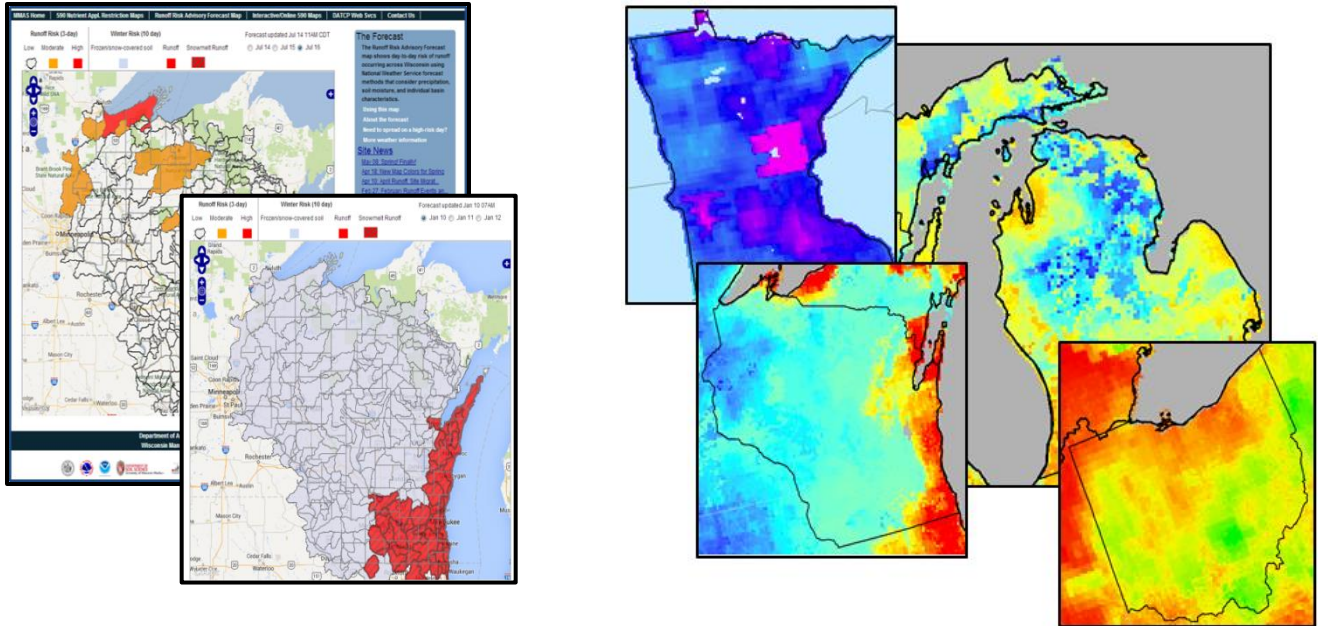


RUNOFF RISK ADVISORY FORECAST (RRAF)

First-of-its-kind Decision Support Tool Focused on Improving Management of Manure & Fertilizer Application Timing to Reduce Agricultural Nutrient Loss & Improve Water Quality



Images: (left): Operational RRAF in Wisconsin during summer to fall and winter to spring mode; (right): Examples of 2nd generation 4km x 4km gridded model in development for Michigan, Ohio, Minnesota, and Wisconsin.

Description

- The RRAF is a decision support tool developed in collaboration with federal, state, academic, and agricultural industry partners. It is the first NWS product focused on water quality.
- The forecast guidance is generated multiple times daily from National Weather Service’s North Central River Forecast Center (NCRFC) models incorporating future precipitation (5 days) and temperatures (10 days) into the NCRFC’s integrated atmosphere-land modeling system.
- The operational product currently covers Wisconsin and is issued 3 times per day. It is hosted on a webpage created by the Wisconsin Department of Agriculture, Trade, & Consumer Protection (DATCP).



Development & Current Implementation

- NCRFC model guidance was validated against observed edge-of-field runoff (EOF) as well as several small USGS gauged watersheds showing positive results.
- Thresholds were developed to stratify predicted risk for runoff into low, medium, and high conditions.
- The RRAF is meant to supplement information gathered by decision makers during critical nutrient application timing. It is not recommended to be the sole source of guidance or as a regulatory tool due to inherent limitations in forecast models.
- The Government Accountability Office (GAO) referenced the RRAF and the need for tools like it in their 2014 report titled “Freshwater: Supply Concerns Continue, and Uncertainties Complicate Planning”.
- The RRAF can be found here :: http://www.manureadvisorysystem.wi.gov/app/events/runoff_forecast
For in-depth background on the RRAF development reference NOAA Technical Report NWS 55:
 - http://docs.lib.noaa.gov/noaa_documents/NWS/TR_NWS

Future Improvements & Expansion

- Many state agencies are interested in setting up their own runoff risk project. Initial projects are being developed in coordination with Minnesota, Michigan, and Ohio. Ohio River Forecast center will be involved in guidance developed for Ohio. Interest has been expressed from New York and Indiana for the following round.
- The EPA has awarded NCRFC funds via the Great Lakes Restoration Initiative (GLRI) Priority Watershed Work Group to aid in developing and implementing the 2nd generation tool in these new areas. The improved runoff risk tool will be derived from higher resolution models ran on a 4km x 4km grid.
- Initial collaboration has begun with the USDA Agriculture Research Service (ARS) in Pennsylvania who will work with the Middle Atlantic RFC using the same model to develop guidance to improve conditions in Chesapeake Bay. Coordination between the two groups will ensure the best method for regional implementation.
- Future efforts will focus on: successful outreach, social science research to fine-tune product effectiveness, quantification of product impact via what-if simulations, developing a regional runoff risk working group among the states, and fine-tuning and improving the hydrological model.

For questions and suggestions on the RRAF please contact the NCRFC:

Dr. Pedro Restrepo	[Hydrologist-in-Charge]	pedro.restrepo@noaa.gov
Steve Buan	[Service Coordination Hydrologist]	steve.buan@noaa.gov
Brian Connelly	[Senior Hydrologist]	brian.connolly@noaa.gov
Dustin Goering	[Hydrologist]	dustin.goering@noaa.gov