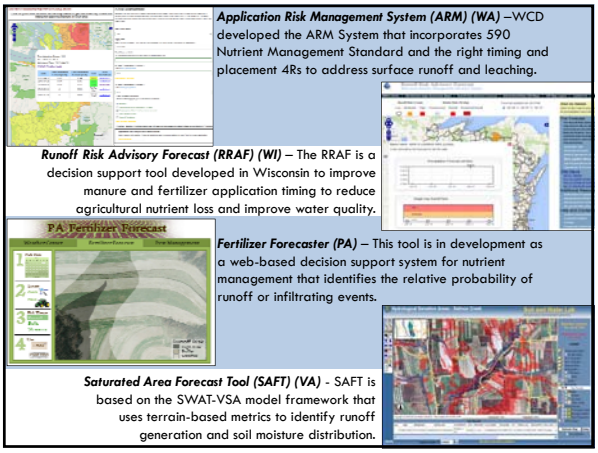
THE USE OF RUNOFF RISK ADVISORY TOOLS FOR WATER QUALITY PROTECTION

LPELC Webcast | June 16, 2017

What Causes a Runoff Pollution Event?

- **Pollutant availability**
  - Crop needs, variable uptake and/or conversion
- **Improper application practices (4R's)**
  - Timing, source, rates, placement, method
- **Weather event**
  - Precipitation, flooding, wind, snow
- **Poor field conditions**
  - Soil type, slope, surface cover, saturated soils, snow, frozen ground, high water table

NRCS Conservation Innovation Grant



Application Risk Management System (ARM) (WA) –WCD developed the ARM System that incorporates 590 Nutrient Management Standard and the right timing and placement 4Rs to address surface runoff and leaching.

Runoff Risk Advisory Forecast (RRAF) (WI) – The RRAF is a decision support tool developed in Wisconsin to improve manure and fertilizer application timing to reduce agricultural nutrient loss and improve water quality.

Fertilizer Forecaster (PA) – This tool is in development as a web-based decision support system for nutrient management that identifies the relative probability of runoff or infiltrating events.

Saturated Area Forecast Tool (SAFT) (VA) - SAFT is based on the SWAT-VSA model framework that uses terrain-based metrics to identify runoff generation and soil moisture distribution.

CIG Runoff Advisory Project Objectives

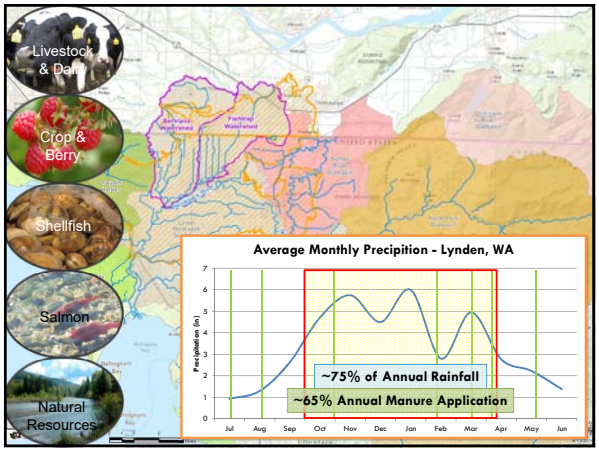
- Qualitatively and quantitatively compare existing runoff advisory tools for strengths, limitations, and integration.
- Coordinate efforts to develop a runoff advisory system interface that can be adapted and implemented to applicable regions of the US.
- Develop supporting educational documents and materials to support advisory system.
- Transfer decision support tools and knowledge to applicable areas of the US.

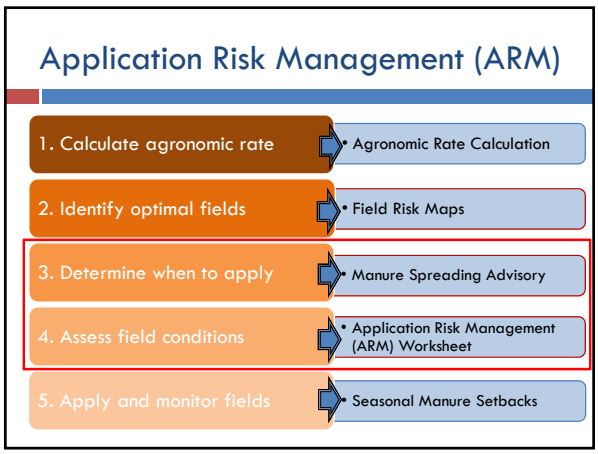
Comparative Paper on Tools

Journal of Environmental Quality, 2017

Easton, Z.M., P.J.A. Kleinman, A.R. Buda, D. Goering, N.M. Embertson, S. Reed, P.J. Drohan, M.T. Walter, P. Guinan, J.A. Lory, A.R. Sommerlot, and A. Sharply. 2017. **Short-term forecasting tools for agricultural nutrient management.** Journal of Environmental Quality. *doi:10.2134/jeq2016.09.0377*

(available online; journal date pending)

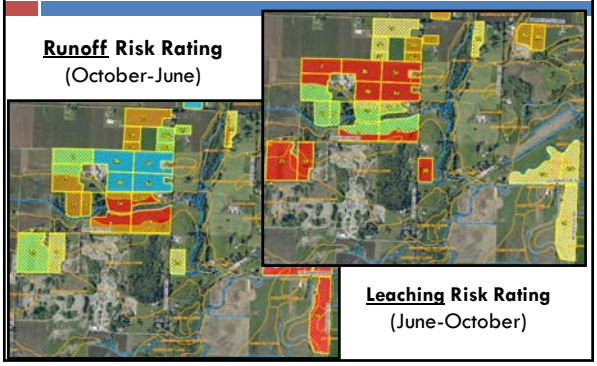




The archived presentation is available at:
http://articles.extension.org/pages/21819/chronological-webcast-archive

Field Risk Mapping

Runoff Risk Rating
(October-June)



Leaching Risk Rating
(June-October)

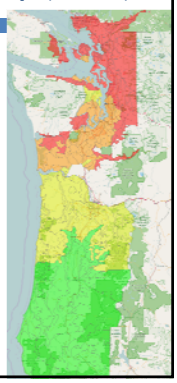
Manure Spreading Advisory (MSA)

Currently available for Washington, Oregon, and British Columbia

WA: www.wadairyplan.org/MSA

OR: www.oregon.gov/ODA/programs/NaturalResources/Pages/MSA.aspx

BC: www2.gov.bc.ca/gov/content/industry/agriculture-seafood/agricultural-land-and-environment/soil-nutrients/nutrient-management/manure-spreading-advisories



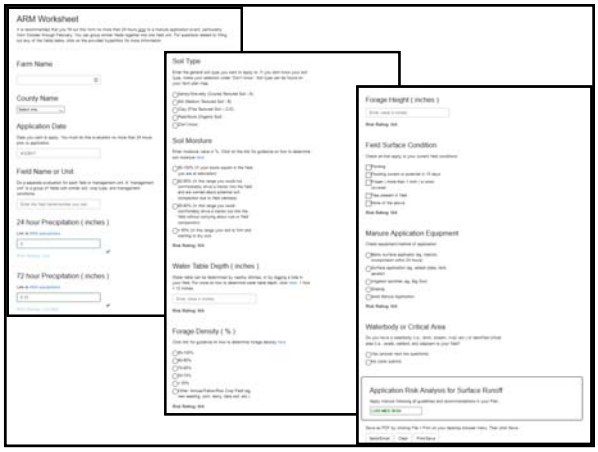
Manure Spreading Advisory (MSA)

- Real-time runoff advisory
- 3-day risk forecast
- Auto-updated with forecast from NOAA
- Decision making tool
- Color coded for easy use
- Link to ARM Worksheet for field risk assessment

www.wadairyplan.org/MSA

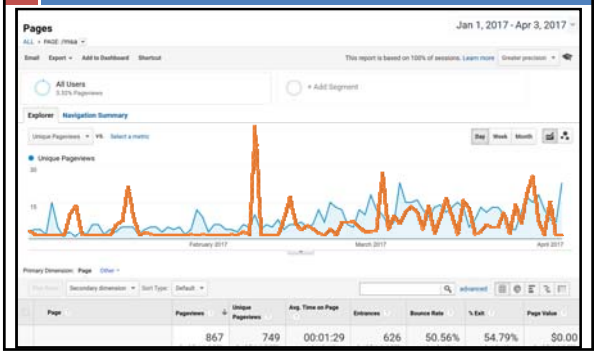
ARM Worksheet

- Fill out Worksheet before application
- Provides Runoff Risk by field and day
- Recordkeeping & accountability
- Based on 4 year field research project
- Mobile friendly



ARM Guidance and Tools

Do People Use the MSA?



Impact

- ARM tools and MSA being promoted by state regulatory agencies, Tribes, livestock industry
- Farmers increasing use every month
- Paired education events to teach how to use
- Tools provide accountability and recordkeeping for state regulations (i.e., dairy nutrient management, CAFO permit, CNMP, NRCS 590)
- Improving tool all the time!