Using Wisconsin's SnapPlus Planning Tool in Pay-for-Performance Projects
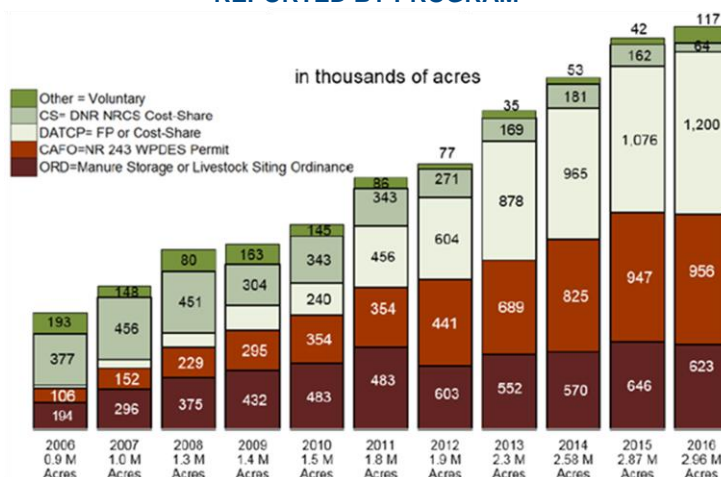
SnapPlus is a nutrient management (NM) planning application, developed by scientists at University of Wisconsin-Madison, designed to assist farmers in the creation of NM plans and estimate phosphorus (P) loss in accordance with statewide agricultural performance standards and resource management policies. SnapPlus also incorporates the latest planning criteria and guidelines from the Wisconsin Natural Resources Conservation Service (NRCS) 590 conservation practice standard for NM, as well as University of Wisconsin nutrient application recommendations. SnapPlus generates annual and rotational average results for soil and P loss related to any cropping system or management practice that can be simulated in RUSLE2 and Wisconsin P Index equations. Given the versatility, usability, and scientific rigor of the application, SnapPlus is the clear tool of choice for NM planners and pay-for-performance (PfP) programs focused on P loss reductions across Wisconsin.

However, pervasive issues around the accuracy and implementation of many SnapPlus plans have emerged in recent years, requiring careful attention by potential PfP projects and stakeholders.

Nutrient Management in Wisconsin

The initial momentum for NM planning stemmed from the NRCS 590 standards adopted by Wisconsin in 2005, in addition to state and/or local compliance obligations for large dairies. Since the NR 151 revisions

**2006-2016 NUTRIENT MANAGEMENT ACRES REPORTED BY PROGRAM**

Source: DATCP (https://datcp.wi.gov/Documents/NMUpdate2016.pdf)

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covering all cropland and livestock operations became effective in January 2011, Wisconsin farmers have nearly doubled the acreage with NM plans from 1.5 million to 2.96 million, as shown in the figure on page 1. Most of these new plans have come through the DATCP Farmland Preservation Program, which offers farmers a $5 to $10 per acre tax credit and requires a "certificate of compliance" from the county Land and Water Conservation Department (LWCD). The certificate is essentially a farmer's attestation plus their current NM then must inspect farms claiming the credit at least once every 4 years. Only about 1% of plans and acres were reviewed by the Department of Agriculture, Trade, and Consumer Protection (DATCP) Quality Assurance Team in 2016, which is not sufficient to make program-wide claims about plan accuracy or compliance with state rules. This low and infrequent verification of SnapPlus plans by DATCP, coupled with inadequate enforcement of the NR 151 performance standards and related water quality regulations by the Department of Natural Resources (DNR), present significant and still-unresolved challenges to the PfP approach.

SnapPlus and Pay-for-Performance

SnapPlus calculates erosion and runoff using the dominant critical area of each field. This is standard practice for NRCS conservation planning and is generally effective at targeting high-risk fields, but can lead to overestimation of P runoff. At the request of DNR, likely due to concerns over the implications for compliance-driven water quality trading and adaptive management programs, the SnapPlus team began testing a more conservative calculation approach that uses each field's predominant soil. The result was a "P Trade" report added to the 14.0 software release in late 2014, which the West Branch PfP pilot project then used exclusively for scenario analysis and farmer payments. The P Trade report requires at least 2 years of input data to run, however, potentially limiting the pool of eligible farmers. The 15.0 and 16.0 releases added geo-referenced field and soil information through the SnapMaps service. This web interface allows farmers and NM plan writers to quickly toggle map layers including: soil series, manure/fall N restrictions, and watershed boundaries. Based on plan data and model

outputs, SnapMaps also includes 17 color-coded variables to provide a field-by-field visual overview. In a PfP program, the "rotation average P Index" layer can be used to quickly show which fields to prioritize for analysis and payment.
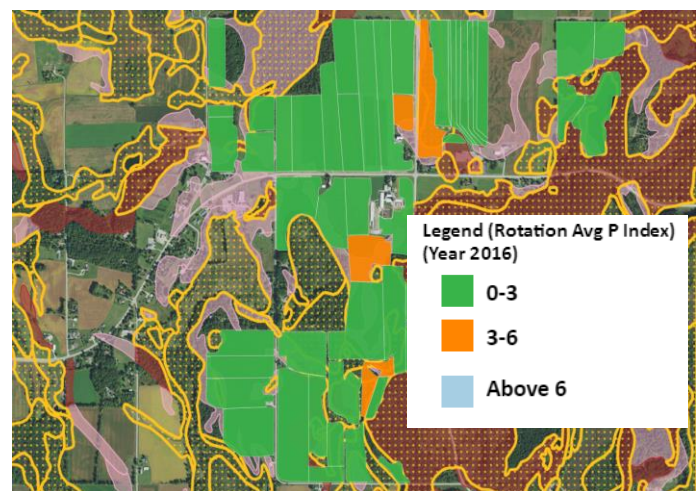
Above: The Rotational Average P Index Layer in SnapPlus

Next Steps for SnapPlus and PfP

For PfP conservation to be successful in Wisconsin, SnapPlus plans must accurately reflect biological and physical conditions of each field while incorporating actual management activities in a timely manner. If plans are not accurate, staff time is needed to correct the plan. This comes at a significant cost to the program, and can jeopardize the success of the whole PfP program.

For PfP to be successful when incorporating and using NM plans created using SnapPlus, the program must:

- Require farmers to sign an attestation that their plan meets appropriate standards and accuracy.
- Perform random spot checks to confirm accuracy and management activities.

If the above requirements are not met, the farmer could be held liable for refunding any affected payments or be disqualified from the PfP program. Such rules will be necessary to ensure the accuracy and integrity of any PfP program, especially as pilot projects navigate how to align with state-sanctioned watershed implementation plans or other high-visibility initiatives.

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