

***N-Gage*: Development of a Validation Tool to Support Local-Scale Water Quality Trading Programs in the Mississippi River Basin**

DAVE GUSTAFSON & HANS KOK

CONSERVATION TECHNOLOGY INFORMATION CENTER

11th NATIONAL MONITORING CONFERENCE



Working Together for Clean Water

March 25 - 29, 2019 Denver, Colorado



Outline

Brief intro to CTIC

CTIC's historical conservation tillage data: CRM

New EPA Water Quality Trading Policy

New Ecosystem Services Market Consortium

New method for monitoring & mapping conservation ag practices (OpTIS)

N-Gage: development of a validation tool (using OpTIS data) for water quality trading programs within the MRB



CTIC: The Mission



CTIC connects, champions and provides information on sustainable agricultural systems and technologies that are productive, profitable and preserve natural resources.



CTIC: What We Do

Formed in 1982 as a public-private partnership involving NACD and several major ag companies & organizations

Historically known primarily as the source of US conservation tillage data (see next slide)

Now leading major soil and water conservation projects funded primarily by EPA and USDA/ARS

In August, CTIC will be hosting its 12th annual *Conservation in Action* tour, this year in the Des Moines area, showcasing WQ BMPs



CRM Survey Tillage Data

**Crop Residue Management (CRM) survey,
conducted with USDA-NRCS from 1989 to 2004
(covering most ag states)**

**Estimated crop residue and
tillage at the county scale**

**Tedious transect method of
data collection eventually
became unsustainable**

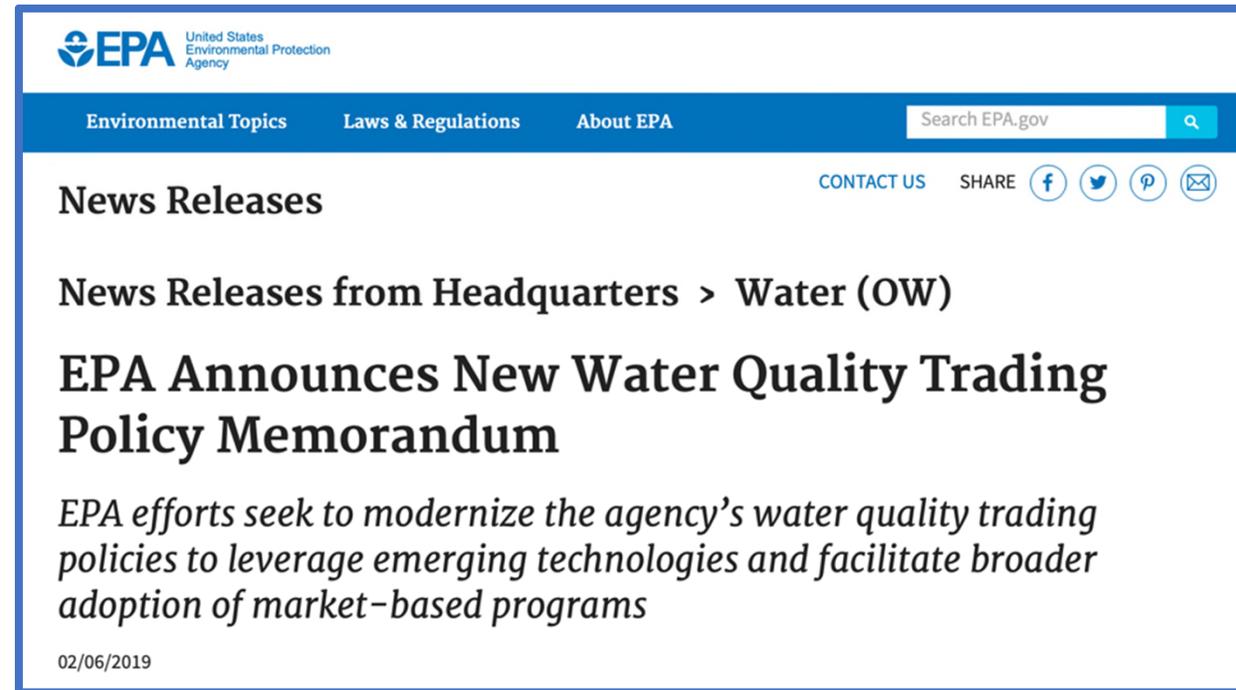
Available at www.ctic.org



New EPA WQ Trading Policy

Encourages use of local water quality trading market approaches

Such approaches will require a cost-effective method for validating the adoption of agricultural conservation practices

A screenshot of the EPA website's News Releases section. The header includes the EPA logo and navigation links for Environmental Topics, Laws & Regulations, and About EPA. A search bar is visible on the right. The main content area shows a breadcrumb trail: News Releases from Headquarters > Water (OW). The headline is "EPA Announces New Water Quality Trading Policy Memorandum". Below the headline is a summary: "EPA efforts seek to modernize the agency's water quality trading policies to leverage emerging technologies and facilitate broader adoption of market-based programs". The date "02/06/2019" is displayed at the bottom left of the article preview.

EPA United States Environmental Protection Agency

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News Releases from Headquarters > Water (OW)

EPA Announces New Water Quality Trading Policy Memorandum

EPA efforts seek to modernize the agency's water quality trading policies to leverage emerging technologies and facilitate broader adoption of market-based programs

02/06/2019

New Ecosystem Services Market Consortium (ESMC)

Includes ADM, Bunge, Cargill, General Mills, Indigo Agriculture, Mars, McDonald's, Noble Research Institute, Soil Health Institute, and The Nature Conservancy



Science-based tools to track ag improvements in soil health, GHG, water quality, and water use

OpTIS: What is it?

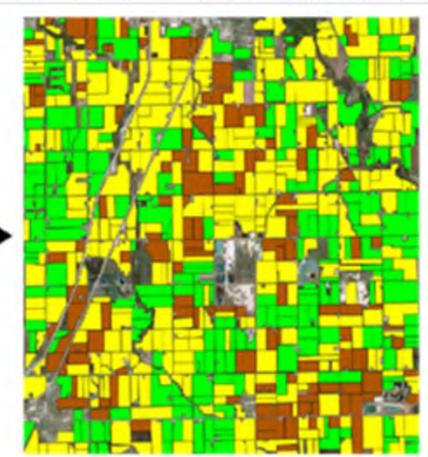
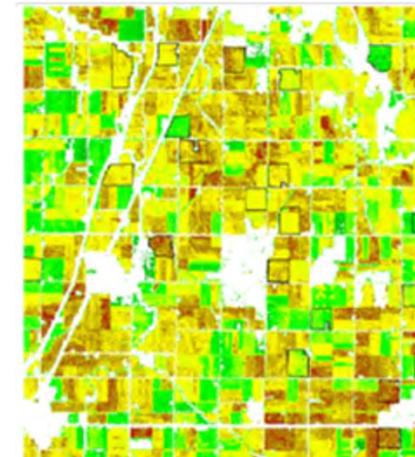
Technology from Applied GeoSolutions

Uses publicly-available remote sensing data to map & monitor adoption of tillage practices and cover crops

Unlike CRM, OpTIS data are “longitudinal,” making multi-year products possible (e.g. include crop rotation overlays)

Calculations at field-scale (30 m), but released only at HUC8 and CRD geographic scales (grower privacy fully respected)

Data available at www.ctic.org

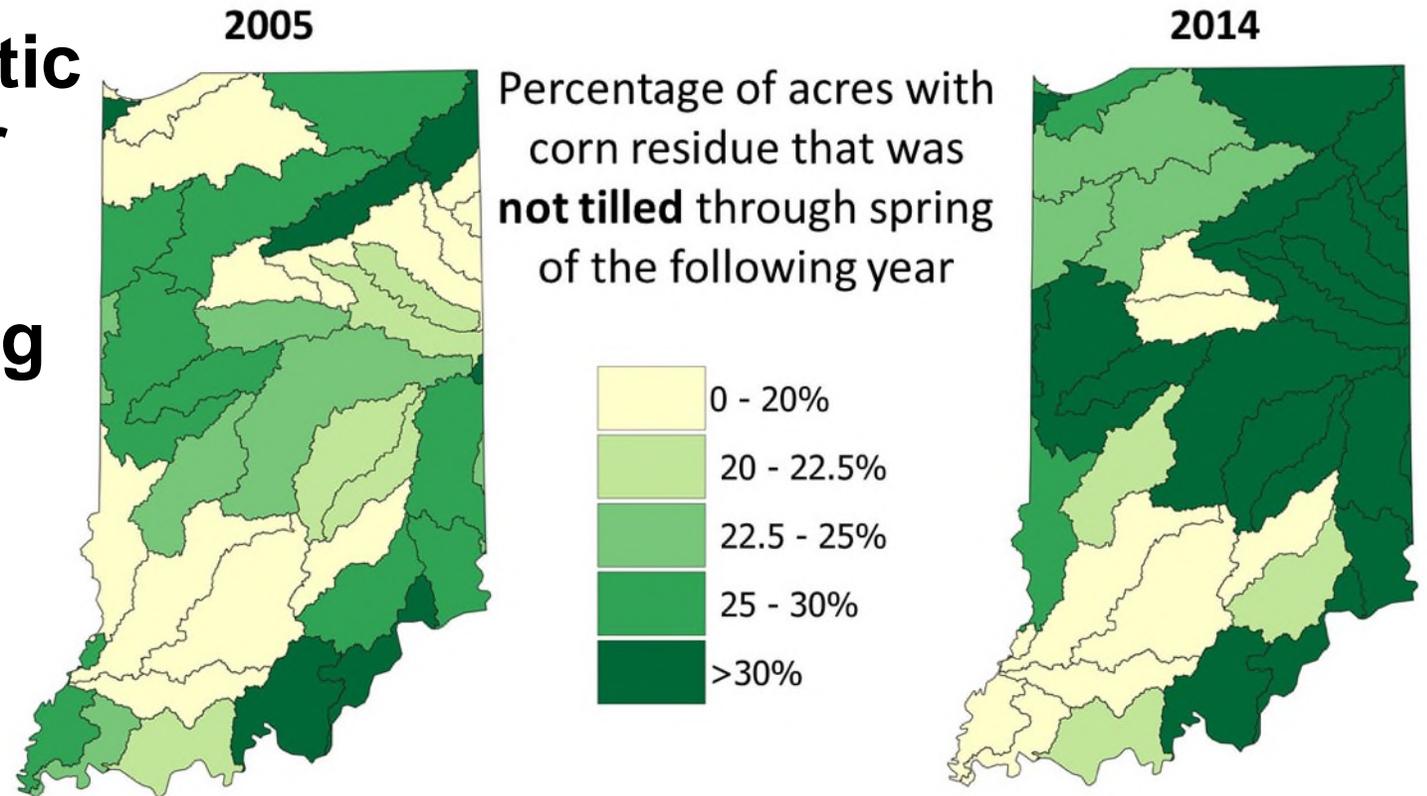


OpTIS: Indiana Pilot

Verified OpTIS automatic processing method for an important ag state

“Ground-truthed” using 10 years of CRM-style tillage-transect data (2005-2014)

Report available at www.optis.ags.io



OpTIS: Possible Applications

Measure **Soil Health** baselines and trends

Input to **Water Quality** models (local and basin-scale)

Input to Biogeochemical models (e.g. DayCent, DNDC, etc.) to estimate **GHG** emissions, **Nitrate** losses to water, and changes in **Soil Carbon**

Targeting **Conservation** efforts

Provide validation data for **Ecosystem Services Markets**

And many others ... (e.g. **Biodiversity**, etc.)

N-Gage: Achieving Mississippi River Basin Conservation Goals

Leverage OpTIS data as a validation tool for supporting local-scale water quality trading programs in the MRB

Unique linkage of OpTIS data to SWAT model representations of watersheds of interest

Nutrient application rates estimated based on publicly-available data on cropping patterns and crop yields

Accuracy will be assessed using relevant WQ data

Six-month effort, planned project launch is April 2019 (to coincide with OpTIS Phase 1 data release)



N-Gage: Key Outcome

Once this validation tool is available, it will be a key enabling technology for the development of self-sustaining, local-scale, market-based approaches for improving water quality throughout the MRB – and eventually beyond



How to learn more

www.ctic.org

contact on *N-Gage* & OpTIS:

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Backup Slides

CTIC Staff

CTIC Board of Directors

OpTIS: Anticipation is Building

CTIC: Who We Are



Crystal Hatfield
Operations Director



Mike Smith
Project Director



Sue Tull
Project Manager



Dave Gustafson
Executive Director



Hans Kok
Project Director



Steve Werblow
Communications Director

Full-Time Staff

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Mark White, Syngenta (Treasurer)

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Dave Gustafson, CTIC Interim ED
Jeremy Peters, NACD ED

Board Member Emeritus
Dick Foell



OpTIS: Anticipation is Building

Stakeholder feedback collected at Soil Health Summit side-event (Jan 15 in St. Louis) co-organized with TNC and AGS

State of Oklahoma (Feb 11) and US Dairy (Feb 15) both reached out and expressed interest in collaborating during recent calls

C-AGG and Iowa 4R's-Plus have both recently requested OpTIS presentations (during early April)

Additional parties have now also reached out, State of Minnesota, USDA/NRCS, etc.

Presentation at next Hypoxia Task Force meeting (May 16)

