

## **APPENDIX F**

### **SUPPLEMENTAL FIGURES**

# DEVELOPMENT OF EMISSIONS-ESTIMATING METHODOLOGIES FOR BROILER CONFINEMENT OPERATIONS

## APPENDIX F – SUPPLEMENTAL FIGURES

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## 1.0 Supplemental Plots to Support EEM Development Decisions

Scatter plots were used to subset data to evaluate trends present in subsections of the data. The data in the plots were binned based on most predictive parameter. For all pollutants, bins were based on average mass (*avem*). Six bins were created that cover 0.5 kg each (e.g., mass bin 1 covers 0 to 0.5 kg, mass bin 2 covers 0.5 to 1.0 kg).

### 1.1 H<sub>2</sub>S Functional Form Plots

Figure 1-1, Figure 1-2, and Figure 1-3 support the use of a cubic function of average bird mass in EEM development. Plots of all emissions values masked the emissions decrease because of large variances in emissions between the houses at that same time. Figure 1-1 contains scatter plots of H<sub>2</sub>S emission versus the average bird mass for each of the 14 flocks that occurred over the study at CA1B House 10. Figure 1-2 contains the same plots for CA1B House 12. Figure 1-3 contains the plots for the six flocks that occurred at the KY1B-2 House 3 at the top half of the figure and KY1B-1 House 5 on the bottom half of the figure.

The remaining plots on the section plot the H<sub>2</sub>S emission versus each of the predictor variables by average mass bin to assist in determining their functional forms.

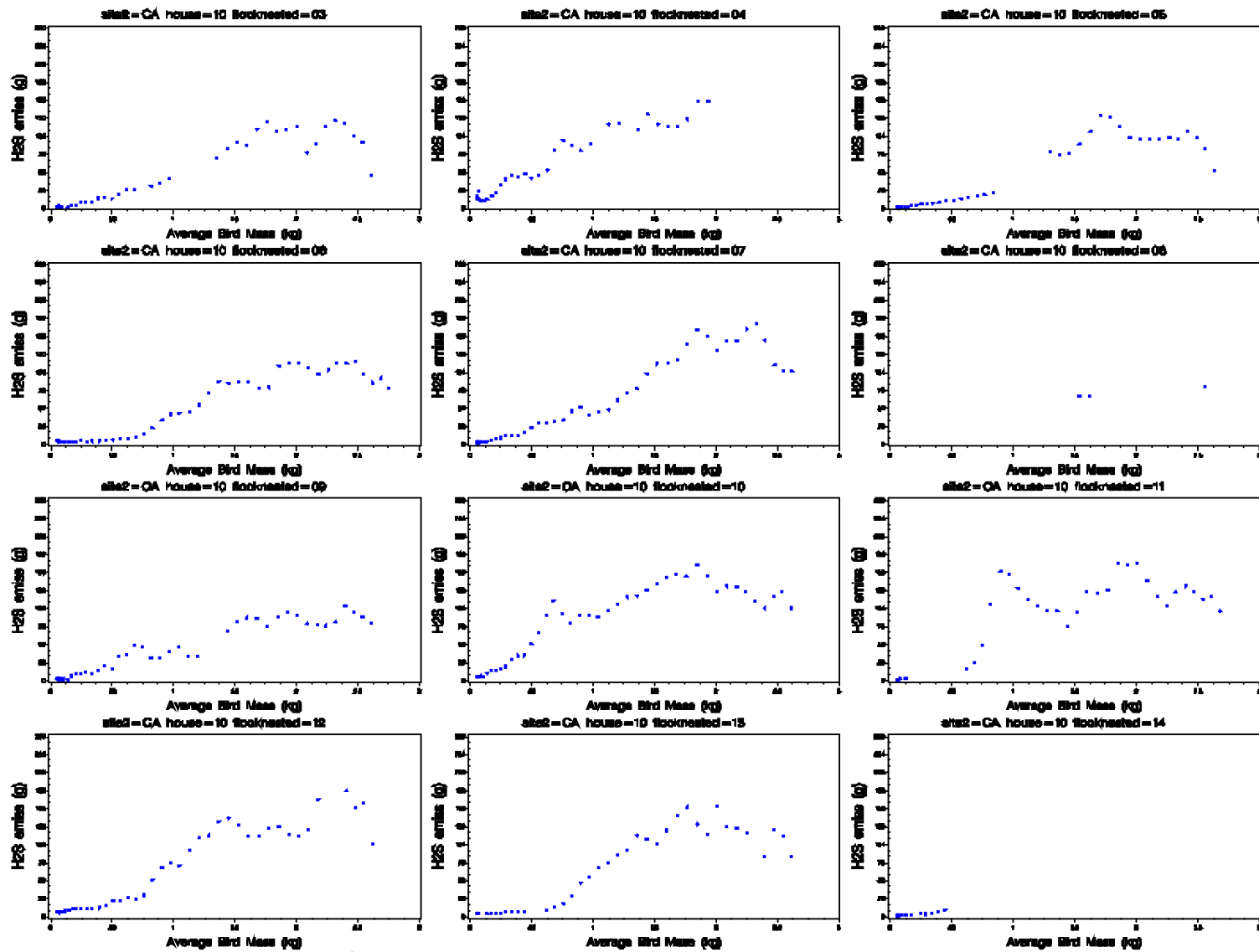


Figure 1-1. H<sub>2</sub>S Emissions Vs. Average Bird Mass, for Each Flock at CA1B H10

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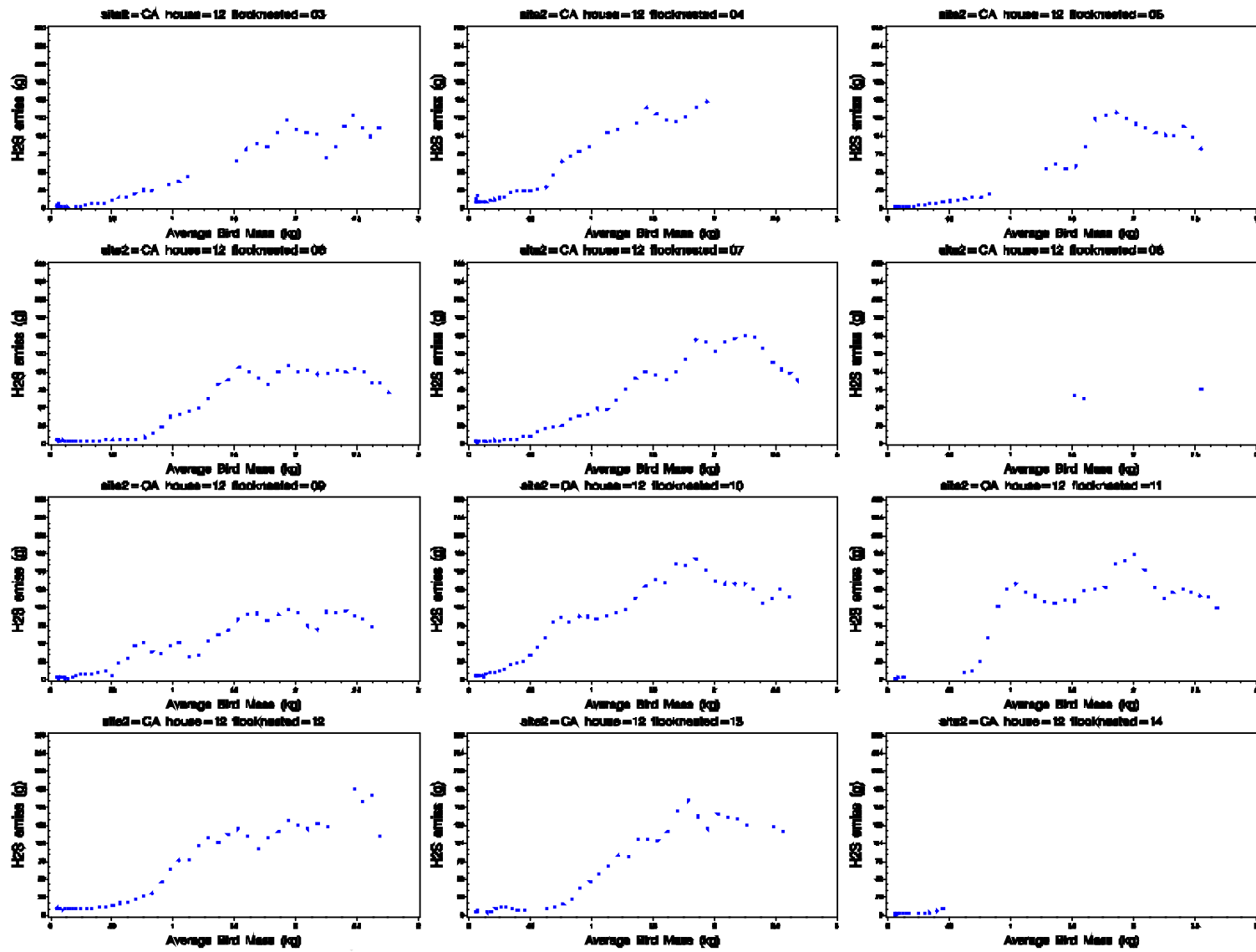


Figure 1-2. H<sub>2</sub>S Emissions Vs. Average Bird Mass, for Each Flock at CA1B H12

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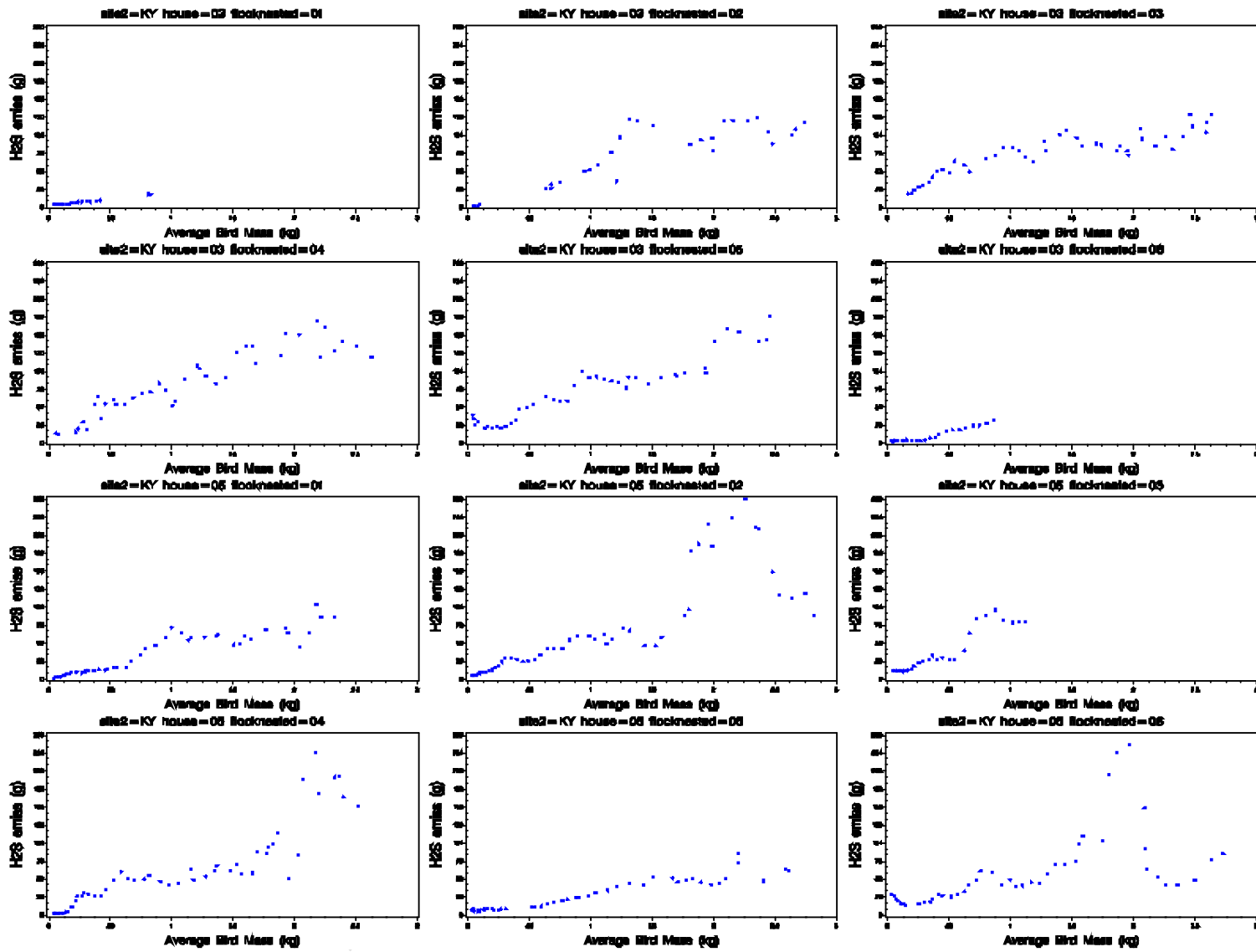


Figure 1-3. H<sub>2</sub>S Emissions Vs. Average Bird Mass, for Each Flock at the Kentucky Sites

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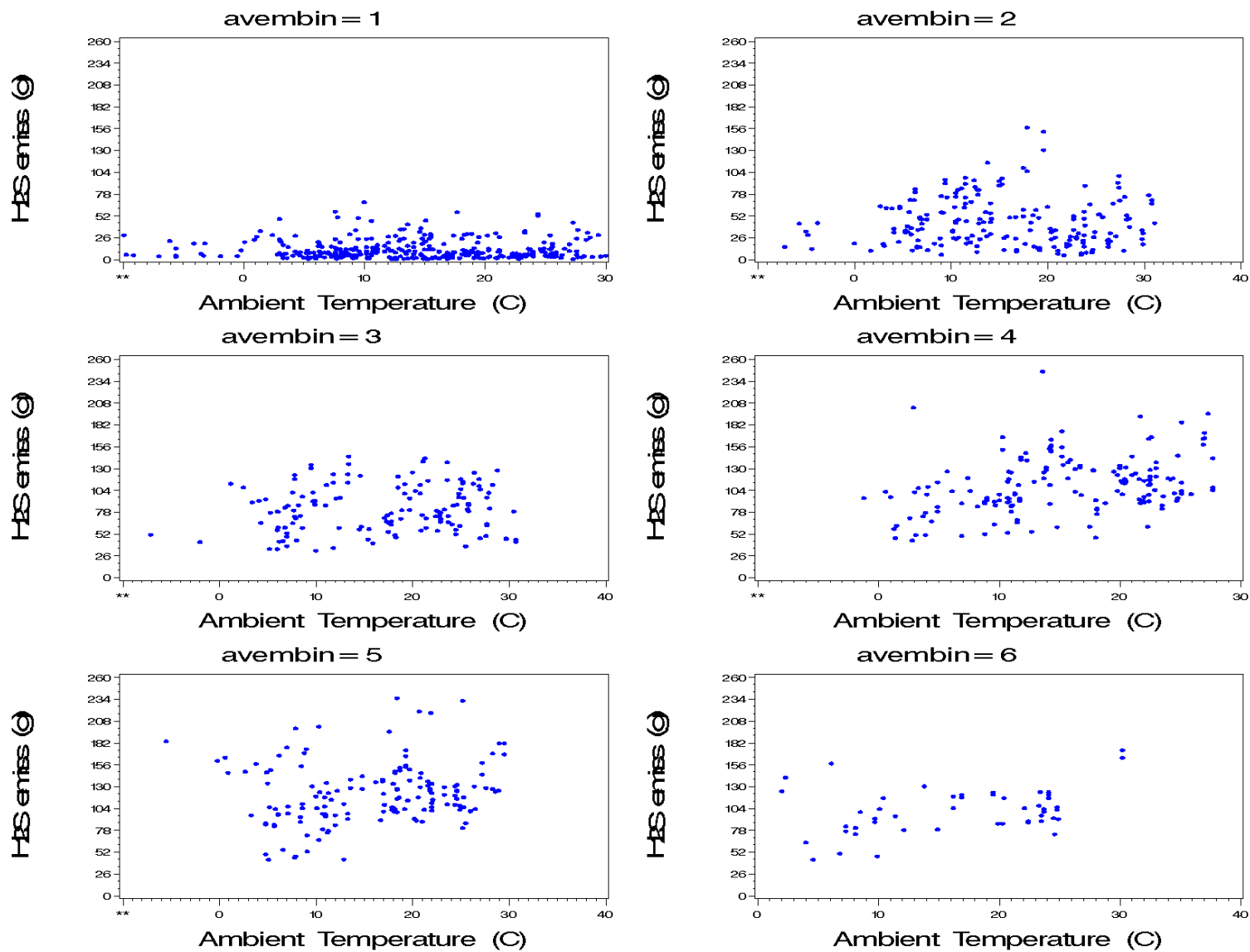


Figure 1-4. H<sub>2</sub>S Emissions Vs. Ambient Temperature, for Each Average Mass Bin

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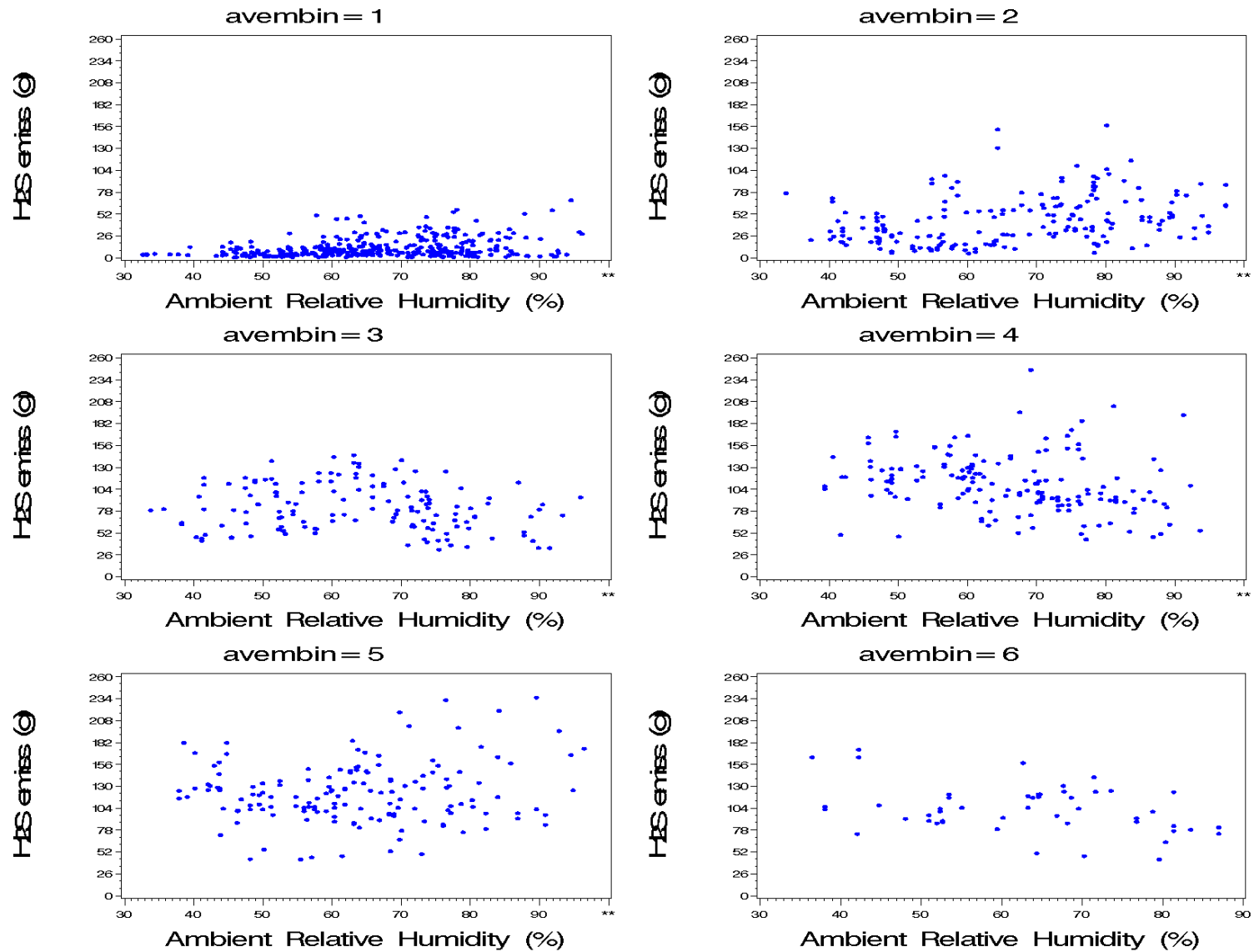


Figure 1-5. H<sub>2</sub>S Emissions Vs. Ambient Relative Humidity, for Each Average Mass Bin

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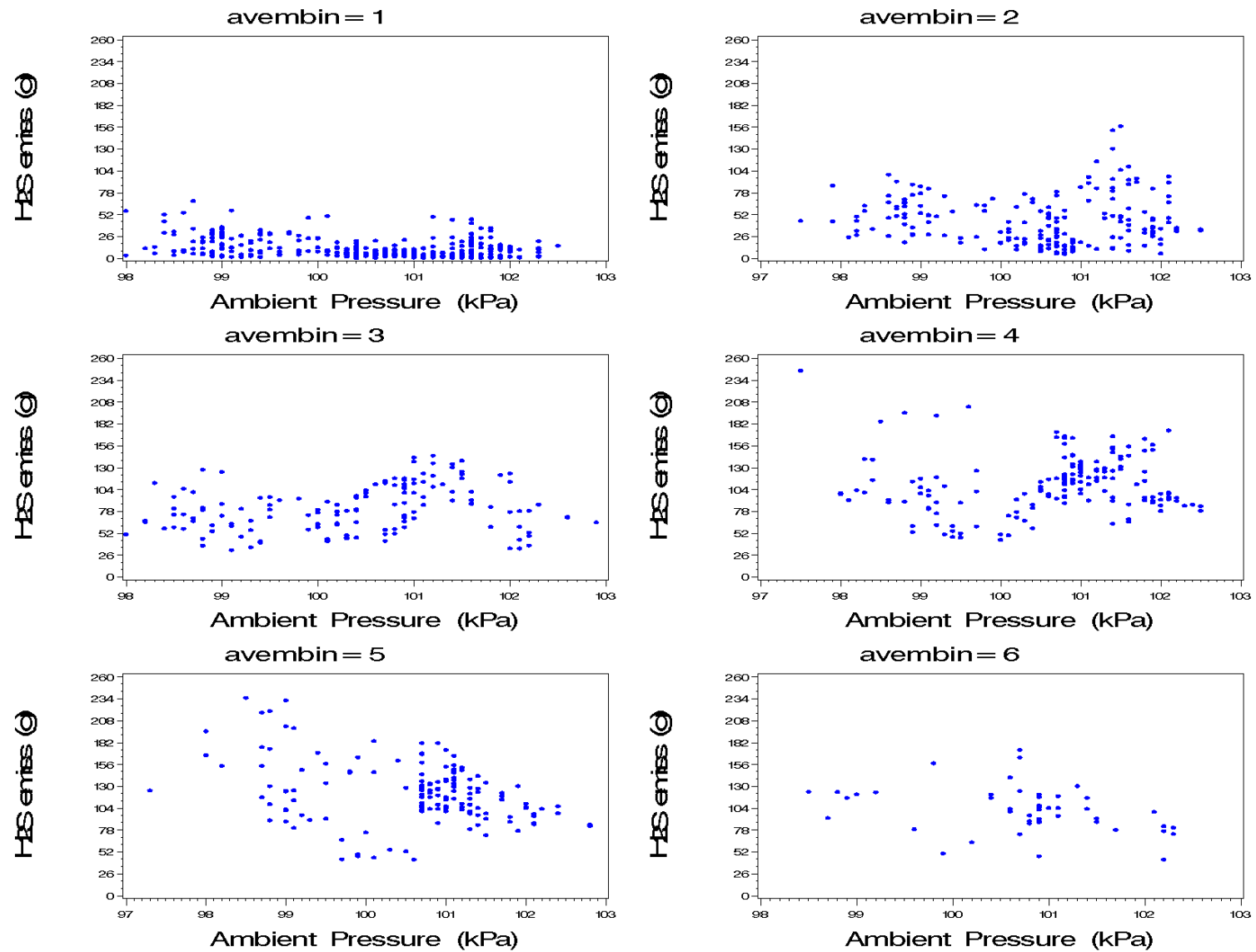
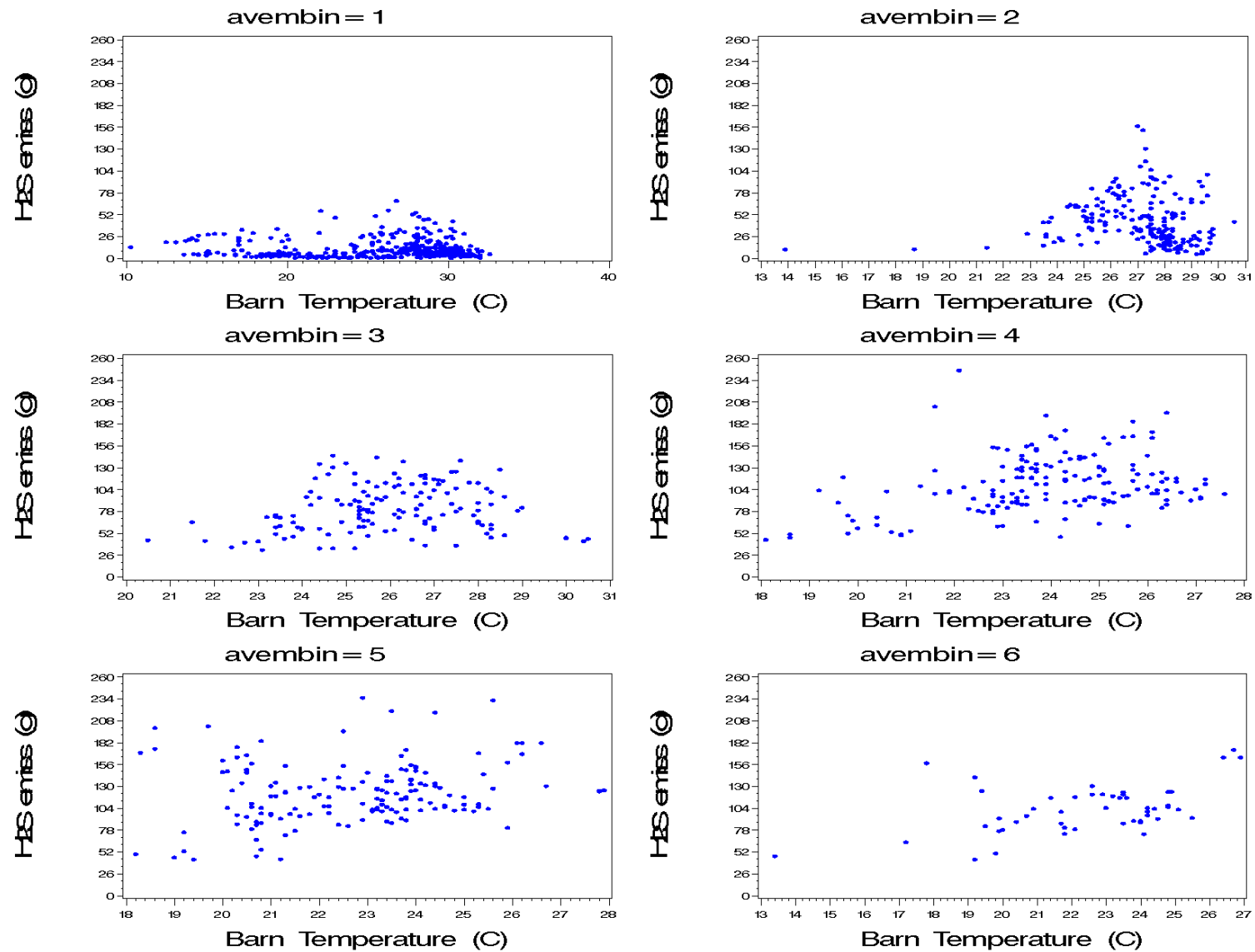


Figure 1-6. H<sub>2</sub>S Emissions Vs. Ambient Pressure, for Each Average Mass Bin

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**Figure 1-7. H<sub>2</sub>S Emissions Vs. House Temperature, for Each Average Mass Bin**

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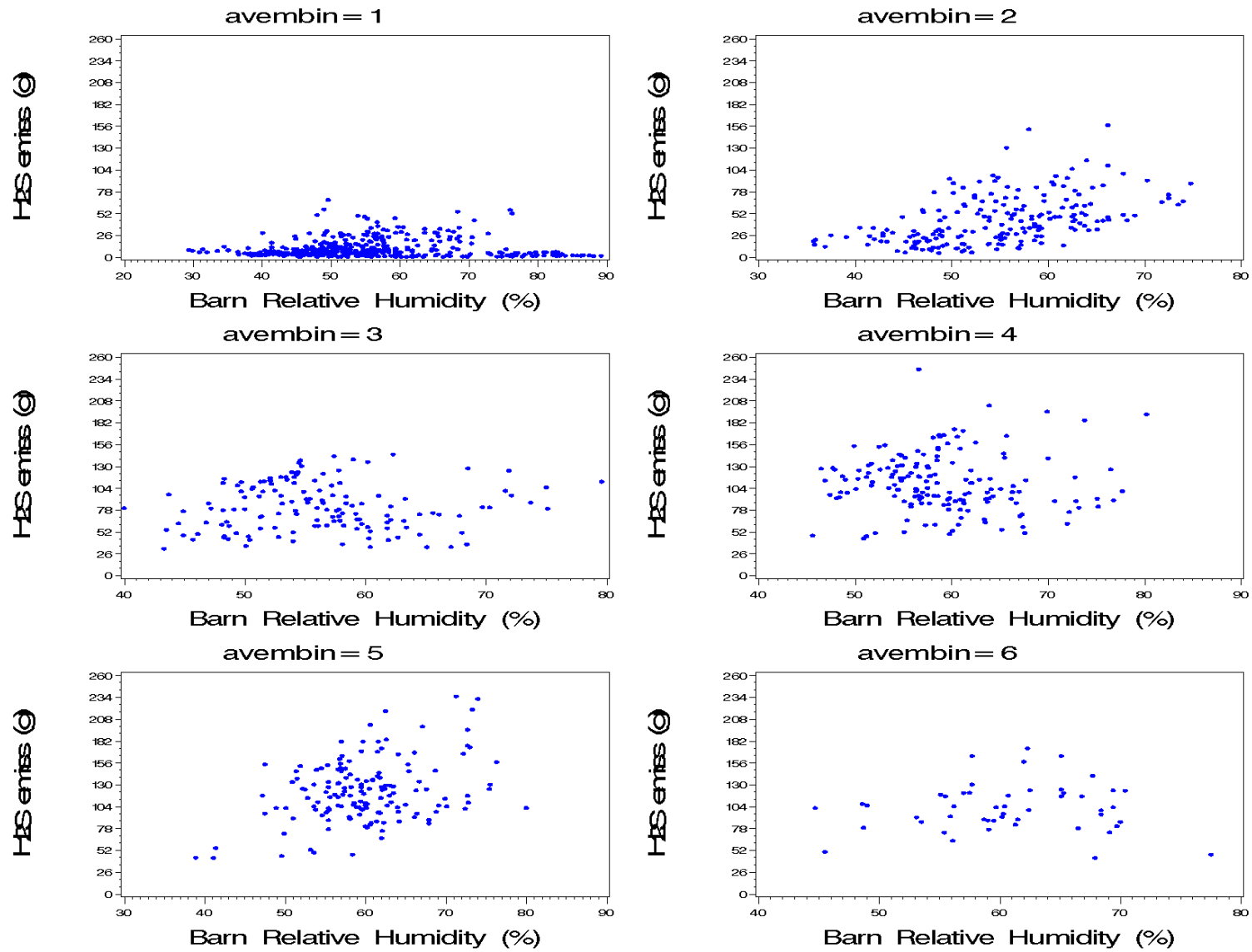


Figure 1-8. H<sub>2</sub>S Emissions Vs. House Relative Humidity, for Each Average Mass Bin

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## 1.2 PM<sub>10</sub> Functional Form Plots

The plots presented in this section plot the PM<sub>10</sub> emission versus each of the predictor variables by average mass bin to assist in determining their functional forms.

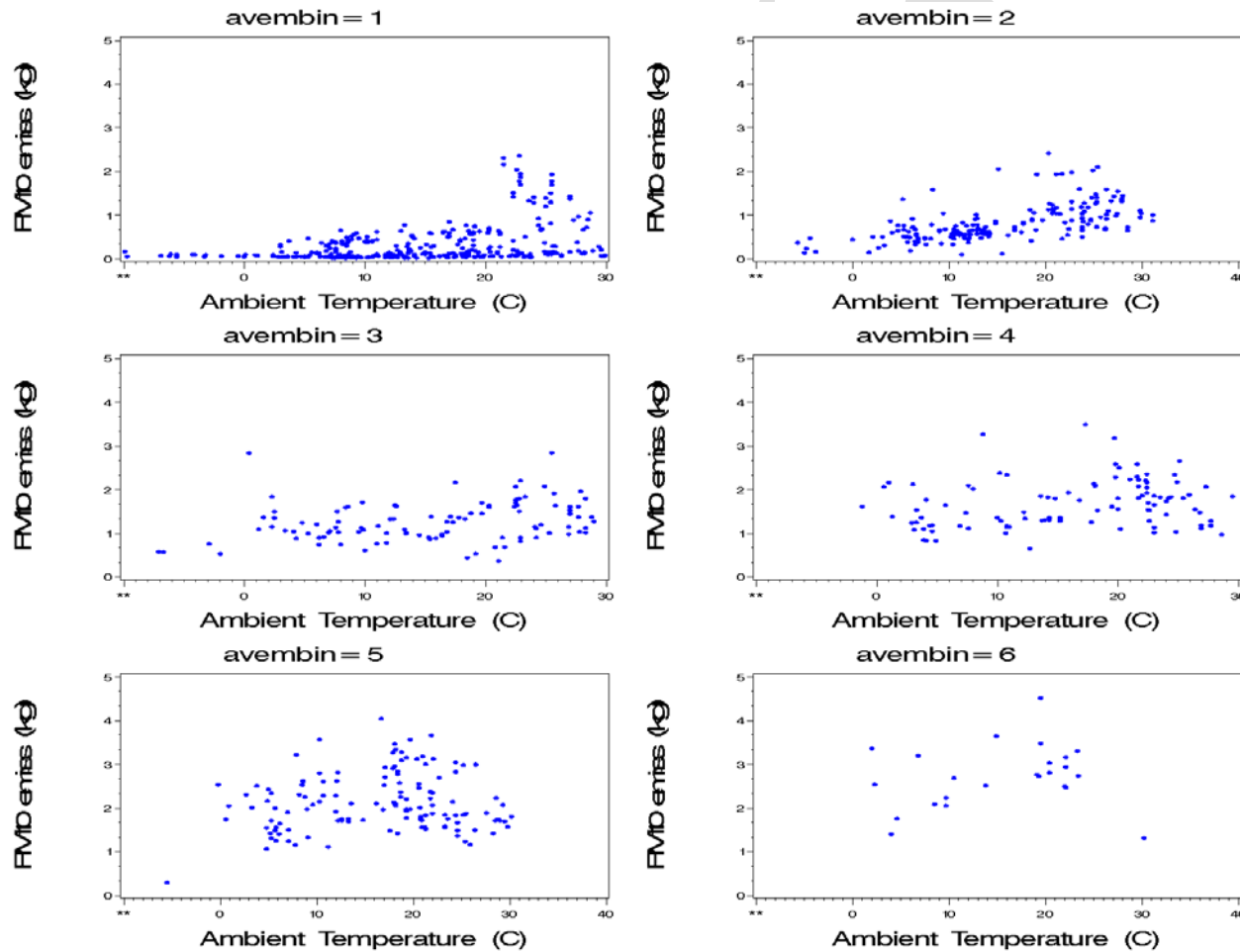


Figure 1-9. PM<sub>10</sub> Emissions Vs. Ambient Temperature, for Each Average Mass Bin

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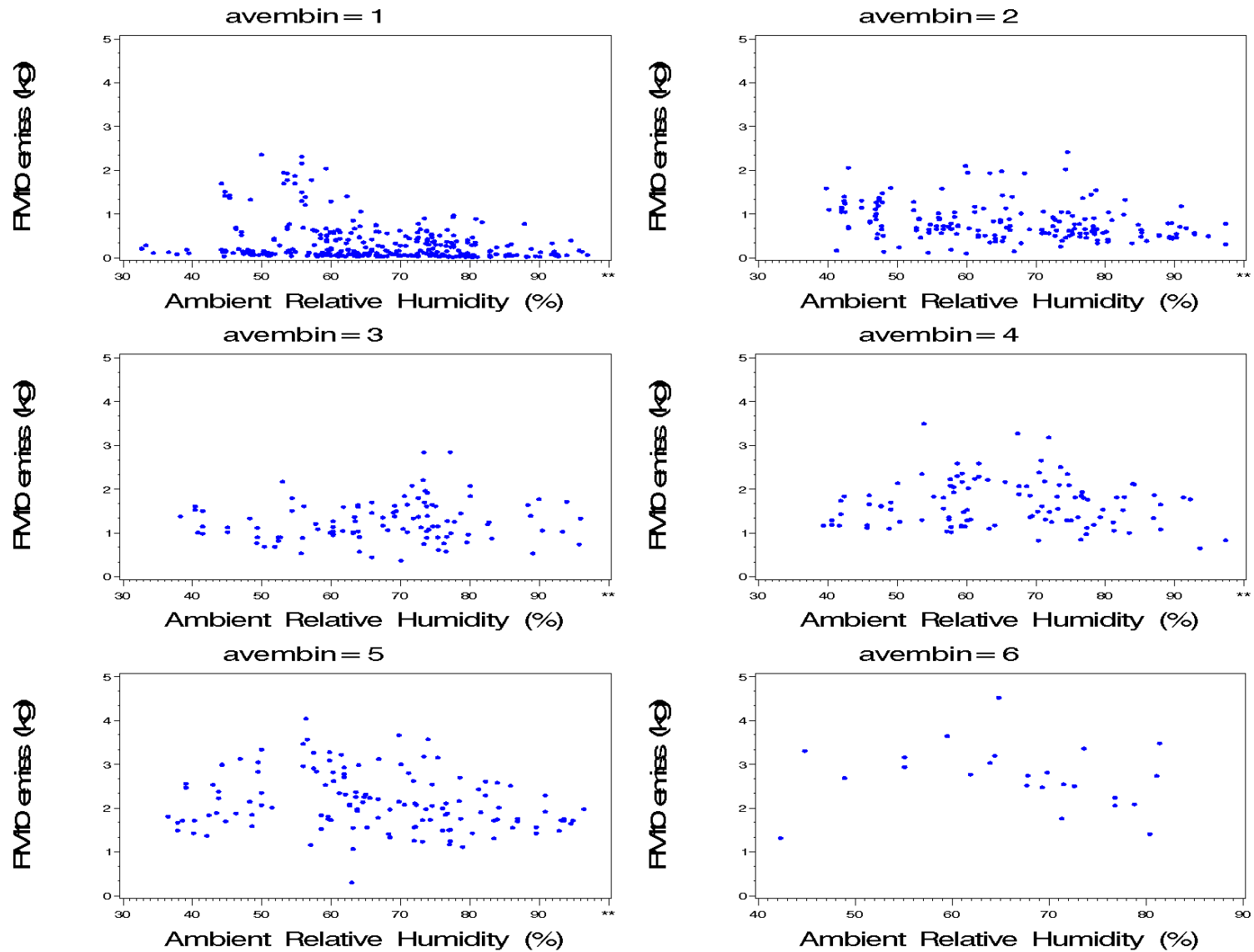


Figure 1-10. PM<sub>10</sub> Emissions Vs. Ambient Relative Humidity, for Each Average Mass Bin

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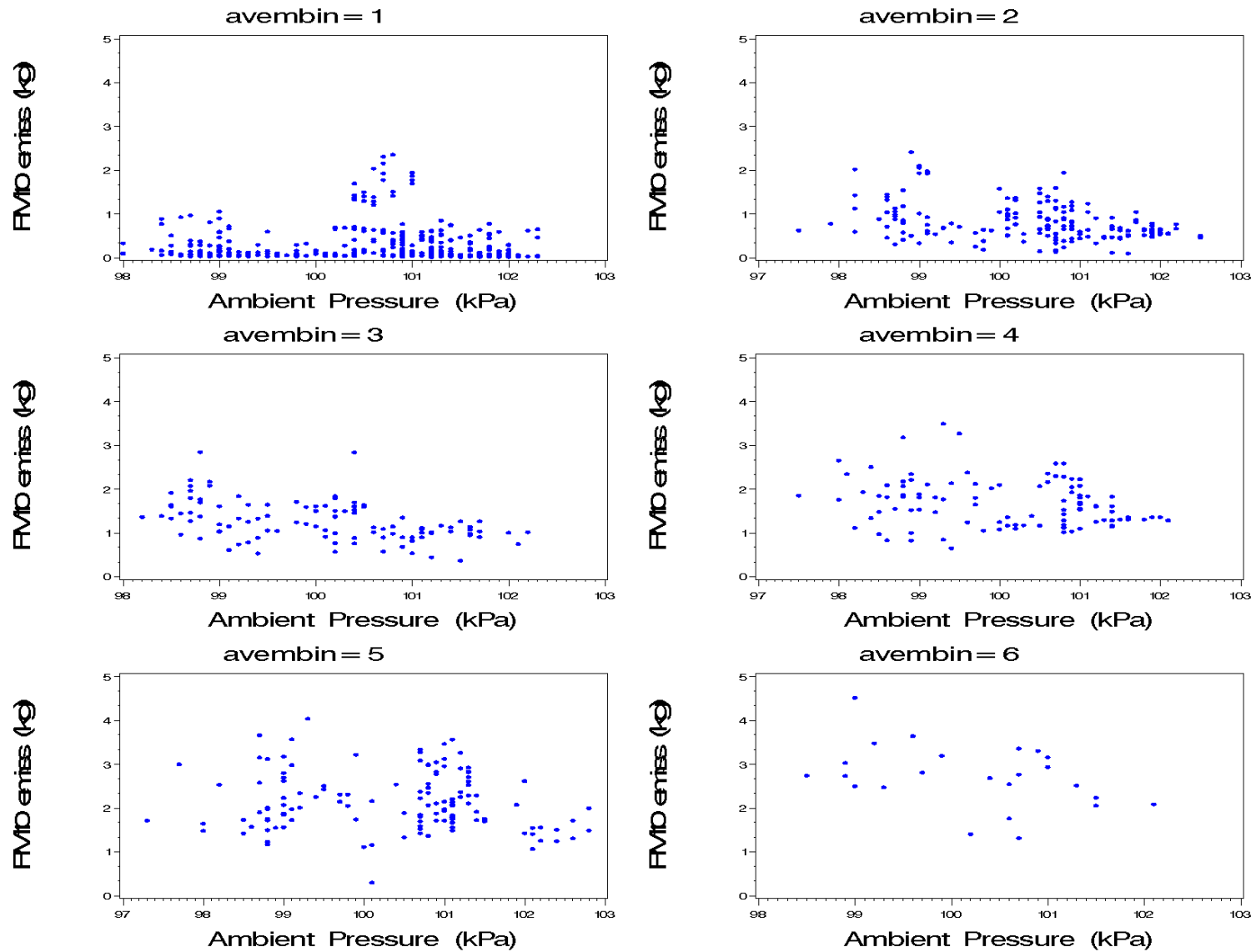
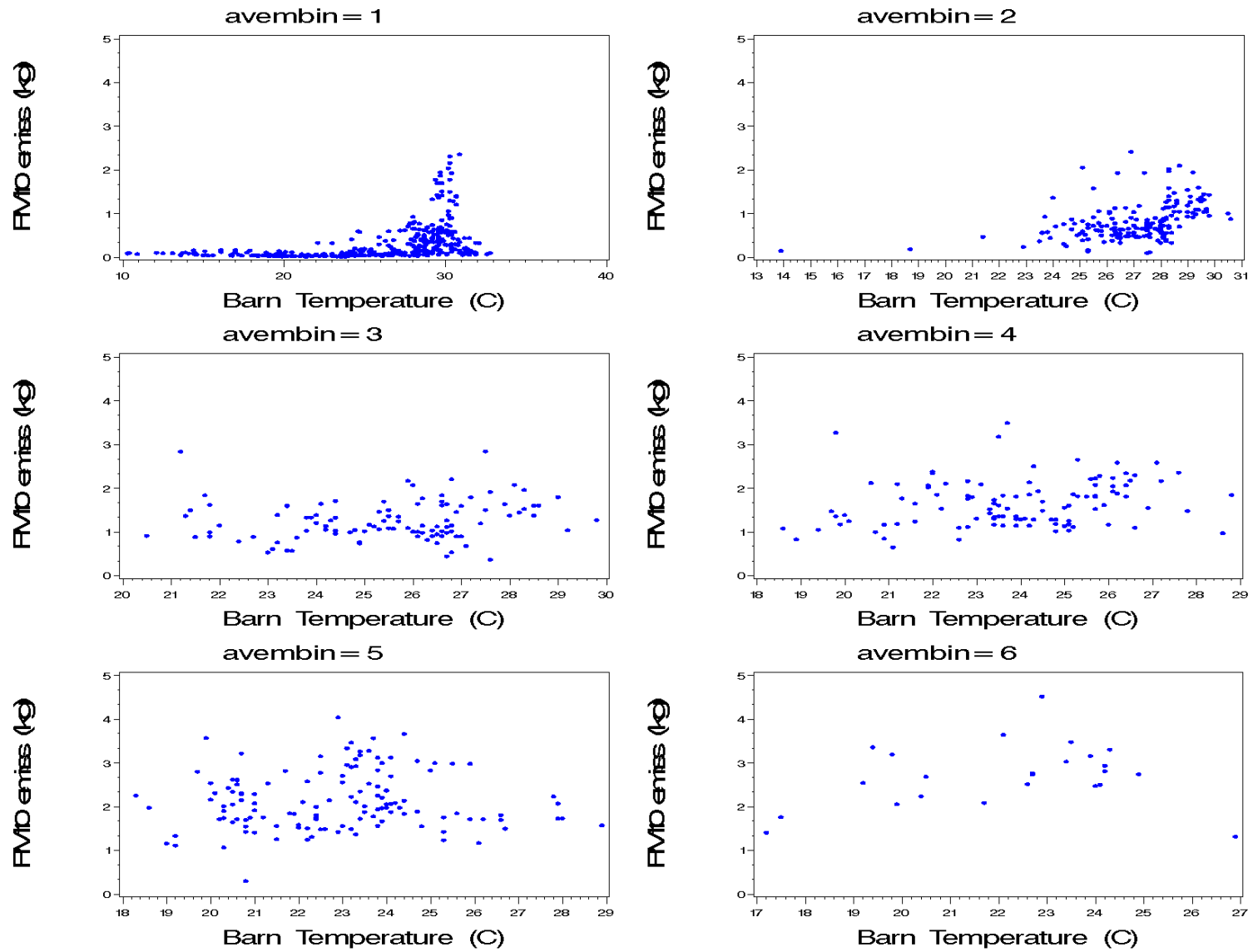


Figure 1-11. PM<sub>10</sub> Emissions Vs. Ambient Pressure, for Each Average Mass Bin

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**Figure 1-12. PM<sub>10</sub> Emissions Vs. House Temperature, for Each Average Mass Bin**

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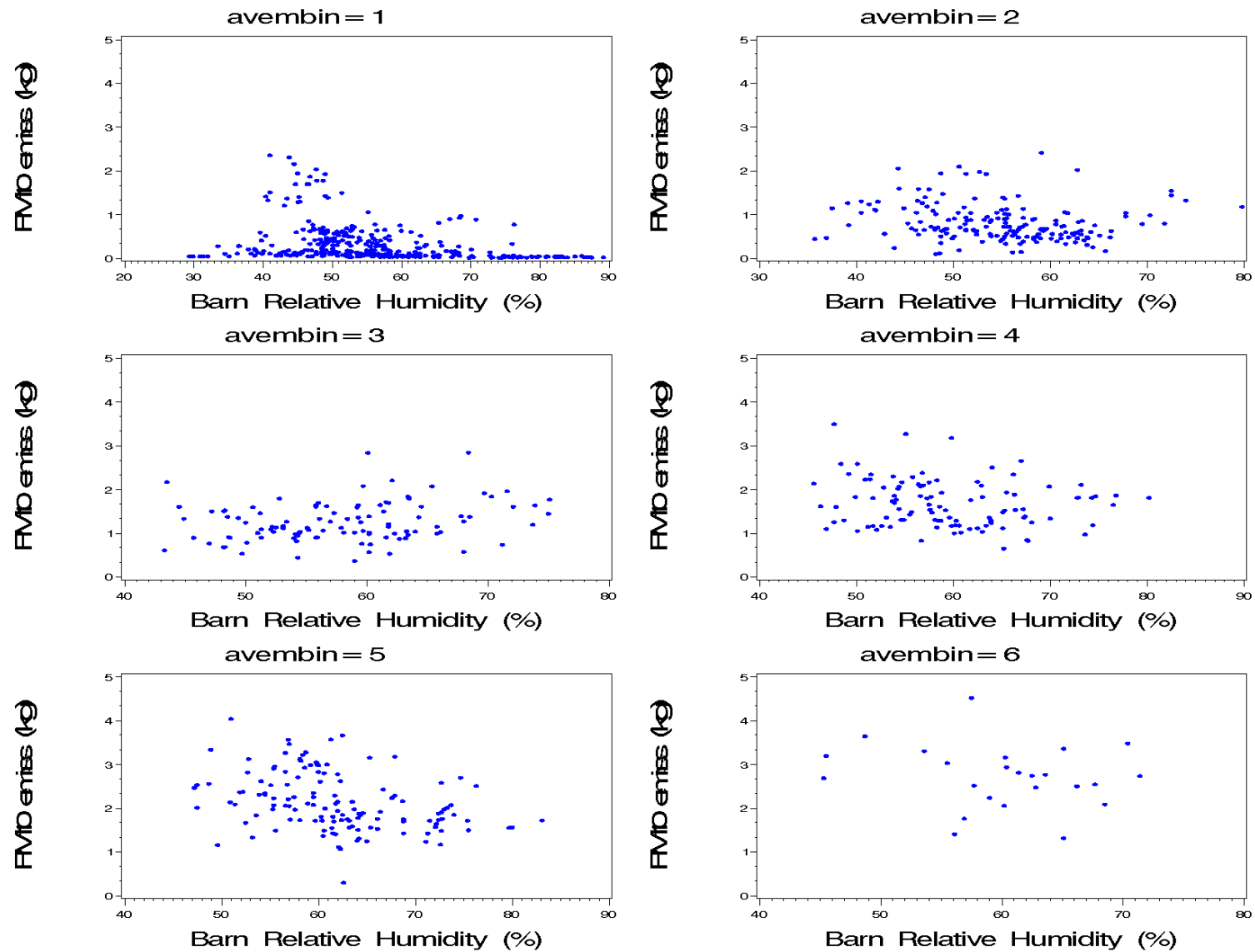


Figure 1-13. PM<sub>10</sub> Emissions Vs. House Relative Humidity, for Each Average Mass Bin

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### 1.3 PM<sub>2.5</sub> Functional Form Plots

The plots presented in this section plot the PM<sub>2.5</sub> emission versus each of the predictor variables by average mass bin to assist in determining their functional forms.

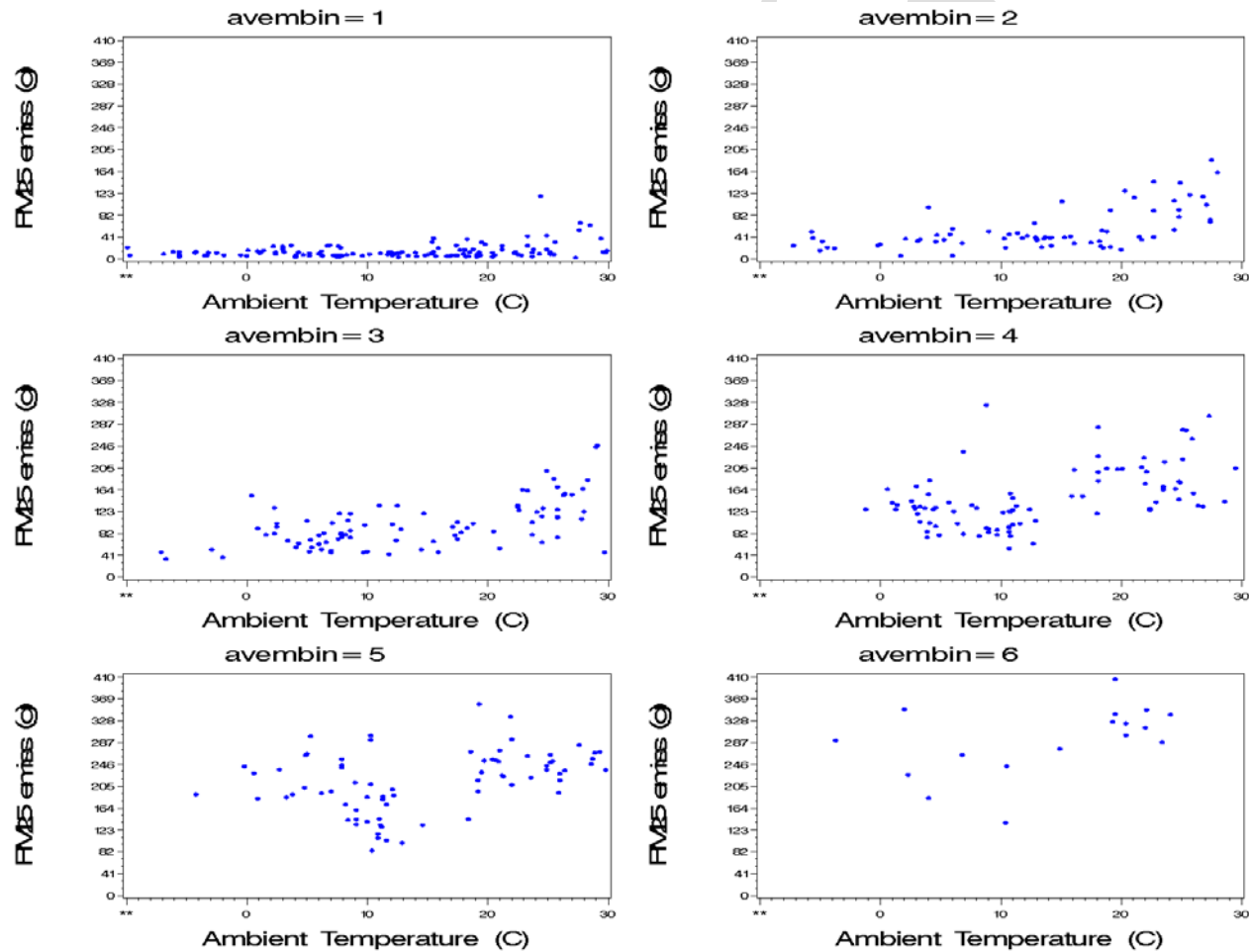


Figure 1-14. PM<sub>2.5</sub> Emissions Vs. Ambient Temperature, for Each Average Mass Bin

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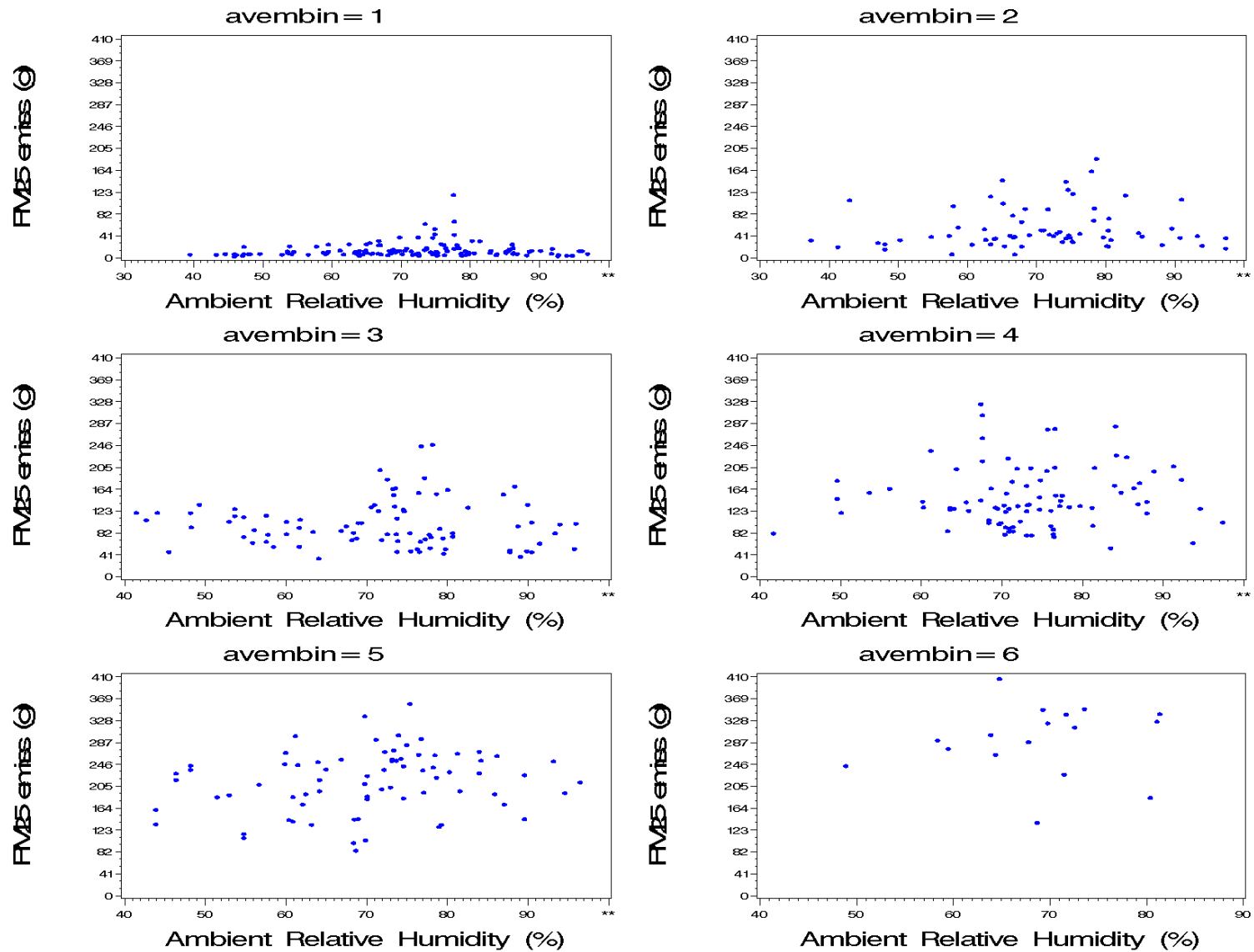


Figure 1-15. PM<sub>2.5</sub> Emissions Vs. Ambient Relative Humidity, for Each Average Mass Bin

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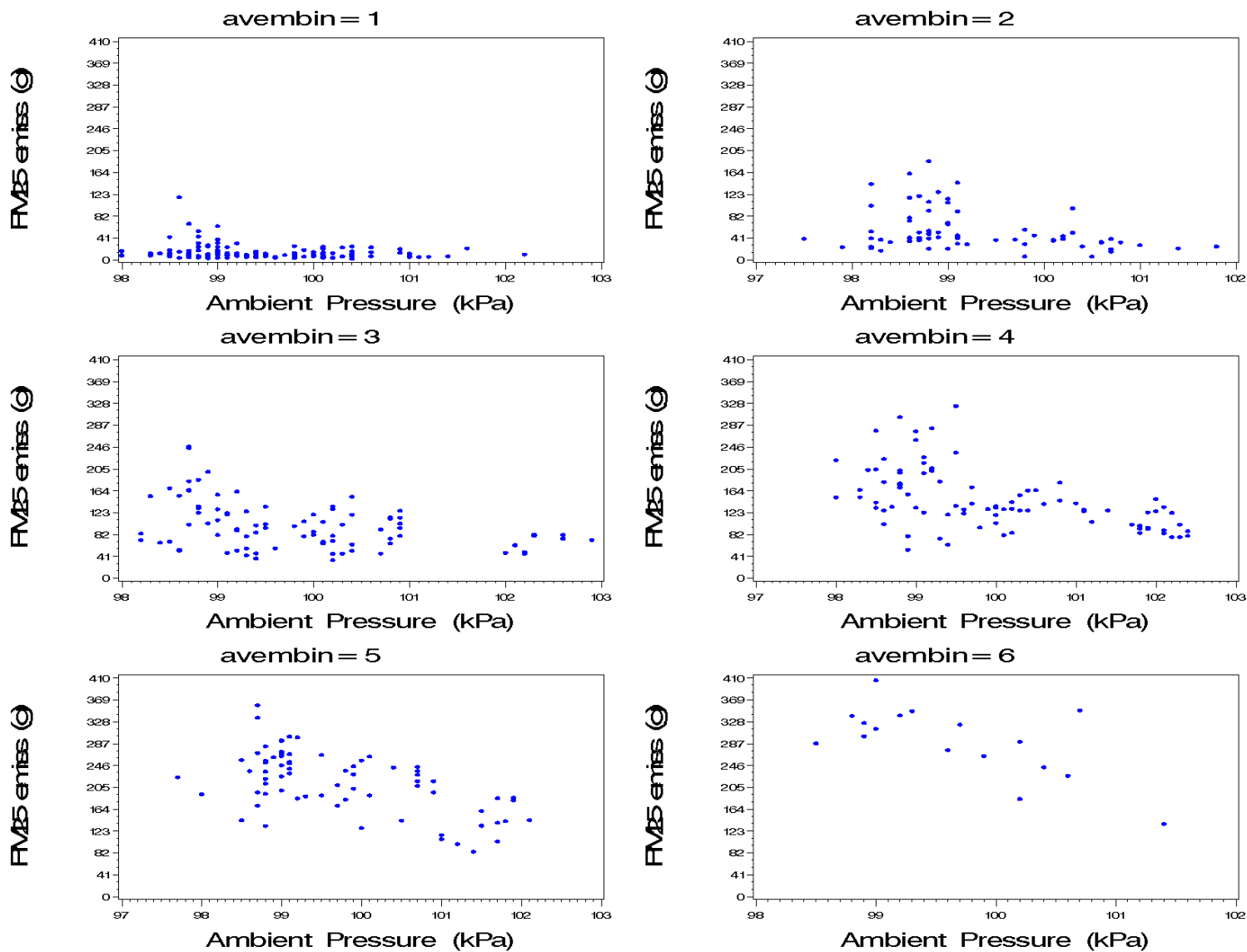


Figure 1-16. PM<sub>2.5</sub> Emissions Vs. Ambient Pressure, for Each Average Mass Bin

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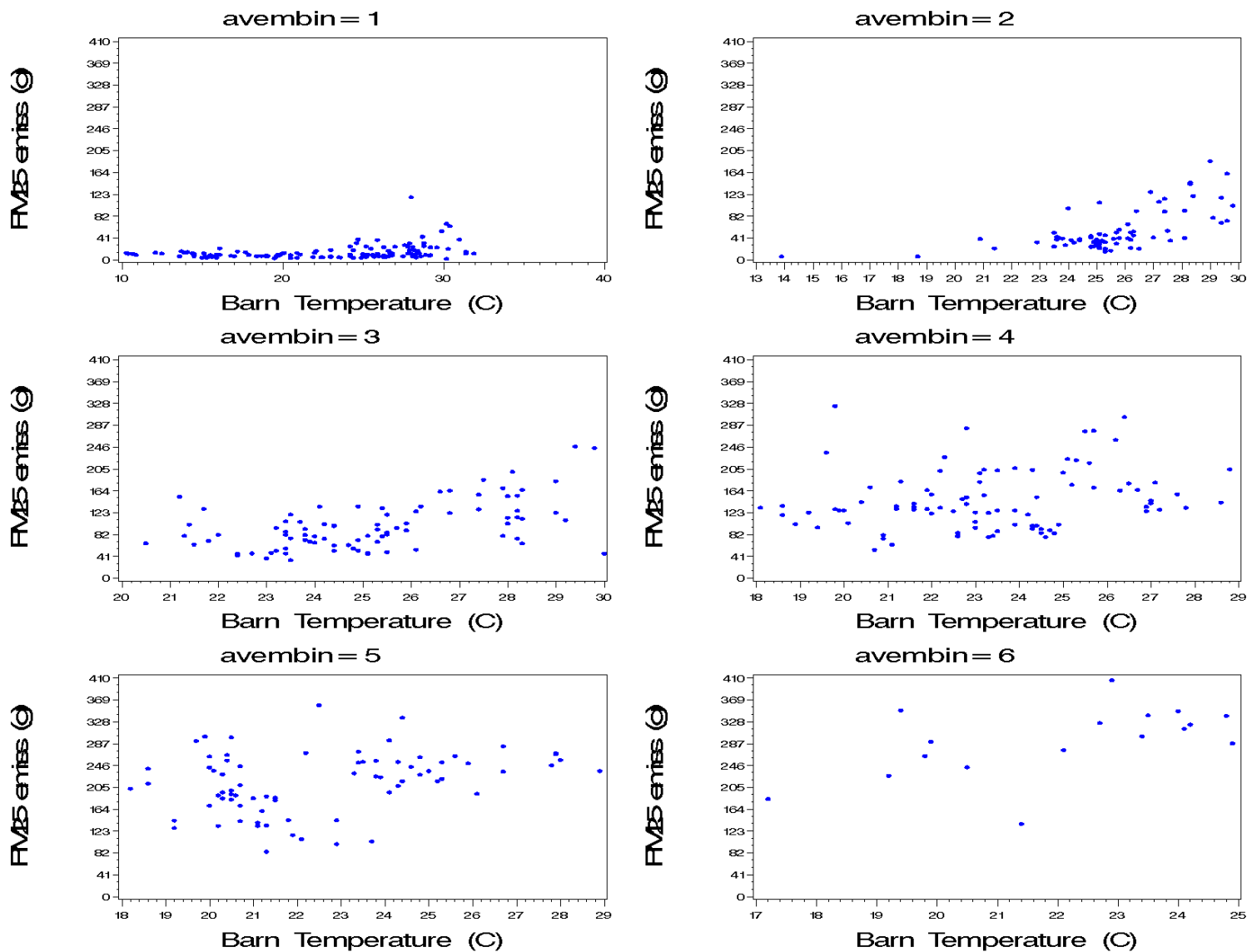


Figure 1-17. PM<sub>2.5</sub> Emissions Vs. House Temperature, for Each Average Mass Bin

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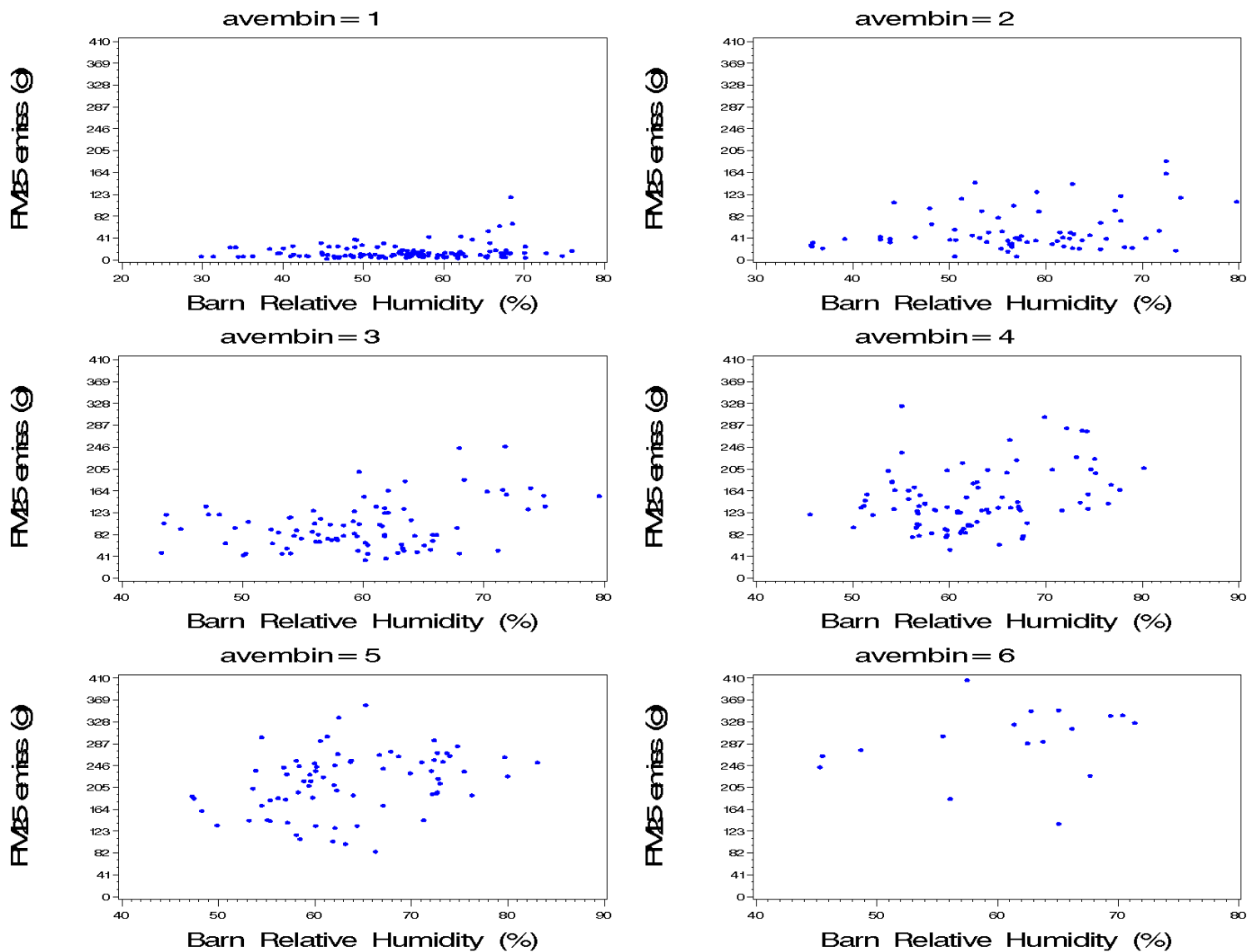


Figure 1-18. PM<sub>2.5</sub> Emissions Vs. House Relative Humidity, for Each Average Mass Bin

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#### 1.4 TSP Functional Form Plots

Figure 1-19 and Figure 1-20 support the use of a quadratic function of average bird mass in EEM development. Plots of all emissions values masked the emissions decrease because of large variances in emissions between the houses at that same time. Figure 1-19 contains scatter plots of TSP emission versus the average bird mass for each of the 9 flocks with TSP measurements that occurred over the study at CA1B House 10 and House 12. Figure 1-20 contains the plots for the six flocks that occurred at the KY1B-2 House 3 at the top half of the figure and KY1B-1 House 5 on the bottom half of the figure.

The remaining plots on the section plot the TSP emission versus each of the predictor variables by average mass bin to assist in determining their functional forms.

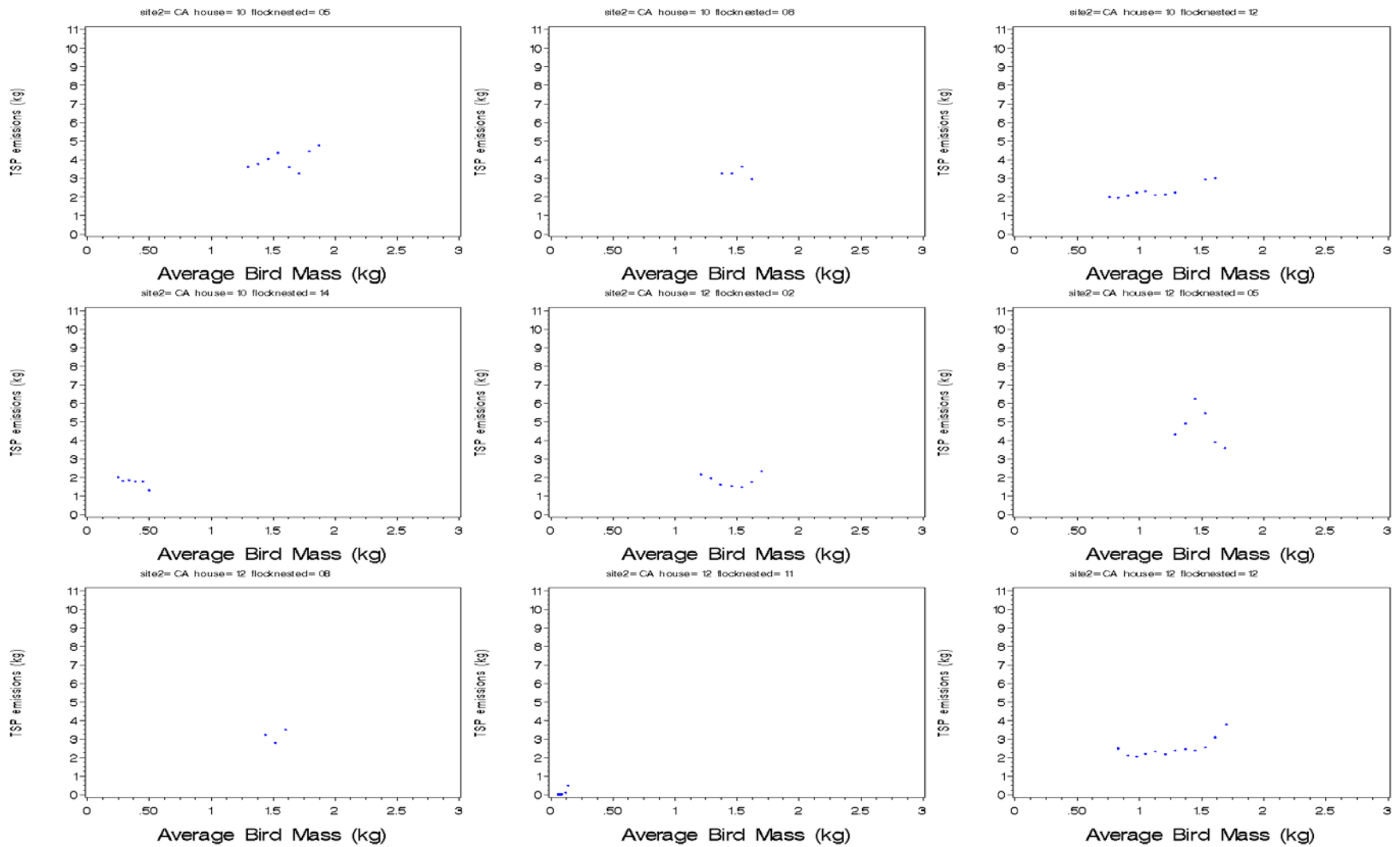
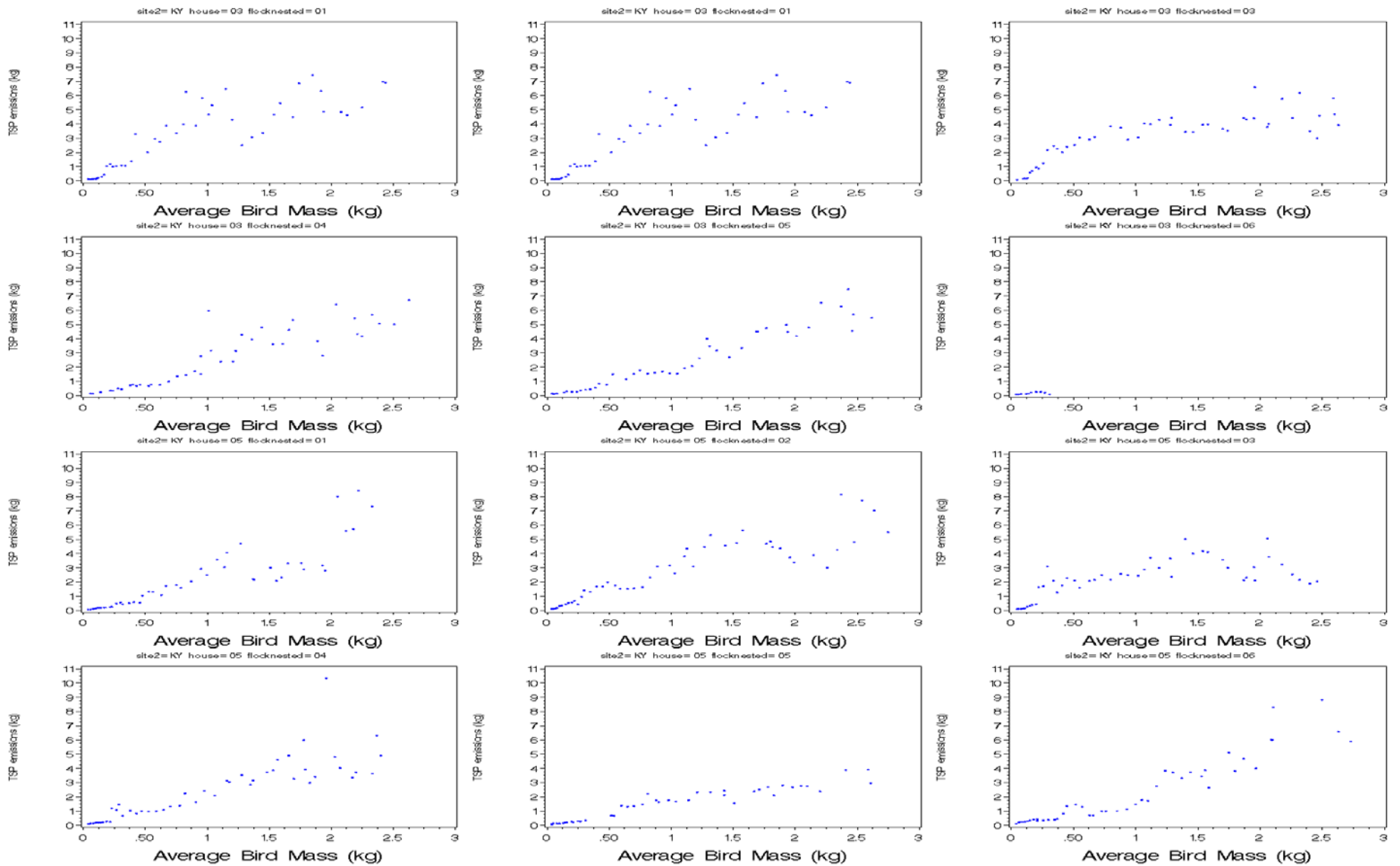


Figure 1-19. TSP Emissions Vs. Average Bird Mass, for Each Flock at CA1B Houses

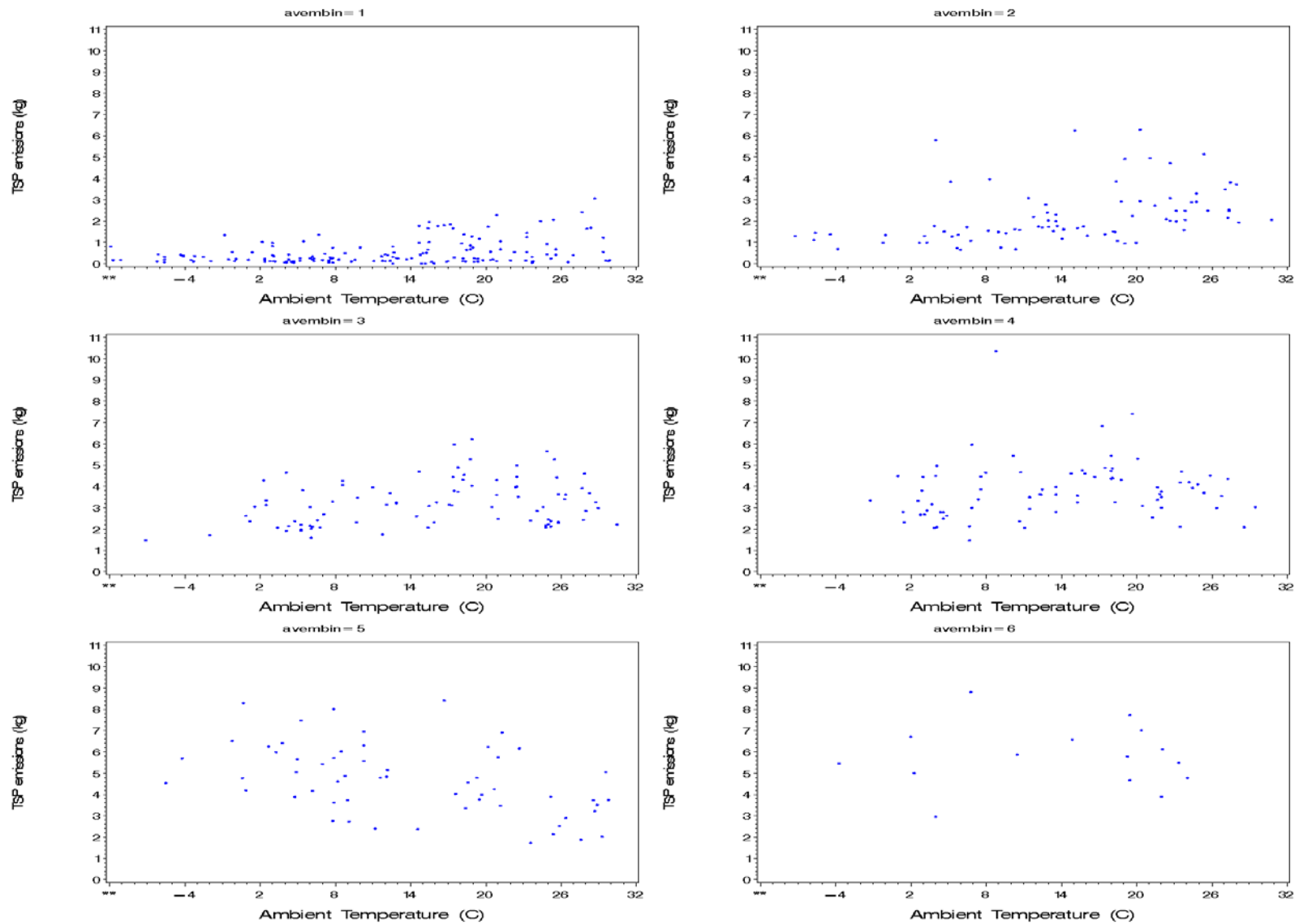
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**Figure 1-20. TSP Emissions Vs. Average Bird Mass, for Each Flock at the Kentucky sites**

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**Figure 1-21. TSP Emissions Vs. Ambient Temperature, for Each Average Mass Bin**

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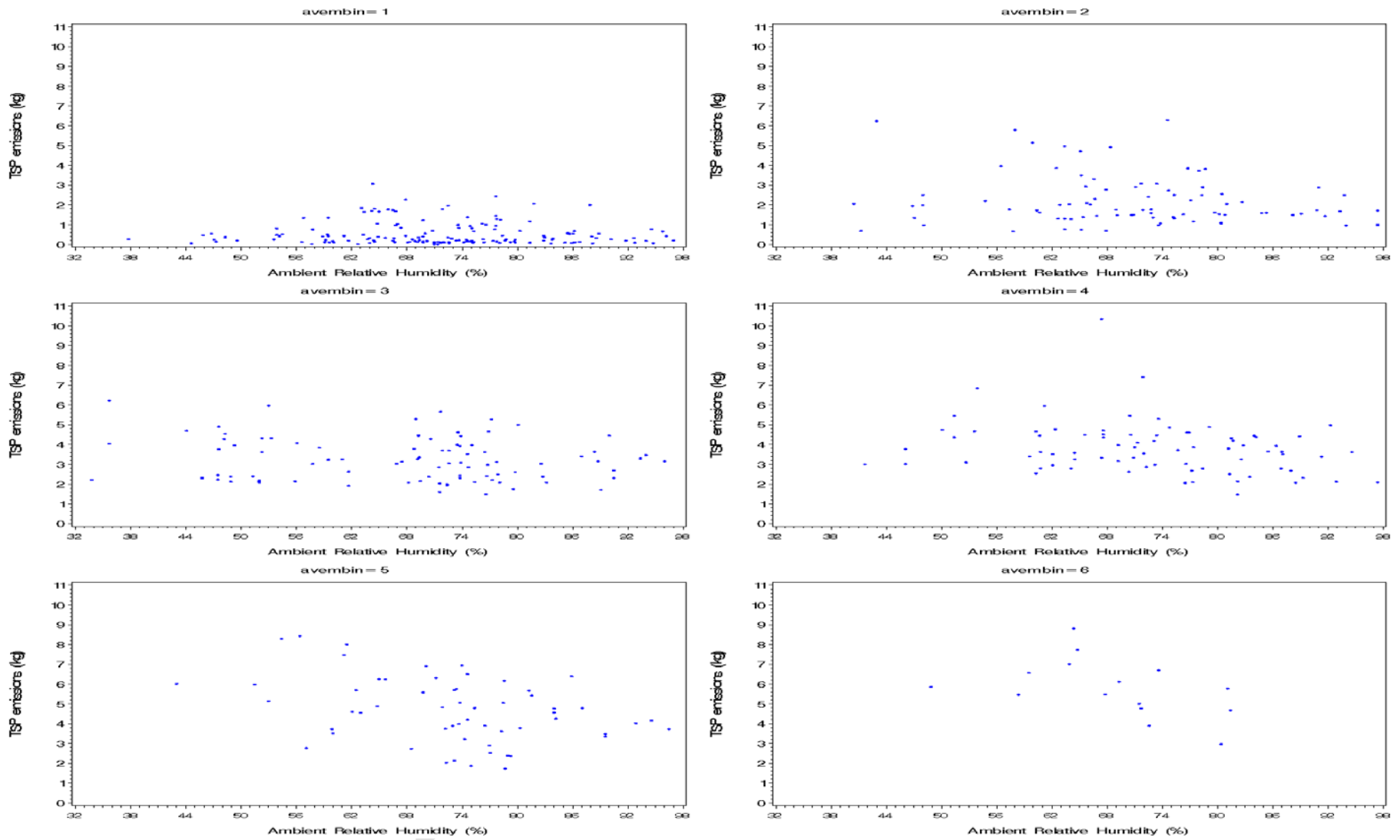


Figure 1-22. TSP Emissions Vs. Ambient Relative Humidity, for Each Average Mass Bin

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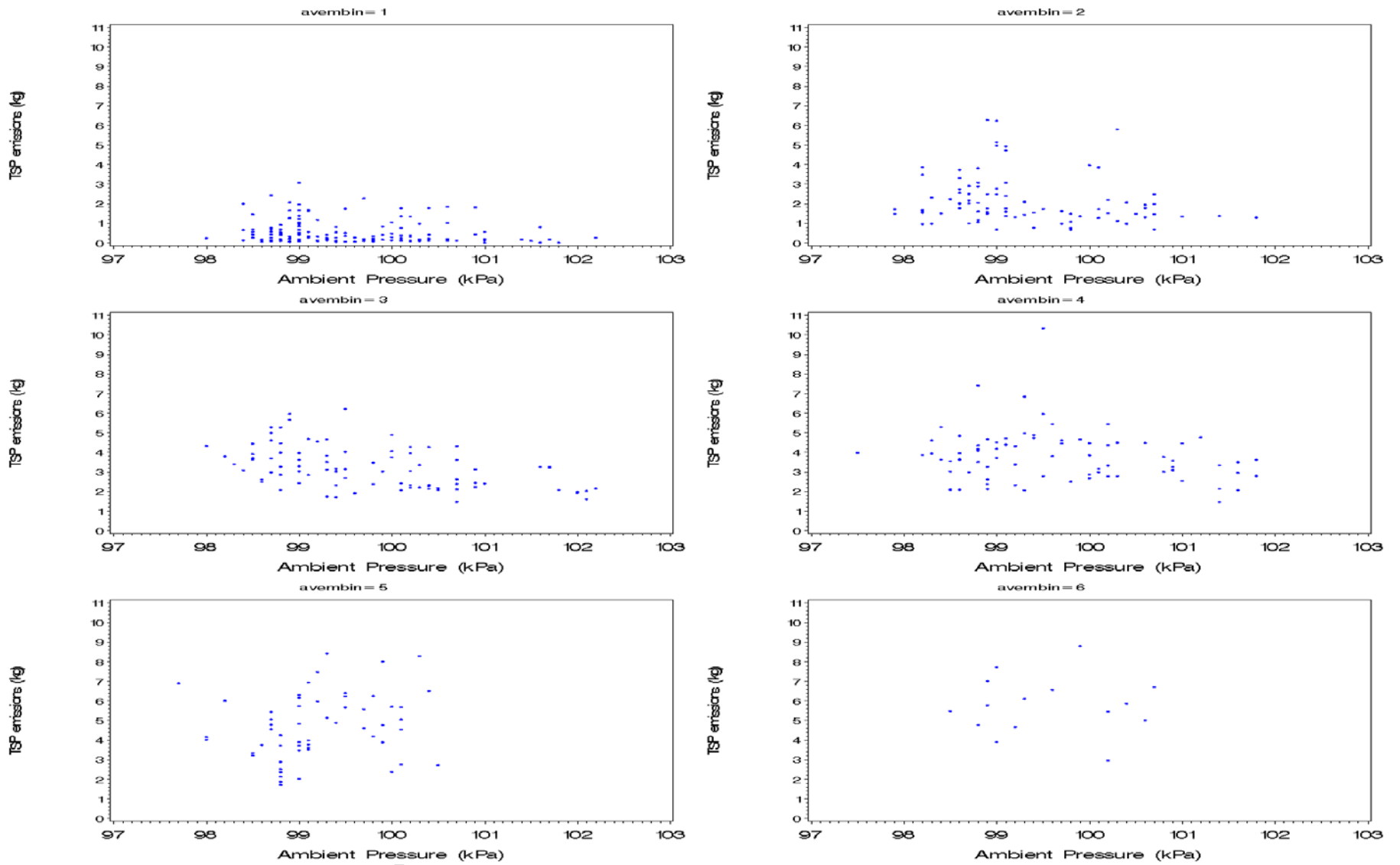


Figure 1-23. TSP Emissions Vs. Ambient Pressure, for Each Average Mass Bin

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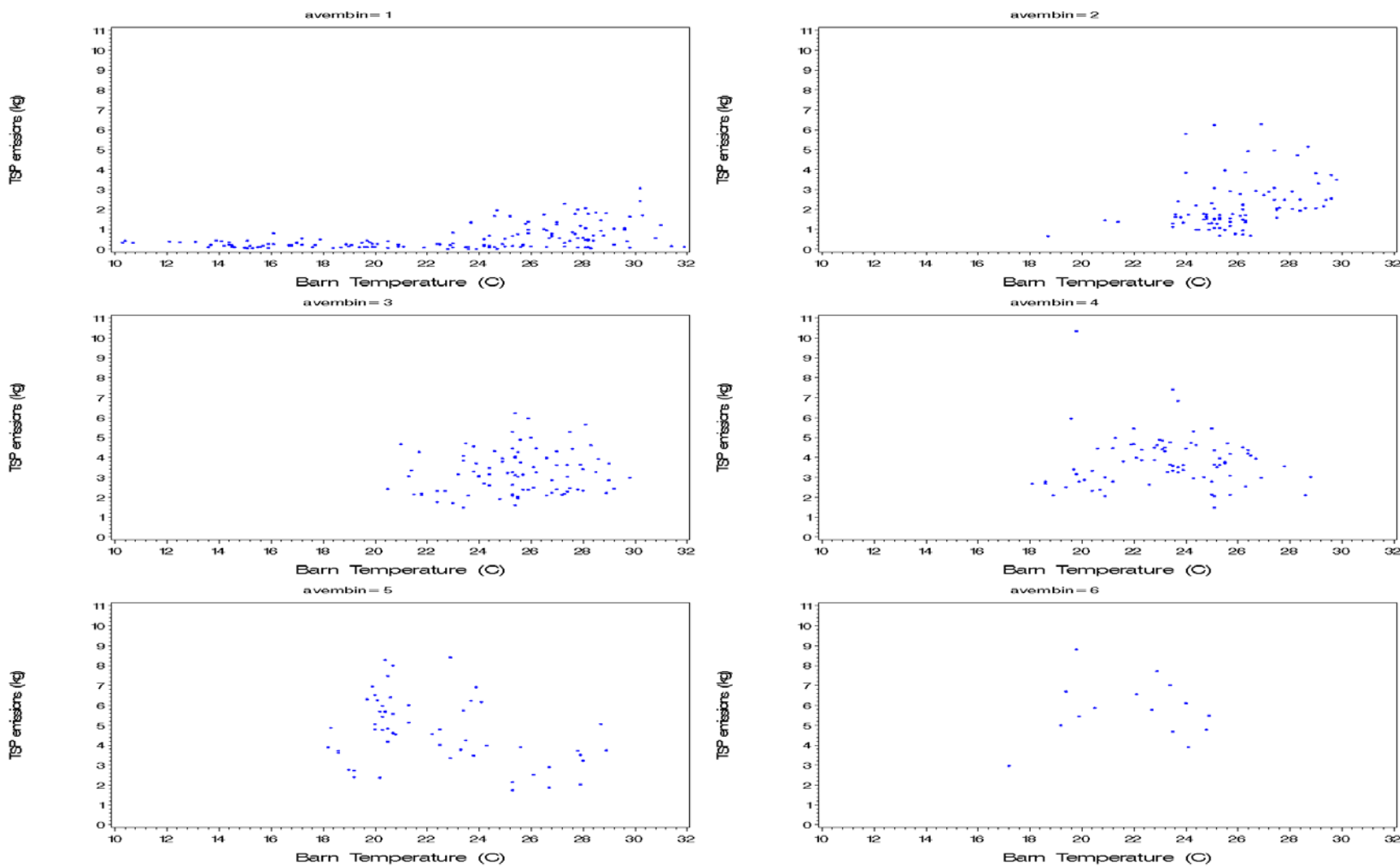
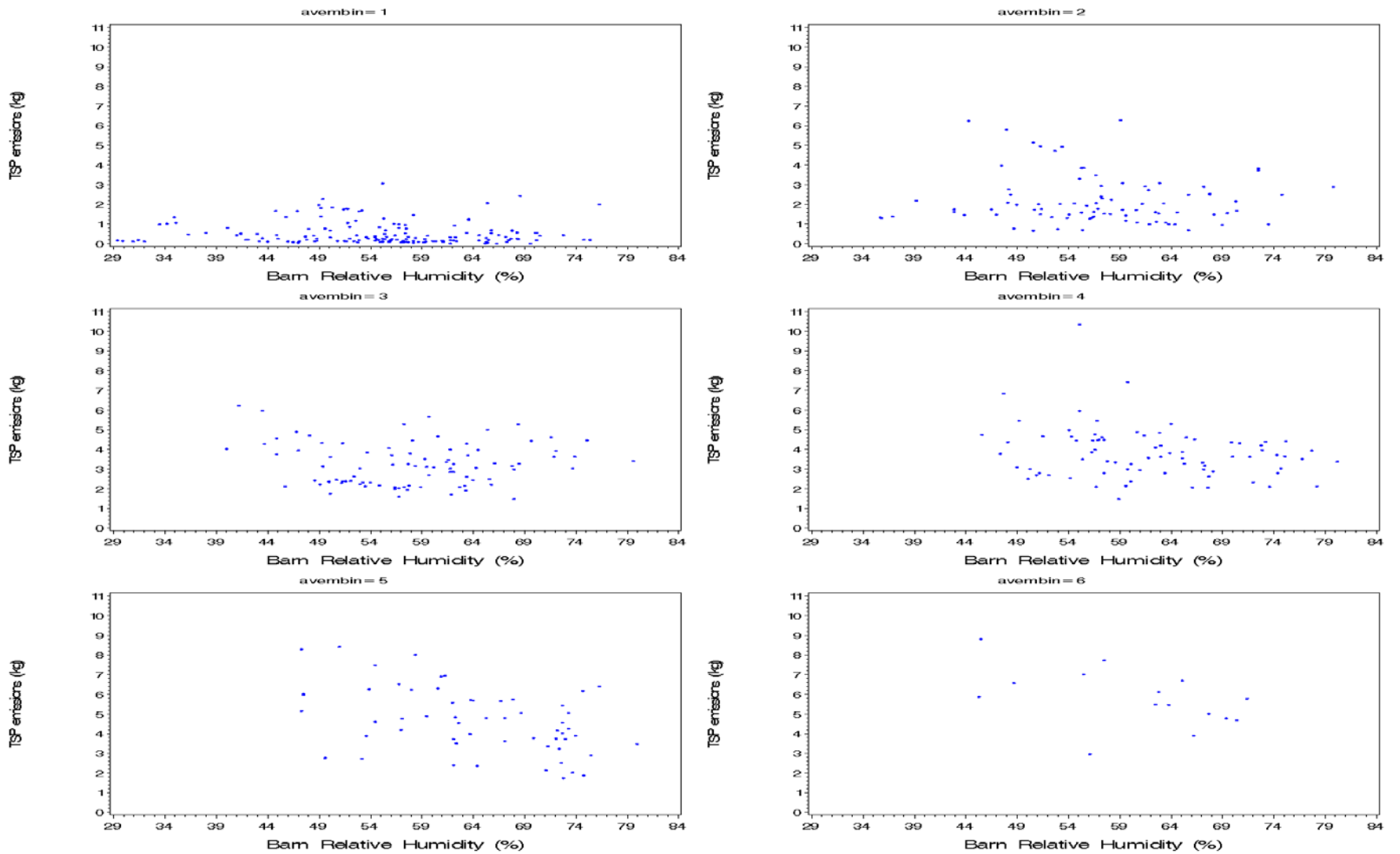


Figure 1-24. TSP Emissions Vs. House Temperature, for Each Average Mass Bin

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**Figure 1-25. TSP Emissions Vs. House Relative Humidity, for Each Average Mass Bin**

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## 1.5 VOC Functional Form Plots

Figure 1-26 supports the use of a quadratic function of average bird mass in EEM development. Plots of all emissions values masked the emissions decrease because of large variances in emissions between the houses at that same time. Figure 1-26 contains scatter plots of VOC emission versus the average bird mass for each of the six flocks that occurred at the KY1B-2 House 3 at the top half of the figure and KY1B-1 House 5 on the bottom half of the figure.

The remaining plots in this section plot the VOC emission versus each of the predictor variables by average mass bin to assist in determining their functional forms.

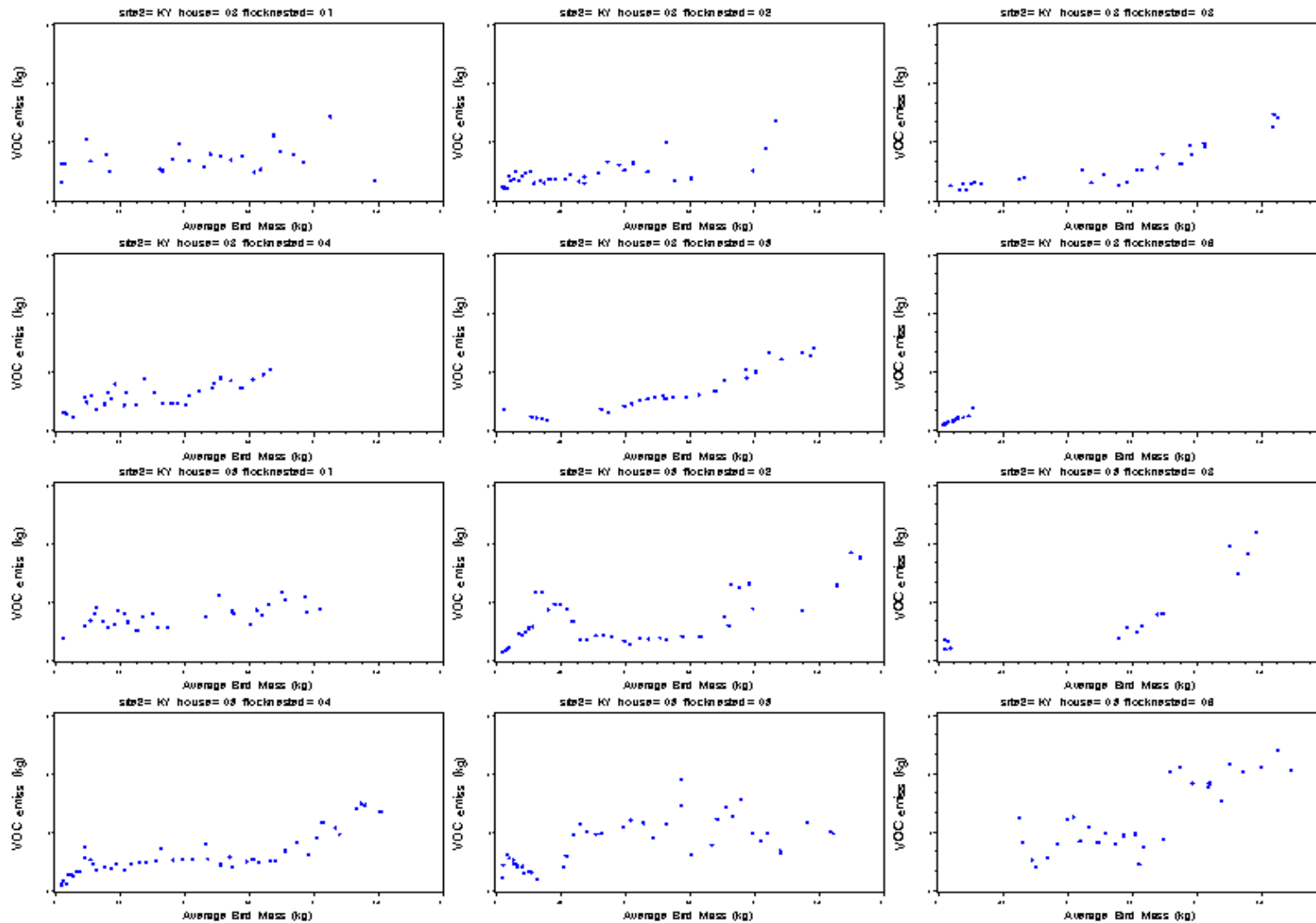


Figure 1-26. VOC Emissions Vs. Average Bird Mass, for Each Flock

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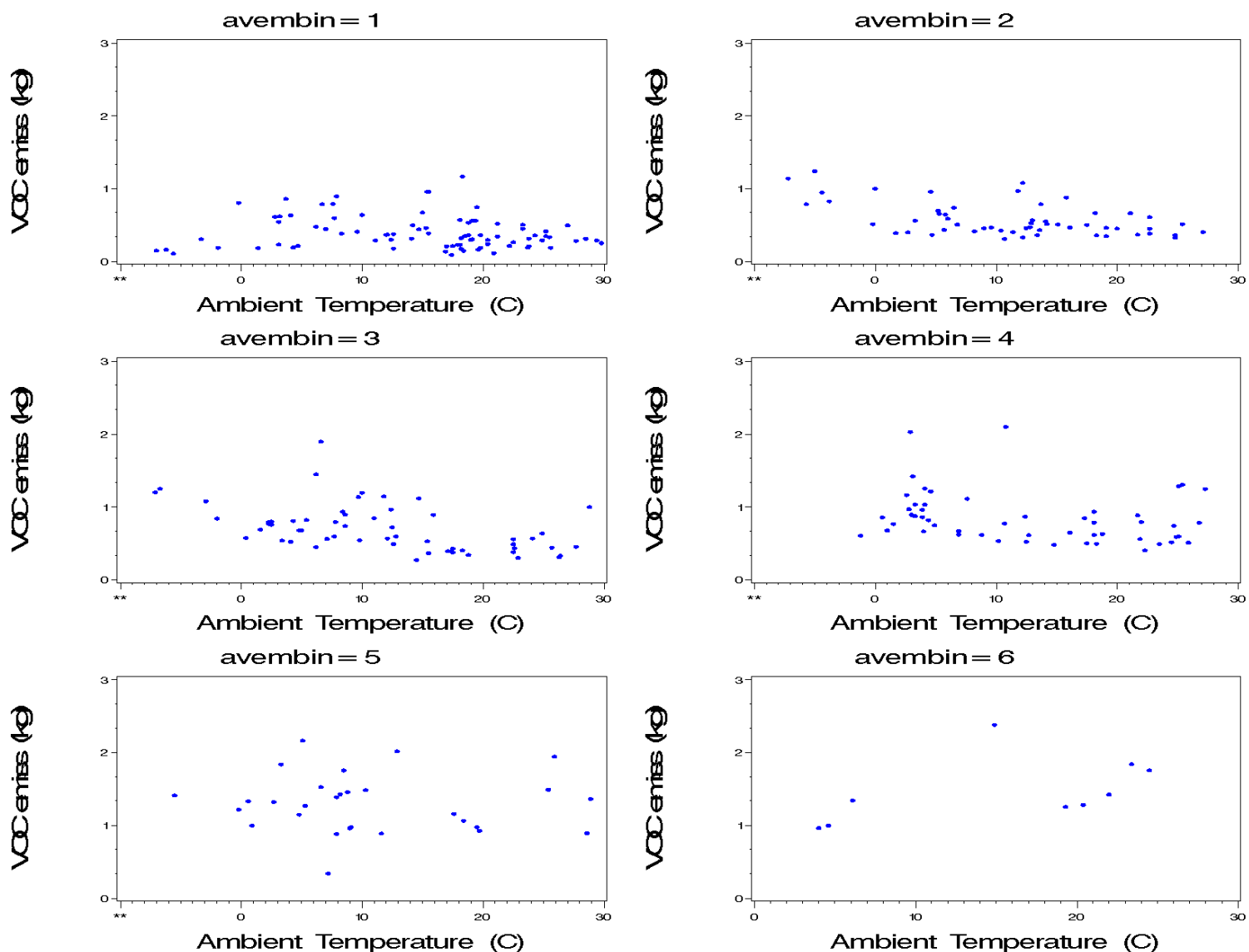


Figure 1-27. VOC Emissions Vs. Ambient Temperature, for Each Average Mass Bin

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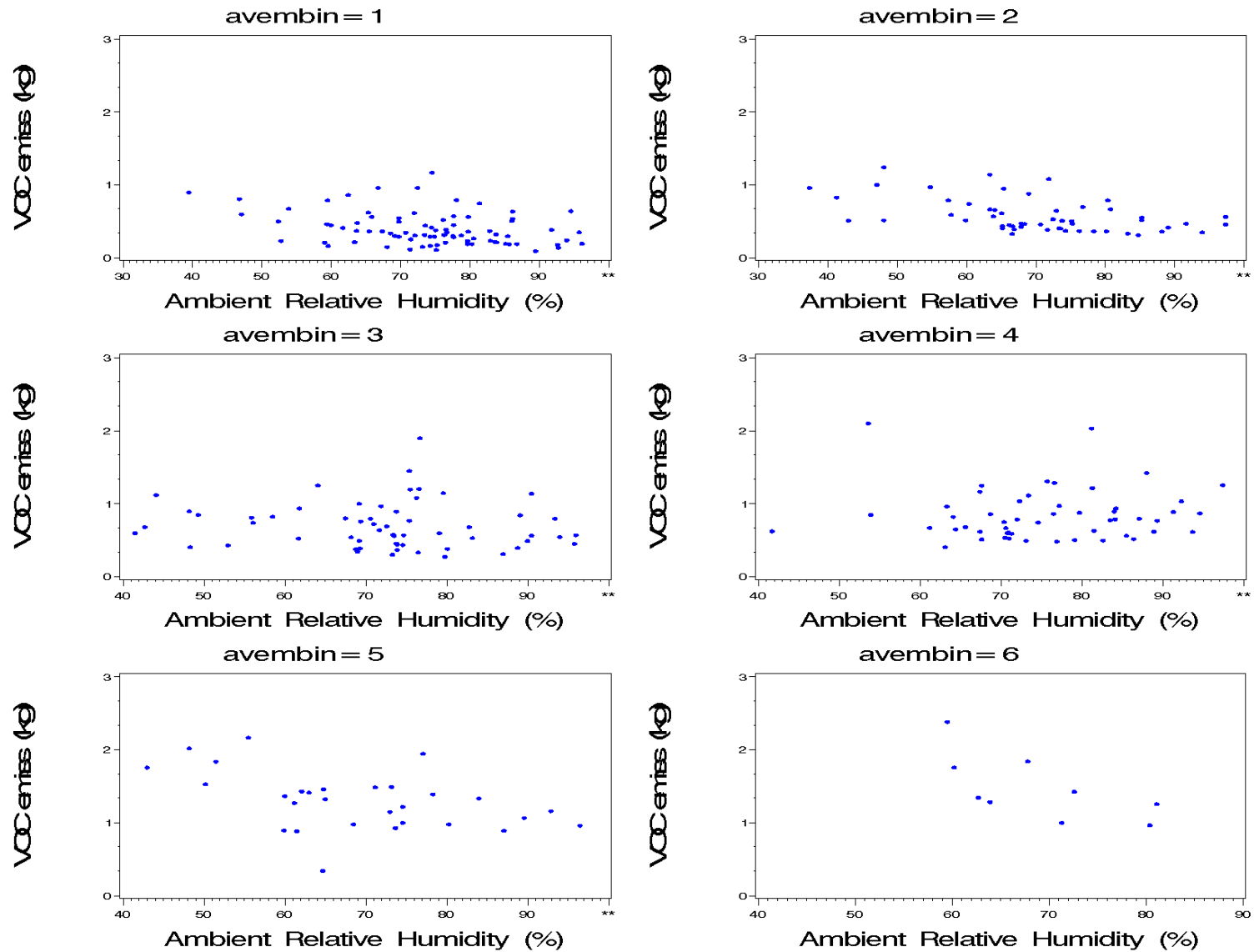
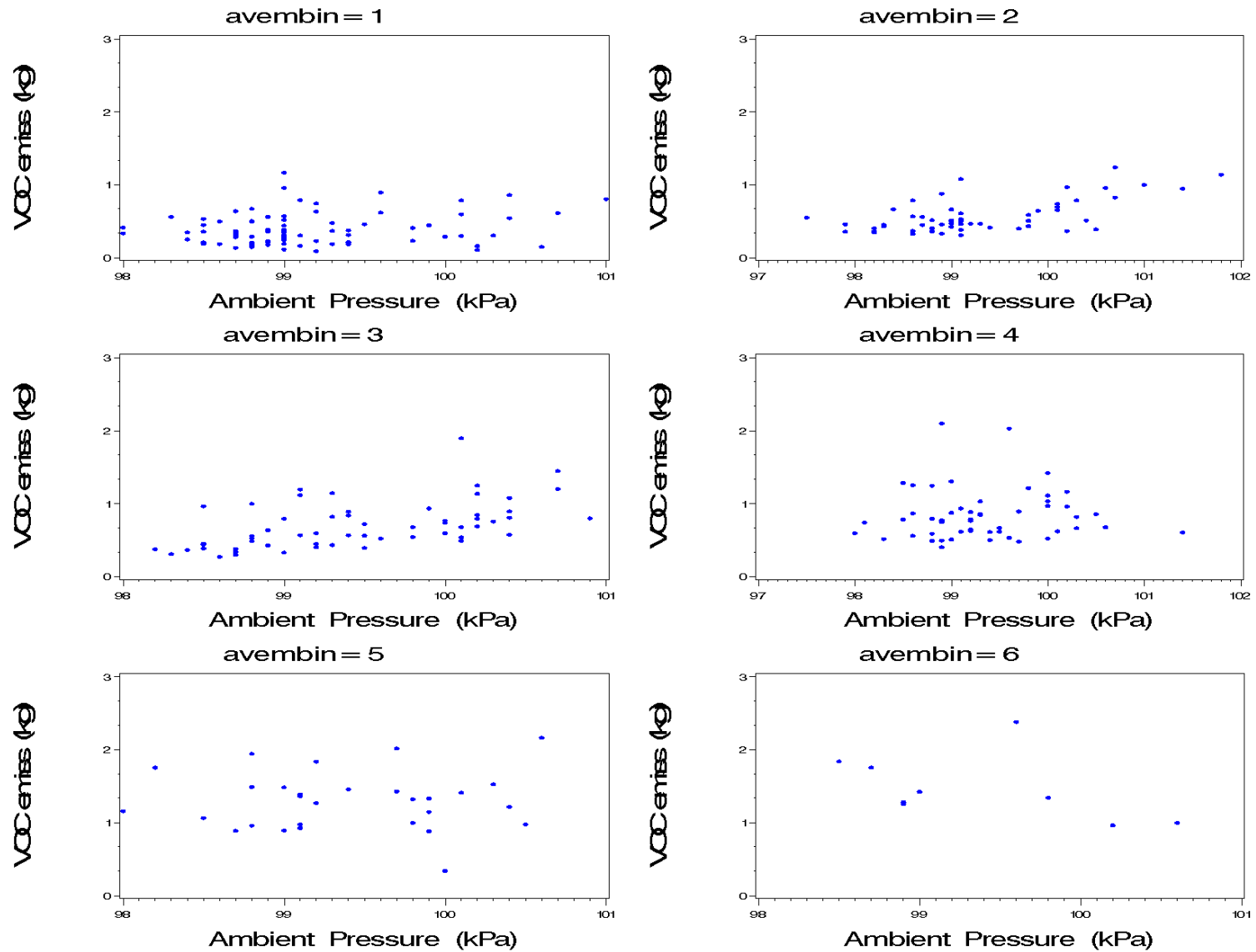


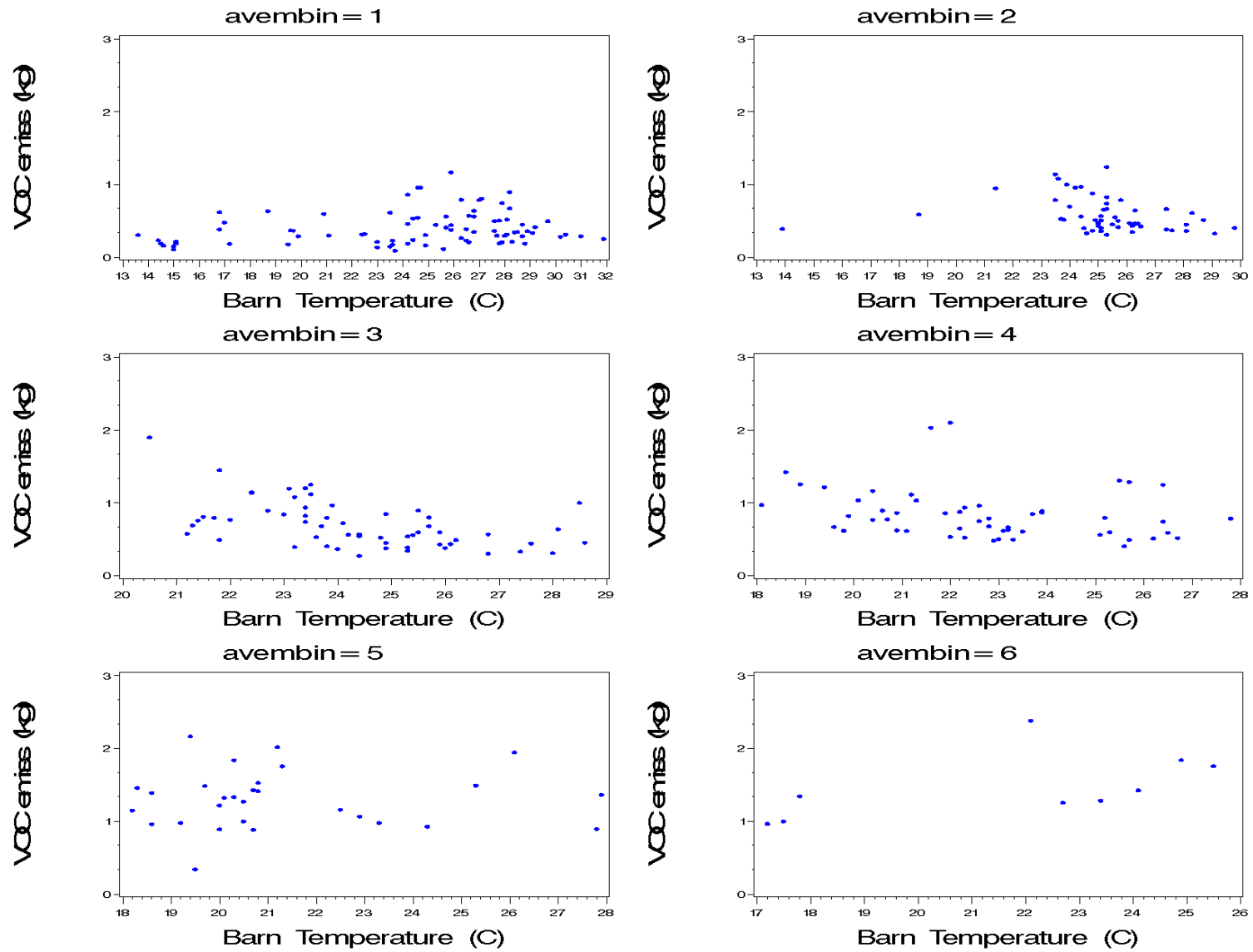
Figure 1-28. VOC Emissions Vs. Ambient Relative Humidity, for Each Average Mass Bin

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**Figure 1-29. VOC Emissions Vs. Ambient Pressure, for Each Average Mass Bin**

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**Figure 1-30. VOC Emissions Vs. House Temperature, for Each Average Mass Bin**

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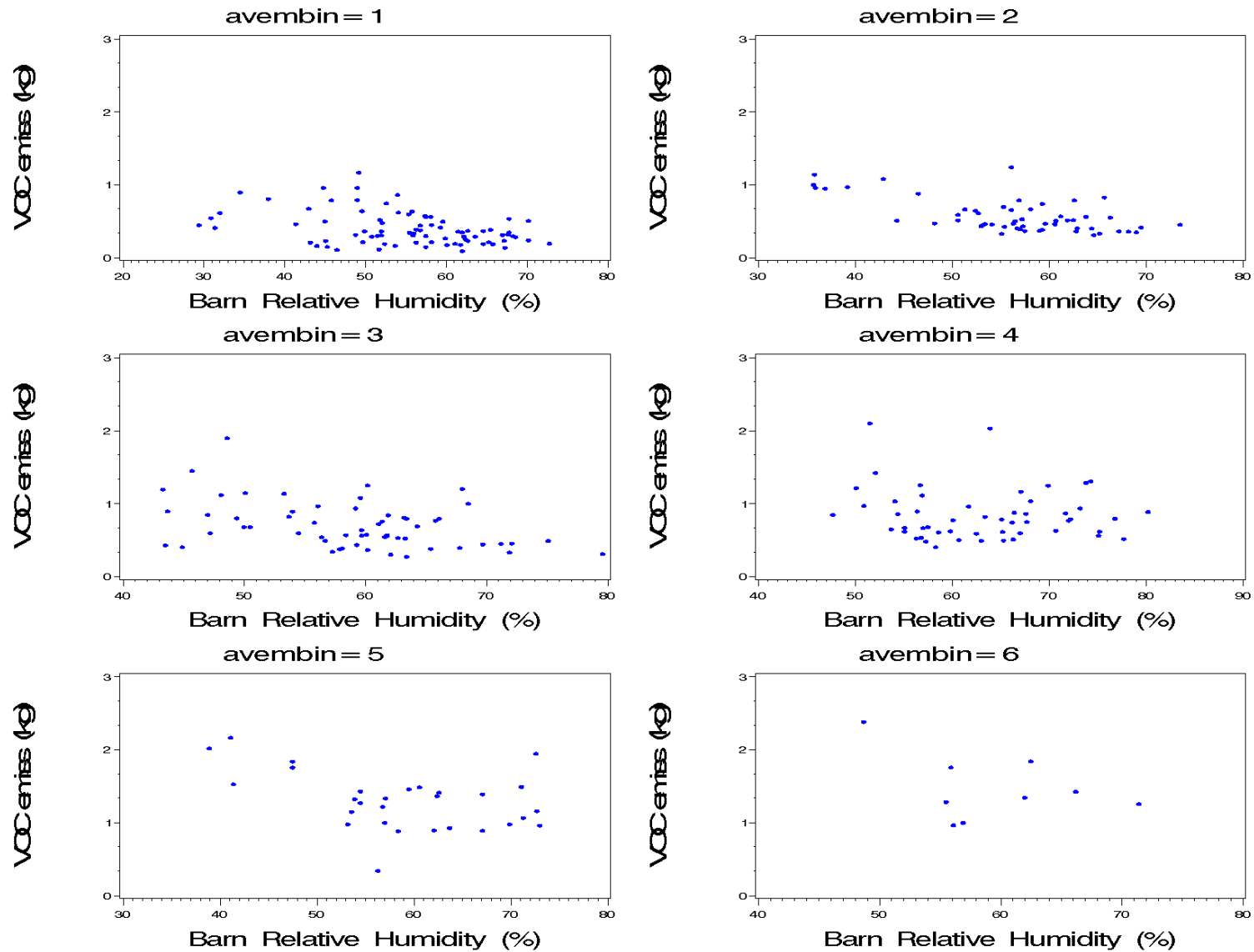


Figure 1-31. VOC Emissions Vs. House Relative Humidity, for Each Average Mass Bin

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