Watershed assessment modelling to identify critical sources of pollution and evaluate effectiveness of conservation management practices

Nichole Embertson  
*Whatcom Conservation District, United States*, nembertson@whatcomcd.org

Meagan Harris  
*Whatcom Conservation District, United States*, mharris@whatcomcd.org

Andrew Phay  
*Whatcom Conservation District, United States*, aphay@whatcomcd.org

Follow this and additional works at: [https://cedar.wwu.edu/ssec](https://cedar.wwu.edu/ssec)

Part of the Fresh Water Studies Commons, Marine Biology Commons, Natural Resources and Conservation Commons, and the Terrestrial and Aquatic Ecology Commons


This Event is brought to you for free and open access by the Conferences and Events at Western CEDAR. It has been accepted for inclusion in Salish Sea Ecosystem Conference by an authorized administrator of Western CEDAR. For more information, please contact westerncedar@wwu.edu.
NATIONAL WATER QUALITY INITIATIVE (NWQI)
Tenmile Watershed Assessment Pilot Project

Nichole Embertson, Ph.D.
Whatcom Conservation District
Salish Sea Conference
April 4, 2018
NATIONAL WATER QUALITY INITIATIVE (NWQI)
Tenmile Watershed Assessment - Pilot Project

Goal:
Implement voluntary conservation practices to **improve water quality** in high-priority watersheds while maintaining agricultural productivity.
Tenmile Watershed was selected for 2017 Pilot Project
Why Tenmile Watershed?

- Focus on improving water quality in watershed
- Specific water quality targets
- Existing partnerships and opportunity to build new partnerships
- WCD actively working with landowners in watershed
- NRCS technical and financial assistance available
Watershed assessment
Identify water quality concerns

Phosphorus  Nitrogen
Suspended solids  Pathogens
Watershed Assessment
Land use, crop and livestock survey
NSPECT Model - What comes out?

Phosphorus

Nitrogen

Darker color = higher potential source contribution
We call these **critical source areas.**
Combined ranking based on all four water quality concerns

**Green** = low potential source contribution

**Yellow** = moderate

**Red** = highest potential source contribution
What Can We Do With Modeling Results?

- Focus planning efforts in critical source areas or specific land uses
- Determine the impact and potential effectiveness of NRCS programs in an area
- Evaluate the effectiveness of various BMPs by land use type and practice
- Focus cost-share priorities and funding
- Adapt outreach materials and efforts to meet the social considerations of the watershed landowners
Social Factors and Outreach

Effective management of water pollution must address both:

Environmental conditions

and

Choices people make that impact the environment
Greatest Threats to Water Quality

- Excessive use of fertilizers for crop production
- Improperly maintained septic systems
- Highway, road or bridge runoff
- Excessive use of residential lawn fertilizers or pesticides
- Land development or redevelopment
- Manure from farm animals
- Droppings from waterfowl and/or other wildlife
- Erosion from stream banks or ditches
- Soil erosion from farm fields
- Pet waste
- None of these

Percent of respondents

Legend:
- Rural Residential
- Agricultural
Barriers to Implementation

- I don’t have enough information about it
- Personal, out of pocket expense
- Insufficient proof of water quality benefit
- Time required
- My own physical abilities
- I want to maximize the amount of land I can use
- Not having access to the equipment that I need
- Hard to use with my land management system
- Lack of government funds for assistance

Percent of respondents

- Collecting, covering & containing manure
- Follow recommended fertilizer timing
- Maintain a setback
Outcomes of Tenmile Watershed Assessment

- Characterize Tenmile Watershed (mapping, land use and livestock surveys)
- Understand social factors affecting BMP implementation (landowner focus groups and landowner survey)
- Outreach to landowners is targeted and based on the watershed and community
- Better, strategic allocation of resources informed by the watershed assessment
- *Expand to other watersheds for better planning, outreach, and implementation*
QUESTIONS?

Thanks Project Team!
- NRCS
- Nichole Embertson, WCD
- Meg Harris, WCD
- Aneka Sweeney, WCD
- Andrew Phay, WCD
- Local Partners