

Montana Shakespeare in the Parks
Patterns of Attendance
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Introduction

Montana Shakespeare in the Parks has provided the people of Montana with amazing entertainment for 44 years. One of the main goals of Shakespeare in the Parks is to expose as many as people as possible to the works of Shakespeare. In order to achieve this goal, one important factor to consider is patterns of attendance. There are several components that can impact attendance including the type of play (tragedy or comedy), and weather conditions. It is already known that more people prefer to attend comedies over tragedies so we decided to look into the effects of weather. Our job is to come up with a plan that helps Montana Shakespeare in the Parks combat the weather and raise their attendance and exposure as much as possible.

Model

Our model provides qualitative descriptions, observations, and suggestions about the best and worst months to attend certain towns due to weather conditions. To create our model, we used quantitative weather and rain data as well as descriptive data about the smoke and fires in Montana. We decided to analyze data from the performances in previous years - 2016 and 2017 - because recent years provide us with the most current data about patterns of attendance and revenue. Taking the goals of Montana Shakespeare in the Parks into account (expose people and sustain), we decided to look into the cities that had over 300 people in attendance and made over \$1000. We found the following to be true:

Over 300 people in attendance

Bozeman	Chico Hot Springs
Lewistown	Helena x2
Powell, WY	Charlo
Cody, WY	Hamilton
Billings	Liberty Lake, WA
Pocatello	Sandpoint, ID
Eureka	Belgrade
Great Falls	Sweet Pea
Missoula	Spokane, WA
Kalispell	

Made over \$1,000

Bozeman x5	Sweet Pea
Lewistown	(Bozeman)
Sidney	Helena x2
Columbus	Charlo
Absarokee	Hamilton
Red Lodge	Liberty Lake,
Cody, WY	WA
Billings x2	Sandpoint, ID
Silver Gate / Cooke City	Libby
Pocatello x2	Eureka
West Yellowstone	Great Falls x2
Chico Hot Springs	Manhattan
Kalispell	Missoula
Spokane, WA	Gardiner

Along with the important cities highlighted above we also thought it was important to acknowledge small towns where the proportion of their population in attendance was very high. Birney and Cooke City have more people attending their show than are in the entire town population. There are 17 cities that overlap in the two lists above and 2 cities with a high population proportion, so we dubbed these our priority cities. From here we decided to look at the rain and smoke history, for each of these cities, during the months of performance, June - September, to deduce how weather might contribute to their attendance.

Our model was created under the following assumptions:

- Factors that affect attendance include
 - Rain
 - High temperatures
 - Smoke/air quality

- Prioritize locations that have high attendance (more than 300 people) and make over \$1000
- Also prioritize rural locations that have high attendance proportion
- Small crowds are easier to relocate indoors

Based on our close analysis of weather and smoke, our model suggests that Montana Shakespeare in the Parks puts as many of the priority city shows in the month of July as they can. This suggestion comes from our observation that July has the least amount of rain and is least affected by smoke and air quality issues. The month of June tends to be very rainy, while the months of August and September are the “fire months” - they have the lowest air quality.

Pocatello, Helena, and Birney are three priority cities that have high average temperatures in July, and so these locations are less of a priority in July. Pocatello and Helena also have less rain in June than many of the other priority cities, so we suggest that these locations be scheduled in June. Cody, WY and Hamilton are two priority cities that also get less rain in June than many of the other cities, so these locations can also be scheduled in June rather than July.

Lewistown and Cooke City are two priority cities that have more precipitation in August than the other priority cities. While we still suggest that these locations be scheduled in July, they have flexibility to be scheduled in August, since their high precipitations would prevent smoke and air quality from affecting the attendance.

Regarding our last assumption, smaller crowds are less complicated to relocate indoors because it would be easier to find a facility to accommodate the crowd. We looked into the cities that had a show attendance of less than 100 people. Between the two years we found the following cities:

Wolf Point	Forsyth
Beach,	Birney
ND	Deer
Ekalaka	Lodge
Malta	

Several of these cities are in Eastern Montana, and based off our earlier assumption, are less likely to be smoky in the months of August and September. Therefore, we suggest that you perform in Wolf Point, Beach, Ekalaka, Malta, and Forsyth in late August or September. If the weather happens to be really smoky, these shows may be easiest to move inside. Conversely Deer Lodge and Birney are more likely to experience smoke than the other cities so it would be more accommodating to move these shows to sometime in June and they can still move indoors more easily than the shows with higher attendance if it rains.

Conclusion

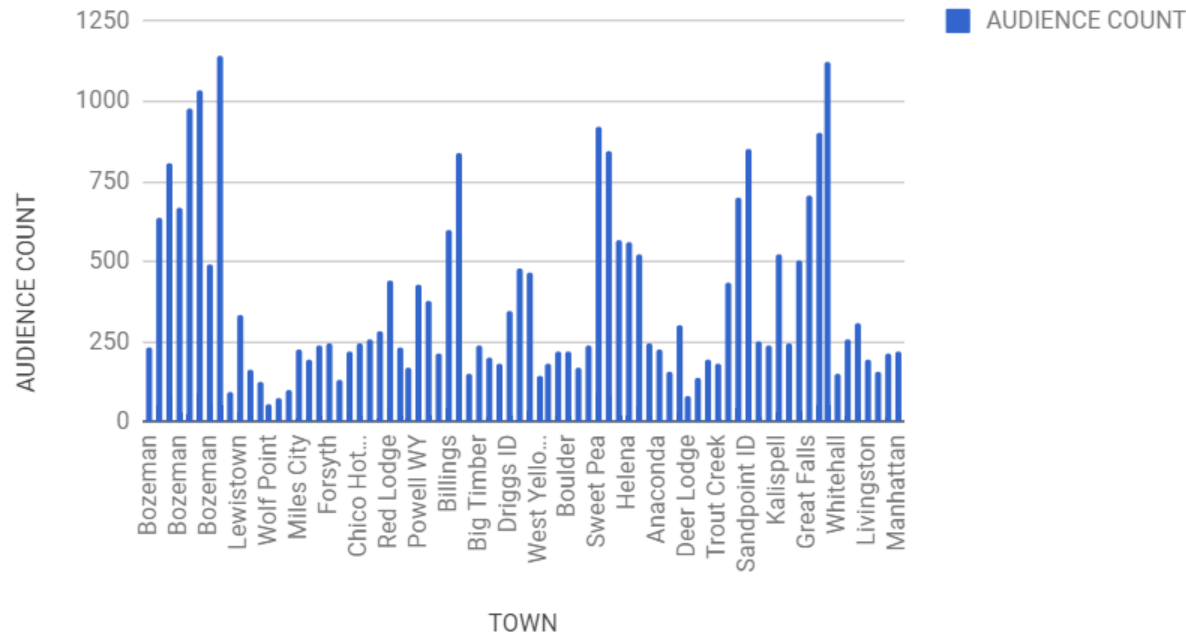
We acknowledge that our model has limitations. Weather patterns from year to year can change and this makes the rainfall, temperatures, and air quality very unpredictable. In addition, our model did not take into account the distance between the priority cities. The locations that we suggest being scheduled in July might not allow for

a conducive route to drive. We also acknowledge that some of the cities might only allow Montana Shakespeare in the Parks to come at certain times of the year, and that each year, cities might be added or cut from the schedule.

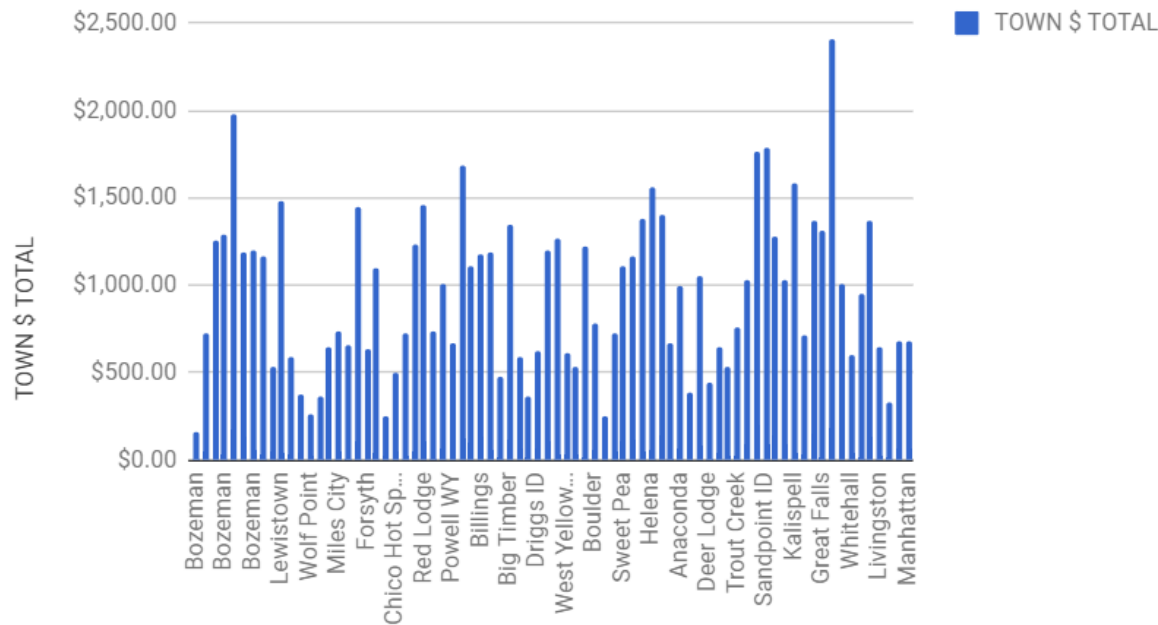
We recommend that Montana Shakespeare in the Parks consider our suggestions for scheduling priority cities in July. We also recommend that they consider our qualitative and quantitative data as they plan their future tour schedules. With our suggestions, we hope that they achieve their goals of reaching as many people as possible and expose them to the works of Shakespeare.

APPENDIX

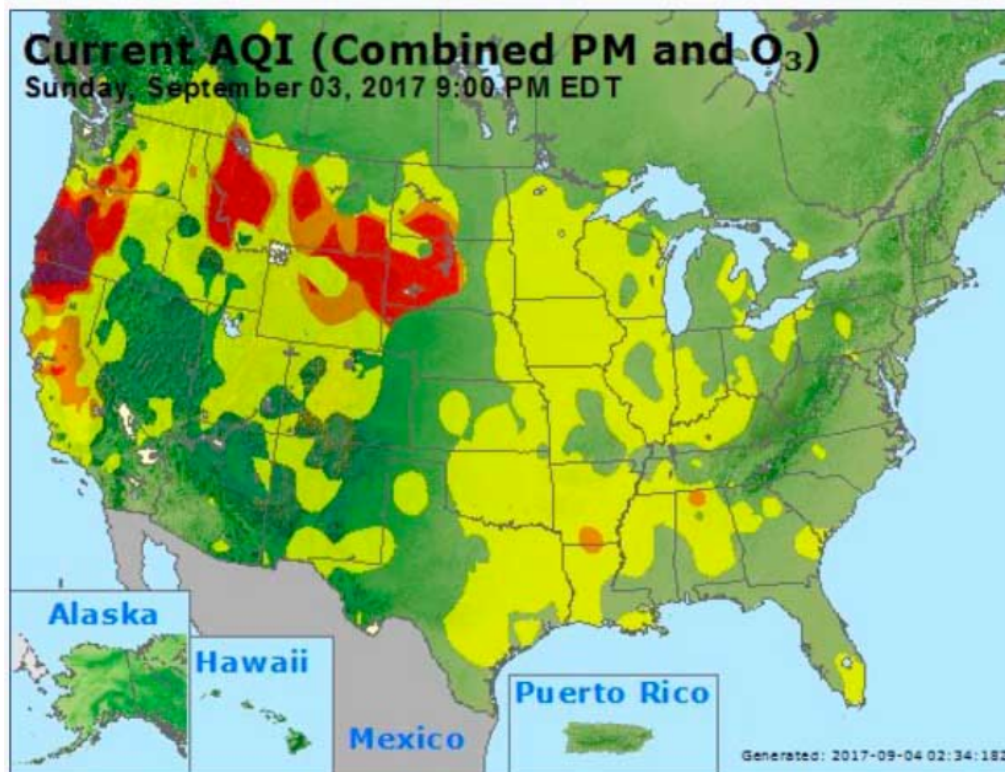
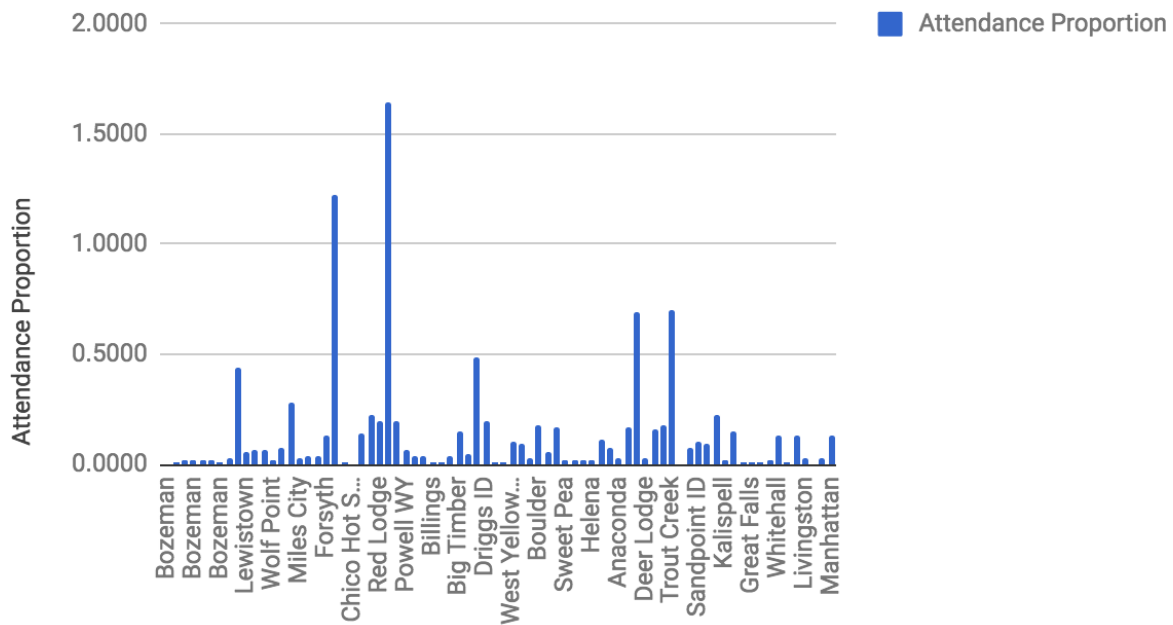
AUDIENCE COUNT vs. TOWN



TOWN TOTAL



Attendance Proportion



	June		July		August		September	
	Temp.	Rain	Temp.	Rain	Temp.	Rain	Temp.	Rain
Bozeman	76°	2.85"	91°	1.44"	85°	1.48"	71°	1.8"
Lewistown	74°	2.93"	90°	2.1"	82°	1.89"	69°	1.38"
Cody, WY	75°	1.58"	87°	1.21"	79°	0.9"	71°	1.13"
Billings	80°	1.98"	93°	1.19"	85°	0.92"	77°	1.42"
Pocatello	80°	0.91"	94°	0.7"	89°	0.7"	76°	0.89"
Eureka	72°	2.1"	86°	1.5"	85°	1.26"	73°	1.07"
Liberty Lake, WA	79°	2.06"	92°	1.02"	90°	1.16"	74°	1.12"
Great Falls	76°	2.24"	93°	1.45"	84°	1.65"	70°	1.23"
Chico Hot Springs	76°		92°		86°		73°	
Sweet Pea	76°	2.85"	91°	1.44"	85°	1.48"	71°	1.8"
Helena	78°	1.82"	94°	1.34"	87°	1.05"	71°	1.05"
Charlo	75°	2.3"	83°	1.39"	84°	1.28"	72°	1.36"
Hamilton	76°	1.62"	93°	1.0"	88°	1.14"	71°	1.07"
Sandpoint, ID	73°	2.46"	86°	1.63"	85°	1.43"	70°	1.6"
Missoula	76°	2.1"	93°	1.28"	88°	1.23"	71°	1.3"
Cooke City	64°	2.85"	73°	2.16"	72°	2.08"	62°	1.95"
Birney	83°	2.46"	91°	1.32"	90°	0.95"	78°	1.04"

Yellow = temperature (hot)

Blue = rain

Dark = extremes, more flexibility

Light = less flexible changes