

Final Report: 2018 Workshop on Innovation and Regulation in Agriculture

December 3-5, 2018

**Topic: Incorporating the Benefits of Vegetative Filter Strips into
Risk Assessment and Risk Management of Pesticides**

**Location: Raleigh Marriott Crabtree Valley, 4500 Marriott Dr.,
Raleigh, NC 27612**

Sponsored by NC State Center of Excellence for Regulatory Science in Agriculture (CERSA). Co-sponsored by Bayer, Syngenta, BASF, Stone Environmental, and AGRO Division of American Chemical Society.



[Website with all presentations](#) is available at NC State

Scientific Program Committee

Jane Tang, Bayer (chair), Members: Kevin Costello, USEPA; Garey Fox, NC State; Nick Goesser, Craigson Group; Lindsay Haines, USDA-NRCS; Bob Lerch, USDA-ARS; Rafa Munoz-Carpene, Univ. Florida; Patricia Rice, BASF; Nelson Thurman, US EPA; Clint Truman, Syngenta; Yongping Yuan, USEPA

Organizing Committee

Laura McConnell, Bayer; Danesha Seth Carley, Director CERSA, NC State

Executive Summary

Vegetative filter strips (VFS) are widely used by producers to mitigate runoff and erosion from production areas. VFS effectiveness for mitigating nutrient runoff and soil erosion is well-established. A growing body of literature has shown that VFS are also effective at mitigating pesticide runoff. Currently the contribution of VFS are not considered in the standard pesticide exposure assessment scenarios utilized by US EPA.

This workshop was designed to bring together experts to explore the state-of-the-knowledge with respect to function, benefits, modelling tools to simulate VFS at a field and watershed scale. Availability of data on the use and management of VFS in conservation programs was explored. Furthermore, information on the economic and agronomic realities of using VFS under different cropping practices were examined.

Goals of the Workshop

The overall goals of the workshop were to develop a set of multi-stakeholder consensus recommendations, which will:

- Provide a path forward towards incorporating the use of VFS in risk assessment and risk management of pesticides;
- Lead to improved cooperation and collaboration among stakeholders to leverage available data and information regarding the design, effectiveness, and implementation of VFS and other runoff mitigation measures for various crops and regions; and,
- Support the development of strategies to increase producer engagement and adoption of VFS and other runoff mitigation measures to protect soil and water resources.

Expected Outcomes Prior to the Workshop:

- Determine the geographic areas where VFS are used, and, leveraging the existing knowledge base, identify the important environmental, economic and agronomic factors supporting vegetative filter strip use for pesticide mitigation;
- Examine existing conservation programs for opportunities to increase implementation of VFS. Review and update existing design standards for VFS and identify other BMPs for pesticide mitigation in areas where VFS are not practical or are less effective;
- Develop a value case which can be disseminated to producers to increase the proper use of VFS and other pesticide runoff mitigation to protect soil and water resources; and,
- Develop a framework to incorporate VFS mitigation in regulatory risk assessment and management of pesticides.

Consensus Statement

Under the auspices of the 2018 CERSA Workshop, multiple stakeholders across public and private sectors agree that Vegetative Filter Strips (VFS), defined in the broadest possible manner, have been shown to be effective to remove pesticides.

- Technology and supporting data exists to quantify mitigation of pesticide runoff
- Other regulatory agencies (such as Europe) are incorporating VFS in their assessments

Therefore, EPA should incorporate filter strip technology into risk assessments and risk management.

Background

A new Center of Excellence for Regulatory Science in Agriculture (CERSA) was recently established at NC State. The work of CERSA is focused on three inter-connected pillars of education, research and engagement. The 2018 workshop is a continuation of previous of multi-stakeholder engagement events to advance the field of regulatory science and to enhance collaboration among academic, government and industry sectors. Danesha Seth Carley is currently director of CERSA.

Prior to the Workshop:

Include short description of organizing committee discussions

Plenary Session

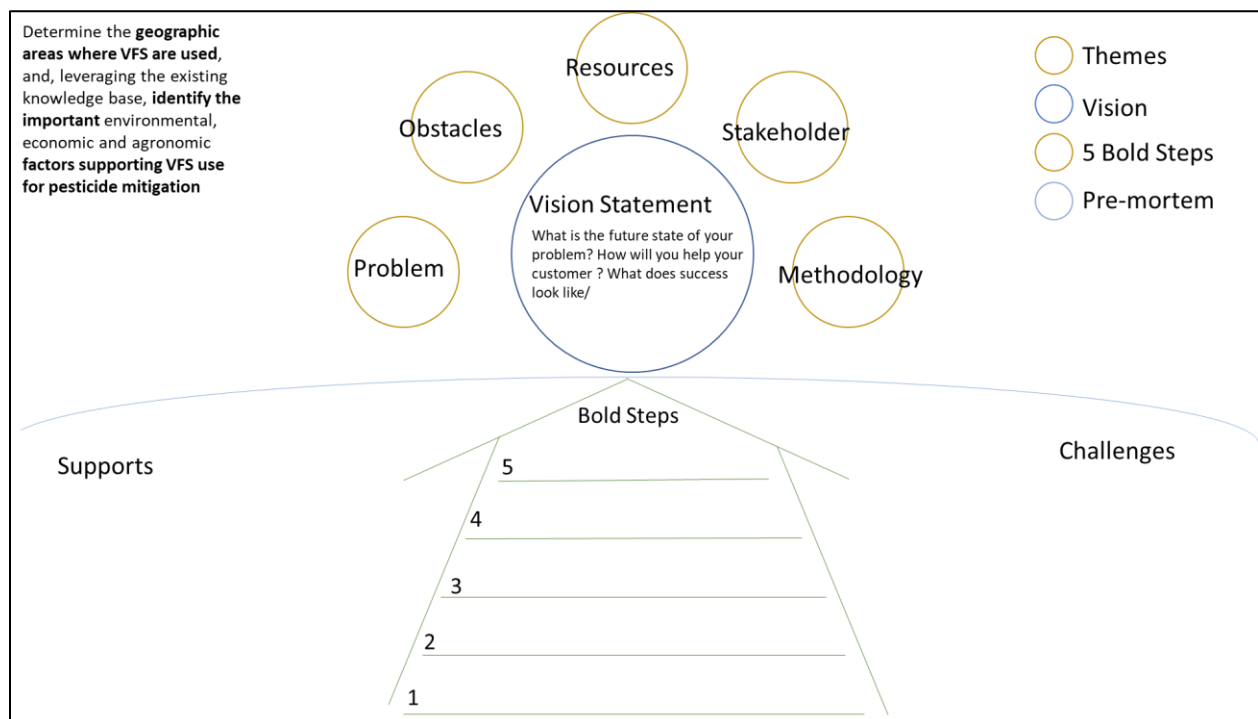
Include a short description of the program and add slides to the appendix.

Methodology:

Based on a pre-workshop survey of participants, attendees were divided into four teams corresponding to the four expected outcomes expressed in a shortened format:

1. Geographic Areas: Current geography and factors that support pesticide use
2. Conservation Program: Benefit of VFS to existing conservation programs; update design standards; beyond VFS
3. Value Case: disseminate to growers and stakeholders
4. Develop Framework: for risk assessment and management of pesticides

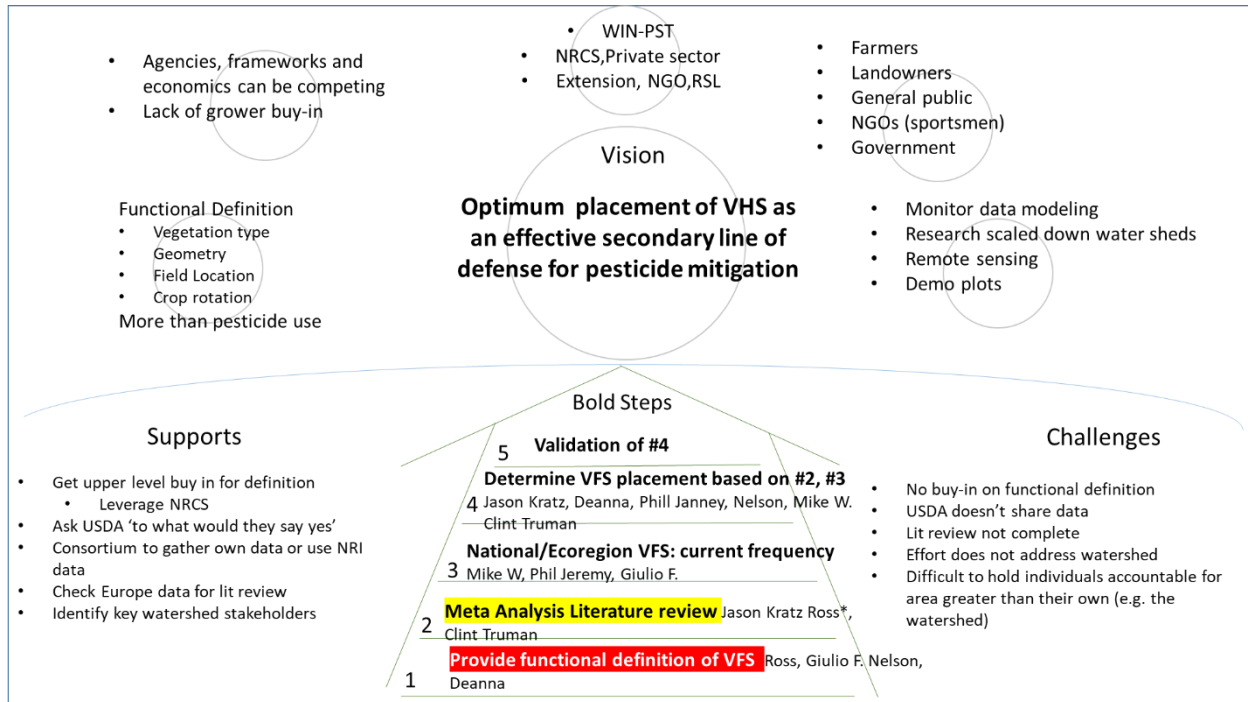
Each team primarily utilized a “Five Bold Steps Vision Canvas” large poster with associated exercises to develop and focus their ideas. For example, the Team 1 canvas is shown below.



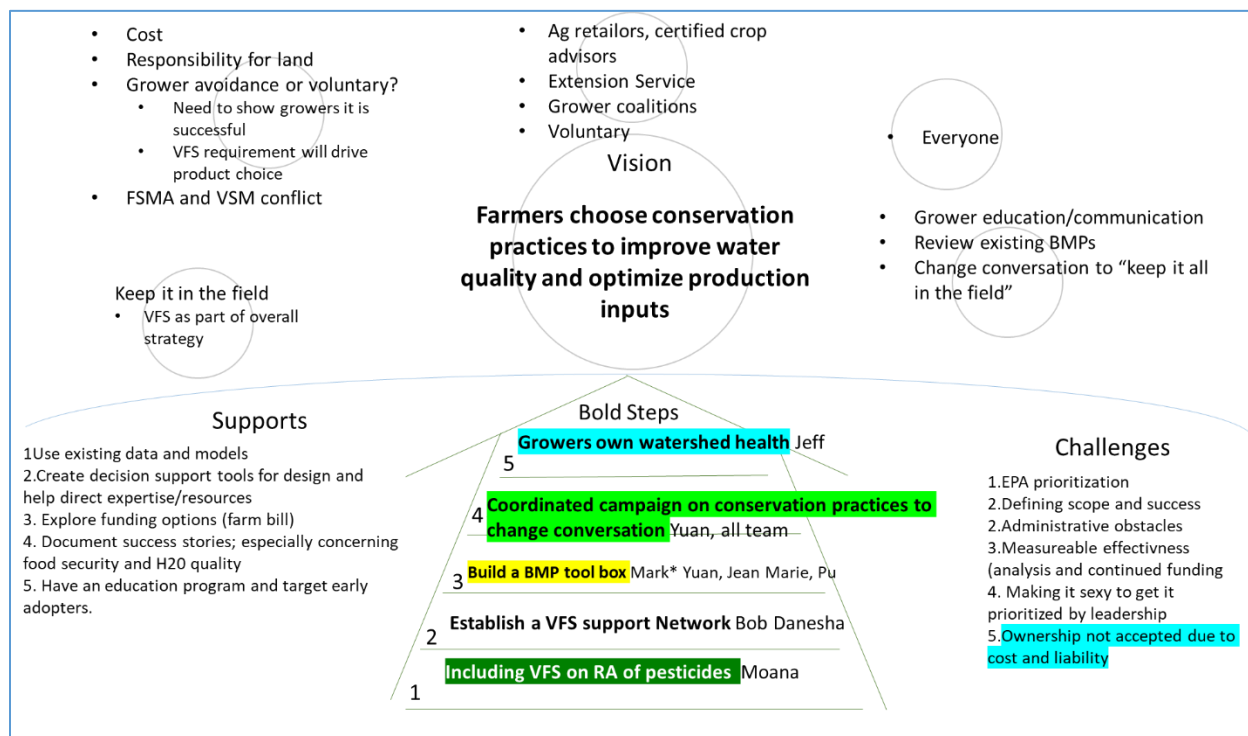
The teams first worked on Themes (clustered around the vision statement) using a montage of key slides from each of the plenary speakers for inspiration. Next each team crafted a vision statement related to their expected outcome and wrote it as a news story set in the future. Following the Vision exercise, the teams brainstormed ideas that could support the vision statement. These many ideas were voted on and put in order as the 5 bold steps. Then teams did a pre-mortem envisioning failure of their vision and looked at supports and challenges that may influence the success or failure of the vision. On the final morning, all four teams brought their canvases together and looked for cross-cutting synergies and arranged themselves into working groups that will continue throughout 2019. The attendees also worked together to draft a consensus statement based on the conclusions of the workshop.

Canvas Results:

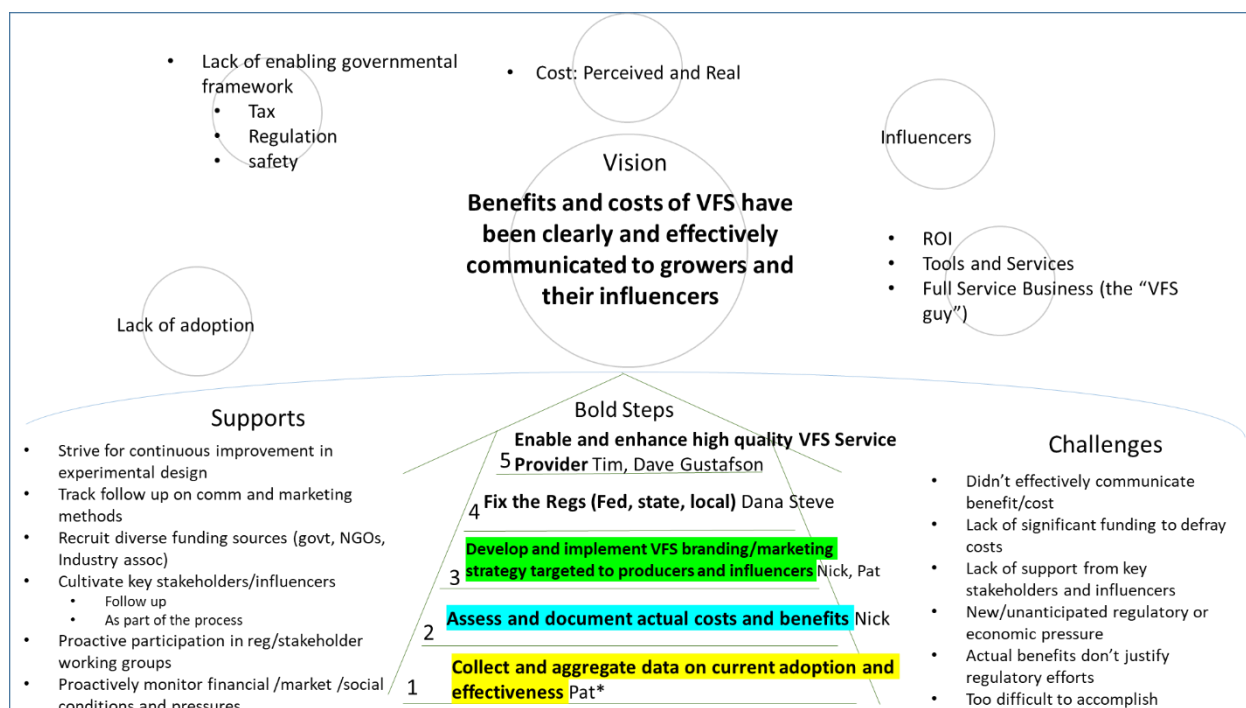
Team 1: Geographic Areas: Current geography and factors that support pesticide use



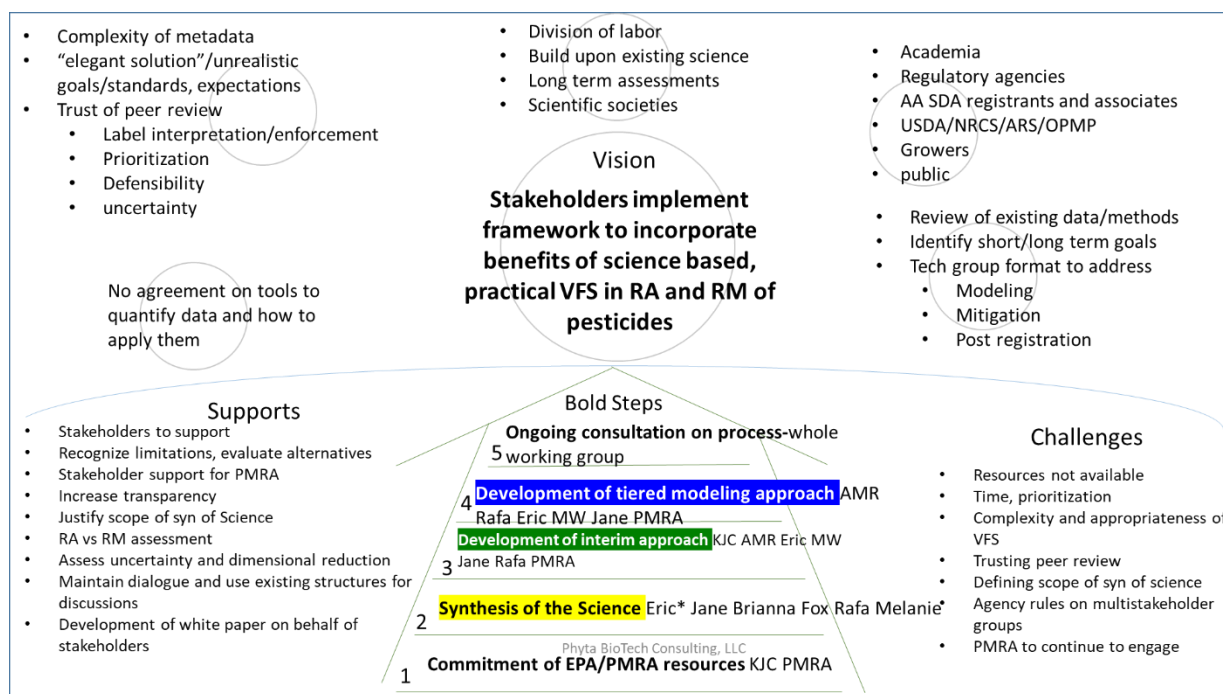
Team 2: Conservation Program: Benefit of VFS to existing conservation programs; update design standards; beyond VFS



Team 3: Value Case: disseminate to growers and stakeholders



Team 4: Develop Framework: for risk assessment and management of pesticides



Summary of 5 Bold Steps for each Team

Team	1: Geographic Areas	2: Conservation program
Vision	Optimum placement of VHS as an effective secondary line of defense for pesticide mitigation	Farmers choose conservation practices to improve water quality and optimize production inputs
5	Validation of #4	Growers own watershed health Jeff
4	Determine VFS placement based on #2, #3 Jason Kratz, Deanna, Phill Janney, Nelson, Mike W. Clint Truman	Coordinated campaign on conservation practices to change conversation Yuan, all team
3	National/Ecoregion VFS: current frequency Mike W, Phil Jeremy, Giulio F	Build a BMP tool box Mark* Yuan, Jean Marie, Pu
2	Meta Analysis Literature review Jason Kratz Ross*, Clint Truman	Establish a VFS support Network Bob Danesha
1	Provide functional definition of VFS Ross, Giulio F. Nelson, Deanna	Including VFS on RA of pesticides Moana

Team	3: Value case	4: Develop Framework
Vision	Benefits and costs of VFS have been clearly and effectively communicated to growers and their influencers	Stakeholders implement framework to incorporate benefits of science based, practical VFS in RA and RM of pesticides
5	Enable and enhance high quality VFS Service Provider Tim, Dave Gustafson	Ongoing consultation on process-whole working group
4	Fix the Regs (Fed, state, local) Dana Steve	Development of tiered modeling approach AMR Rafa Eric MW Jane PMRA
3	Develop and implement VFS branding/marketing strategy targeted to producers and influencers Nick, Pat	Development of interim approach KJC AMR Eric MW Jane Rafa PMRA
2	Assess and document actual costs and benefits Nick	Synthesis of the Science Eric* Jane Brianna Fox Rafa Melanie
1	Collect and aggregate data on current adoption and effectiveness Pat*	Commitment of EPA/PMRA resources KJC PMRA

Post Workshop Teams and Milestones:

Literature Review Team

One meeting by 1/14/2019

- | • Team members | • Milestones |
|---|---|
| • 1. Jason, Ross, Clint | • Start literature search |
| • 2. Mark*, Yuan, Jean-Marie, Pu | • Collect existing review articles |
| • 3. Pat*, Dave, Deana | • Create outline (straw man) for article |
| • 4. Eric, Jane, Brianna, Melanie, Rafa, *Garey | • Goal: Different papers combined in series for 1 journal |
| | • Prep for ACS talk-VFS Aug 2019 |
| | • Step 2: Economic Analysis |

Economic Analysis

- | Team members | Milestones |
|------------------------------|--------------------------------------|
| ➤ 3. Nick | ➤ Team send group (?) email |
| ➤ 3. Jeff | ➤ Set up Google folder |
| ➤ Recruit Wally Tyner (Nick) | ➤ Review articles into google folder |
| ➤ USDA/OPMP-Sheryl Kunickis | ➤ Call before Jan 14 |
| ➤ BEAD Costello | |
| ➤ EPA-Inform, Involve | |

Provide functional definition of VFS

Team members

- Giulio*
- Ross
- Nelson
- Deana
- Dave

One meeting before 1/14/2019

Milestones

1. Will Develop 2 possible definitions by end of year within group
2. Will develop a list of pros and cons for each definition and also list any criteria for design
3. Will deliver a package to CERSA early 2019 for voting on preferred definition

Tiered Modeling Approach

Members

- Amy
- Raffa
- Eric*
- Mike
- Jane
- Melanie
- (EPA?)
- Yong Ping (ORD)

Milestones

- Recognize an interim approach is imperfect; develop paper to outline future tiered approach
- Provide document to EPA and PMRA on European approach
 - Model validation paper
- Bob: provide research data to EPA by Jan 14
- Model simulations for Canada-tbd in Jan meeting
- One meeting before 1/14/2019

Interim Approach

Members

- Moana
- Bob
- Oscar
- Kevin*
- Amy
- Eric
- Mike
- Jane*
- Raffa
- Melanie

Milestone

- One meeting before 1/14/2019
- Need flexible design
- Tiered Modeling approach required to get started on this action item

Appendix

Workshop Program

Sunday Evening Reception, December 2

6:30—9:30 PM

Monday, December 3

6:45-7:45 AM Breakfast

Opening Plenary

8:00 AM—Opening Remarks

Rick Keigwin, Director, US EPA-Office of Pesticide Programs

Iain Kelly, Director, Bayer, North American Regulatory Policy and Issues Management

8:20 AM—NC State's New Center of Excellence: Advancing Regulatory Science in Agriculture. Danesha Seth Carley, Director, CERSA, NC State

8:30 AM—Regulatory perspective: opportunities and challenges in considering vegetative filter strips in pesticide risk assessments. Kevin Costello and Nelson Thurman, US EPA-OPP

9:00 AM—VFS Effectiveness to Mitigate Pesticides in Runoff. Bob Lerch, USDA-ARS

9:30 AM—VFS Effectiveness to Mitigate Pesticides: Mechanistic Analysis with VFSSMOD. Rafa Muñoz-Carpena, Univ. of Florida

10:00 AM—Conservation Effectiveness Assessment Project (CEAP), Benefits of conservation practices for water quality. Michael White, USDA-ARS

10:20 AM—Break

10:40 AM—USDA Conservation Programs Relevant to Pesticide Runoff Mitigation. Lindsay Haines, USDA-NRCS

11:00 AM—Factors Influencing Grower Decisions to Implement Conservation Practices. Nick Goeser, Craigson Group

11:30 AM—Registrant Perspective: Seeking a Path Forward to Incorporate VFS in Pesticide Risk Assessment. Jane Tang, Bayer

12:00 AM-Panel Discussion. Moderated by Susanne Kjemtrup, Phyta BioTech Consulting

12:30 PM—End of Morning Session

12:30 PM—1:30 PM—Lunch, Salon F, G, H

Moderated Workshop Sessions

1:30-2:00 PM—Introduction

2:00-2:30 PM— Ice Breaker

2:30-4:00 PM— Themes (Breakout Rooms, Salon A, B, C, D)

4:00-5:00 PM— Share Themes

5:00 PM—End of Afternoon session

Monday Evening

6:00 PM— Dinner at McCormick and Schmicks Seafood & Steaks

Dinner Speaker:

Dr. Jeffrey Jenkins, Oregon State University

"A systems approach to modeling pesticide transport in a Pacific Northwest watershed".

Tuesday, December 4

7:30—8:30 AM—Breakfast

8:30 —8:45 AM—Quick Review

8:45-9:45 AM— Vision (Breakout rooms)

9:45-10:30 AM— Share Vision

10:30-12:00 PM— 5 Bold Steps (Breakout Rooms)

12:00-1:00 PM— Lunch

1:00-2:00 PM— Finish 5 bold steps (Breakout Rooms)

2:00-3:00 PM— Pre-mortem (Breakout Rooms)

3:00-4:00 PM— Practice 5 bold steps presentation (Breakout)

4:00-4:30 PM— Break

4:30-6:30 PM— Poster Session & Reception

6:30 PM—Dinner on your own

Wednesday, December 5

7:00-8:00 AM— Breakfast

8:00-10:00 AM— Presentation of posters by each team

10:00-11:30 AM—Round robin: opportunities for synergy

11:30-12:15 PM— Working lunch wrap-up

12:30 PM— Depart for tours at NC State

Tour Stops:

- Riparian Buffers and Wildlife Corridors at the Lonnie Poole Golf Course. Danesha Seth Carley, Horticultural Science
- Methods for improving vegetation establishment and soil properties in lawns, buffers, and landscaped areas in order to reduce runoff volume and improve water quality. Rich McLaughlin, Crop and Soil Sciences, Lake Wheeler Road Field Laboratory.

4:00 PM—Tours end. Transportation back to hotel or to RDU airport.

Poster Presentations

Presenter	Title/Authors
Kevin Armbrust, Louisiana State University	Impacts Sunlight Imposes on Emerging Rice Field Herbicides and Their Chemical Behaviors in the Presence of Sediment. Emily N. Vebrosky, Jessica N. Landry, Laura M. Basirico, Michael LaNasa, Kevin L. Armbrust
Kevin Armbrust, Louisiana State University	Responses to Hydroxychlorothalonil and Dicloran Exposure by <i>Menidia beryllina</i> in the Presence of Varying Salinities and Sunlight. Emily N. Vebrosky, Wei Xu, Kevin L. Armbrust
Jessica Chen. Bayer	An integrated modeling system (PRZM/VFSMOD/VVWM) for incorporating vegetative filter strips in risk assessments.
Garey Fox, NC State	Quantifying the Effectiveness of Vegetative Filter Strips for Pesticide and Total Phosphorus Trapping through Semi-Empirical and Process-Based Approaches
Garey Fox, NC State	Impact of Preferential Flows on Contaminant Transport through Riparian Buffers. G. Fox, R. Muñoz-Carpena, B. Gao, D. Heeren, T. Halihan, L. Guertault, E. Orozco-Lopez
Dave Gustafson, Conservation Technology Information Center	OpTIS: Use of Remote Sensing Data to Map Conservation Ag Practices and Establish Soil Health Baselines," Dave Gustafson (CTIC) and Steve Hagen (Applied GeoSolutions)
Jeffery Jenkins and Philip Janney. Oregon State University	Probabilistic Methods to Evaluate the Relationship Between Chlorpyrifos Use at the Watershed Scale and Impacts on Aquatic Resources.
Jen Kalinowski, NC State*	Prairie strips improve biodiversity and the delivery of multiple ecosystem services from corn-soybean croplands.
Patrick Maxwell, NC State*	Pesticide Phytoremediation Capacity of <i>Iris versicolor</i>
Deanna Osmond, NC State	Conservation Practices and Water Quality: The NIFA-CEAP Experience. Deanna Osmond ¹ , Donald W. Meals ² , Dana Hoag ³ , Mazdak Arabi ³ , A.E. Luloff ⁴ , Greg Jennings ¹ , Mark McFarland ⁵ , Jean Spooner ¹ , Andrew Sharpley ⁶ and Daniel Line ¹ (1)NC State University, Raleigh, NC, (2) Ice.Nine Environmental Consulting, Burlington, VT, (3) Colorado State University, Ft. Collins, CO, (4) Penn State University, University Park, PA, (5) Texas AgriLife Extension Service, College Station, TX, (6) University of Arkansas, Fayetteville, AR
Deanna Osmond, NC State	Riparian Buffer Effectiveness: Twelve Years After Installation. Osmond, D., S. King, J. Smith, M. Burchell, M. Dukes, R. Evans, and S. Knies
Shiran Qiu, knoell USA	Recalibration and cross-validation of pesticide trapping equations for vegetative filter strips (VFS) using additional experimental data.
Amy Ritter, Waterborne Environmental	Vegetative Filter Strip (VFS) Modeling in Risk Assessment. Amy Ritter, Dean Desmarteau, Paul Hendley
Michael Winchell, Stone Environmental	Effectiveness of Buffers Installed at Targeted Critical Drainage Areas in Minnesota. John Hanzas (Stone Environmental), Bill Vanryswyk (MN Department of Agriculture), Bruce Drager (Bayer CropScience), Michael Winchell (Stone Environmental)

Attendees List

Name, affiliation	Email	Biosketch
Moana Appleyard, US EPA-OPP	appleyard.moana@epa.gov	Chemical Review Manager in the Pesticide Re-evaluation Division of the Office of Pesticide Programs in EPA. Coordinator of the ecological risk management of the pyrethroids.
Kevin Armbrust, Louisiana State University	armbrust@lsu.edu	Professor and Chair - Environmental Chemist/toxicologist in the Department of Environmental Sciences at Louisiana State University. His expertise and research interests include assessments of the fate and effects of pesticides and other chemicals in and upon Louisiana watersheds, wetlands and coastal areas especially as they impact the regulatory sciences, as well as risks associated with chemical contaminants in manufactured and retail food.
Dana Ashford-Kornburger, USDA-NRCS	dana.ashford@wdc.usda.gov	National Nutrient Management Specialist in the Ecological Science Division of USDA-NRCS at the NHQ in Washington, DC. Dana provides national leadership for NRCS on nutrient utilization and management as it relates to policy development for ecosystem management.
Daniel Botts, Florida Fruit and Vegetable Association	Daniel.Botts@ffva.com	Vice President Industry Resources -- agricultural environmental regulatory and policy advocate for the specialty crop industry. Primary areas of interest and activity include; environmental risk assessment, characterization of land use practices and impacts, and coordination of data development for to inform regulatory policy.
Ross Breckles, PMRA	ross.breckels@canada.ca	Scientific Evaluator at PMRA - Aquatic Biologist. Ross is new to PMRA but has expertise in the effects of anthropogenic stressors on aquatic organisms. He is also involved in a special project related to vegetative filter strips.
Rafa Muñoz-Carpena, University of Florida	carpena@ufl.edu	Full Professor in Hydrology and Environmental Modeling at the Agricultural and Biological Department, University of Florida, Gainesville. His expertise is in in hydrological, water quality and environmental modeling. He is author of VFSSMOD, the vegetative filter strips (VFS) modeling system, a mechanistic numerical model to calculate the VFS reduction efficiency of surface runoff, sediment, and chemicals under realistic field conditions.
Kevin Costello, US EPA-OPP	costello.kevin@epa.gov	Acting Deputy Division Director of the USEPA Office of Pesticide Programs Biological and Economic Analysis Division. With 13 years each of ecological risk assessment and risk management experience, he has expertise in several aspects of pesticide regulation.
Garey Fox, North Carolina State University	gafox2@ncsu.edu	Professor and Department Head of Biological & Agricultural Engineering at North Carolina State University. He has participated in a number of studies related to the fate and transport of pesticides in the environment, including the development of an empirical pesticide efficiency equation for vegetative filter strips.
Giulio Ferruzzi, USDA-NRCS	giulio.ferruzzi@por.usda.gov	Conservation Agronomist- Agronomist serving our agency's state-level agronomists in the thirteen western states and territories. Providing assistance in the delivery of our nutrient and pest management conservation practices as well as support for Highly Erodible Land Compliance (HELC), Organic Agriculture and other conservation practices to support sounds resource management on our nation's farms and minimum impacts on the surrounding areas.

Nick Goeser, Craigson Group	nick.goeser@craigsongroup.com	President - Craigson Innovation Group - soil scientist and agronomist. Expertise in crop productivity, soil health, and water quality research, education and communications.
David Gustafson, Conservation Information Technology Center	dr.dave@real-whirlwind.com	Environmental scientist who worked 30 years in private industry and then at the ILSI Research Foundation through 2016. Now an independent scientist, he leads multiple efforts helping food systems meet nutrition needs in more sustainable ways, including this current role at CTIC, which began in May 2018.
Lindsay Haines, USDA-NRCS	lindsay.haines@wdc.usda.gov	National Pest Management and Organic Systems Specialist with USDA-NRCS. Responsible for updating/developing national technical standards and technical resources relating to Pest Management and Organic Agricultural Systems.
Brianna Henry, USDA-NRCS	Brianna.Henry@wdc.usda.gov	Natural Resource Specialist- a member of the Conservation Effects Assessment Project (CEAP) modeling team at NRCS in Beltsville, MD. Her background is in aquatic ecology, and focus in her present position will be on improving use of pesticide data from CEAP surveys and in modeling outputs.
Eric Henry, BASF	eric.henry@basf.com	Exposure assessment scientist and member of the Environmental Fate group at BASF in Research Triangle Park. He conducts modeling and provides regulatory support for plant protection products in the US and Europe.
Steve Hensley, National Cotton Council	shensley@cotton.org	Senior Scientist, Regulatory and Environmental Issues - regulatory analyst for the Washington, DC office of the National Cotton Council. He works on a range of issues from all regulatory agencies.
Douglas Hines, Bayer	douglas.hines@bayer.com	Manager, Product Chemistry and Compliance - analytical chemist and a member of the regulatory group at Bayer in Research Triangle Park. Expertise is in assuring product compliance from regulatory authorities through to the production of products and defining physical and chemical properties of materials.
Philip Janney, Oregon State University	Philip.Janney@oregonstate.edu	Research Associate, Oregon State University – My research interests primarily focus on leveraging institutional expertise and resources with local knowledge through watershed scale ecohydrologic modeling to refine the understanding of the relationship between land management practices and water quality.
Jeffrey Jenkins, Oregon State University	Jeffrey.Jenkins@oregonstate.edu	Professor and Extension Specialist, Oregon State University. My Extension and research interests are issue based – primarily focused on chemical use in agriculture and forestry – working with producers to balance production and environmental protection goals, with state and federal agencies charged with regulatory oversight, and with a cross section of stakeholders concerned about adverse impacts of chemical technology.
Morten Jensen, Bayer	morten.jensen@bayer.com	Alliance Manager with Bayer's Crop Science Division. Morten has a background in plant biology and now develops and manages external partnerships for Bayer R&D.
Susanne Kjemtrup, Phyta BioTech Consulting	kjemtrup@icloud.com	Principal, Phyta BioTech Consulting— Susanne applies her extensive technical and leadership background in AgTech R&D to drive innovation management and strategic planning in both the public and private sectors.

Larry Jason Krutz, Mississippi State University	ljk81@msstate.edu	Director of Mississippi Water Resources Research Institute at Mississippi State University. Prior to serving as Director, Jason was the environmental lead for the Crop Production Systems Unit, United States Department of Agricultural Research Service, Stoneville, MS. Dr. Krutz has authored over 100 scientific articles describing the effects of agricultural production practices and best management practices on water quantity and quality. Jason currently resides in Starkville, MS with his wife and five children.
Bob Lerch, USDA-ARS	Bob.Lerch @ARS.USDA.GOV	Research Soil Scientist- soil chemist with expertise in the fate and transport of pesticides and development and testing of practices to improve water quality
Pu Li, PMRA	pu.li@canada.ca	Scientific Evaluator, environmental modeller and a member of the Environmental Exposure Modelling Section at PMRA in Health Canada. His expertise is in transport and fate simulation of pesticides in soil and water environment.
Martin Locke, USDA-ARS	martin.locke@ars.usda.gov	Director, USDA-Agricultural Research Service's National Sedimentation Laboratory (NSL), Oxford, MS. In research as a soil scientist, Martin studies processes and factors determining the effectiveness of conservation management in protecting and enhancing soil and water resources.
Laura McConnell, Bayer	Laura.mcconnell @bayer.com	Principal Scientist - analytical chemist and a member of the Environmental Safety group at Bayer in Research Triangle Park. Her expertise is in the environmental fate of pesticides and in agricultural practices to protect water quality.
Deanna Osmond, North Carolina State University	deanna_osmond@ncsu.edu	Professor and Department Extension Leader and Associate Head in the Crop and Soil Sciences Department at NC State University. She has worked at the interface of nutrient management, conservation practices, and water quality for over 25 years, with a particular emphasis on riparian buffers, watersheds, and soil fertility.
Tim Palmer, National Association of Conservation Districts	tim-palmer@nacdn.org	President-Elect of the National Association of Conservation Districts. NACD represents the 17000 locally elected or appointed conservation district officials that work with producers to solve conservation and water quality concerns. Tim is a row crop and cattle farmer from SC Iowa.
Jean-Mari Peltier, Environmental Solutions Group, LLC	jmpeltier@esgllc.net	President of Environmental Solutions Group, LLC, is a former Chief Deputy Director of the California Department of Pesticide Regulation. In addition to working with the Pyrethroid Working Group, Peltier also represents a number of California commodity groups.
Oscar Perez-Ovilla, Bayer	oscar.perez-ovilla@bayer.com	Regulatory Manager for Insecticides at Bayer – Technical background in chemical, environmental and agricultural engineering. His experience covers EPA's regulatory framework for the registration of pesticides and is one of Bayer's experts in the modeling of pesticides transport in vegetative filter strips.
Shiran Qiu, knoell USA	SQiu@knoellusa.com	Environmental fate and modeling scientist and a member of the Environmental Safety group at knoell USA in Garnet Valley, PA. His expertise is in the field of environmental fate, exposure modeling, and risk assessment of agrochemicals.
Patricia Rice, BASF	patricia.rice@basf.com	Regulatory Technical Stewardship Manager - a member of the Development Regulatory Strategy / Stewardship group at BASF in Research Triangle Park. Her expertise is in the environmental fate and stewardship of pesticides, ecotoxicology, exposure assessments, and sustainable agriculture.

Amy Ritter, Waterborne Environmental	rittera@waterborne-env.com	Principal Engineer at Waterborne Environmental, Inc. She has over 25 years working in the field of environmental fate and transport modeling and risk assessment.
Danesha Seth Carley, North Carolina State University	dgseth2@ncsu.edu	Director for the Southern IPM Center, and the new Center of Excellence for Regulatory Science in Agriculture. As an Associate Professor in Horticultural Science at NC State, her research, and outreach programs focus on sustainable managed landscapes. Recent projects include the restoration of historic Pinehurst No. 2 and No. 4 Golf Courses, and pollinator protection and habitat conservation.
Jane Tang, Bayer	Jane.tang@bayer.com	Manager and Senior Principle Scientist, Environmental Exposure Assessment of Environmental Safety group at Bayer in Research Triangle Park. Her expertise is in hydrological/water quality models in exposure and risk assessment of agrochemicals, and integration with spatial analysis techniques.
Nelson Thurman, US EPA	thurman.nelson@epa.gov	Senior Science Advisor, US EPA Office of Pesticide Programs, Environmental Fate and Effects Division. His expertise is in pesticide fate and transport, water quality, risk assessments, GIS, and spatial modeling.
Dana Wernsman, Bayer	dana.wernsman@bayer.com	State Registrations, Bayer. Previously an analytical chemist in Environmental Safety residue laboratory.
Clint Truman, Syngenta	Clint.Truman@syngenta.com	Technical Leader within the Environmental & Product Safety group at Syngenta Crop Protection in Greensboro, NC. His expertise is in surface water hydrology, erosion and sedimentation, agricultural BMPs, and pesticide fate and transport.
Michael Winchell, Stone Environmental	mwinchell@stone-env.com	Vice President and Senior Environmental Modeler, leads the Environmental Systems Modeling group at Stone Environmental. His expertise is in the development and application of water quality models and the integration of spatial analysis based parameterization approaches.
Mark White, Syngenta	mark.white@syngenta.com	Sr. Stewardship Manager with Syngenta's Stewardship and Regulatory Policy group. Expertise in watershed management, water monitoring programs, crop protection product stewardship, and stakeholder engagement to gain compliance with regulatory requirements.
Mike White, USDA-ARS	mike.white@ars.usda.gov	Research Scientist - agricultural engineer and a member of the SWAT model development and CEAP teams in Temple, Texas. Primary expertise in the evaluation of conservation practices and policies at the local and national level using models.
Mélanie Whiteside, PMRA	melanie.whiteside@canada.ca	Head of Environmental Exposure Modelling at PMRA – Biologist and regulatory scientist. Her expertise is in the integration of the various components of pesticide risk assessments, including water modelling, fate characterization and risk mitigation.
Yongping Yuan, US EPA	yuan.yongping@epa.gov	Yongping Yuan, Research Hydrologist - Integrated Environmental Modeling Branch; she has been extensively working on watershed hydrology and water quality monitoring and modeling to explore complex water quality dynamics and find innovative strategies to protect water quality from non-point source pollution.
Leah Zorrilla, Bayer	leah.zorrilla@bayer.com	Principle Scientist- regulatory toxicologist in Human Safety at Bayer in Research Triangle Park. Her expertise is in reproductive and endocrine toxicology and biopesticide human safety evaluations.