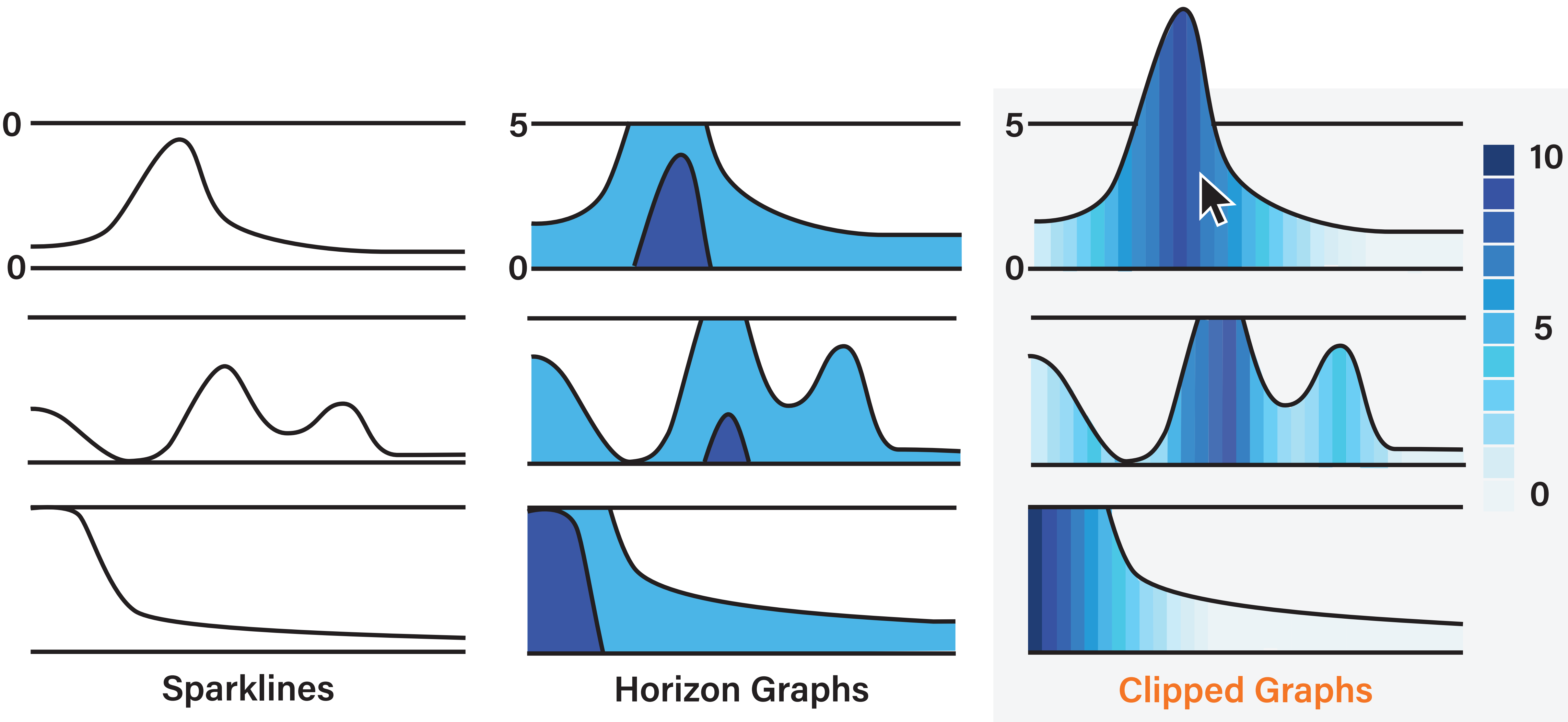


# Clipped Graphs: A Compact Time-Series Encoding

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## 1 Designed to visualize time series data with skewed distributions and rare peaks

We introduce clipped graphs, a hybrid clipped area chart that uses redundant color coding for visualizing time series data. The technique is designed to visualize time series data with skewed distributions and relatively rare peaks, in compact tabular layout. The area above the predefined threshold is clipped, and can be revealed on demand.



We demonstrate three techniques of visualizing time series. The range of the example data set goes from 0 to 10. Sparklines [1] visualize the data on the scale 0-10. Horizon graphs [2] fold at 5 and stack the area chart over the lower range. Clipped graphs use 5 as the clipping threshold. The area above 5 is clipped, and the area under the line chart is colored based on the value of each point. When a user's mouse hovers on a clipped graph, it draws the full area chart, as demonstrated in the example.

## 2 Real-world Application in Multivariate Data Visualization System for Visualizing Family Trees

We integrate clipped graphs into an existing multivariate data visualization system, Lineage [3], which visualizes clinical genealogies and detailed data about individuals in a tabular layout. Our collaborator was interested in studying the effect of air pollution on suicide. Air pollution data typically varies in lower range, with rare large peaks.



Lineage visualizes genealogy trees with attributes for individuals in each row. We use clipped graphs to visualize air pollution data. For each column of a air pollution attribute, we designed a header to represent the clipping threshold with a dashed line, and include the full color scale for reference. We use red-green color scale for AQI related attributes, and single red hue for other attributes. In the zoomed view, we show an example of clipped peaks being revealed on mouse hovering.

## 3 Advantages of Clipped Graphs

- Preserve details when the distribution is skewed in a compact layout.
- Easy comparison between different time series through encoding the values using both color and position.
- Reveal trends and variations in the data through color and line graph.