GIS Opportunities: Successes and challenges in adopting ArcGIS Online

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Outline

• Introduction
• Objectives
• Methodology
• Results
• Future Work
• Conclusions
• Comments/Questions
Introduction

• Prairie View, Texas exists at the ecotone of three ecological zones (Gulf Prairie and Marshes, Pineywoods, and Post Oak Savannah)
• Prairie A&M University has a university research farm that is 778 acres
• Rainfall is one of the critical factors in land management and when planning agricultural programs such as crop and water management, erosion control, and flood control
Objectives

• Utilize the ArcGIS platform to develop a rainfall data collection system for use on mobile devices

• Provide timely information to enhance decision-making for land management and agriculture related operations

• Support farm manager and other decision makers with a tool to visualize rainfall data

• Lay the groundwork for centralized data storage and access
Horse Pasture Rain Gauge
Elevation & Precipitation
<table>
<thead>
<tr>
<th>Rain gauge (RG)</th>
<th>Acres</th>
<th>Landuse(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RG1</td>
<td>273.13</td>
<td>Beef cow pasture, hay, gardens, grass plot and corn</td>
</tr>
<tr>
<td>RG2</td>
<td>224.70</td>
<td>Hay</td>
</tr>
<tr>
<td>RG3</td>
<td>105.39</td>
<td>Corn and beef cow pasture</td>
</tr>
<tr>
<td>RG4</td>
<td>225.36</td>
<td>Hay, corn and goat pasture</td>
</tr>
<tr>
<td>RG5</td>
<td>243.07</td>
<td>Hay and beef cow pasture</td>
</tr>
<tr>
<td>RG6</td>
<td>193.89</td>
<td>Beef cow pasture, goat pasture and corn</td>
</tr>
<tr>
<td>RG7</td>
<td>214.76</td>
<td>Not designated at the time of study</td>
</tr>
</tbody>
</table>
Challenges

• Previously relied on a paper-based data collection method
• System did not facilitate visualization of data in a timely manner
## Current Approach

<table>
<thead>
<tr>
<th>PVAMU Rainfall Data Collection Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date:</strong></td>
</tr>
<tr>
<td><strong>Collector:</strong></td>
</tr>
<tr>
<td>90-Acre Site</td>
</tr>
<tr>
<td>Cameron Road</td>
</tr>
<tr>
<td>NW Pasture</td>
</tr>
<tr>
<td>Goat Center</td>
</tr>
<tr>
<td>Horse Pasture</td>
</tr>
<tr>
<td>Main Farm Road</td>
</tr>
<tr>
<td>SW Hay Meadow</td>
</tr>
<tr>
<td>Owens Road</td>
</tr>
</tbody>
</table>
Methodology

- Utilize ArcGIS Collector to create a mobile data entry system to replace paper-based method
- Utilize Operations Dashboard for ArcGIS to create a common view of rain gauge data collection operations
New Approach

- (Collector and Operations Dashboard) screenshots
- To include description of the data collection layer
Data Collection Layer

- There are seven rain gauges
Field Data Collection on iPad
Rainfall Totals Dashboard

7 number gauges

- Horse Pasture (RG1), 2.40 inches
  June 29, 2015
- Goat Center (RG6), 2.50 inches
  June 29, 2015
- SW Hay Meadow (RG2), 2.30 inches
  June 29, 2015
- NE Hay Meadow (RG4), 2.50 inches
  June 29, 2015
- 30-Acre (RG7), 2.50 inches
  June 29, 2015
- NW Pasture (RG5), 2.70 inches
  June 29, 2015
- Fleckinger Rd (RG3), 2.50 inches
  June 29, 2015

Average Rainfall
Rainfall Totals by Amount

- 2.5
- 2.5
- 2.5
- 2.4
- 2.3
- 2.7
- 2.3

Average rainfall is inches
Agriculture & Planning

• The importance of agriculture to food systems planning
  - Considerations for land use planning based on rainfall distribution
• Crop-based agriculture has different rainfall data needs as compared to animal-based agriculture operations
• Visual display of rainfall quantity and spatial variability can be used to determine fertilization, irrigation, and rotation of animals in pasture
Conclusions

• Faster data collection
• Enhanced user experience
• Enhanced decision-making
Future Work

- Enhanced graphical representation of rainfall data
- Ability to query archival rainfall data to assess seasonal variability and potential forecasting options for weather futures
- Rainfall data warehouse for use by public and private end users
Questions?