# Supplementary information for RC2 response.

**Runtimes for experiments 1a and 1b**

Runs were performed on a workstation with an AMD Ryzen 5600G (CPU learning) and 32GB DDR4 RAM.

**Table S2.** Runtimes for experiment 1a: cluster-based temporal undersampling. The symbol '-' denotes a compromised runtime calculation.
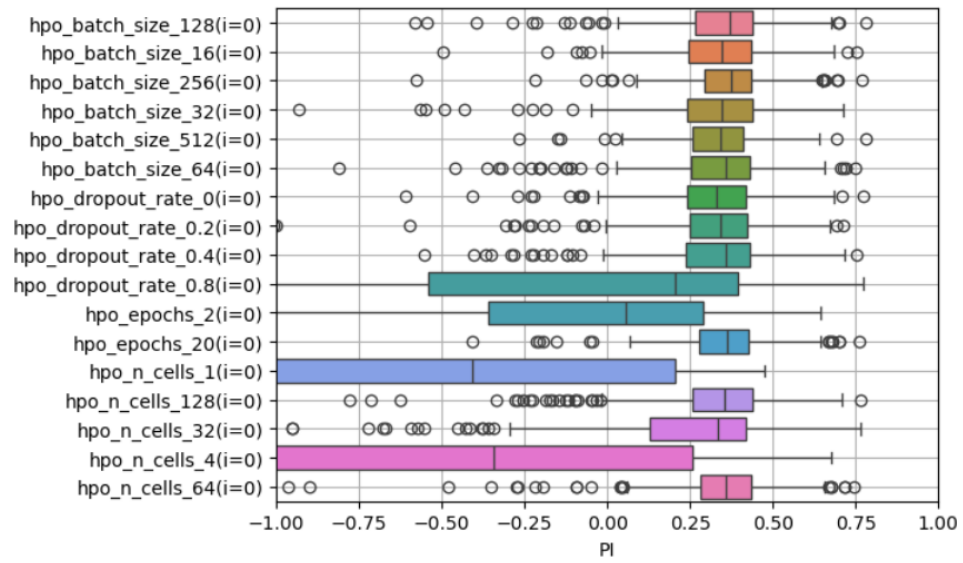
| configuration | run duration (minutes) |
|---|---|
| baseline | 116.37 |
| $CUS_Q$ (K=12, $\phi$=0.50) | - |
| $CUS_Q$ (K=6, $\phi$=0.25) | 37.70 |
| $CUS_Q$ (K=6, $\phi$=0.50) | 73.33 |
| RUS ($\phi$=0.25) | 57.55 |
| RUS ($\phi$=0.50) | 62.68 |

*Table RC2a: runtimes for experiment 2a.*

**Table S3.** Runtimes for experiment 1b: cluster-based spatial undersampling. The symbol '-' denotes a compromised runtime calculation.

| configuration | run duration (minutes) |
|---|---|
| baseline | 176.65 |
| $CUS_B$ (K=2, B=64) | 94.60 |
| $CUS_B$ (K=32, B=64) | 76.33 |
| $CUS_B$ (K=32, B=96) | 108.95 |
| $CUS_B$ (K=8, B=64) | 90.75 |
| RUS (B=64) | 66.43 |
| RUS (B=96) | - |

*Table RC2b: runtimes for experiment 2b.*

*FigureRC2a: Hyperparameter optimisation results in terms of PI performance on the validation dataset.*
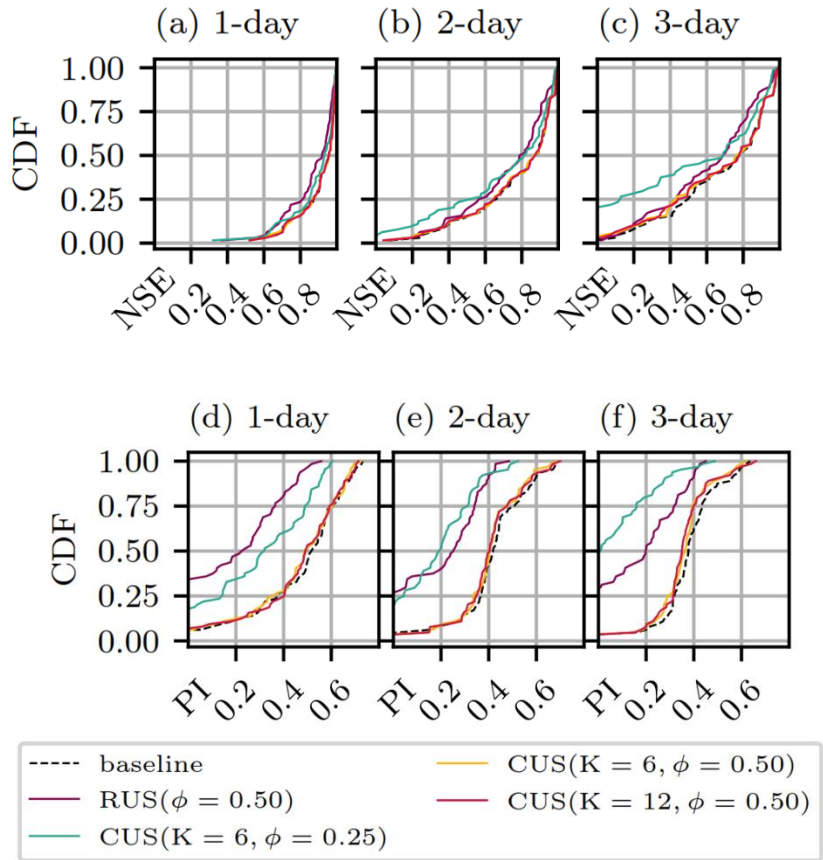
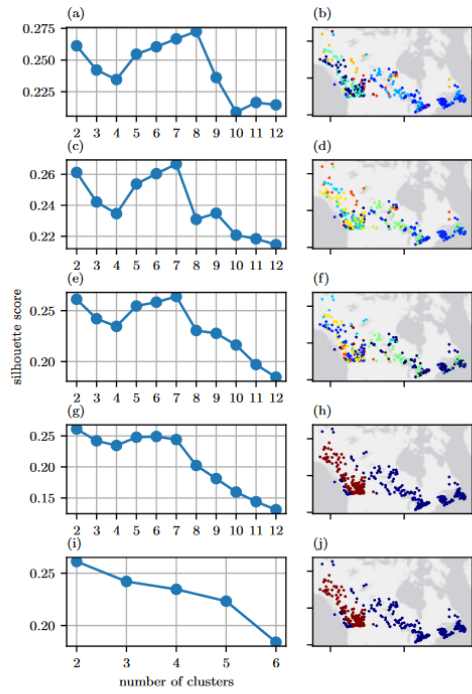Figure RC2b: revised Figure 4 with reduced linewidths.

**Figure S1.** Silhouette scores (left) for minimum cluster sizes of 2 (a), 8 (c), 16 (e), 32 (g), and 64 (i). Respective clustering results (right) for K values (corresponding to maximum silhouette score) of 8 (b), 7 (d, f), and 2 (h, j). World Gray Canvas basemap provided by ESRI.

*Figure RC2c: Relationship between silhouette score and minimum cluster size.*
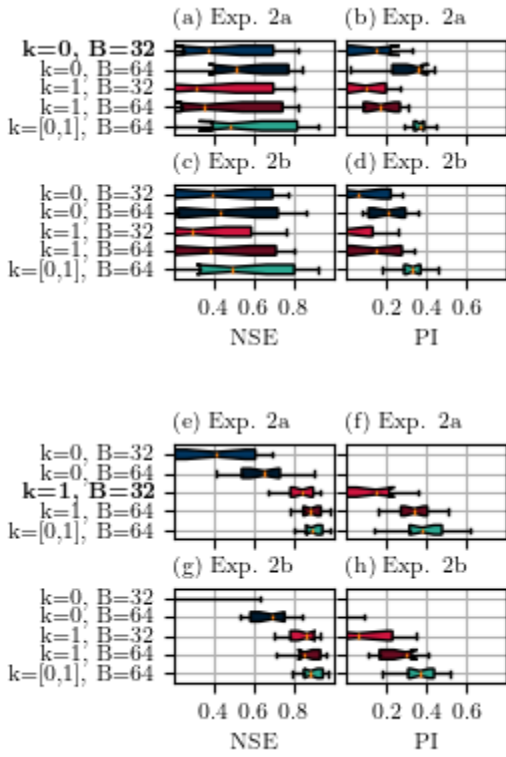
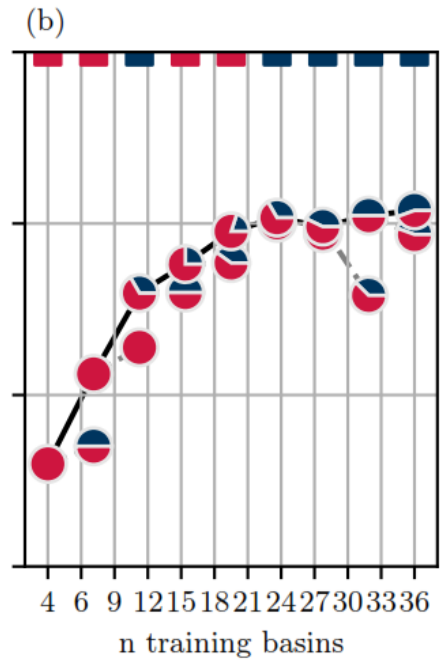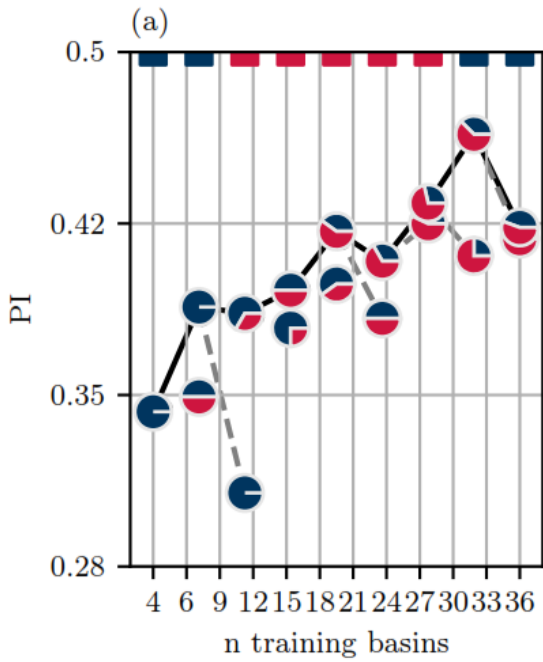*Figure RC2d: Updated Figure 10 with an increased number of subplots and detailed subplot titles.*
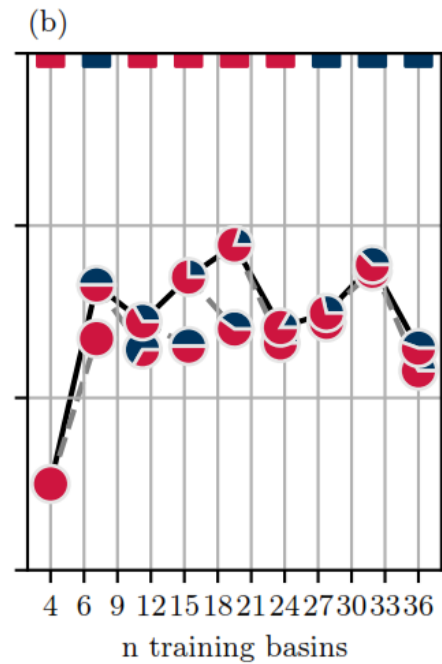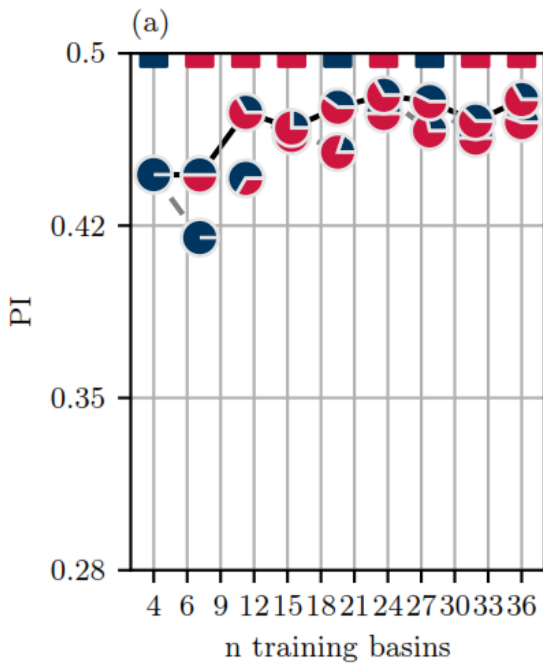
*Figure RC2e: Original experimental results.*



*FigureRC2f: Additional experimental run on two sets of 4 different basins*