Landscape Design Implications of BT16 Volume 2

Presented at:
Bioeconomy 2017: Domestic Resources for a Vibrant Future
Breakout Session 3-A
"*Understanding the Environmental Potential of a Billion Ton Bioeconomy*"
July 12, 2017

Douglas L. Karlen
USDA-ARS
National Laboratory for Agriculture & the Environment
Ames, IA

How BT16 Vol. 2 Supports Landscape Design

Data shows how land-use and land-management decisions (*i.e.*, landscape design) affect feedstock supply and environmental outcomes

Shows that with appropriate landscape design, a vibrant, environmentally friendly bio-economy can be developed

Helps identify research gaps and needs at local, regional, national and global scales

Volume 2 and the accompanying Knowledge Discovery Framework (KDF) can assist stakeholders in identifying beneficial biomass production opportunities

BT16 Recognizes Nature's Pillars for Landscape Design

Diversity –

- Efficient nutrient cycling
- Multiple C sequestration pathways
- Filtering and buffering
- Wildlife food and habitat
- Soil Protection and enhancement
- Economic opportunities for humankind

Enhanced Soil Health – physical, biological, & chemical

Unimpaired Water Quality and Quantity

One Approach for Landscape Design

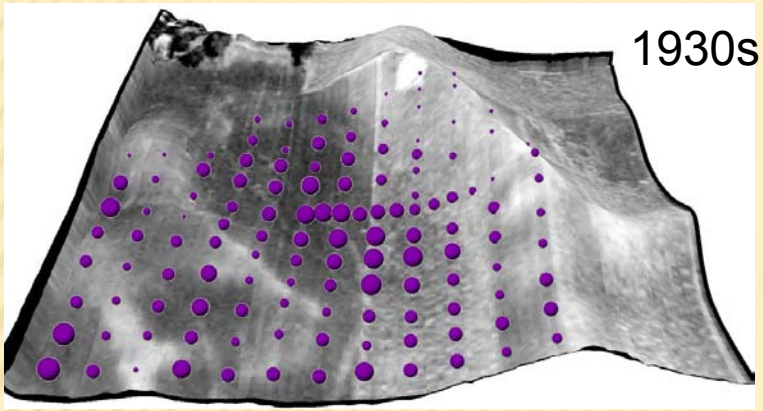
Characterize your target landscape

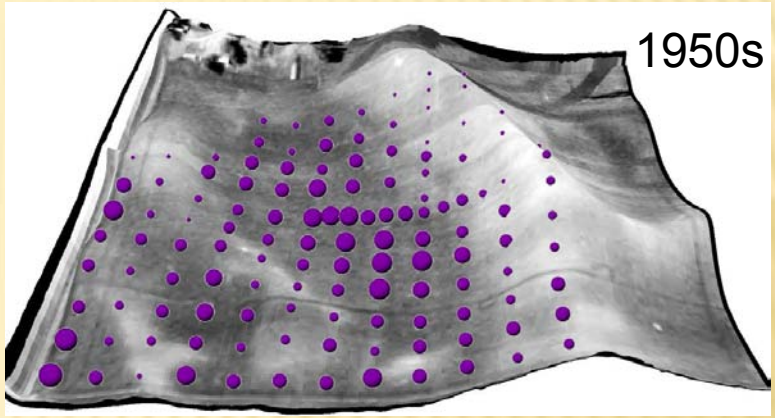
Use BT16 Vol. 2 scenarios as conceptual models to redesign your target landscape

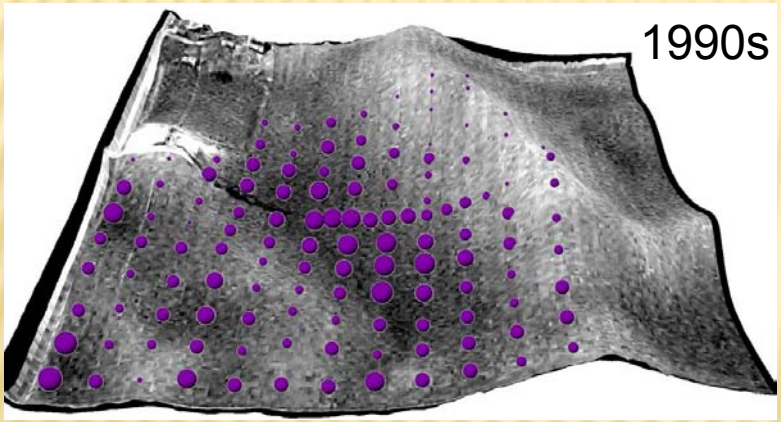
Use BT16 Vol. 2 data as input for simulation models to project landscape design effects

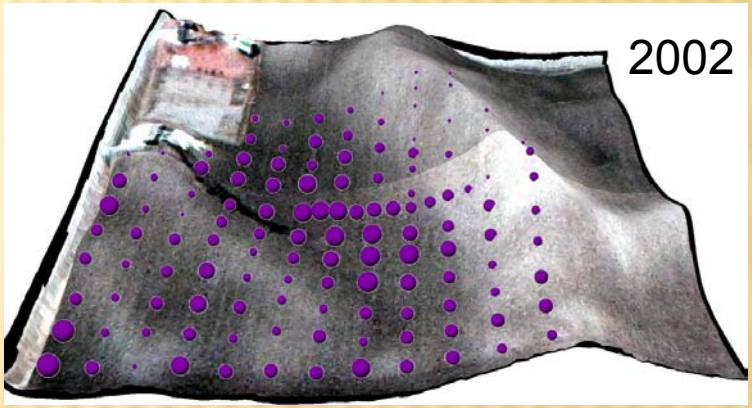
Implement a new landscape design and compare BT16 Vol. 2 data to measured responses

Landscape Design Addresses Long-Term Change









CS_137_M2

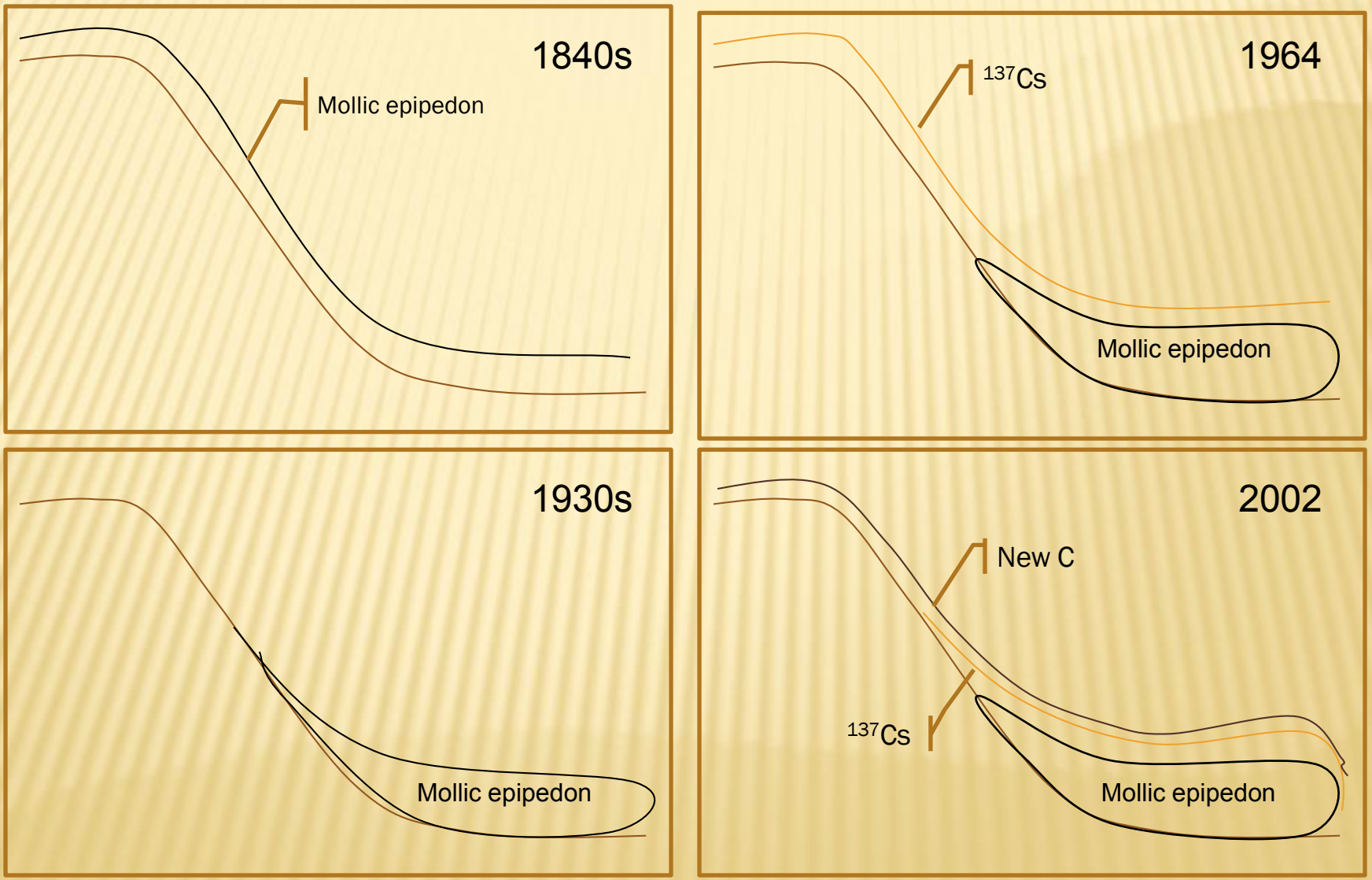
- 731 - 1200
- 1201 - 2000
- 2001 - 3000
- 3001 - 40000
- 40001 - 5890

Z axis 15 x elevation

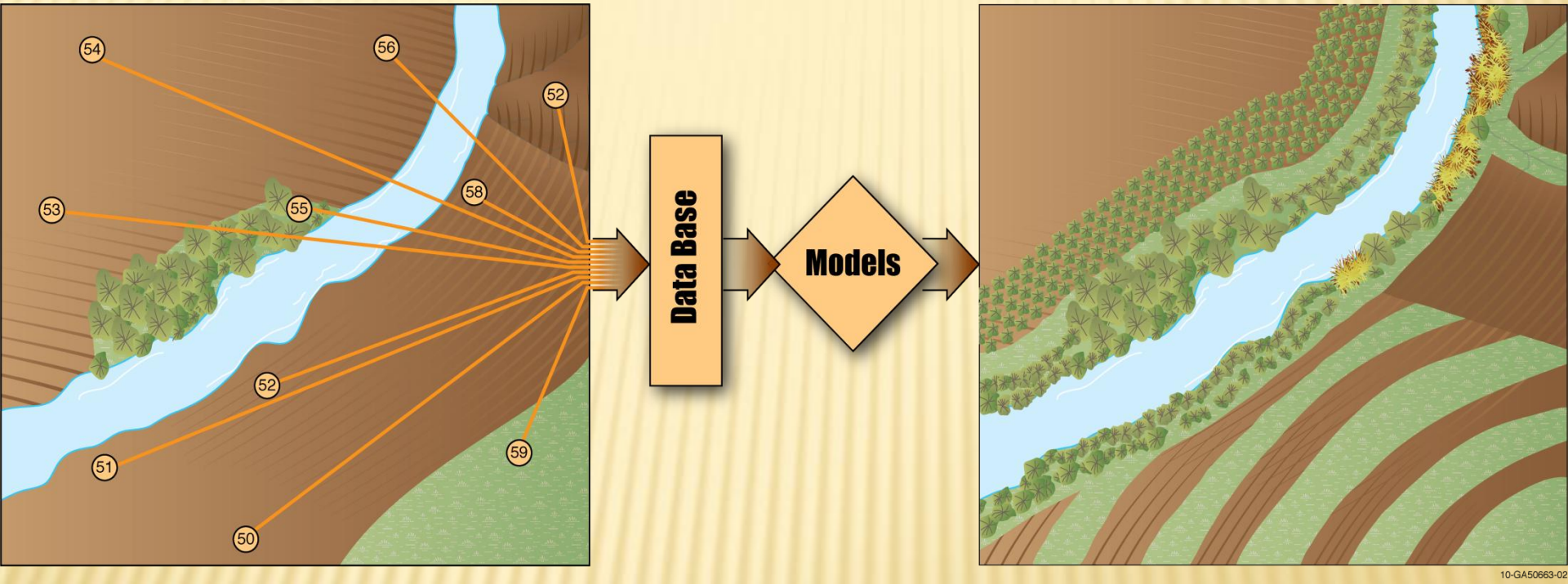
Meters

0 20 40 80 120 160

Long-Term Change Reflects Topsoil Erosion



Landscape Design Proposed to DOE in 2010



- Utilizing existing USDA-NRCS Conservation Stewardship Program (CSP), Environmental Quality Incentive Program (EQIP), and USDA-FAS Biomass Crop Assistance Program (BCAP) programs to create a more diversified, ecosystem friendly landscape

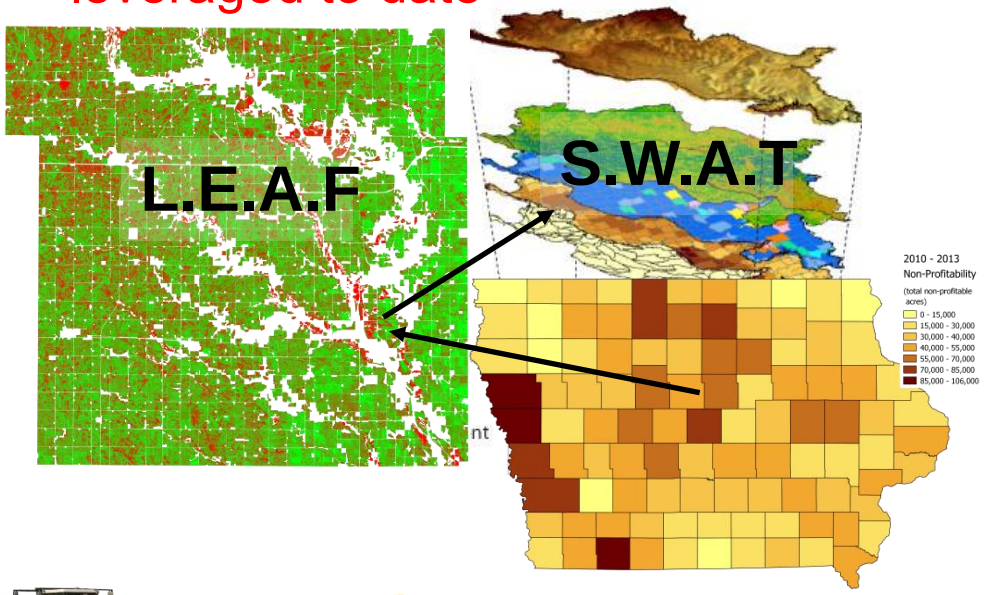
Landscape Design for Sustainable Bioenergy Systems

Goal Statement:

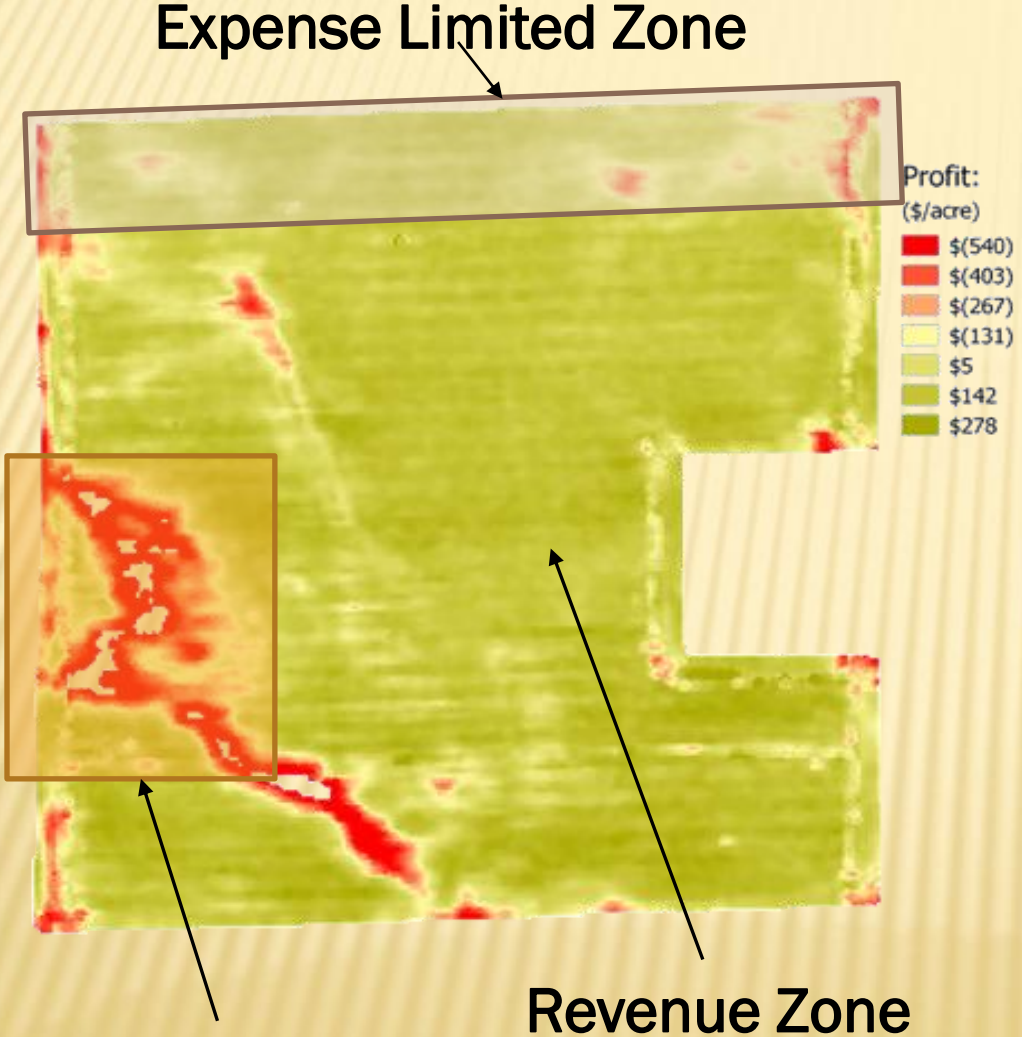
The team will work with growers and biomass end-users to utilize subfield agronomic models to target areas within existing cellulosic ethanol feedstock supply sheds to build baseline datasets, implement conservation practices, monitor key environmental indicators, and monitor the environmental and economic impacts to the watersheds and the biomass supply chain. (to enable future biomass supply systems)

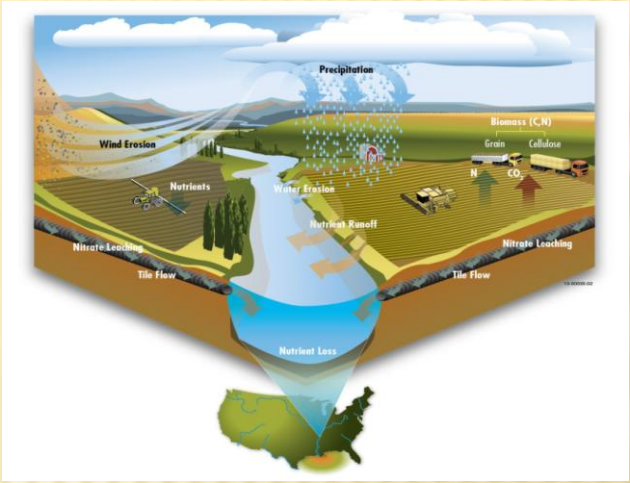
Total Project Budget	$12,000,000
DOE Funds Awarded	$9,000,000
Applicant Cost Share	$3,000,000

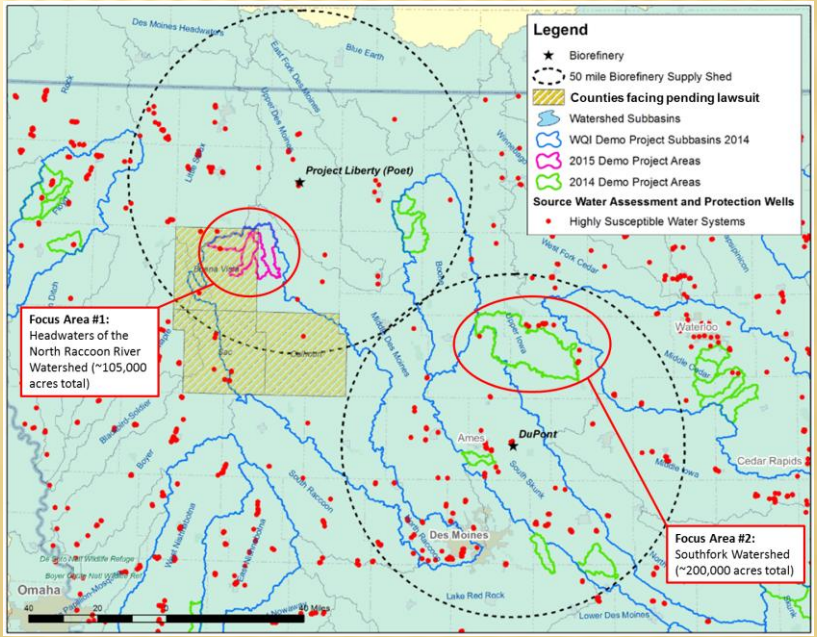
$12.25 million additional leveraged to date



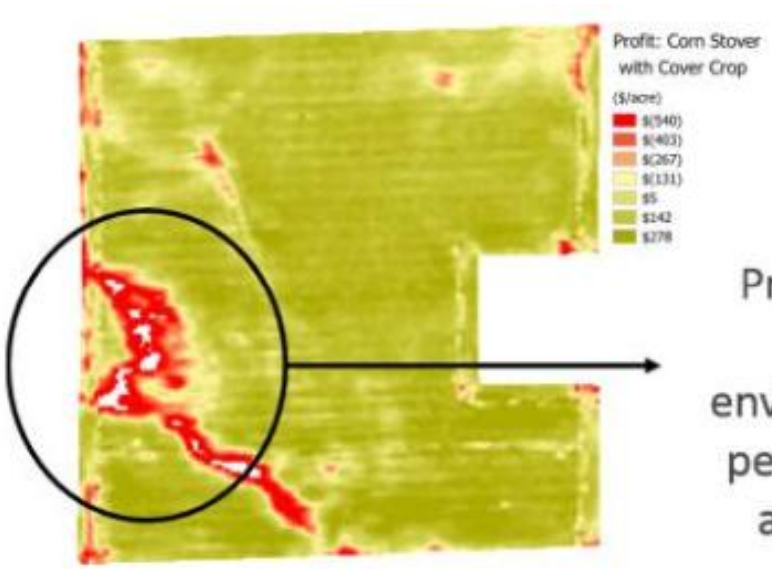
BT16 Vol 2 Helped Justify Funding



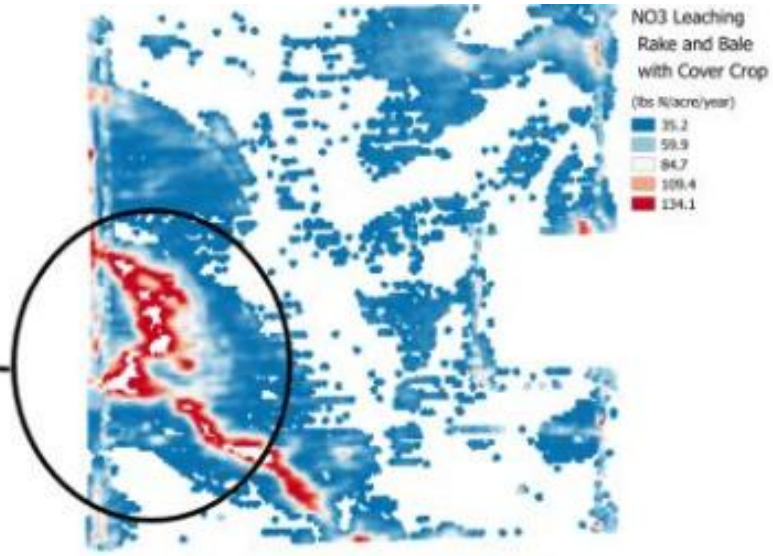




Approach (Technical)

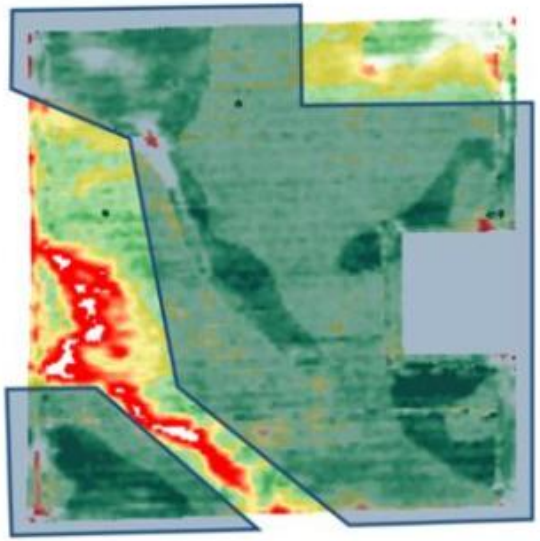


Profitability and environmental performance are linked

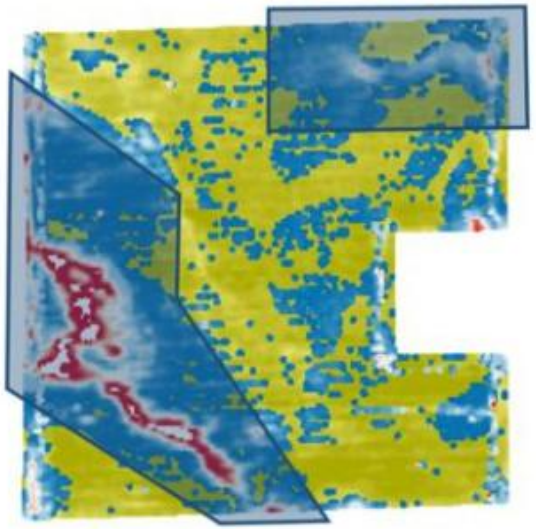


- Changing management practices to improve profitability, environmental performance, and biomass supplies

Stover Removal Management Zones



NO3 Leaching Mitigation Management Zones



CP-38 Pheasant Recovery Participant Promotion

Antares Group and install partner FDC Enterprises, Inc. in cooperation with the local SWCD, FSA and NRCS are seeking landowners enrolled in the CP-38 Pheasant Recovery program to participate in a landscape design project funded by the US Department of Energy. An objective of the project is to assess the potential biomass yield that could be produced in the area and the environmental benefits of CRP establishment practices. Participants will receive numerous incentives described below.

Participant Incentives:

- **Full establishment of your CRP practice free of charge. The team will pay for the portion of your project not covered by FSA's cost share and practice incentive payments. All seed, chemical and establishment will be arranged for you.**
- **Establishment of your CRP practice by a company with over 270,000 acres of CRP establishment experience.**
- **Optional whole farm profitability assessment with Agsolver.**
- **Optional financial and technical assistance for additional projects such as buffer strips and saturated buffers.**
- **Optional payments for harvest of 1/3 the native mix, in nesting cover portion only, of CRP practice in years 4, 5 and 6. Harvest of winter cover is not authorized.**

Contract Terms:

- 5 year assessment of CRP establishment. The team will periodically take measurements related to soil erosion, water quality and wildlife benefits.
- Information gathered on your CRP planting will remain anonymous.
- All results will be shared with cooperator.
- Cooperator to abide by all rules of CRP program.

SIGN UP PERIOD:
DEC 15th - SEPT 30th

To learn more about the landscape design project and participation in the program contact us at:
712-253-6628
515-313-0080
tom@fdcenterprises.com

ANTARES Group Incorporated

FDC Enterprises, Inc.
www.fdcenterprises.com

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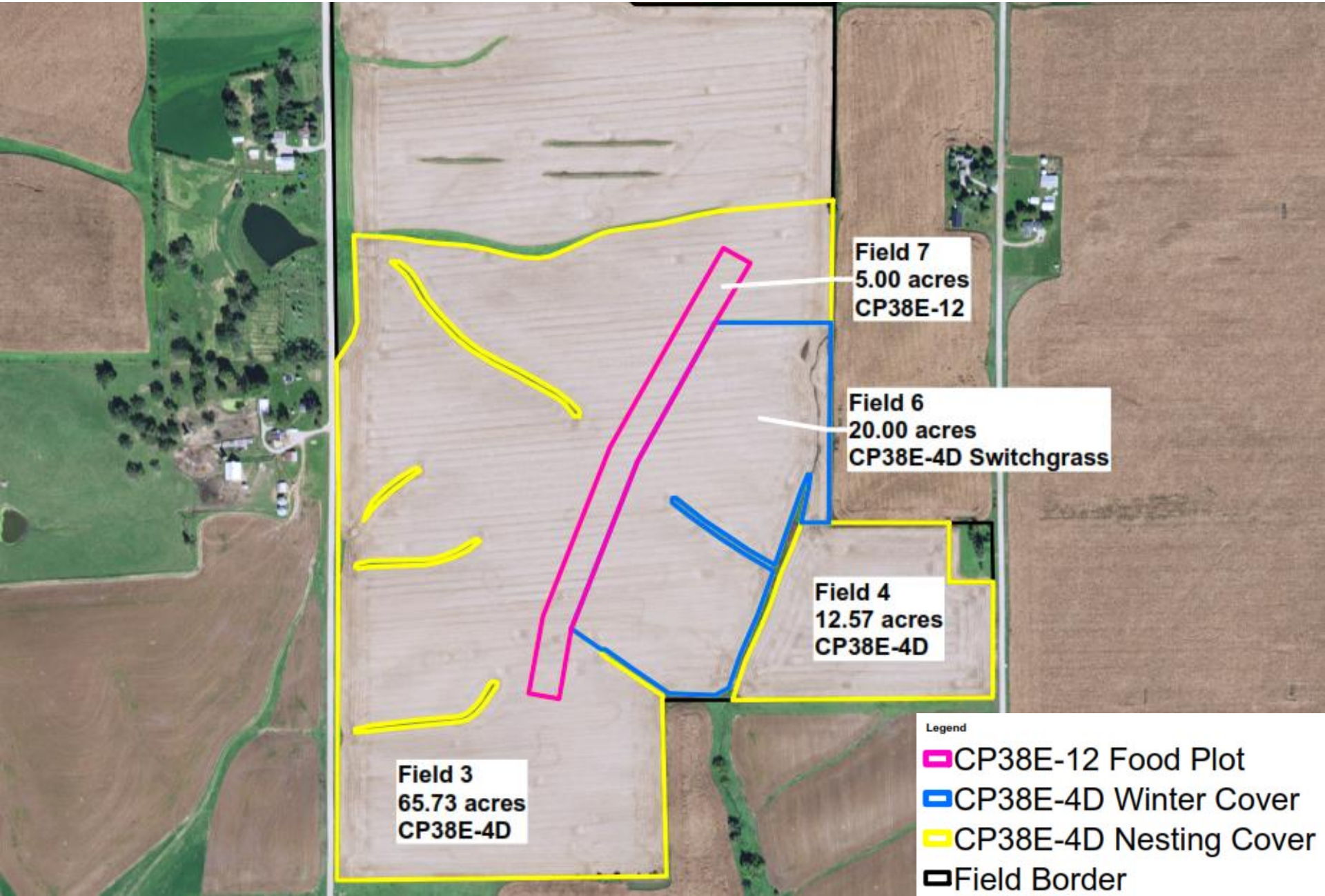
CP-38 Field Plan Example (Row Crop)



Feedstock Logistics – A Landscape Design Component

ANTARES Group Incorporated

FDC Enterprises Grasslands Services

OAK RIDGE National Laboratory

STATE

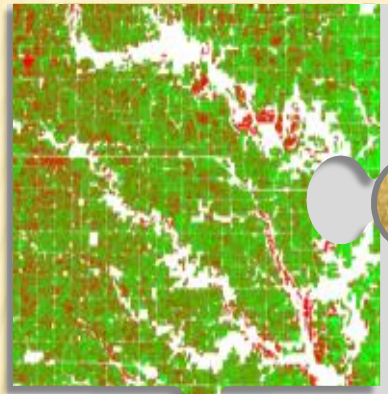
INL Idaho National Laboratory

PacificAg

BT16 Vol. 2 Helps Combine the Pieces

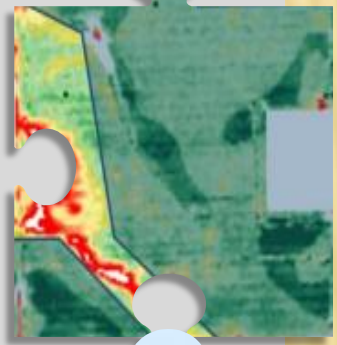
Advanced Harvest & Logistics, 2nd Pass

Regional Impact Modeling & Monitoring



Perennial Grass for Conservation & Biomass Supply

Implementation of Conservation Practices (Cover Crops, Buffer Strips, etc.)



Subfield Precision Business Planning

Advanced Harvest & Logistics, Single Pass

Sustainable Residue Harvest

Multi-stakeholder Outreach

The Ultimate Goal: Healthy Soils → Healthy Landscapes → Vibrant Bio-Economies