Developing Remote Sensing Protocols for Inventory of Nutrient Management Practices

Issue: An accurate inventory of in-field and off-site nutrient management practices is essential to establish baseline conditions and document implementation of the Iowa Nutrient Reduction Strategy. For some practices, such as crop rotation, available satellite sensor data already has been processed into crop rotation datasets. For most practices — cover crops, residue cover, riparian buffers, flow or erosion control structures — more research is needed to refine methodologies and calibrate results.

Objective: This project will develop standard remote sensing protocols to inventory cover crops and residue cover. These protocols will be validated in the Turkey River, Cedar River and Skunk River watersheds.

Approach: Remote detection of cover crops will use Landsat-7 and 8 satellite sensor data, plus other high resolution/high repeat datasets. Landsat imagery will be acquired in late fall and spring to detect greenness at each of these times, and used to determine the presence of a cover crop over the winter period.

Estimates of residue cover at the field scale will be evaluated using Landsat-7 and 8 satellite sensor data to produce a normalized difference tillage index (NDTI). The NDTI is a promising methodology to estimate residue cover prior to crop emergence.

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