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

Geographic **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.

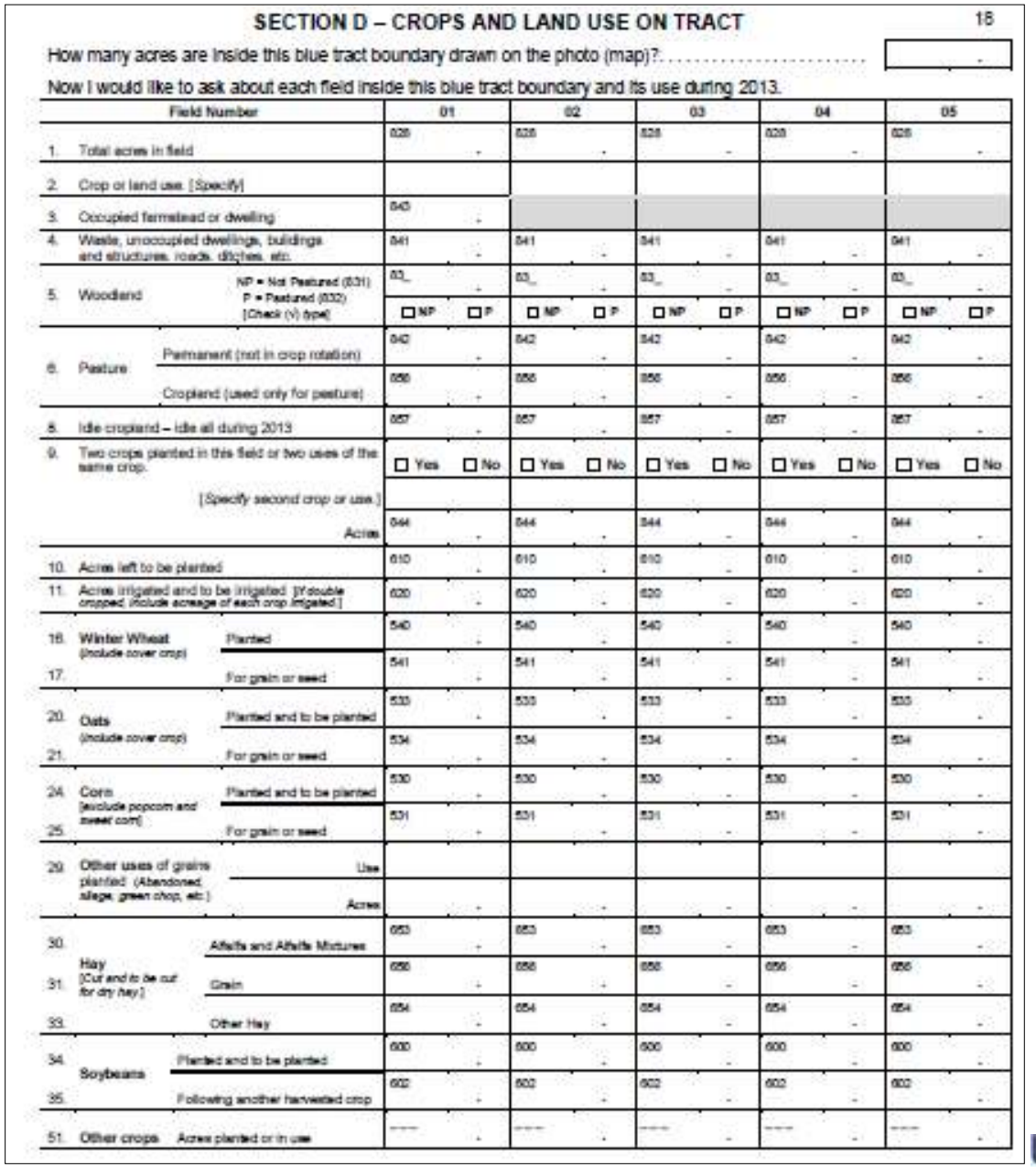
Overview of June Area Survey

- 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

16

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		028 .	028 .	028 .	028 .	028 .
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	540 .	540 .	540 .	540 .	540 .
17.	For grain or seed	541 .	541 .	541 .	541 .	541 .
20. Oats (include cover crop)	Planted and to be planted	533 .	533 .	533 .	533 .	533 .
21.	For grain or seed	534 .	534 .	534 .	534 .	534 .
24. Corn [exclude popcorn and sweet corn]	Planted and to be planted	530 .	530 .	530 .	530 .	530 .
25.	For grain or seed	531 .	531 .	531 .	531 .	531 .
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	600 .	600 .	600 .	600 .	600 .
35.	Following another harvested crop	602 .	602 .	602 .	602 .	602 .
51. Other crops	Acres planted or in use	---- .	---- .	---- .	---- .	---- .

Hybrid of the Thin Client CAPI Framework

Agricultural Operation

Field Interviewer (iPAD)

Wireless Broadband (3G/4G)

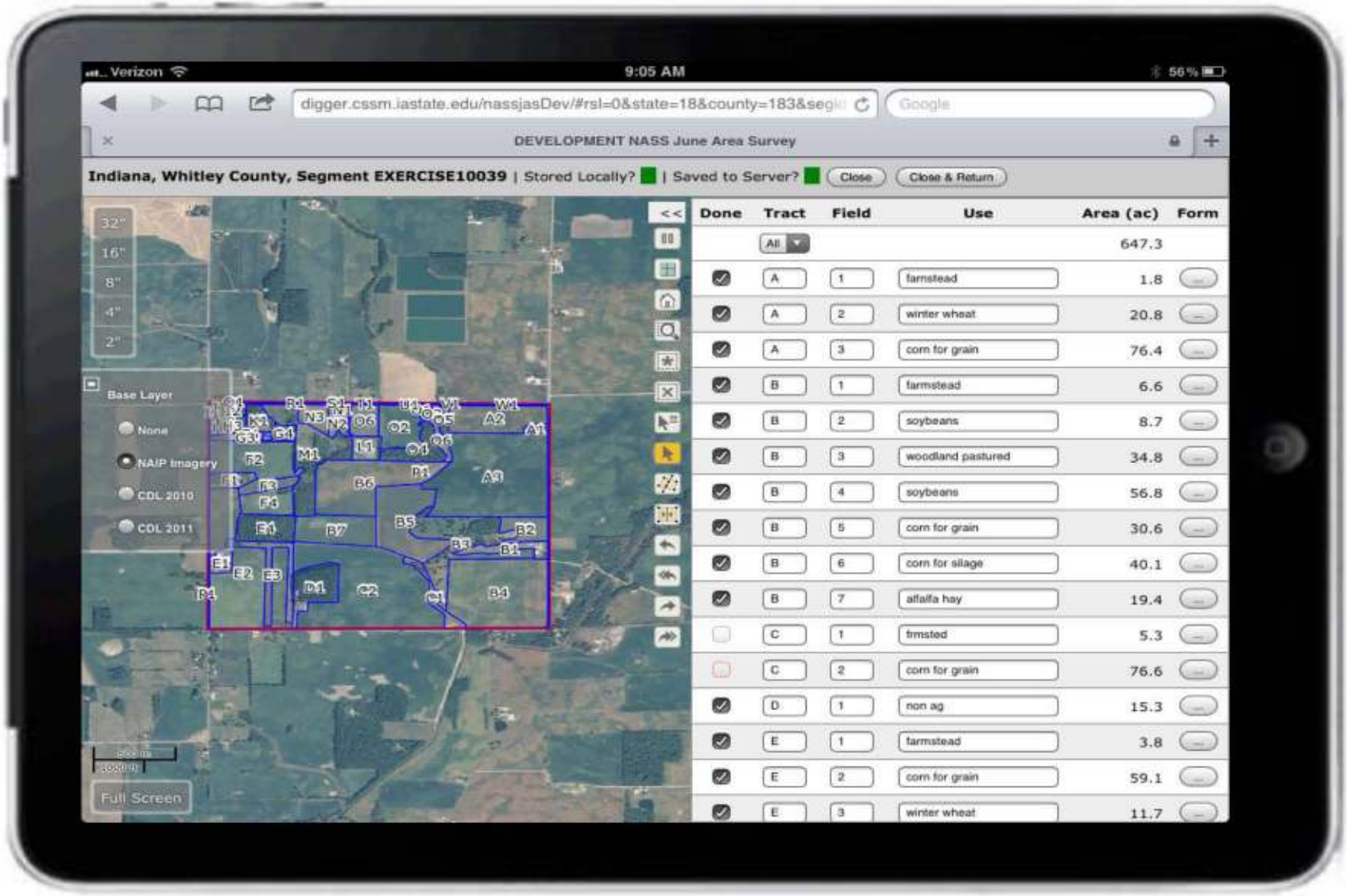
~~USDA-NASS~~

Iowa State University

Web Survey Site

Cell Tower

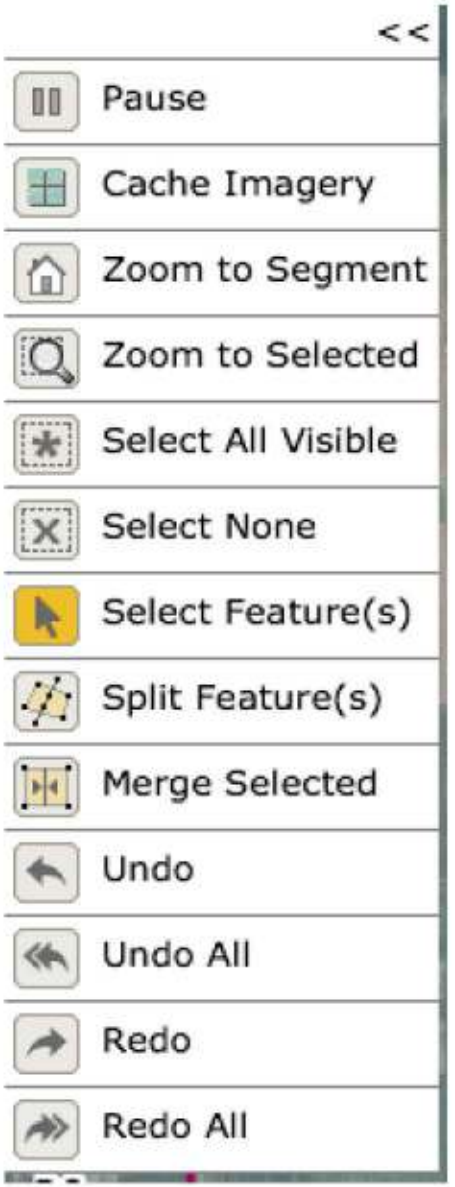
USDA - NASS Field Office



Powered by **Giraffe**

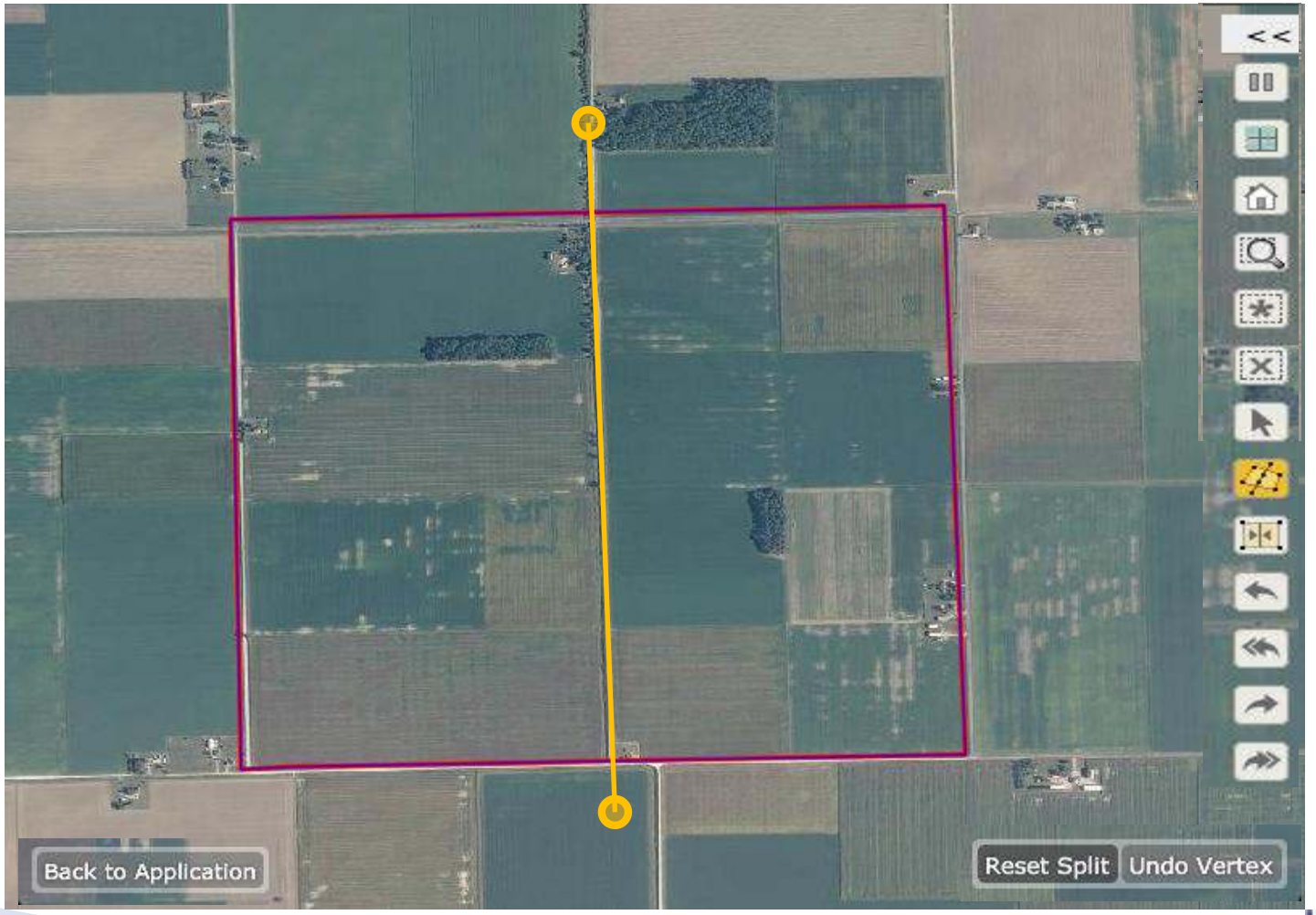
USDA

Available Tools

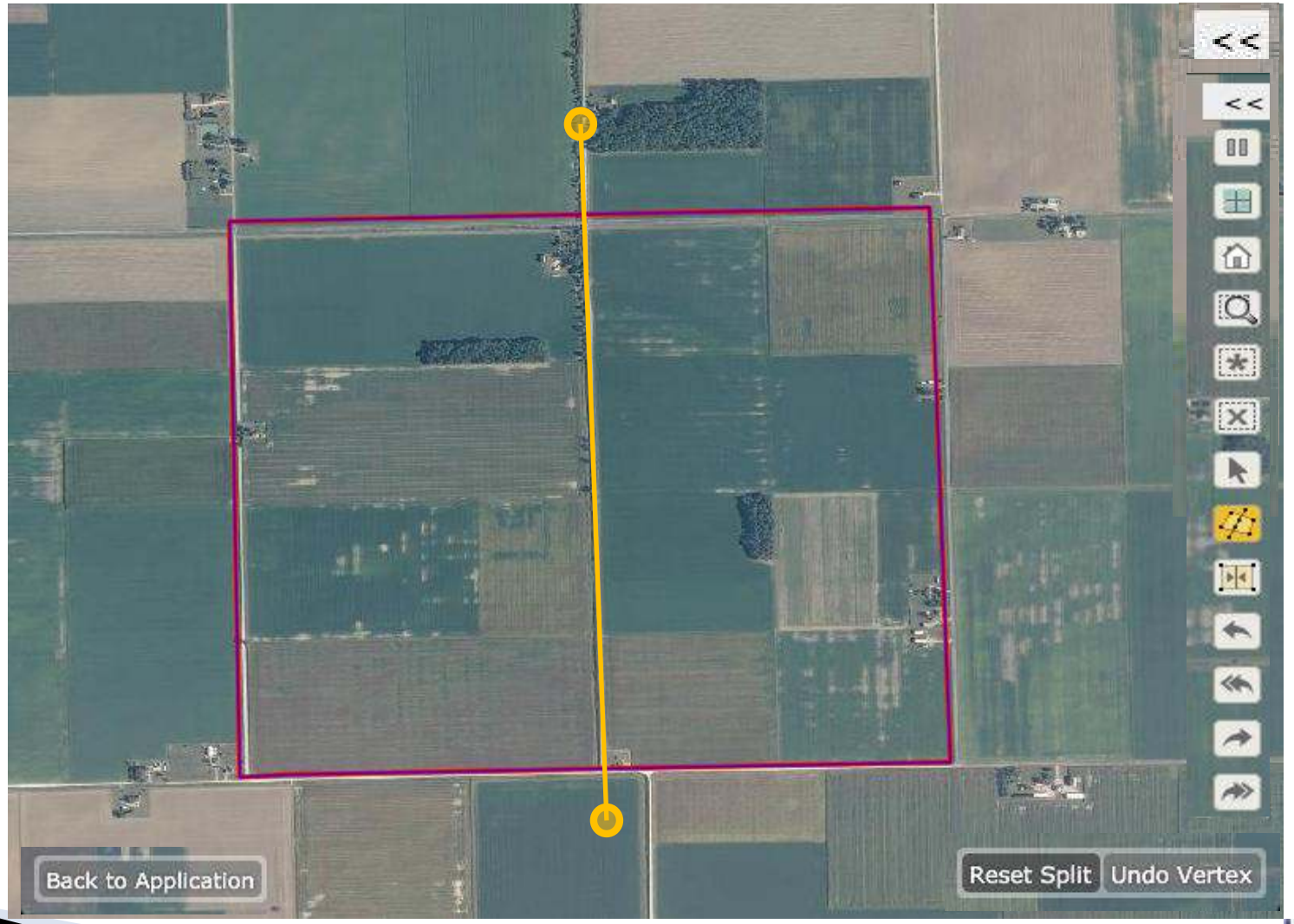


Select the Split Button tool. Start a new line by tapping once outside of the red boundary and a yellow circle will appear.

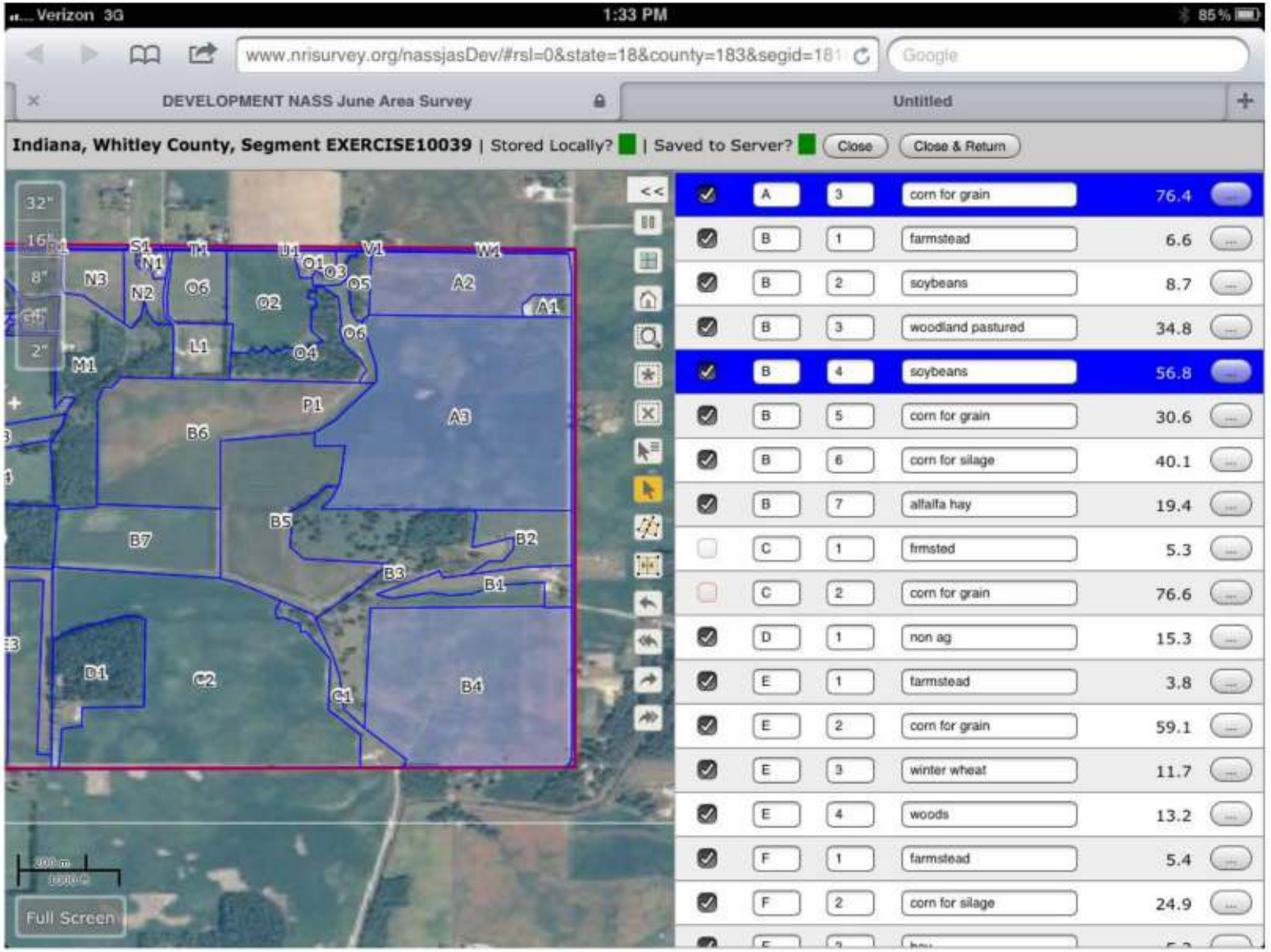
Drawing lines is NOT a dragging motion. Lift your finger and tap outside the bottom edge of the red boundary and another yellow circle will appear with a yellow line connecting the two circles.

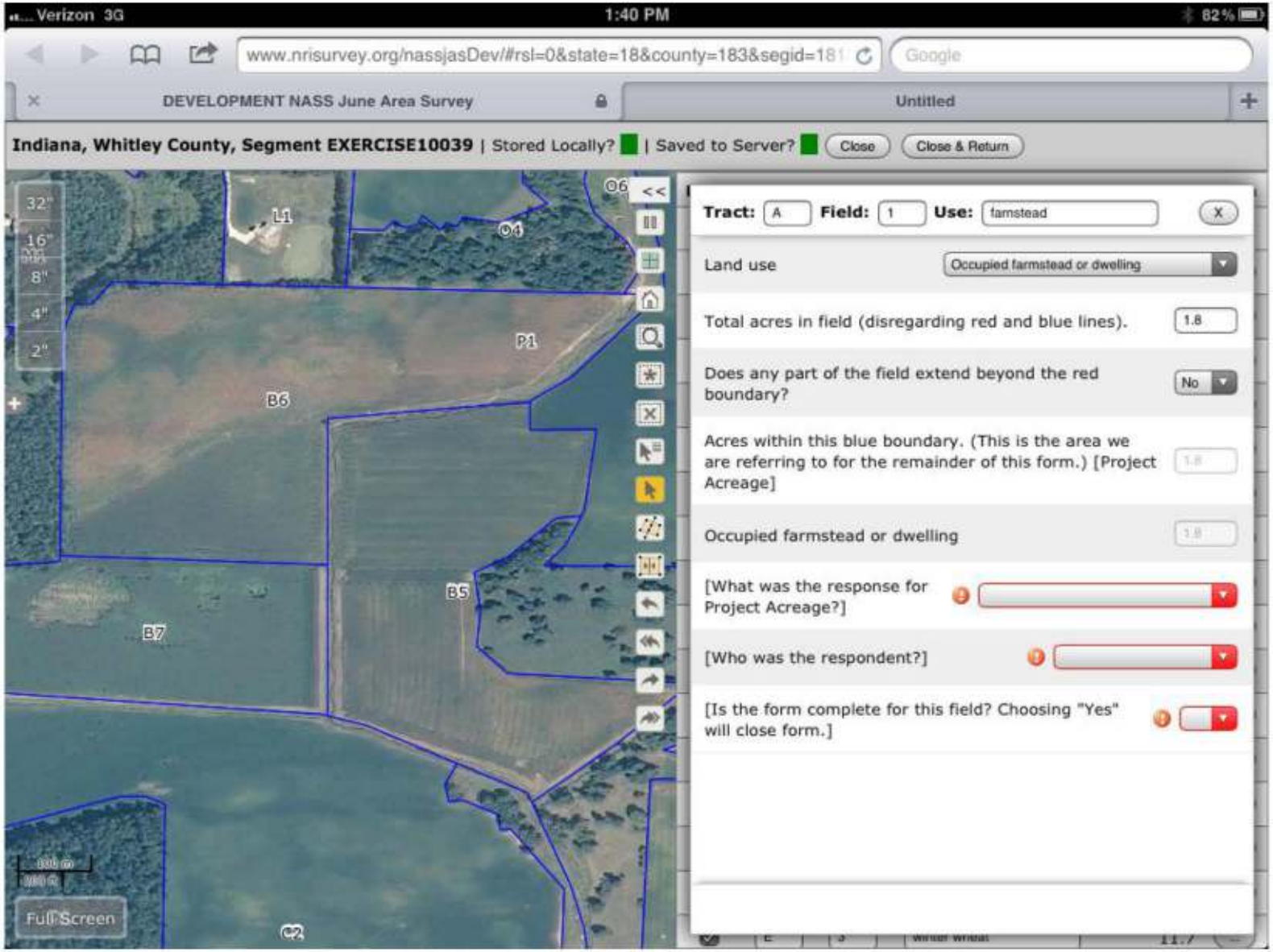


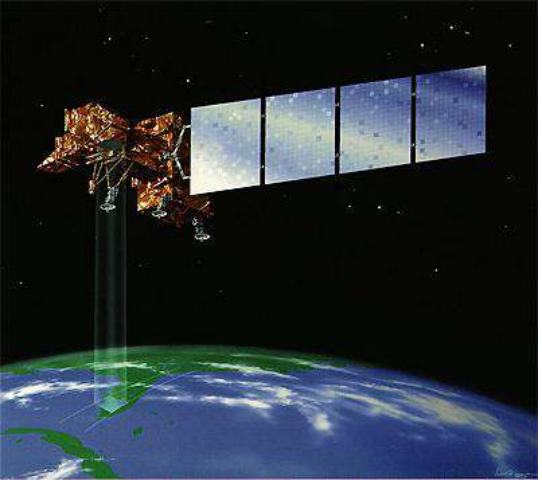
Tapping quickly 2 times completes a line. Make sure to do this outside of the red boundary and close to the last yellow circle.



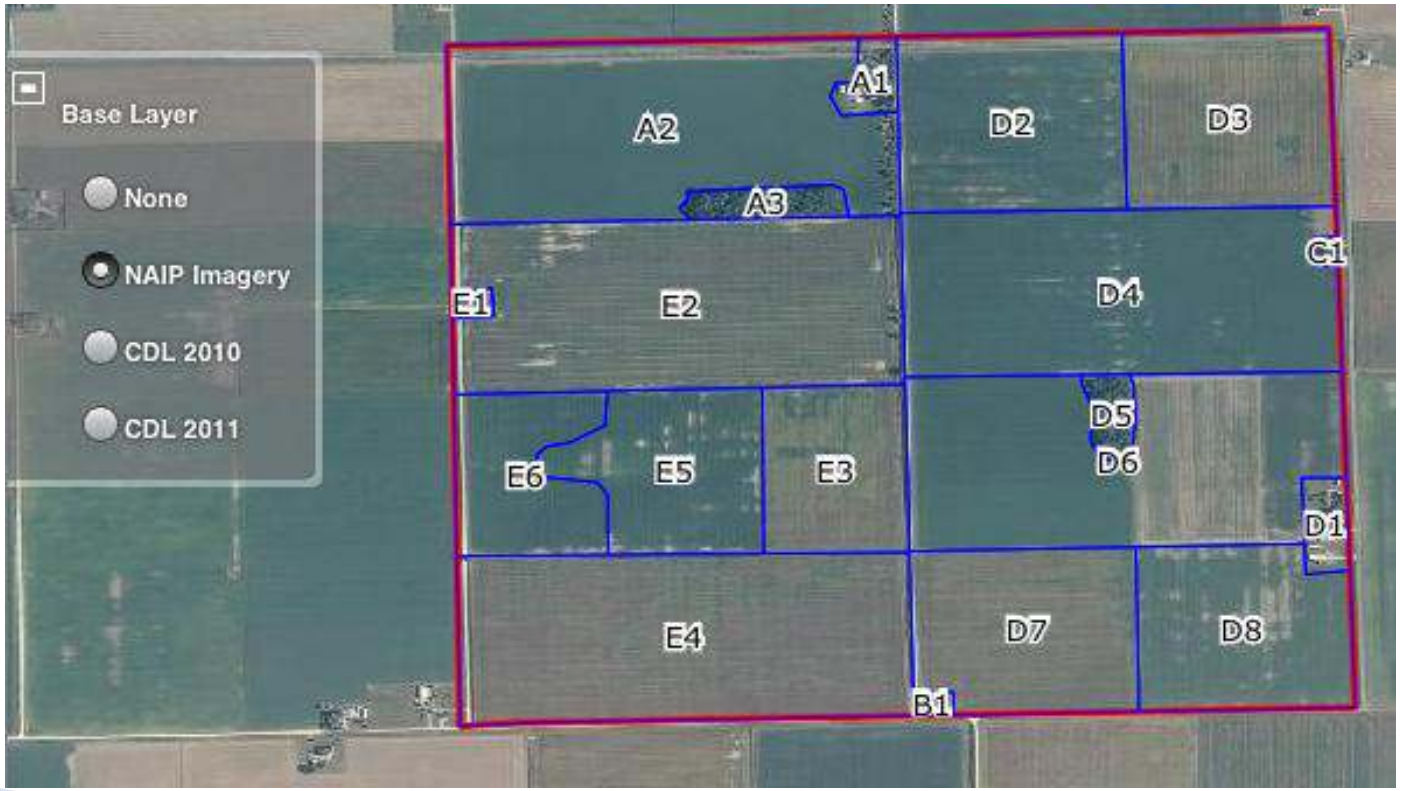
Once you tap twice a blue line will appear within the red boundary and all circles and lines outside the boundary will disappear.


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
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
Tract: A
Field: 1
Use: farmstead
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]
Occupied farmstead or dwelling
[What was the response for Project Acreage?]
[Who was the respondent?]
[Is the form complete for this field? Choosing "Yes" will close form.]
L1
O4
O6
P1
B6
B5
B7
C2
Full Screen



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.

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

The TEAM for Phase I

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Questions