Re-plumbing the Chesapeake Watershed Workshop

9-10 October 2014 Easton, MD

MD Secretary of Environment, Dr. Robert Summers

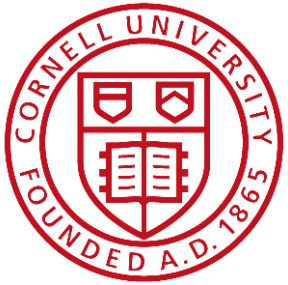
Re-plumbing the Chesapeake: Workshop Steering Committee

- **Kathy Boomer** (co-leader), The Nature Conservancy
- **Rebecca Schneider** (co-leader), Cornell University
- **Steve Bloser**, Penn State
- **Ray Bryant** (sponsor), USDA-ARS
- **Peter Clagget**, USGS
- **Matt Ellis** (support), Chesapeake Research Consortium
- **Natalie Gardner** (support) Chesapeake Research Consortium
- **Alan Girard** (moderator), Chesapeake Bay Foundation
- **Norm Goulet**, Northern Virginia Regional Commission
- **Jennifer Greiner,** USFWS
- **Katherine Bunting-Howarth**, Cornell University
- **Amy Jacobs** (moderator), The Nature Conservancy
- **Donnelle Keech** (facilitator), The Nature Conservancy
- **David Orr**, Cornell University
- **Nicholas Parlato** (support), Cornell Universty
- **Michael Slattery**, USFWS

Thank you!

Re-plumbing the Chesapeake: Workshop Sponsors

Thank you!



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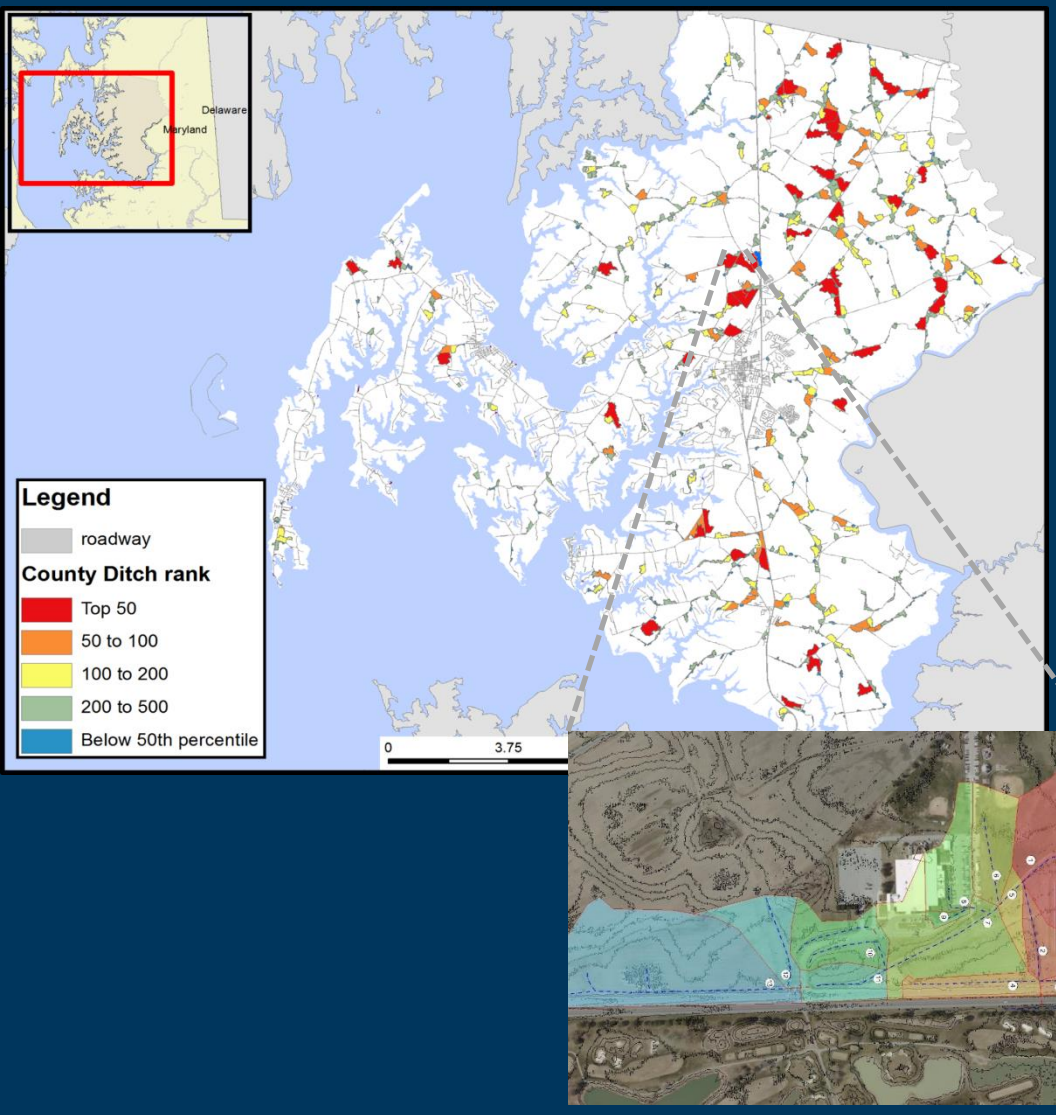
Re-plumbing the Chesapeake: History of Workshop Development



Talbot Co Roadside Management Program

- High resolution spatial analysis identified more than **1000** County Road opportunities to mitigate ag & urban impacts, each year, **intercepting up to 4,000 lbs TN, 500 pounds TP, and 10 tons of sediment**.

QUESTIONS:

- Reliability of targeting?
- Best practice design?
- Acceptability by MDE/CBP?

Re-plumbing the Chesapeake: Workshop Structure

- SESSION I: **Sizing Up the Problem**
  - Rebecca Schneider (NY)
  - Beverly Wemple (VT)
  - Zack Easton (VA)
  - Robin Van Meter (MD)
- SESSION II: **Mitigation Strategies**
  - Steve Bloser (PA)
  - David Wick (NY)
  - Ray Bryant (PA/MD)
  - Bernard Sweeny (PA/MD)
  - Laura Christianson (MS)
  - Jason Keppler (MD)
  - William Ryall (MD)
- SESSION III. **Barriers to Implementation**
  - Jeff Sweeney (CBP)
  - Kari Dolan (VT)
  - David Orr (NY)
  - Robert Shreeve (MD)

Re-plumbing the Chesapeake: Workshop Discussion

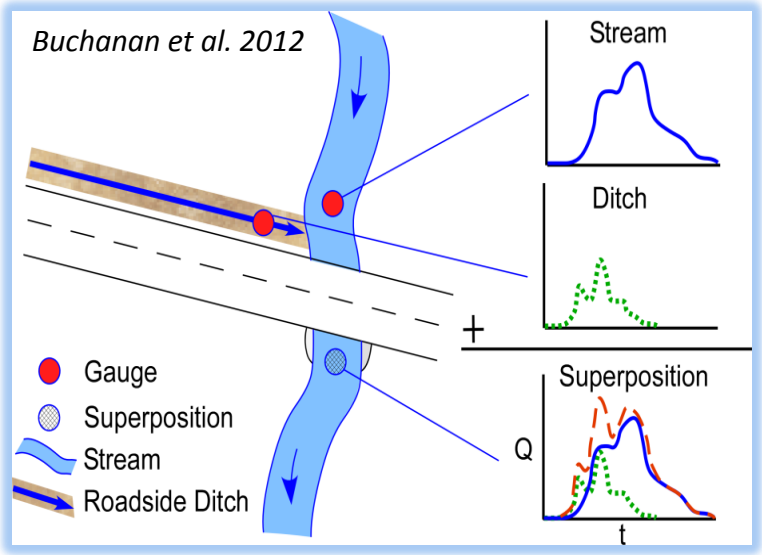
I. How do roadside ditch impacts & practices vary across the Bay watershed?

II. What is needed to improve roadside management across the Bay watershed?

Roadside Ditches: Big Impacts from Micro-scaled Features

Hydrologic Impacts:

- Extends stream network, doubling or more stream density (Sweeny 2014)
- Intercepts more than 20% of runoff/shallow groundwater flow (Schneider et al 2014; Diaz-Robles 2007)
- Increases peak flow by more than 50% (Buchanan 2012)



Roadside Ditches: Big Impacts from Micro-scaled Features

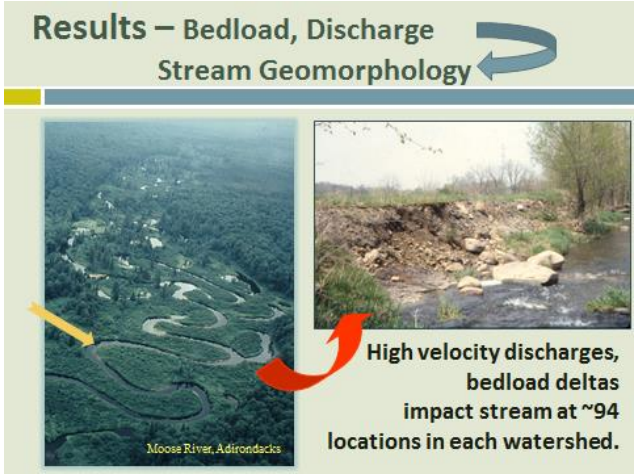
Water Quality Impacts:
Source and Conduit

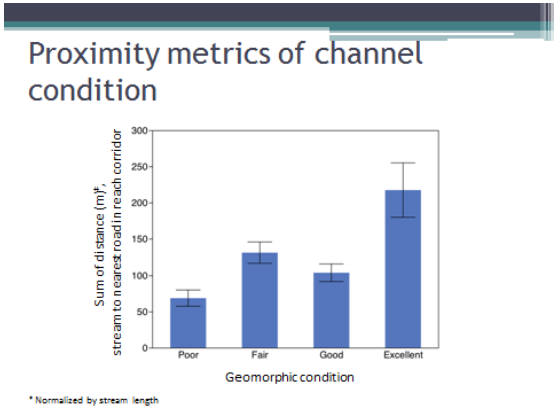
- Exposed (scraped) ditches exponentially increase TSS concentrations (Diaz-Robes 2007)
- Accounts for more than 10% of observed sediment load in upper Susquehanna (SRBC)
- Provides important conduit of *E. coli* bacteria

Roadside Ditches: Big Impacts from Micro-scaled Features

Habitat Impacts:

- Alters environmental flow regimes
- Increases bed loads causing down-stream disequilibrium (e.g., Pechenick et al 2014)
- Headwaters dry out
- Salinization of freshwater habitats (e.g., Kaushal et al 2005)





Credit: R. Schneider; B. Wemple

PA Dirt and Gravel Road Maintenance Program

- Began in 1997 (Trout Unlimited initiative)
- 2,500 projects and counting
- PA priority: $35 million budget

Steve Bloser, Director
Penn State University

Program Overview

~~Traditional Stormwater~~

- ~~Collection~~
- ~~Armoring~~
- ~~Transport~~

Environmentally Sensitive Maintenance

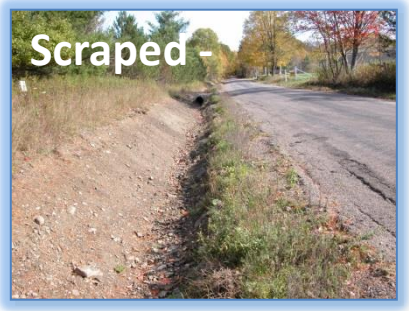
- **Dispersal**
- **Sheet flow**
- **Infiltration**

“disconnect the rural storm water system”

“restore natural drainage”

Roadside Ditches: Low Cost ($) Mitigation Strategies

- Scrape during late spring/early summer (facilitates vegetation re-establishment
- Scrape to trapezoidal shape (decrease flow rates, facilitate maintenance)
- Hydroseed
- Disconnect from streams



vs.

Roadside Ditches: More Expensive ($$$) Mitigation Strategies

Engineered Road Design and Aggregate

Filters Mediums

Flood pocket Wetlands, Level Lip Spreaders

Credits: S. Bloser; R. Bryant; B. Sweeny

Roadside Ditches: Evolving Management Recommendations

- Recognize flood and water quality impacts of roadside ditches
- Develop portfolio of mitigation strategies
- Develop centralized network of professionals to help manage roadside ditches throughout the Bay watershed.
  - Develop targeting framework
  - Ensure TMDL framework recognizes accommodates roadside ditch impacts management opportunities
    - More than land use/land cover: Road networks and condition impose major influence on flooding and water quality
  - Standardize management practices
  - Provide additional outreach forums

Credit: Beverly Wemple

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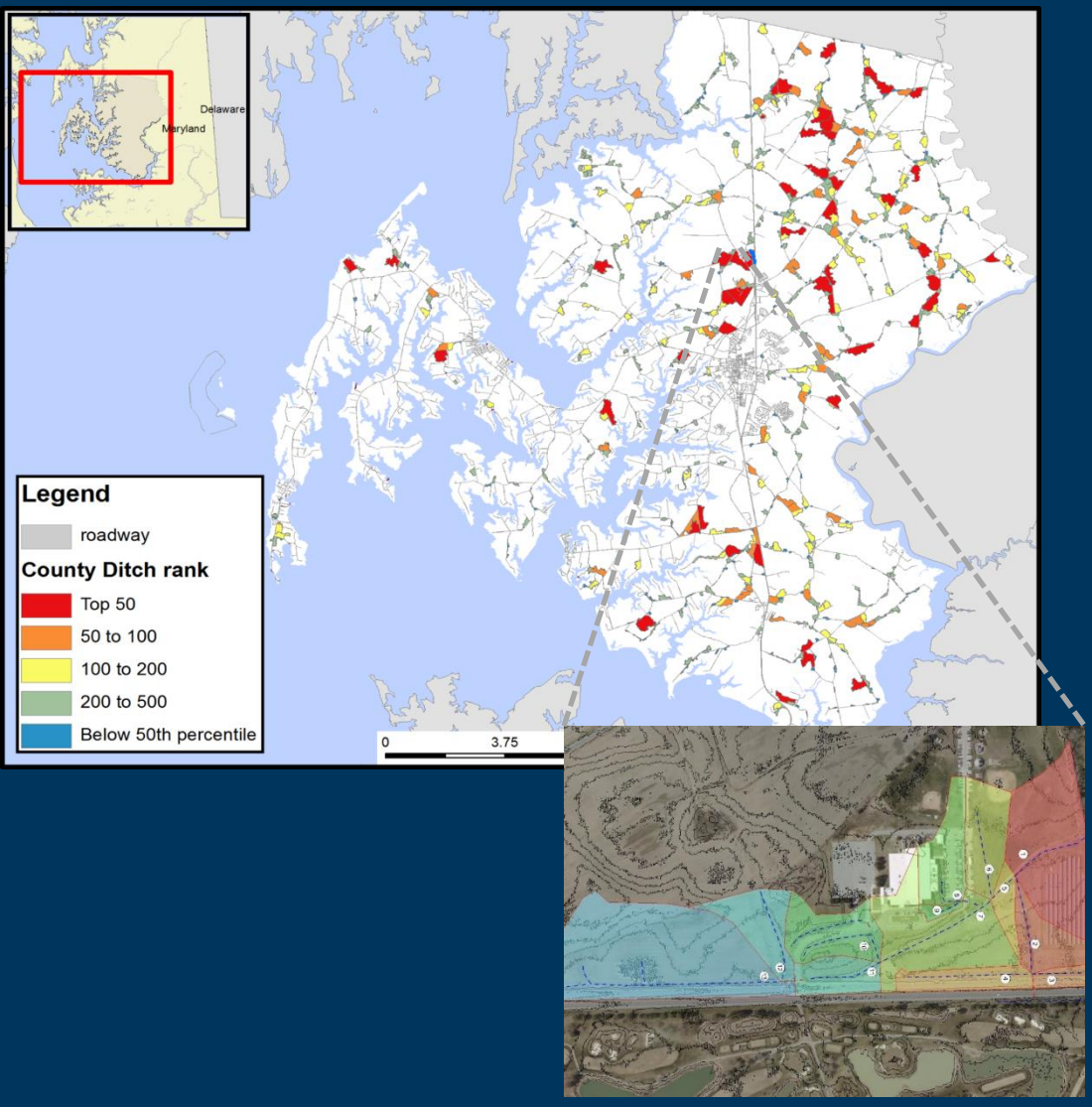
Re-plumbing the Chesapeake: Information (Science) Gaps & Needs



- Targeting models
  - Event-based predictions
- Best practice design
  - By-products, longevity
  - Performance variation by location
- Acceptability by regulators

Roadside Ditches: Next Steps

- Highlight key role of ditches (land mng't >> LULC)
- Form Bay-wide Ditch Management Committee
  - Invite all relevant agencies for representation
  - Secure funds