Remedial Priority System

Assigning Categories to the RPS Score

March 2012

Assigning Categories to the RPS

- The statute required the Department to create a "ranking system" that "establishes categories in which to rank sites…".
  - The Model calculates a score ranging from 0 to 53,244 for the Human Health Receptor Score
  - How to rank all the sites?

Assigning Categories to the RPS

- Several Methods were evaluated to rank sites:
  - **Jenks Optimization method**
  - Natural Breaks (without Jenks Optimization),
  - Equal Interval,
  - Quintile, and
  - Nested means.

- It was determined that Jenks Optimization method was the best method to Rank the sites within the RPS framework.

Assigning Categories to the RPS

- The **Jenks Optimization method** is also referred to as The "Jenks Natural Breaks" Classification method. It is a data classification method designed to determine the best arrangement of values into different classes so that they can be displayed on a chloropleth map.
- **Jenks Optimization method** seeks to minimize each class's average deviation from the class mean, while maximizing each class's deviation from the means of the other groups. In other words, the method seeks to reduce the variance within classes and maximize the variance between classes.
- **Jenks Optimization method** was developed with the intention of dividing data into a relatively few data classes, less than seven.

- 1. Jenks, George F. 1967. "The Data Model Concept in Statistical Mapping", International Yearbook of Cartography 7: 186-190.
- 2. McMaster, Robert, "In Memoriam: George F. Jenks (1916-1996)". Cartography and Geographic Information Science. 24(1) p.56-59.

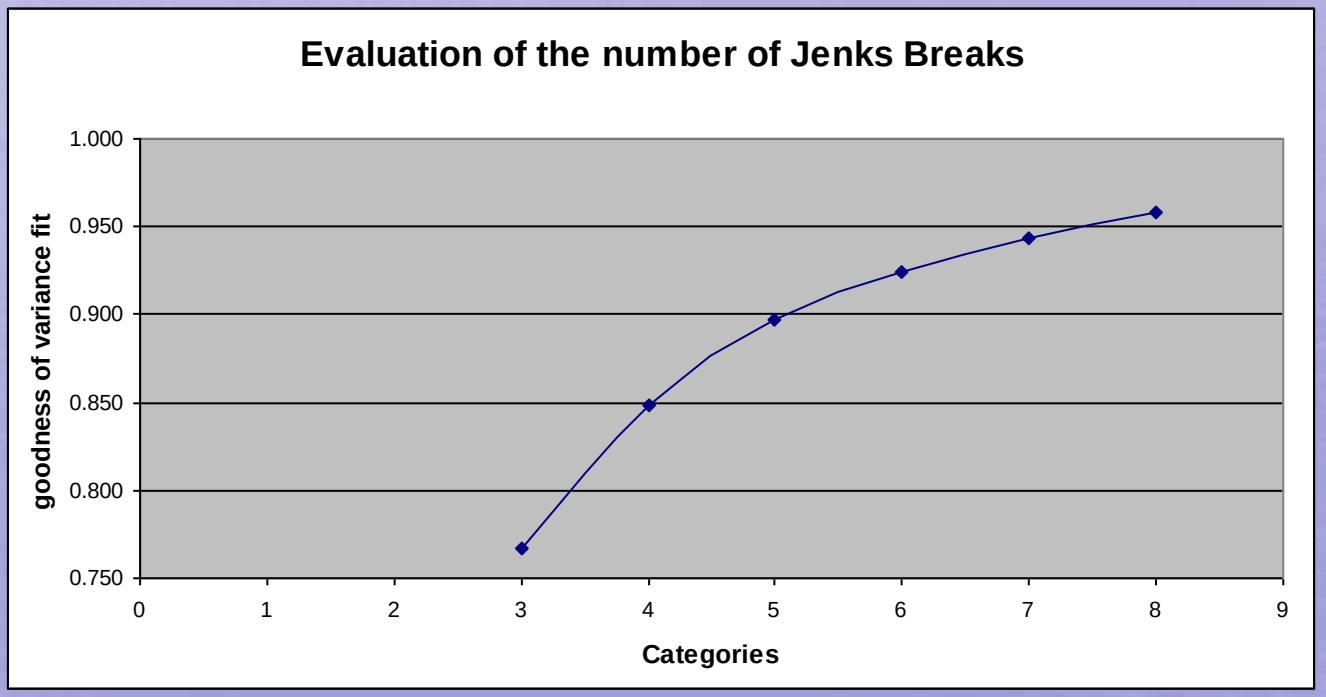
Assigning Categories to the RPS

Evaluating the number of Breaks

- The Goodness of Variance Fit was evaluated to determine the correct number of breaks to establish.

Categories	GVF
3	0.767
4	0.848
5	**0.897**
6	0.924
7	0.944
8	0.958

GVF = Goodness of Variance Fit



- Based on the evaluation performed, the Department decided on using 4 breaks (5 Categories) for the RPS scores.

Assigning Categories to the RPS

Implementing Jenks Natural Breaks

Once a final RPS scores have been calculated, the values are categorized using "Jenk's natural breaks" to describe the cumulative risk posed by each site.

The categories range from 1 to 5.

Category 1 includes sites with the lowest RPS scores; and

Category 5 includes sites with the highest RPS scores.

The number of sites per category and the corresponding categories are:

Rank	Range		Count
1			
2			
3			
4			
5			
		Total	

Assigning Categories to the RPS

Implementing Jenks Natural Breaks

- The RPS will be run on periodic bases.
  - Every time the RPS is run, the Jenks natural break will change; however, the breaks will be held consistent once they are established.
  - Resetting the breaks will occur after a major revision to the RPS Model.
- SRP refers to these classes as categories.