Assessing Threats to Publicly Identified Places of Importance

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Introduction to PPGIS

- Public Participation Geographic Information Systems (PPGIS)
- Developed in late 1990’s
- Captures local values, knowledge, and preferences
- Used to identify important places for stakeholders
Project Overview

• Public Participation GIS (PPGIS) survey
• Mail-based survey
• Participants use labeled stickers to identify management preferences and places they think are important for a range of values on a map
Study Area

• Mobile Bay, AL (Baldwin and Mobile counties)
• 4,600 square miles
• Mixed urban and rural landscape
• Variety of terrestrial and aquatic ecosystems
Survey Methodology

• Dillman method
  1. Pre-notice letter
  2. Survey
  3. Reminder postcard
  4. Reminder letter
• 988 surveys sent
• 274 surveys received (30%)
Questionnaire

6 parts

1. Bay knowledge and length of residence
2. Participation in outdoor recreation activities
3. Opinions on a range of wildlife, water, and development issues
4. Satisfaction with a range of regional characteristics
5. A landscape values mapping activity
6. Demographic information
## Mapping Components

<table>
<thead>
<tr>
<th>Value</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cultural Values</strong></td>
<td></td>
</tr>
<tr>
<td>Economic/Livelihood</td>
<td>These places are important to me for the economic benefits they provide,</td>
</tr>
<tr>
<td></td>
<td>such as timber, fisheries, or oil.</td>
</tr>
<tr>
<td>Recreation/Tourism</td>
<td>These places are important to me because they provide outdoor recreation</td>
</tr>
<tr>
<td></td>
<td>or tourism opportunities.</td>
</tr>
<tr>
<td>Historic</td>
<td>These places are important to me because they are a significant part of</td>
</tr>
<tr>
<td></td>
<td>human cultural legacy to me, others, and/or the nation.</td>
</tr>
<tr>
<td>Aesthetic</td>
<td>These places are important to me for the attractive scenery, sights,</td>
</tr>
<tr>
<td></td>
<td>smells, sounds, etc.</td>
</tr>
<tr>
<td><strong>Water Values</strong></td>
<td></td>
</tr>
<tr>
<td>Fish Nursery</td>
<td>These places are important to me because they provide key habitat for</td>
</tr>
<tr>
<td></td>
<td>juvenile fish to mature and support local fisheries.</td>
</tr>
<tr>
<td>Storm Protection</td>
<td>These places are important to me because they provide protection and</td>
</tr>
<tr>
<td></td>
<td>buffering against the effects of hurricanes and storm surge.</td>
</tr>
<tr>
<td>Flood Protection</td>
<td>These places are important to me because they minimize flooding from</td>
</tr>
<tr>
<td></td>
<td>rivers and streams.</td>
</tr>
<tr>
<td>Water Quality Protection</td>
<td>These places are important to me because they filter sediment and remove</td>
</tr>
<tr>
<td></td>
<td>pollutants from water.</td>
</tr>
<tr>
<td><strong>Wildlife Habitat Values</strong></td>
<td></td>
</tr>
<tr>
<td>Black Bears</td>
<td>I would like to see these places maintained for the conservation of black</td>
</tr>
<tr>
<td></td>
<td>bears.</td>
</tr>
<tr>
<td>Manatees</td>
<td>I would like to see these places maintained for the conservation of</td>
</tr>
<tr>
<td></td>
<td>manatees.</td>
</tr>
<tr>
<td>Sea Turtles</td>
<td>I would like to see these places maintained for the conservation of sea</td>
</tr>
<tr>
<td></td>
<td>turtles.</td>
</tr>
<tr>
<td>Wading Birds</td>
<td>I would like to see these places maintained for the conservation of wading</td>
</tr>
<tr>
<td></td>
<td>birds (cranes, herons, egrets, etc.).</td>
</tr>
<tr>
<td><strong>Pollution Threats</strong></td>
<td></td>
</tr>
<tr>
<td>Air Pollution</td>
<td>Please indicate places that you believe threaten air quality.</td>
</tr>
<tr>
<td>Water Pollution</td>
<td>Please indicate places that you believe threaten water quality.</td>
</tr>
<tr>
<td><strong>Development Preferences</strong></td>
<td></td>
</tr>
<tr>
<td>No Development</td>
<td>Please indicate places where you think any future development should</td>
</tr>
<tr>
<td></td>
<td>be prohibited.</td>
</tr>
<tr>
<td>Residential Development</td>
<td>Please indicate places where you think residential development could</td>
</tr>
<tr>
<td></td>
<td>occur with a well-designed plan.</td>
</tr>
<tr>
<td><strong>Special Places</strong></td>
<td></td>
</tr>
<tr>
<td>Special Places</td>
<td>Use these dots to identify up to 3 of your special places. Please</td>
</tr>
<tr>
<td></td>
<td>remember to write your reason why these places are special in the</td>
</tr>
<tr>
<td></td>
<td>survey booklet.</td>
</tr>
<tr>
<td>Places You Dislike</td>
<td>Use these dots to identify up to 3 places that you dislike. Please</td>
</tr>
<tr>
<td></td>
<td>remember to write your reason why you dislike these places in the</td>
</tr>
<tr>
<td></td>
<td>survey booklet.</td>
</tr>
<tr>
<td>Most Recent Recreation Trip</td>
<td>Use this dot to identify the location of your most recent recreation trip</td>
</tr>
<tr>
<td></td>
<td>in the Mobile Bay region.</td>
</tr>
</tbody>
</table>
PPGIS Mapping Exercise

- Example completed map
- 87 possible points
- 24 x 36 in.
- Scale: 1:150,000

- Results from 242 respondents
- 11,391 points
- Mean: 47.07 points per respondent
Respondent Demographics

- Gender: 64% male, 30% female
- Race: 91% White/ Caucasian, 7% Black/ African American, 1% Native American, 0% Asian
- Education: 98% high school degree, 48% bachelor’s degree, 21% graduate or professional degree
- Retired: 41% yes, 59% no
- Year of birth: mean = 1956
- County: Baldwin 43.22%, Mobile 56.78%
Respondent Demographics

- Income for 2011:

<table>
<thead>
<tr>
<th>Income Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $14,999</td>
<td>4%</td>
</tr>
<tr>
<td>$15,000 to $19,999</td>
<td>4%</td>
</tr>
<tr>
<td>$20,000 to $24,999</td>
<td>5%</td>
</tr>
<tr>
<td>$25,000 to $34,999</td>
<td>10%</td>
</tr>
<tr>
<td>$35,000 to $49,999</td>
<td>16%</td>
</tr>
<tr>
<td>$50,000 to $74,999</td>
<td>22%</td>
</tr>
<tr>
<td>$75,000 to $99,999</td>
<td>13%</td>
</tr>
<tr>
<td>$100,000 to $149,999</td>
<td>15%</td>
</tr>
<tr>
<td>$150,000 or more</td>
<td>12%</td>
</tr>
</tbody>
</table>
Kernel Densities

Aesthetic

Black Bears

Legend

Aesthetic Kernel Density

Legend

Kernel density

0 - 0.225
0.225 - 0.447
0.447 - 0.677
0.677 - 0.907
0.907 - 1.138

Legend

Kernel density

0 - 0.225
0.225 - 0.447
0.447 - 0.677
0.677 - 0.907
0.907 - 0.907
Kernel Densities

Wading Birds

Development

Legend
Wading Birds Kernel Density
0.0 - 0.223
0.223 - 0.447
0.447 - 0.885
0.885 - 2.205

Legend
Kernel Density
0.0 - 0.223
0.223 - 0.447
0.447 - 0.885
0.885 - 1.962
Kernel Densities
Kernel Densities
Kernel Densities

Fish Nursery

Air Pollution
Kernel Densities

Places I Dislike

Legend
Kernel density
0 - 0.223
0.223 - 0.447
0.447 - 0.67
0.67 - 0.983
0.983 - 2.35

Water Quality Protection

Legend
Water Quality Kernel Density
1 - 323
323 - 647
647 - 992
992 - 1503
1503 - 2453
Kernel Densities

Recreation

Storm Protection
Kernel Densities
Kernel Densities

Water Pollution

Most Recent Recreation Trip
Kernel Densities

- Kernel densities greater than or equal to 0.67 are considered to be significant hotspots for each item
Publicly Identified Pollution Threat
Pollution Threat

Pollution Threat to Aesthetic

Legend
- Orange: Pollution not threatening aesthetic
- Red: Pollution threatening aesthetic
- Green: Aesthetic not threatened by pollution

Pollution Threat to Wading Birds

Legend
- Orange: Pollution not threatening birds
- Green: Birds not threatened by pollution
- Red: Pollution threatening birds
Pollution Threat
Sea Level Rise

2 Foot Sea Level Rise Threat to Aesthetic

Legend:
- Blue: 2 ft sea level rise
- Green: Aesthetic clusters
- Red: Incubated aesthetic clusters

2 Foot Sea Level Rise Threat to Wading Birds

Legend:
- Blue: 2 ft sea level rise
- Green: Wading bird clusters
- Red: Incubated wading bird clusters
Sea Level Rise

2 Foot Sea Level Rise Threat to Water Quality

Legend:
- Green: Water quality protection clusters
- Blue: 2 ft sea level rise
- Red: Inundated water quality protection clusters

2 Foot Sea Level Rise Threat to Recreation

Legend:
- Blue: 2 ft sea level rise
- Green: Recreation clusters
- Red: Inundated recreation clusters
Conclusions

• Spatial analysis of public perceptions provides important information for identifying hazard threats
• Allows identification of important places to stakeholders
• Facilitates spatial identification of threats to these places
• Management strategies can then be developed to address the threats to these places
Acknowledgements

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