Spatial Analytics for Teaching in Business and Retail Geography

Murray D. Rice
Associate Professor, Location Intelligence
Department of Geography and the Environment
University of North Texas

www.murrayrice.com

Talk Overview

- Challenging Students to Learn Spatial Analytics
- How I Bring Spatial Analytics into the Classroom
- Benefits of a Hands-On Approach
- Brief Spatial Analytics Demonstration

Challenging Students to Learn

- I am mid-stream in the development of a modest suite of courses providing a broad and cumulative background in spatial analytics and geographic reasoning
- *Goal:* challenge my students to link spatial analytics concepts and methodologies with real-world challenges faced by practitioners
- *Defining feature:* theory grounded by application

Challenging Students to Learn

- Overview of spatial analytics in my teaching program (current and planned):
  - *GEOG 3100: US and Canada – Cities, Economies, and Sustainability.* Current gateway course to spatial analytics framed within the broad context of the North American economy: taught as such since 2014.
  - *GEOG 4220: Applied Retail Geography.* Integration of retail concepts and spatial analytics: taught in current format since 2011.
  - *GEOG 4230: Location Intelligence – Business GIS Concepts and Applications.* GIS applied to industry-specific issues (retail, real estate, manufacturing, transportation, and insurance): new spatial analytics course I am proposing for introduction in 2017.

Challenging Students to Learn

- Applied Retail Geography course: spatial analytics applications are important, but not the sole focus
- The majority of time in this course explores a set of ideas that develop a foundational understanding of the retail environment:
  - Site selection
  - Market analysis
  - Retail growth strategies
  - The interface between retail business activity and cities at multiple geographic scales (from local to national)

Challenging Students to Learn

- To balance our conceptually-oriented classroom discussions, I introduce GIS-based applied exercises midway through the semester
  - *Aim:* have the students gain experience with putting retail concepts into practice with field observations and analytics
- I also ask my students to use their emerging GIS skills in their group-based semester research project, due at the end of the course

How I Bring Analytics into the Classroom

- My aim with the use of analytics is to draw a close connection between the <u>conceptual component</u> of my business location teaching and <u>GIS skills</u>
  - Building this link emphasizes that the ideas taught in my classroom are <u>directly relevant to business careers</u> (not just "good things to know")
- In my instructional context, to do this well it is important to use software that is <u>capable but not overly complex</u>
  - Some students with previous GIS coursework, others with none (difficult balance to teach to)
- I currently use Esri's *Business Analyst Online* (BAO) cloud software

How I Bring Analytics into the Classroom

- I use BAO for my retail class because it is
  - 1. <u>Accessible</u> (not difficult to learn), which is important since my class has a broad mix of student backgrounds
  - 2. <u>Flexible</u> (because it is cloud-based), enabling students to use it in our classroom analysis sessions but also outside of our class time
    - More time on the software = More learning
  - 3. <u>Bundled with rich datasets</u>, covering general, census-based demographics but also more specialized data offerings including
    - Business locations
    - Purchase behaviors
    - Street traffic-volume data

How I Bring Analytics into the Classroom

- Other GIS/analytics packages support hands-on learning in different ways and are worthy of consideration
- Any of the following might be a good fit for you, depending on your course objectives, student needs, and available resources
  - 1. Esri *Business Analyst Desktop*
  - 2. *Alteryx*
  - 3. *MapInfo*
  - 4. Caliper's *Maptitude* and *TransCad*
  - 5. *QGIS* (Open Source)
  - 6. Trade Area Systems *TAS Online*, *TAS Analyst*, and *TAS Mobile*
  - 7. Forum Analytics *SIMMS Online*

Benefits of a Hands-On Approach

- Use of spatial analytics in classwork reinforces to the students the connection between <u>theory</u> and <u>application</u>
- GIS work in my class requires the students to <u>place their conceptual understanding of business within real-world situations</u> that demand the kind of answers that our alumni provide in their careers
- My graduates indicate that the software they use in my class is also important in their work
  - The introduction to business GIS applications they gain in the classroom is on-target career preparation
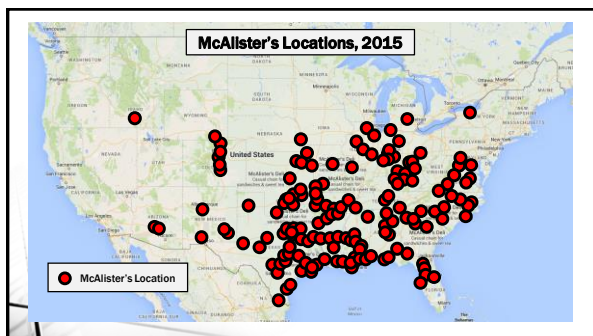
A Brief Spatial Analytics Demonstration

A Simple Application of BAO Spatial Analytics in Combination with Market and Site-Based Field Observation

Spatial Analytics Demonstration

- This sample exercise places the student in a specific scenario: location analyst for *McAlister's Deli*, a restaurant chain with locations mostly in the southern and central United States (but growing)

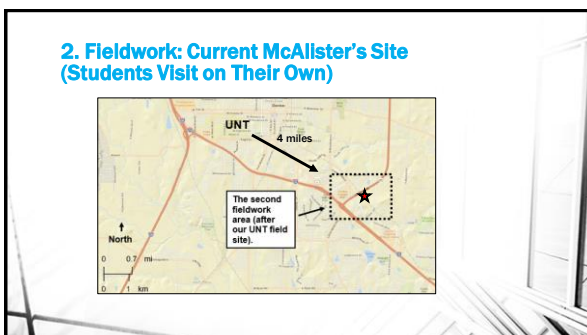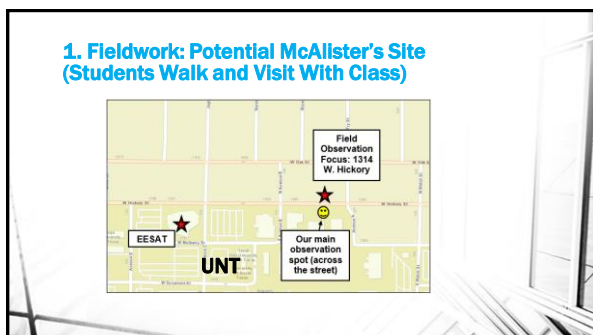McAlister's Locations, 2015

Spatial Analytics Demonstration

- The exercise includes two major components
  - 1. Fieldwork: observation of potential and current McAlister's sites in the D-FW metroplex
    - Reinforce that this is a real situation, with actual sites and markets being analyzed
    - Students personally gather crucial location data that they need to consider in combination with market data gained from secondary sources

Spatial Analytics Demonstration

- The exercise includes two major components
  - 2. GIS analysis: metropolitan (Dallas-Fort Worth) and local (Denton, a suburban city within D-FW, and the location of my institution)
    - Introduce students to GIS capabilities in a familiar geographic context
    - Provide students with experience in doing specific analytical tasks

1. Fieldwork: Site Survey Instrument

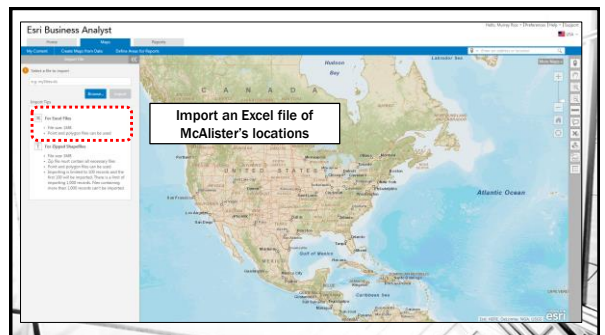Site Survey Form courtesy of one of my restaurant industry partners

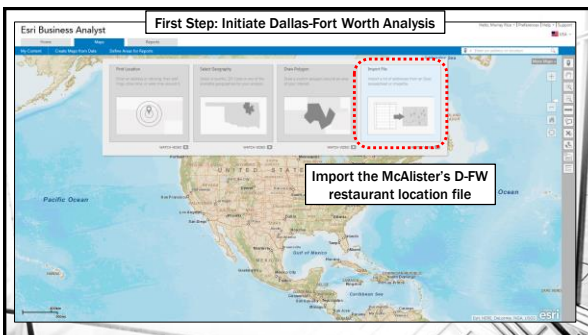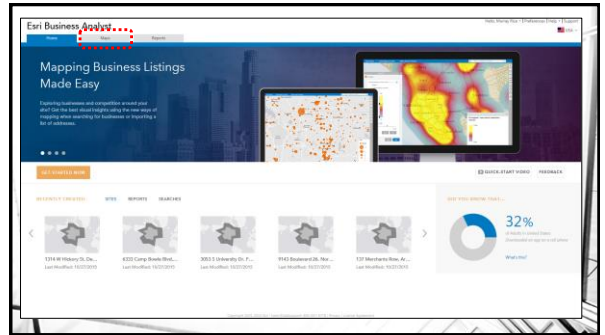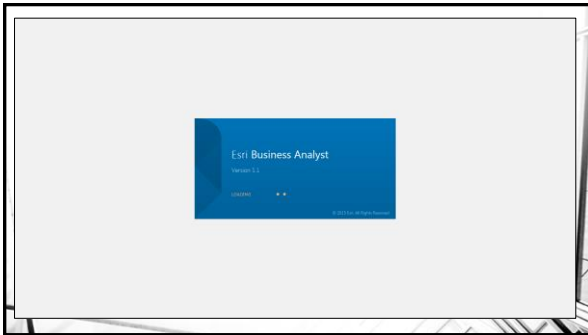## 1. Fieldwork: Potential McAlister's Site (Students Walk and Visit With Class)

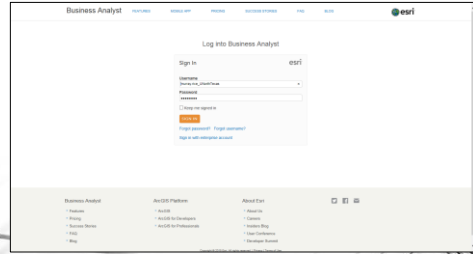## 2. Fieldwork: Current McAlister's Site (Students Visit on Their Own)
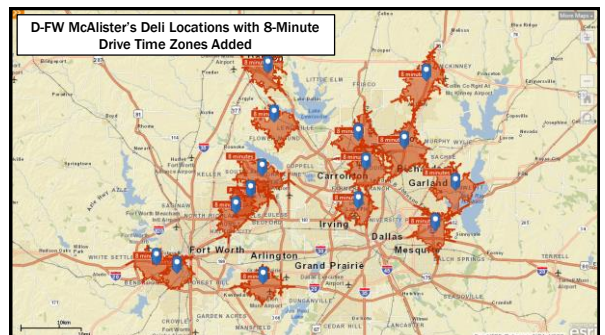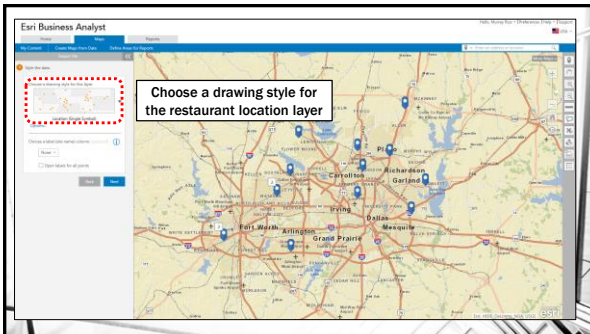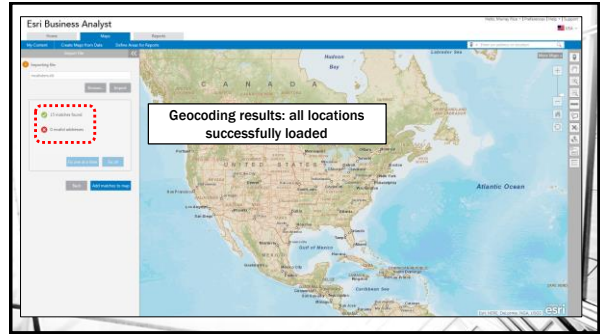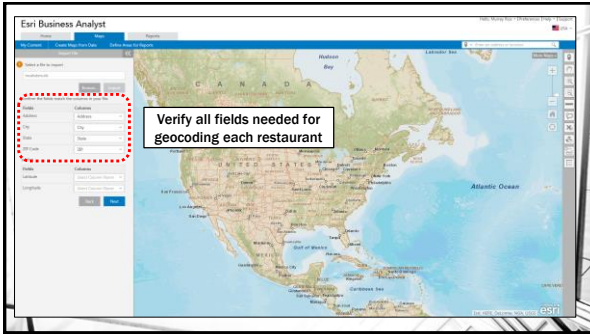
2. Fieldwork: Current McAlister's Site (Students Visit on Their Own)
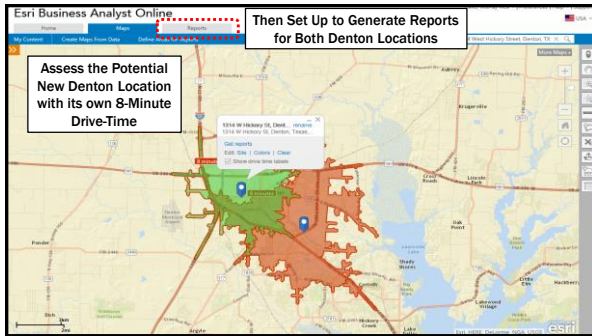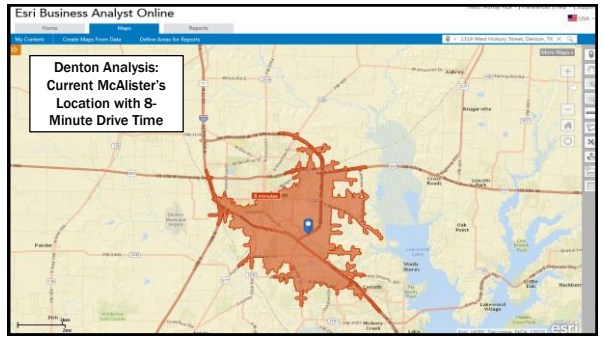
A dynamic regional retail cluster:
- Next to Target, Home Depot
- Nearby big box complex: Best Buy, Michael's, TJ Maxx, Sports Authority
- Close to Golden Triangle Mall
- Many nearby restaurants (fast food, fast casual)
- Close to I-35E, light rail public transit

3. GIS Analysis: Use Esri's Business Analyst Online (BAO)

First Step: Initiate Dallas-Fort Worth Analysis

Import the McAlister's D-FW restaurant location file

Import an Excel file of McAlister's locations

4

Verify all fields needed for geocoding each restaurant

Geocoding results: all locations successfully loaded

Choose a drawing style for the restaurant location layer

Choose to add Market Area Zones to the Map

Define Market Areas as 8-minute Drive Time Zones

D-FW McAlister's Deli Locations with 8-Minute Drive Time Zones Added

Next Step: Assess the Expansion Possibility in Denton (field work site)

Denton Analysis: Current McAlister's Location with 8-Minute Drive Time

Then Set Up to Generate Reports for Both Denton Locations

Assess the Potential New Denton Location with its own 8-Minute Drive-Time

Generate Restaurant Market Potential Reports: Current & Potential Sites (8-Minute Drive Time Zones)
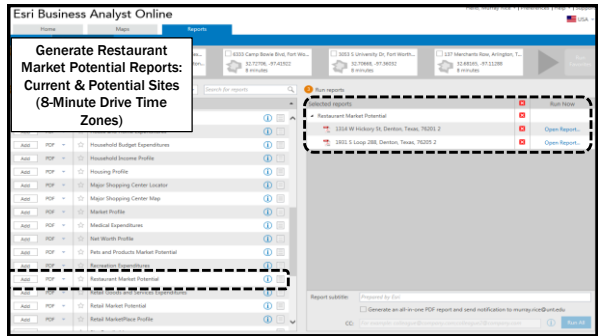
Restaurant Market Potential Reports for both Denton Locations (Current and Proposed)

4. Assessment and Decision

Evaluate all primary & secondary evidence (informed by class concepts), make the final business location recommendation

Fieldwork Observations

GIS Map-Based Analysis

GIS Analysis-Based Reports

Summary

- I follow a cumulative approach to teaching spatial analytics
  - 1. Establish motivation and interest in an analytical approach (broad scenario, problem, and issue-based discussion)
  - 2. Conceptual development (specific business & geography ideas, perspectives, and ways of thinking/observing the world)
  - 3. Emphasis on GIS/spatial analytics (but tied directly to application)
- This general approach holds for my individual course plans and the overall sequence of courses I am building
- Within all of this, I recommend hands-on project work with a wide range of real-world data and relevant software

Thanks for Listening

- Feel free to follow up
  - **Email:** rice@unt.edu
  - **Web:** www.murrayrice.com
  - **Twitter:** @murrayrice