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Re-plumbing the Chesapeake Watershed: Improving roadside ditch management to meet TMDL Goals

Workshop Findings and Recommendations
October 2014

Roadside Ditches

Workshop Goals

1. **Increase awareness of the critical impacts** of roadside ditches and best management practices to reduce these impacts.

2. Inventory the current status of **ditch management** across the Chesapeake Watershed.

3. **Develop recommendations** for how best to improve roadside ditch management to meet TMDL goals, reduce flooding and buffer impacts of climate change.

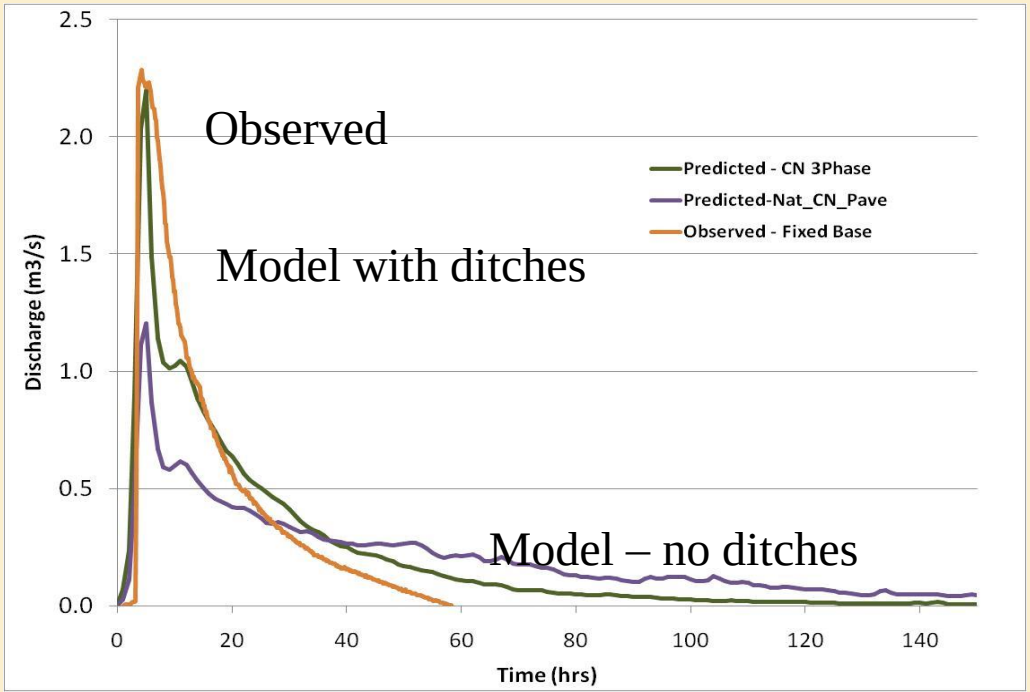
Take-home Message

“Roadside ditches have had a significant but previously unrecognized impact on the Chesapeake Bay for almost a century. The audience of 71 water resource professionals, highway practitioners, scientists, and policy-makers unanimously agreed that roadside ditch management represents a critical but overlooked opportunity to help meet TMDL and habitat goals. Additionally, improved ditch management provides a strategy for buffering the impacts of high intensity rainfalls and other extremes expected with climate change. “

Key Findings – Ditch Impacts

Three main areas of roadside ditch impacts:

1. Hydrologic impacts, including increased storm runoff peak flows, flashier stream discharge, and more frequent downstream flooding.



Key Findings – Ditch Impacts

2. Water quality impacts, with ditches acting variously as **conduit**, **source** or **transformer** of nutrients, sediment, microbial pathogens, and other contaminants.

Key Findings – Ditch Impacts

3. The shunting of both runoff and contaminants into the stream network at numerous locations degrades habitat, drives regional stream systems towards disequilibrium, and encourages invasives.

Key Findings - Management

Diverse array of BMPs to reduce impacts:

1. BMPS which hold or redirect stormwater runoff, and reduce flooding downstream;
2. BMPS which slow down flow and filter out contaminants, which reduce pollution;
3. BMPS which improve habitat.

Key Findings - Management

Challenges and barriers to improving ditch management

1. Unclear tools and guidance on their use;
2. Lack of efficient communications network among the hundreds of jurisdictions;
3. Unmapped ditch networks;
4. Pervasive unawareness by public, who control ROWs;
5. Problematic, conflicting policies concerning adoption of roadside ditch BMPS;
6. Insufficient resources, equipment, manpower;
7. Exacerbation of ditch impacts due to climate extremes.

Key Findings - Management

Critical elements of successful programs
(PA Center for Dirt and Gravel Roads, Cornell Local Roads, NYS Soil and Water Conservation District, Lake Champlain Basin TMDL Program)

1. Mapping of roadside ditch networks and their condition;
2. Cooperation and cross-agency partnerships;
3. Education of all stakeholders;
4. Good leadership.

Recommendations

1 Develop a watershed-wide program to promote "re-plumbing" of roadside ditch networks throughout the Chesapeake Bay watershed.

- Needs to be geographically comprehensive because roadside ditch networks, like streams, ignore political boundaries
- Poor practices in upstream municipalities contribute to flooding and pollution in downstream areas.
- Should address the diversity of government structure, highway maintenance needs, and landscape settings throughout the region.

Recommendations

2 To ensure success, the program must employ a full suite of strategies to incentivize better roadside ditch management:

- Education and awareness campaigns specifically tailored to different stakeholder groups;
- A carefully selected set of regulatory incentives and deterrents;
- Increased access to equipment and other resources;
- Funding for implementation and for targeted research.

Recommendations

3 Develop a broad-based education and outreach program to increase awareness and provide guidance to key stakeholder groups:

- Build on successes of existing programs and Local Technical Assistance Program training centers;
- Stakeholders: highway staff, policy-makers; agency staff; NGOs and private landowners.

Recommendations

4 Develop comprehensive BMP implementation guidelines, that include a full, organized inventory of BMPs:

- A plethora of relevant and successful BMPS exist but guidance is lacking on when and where a given BMP is appropriate;
- Information is needed on performance and cost-effectiveness;
- Tie BMPS to TMDL regulatory framework;
- A well-organized website could address this need.

Recommendations

5 Create a Roadside Ditch Management Executive Team, with representatives from all relevant agencies from federal to town levels, along with other stakeholders including scientists and NPOs.

- This team will avoid redundancy or conflicting requirements among agencies and develop recommendations that work across political boundaries.
- Urban Stormwater Wkgp, Watershed Technical Wkgp, and Agriculture Workgroup of the CBP should develop ditch management recommendations collaboratively.

Recommendations

6 Support funding for roadside ditch improvement and maintenance practices.

- Highway staff unanimously report limited manpower, time, and equipment.
- Current pools of related funding for green infrastructure, stormwater management, or conservation may be relevant but grant writing support to highway staff will be helpful.

Recommendations

7 Prioritize applied research that address knowledge gaps limiting the reliability of decision tools and guidelines

- Effectiveness of BMPs in different settings;
- Chemical contaminant transformations in ditches, e.g. nitrogen, phosphorus;
- Impacts of the altered hydrology on downstream aquatic ecosystems;
- Additional contaminants needing attention.

Recommendations

8 Link science and management efforts, specifically research models to the development of targeting tools or guidelines and promote monitoring to evaluate success.

- The CBP Land Use Workgroup should consider whether current land use inventories and the CBP hydrologic modeling framework adequately capture impacts from roadside ditch networks.

Questions?