

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



“ . . . providing timely, accurate, and useful statistics in service to U.S. agriculture.”



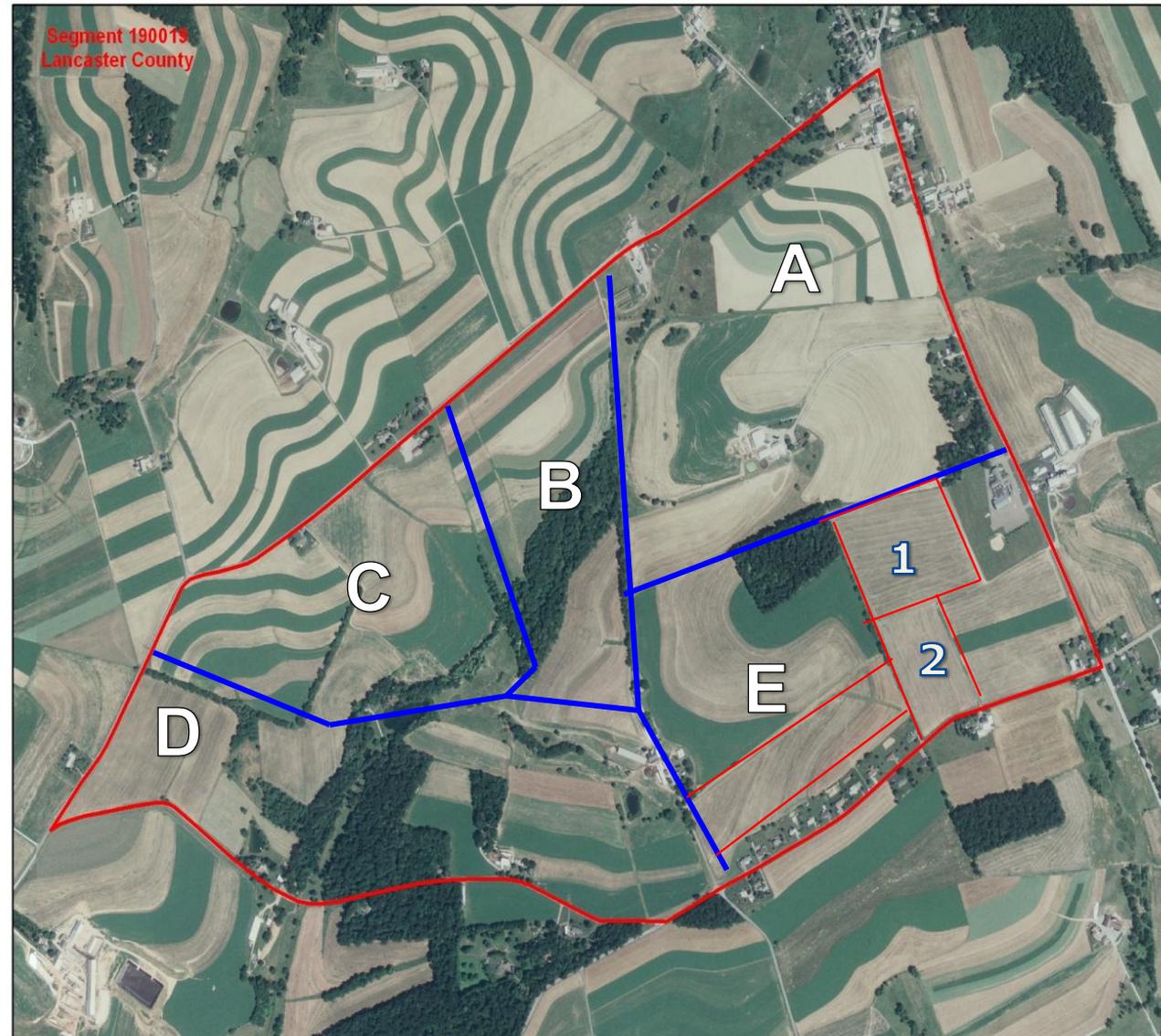
Overview of June Area Survey

- ▶ 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.



SECTION D – CROPS AND LAND USE ON TRACT

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.

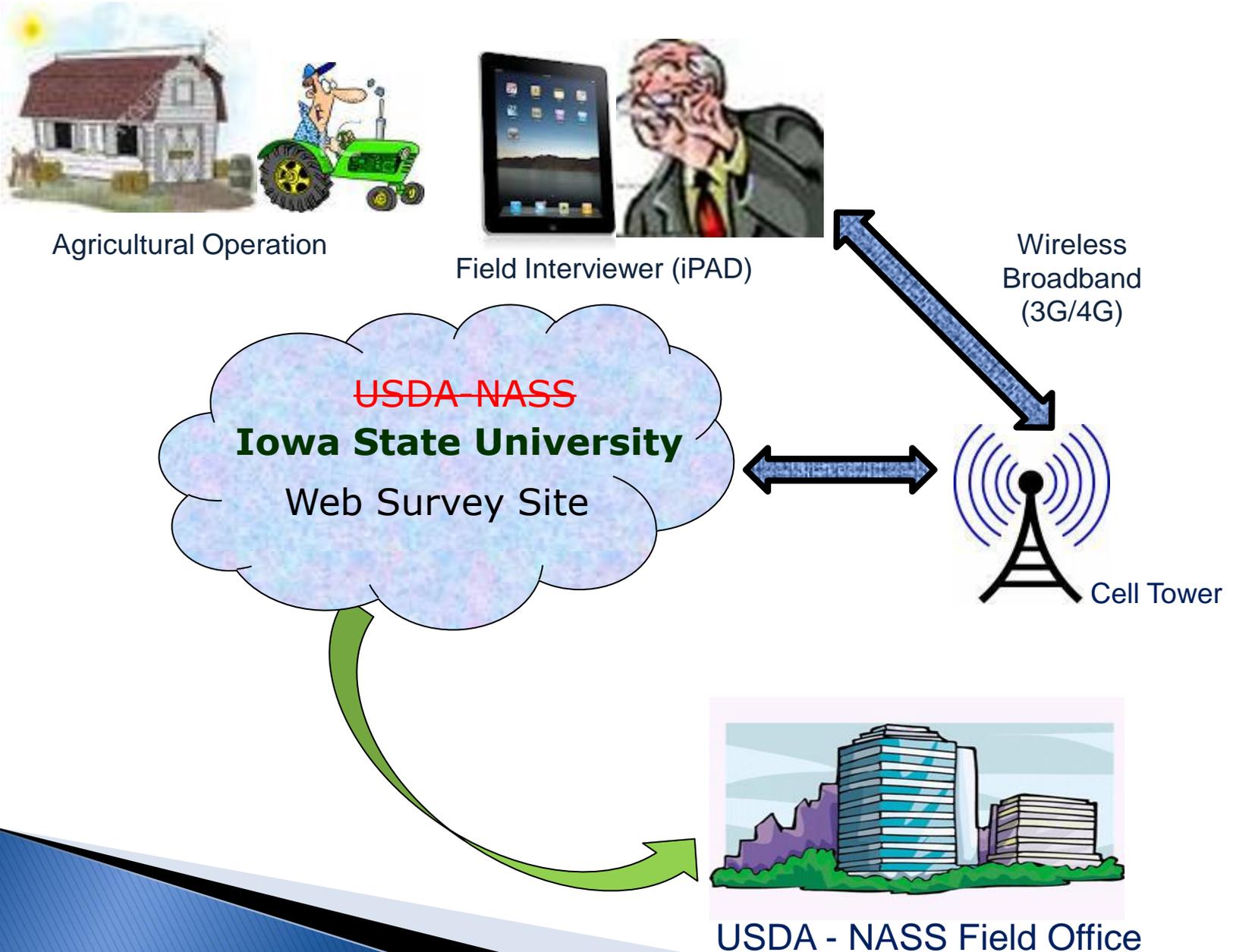
Field Number	01	02	03	04	05
1. Total acres in field	020	020	020	020	020
2. Crop or land use. [Specify]					
3. Occupied farmland or dwelling	043				
4. Waste, unoccupied dwellings, buildings and structures, roads, ditches, etc.	041	041	041	041	041
5. Woodland NP = Not Pastured (031) P = Pastured (032) [Check (x) type]	03_	03_	03_	03_	03_
	<input type="checkbox"/> NP <input type="checkbox"/> P				
6. Pasture Permanent (not in crop rotation)	042	042	042	042	042
	056	056	056	056	056
Cropland (used only for pasture)					
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. [Specify second crop or use.]	<input type="checkbox"/> Yes <input type="checkbox"/> No				
	Acres	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)	540	540	540	540	540
17. For grain or seed	541	541	541	541	541
20. Oats (include cover crop)	533	533	533	533	533
21. For grain or seed	534	534	534	534	534
24. Corn (exclude popcorn and sweet corn)	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. Alfalfa and Alfalfa Mixtures	053	053	053	053	053
31. Hay (Cut and to be cut for dry hay)	056	056	056	056	056
	Grain				
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	----	----	----	----	----

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.

Hybrid of the Thin Client CAPI Framework



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digger.cssm.iastate.edu/nassjasDev/#rsl=0&state=18&county=183&segid

DEVELOPMENT NASS June Area Survey

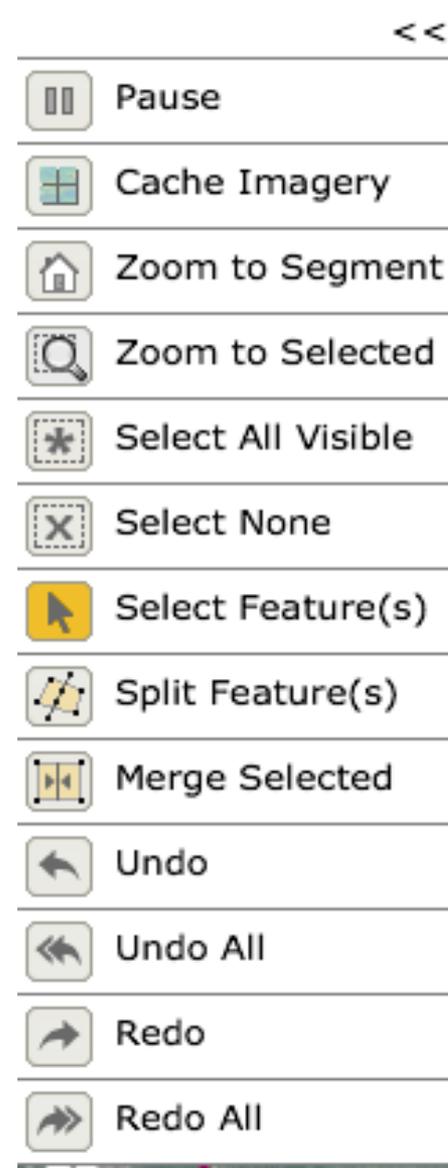
Indiana, Whitley County, Segment EXERCISE10039 | Stored Locally? | Saved to Server? | Close | Close & Return

Done	Tract	Field	Use	Area (ac)	Form
	All			647.3	
<input checked="" type="checkbox"/>	A	1	farmstead	1.8	...
<input checked="" type="checkbox"/>	A	2	winter wheat	20.8	...
<input checked="" type="checkbox"/>	A	3	corn for grain	76.4	...
<input checked="" type="checkbox"/>	B	1	farmstead	6.6	...
<input checked="" type="checkbox"/>	B	2	soybeans	8.7	...
<input checked="" type="checkbox"/>	B	3	woodland pastured	34.8	...
<input checked="" type="checkbox"/>	B	4	soybeans	56.8	...
<input checked="" type="checkbox"/>	B	5	corn for grain	30.6	...
<input checked="" type="checkbox"/>	B	6	corn for silage	40.1	...
<input checked="" type="checkbox"/>	B	7	alfalfa hay	19.4	...
<input type="checkbox"/>	C	1	farmstead	5.3	...
<input type="checkbox"/>	C	2	corn for grain	76.6	...
<input checked="" type="checkbox"/>	D	1	non ag	15.3	...
<input checked="" type="checkbox"/>	E	1	farmstead	3.8	...
<input checked="" type="checkbox"/>	E	2	corn for grain	59.1	...
<input checked="" type="checkbox"/>	E	3	winter wheat	11.7	...

Powered by **Giraffe**



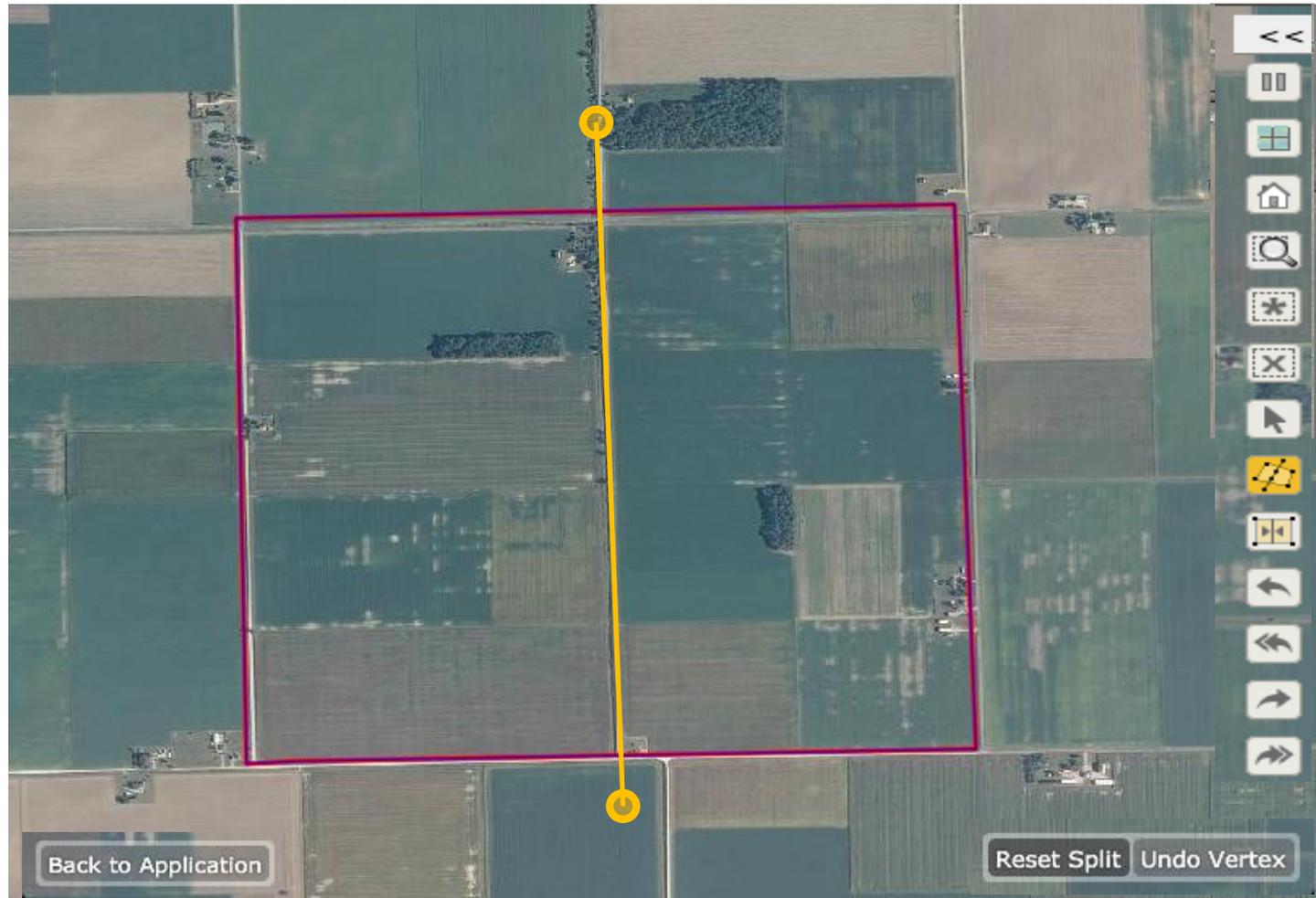
Available Tools



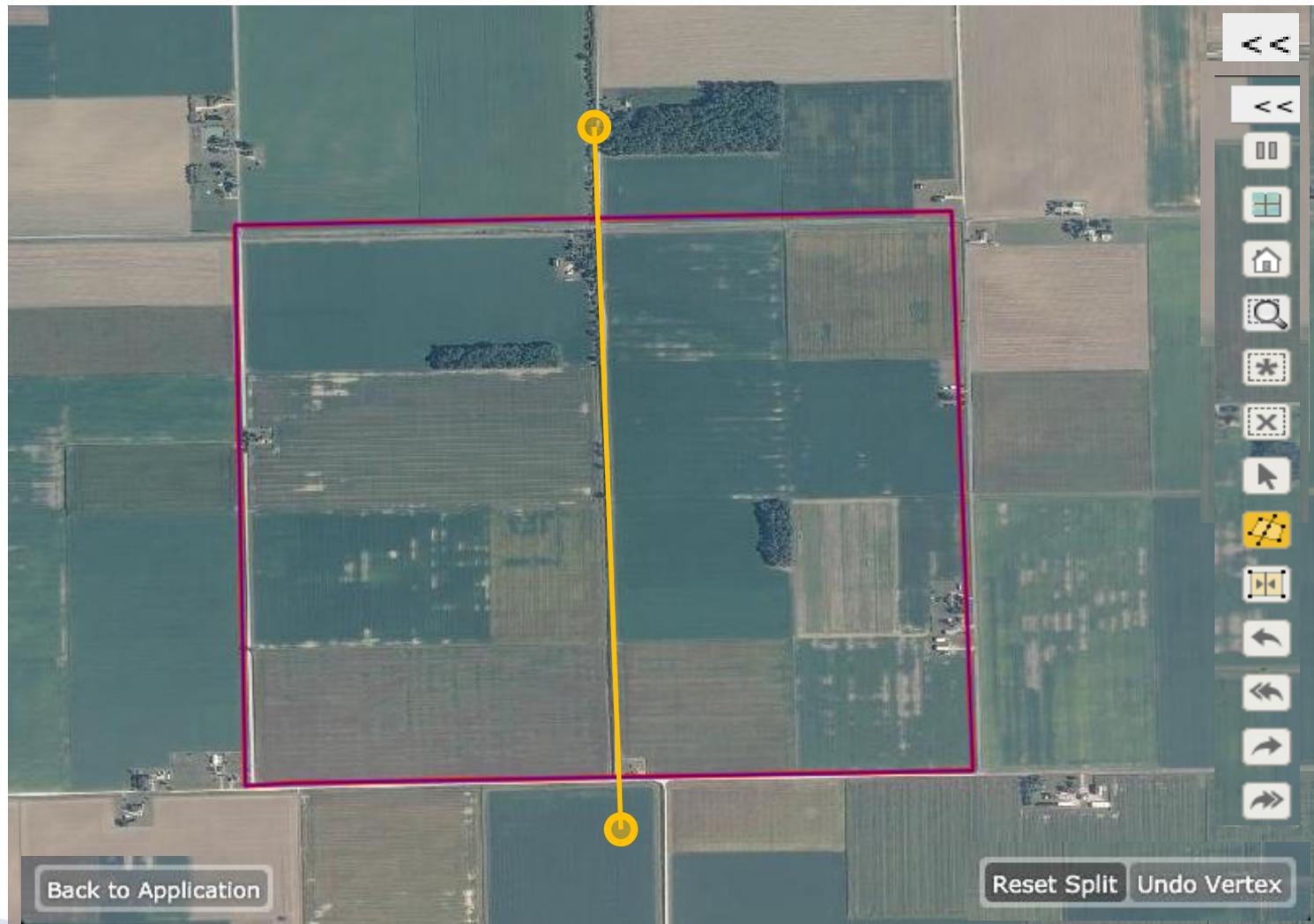
Select the Split Button tool. Start a new line by tapping once outside of the red boundary and a yellow circle will appear.



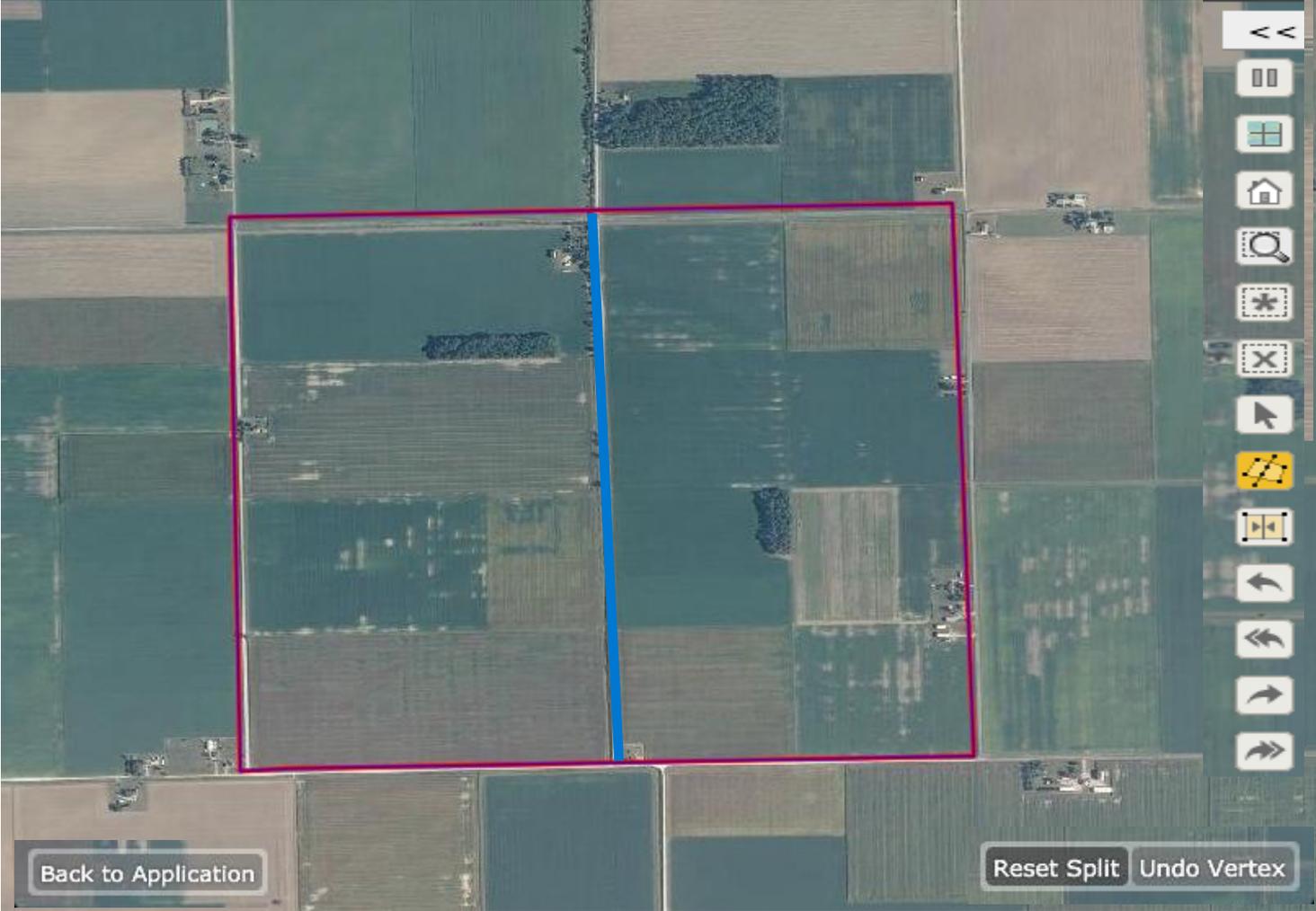
Drawing lines is NOT a dragging motion. Lift your finger and tap outside the bottom edge of the red boundary and another yellow circle will appear with a yellow line connecting the two circles.



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.



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www.nrsurvey.org/nassjasDev/#rsl=0&state=18&county=183&segid=181

DEVELOPMENT NASS June Area Survey

Indiana, Whitley County, Segment EXERCISE10039 | Stored Locally? | Saved to Server? Close Close & Return

<input checked="" type="checkbox"/>	A	3	corn for grain	76.4	...
<input checked="" type="checkbox"/>	B	1	farmstead	6.6	...
<input checked="" type="checkbox"/>	B	2	soybeans	8.7	...
<input checked="" type="checkbox"/>	B	3	woodland pastured	34.8	...
<input checked="" type="checkbox"/>	B	4	soybeans	56.8	...
<input checked="" type="checkbox"/>	B	5	corn for grain	30.6	...
<input checked="" type="checkbox"/>	B	6	corn for silage	40.1	...
<input checked="" type="checkbox"/>	B	7	alfalfa hay	19.4	...
<input type="checkbox"/>	C	1	frmsted	5.3	...
<input type="checkbox"/>	C	2	corn for grain	76.6	...
<input checked="" type="checkbox"/>	D	1	non ag	15.3	...
<input checked="" type="checkbox"/>	E	1	farmstead	3.8	...
<input checked="" type="checkbox"/>	E	2	corn for grain	59.1	...
<input checked="" type="checkbox"/>	E	3	winter wheat	11.7	...
<input checked="" type="checkbox"/>	E	4	woods	13.2	...
<input checked="" type="checkbox"/>	F	1	farmstead	5.4	...
<input checked="" type="checkbox"/>	F	2	corn for silage	24.9	...
<input checked="" type="checkbox"/>	F	3

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www.nrisurvey.org/nassjasDev/#rsl=0&state=18&county=183&segid=181

DEVELOPMENT NASS June Area Survey

Indiana, Whitley County, Segment EXERCISE10039 | Stored Locally? | Saved to Server? | Close | Close & Return

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

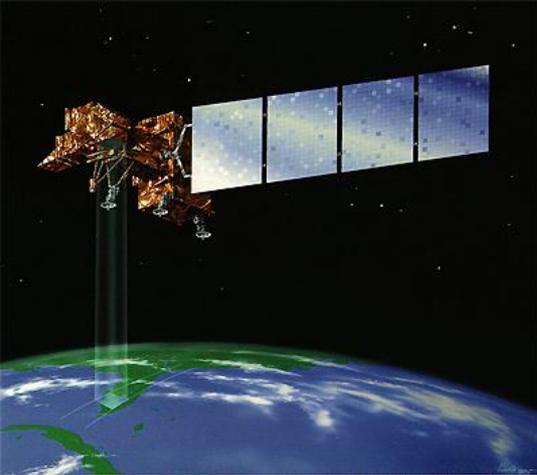
Acres within this blue boundary. (This is the area we are referring to for the remainder of this form.) [Project Acreage] 1.8

Occupied farmstead or dwelling 1.8

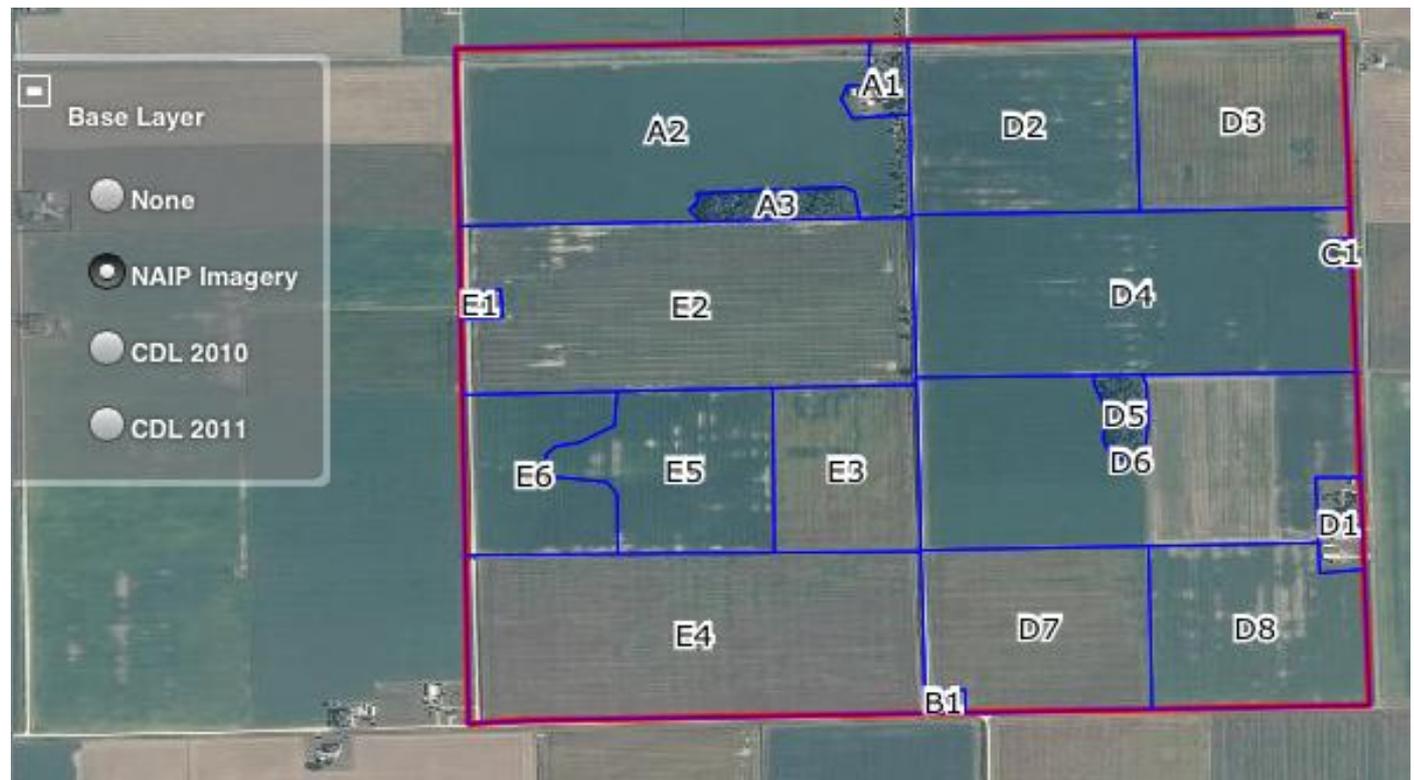
[What was the response for Project Acreage?] [Red dropdown menu]

[Who was the respondent?] [Red dropdown menu]

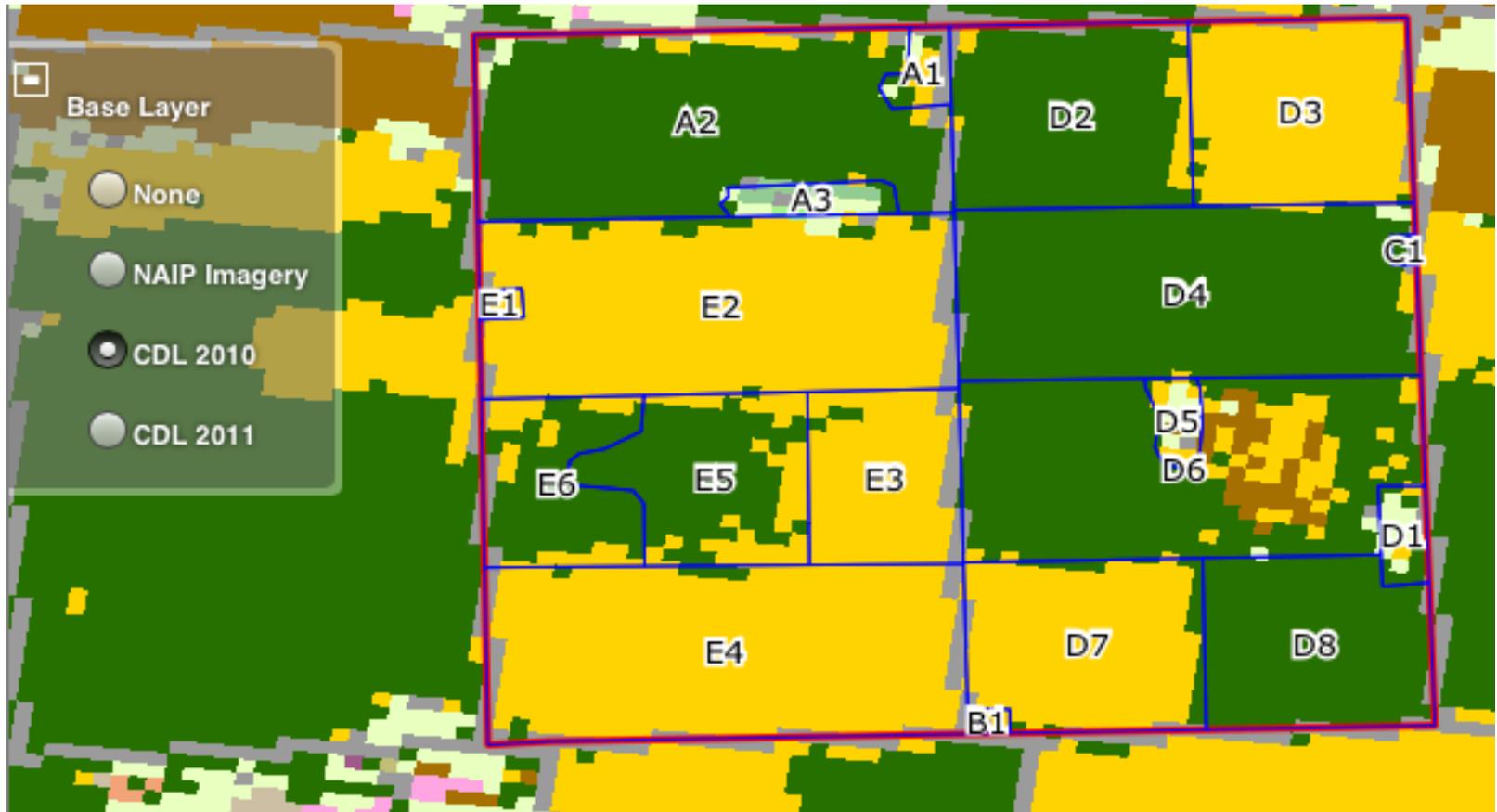
[Is the form complete for this field? Choosing "Yes" will close form.] [Red dropdown menu]



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) + Custom 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

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

Executive Sponsors

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Questions

