP (33%)
- \*\* includes USDA portion of CREP - \$1,327,000

# *CREP - New York City W/S*

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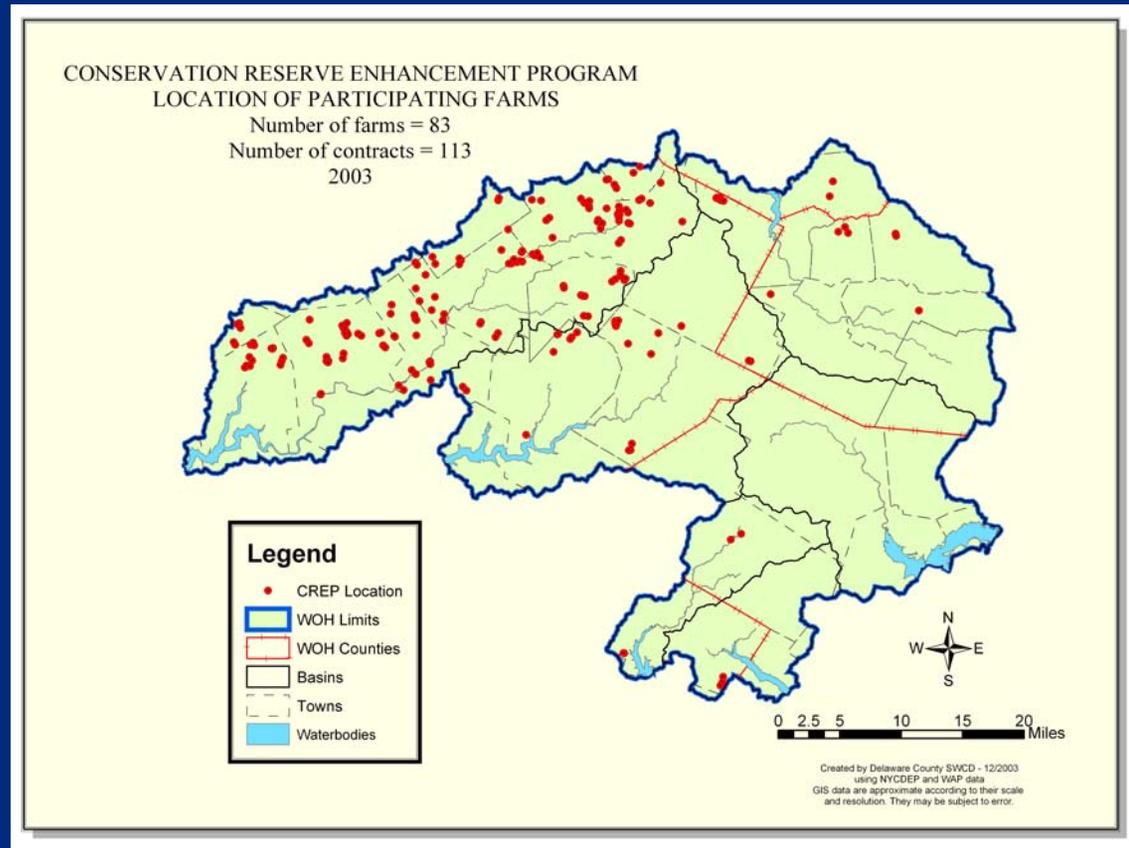
- Multiple barrier approach.
  - Source
  - Field
  - Stream Edge
- 5000 acre goal
  - 3000 Highly Erodible Land
  - 2000 Riparian Forest Buffer
- Funding \$10.4 million
  - USDA - \$7.7 million
  - NYC – \$2.7 million

# *CREP – New York City W/S*

- Increased Rental Rate on Enrolled Acreage
- 100% Cost of Practice Installation
  - 50% USDA
  - 50% NYC Watershed Ag Council
- Signing Incentive Payment
- Practice Incentive Payment

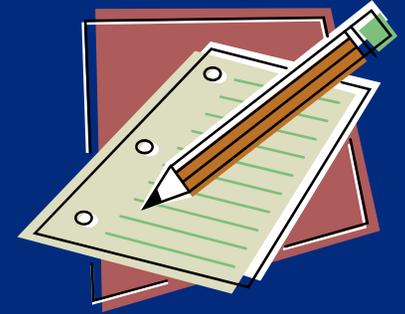
# *Progress to Date*

- 127 participants
- 189 tracts
- 1750 ac. planned
- 128 contracts
- 1353 ac. contracted
- 375 miles of RFB



# *CREP Administration*

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- Monthly meetings
- Set goals and coordinate inter-agency responsibilities
- Monitor planning, contracting, and implementation
- Coordinate inter-agency, participant and contractor training

# *Best Management Practices*

- Riparian Forest Buffer



- Fencing
- Alternative Water Sources
- Crossing
- Tree Planting



# Sample CREP 16.5 ac. Contract

<u>Practice</u>	<u>Total</u> <u>Cost</u>	<u>USDA</u> <u>Cost</u>	<u>WAP</u> <u>Cost</u>
Tree & Shrub	9145	4572	4572
Spring Dev.	13497	6748	6748
Pipeline & Hydrants	13277	6638	6638
Fencing	<u>13928</u>	<u>6964</u>	<u>6964</u>
Total	49847	24922	24922
		Cost Without CREP -	(40702)

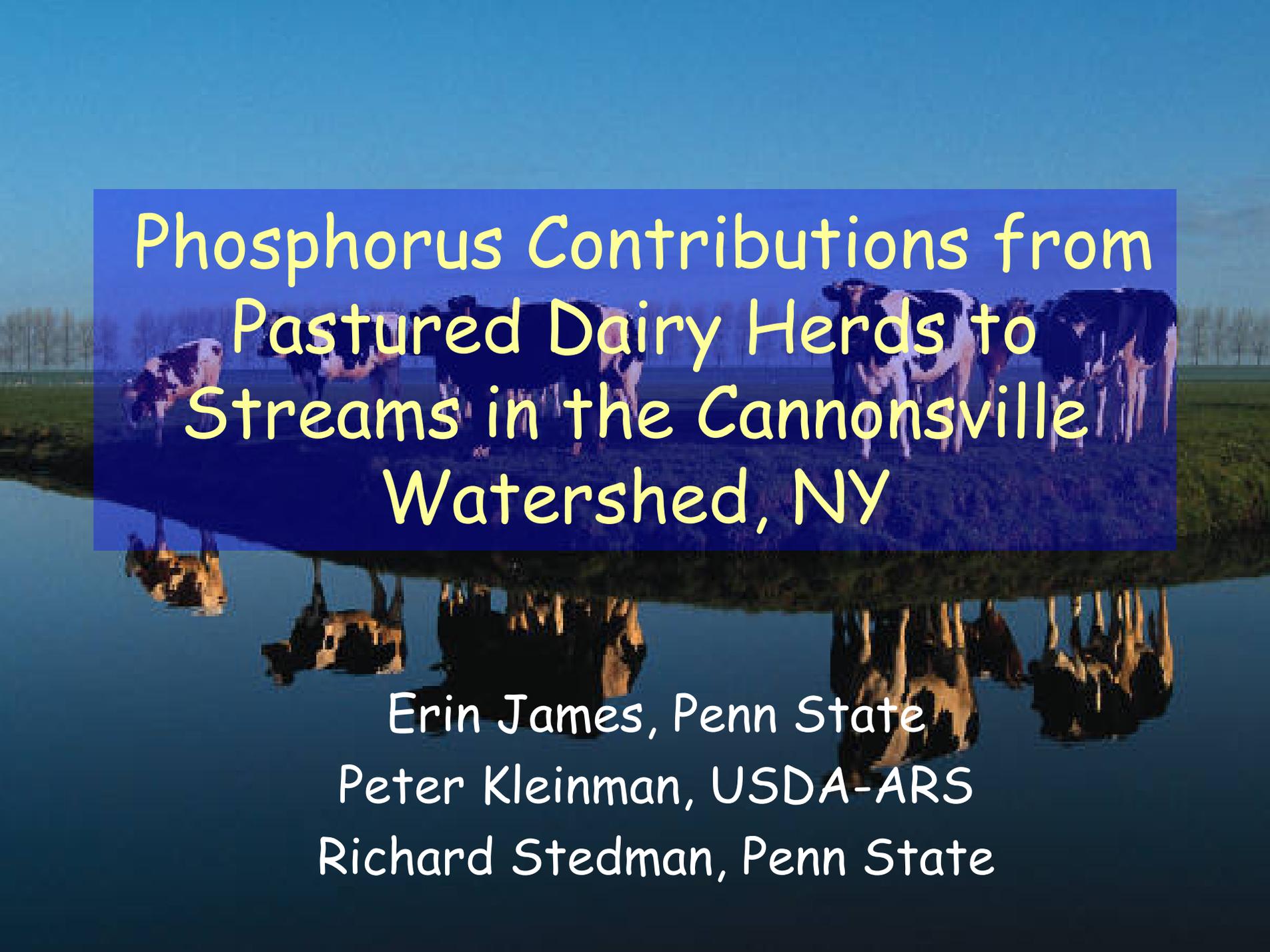
## Additional Payments by USDA

Rental - 16.5ac x \$115.6/ac = \$1907 x 15 years = \$28,605

SIP - 16.5ac x \$10.00/ac/year x 15 years = \$2,475

PIP - \$49847 x .40 = \$19,939

Total Payments to Farmer - (\$51,019)



Phosphorus Contributions from  
Pastured Dairy Herds to  
Streams in the Cannonsville  
Watershed, NY

Erin James, Penn State  
Peter Kleinman, USDA-ARS  
Richard Stedman, Penn State

Objective: To estimate P loadings to streams from pastured dairy cattle in the Cannonsville Watershed, NY

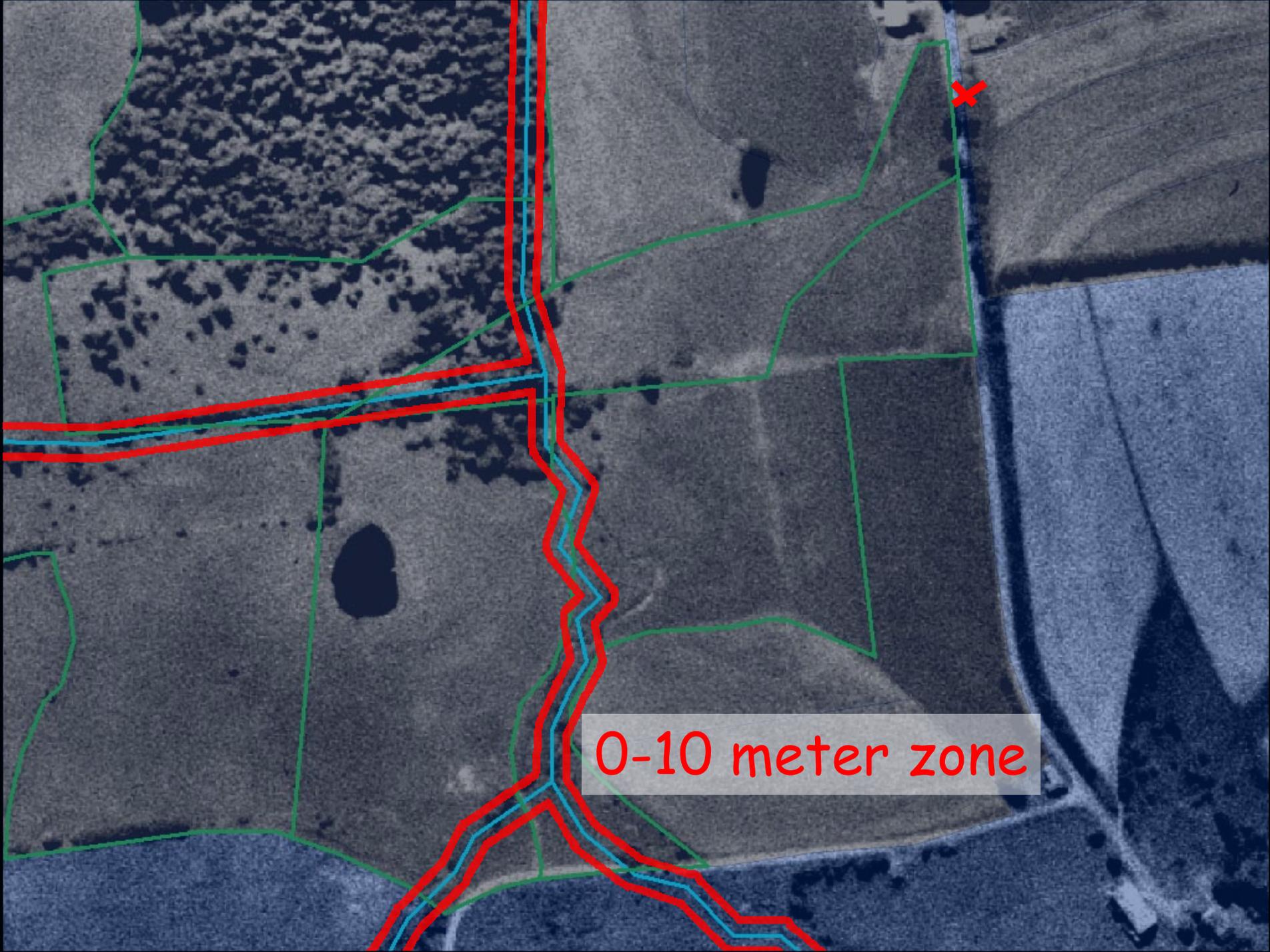


## Field Observation Methods :

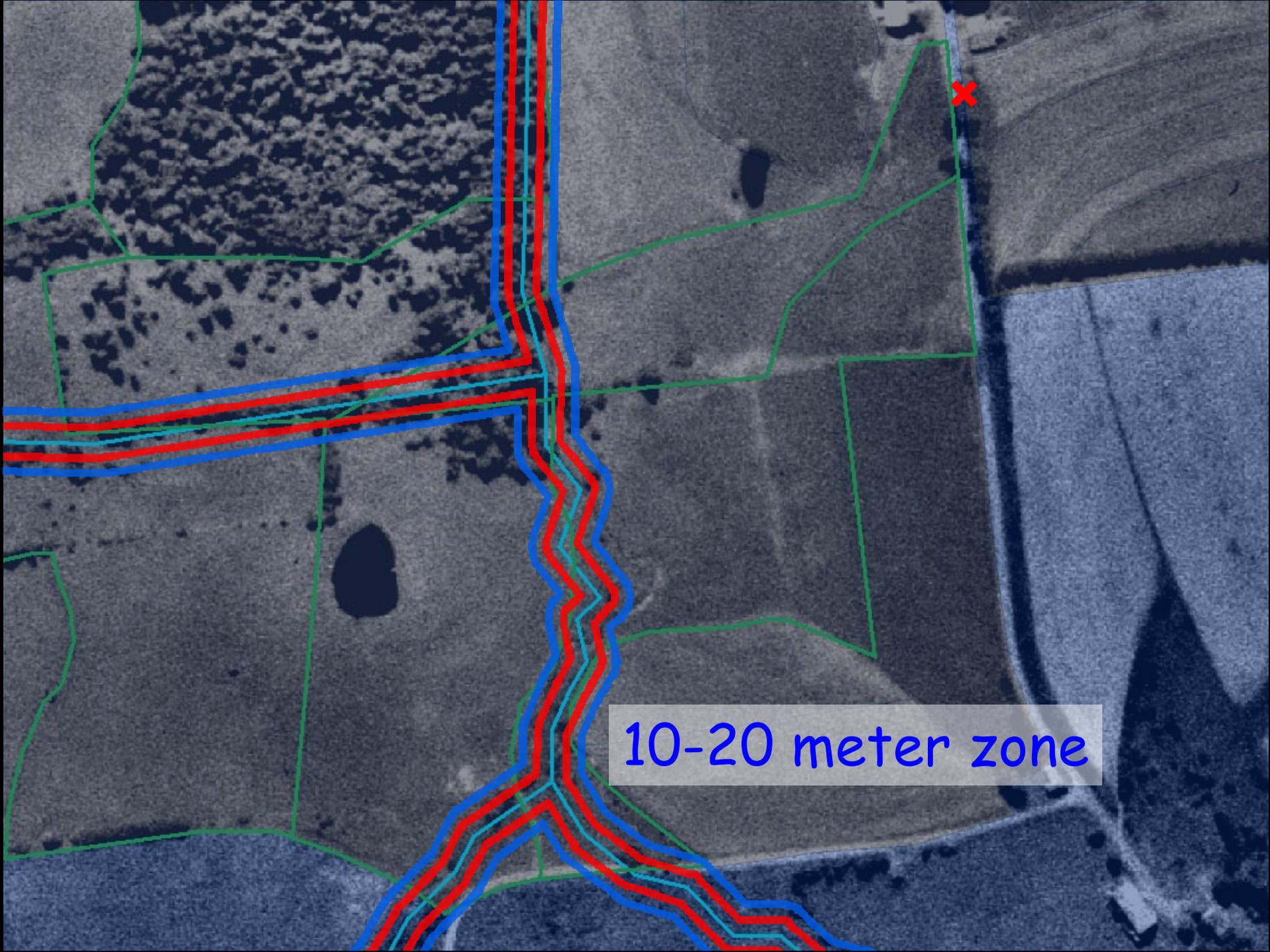
- ❖ four herds selected for observation with ranges of the following variables:
  - ❖ herd size
  - ❖ herd type (dry cow and heifer vs. lactating)
  - ❖ time in pasture
  - ❖ location and width of stream
  - ❖ pasture size
  - ❖ placement of alternative water, salt, feeders, etc.
- ❖ each herd observed in pasture on four occasions for four hour periods
- ❖ manure distribution and cattle behavior patterns recorded
- ❖ manure samples analyzed for nutrient content

# Sample Observation Farm

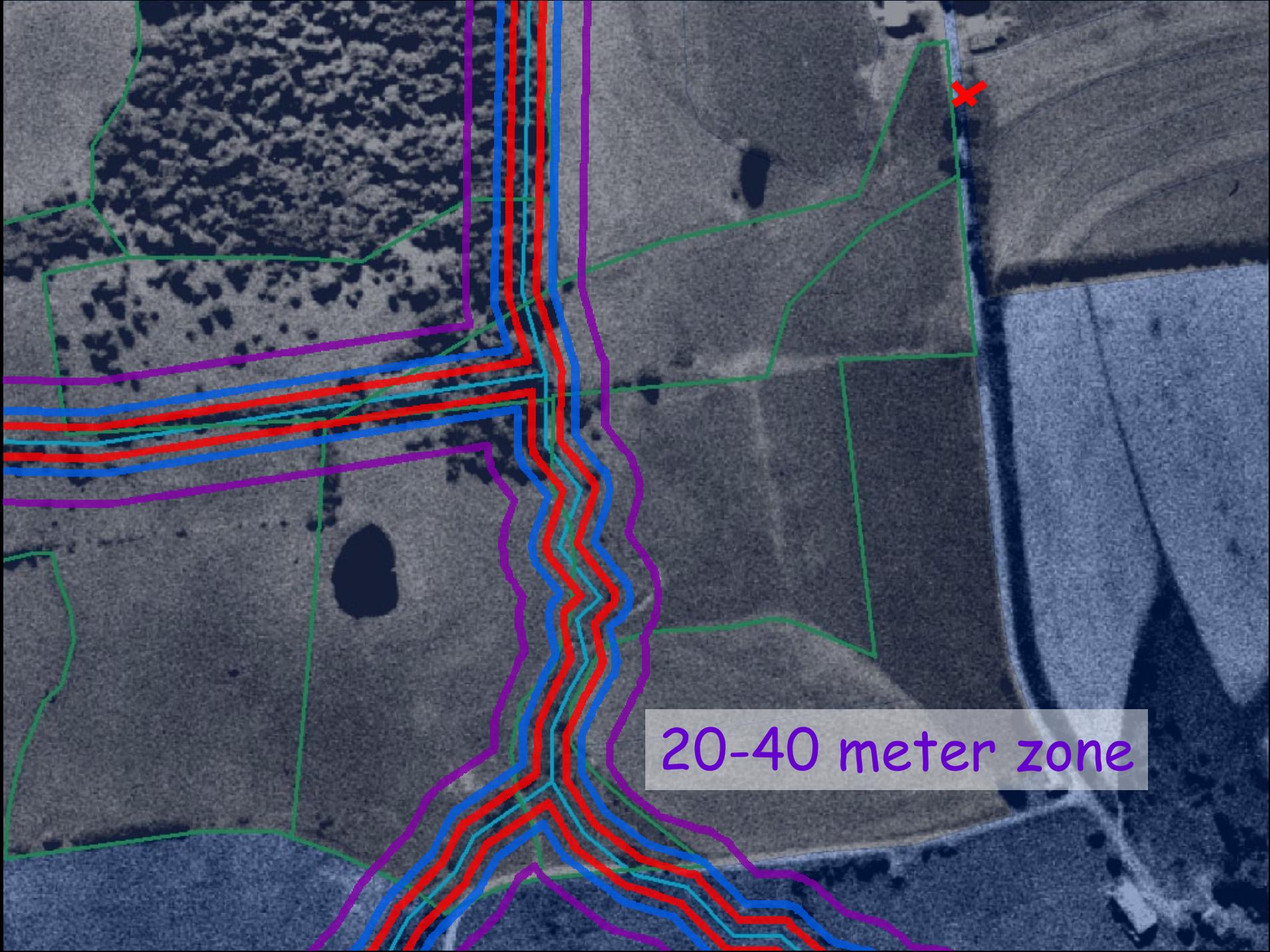




0-10 meter zone

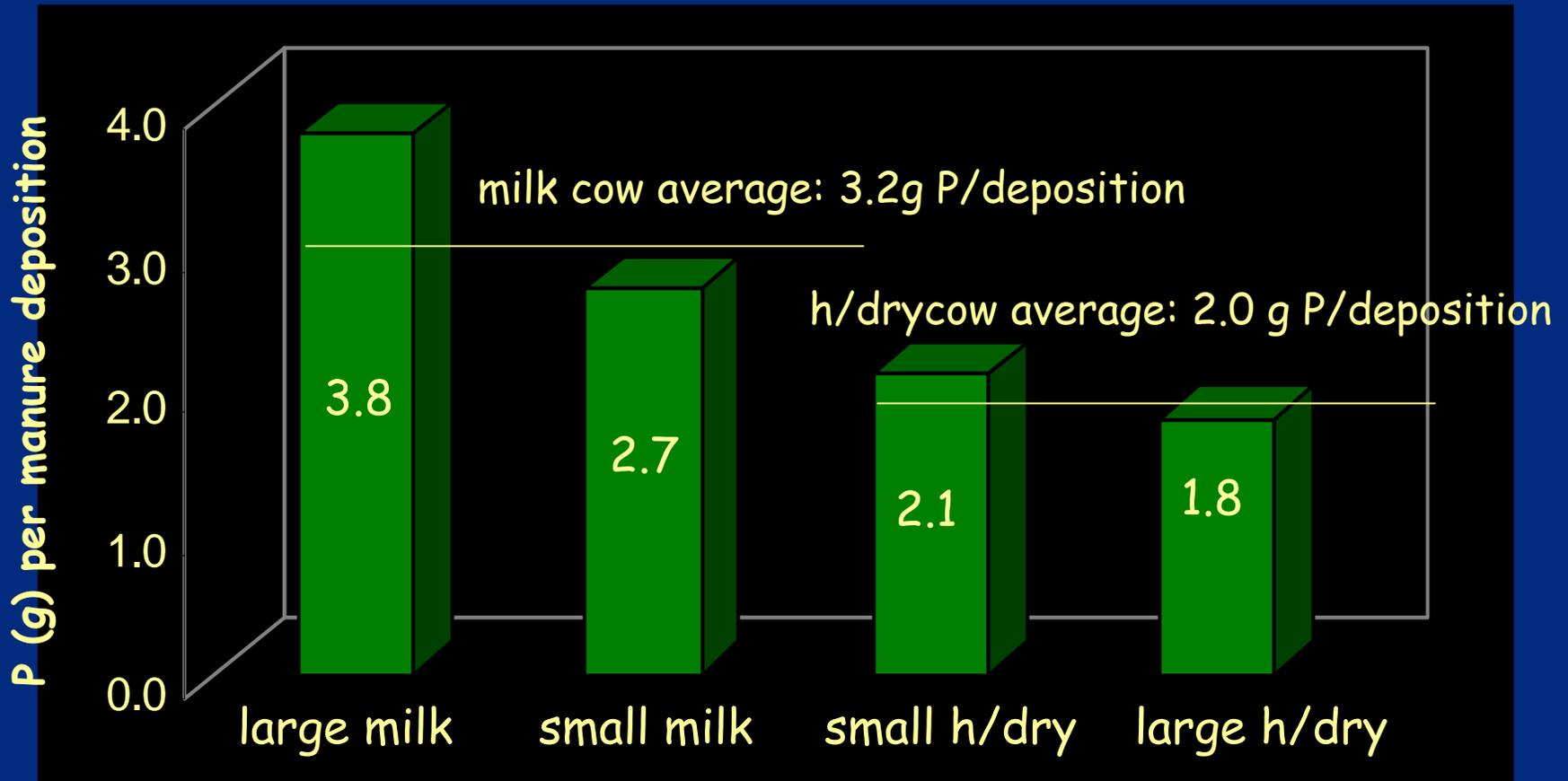


10-20 meter zone



20-40 meter zone

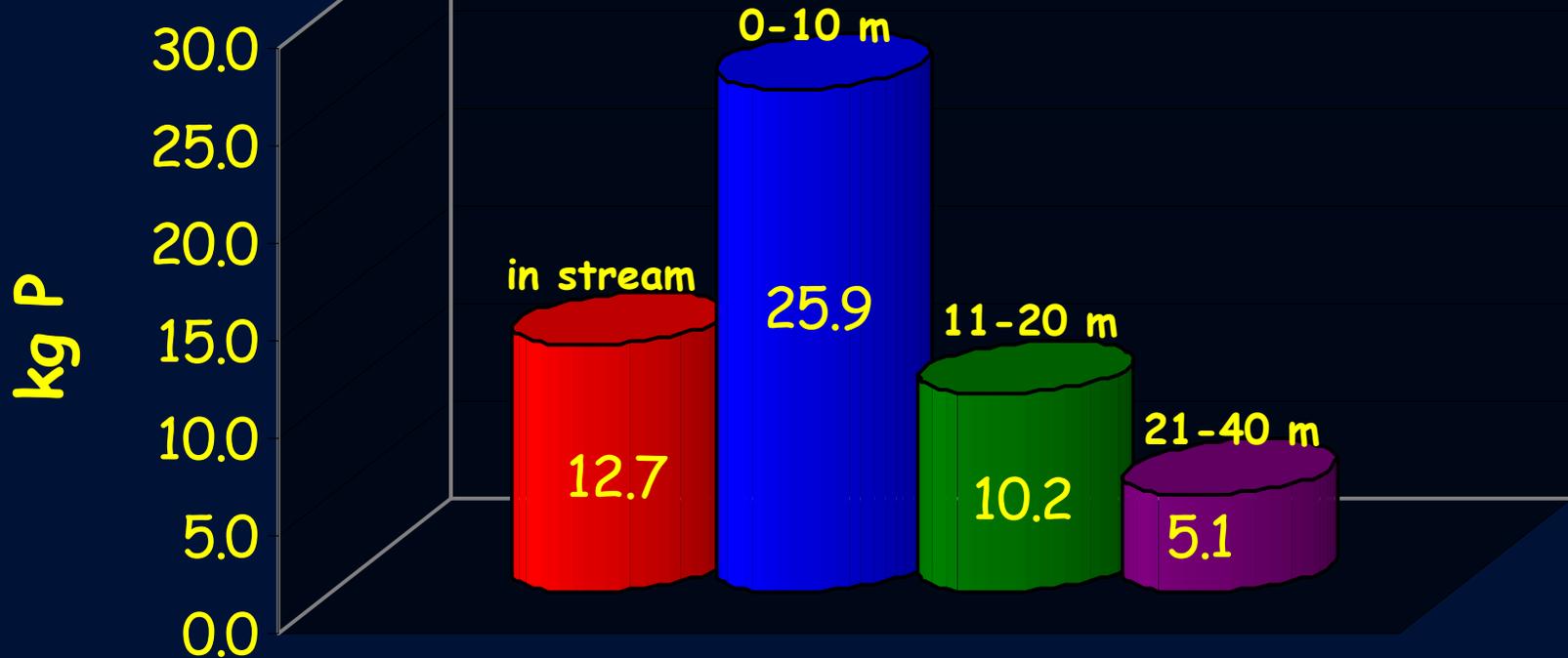
# Manure P Content



# Estimated Annual P Contributions\*

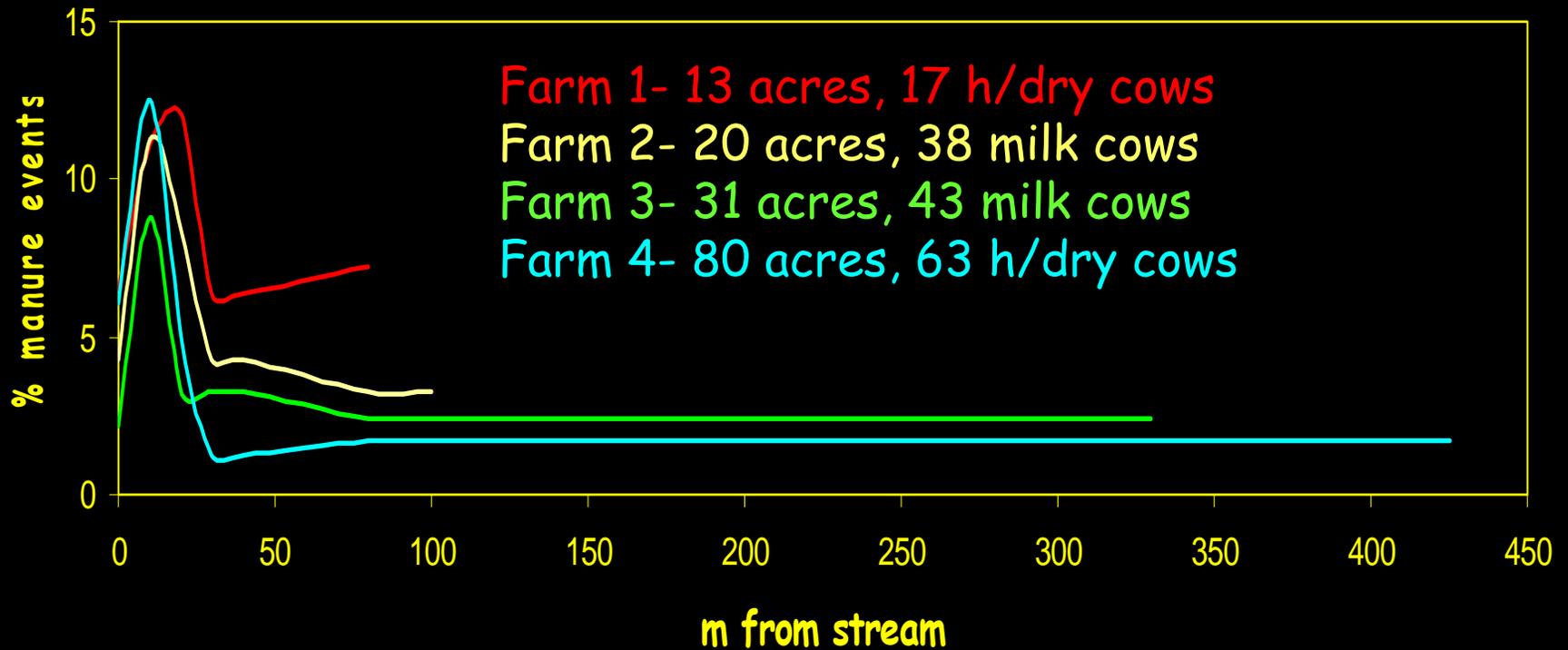
## Farm E

average herd size: 63 heifers and dry cows  
80 acre pasture



\*assumes total pasture time = % total pasture

## Manure Events as a Function of Distance From Stream

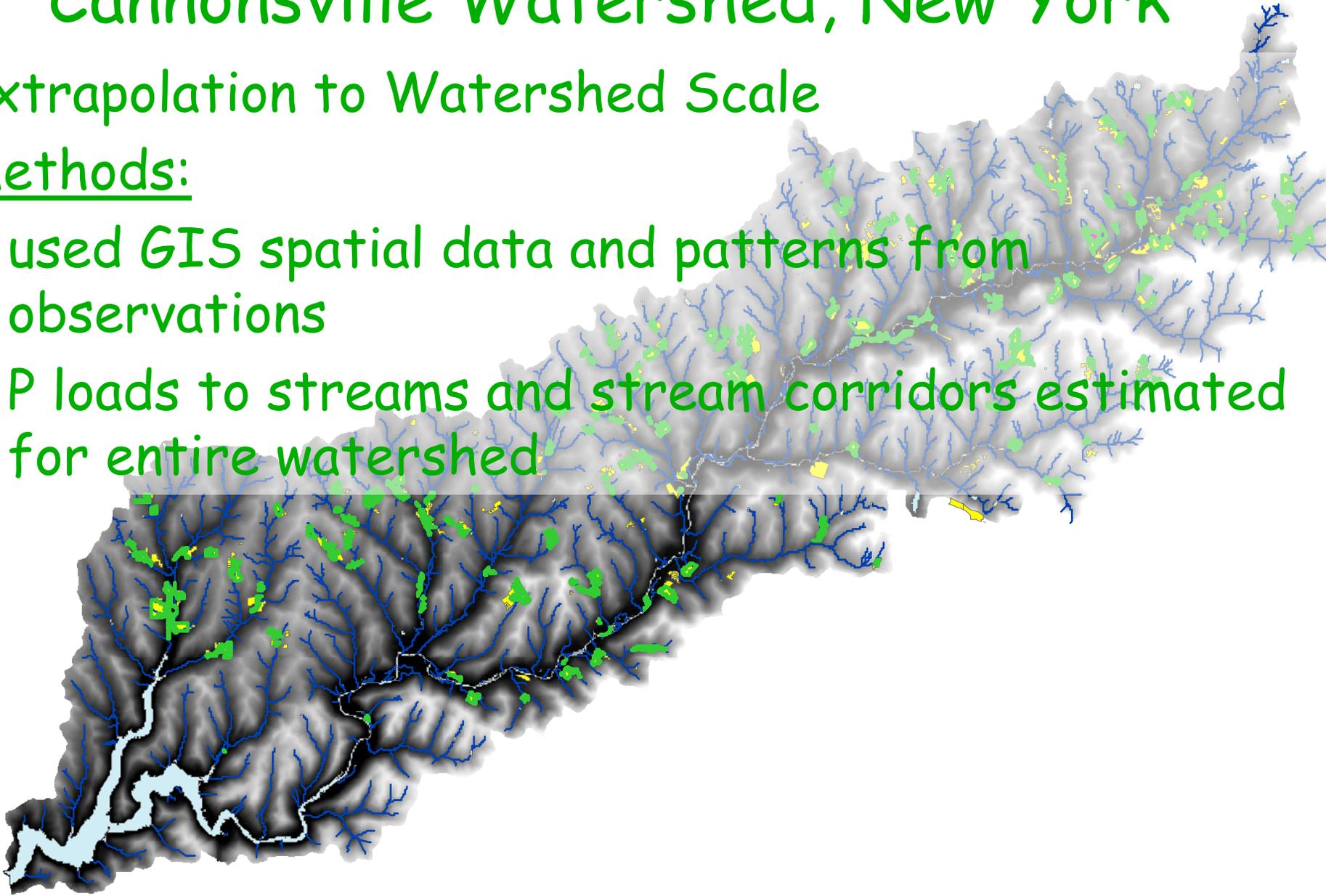


# Cannonsville Watershed, New York

## Extrapolation to Watershed Scale

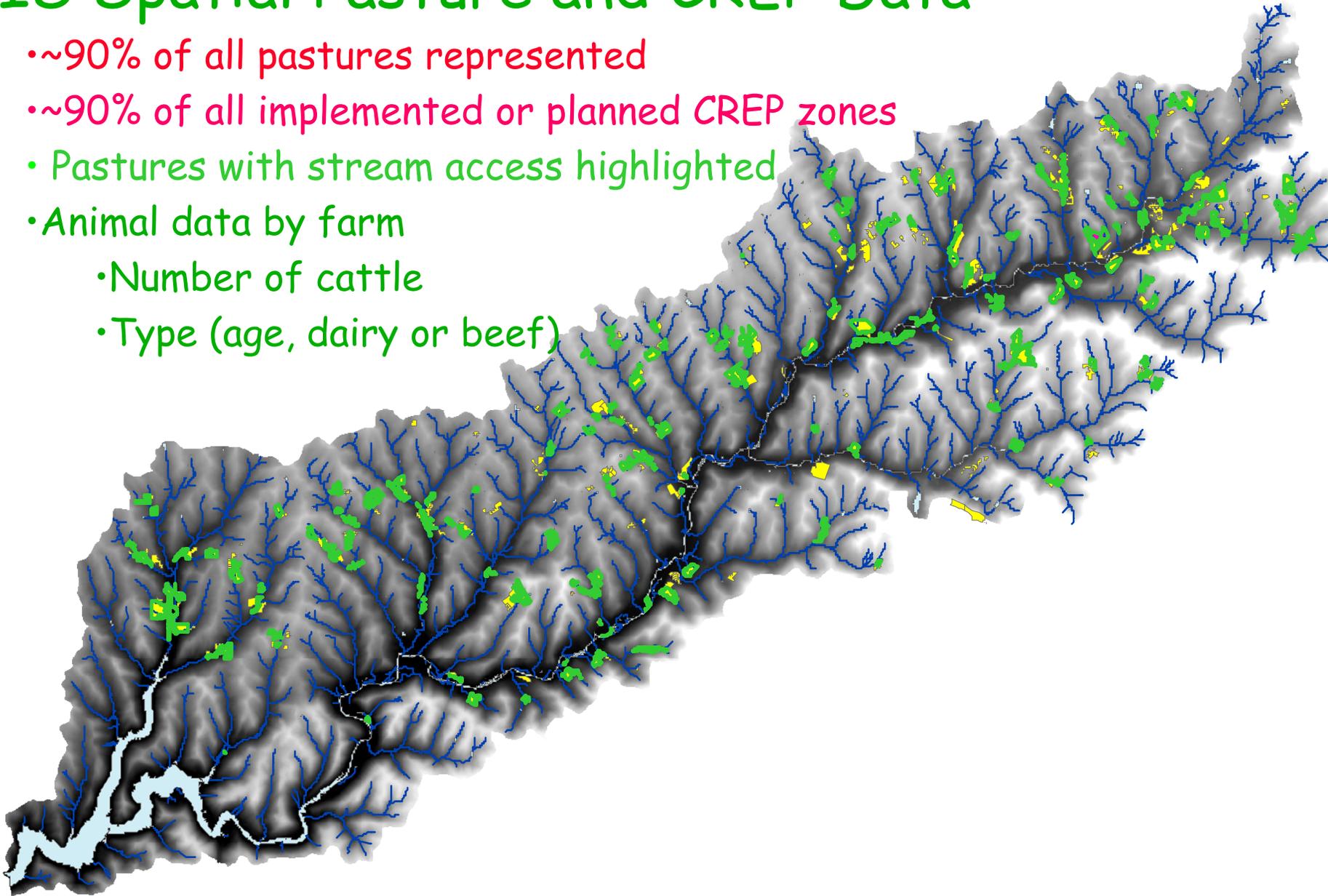
### Methods:

- ❖ used GIS spatial data and patterns from observations
- ❖ P loads to streams and stream corridors estimated for entire watershed



# GIS Spatial Pasture and CREP Data

- ~90% of all pastures represented
- ~90% of all implemented or planned CREP zones
- Pastures with stream access highlighted
- Animal data by farm
  - Number of cattle
  - Type (age, dairy or beef)



# Results:

## Watershed Level P Deposits

<u>zone</u>	<u>Annual P deposition</u>
in stream	1250 kg
0-10 m	3200 kg
10-20 m	2100 kg
20-40 m	2400 kg

# In- and Near- Stream Impact

(watershed level)

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1250 kg P in stream

+ 240 kg dissolved P in runoff within 40m

1490 kg P annual P load in stream

equivalent to:

8% total ag P load in reservoir

3% total nonpoint P load in reservoir

# CREP Benefits

Baseline Impact Estimate (w/out CREP implemented)

1810 kg P pre-CREP

-1250 kg P post CREP

560 kg P annual reduction

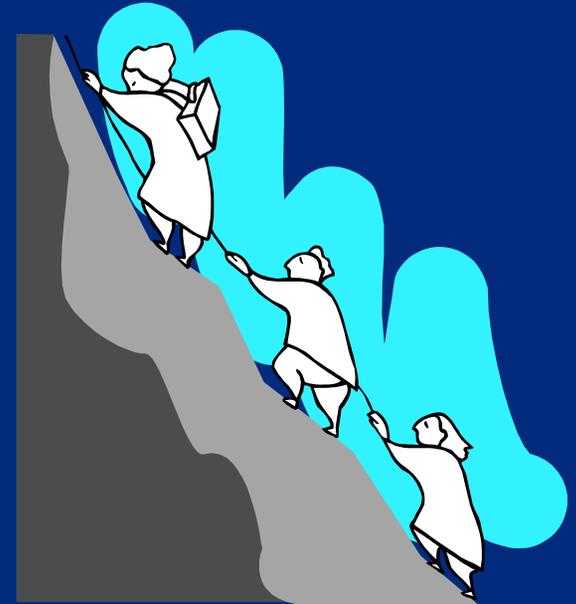
CREP implemented so far has resulted in a one-third (31%) reduction of P loading to streams

# Take Home Message

- CREP works! 31% reduction in P load to streams
- When prioritizing lands for CREP,
  1. number of cattle fenced out
  2. pasture timeshould be taken into consideration to better quantify benefits

# *Challenges/Improvements*

- Staffing
- Rising Costs
- Plant Material
  - Availability
  - Limited Planting Season
- Contractor Availability
- Time Constraints
- Cultural Resources
- Prioritize by Numbers of Cows
- Concentration of Cows in New Shady areas
- Operation & Maintenance



# *Challenges/Improvements*

- Eroding Stream Banks



# *Future Opportunities*

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- Program extension
- Perpetual easements
- Staffing to meet enrollment needs
- Stream Corridor Program
  - Addressing unstable banks
  - Running behind CREP
- Expanded program East of Hudson Watershed thru N.Y.S. CREP

# *Summary*

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- Long-Term Benefits:
  - Pollutant Barrier Protecting NYC Drinking Water
  - Wildlife/Fisheries
- Excellent Program Reception
  - Landowners
  - Partners
  - Staff
  - Environmental Groups

