Visitation: Recreation and Tourism Model

Shuang Feng

Florida State University, Center for Economic Analysis and Forecasting

May 02, 2017
Visitation: Recreation and Tourism Model

- Supporting Ecosystem Services
- Final Ecosystem Services
  - Visitation: Recreation and Tourism
Outline

• Introduction
  • Services
  • Area of interest (AOI)
  • Purpose
• Model
  • Linear Regression
• Data
  • Photo - User - Days
  • Predictor Variables
• Data Statistics
• Results
• Interpretation and Preliminary Conclusion
Introduction

Services

The services provided by recreation and tourism

- Important components of national and local economies
- Contribution to quality of life
Introduction

• Area of interest (AOI): Pellicer watershed and Its tributaries
• Purpose: To quantify the value of the AOI and predict the spread of person-days of recreation
• Scenario: How future changes to natural features will alter visitation rates
Model

Linear Regression

\[ y_i = \beta_0 + \beta_1 x_{i1} + \cdots + \beta_{p-1} x_{ip-1} + \beta_p x_{ip}, \quad i = 1, \ldots, n \]

\( y_i \): empirical data on visitation for part \( i \) in the AOI

\( x_{ip} \): predictor \( p \) of land use (LU) type for part \( i \) in the AOI
Model
Assumptions and Simplifications

- People’s responses to attributes that serve as predictors in the model will not change over time.
- The model does not presuppose that any predictor variable has an effect on visitation.
- The model estimates the magnitude of each predictor’s effect based on its spatial correspondence with current visitation in the area of interest.
Data

- Empirical data on visitation $y_i$
  - Photo-User-Days (PUD) of recreation and tourism, based on the locations of natural habitats, accessibility.
  - A crowd-sourced measure of visitation: *geotagged* photographs posted to the website *flickr* (2005-2014)
  - Data are available as the results of the regression
Data

- **Predictor Variables**
  - **Selection:**
    - natural capital (e.g. habitats, lakes)
    - built capital (e.g. roads, hotels)
    - industrial activities
    - access or cost (e.g. distance to major airport)
  - **Scenario Analysis:** a set of modified predictors that represent a future or alternative scenario (e.g. modified road networks, additional hotel points, altered habitat distributions, etc)
Data

• Predictor Variables

Visit Florida: Research FAQ

• Do most visitors come to Florida by car or plane?
• How many nature parks are in Florida?
• What activities do Florida visitors participate in the most?
• How many hotel rooms are in Florida?
Data

- Predictor Variables
  1. Major highways: I-95, Palm Coast Pkwy, Hammock Dunes Bridge, Matanzas Woods Pkwy, Moody Blvd, US 1/SR 5, and US 1
  2. Airports: Flagler County and St. Johns County
  3. Parks and recreational facilities
  4. Salt marshes habitat
  5. Swimming beaches:
  6. Hotels
Data Statistics

Visitation
Data Statistics

Visitation

Average Annual Photo User Days

<table>
<thead>
<tr>
<th>Location</th>
<th>User Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pellicer Creek</td>
<td>17</td>
</tr>
<tr>
<td>Pellicer Creek-Big Mulberry Branch Frontal</td>
<td>139.75</td>
</tr>
<tr>
<td>Pringle Branch</td>
<td>2</td>
</tr>
<tr>
<td>Stevens Branch</td>
<td>5.25</td>
</tr>
</tbody>
</table>
Data Statistics

Visitation

Average Monthly Photo User Days

- Pellicer Creek
- Pellicer Creek-Big Mulberry Branch Frontal
- Pringle Branch
- Stevens Branch
Data Statistics
Predictor Variables
## Data Statistics

### Predictor Table

<table>
<thead>
<tr>
<th>id</th>
<th>path</th>
<th>type</th>
</tr>
</thead>
<tbody>
<tr>
<td>habitats</td>
<td>saltmarshes.shp</td>
<td>polygon_area_coverage</td>
</tr>
<tr>
<td>rds</td>
<td>main_hwy.shp</td>
<td>line_intersect_length</td>
</tr>
<tr>
<td>hotels</td>
<td>hotel.shp</td>
<td>point_count</td>
</tr>
<tr>
<td>airdist</td>
<td>airports.shp</td>
<td>point_nearest_distance</td>
</tr>
<tr>
<td>beach</td>
<td>swimbeach.shp</td>
<td>polygon_area_coverage</td>
</tr>
<tr>
<td>park_rf</td>
<td>park_rf.shp</td>
<td>point_count</td>
</tr>
</tbody>
</table>

- **Units**: Maps/Display (Meters)
### Results

<table>
<thead>
<tr>
<th>Predictor $p$</th>
<th>Pellicer Creek</th>
<th>Pellicer Creek-Big Mulberry Branch</th>
<th>Pringle Branch</th>
<th>Stevens Branch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Highways</td>
<td>0.233</td>
<td>0.088</td>
<td>0.008</td>
<td>0.152</td>
</tr>
<tr>
<td>Airports</td>
<td>0.082</td>
<td>0.059</td>
<td>0.100</td>
<td>0.075</td>
</tr>
<tr>
<td>Parks and Recreational Facilities</td>
<td>4</td>
<td>33</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Marsh Habitat</td>
<td>0</td>
<td>0.001</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Swimming Beaches</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hotels</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Interpretation and Preliminary Conclusion

- Roads: Length of roads intersecting with watersheds has significant impacts on the visitation of Pellicer Creek and Stevens Branch Watershed.
- Airports: The distance of the nearest airport has positive effects on the visitation of Pringle Branch Watershed. With less disturbance of airports, the number of visitation will increase.
- Parks and recreational facilities: the number of park and recreational facilities is an important driven factor for the development of tourism in Pellicer Creek-Big Mulberry Branch Frontal. One more park or recreational facility can increase the time of visitation dramatically in Pellicer Creek-Big Mulberry Branch Frontal Watershed.
- Hotels: The number of hotels is also a driven factor for the development of tourism in Pellicer Creek-Big Mulberry Branch Frontal.
- Swimming beaches: The overlap area on the map is