National Soil Tilth Lab Carbon Research

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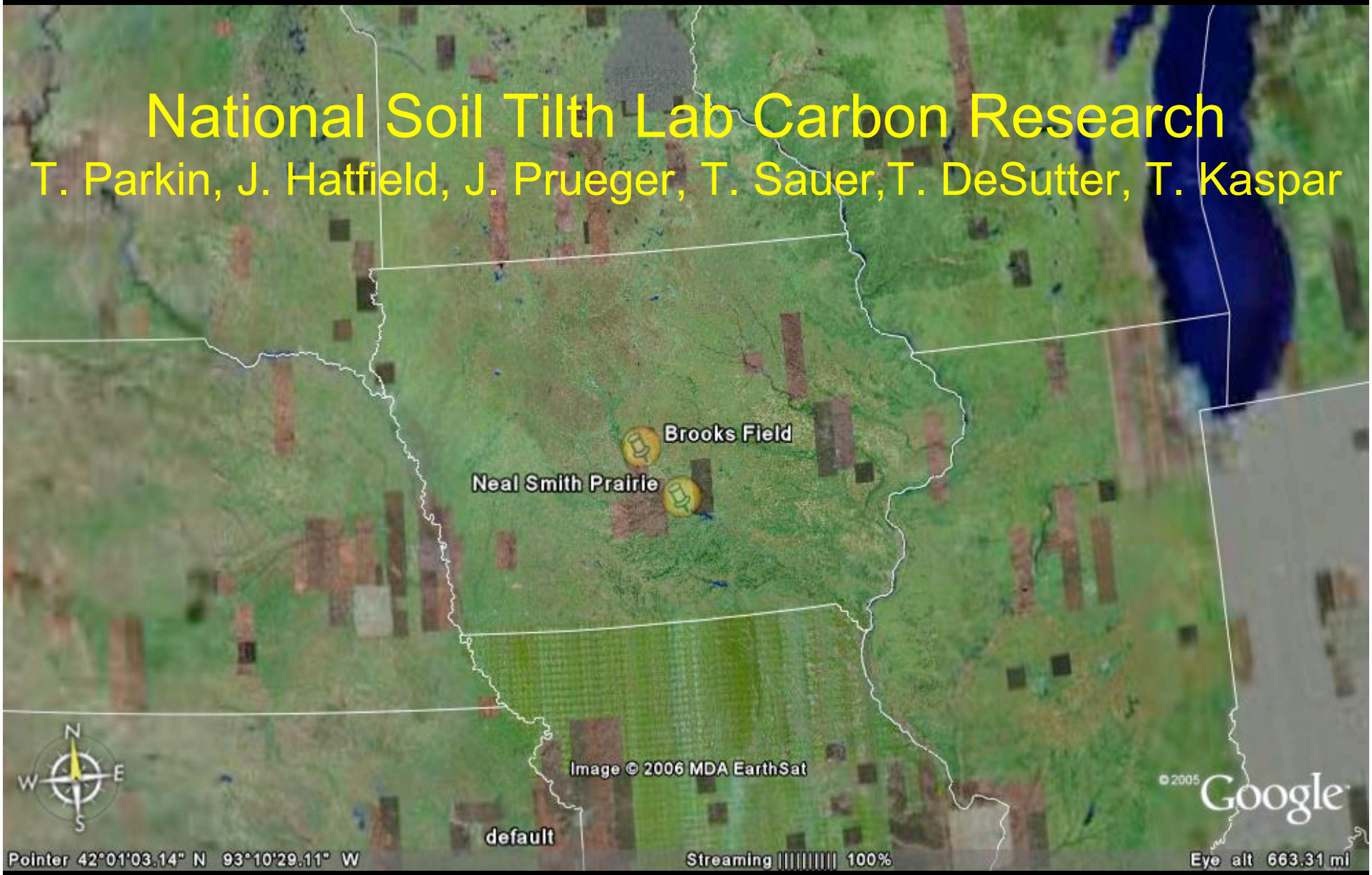


Brooks Field

Eddy Covariance

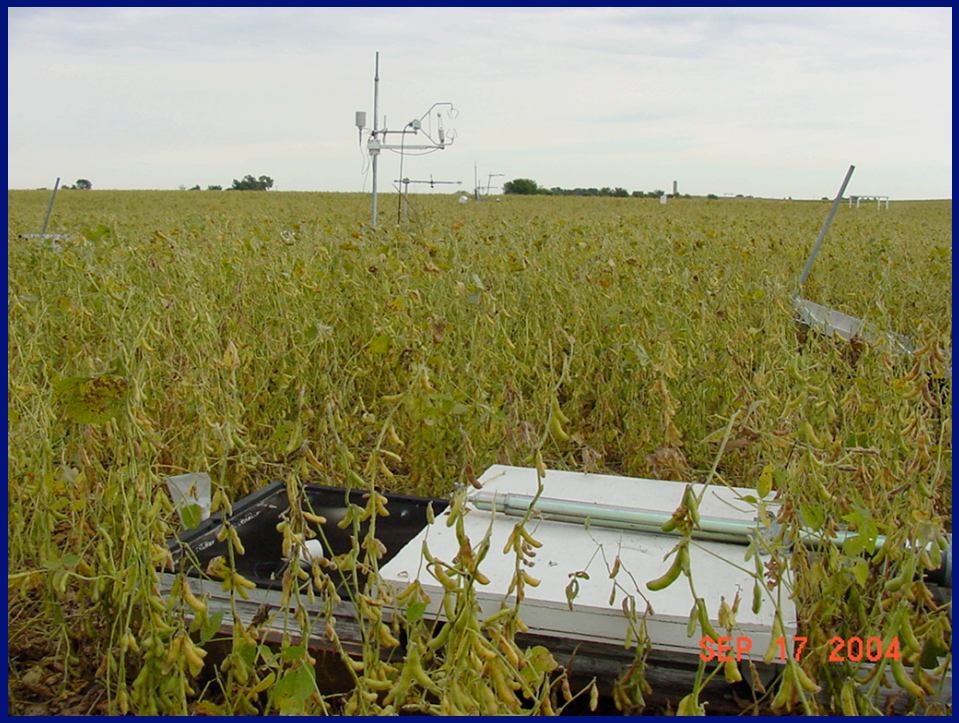
-Continuous since 2001
-Annual NEE
-Growing Season net C flux
-Fallow Season net C flux

Soil Respiration

-Gross Productivity
-Automated Chambers
-Closed Chambers
-Soil Gradient Diffusion

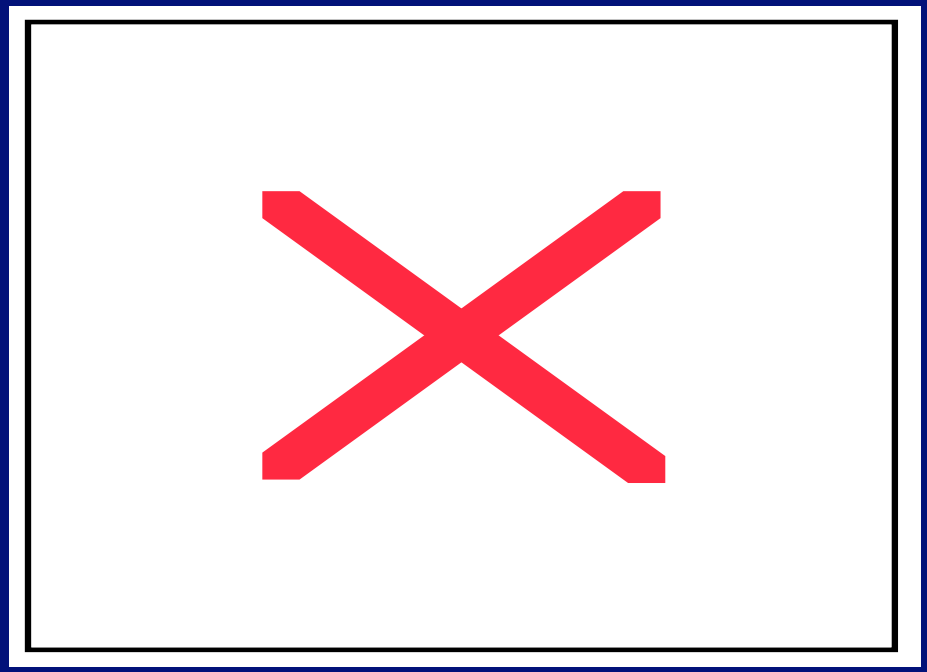
Automated Chambers

-Open, vented design
-Corn and Soybeans
-Planted and Fallow Areas
-Hourly Fluxes



Closed Chambers

-Methods comparisons
-Landscape Patterns
-Management effects



Soil CO_2 Gradient

-Buried Teflon tubing

-Hourly Concentrations (surface, 2 cm, 10 cm, 18 cm)

-Diffusion coefficients

-Gas wells

Canopy Dynamics

-CO_2 and H_2O Gradients

-Diurnal dynamics

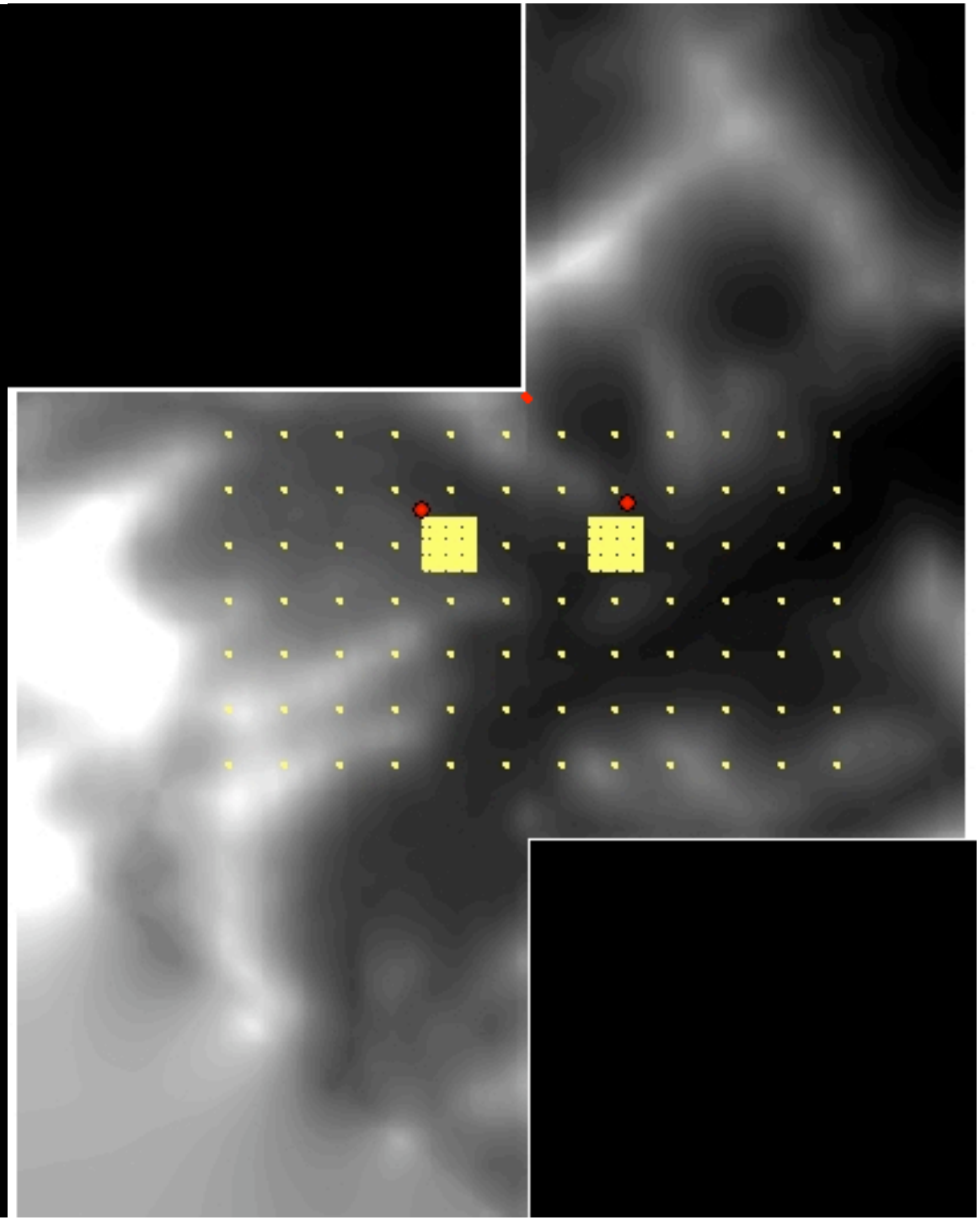
-Soil CO_2 Partitioning

Biomass Sampling

-Weekly leaf area index
-Sampling at Harvest
-Above ground biomass
-Roots to 60 cm

Soil Sampling

-Spring 2005
-Coarse Grid (50 m)
-Fine Grid (5 m)
-Sampling to 1.2 m
-Total C, N



Residue Decomposition

-Corn and Soybeans
-Leaves, Stems, Cobs, Roots
-Buried Litter Bags
-Two Landscape Positions
-Incubation Times 0.5 – 3 y
-Weight, Total C, N

USDA-ARS GRACEnet

(Greenhouse Gas Reduction through Agricultural Carbon Enhancement)

Goal

…develop and evaluate management practices that increase soil C and decrease net greenhouse gas emissions

Management Systems

- Tillage (Chisel Plow / No Till
- Fertility (Timing / Inhibitors / Manure)
- Rotations / Cover Crops

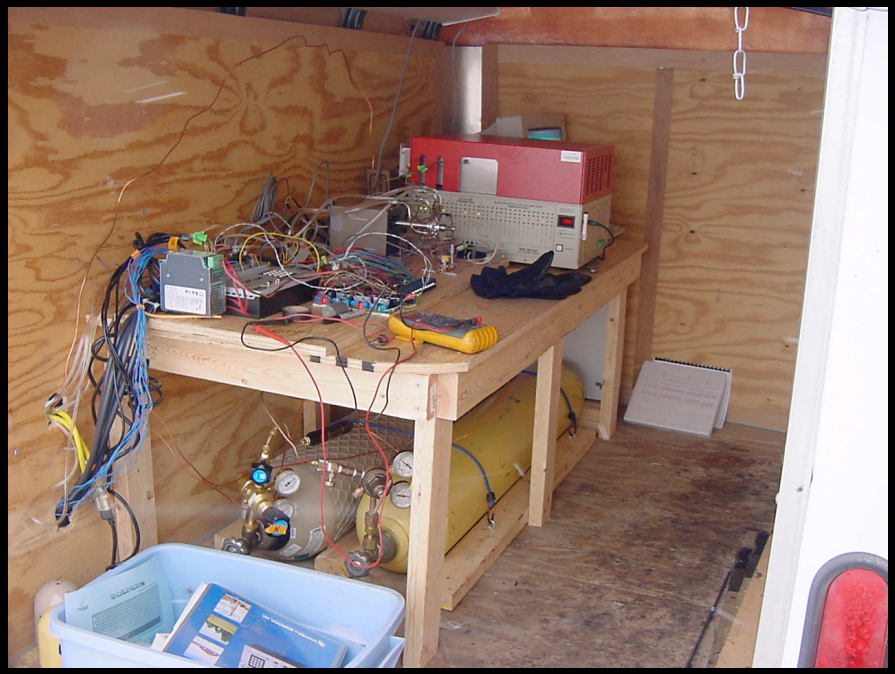
Measurements

- Trace Gas Flux (CH_4, N_2O) - soil chambers (Relaxed Eddy – June ’06)
- Soil
- Plant
- Weather
- Climate

(Protocols: www.usda. gracent.gov)

Automated Chamber Trace Gas Flux

-Deployed Feb, 2006

-N_2O and CH_4 flux

-Fluxes every 6 h