Supplementary material for evaluating the accuracy of downwind methods for quantifying point source emissions

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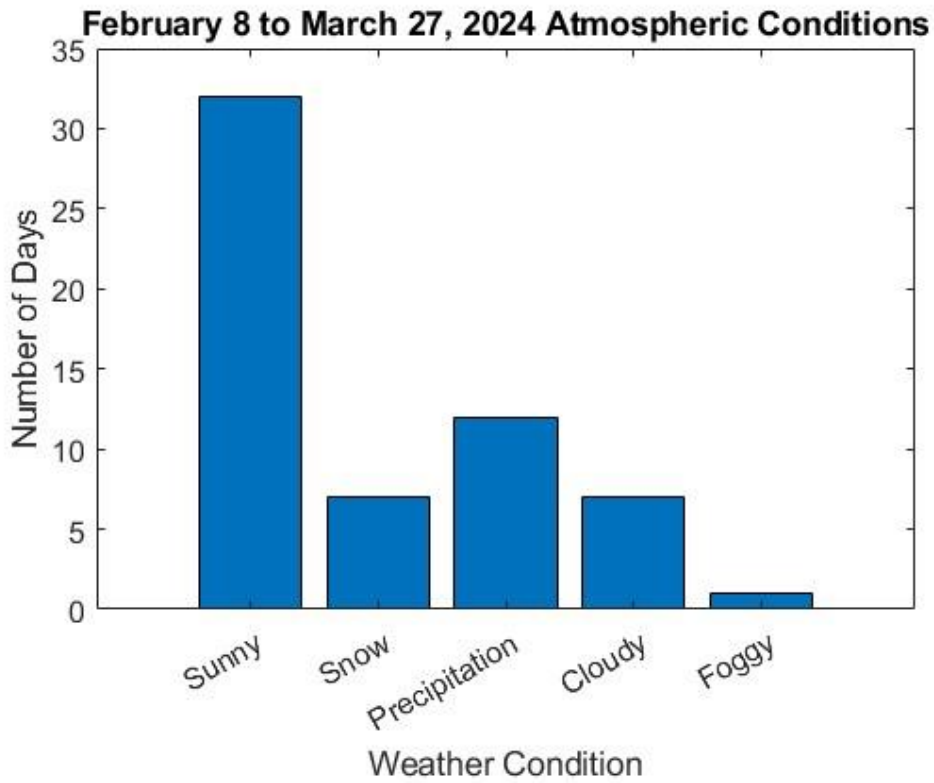
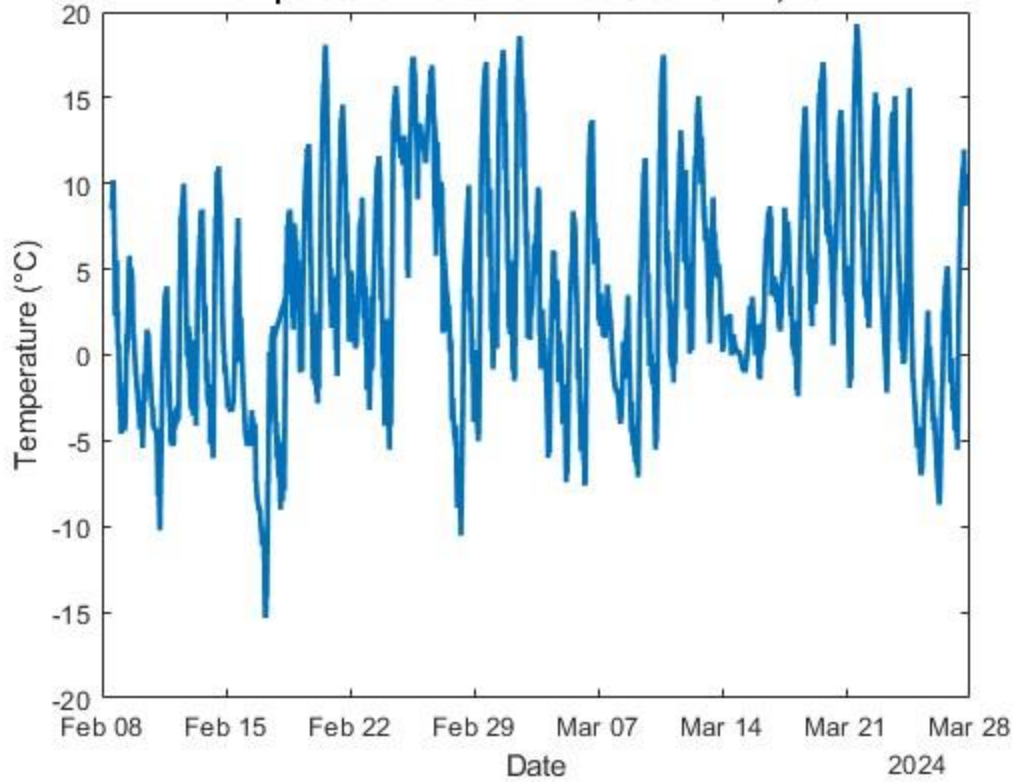
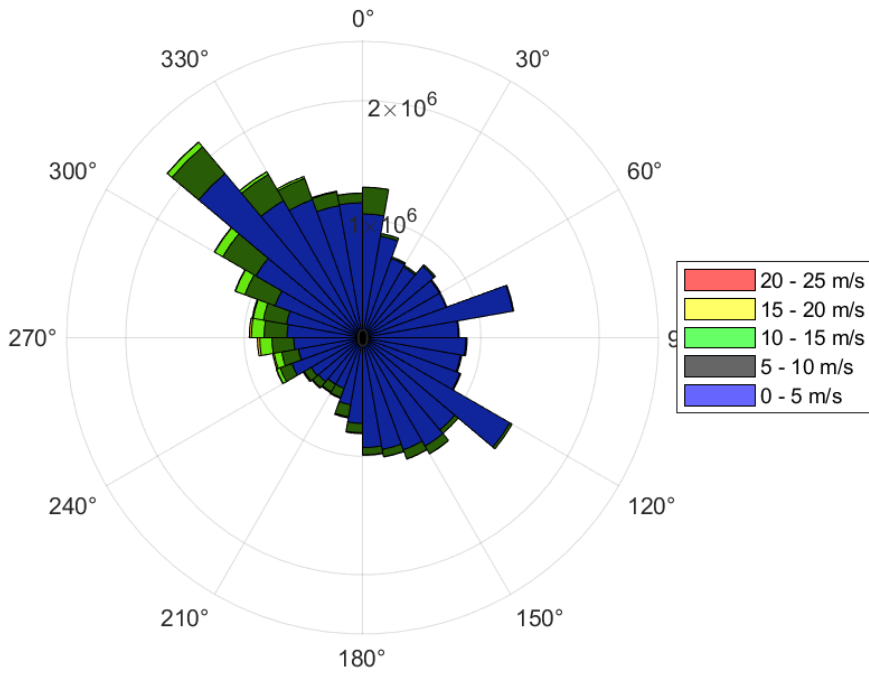
Section 1: Atmospheric Conditions during the Test Period

Section 2: Methane emission quantification

2.1 Eddy Covariance

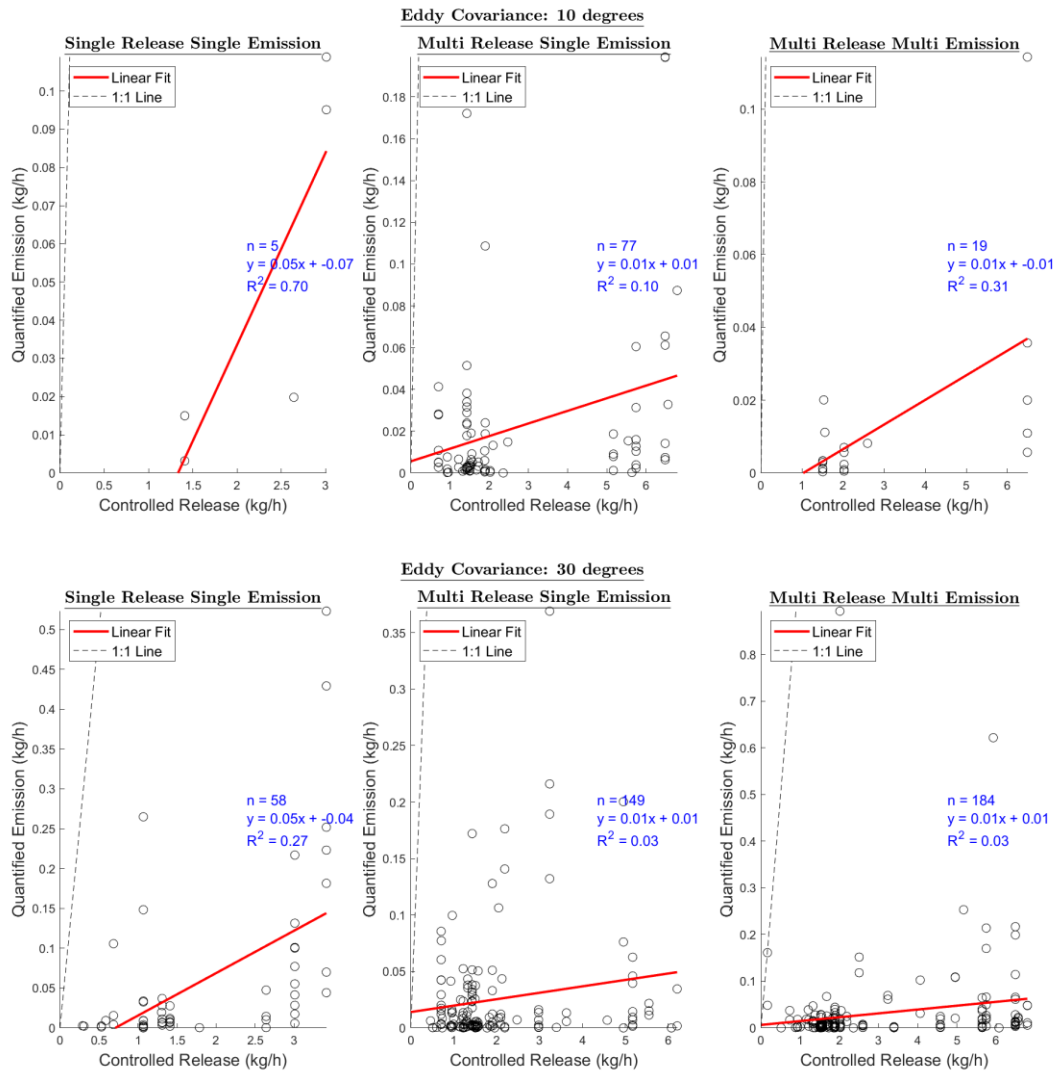



Figure S1 Quantified emission calculated using the eddy covariance method. The dashed line represents the 1:1 line (points below the line were underestimated), the red line is the linear regression fit of the data, and n is the number of data points.

2.2 Aerodynamic Flux Gradient

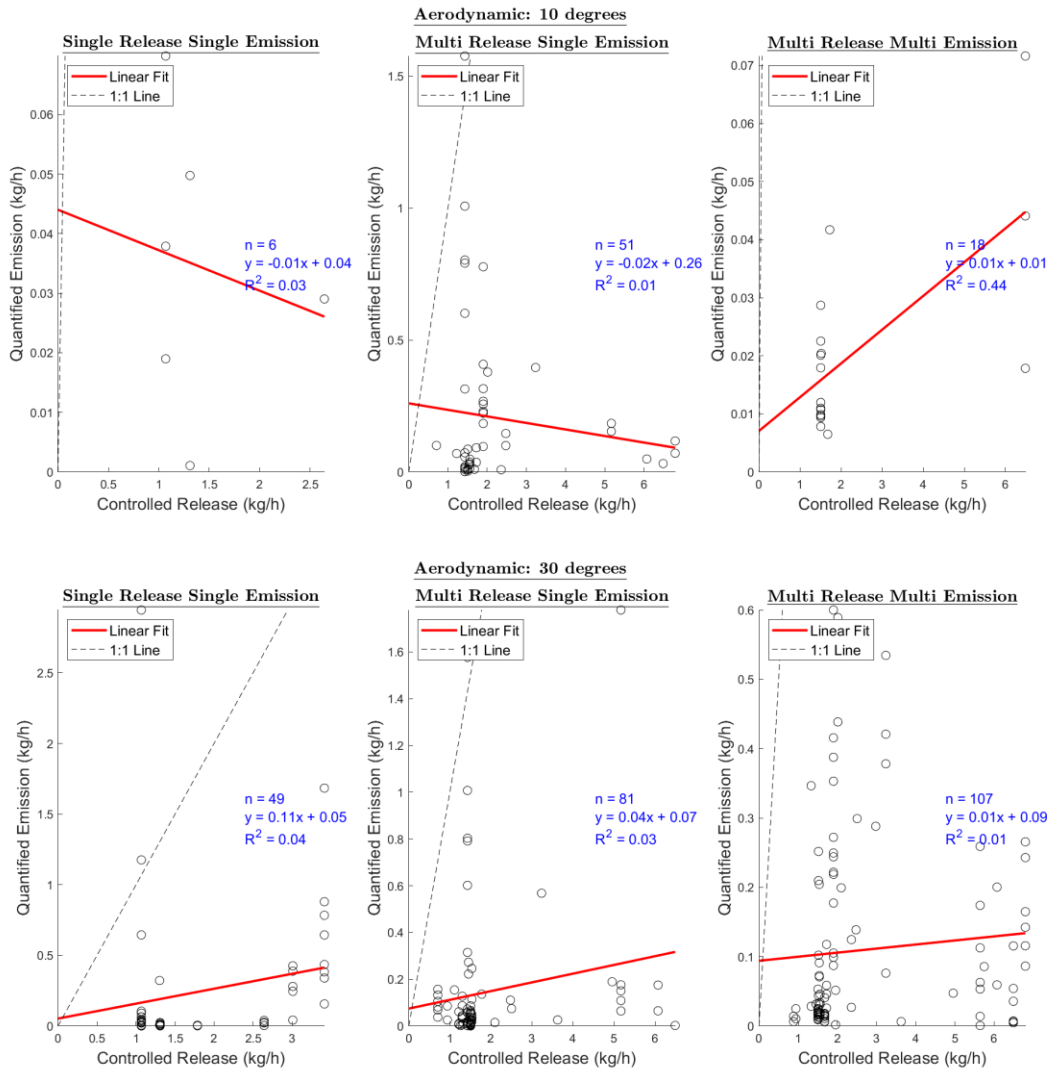



Figure S2 Quantified emission calculated using the aerodynamic flux gradient method. The dashed line represents the 1:1 line (points below the line were underestimated), the red line is the linear regression fit of the data, and n is the number of data points.

2.3 Gaussian Plume Inverse method

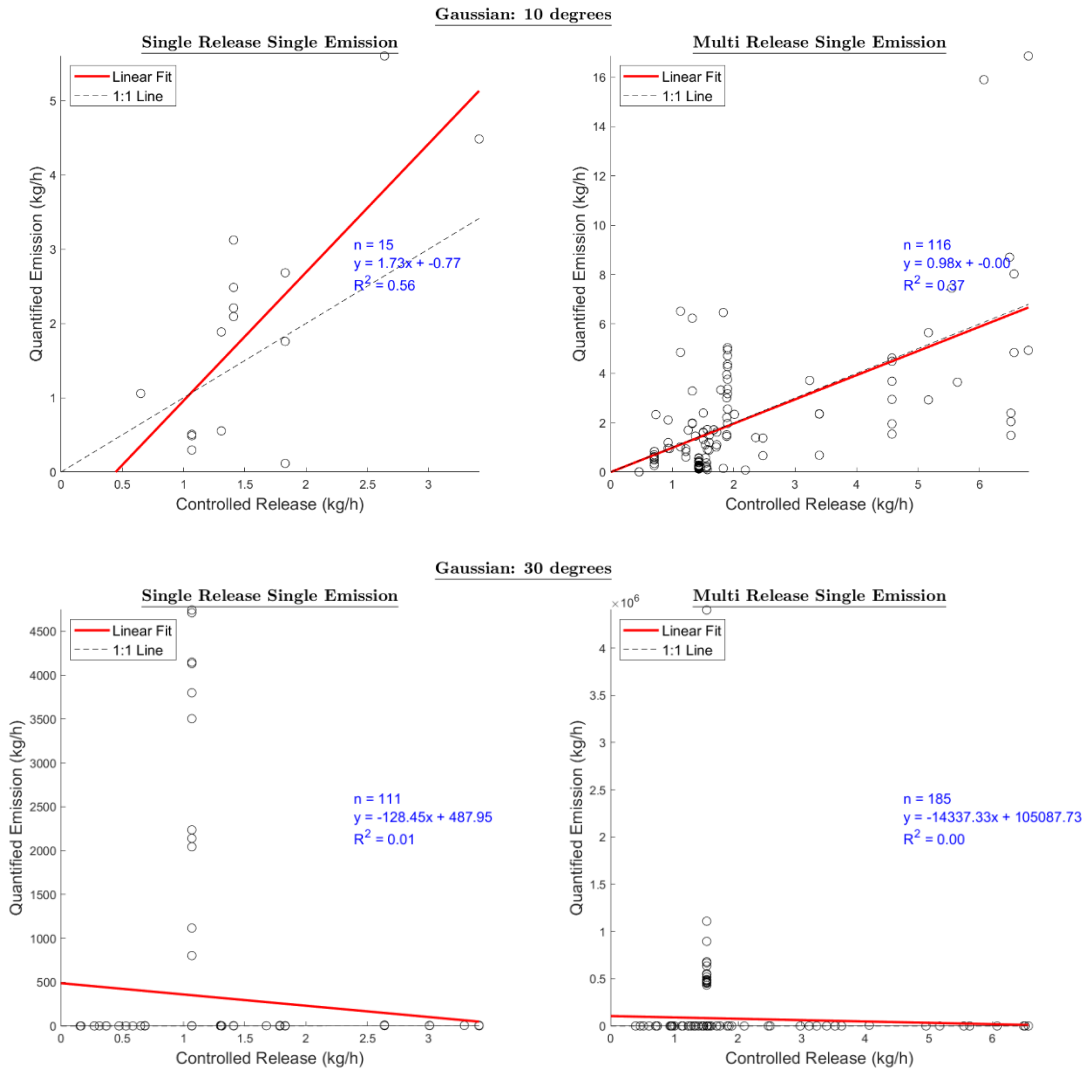



Figure S3 Quantified emission calculated using the Gaussian plume inverse method. The dashed line represents the 1:1 line (points below the line were underestimated), the red line is the linear regression fit of the data, and n is the number of data points.

Section 3: Quantification within 30% uncertainty

3.1 Eddy Covariance

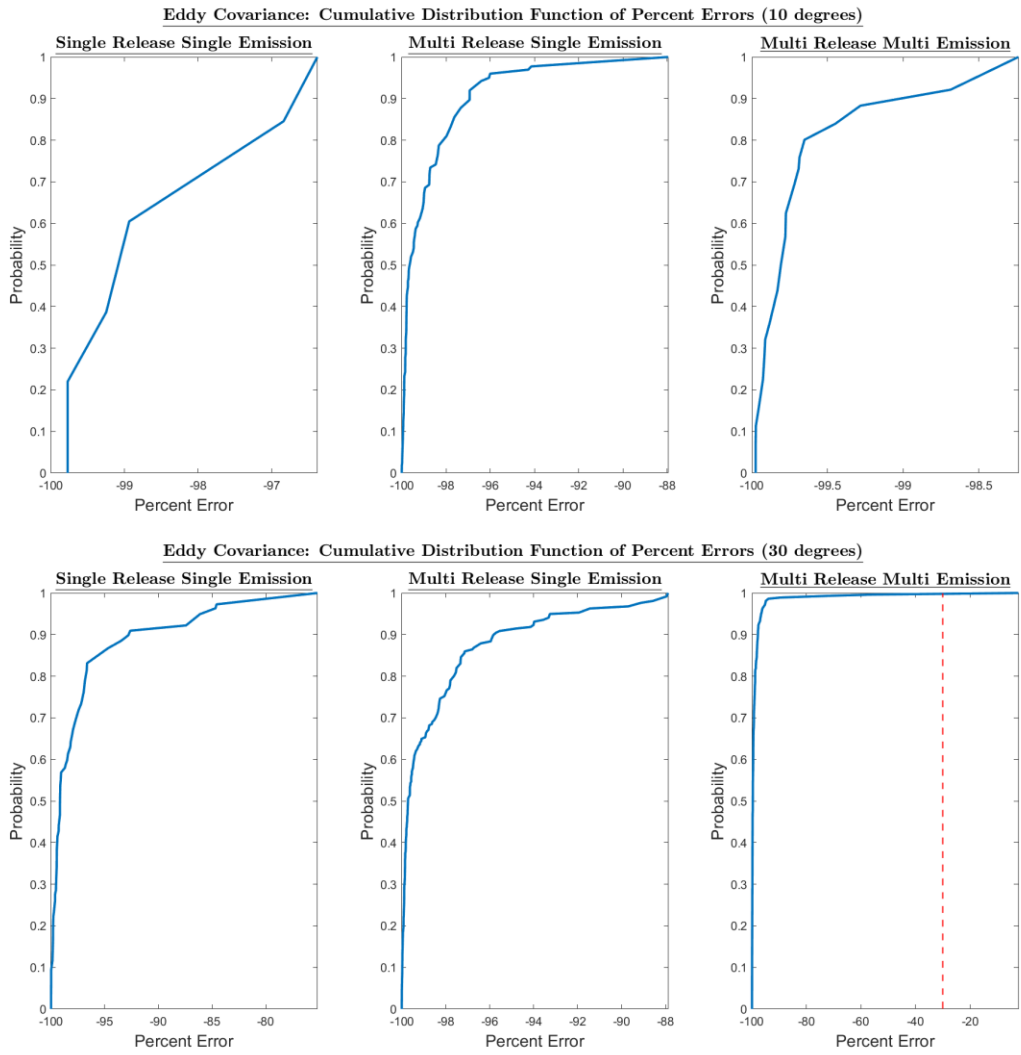



Figure S4 The cumulative distribution function of percent errors for eddy covariance. The area bounded by the red dotted line shows the region within ±30 uncertainty.

3.2 Aerodynamic Flux Gradient

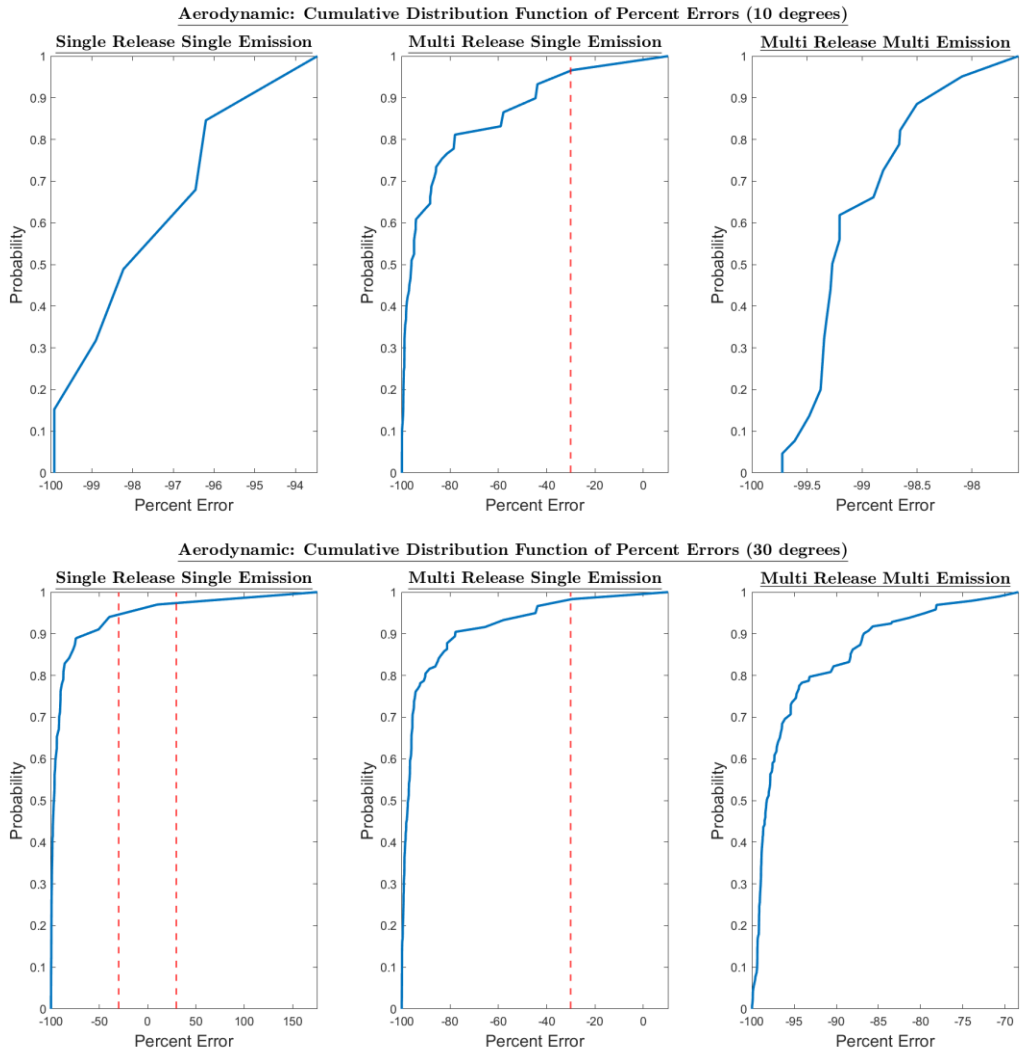



Figure S5 Cumulative distribution function of percent errors for aerodynamic flux gradient method. The area bounded by the red dotted line shows the region within ±30 uncertainty.

3.3 Gaussian Plume Inverse Method

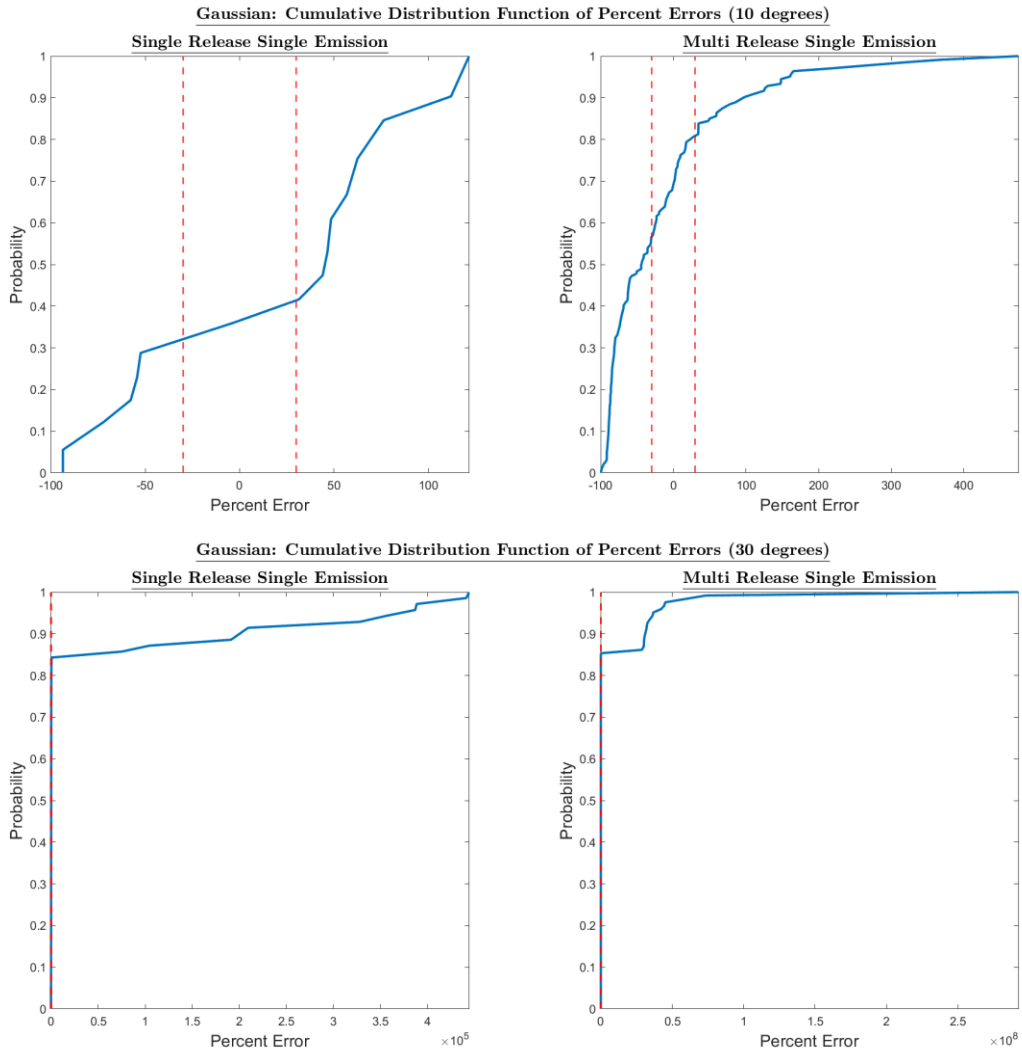



Figure S6 Cumulative distribution function of percent errors for the Gaussian plume inverse method. The area bounded by the red dotted line shows the region within ±30 uncertainty.

Section 4: Variables affecting quantification

4.1 Eddy Covariance

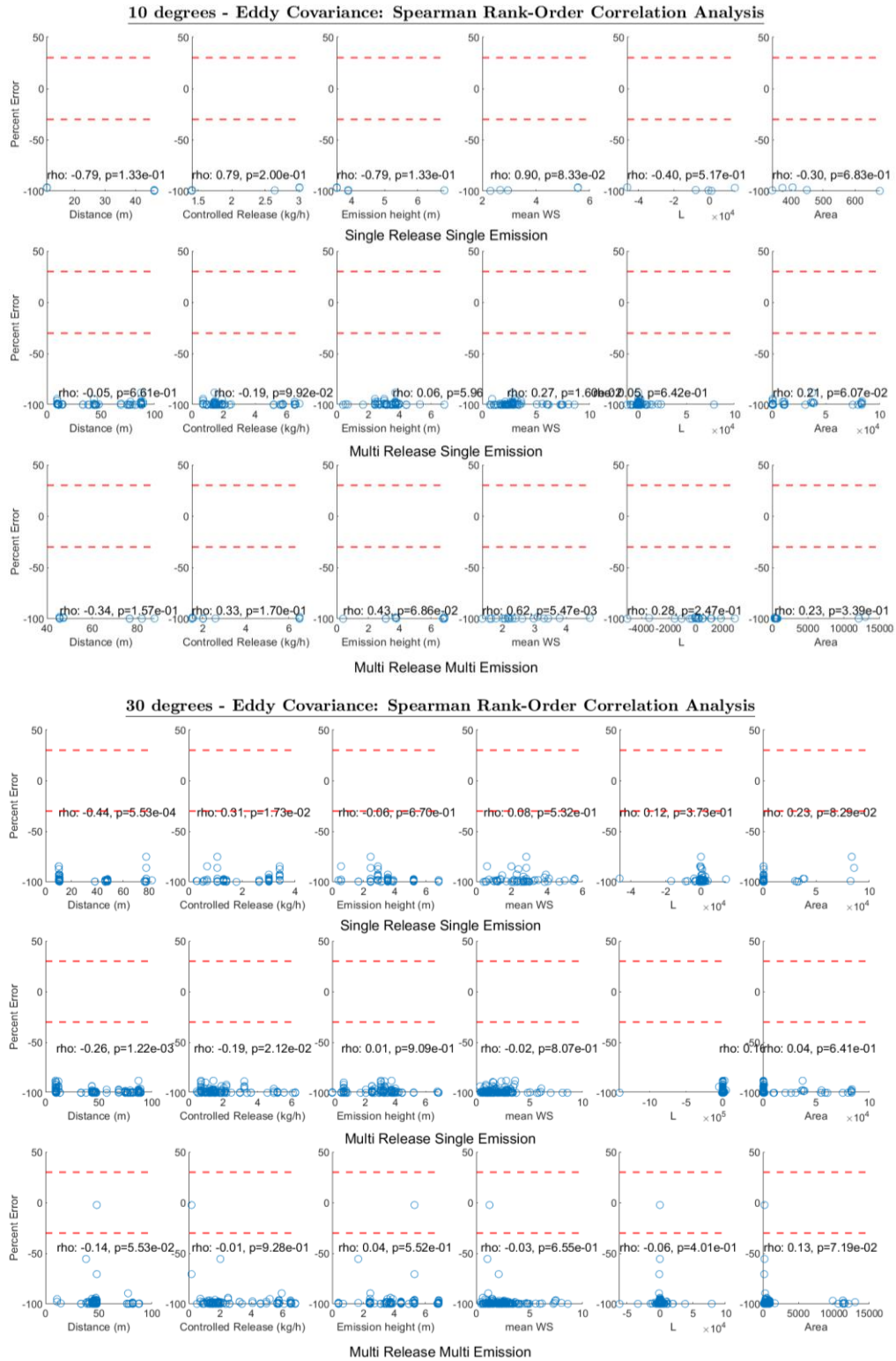



Figure S7 Correlation analysis for eddy covariance in the three release categories. The area bounded by the red dotted line shows the region within ±30 uncertainty.

4.2 Aerodynamic Flux Gradient

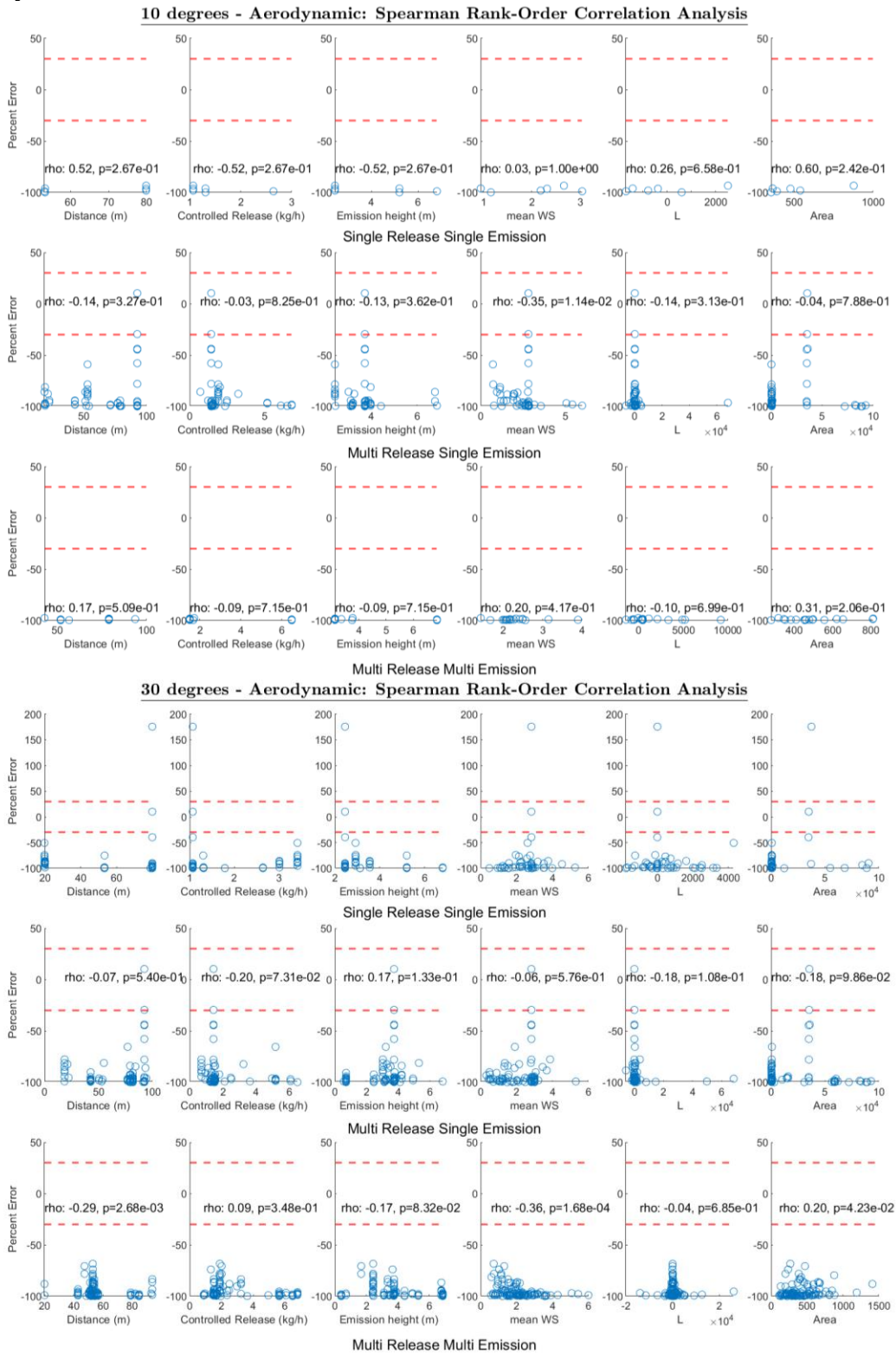



Figure S8 Correlation analysis for aerodynamic flux gradient in the three release categories. The area bounded by the red dotted line shows the region within ±30 uncertainty.

4.3 Gaussian Plume Inverse Method

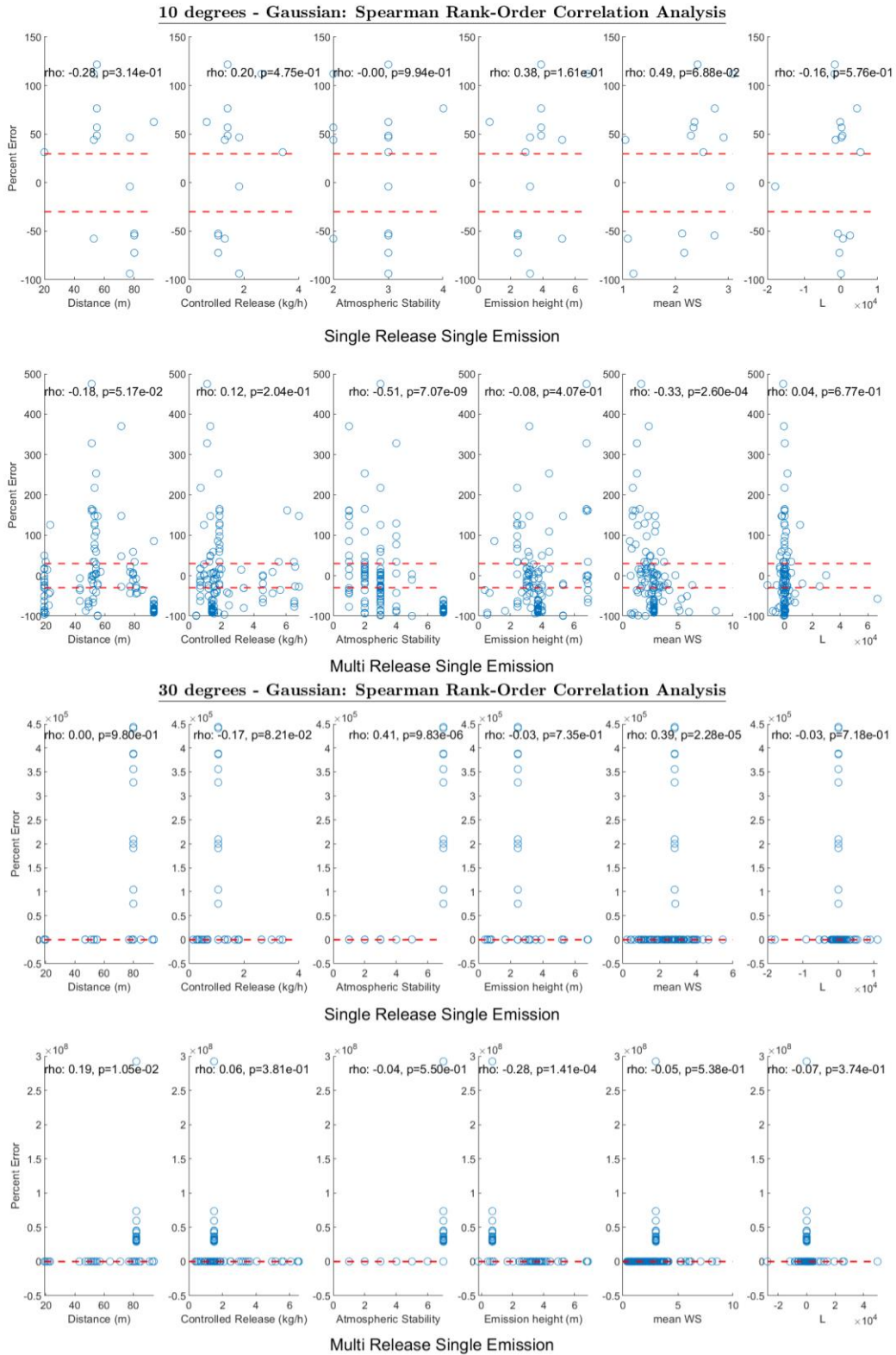



Figure S9 Correlation analysis for the Gaussian plume inverse method in the three release categories. The area bounded by the red dotted line shows the region within ±30 uncertainty.