Supplementary material

Table S1. Conversion of categorical variables into numeric for the NN model.

Case	Configuration	New Variables				
		Arc Projecting	Flushed	Projecting	Linear	Non Linear
A	linear, projecting	0	0	1	1	0
B	arced, projecting	1	0	0	0	1
C	arced, projecting	1	0	0	0	1
D	arced, projecting	1	0	0	0	1
E	linear, flush	0	1	0	1	0
F	linear, projecting	0	0	1	1	0
G	arced, projecting	1	0	0	0	1
H	arced, projecting	1	0	0	0	1
I	arced, projecting	1	0	0	0	1
J	linear, flush	0	1	0	1	0

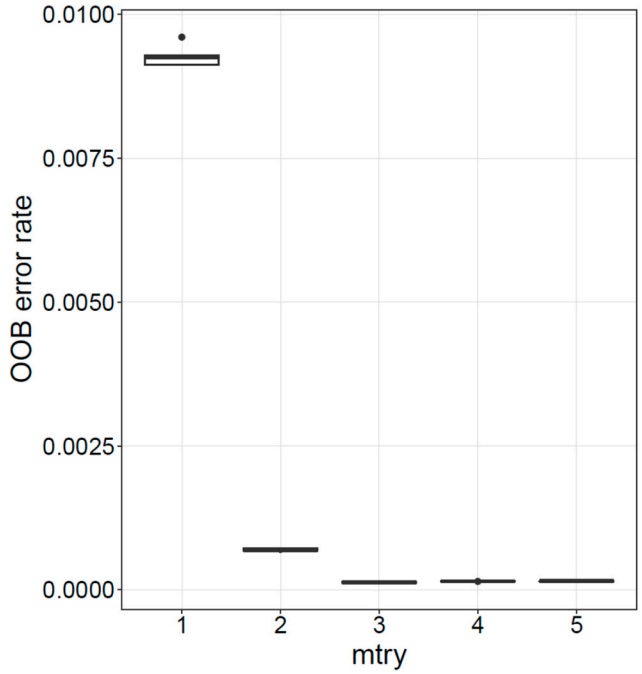

Figure S1. Effect of *mtry* on prediction accuracy for RF models. Results for 5 repetitions of each *mtry* value.

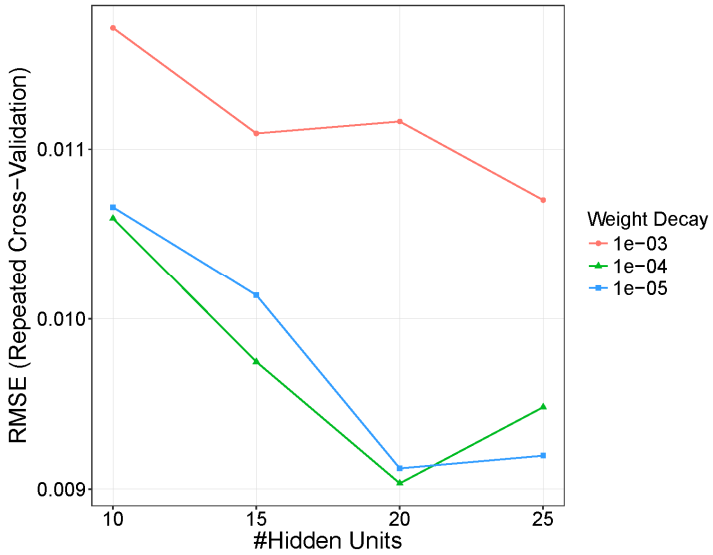

Figure S2. Parameter tuning for NN models based on repeated cross-validation.

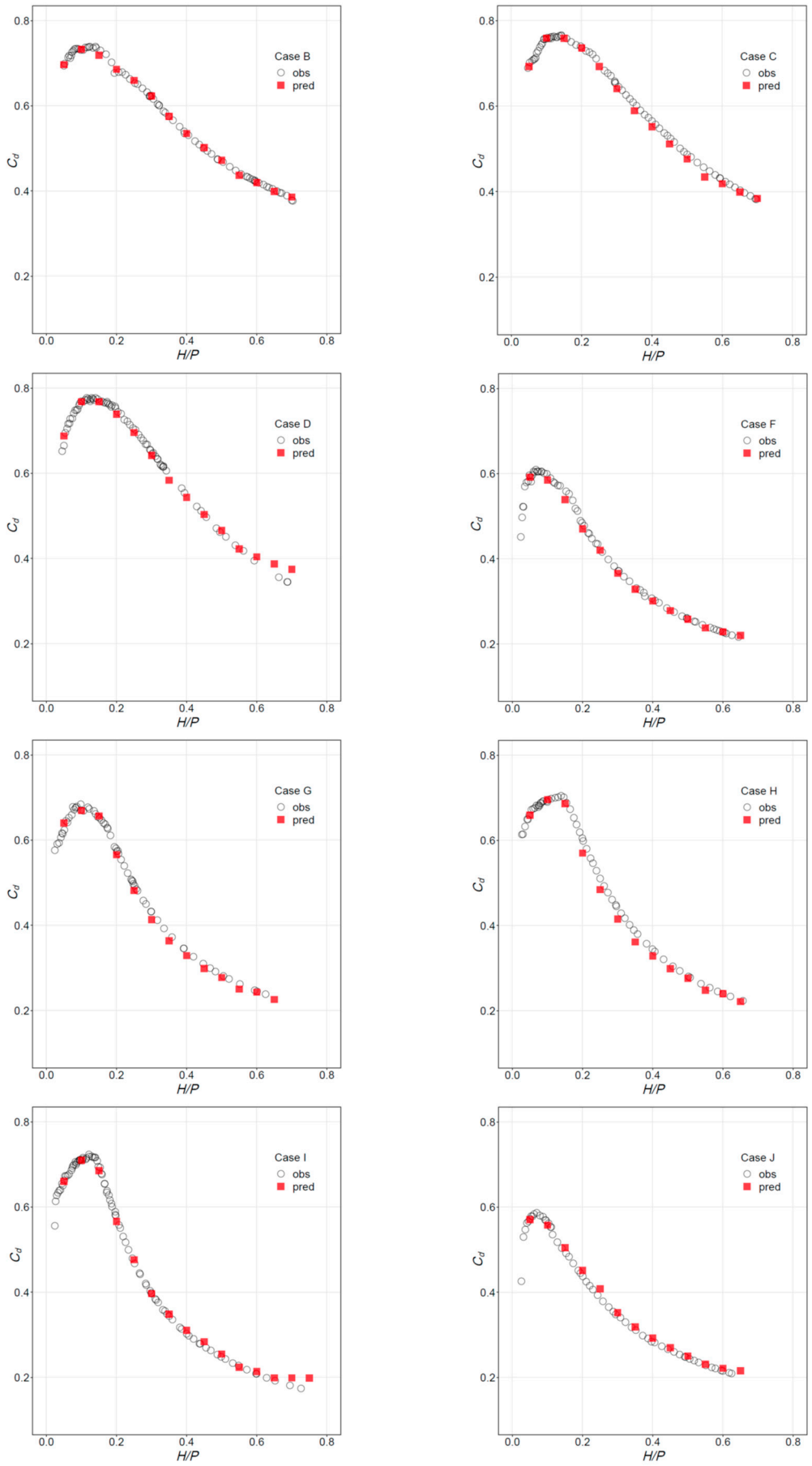

Figure S3. Estimated discharge curves with RF model. Observations (gray) vs. predictions (red) for Cases B, C, D, F, G, H, I, and J.

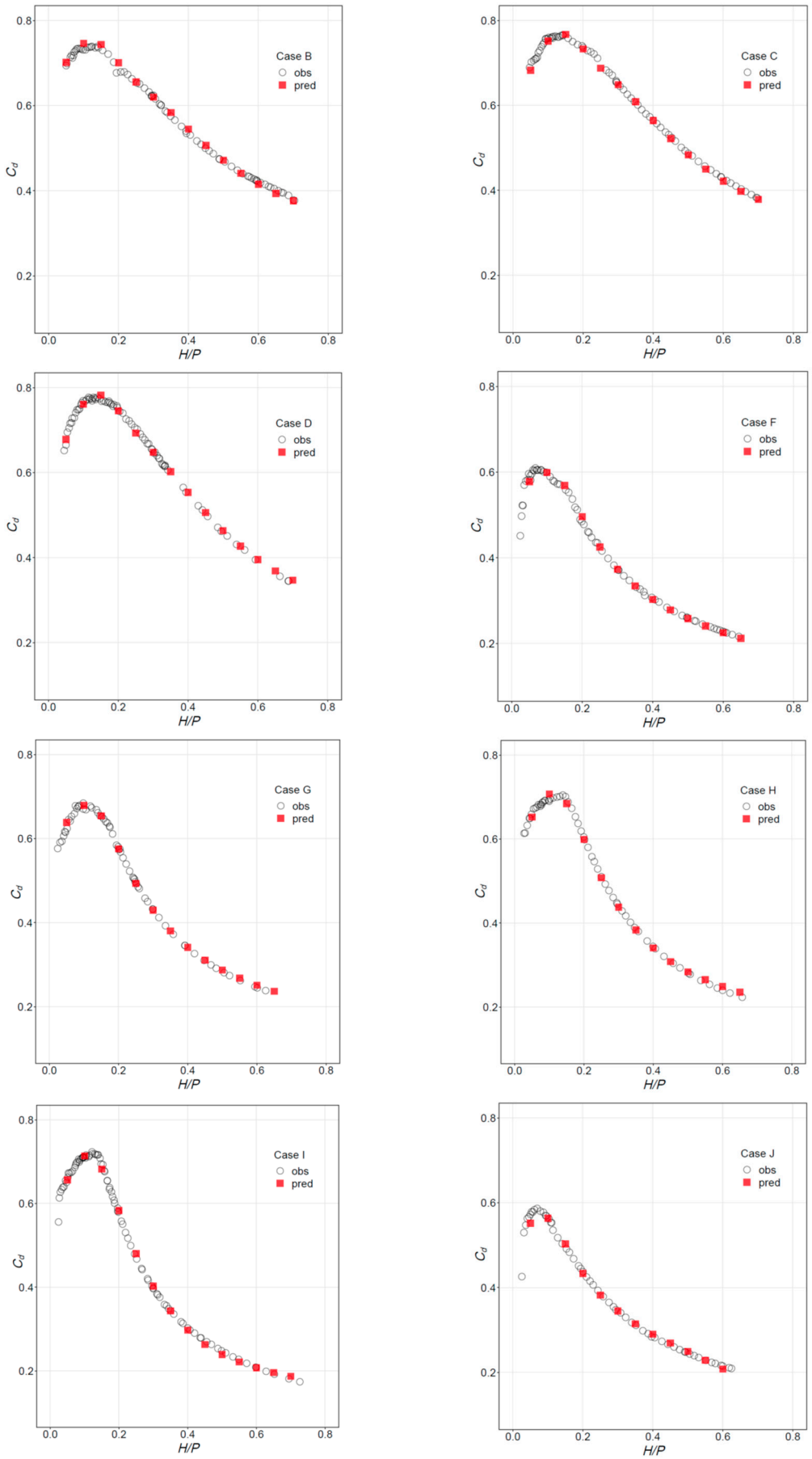

Figure S4. Estimated discharge curves with NN model. Observations (gray) vs. predictions (red) for Cases B, C, D, F, G, H, I, and J.

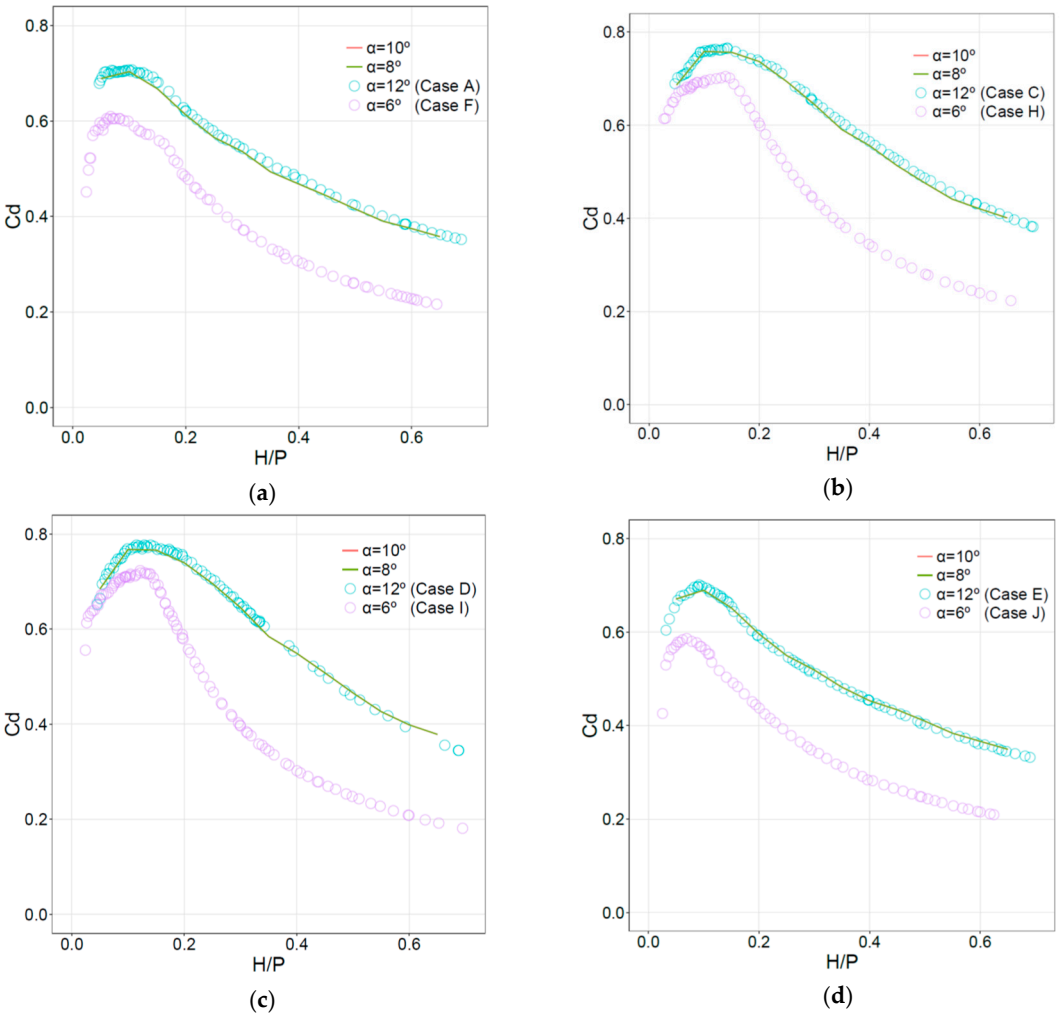

Figure S5. Estimated discharge curves with RF model for intermediate cases. Reference cases (gray) and predictions for $\alpha = 8$ and $\alpha = 10$: (**a**) between Case A and Case F; (**b**) between Case C and Case H; (**c**) between Case D and Case I; (**d**) between Case E and Case J. Note that the predictions are identical for $\alpha = 8$, 10 and 12.

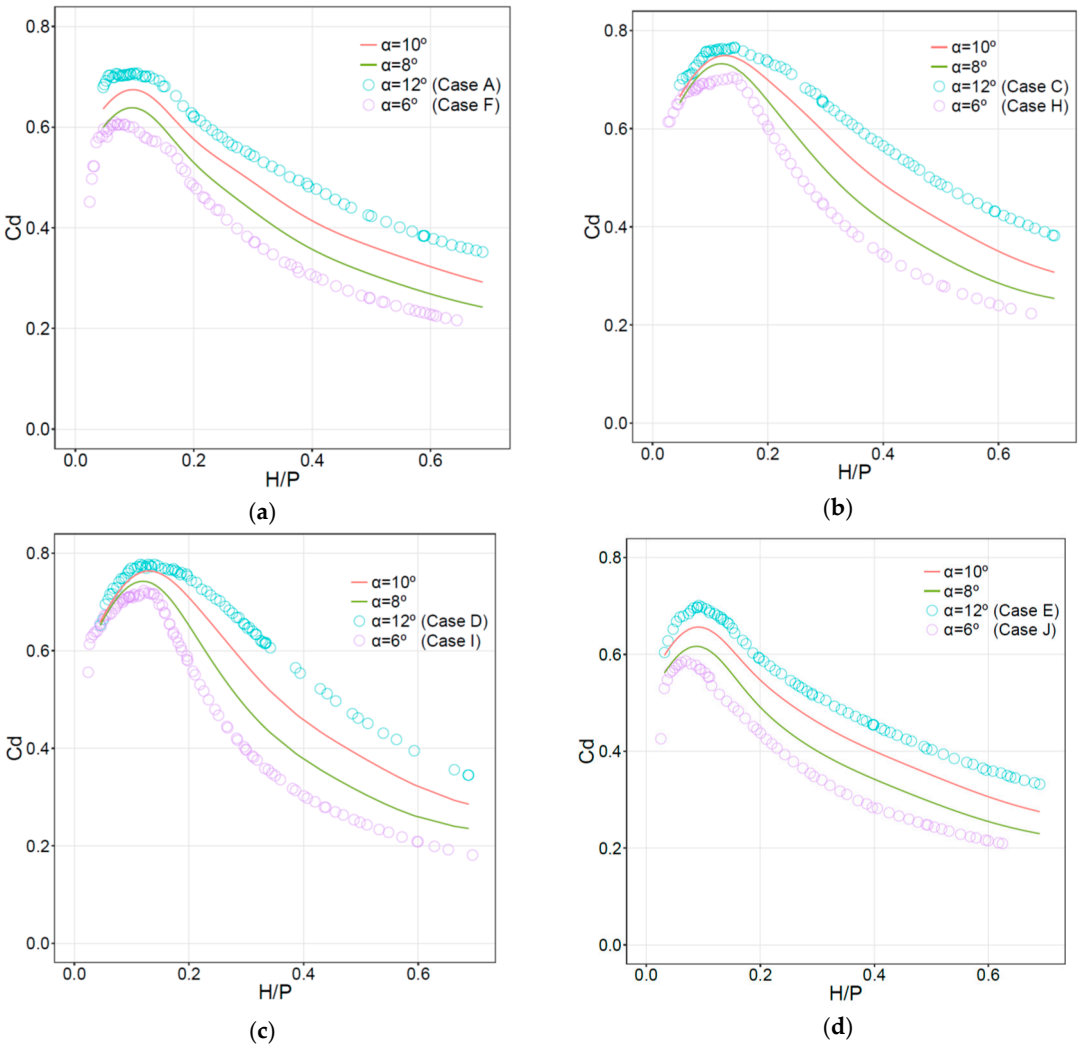

Figure S6. Estimated discharge curves with NN model for intermediate cases. Reference cases (grey) and predictions for $\alpha = 8$ and $\alpha = 10$: (**a**) between Case A and Case F; (**b**) between Case C and Case H; (**c**) between Case D and Case I; (**d**) between Case E and Case J.