Remote Sensing with OpTIS

Measuring the adoption of sustainable farming practices

WHAT IS OPTIS?

OpTIS, or Operational Tillage Information System, uses remote sensing (satellite-based) data to measure the adoption of cover crops and specific tillage systems that impact environmental sustainability. These practices affect greenhouse gas emissions and soil carbon sequestration and improve soil health and water quality outcomes.

OpTIS helps scientists, farm advisors, conservationists and others assess the progress of sustainable practice adoption.

Days of green/senescent cover

Tillage practices detection

Crop emergence date detection

Row and grain crop management history

Planting/field boundary detection based on management history

Cover crop detection

HOW DOES IT WORK?

OpTIS algorithms utilize MODIS, Landsat and Sentinel satellite imagery to determine tillage and cover crop adoption. Information on practices such as the presence and quality of cover crops and crop residue levels, are determined by performing time series analysis of publicly available remote sensing data. Information is processed at the field level, but released only on a larger geographic scale to protect grower privacy.

The satellites used in OpTIS pass each land area every 3-5 days, ensuring that data is always up to date.
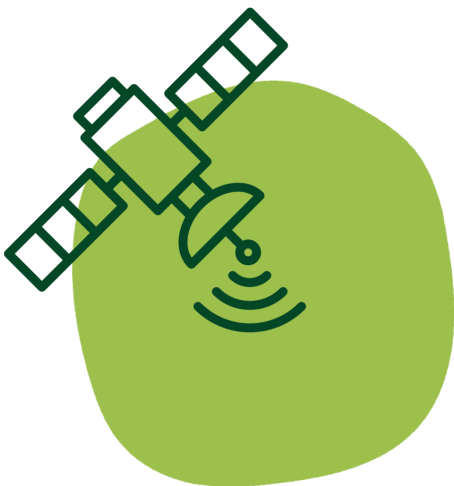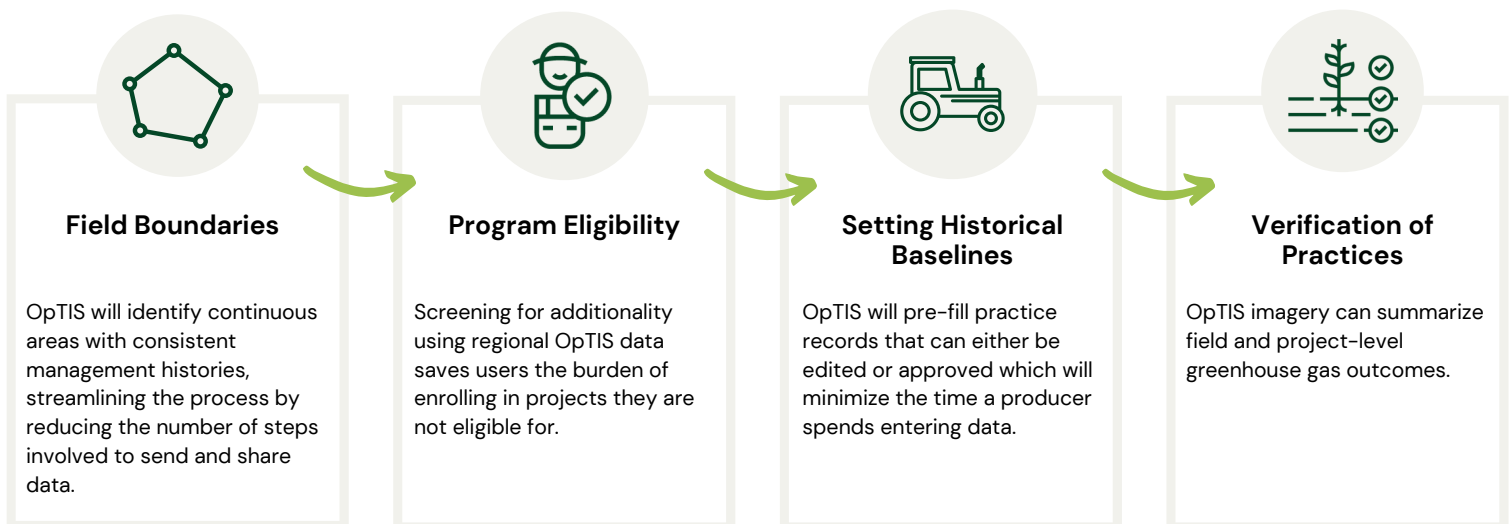
OpTIS data is utilized across many Regrow products, including Sustainability Insights and our MRV platform (which powers measurement, reporting and verification for ecosystem markets).

Data on sustainable practice adoption is aggregated for Sustainability Insights, empowering users to identify opportunities for new investments in sustainable farming.

Regrow's MRV platform uses OpTIS products to simplify workflow and verify practices in several stages of the carbon credit development process. On the grower's side, we use OpTIS to pre-fill growers' historical farm management data (in combination with the information from the producer's Farm Management System), making data collection simple for growers embarking on a carbon farming project.

In credit verification, OpTIS data may be used by verification bodies and standards wishing to cross-check the information provided by growers.

Here's an example of OpTIS capabilities in a carbon farming project, for which our MRV Platform is used:

Field Boundaries

OpTIS will identify continuous areas with consistent management histories, streamlining the process by reducing the number of steps involved to send and share data.

Program Eligibility

Screening for additionality using regional OpTIS data saves users the burden of enrolling in projects they are not eligible for.

Setting Historical Baselines

OpTIS will pre-fill practice records that can either be edited or approved which will minimize the time a producer spends entering data.

Verification of Practices

OpTIS imagery can summarize field and project-level greenhouse gas outcomes.

MODEL ACCURACY

Studies that compared OpTIS results with 5,000 road-side observations report that OpTIS has been able to make a determination of tillage practice or cover crop with 85-90% accuracy in the area that has been analyzed to date.

MEASURING ACCURACY THROUGH SUSTAINABILITY WATCH

At Regrow, we are continuously improving our models through efforts like the Sustainability Watch Program. This program utilizes agronomists across the United States to help monitor changes in the adoption of conservation practices. Agronomists collect on-the-ground data regarding farms in a specific region, and data will be compared with OpTIS observations to determine the tool's accuracy.

The Sustainability Watch Project is part of public-private partnerships between Regrow, The Nature Conservancy, the Conservation Technology Information Center and the Foundation for Food and Agriculture Research.

Regrow also provides OpTIS results to the public at crop reporting district and HUC8 watershed scales, making this data accessible at a broad scale.

To learn more, watch this webinar hosted by The Nature Conservancy.
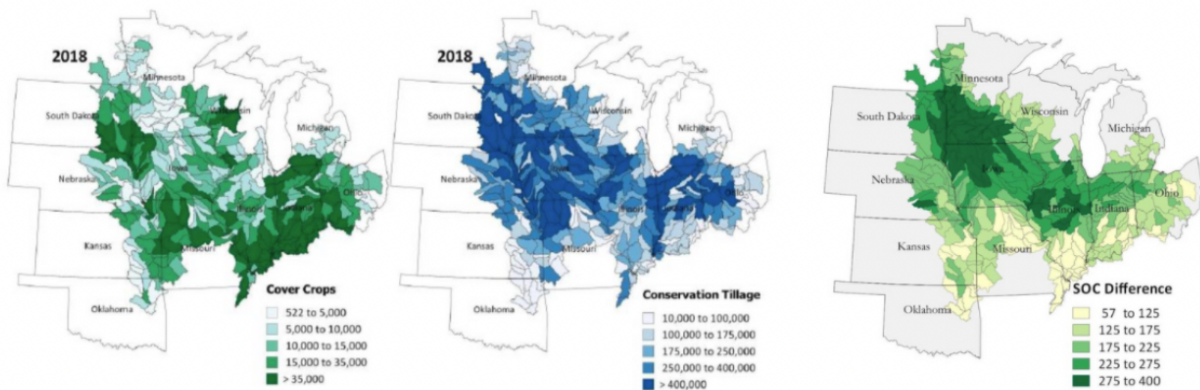
SCALABILITY

OpTIS offers a scalable alternative to on-the-ground data collection, reducing the costs and manual labor associated with this level of data.

The accuracy and timeliness of the data provided ensures that OpTIS will be scalable as sustainable practice adoption increases, and as adoption trends spread over broader geographic regions and farming systems.

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