

Supplementary Information

March 15, 2021

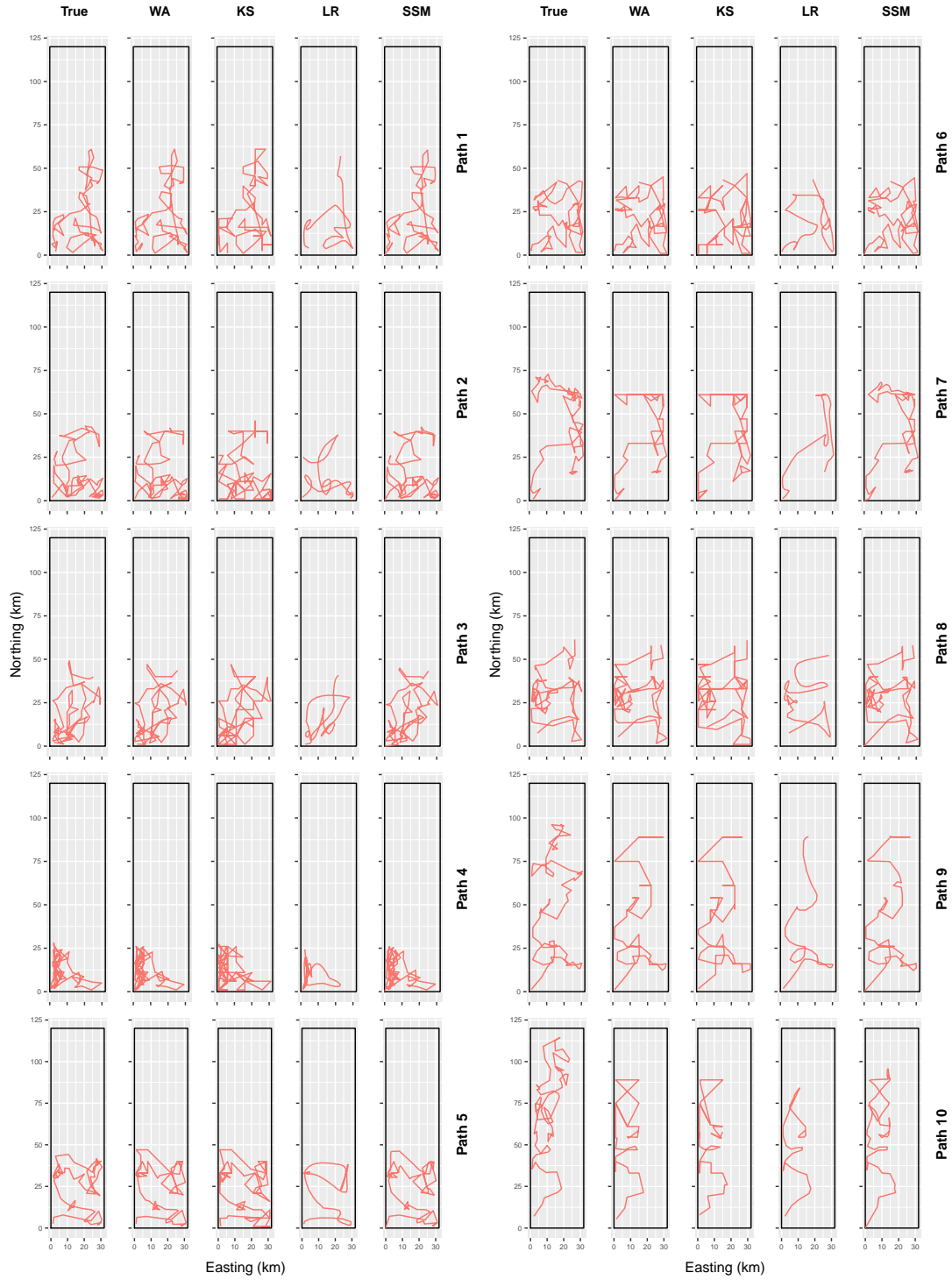


Figure S1: Reconstructed movement paths with the true average path using three hour time bins, the simple weighted average method (WA), kernel smoothing with the Gaussian kernel (KS), cross-validated local polynomial regression approach (LR), and the state-space modeling approach (SSM) for Simulation 1 (Bin hours = 3 and tracking period = 10 days).

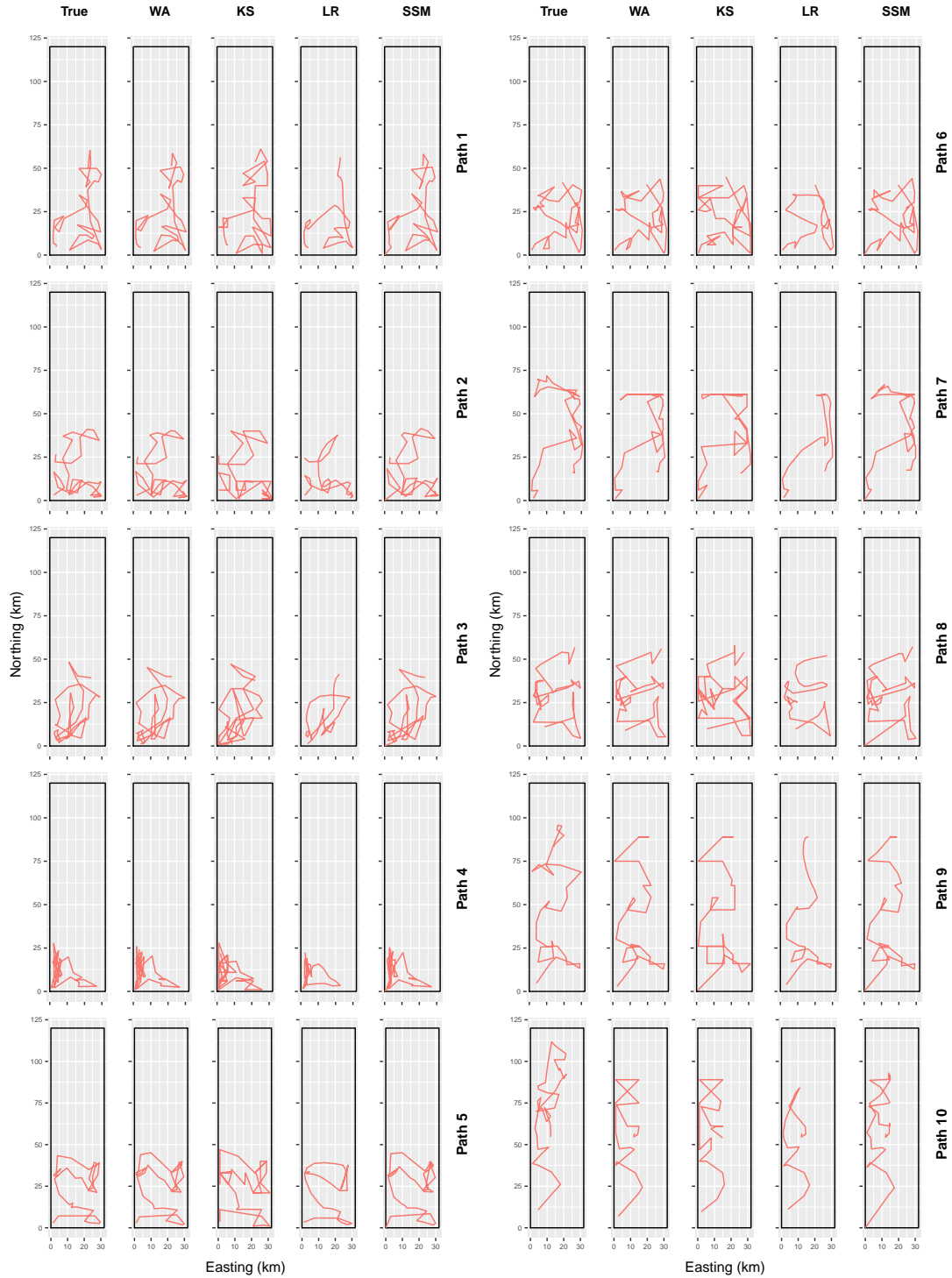


Figure S2: Reconstructed movement paths with the true average path using six hour time bins, the simple weighted average method (WA), kernel smoothing with the Gaussian kernel (KS), cross-validated local polynomial regression approach (LR), and the state-space modeling approach (SSM) for Simulation 2 (Bin hours = 6 and tracking period = 10 days).



Figure S3: Reconstructed movement paths with the true average path using 12 hour time bins, the simple weighted average method (WA), kernel smoothing with the Gaussian kernel (KS), cross-validated local polynomial regression approach (LR), and the state-space modeling approach (SSM) for Simulation 3 (Bin hours = 12 and tracking period = 10 days).

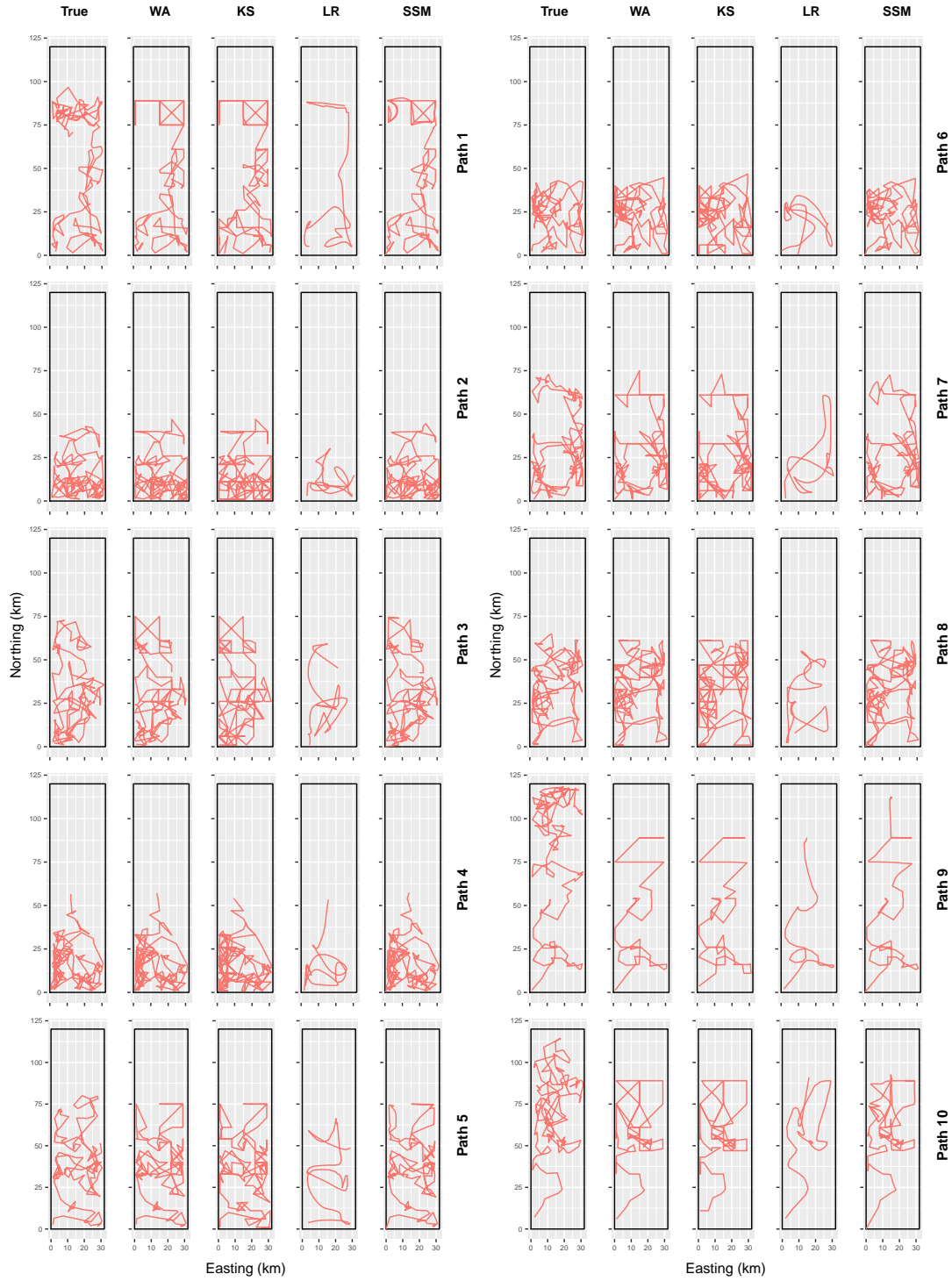


Figure S4: Reconstructed movement paths with the true average path using three hour time bins, the simple weighted average method (WA), kernel smoothing with the Gaussian kernel (KS), cross-validated local polynomial regression approach (LR), and the state-space modeling approach (SSM) for Simulation 4 (Bin hours = 3 and tracking period = 20 days).

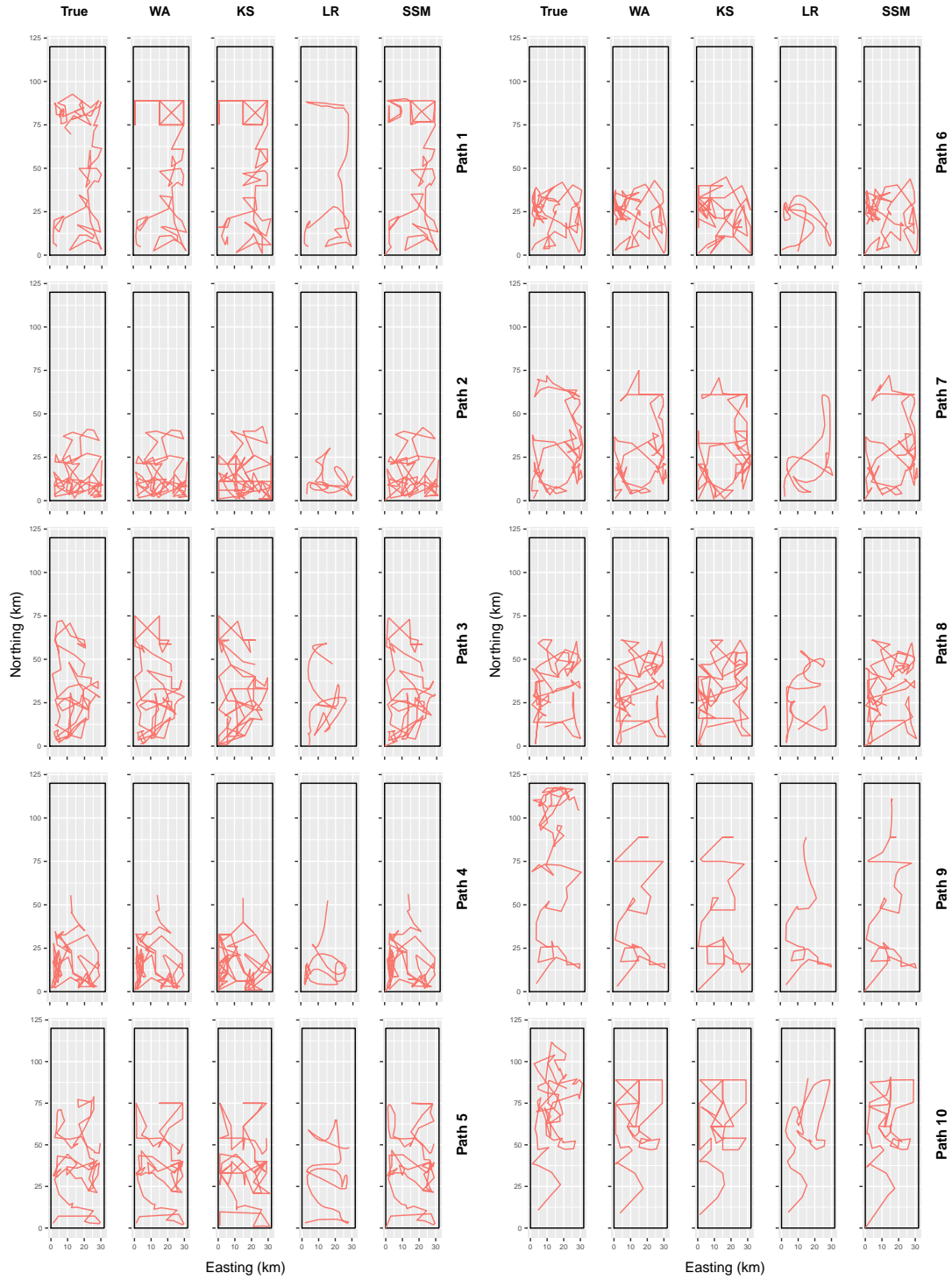


Figure S5: Reconstructed movement paths with the true average path using six hour time bins, the simple weighted average method (WA), kernel smoothing with the Gaussian kernel (KS), cross-validated local polynomial regression approach (LR), and the state-space modeling approach (SSM) for Simulation 5 (Bin hours = 6 and tracking period = 20 days).



Figure S6: Reconstructed movement paths with the true average path using 12 hour time bins, the simple weighted average method (WA), kernel smoothing with the Gaussian kernel (KS), cross-validated local polynomial regression approach (LR), and the state-space modeling approach (SSM) for Simulation 6 (Bin hours = 12 and tracking period = 20 days).

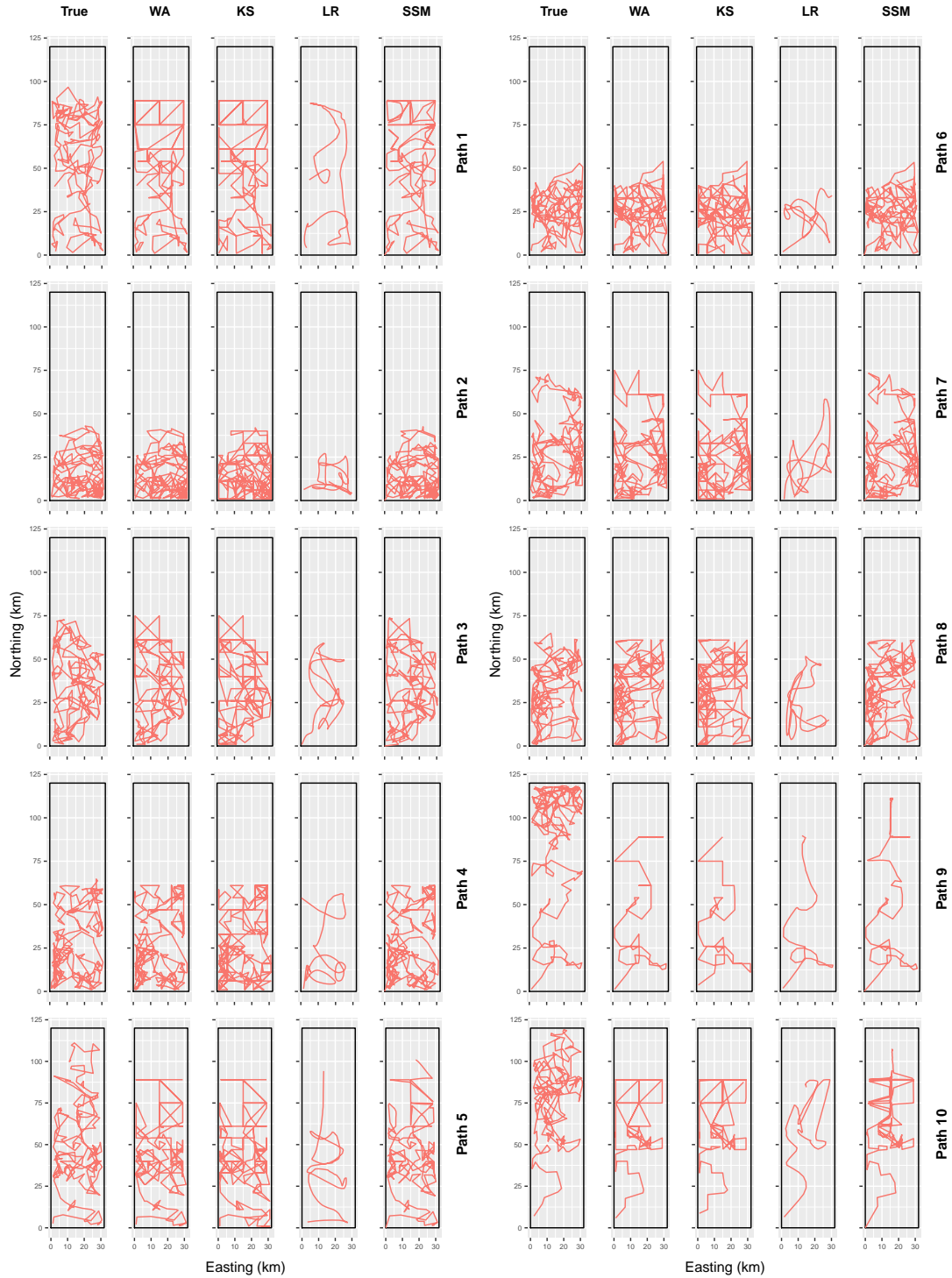


Figure S7: Reconstructed movement paths with the true average path using three hour time bins, the simple weighted average method (WA), kernel smoothing with the Gaussian kernel (KS), cross-validated local polynomial regression approach (LR), and the state-space modeling approach (SSM) for Simulation 7 (Bin hours = 3 and tracking period = 30 days).

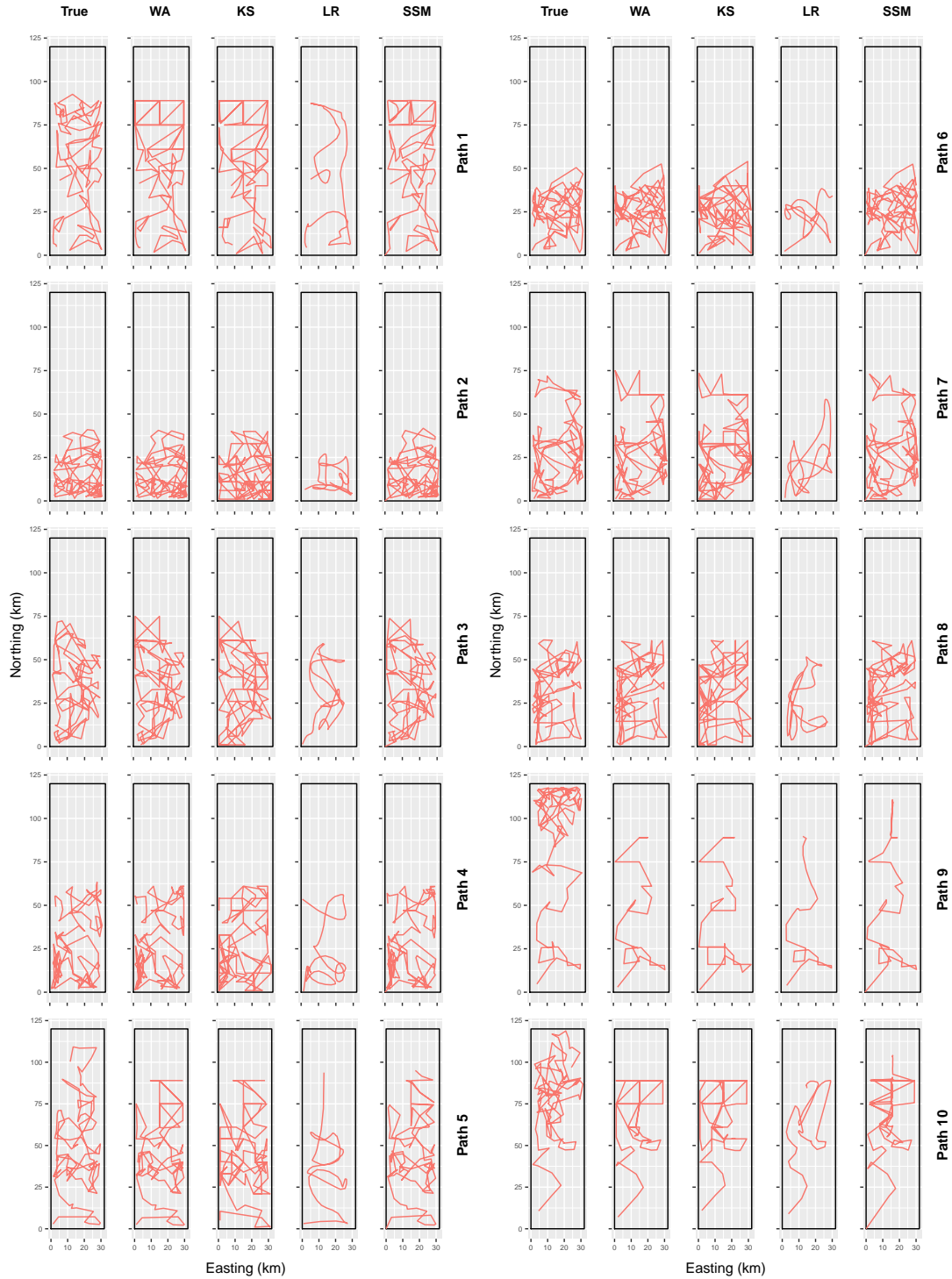


Figure S8: Reconstructed movement paths with the true average path using six hour time bins, the simple weighted average method (WA), kernel smoothing with the Gaussian kernel (KS), cross-validated local polynomial regression approach (LR), and the state-space modeling approach (SSM) for Simulation 8 (Bin hours = 6 and tracking period = 30 days).

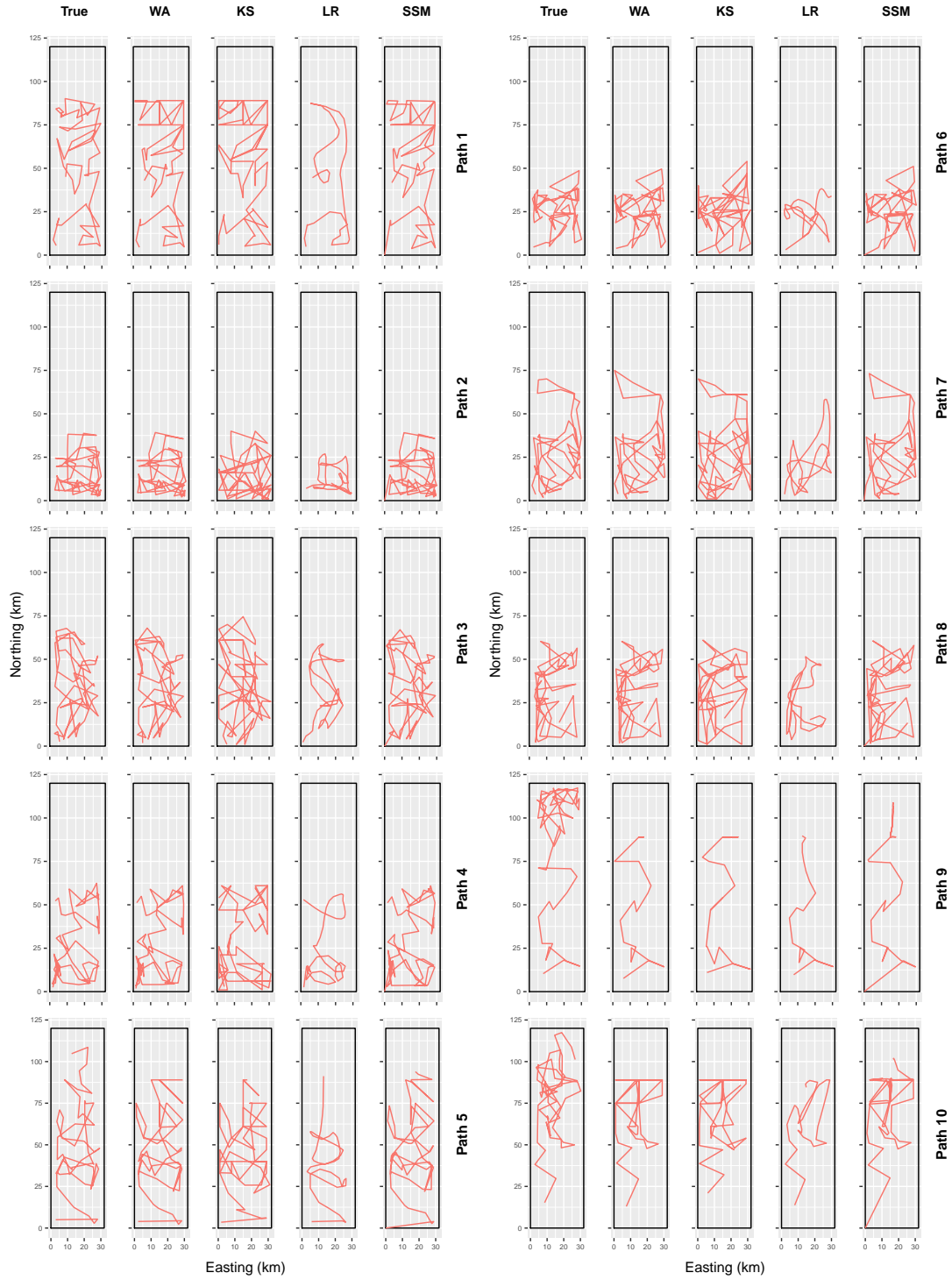


Figure S9: Reconstructed movement paths with the true average path using 12 hour time bins, the simple weighted average method (WA), kernel smoothing with the Gaussian kernel (KS), cross-validated local polynomial regression approach (LR), and the state-space modeling approach (SSM) for Simulation 9 (Bin hours = 12 and tracking period = 30 days).