

# Analyzing Spatiotemporal Patterns and Marketing a Changing Community

Presented By:

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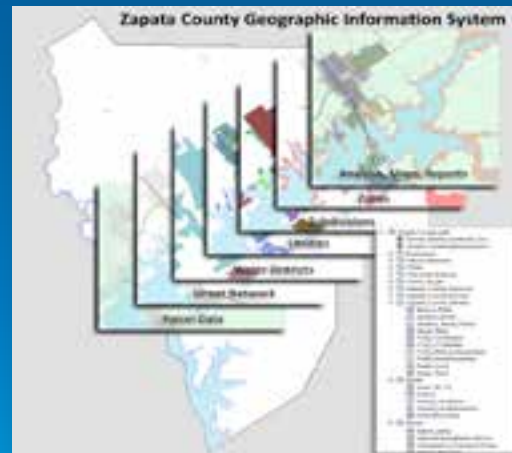
Sustainable Development and Humanitarian Affairs

# Content

- q Zapata Economic Development Center (ZEDC)
  - q Lack of infrastructure for spatial data
    - q ZEDC's Countywide GIS
- q Concepts and Agendas for Sustainable Development
  - q Study Area
    - q Methods
    - q Results
  - q Discussion

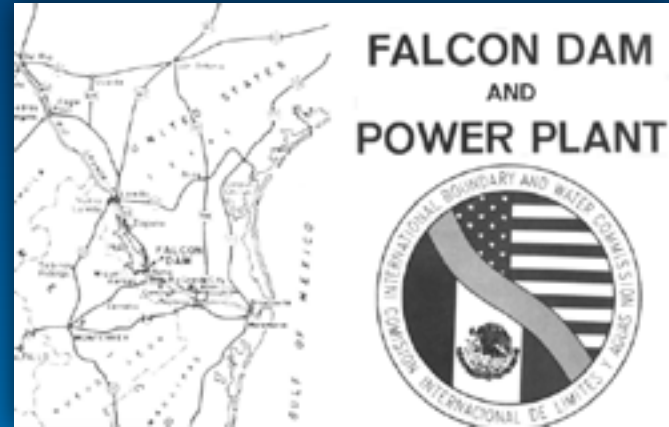
# Introduction

- ✓ Lack of Spatial Data Infrastructure
  - ✓ Record As-Builts
  - ✓ Spatial Cognition
- ✓ ZEDC Countywide GIS



# Introduction

- ✓ Falcon Lake
- ✓ Local and Regional Economy



Falcon Lake  
Zapata, Texas



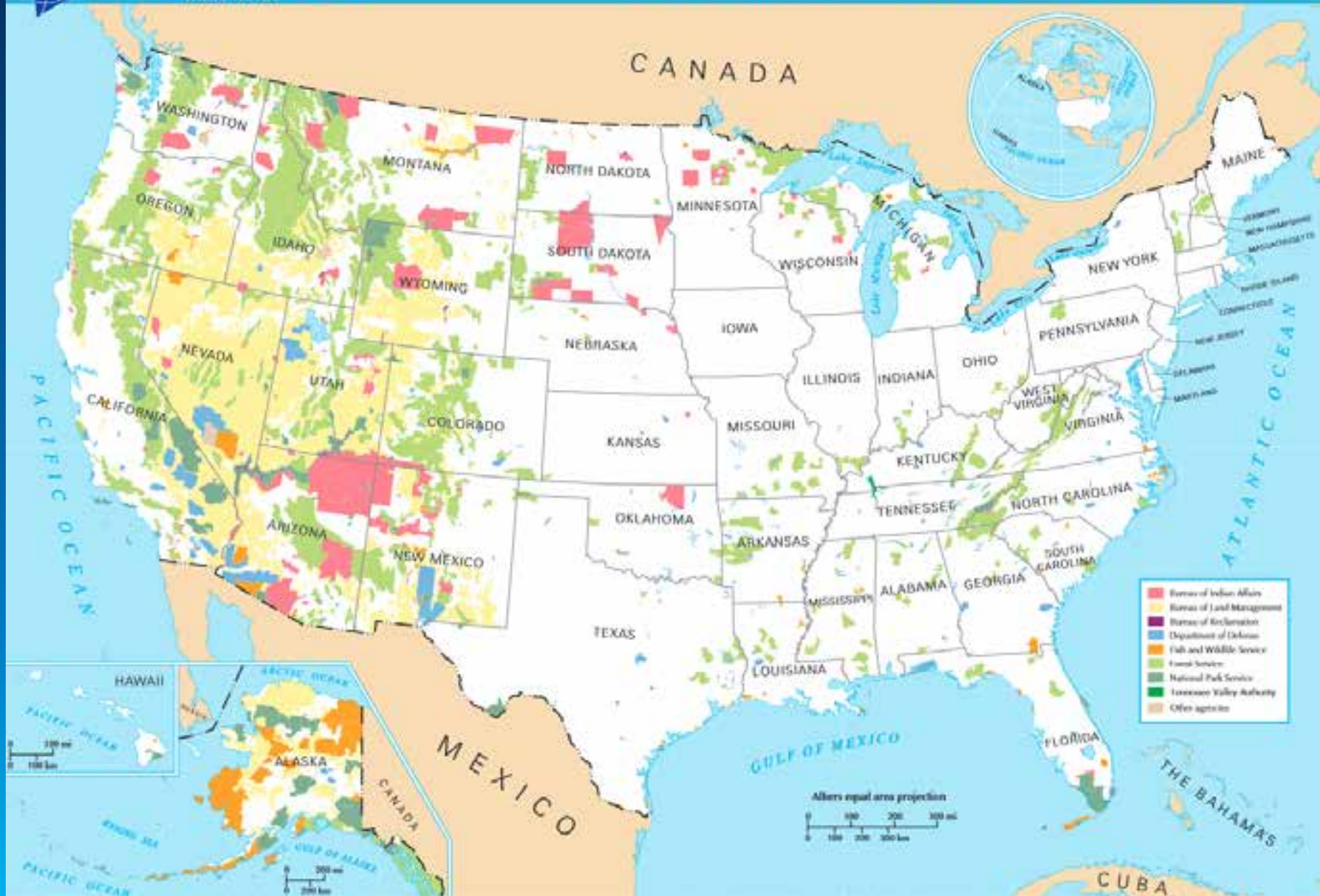
# Introduction

## Sustainable Development

“Sustainable development is the balance of meeting humankind’s present needs while protecting the environment to ensure the fulfillment of future generations’ needs.” (ESRI, 2014)

- ✓ Texas Local Government Code, Section 231.172
- ✓ ICLEI (International Council for Local Environmental Initiatives)
- ✓ Agenda 21 - United Nations (UN) Rio Earth Summit in 1992. Attended by U.S. President George Bush, Sr. and leaders from 178 other nations
- ✓ the President’s Council on Sustainable Development by President Clinton’s executive order in 1993
- ✓ President Obama’s Federal Leadership in Environmental, Energy, and Economic Performance through executive order in 2009





# Study Area

- Zapata County
- South Texas
- Rio Grande
- Falcon Lake

Zapata County has a population of just over 14,000 and covers approximately 677,000 acres of land and about 61 square miles of water



## Study Area

- "BASSMASTERS 100 Best Bass Lakes" in the United States in 2012
- Zapata County is a destination for eco-tourism especially in the areas of Fishing, Hunting, and Birding
- pronounced Hispanic culture of music, art, and history with the neighboring town of San Ygnacio within the county being the oldest in Texas and home to nationally recognized historic buildings

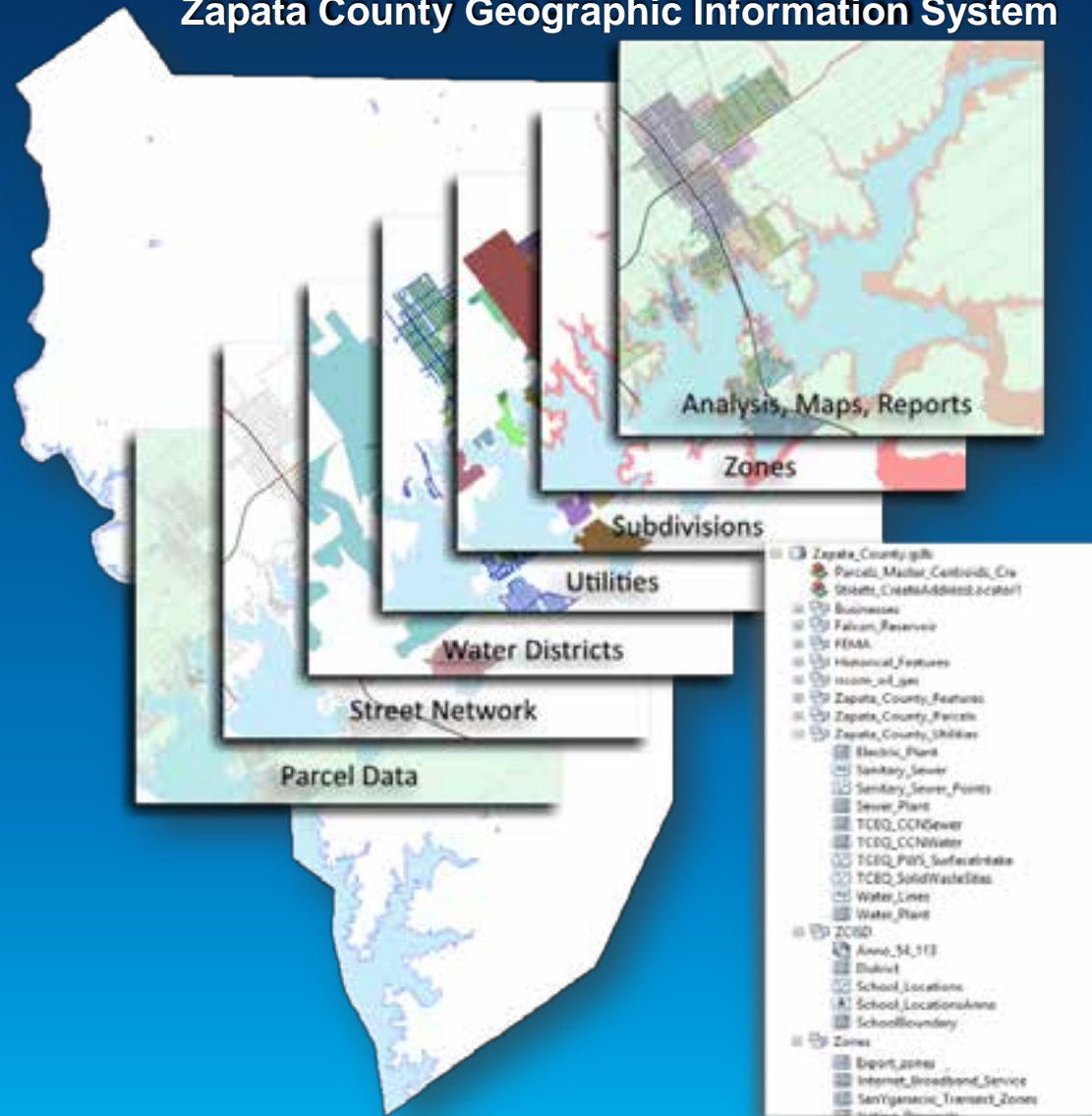




# Methods

- Implementation of a countywide GIS using ESRI's ArcMap 10.1
- Using data pertaining to areas of development, economic growth, and patterns in tourism

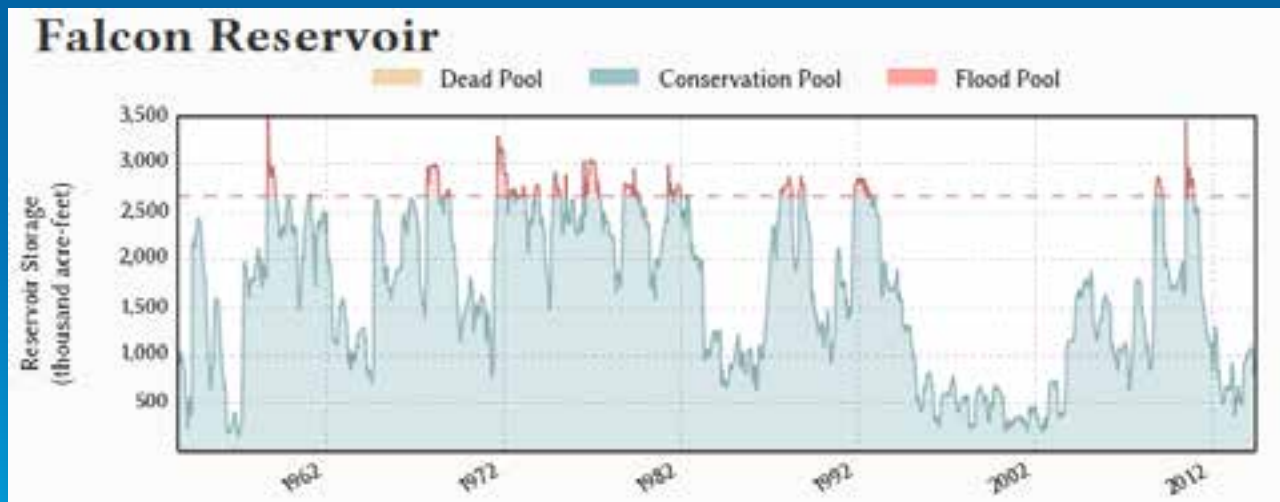
## Zapata County Geographic Information System



# Methods

## Falcon Reservoir

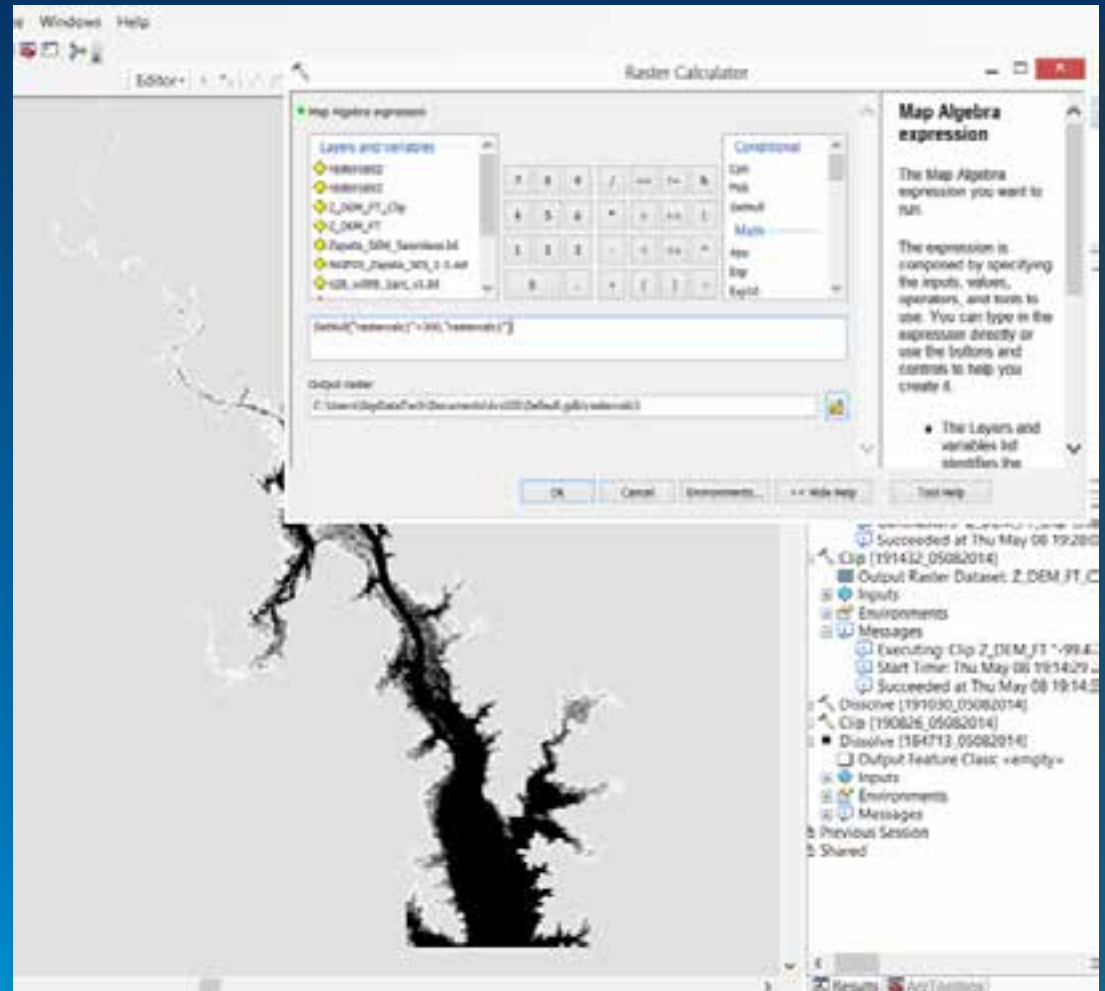
The geometrical transformation which occurs is that of size and form affecting the fishery and other lake activities. Spatial relationships among other objects may also change as a consequence (Yeung and Lo, 2002). Beginning the analysis pertaining to Falcon Reservoir and the local tourism economy consisted of the determination of the limits and occurrences of lake level fluctuations.



# Methods

## Falcon Reservoir

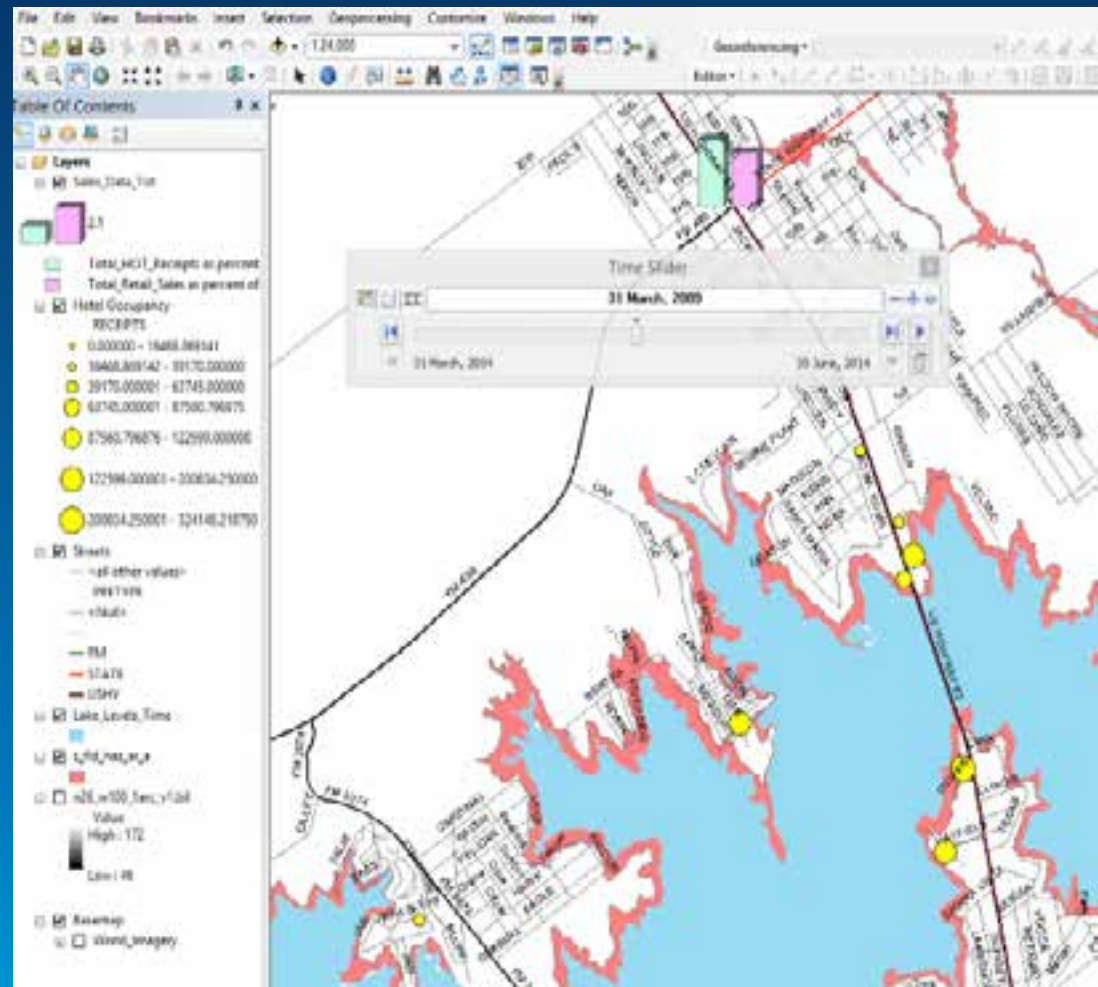
- Extract pertinent elevation range from digital elevation model
- Generate contours
- Generate generalized polygons representing lake levels
- Include date attribute for time aware layer



# Methods

## Falcon Reservoir

- Hotel revenue data is associated with the locations of corresponding hotels
- Point features with hotel revenue and date attributes are quantified with graduated symbols
- Total Hotel Receipts and Total Retail Sales are normalized by the percent of Totals symbolized with a Column Chart



[View Time Animation](#)

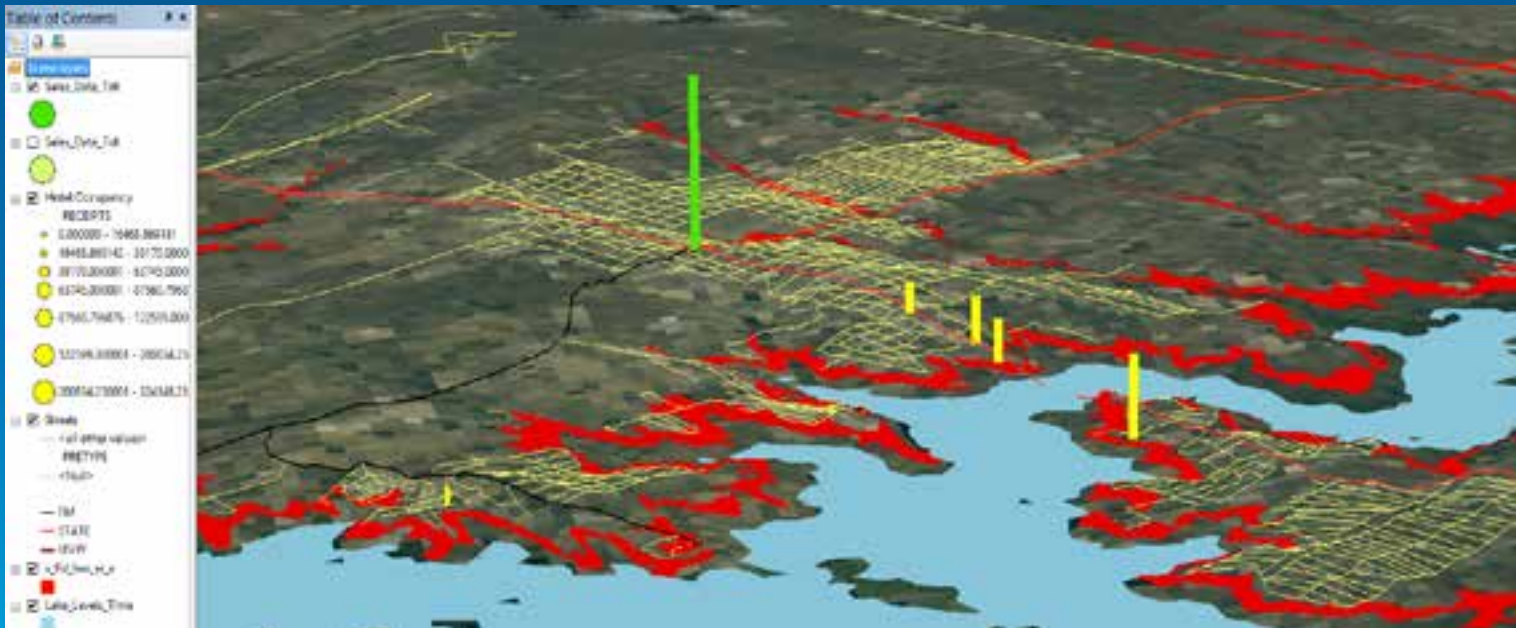


# Methods

## Falcon Reservoir

- ArcScene is used for 3D visualization using a DEM as a base layer
- The hotel receipts data are now shown as bars rising vertically from the base elevation as graduated symbols

[View ArcScene Animation](#)





# Methods

## Publish Spatial Data

- ArcGIS online is used to create an online geoportal with access to a variety of highly focused special purpose maps
- Increase awareness of available community assets, development constraints, and economic activity
- Comprehensive local business locations
- Voting districts
- FEMA flood zone areas
- Platted subdivisions
- County garbage pickup
- School locations and boundaries.



# Results

## GIS Implementation

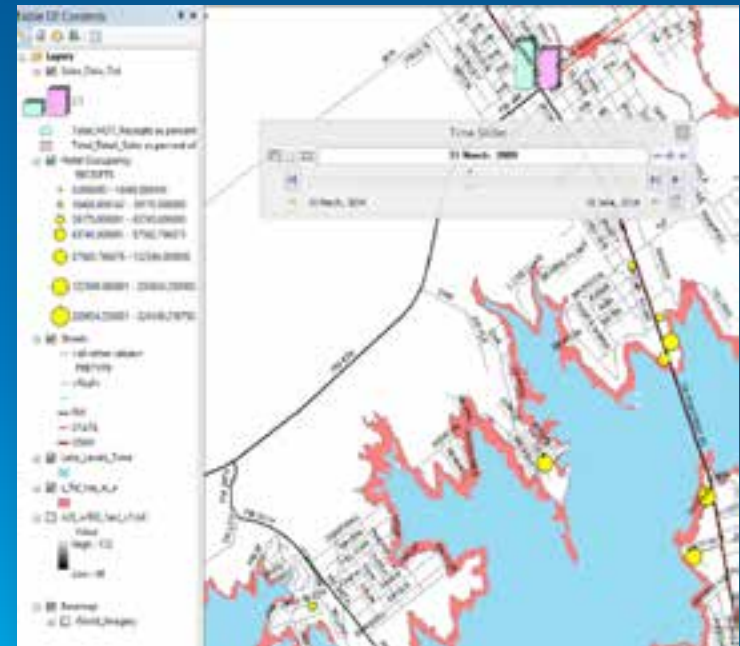
- Effectiveness of the GIS implemented.
- Challenges / Constraints
- Data Availability



# Results

## Lake Level Fluctuation and Revenues Analysis

- Does not show that sales directly correlate with the rise and fall of lake levels
- The relationship of hotel receipts and retail sales with fluctuations in the reservoir levels shows that when the lake rises and is relatively constant, revenues are generally higher



# Results

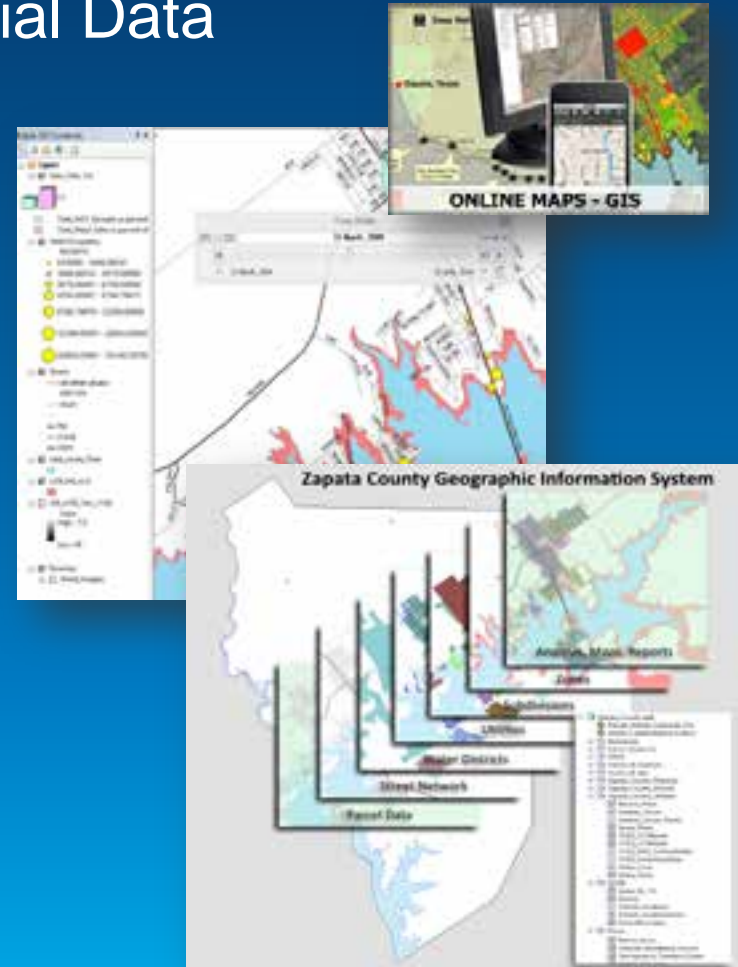
Publishing and Sharing Spatial Data

- ArcGIS Online
- Presentations
- Public
- Local Government



# Results / Discussion

- Publishing and Sharing Spatial Data
- Visualization
- Site Selectors
- Time Animation
- Economic and Sustainable Development





# End

- Thank you for your time!
- Questions?