# Field Data Collection Utilizing iPADs on the USDA's June Area Survey

**G**eographic **I**nformation **R**unning **A**rea **F**rame **F**orms **E**lectronically

National Agricultural Statistics Service

Presented by: Michael Gerling

# Overview of June Area Survey

- Annual survey that provides data on U.S. crops, livestock, grain storage capacity, and type and size of farm.
- Comprised of designated land areas (segments). Each segment is about 640 acres (1 square mile).
- 11,000 segments surveyed across the U.S.

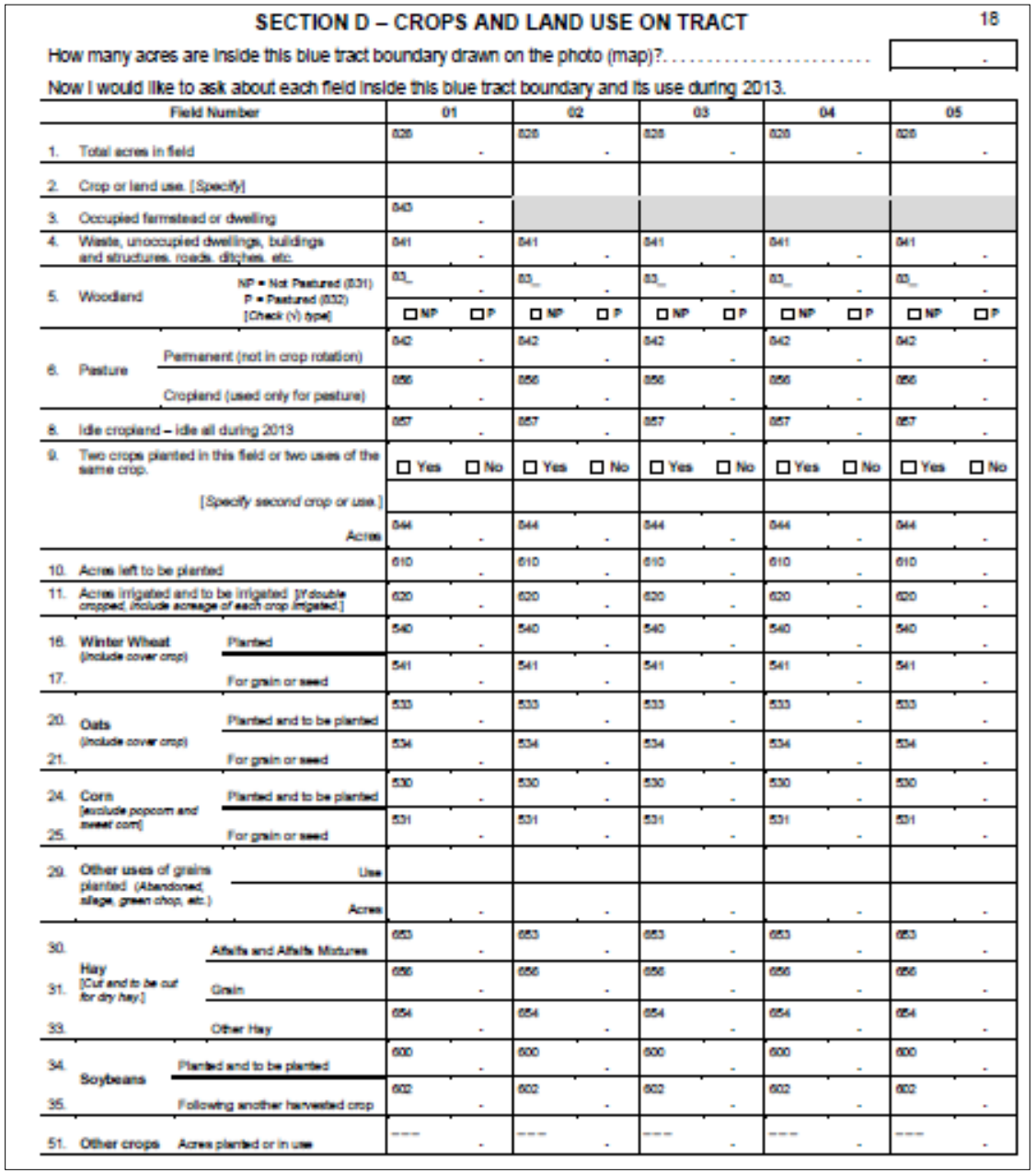
# Overview of June Area Survey

- Using a provided aerial photo, the interviewer divides segment into tracts representing unique land operating arrangements.
- Interviewers screen for whether tract is part of a farm and collect crop and livestock information for each tract.
- 42,000 Agricultural Tracts.
- Paper questionnaire used to record data.

**Current Paper Version**
**24 or more pages.**

Shows one of two pages used to collect tract and field level information.

**Basically, lots of rows and columns.**



## SECTION D – CROPS AND LAND USE ON TRACT

18

How many acres are inside this blue tract boundary drawn on the photo (map)? .....

Now I would like to ask about each field inside this blue tract boundary and its use during 2013.

| Field Number | | 01 | 02 | 03 | 04 | 05 |
|---|---|---|---|---|---|---|
| 1. Total acres in field | | 026 . | 026 . | 026 . | 026 . | 026 . |
| 2. Crop or land use. [Specify] | | | | | | |
| 3. Occupied farmstead or dwelling | | 043 . | | | | |
| 4. Waste, unoccupied dwellings, buildings and structures, roads, ditches, etc. | | 041 . | 041 . | 041 . | 041 . | 041 . |
| 5. Woodland | NP = Not Pastured (031) P = Pastured (032) [Check (√) type] | 03_ . ☐ NP ☐ P | 03_ . ☐ NP ☐ P | 03_ . ☐ NP ☐ P | 03_ . ☐ NP ☐ P | 03_ . ☐ NP ☐ P |
| 6. Pasture | Permanent (not in crop rotation) | 042 . | 042 . | 042 . | 042 . | 042 . |
| | Cropland (used only for pasture) | 056 . | 056 . | 056 . | 056 . | 056 . |
| 8. Idle cropland – idle all during 2013 | | 057 . | 057 . | 057 . | 057 . | 057 . |
| 9. Two crops planted in this field or two uses of the same crop. | | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No | ☐ Yes ☐ No |
| | [Specify second crop or use.] | | | | | |
| | Acres | 044 . | 044 . | 044 . | 044 . | 044 . |
| 10. Acres left to be planted | | 010 . | 010 . | 010 . | 010 . | 010 . |
| 11. Acres irrigated and to be irrigated. [If double cropped, include acreage of each crop irrigated.] | | 020 . | 020 . | 020 . | 020 . | 020 . |
| 16. Winter Wheat (include cover crop) | Planted | 040 . | 040 . | 040 . | 040 . | 040 . |
| 17. | For grain or seed | 041 . | 041 . | 041 . | 041 . | 041 . |
| 20. Oats (include cover crop) | Planted and to be planted | 033 . | 033 . | 033 . | 033 . | 033 . |
| 21. | For grain or seed | 034 . | 034 . | 034 . | 034 . | 034 . |
| 24. Corn [exclude popcorn and sweet corn] | Planted and to be planted | 030 . | 030 . | 030 . | 030 . | 030 . |
| 25. | For grain or seed | 031 . | 031 . | 031 . | 031 . | 031 . |
| 29. Other uses of grains planted (Abandoned, silage, green chop, etc.) | Use | | | | | |
| | Acres | . | . | . | . | . |
| 30. Hay [Cut and to be cut for dry hay.] | Alfalfa and Alfalfa Mixtures | 053 . | 053 . | 053 . | 053 . | 053 . |
| 31. | Grain | 056 . | 056 . | 056 . | 056 . | 056 . |
| 33. | Other Hay | 054 . | 054 . | 054 . | 054 . | 054 . |
| 34. Soybeans | Planted and to be planted | 000 . | 000 . | 000 . | 000 . | 000 . |
| 35. | Following another harvested crop | 002 . | 002 . | 002 . | 002 . | 002 . |
| 51. Other crops | Acres planted or in use | --- . | --- . | --- . | --- . | --- . |

# Hybrid of the Thin Client CAPI Framework

Agricultural Operation

Field Interviewer (iPAD)

Wireless Broadband (3G/4G)

~~USDA-NASS~~

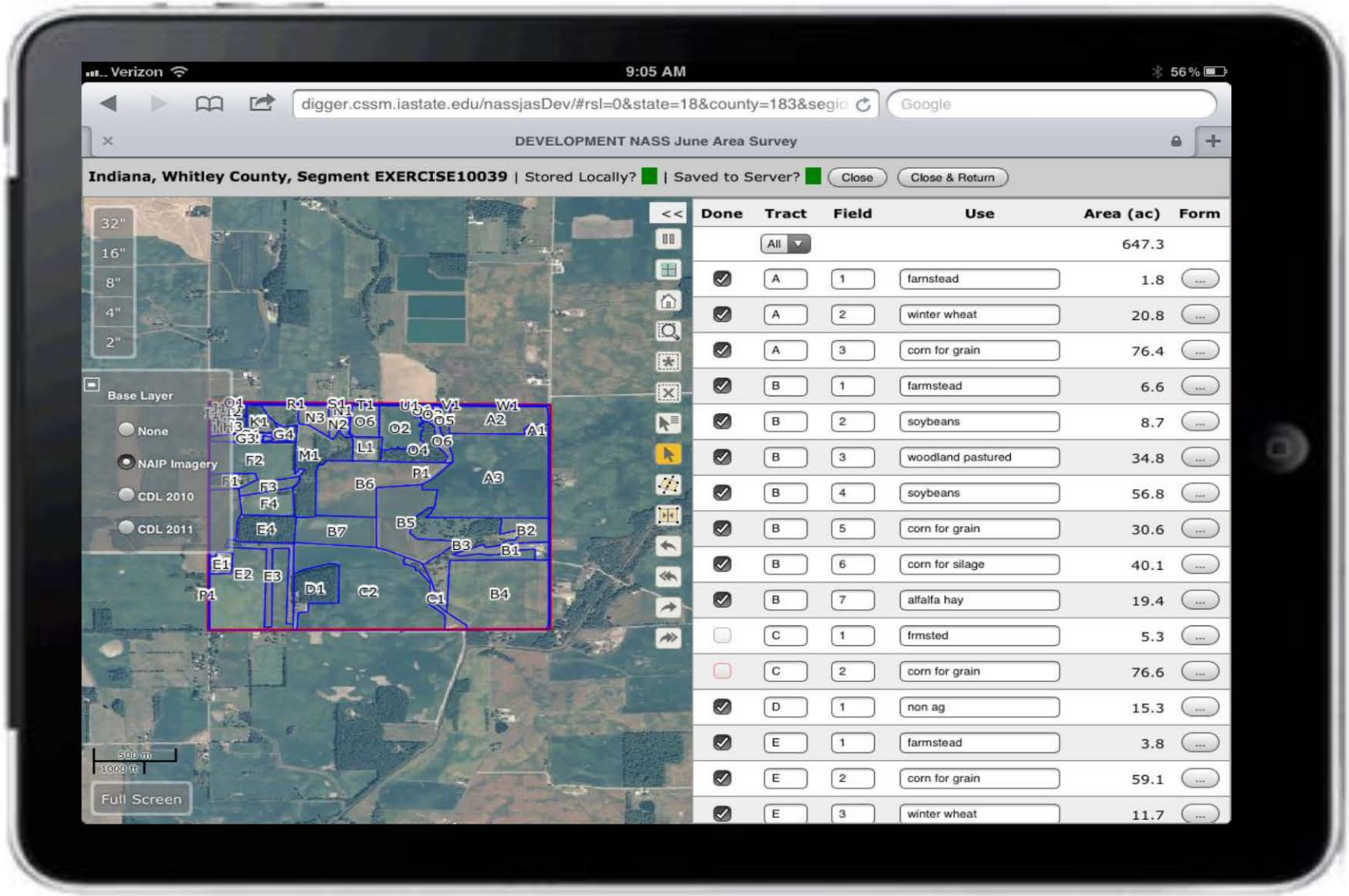
**Iowa State University**

Web Survey Site

Cell Tower

USDA - NASS Field Office

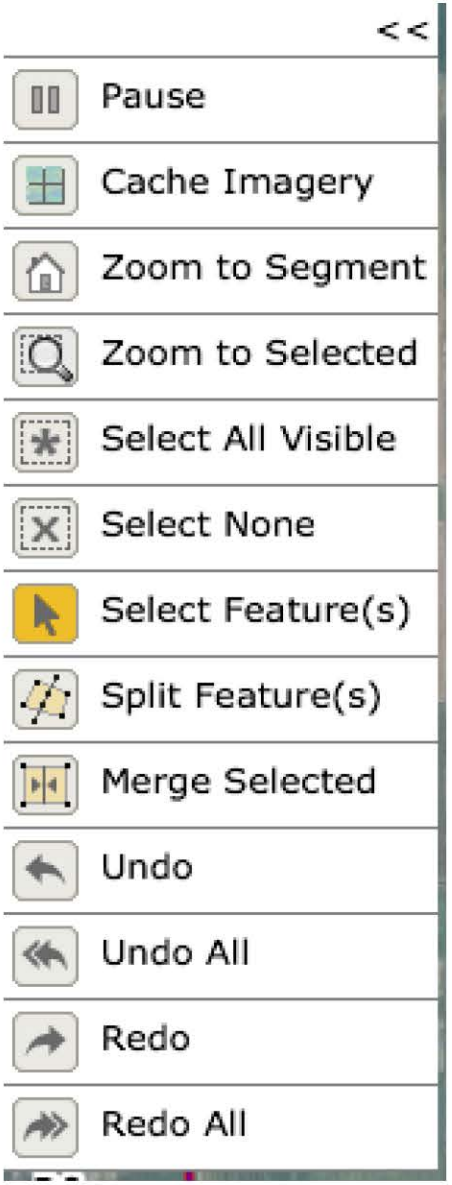
USDA




Powered by **Giraffe**

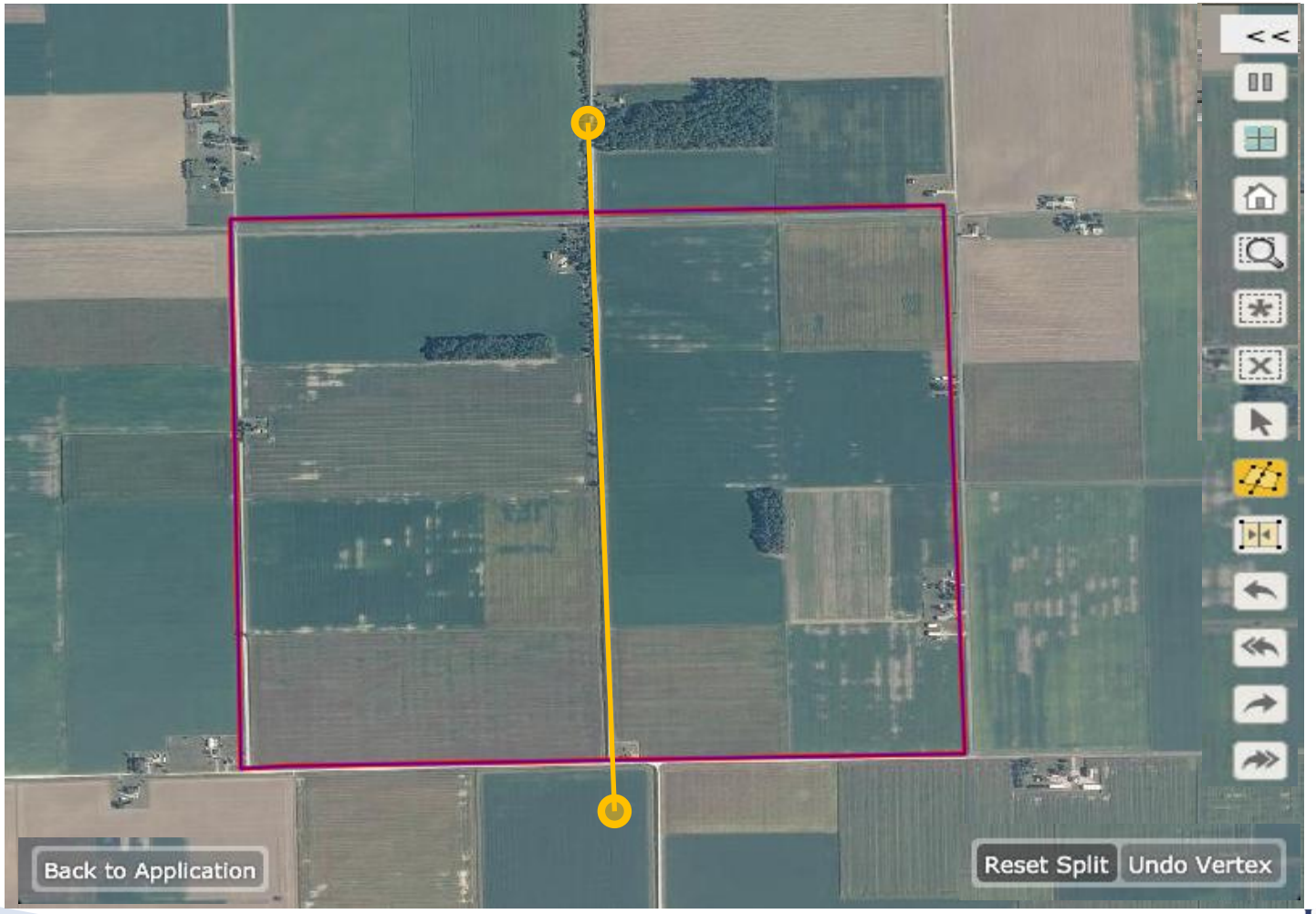
USDA

# Available Tools

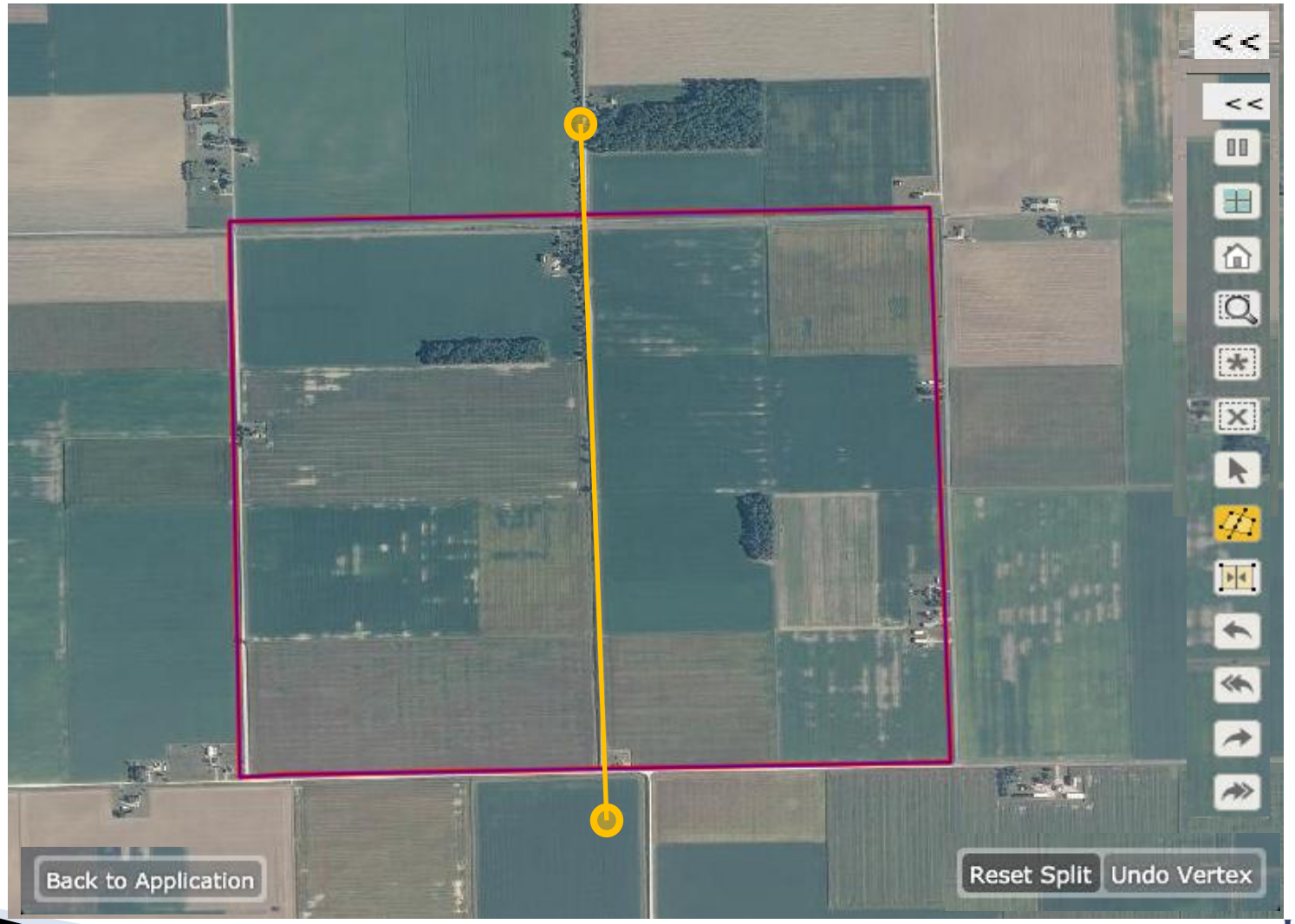



Select the Split Button tool.  Start a new line by tapping once outside of the red boundary and a yellow circle will appear.

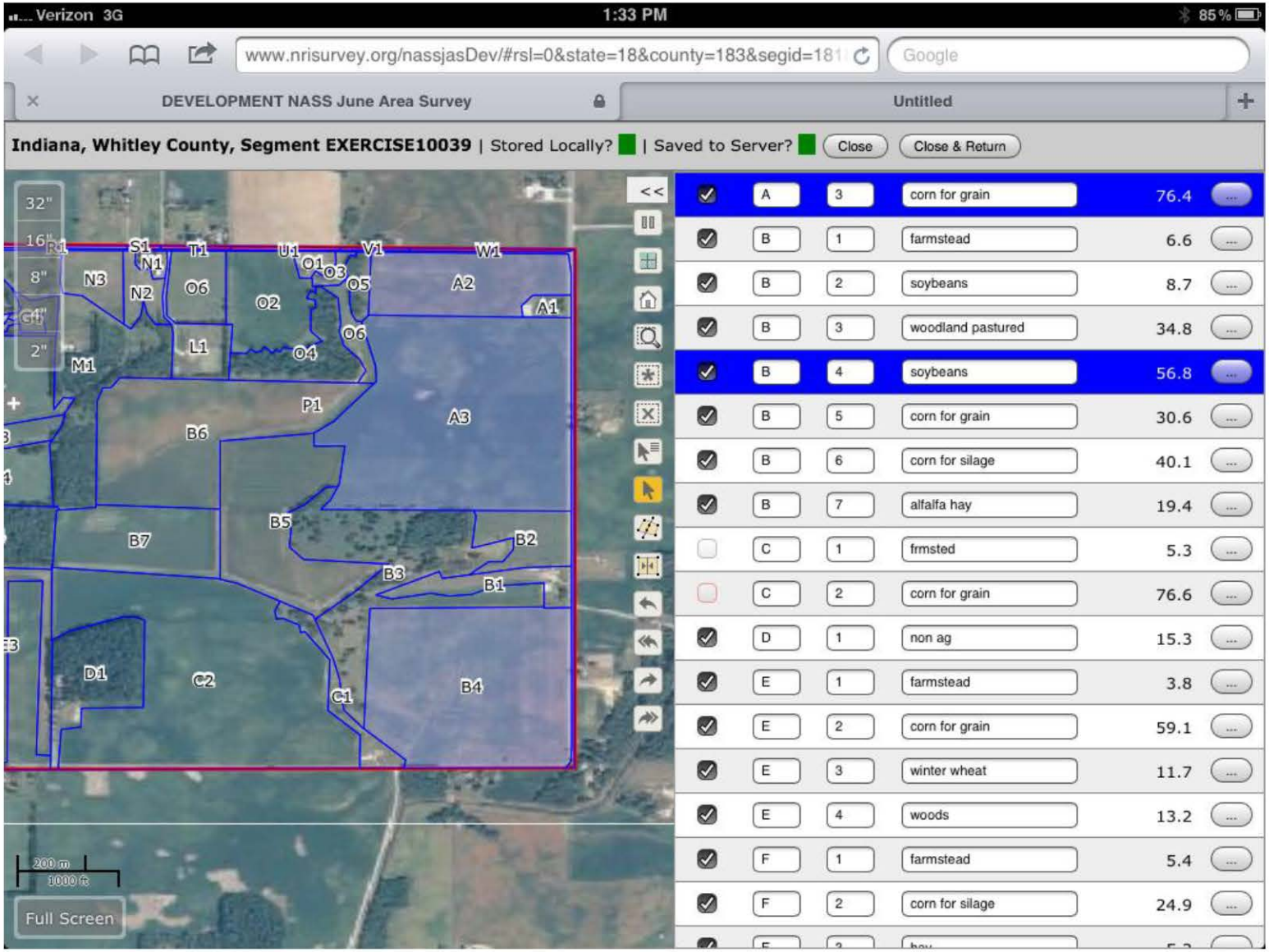
Drawing lines is NOT a dragging motion. Lift your finger and tap outside the bottom edge of the red boundary and another yellow circle will appear with a yellow line connecting the two circles.

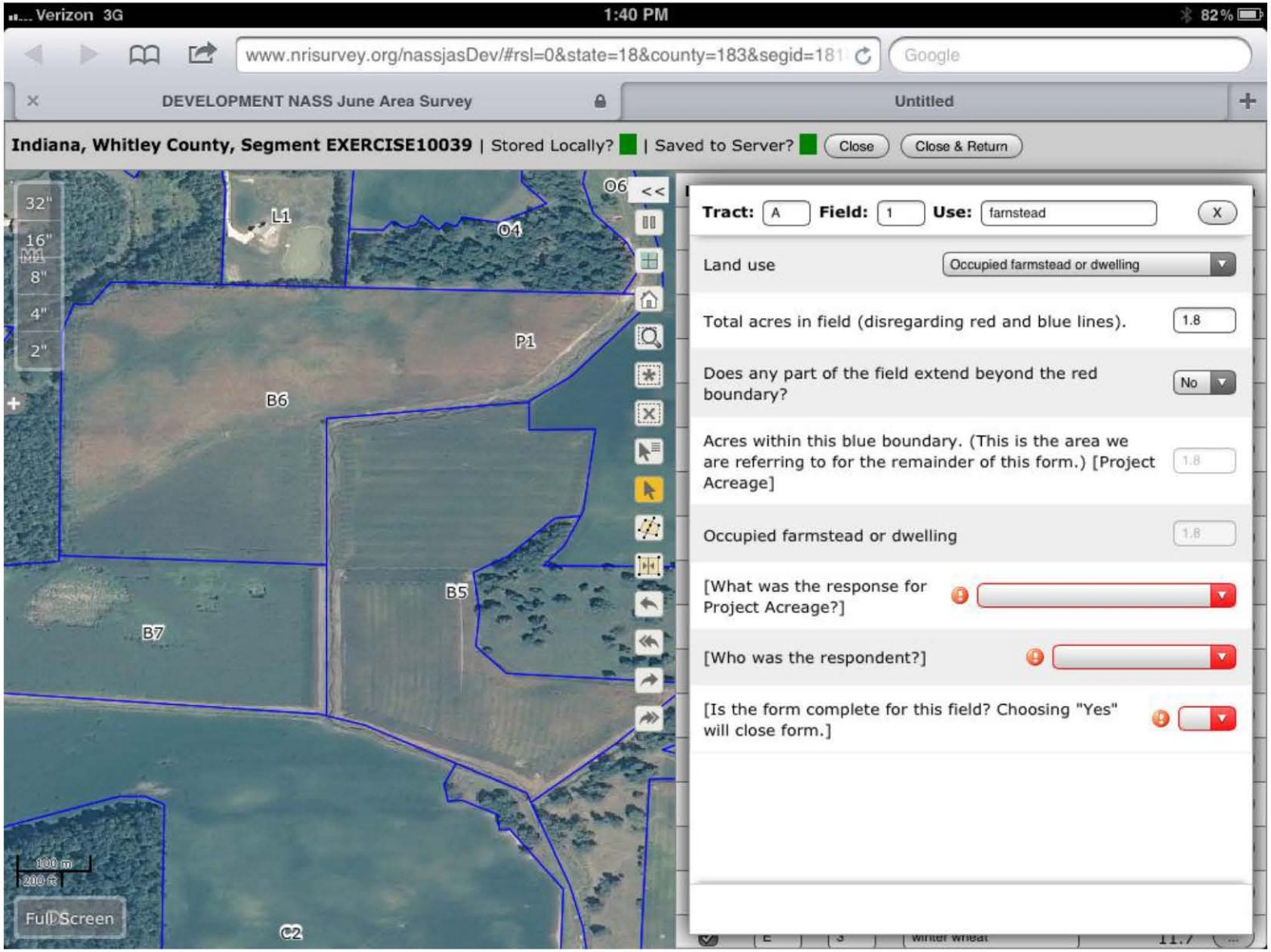


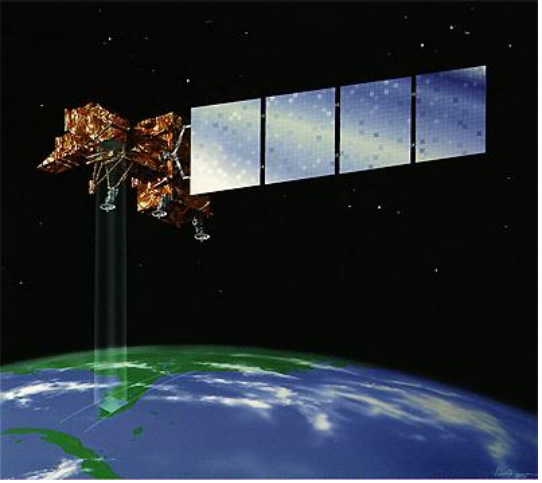
Tapping quickly 2 times completes a line.  Make sure to do this outside of the red boundary and close to the last yellow circle.



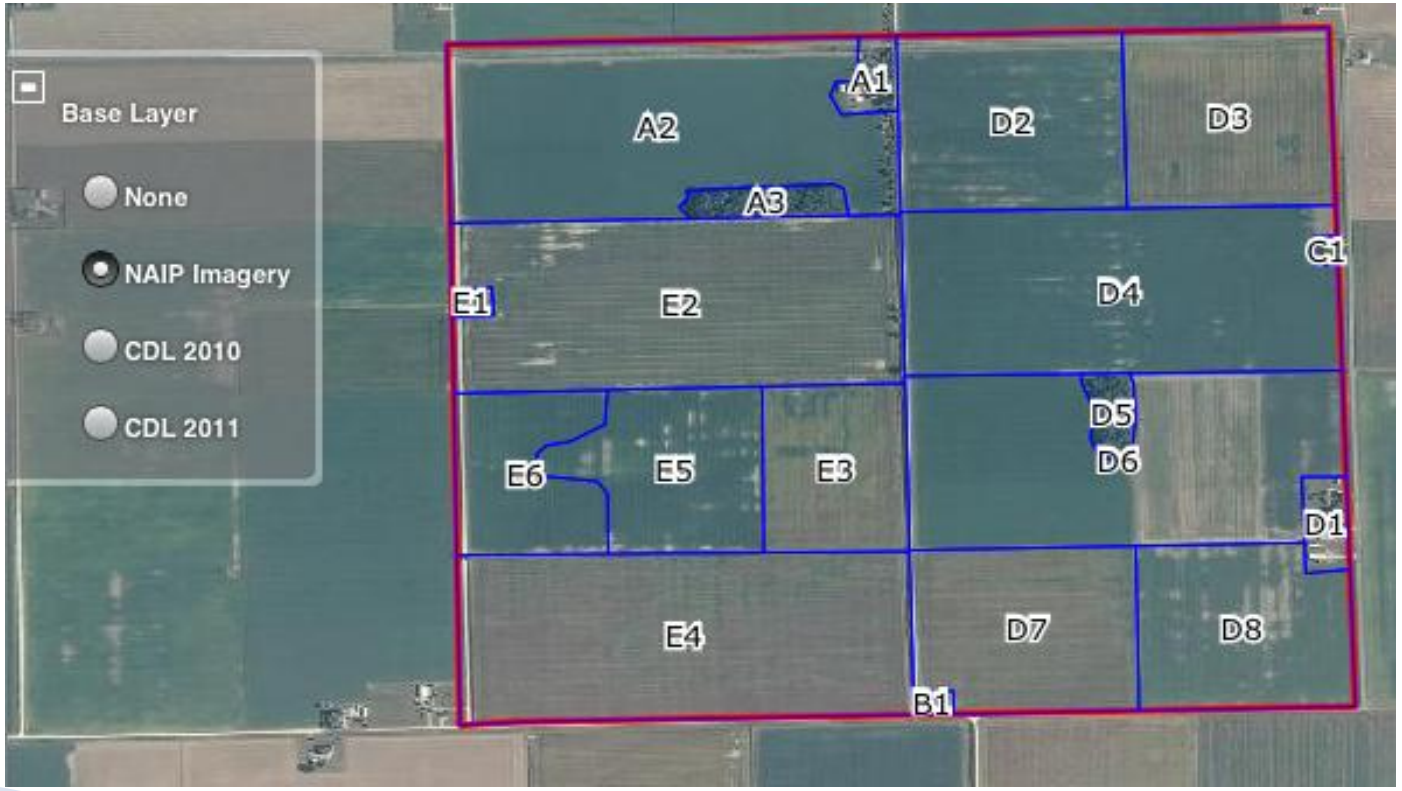
Once you tap twice a blue line will appear within the red boundary and all circles and lines outside the boundary will disappear.


Verizon 3G
1:33 PM
85 %
www.nrisurvey.org/nassjasDev/#rsl=0&state=18&county=183&segid=181
Google
DEVELOPMENT NASS June Area Survey
Untitled
Indiana, Whitley County, Segment EXERCISE10039 | Stored Locally? | Saved to Server?
Close
Close & Return
32"
16"
8"
4"
2"
Full Screen
A 3 corn for grain 76.4
B 1 farmstead 6.6
B 2 soybeans 8.7
B 3 woodland pastured 34.8
B 4 soybeans 56.8
B 5 corn for grain 30.6
B 6 corn for silage 40.1
B 7 alfalfa hay 19.4
C 1 frmsted 5.3
C 2 corn for grain 76.6
D 1 non ag 15.3
E 1 farmstead 3.8
E 2 corn for grain 59.1
E 3 winter wheat 11.7
E 4 woods 13.2
F 1 farmstead 5.4
F 2 corn for silage 24.9


Verizon 3G
1:40 PM
82%
www.nrisurvey.org/nassjasDev/#rsl=0&state=18&county=183&segid=181
Google
DEVELOPMENT NASS June Area Survey
Untitled
Indiana, Whitley County, Segment EXERCISE10039 | Stored Locally? | Saved to Server?
Close
Close & Return
32"
16"
8"
4"
2"
L1
O4
O6
P1
B6
B5
B7
C2
Full Screen
Tract: A
Field: 1
Use: farmstead
X
Land use
Occupied farmstead or dwelling
Total acres in field (disregarding red and blue lines).
1.8
Does any part of the field extend beyond the red boundary?
No
Acres within this blue boundary. (This is the area we are referring to for the remainder of this form.) [Project Acreage]
1.8
Occupied farmstead or dwelling
1.8
[What was the response for Project Acreage?]
[Who was the respondent?]
[Is the form complete for this field? Choosing "Yes" will close form.]



# National Agricultural Imagery Program (NAIP Imagery)



# Cropland Data Layer

# The Benefits

1. Lower Costs
   a. Data Entry
   b. Less Paper
   c. Fewer Resources Needed (Aerial Photo)
   d. Minimizes mailing costs

2. Improve Data Quality
   a. Edit Checks
   b. Geographic Information System (GIS) - improved precision

3. Flexibility
   a. Able to move assignments around

4. Widens Data Collection Window
   a. Collect data even at the last minute

5. Will improve the Cropland Data Layer which in turn improves our sampling scheme and what is displayed on the iPAD for the next year.

USDA

# TECH SIDE:
# Initial Requirements (Spring 2012)

- Run on an iPad
- Capture tract and field boundaries as GIS polygons
  - Display imagery
  - Provide the appropriate GIS tools
- Label tracts and fields appropriately
- Operate without a reliable Internet connection
- Automatically save data to server when possible

# Computer off the Shelf (COTS) + Custon Code vs. Open Source + Custom Code

- **ArcGIS API**?

  Editing operations are server-side *(off-line operation not possible)*

- **Java Script API**?

  Not optimized for touch interfaces

- **Native iOS API - iPAD**?

  No expertise and steep learning curve (language, libraries, etc.)

  Distribution/deployment questions - legalities

API = Application Programming Interface

# Popular JavaScript Web Mapping Libraries

- Google Maps
- Bing Maps
- Leaflet – open source JavaScript library for mobile-friendly interactive maps
- ArcGIS API for JavaScript
- **OpenLayers**

# OpenLayers

- Quickly make web pages with embedded maps.
- Support for various image layer types.
- Standard tools for map navigation and editing
- Support for user-editable vector layers

# So How can this Benefit my Agency?

- Not just agriculture but draw off any land shapes and capture data about it.
- Shows that this hybrid of the true thin client data collection approach can actually work.
- Future – show location of the interviewer. Add a roads map layer.
- Two side benefits of the project:
  1.) Recording interviews with another iPAD.
  2.) Remote/Correspondence Training

USDA

# *The TEAM for Phase I*

Executive Sponsors
Jeff Bailey, Mark Harris, Chris Messer

Eric Wilson – Team Leader

Michael Gerling, Matt Deaton, William Jordan, David Hancock,
Leslee Lohrenz, Pam Hird, Prince Hakim, Jonathan Lisic

Linda Lawson – Indiana
Debbie Dunham – Indiana

Sherry Deane – Pennsylvania
Jillayne Weaber – Pennsylvania

Eric Stebbins – Washington

Iowa State University
Sarah Nusser
Alan Dotts
Andrew Vardeman

USDA

# Contact Information

- Michael Gerling michael.gerling@nass.usda.gov
- Claire Boryan clarie.boryan@nass.usda.gov

# Questions