# THE CENTER FOR SPATIAL ANALYSIS
# KEY PROJECTS AND SERVICES

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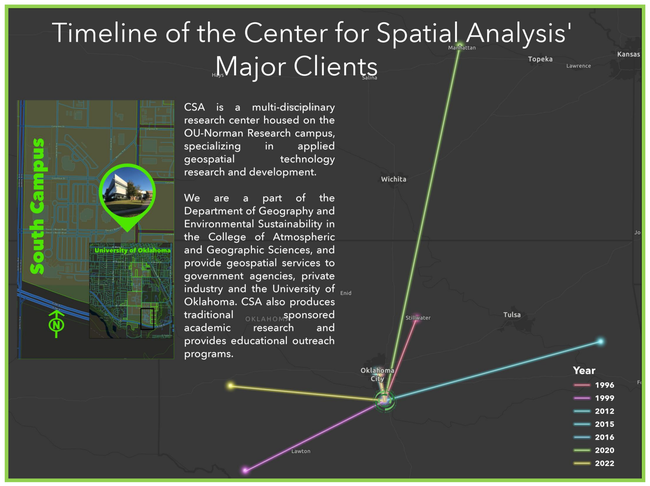
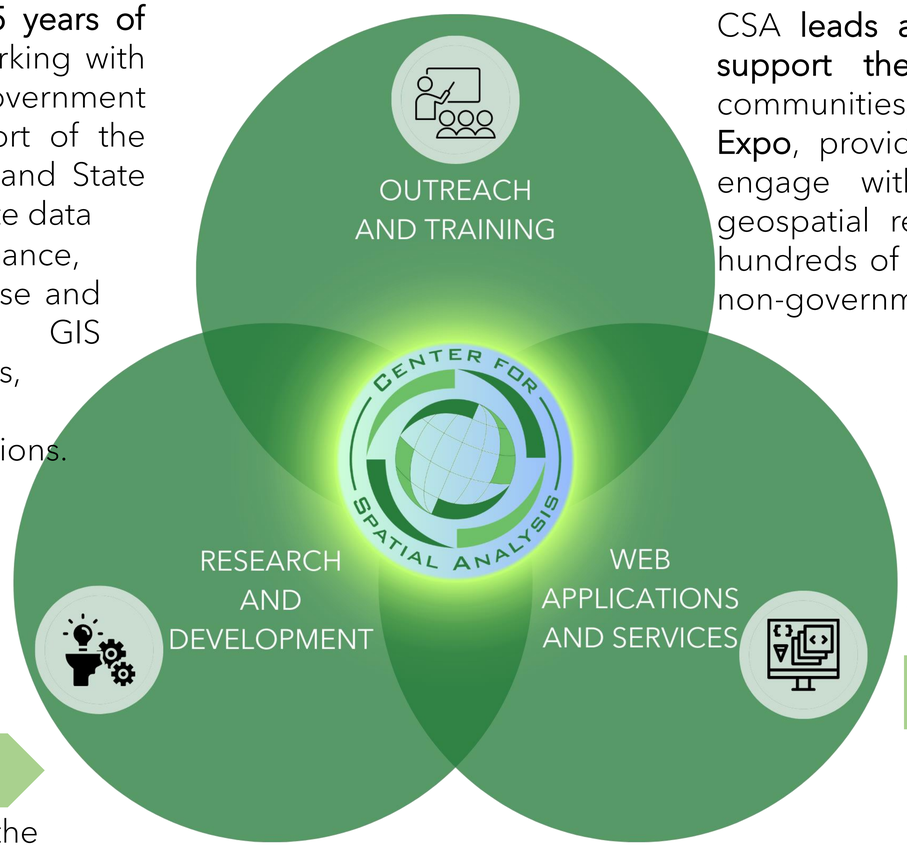
## CORE CAPABILITIES

The Center for Spatial Analysis (CSA) has **over 25 years of applied research and development experience** working with federal, state, tribal, county, and municipal government agencies as well as long term projects in support of the Oklahoma Tax Commission, State Election Board, and State Department of Education. Areas of focus include state data maintenance, Enterprise and AGOL GIS solutions, custom applications.




## EDUCATIONAL OUTREACH

CSA **leads a variety of educational programs** and events to **support the use of geospatial technologies** in schools, communities, and businesses. We host OU's annual **GIS Day Expo**, providing students from across disciplines a venue to engage with GIS professionals and showcase their own geospatial research. Since 2012, GIS Day at OU has served hundreds of students, faculty, and corporate, governmental and non-governmental champions of geospatial technologies.

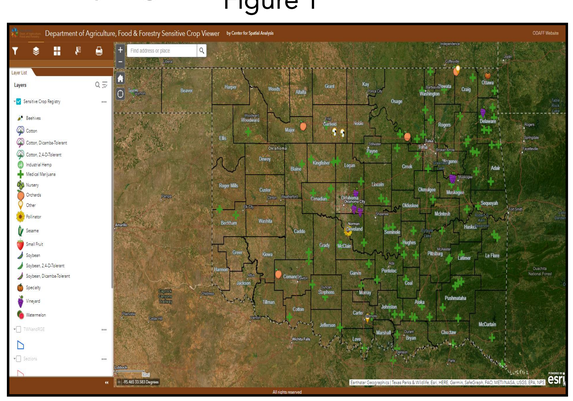
CSA also hosts **custom workshops** designed to **provide students and professionals with data visualization and spatial analysis skills**. Previous workshop topics have ranged from GIS for Health and the Environment, applying GIS to Understand Hydrologic Impacts of Bridge Construction, and teaching the fundamentals of ArcGIS Online through web mapping and StoryMaps.

## WEB AND MOBILE APPS

CSA's developer team has worked closely with the Oklahoma Department of Agriculture, Food and Forestry (**ODAFF**) to enhance their data collection programs using GIS. The **Sensitive Crop Registry** was developed using **Survey123** along with a **Django framework**.

**User authentication** was created to supply data to the **Sensitive Crop Viewer (Figure 1).** Users of the Sensitive Crop Viewer check within their area to confirm if a sensitive crop is nearby before spraying any pesticides. If a crop is nearby the crop owner must be notified. CSA's developer team also has expertise in **web mapping and ArcGIS Field Maps**.

Figure 1




## GIS DATA WAREHOUSE

CSA hosts the **State of Oklahoma GIS Data Warehouse**, a **central repository of geospatial data** for the state. Data are **freely available** for download.

**Web applications** are available, giving users access to interactive web maps on the state's **demographics** (Census population counts and density by tracts, block groups and blocks), **legislative boundaries** (State house, senate, congressional districts, commissioner districts and voter precinct boundaries), and **education boundaries** (school sites, school district wards, school transportation districts and school districts). The **By County Data Viewer (Figure 2)** gives users access to an interactive web map displaying all legislative boundary data for each county in the state.

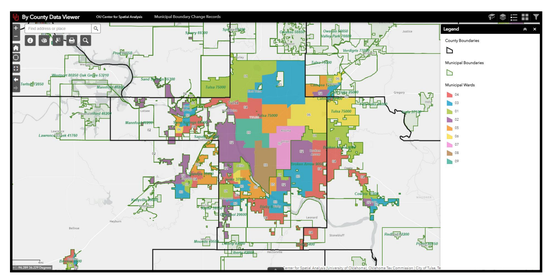



Figure 2

Scan the QR code to access the State of Oklahoma GIS Data Warehouse or visit csagis-uok.opendata.arcgis.com

# Transitioning Field Data Collection from Excel to Field Maps

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## Background

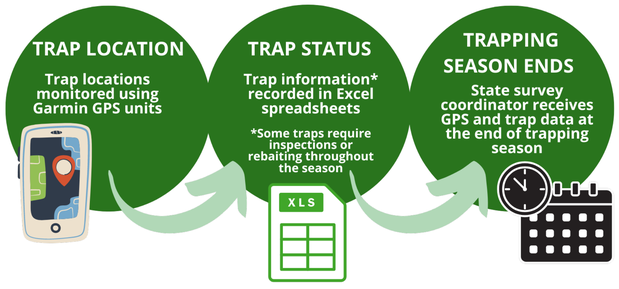
The Oklahoma Department of Food, Forestry, and Agriculture(**ODAFF**) Consumer Protection Division works with the United States Department of Agriculture (**USDA**) in the Cooperative Agriculture Pest Survey (**CAPS**) Program to **protect American agriculture and natural resources from invasive pests**.

*"The mission of the CAPS program is to provide a survey profile of exotic plant pests in the United States deemed to be of regulatory significance through early detection and surveillance activities".*

CAPS monitors for several insect and plant diseases across the United States, however the search for certain pests and diseases varies state-to-state based on the previous year's data and funding from the USDA. **The CAPS program is a collaborative effort among all states, necessitating all participating states to enhance their collection methodology with the use of technology.**

ODAFF employs upwards of 30 field staff in the consumer protection division, each collecting data for the CAPS program based on which counties are involved.

Prior to the Center for Spatial Analysis' **(CSA)** involvement in 2021, ODAFF monitored for pests using a workflow that required manual data entry, making it prone to human error:




ODAFF faced several obstacles with their data collection workflow:

- **Incorrect GPS locations**, transposed latitude and longitude values, and/or **wrong coordinate system** used at time of collection.
- GPS data accidently deleted or **incorrect use of the Garmin device**.
- Incorrect nomenclature in the excel spreadsheets.
- **Manually combining Excel spreadsheets** from 20+ field staff.

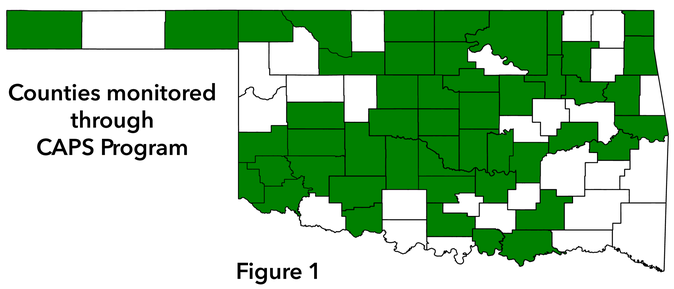
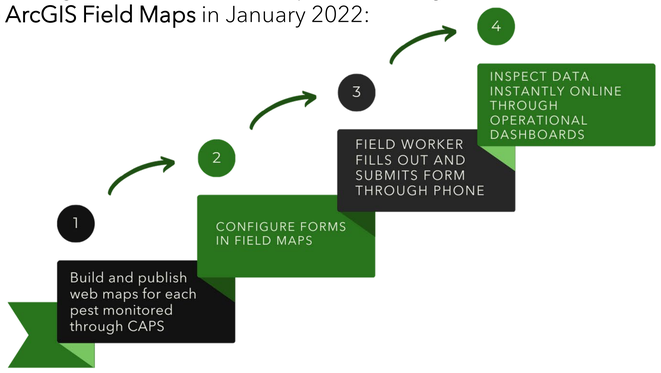



**Figure 1**

## Introducing ODAFF to Field Maps

ODAFF collects field data for the **imported fire ant**, Japanese beetle, forest pest survey (includes 5 different pests), sweet potato weevil, karnal bunt, and P. Ramoram (**Figure 1**). The department received a grant from the USDA to **enhance their data collection technology** and began working with CSA in 2021.

ODAFF was **interested in using a map-centric smart form** for collecting field data, prompting CSA's developers to propose **ArcGIS Collector** – an application which had proven to be an invaluable tool for previous projects. After an **ArcGIS Enterprise portal** for ODAFF was deployed, the following workflow was developed (CSA migrated from ArcGIS Collector to **ArcGIS Field Maps** in January 2022:




### 1 Build and Publish Web Maps

An empty **feature class** is created in **ArcGIS Pro**, based on pest, a related table for inspections may be created and associated **domains** to provide **coded values** to users. Feature class is then published to the ODAFF portal (version 10.9.1)

### 2 Configure Forms in Field Maps

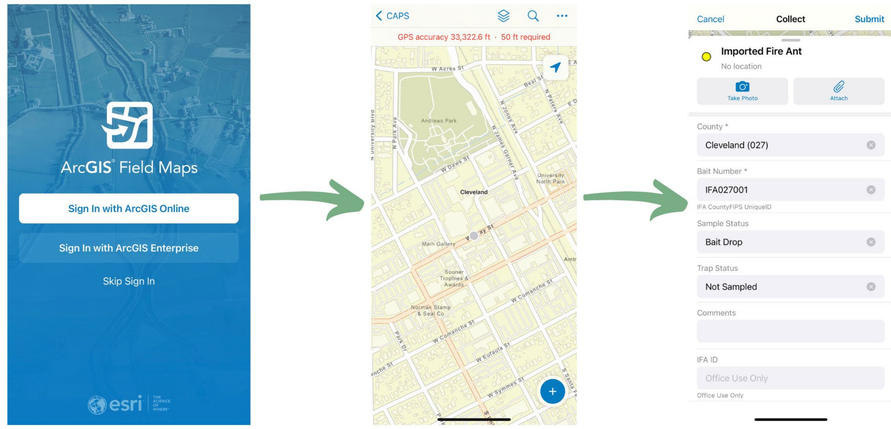
A web map is created from the published feature class in the ODAFF portal. **Dynamic symbology and custom pop-ups** can be configured here. Use Field Map Web App to customize the form even further with conditional statements for cascading questions.

### 3 Deploy Forms for Field Work

Create a group in the enterprise and share the web map and associated feature classes to the group of users. This allows only those a part of the group access to maps that may pertain sensitive information.

### 4 Inspect Data Instantly Online

Field staff can visually see their collected data within the app and the work of others. Office staff have been able to view collected data in real-time with use **of Dashboards** and edit any mistakes with **web apps**.




With Field Maps, custom dashboards and web apps ODAFF has streamlined their data collection and **increased the accuracy** of the data reported to the USDA and stakeholders.

To view the Imported Fire Ant Historical Dashboard scan the QR code.

## Beyond Field Maps


CSA has worked with ODAFF to enhance other programs using GIS, such as the **Sensitive Crop Registry** and Sensitive Crop Viewer. Survey123 is imbedded into a **Django framework** for **user authentication**. The **Survey123** then supplies data to a **web app**, the **Sensitive Crop Viewer**. Users of the Sensitive Crop Viewer check within their area to confirm if a sensitive crop is nearby before spraying any pesticides. If a crop is nearby the crop owner must be notified.

Thank you to the Oklahoma Department of Agriculture, Food, and Forestry for allowing CSA to use data collected by the Consumer Protection Division staff.

Scan the QR code on the right to view the Sensitive Crop Viewer.