Evaluation of GIS School Location Data for Santa Barbara County, California

Jessica Karste
MGIS, Geography 596B
The Pennsylvania State University
December 4, 2012

- No statewide geospatial layer of school campus boundaries for California

- Research & policy efforts dealing with specific land uses near schools are hindered by the lack of geospatial data defining school boundaries

- School location data readily available is often a point based on a the street address rather than the extent of the school campus

- Using a point based on an address instead of the extent of the school campus can lead to errors in analyzing activities within a set distance of a school

- The creation of a school campus geospatial layer is the key element

Santa Barbara County
Public Primary and Secondary Schools

1. **Build a school campus boundary layer for Santa Barbara County primary and secondary schools**

2. **Create a school point layer for Santa Barbara County primary and secondary schools**

3. **Compare the location of the school campus to the location of the school point**

4. **Evaluate differences of using school campus versus school point in use case scenarios that are interested in a set area distance from schools**

Family Smoking Prevention and Tobacco Control Act:

Restricts the advertising of tobacco products to children. The original bill limits any type of outdoor advertising (i.e. retailer window displays) within 1,000 feet of schools or playgrounds. The bill has been challenged by the tobacco industry and has not yet been put into place.

Megan's Law:

All registered sex-offenders under California Penal Code 3003.5.(b) are prohibited to reside within 2,000 feet of any public or private school, or park where children regularly gather.

School Addresses:
California Department of Education publishes complete datasets of all public schools within the state
(http://www.cde.ca.gov/ds/). Data from 2011

School Campus Polygon:
Santa Barbara County 2011 parcel data was used in the project to identify the spatial location of each school campus.
http://www.countyofsb.org/gis/default.aspx?id=2802

Tobacco Retailer Addresses:
Tobacco retailer data was obtained from California Board of Equalization (http://www.boe.ca.gov/). Data published
on October 4, 2012

Sex-Offender Addresses:
Addresses published by the Santa Barbara County Sheriff Office where used to locate sex offenders' residences
(http://www.sbsheriff.org/offenderwatchdisclaimer.html). Data published on October 30, 2012

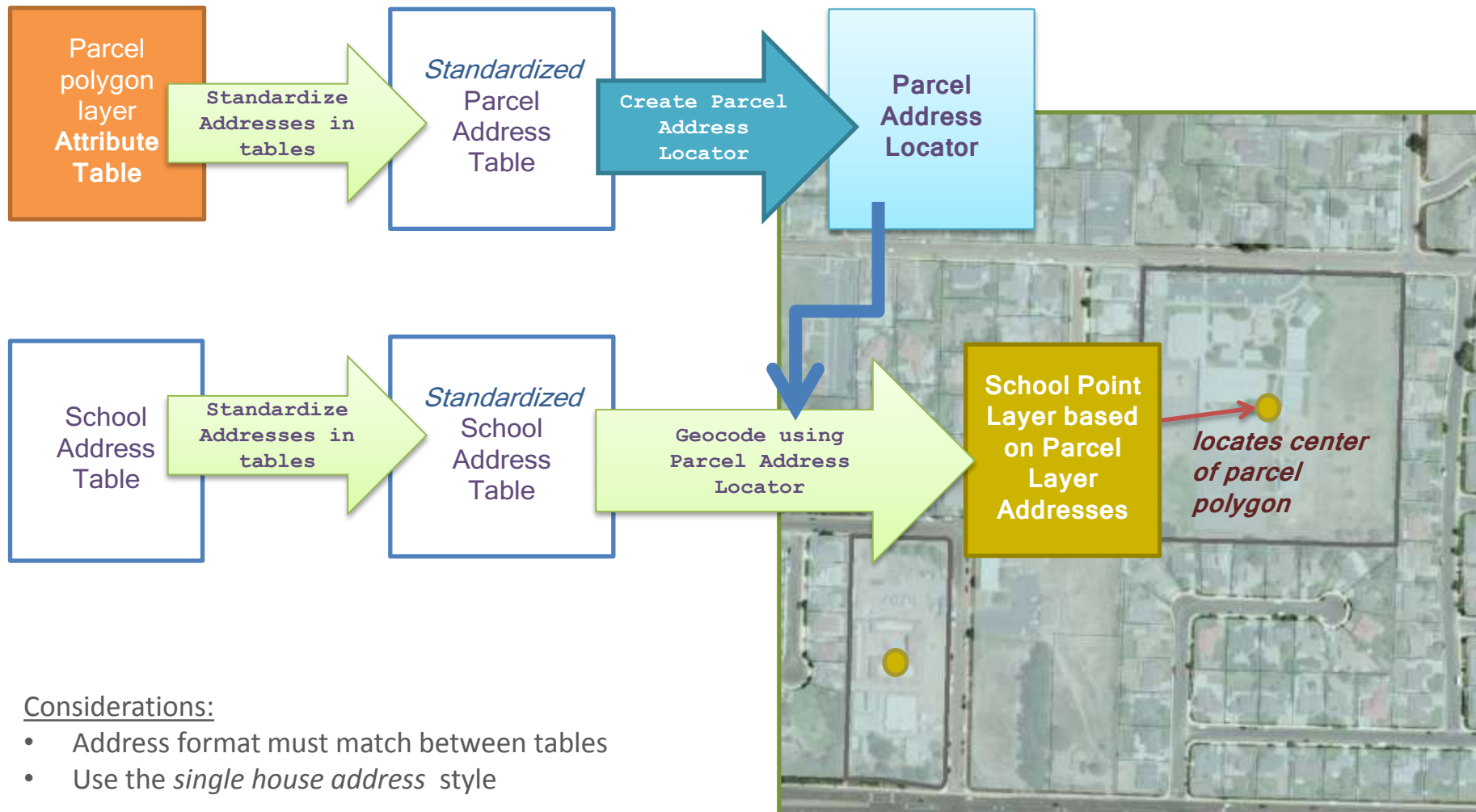# Build School, Tobacco Retailer, & Sex Offender Point Layers

Create point layers: Geocode addresses using ArcGIS 10 US Streets Geocode Service

Results: Located 116 schools, 419 tobacco retailers, and 44 sex-offenders

School Address Table

ArcView 10 US Streets Geocode Service

Point Layer of Schools based on Street Network

locates on street network

OID	DISTRICT		
72	Orcutt Union Elementary	Orcutt	Pinal Street
73	Orcutt Union Elementary	Patterson Road Elementary	400 Patterson Road
74	Santa Maria Joint Union High	Delta High	4893 Bethany Lane
75	Santa Maria Joint Union High	Ernest Righetti High	941 East Foster Road
75	Santa Maria Joint Union High	Santa Maria High	901 South Broadway
77	Santa Ynez Valley Union High	Refugio High	2975 East Highway 246
78	Santa Ynez Valley Union High	Santa Ynez Valley Union High	2975 East Highway 246
79	Solvang Elementary	Solvang Elementary	565 Atterdag Road
80	Vista del Mar Union	Vista de Las Cruces	9467 San Julian Road
81	Santa Barbara County ROP	Santa Barbara County ROP - South	4400 Cathedral Oaks Road
82	Santa Barbara County ROP	Snata Barbara County ROP - North	4893 Bethany Lane
83	Cuyama Joint Unified	Cuyama Valley High	4500 Highway 166

Geocodes school addresses using the parcel attribute table as a reference in a custom address locator

Parcel polygon layer **Attribute Table**

Standardize Addresses in tables →

Standardized Parcel Address Table

Create Parcel Address Locator →

Parcel Address Locator

School Address Table

Standardize Addresses in tables →

Standardized School Address Table

Geocode using Parcel Address Locator →

School Point Layer based on Parcel Layer Addresses

locates center of parcel polygon

Considerations:
- Address format must match between tables
- Use the *single house address* style

Create School Campus Layer: Locate school parcel polygons by spatially joining the point layer in the previous step to the parcel polygon layer

Results: Approximately 70% of the 116 schools (82) were associated with a polygon using the parcel geocoding method. The remaining 34 were visually located using the street network geocoded point as a reference.
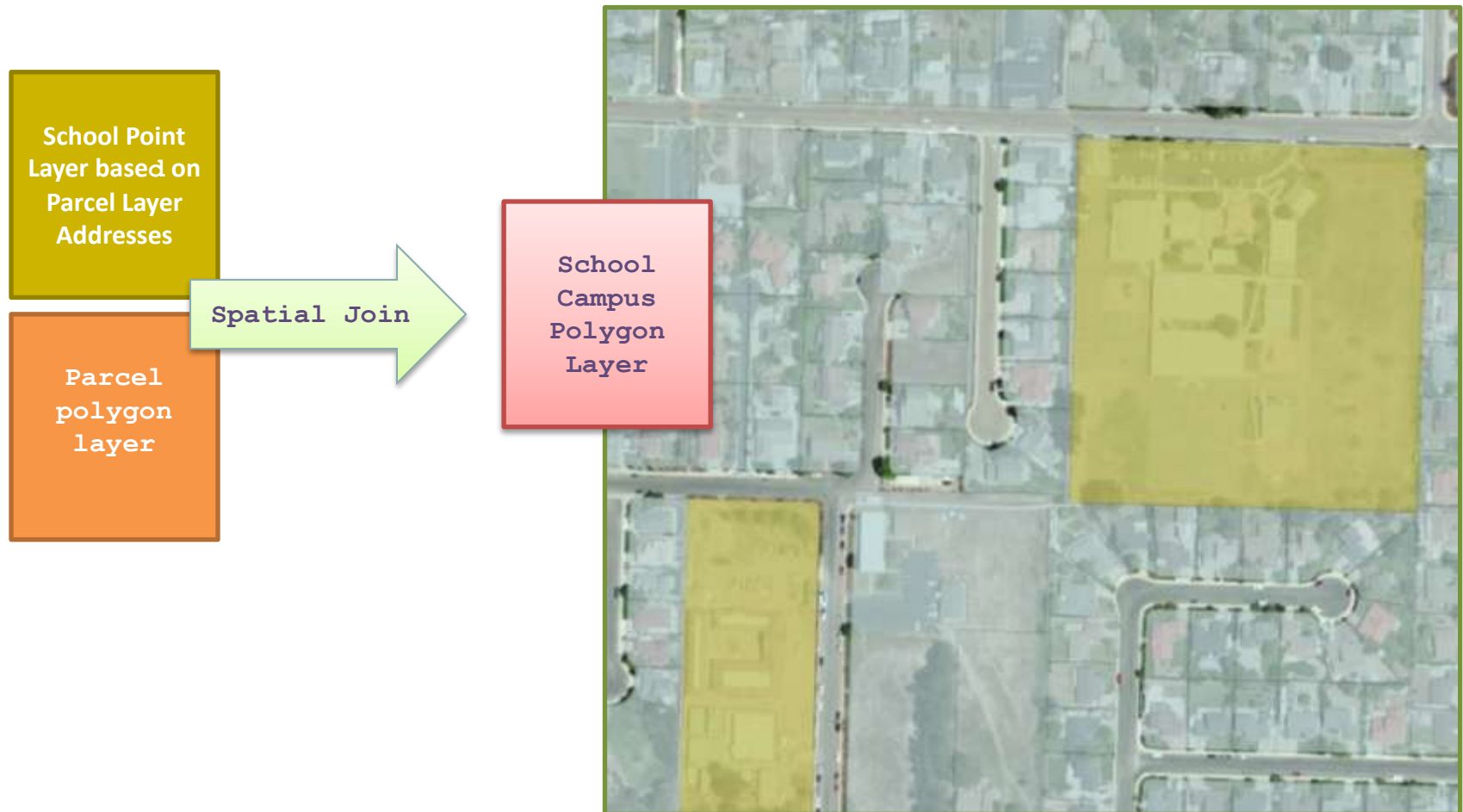
Comparison of Location of School Points to Location of School Campus

Calculate the distance from the school point to the nearest school campus (Analysis Tools: *NEAR*)

Results: 17 points within school campus; 99 points outside of the school campus (Max distance 402 feet, Mean distance 27 feet, Standard Deviation 53 feet)

54 retailers within 1,000 feet of school points

90 retailers within 1,000 feet of school campuses
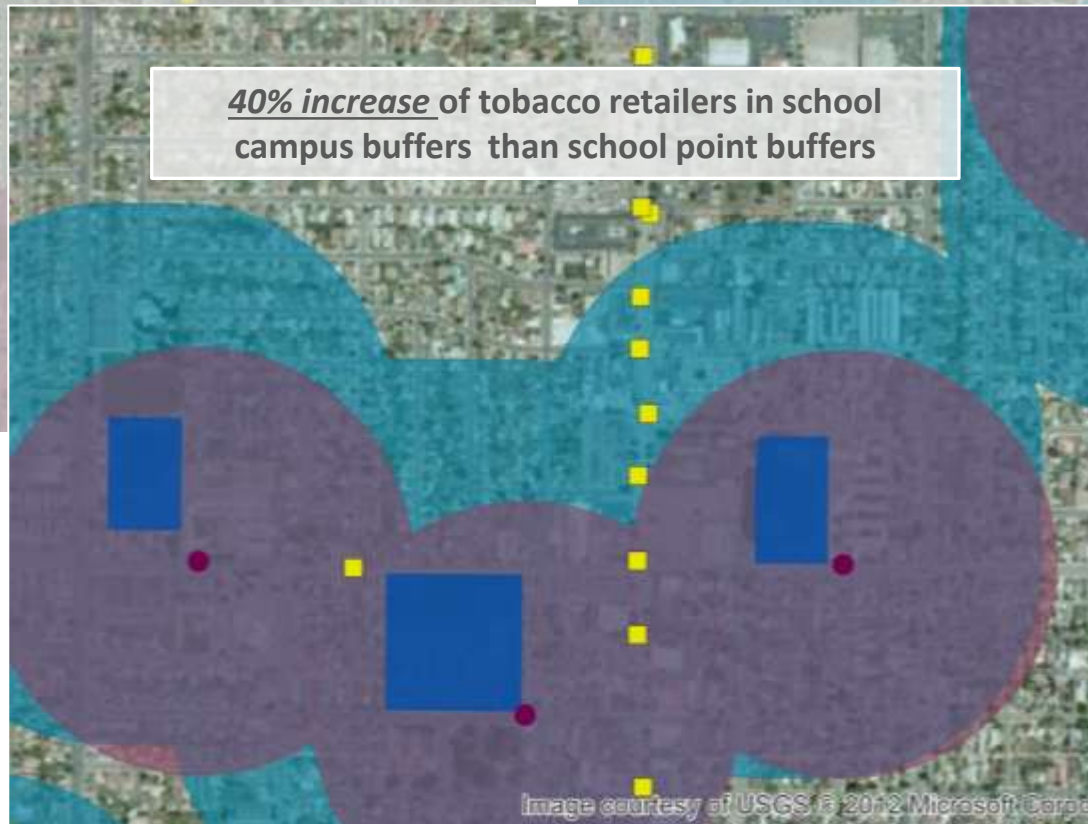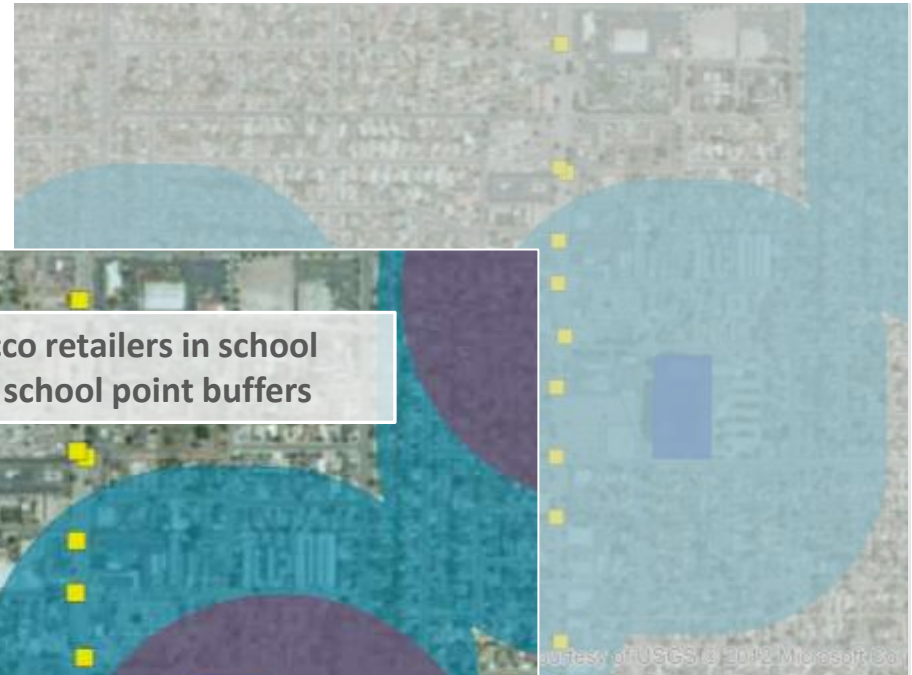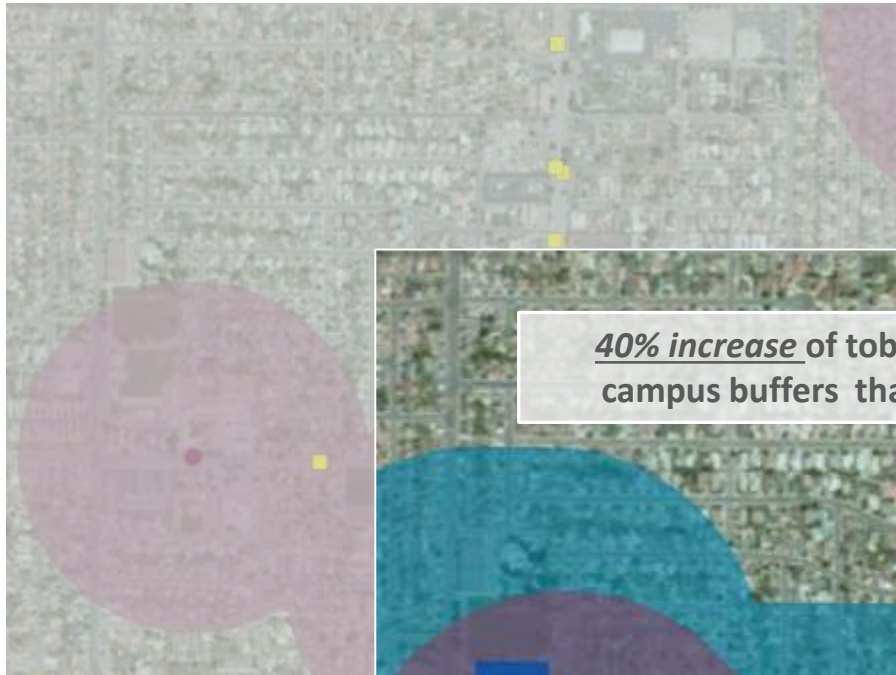
40% increase of tobacco retailers in school campus buffers than school point buffers
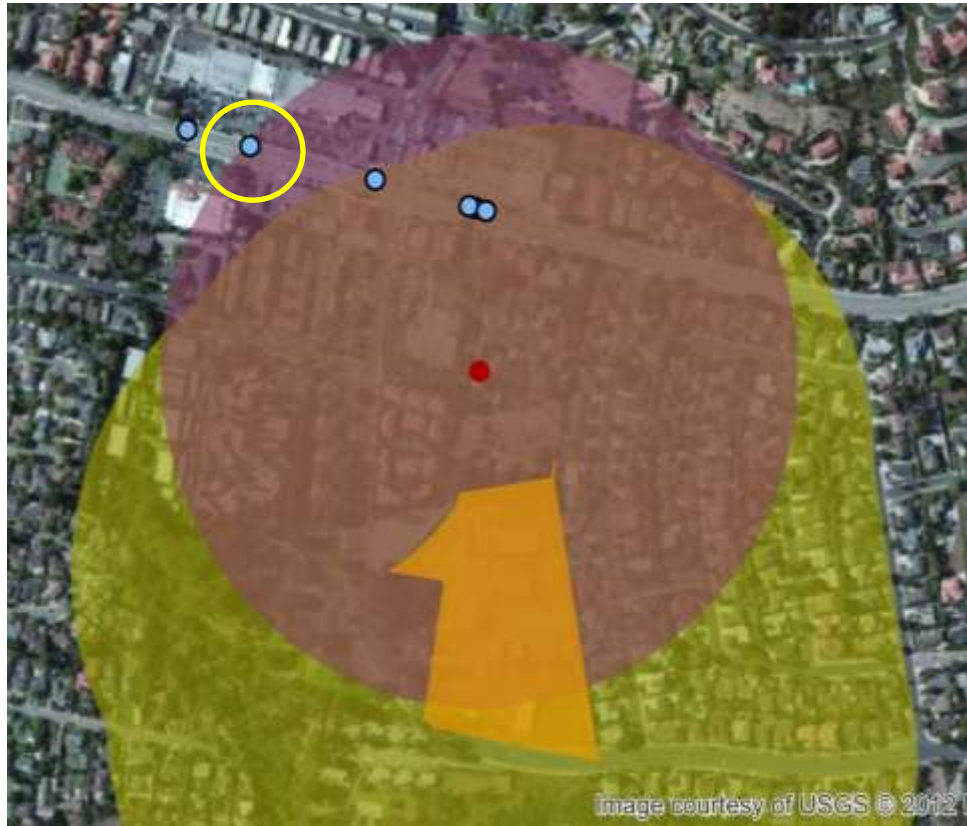
21 Sex Offenders within 2,000 feet of school points

27 Sex Offenders within 2,000 feet of school campuses
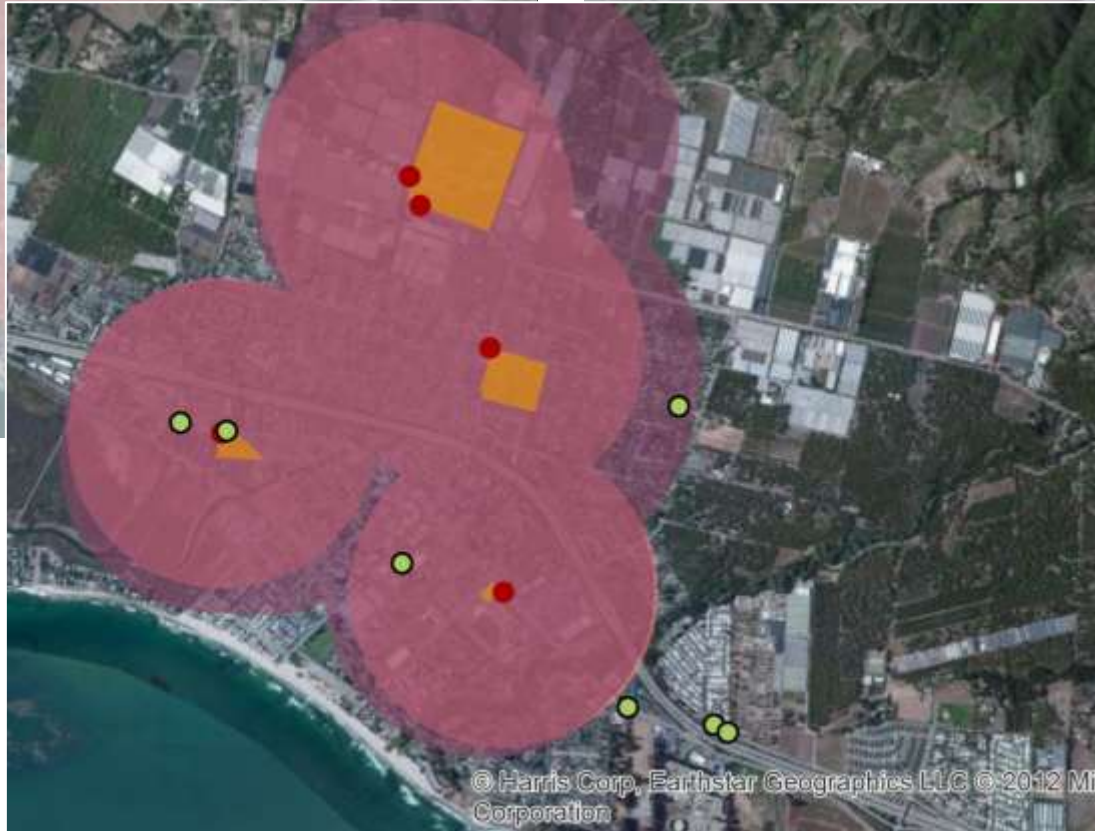
- Using a school point for analysis of occurrences at a set distance from a school can result in 'false positives'

- Both use cases located occurrences within the school point buffer that were actually at a greater distance from the school campus.

Occurrences within school point buffer but not school campus extent: 5 Tobacco Retailers, 1 Sex Offenders
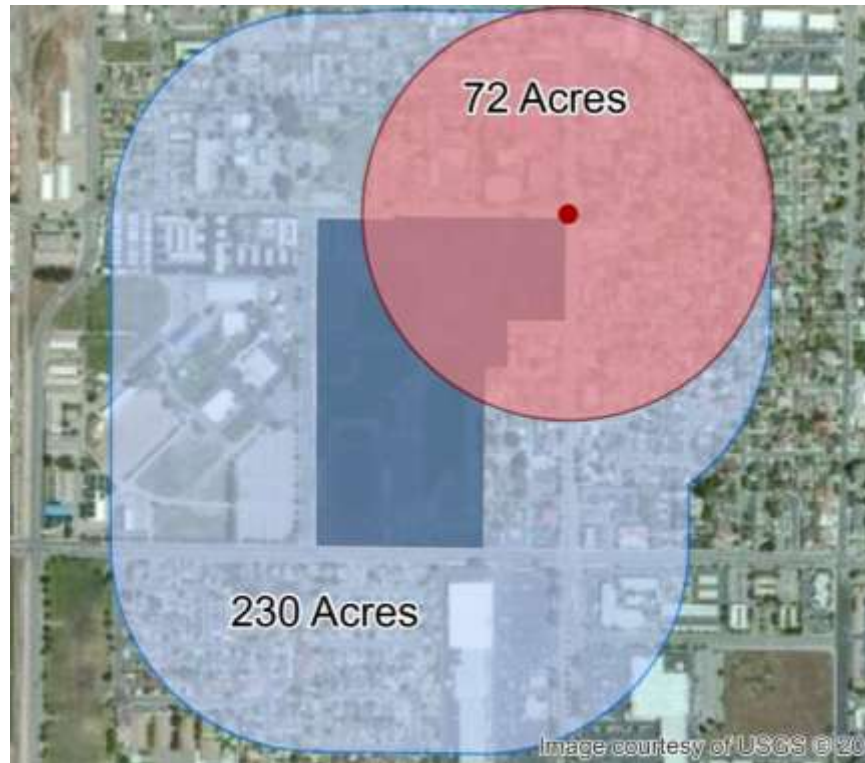
- Area differences between school point buffer and school campus buffer

    1,000 foot school point buffer = 72 acres
    1,000 foot school campus buffer = 160 mean acres (maximum 888 acres & minimum 79 acres)

    2,000 foot school point buffer = 288 acres
    2,000 foot school campus buffer = 446 mean acres (maximum 1,500 acres & minimum 302 acres)

Questions?