



Tillage and Erosion Survey Program

Program Update

February 2017

Objectives

- Develop a long-term program to systematically collect tillage (crop residue after planting) data and soil erosion estimates to analyze trends in agricultural soil and water management,
- Track tillage trends, cover crop adoption, and land cover in the 67 county area with greater than 30% of land dedicated to row crop production, and
- Quantify and track trends in average annual and daily soil loss due to wind and water erosion.

Partners

- University of Minnesota: Department of Soil, Water and Climate, and
- Iowa State University: Department of Agricultural and Biosystems Engineering.

Products

- Maps and raster datasets of crop residue cover, conservation tillage, cover crop adoption,
- County and HUC-12 GIS layers with scaled wind and water erosion estimates,
- GIS database of residue cover, cover crop cover/land cover, and model parameters for water and wind erosion estimates,
- Public online portal for data access and visualization of erosion estimates (expands the Daily Erosion Project into Minnesota), and
- Annual reports and trend analysis for spring residue cover and fall vegetative cover.

Methods

- Utilize remote sensing technologies to assess crop residue cover using Landsat satellite imagery,
- Collect ground truth data to calibrate and measure accuracy of remote sensing algorithms,
- 2016 ground truth data collection in Stearns, Redwood, Blue Earth, Fillmore, and Polk counties and a planned expansion of this effort in 2017,
- Use USDA-developed models, WEPP and RUSLE2, to estimate wind and water erosion, and
- Convene a stakeholder committee to provide feedback and direction.

Benefits

- Remote sensing methodology is efficient and lays the foundation for a cost-effective, long-term data collection program,
- Consistent data collection across jurisdictions and reduces human error/bias in estimating residue,
- Ability to analyze archived Landsat imagery and fill in the gaps when tillage transect survey was not conducted (2007 – 2015),
- Measures voluntary conservation done by farmers,
- Measures changes in land cover such as losses and gains and perennial cover, hay land, pasture etc.,
- Baseline data to monitor adoption and effects of soil conservation efforts,

- Inform public and policy-makers of the current status of Minnesota's soil resource as well as trends in conservation and resource protection over time,
- Enhance water quality modeling efforts and watershed planning goal setting, and
- Data can be used with models and toolkits to provide targeted BMP recommendations.

What has been completed as of February 2017?

- The first year of field data collection has been completed and analyzed,
- The University of Minnesota has been utilizing the 2016 field data collected from the spring and fall to begin developing correlations of actual residue and cover crop information to predicted outcomes based on satellite remote sensing analysis, and
- Databases and base layer creation for the Daily Erosion Project (DEP) has commenced and will continue through 2017,



Residue Cover Field Data Collection Site Spring 2016

What will be completed in the next year?

- Development and deployment of the Daily Erosion Project (DEP): The current DEP website will include data from the 67 agricultural counties in Minnesota that are a part of this project. See existing website: <https://dailyerosion.org/>,
- Expanded field data collection in the spring and fall to include identified gaps in landscape and cover types,
- Refinement of the remote sensing methods utilizing new satellite data that is coming on-line 2017, and
- This project will be completed in 2018 and BWSR will be posting analysis and products on the web in mid-2017 at: <http://www.bwsr.state.mn.us/>.

Who can I contact for more information?

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