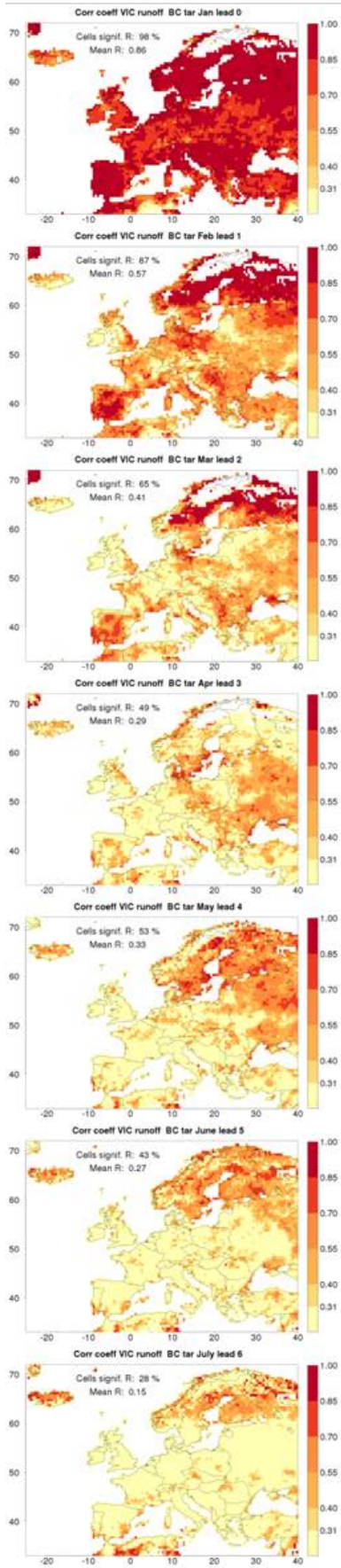Supplementary figures

Seasonal streamflow forecasts for Europe – I. Hindcast verification with pseudo- and real observations
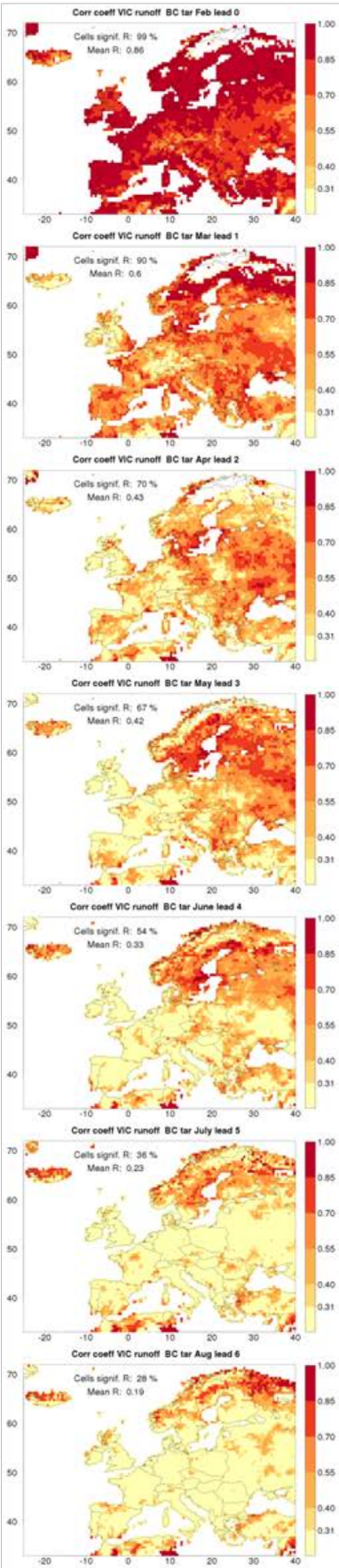
Wouter Greuell, Wietse H. P. Franssen, Hester Biemans and Ronald W. A. Hutjes

Figure S1: This figure (next 4 pages) supplements Figs. 1 and 2. It shows skill of the runoff hindcasts for all target and lead months. Note that each column represents all hindcasts initialised in the same month for, from top to bottom, the seven different lead months. Figure 1 is reproduced here as the fourth column, Figure 2 is reproduced here as the third row (across all columns). More explanation is given in the caption of Fig. 1.
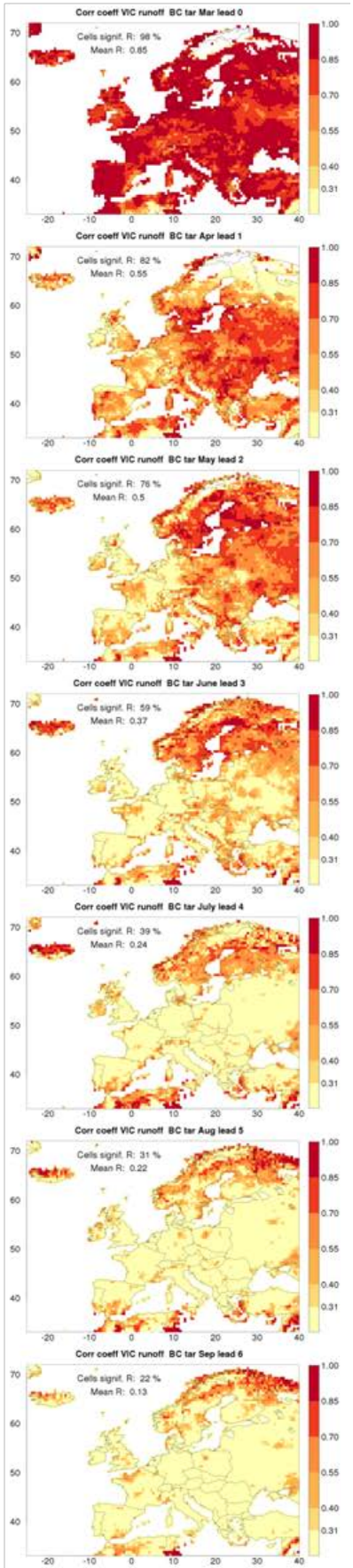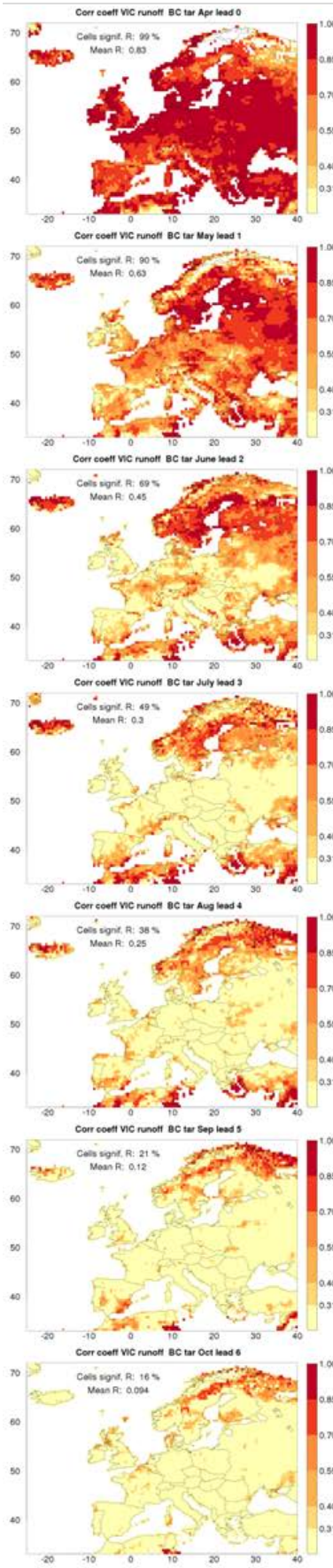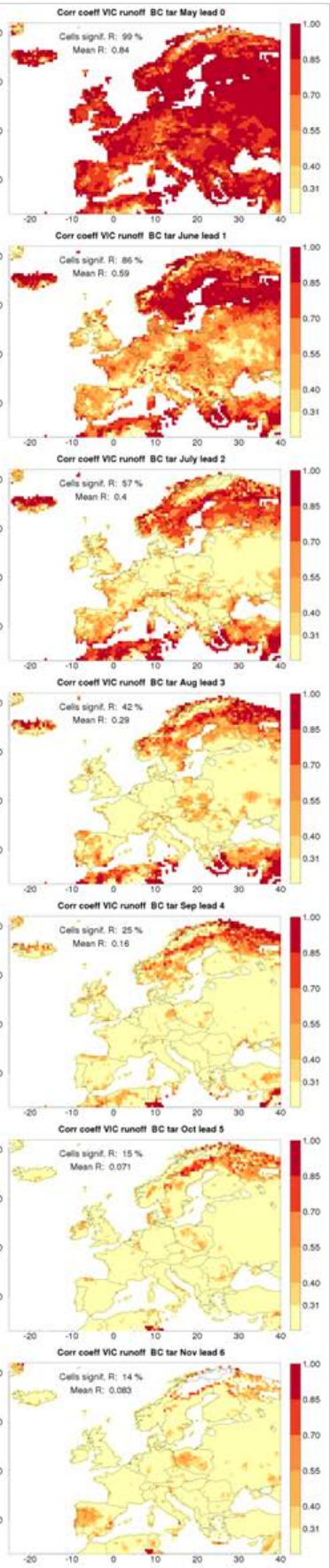
Initialisation January **Initialisation February** **Initialisation March**

Initialisation April   **Initialisation May**   **Initialisation June**
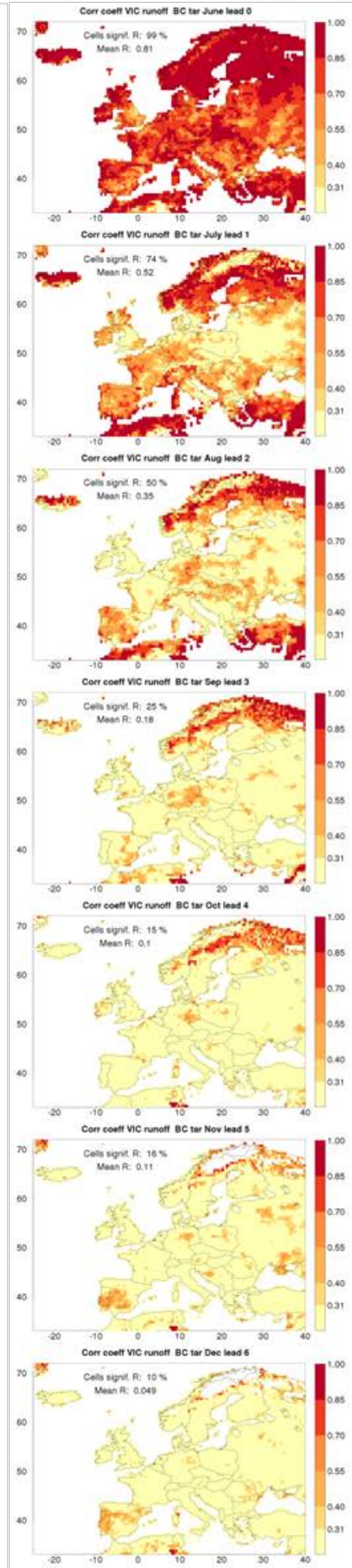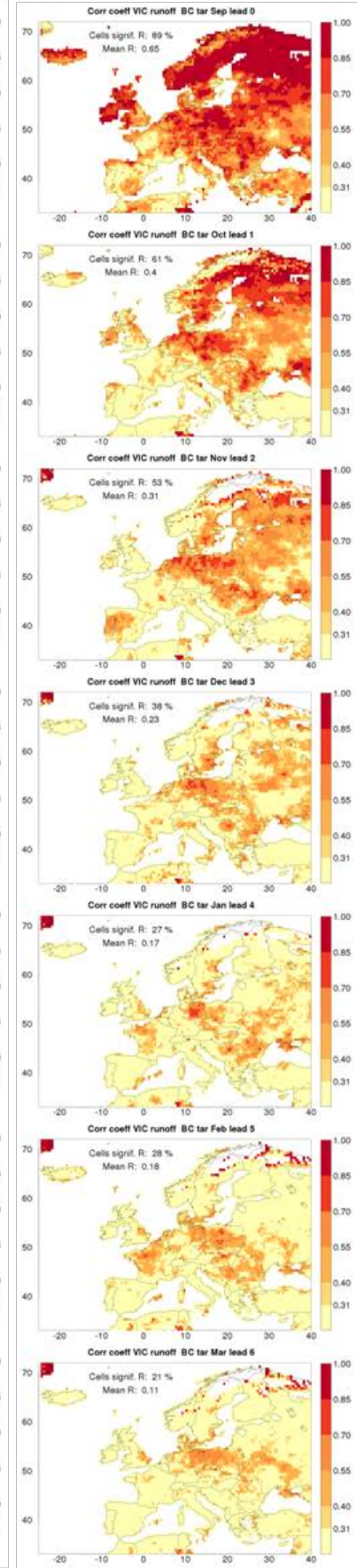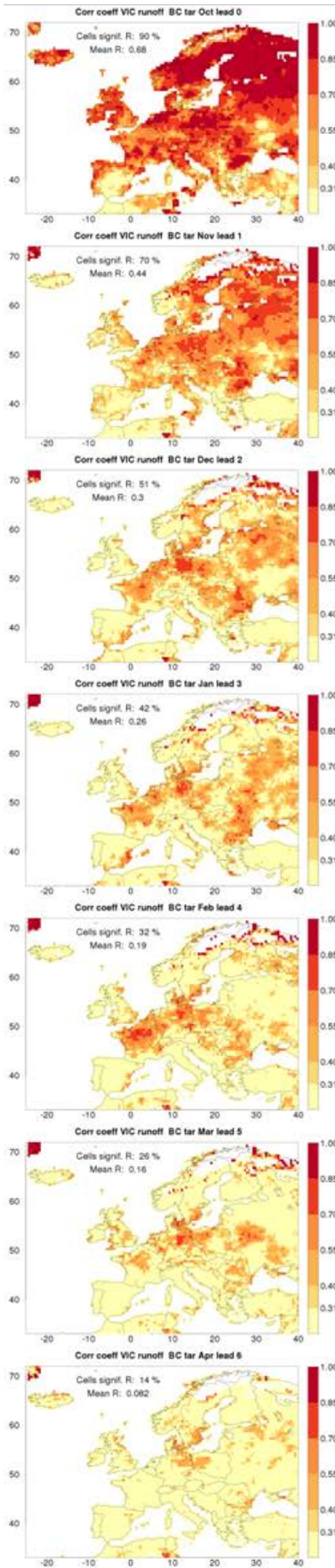
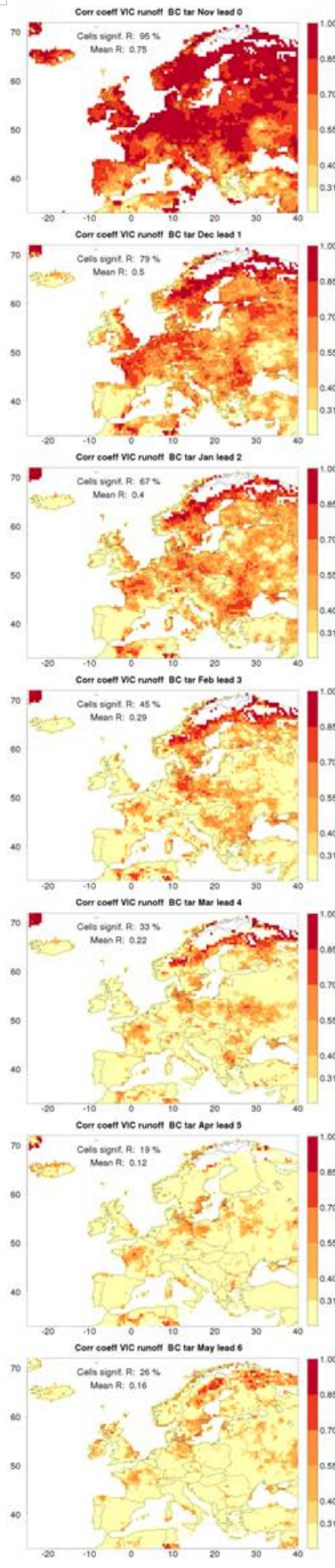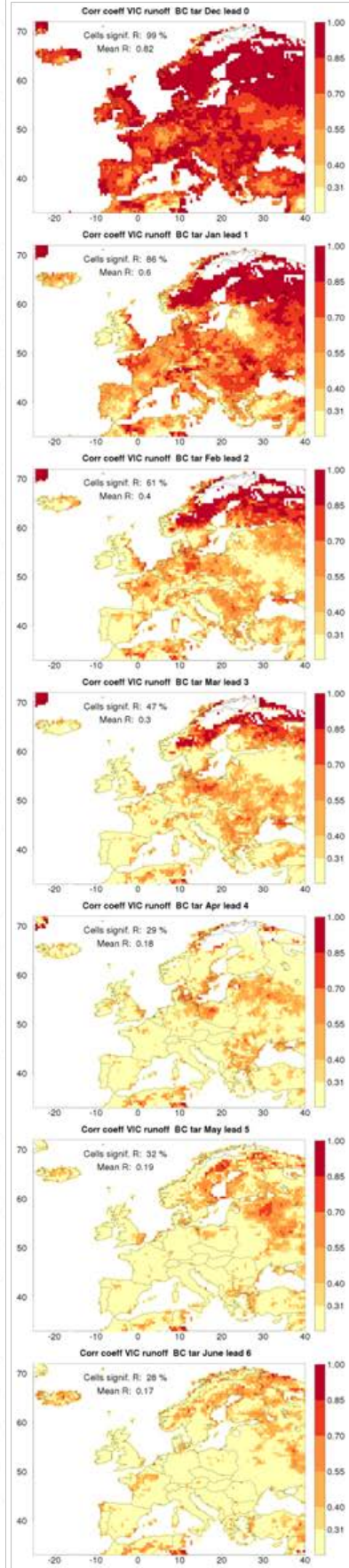**Initialisation July** | **Initialisation August** | **Initialisation September**
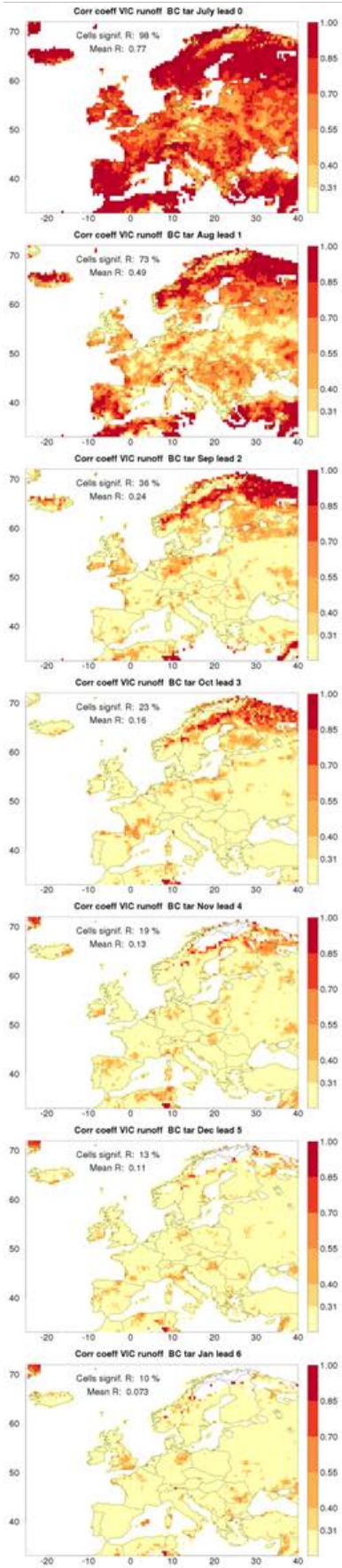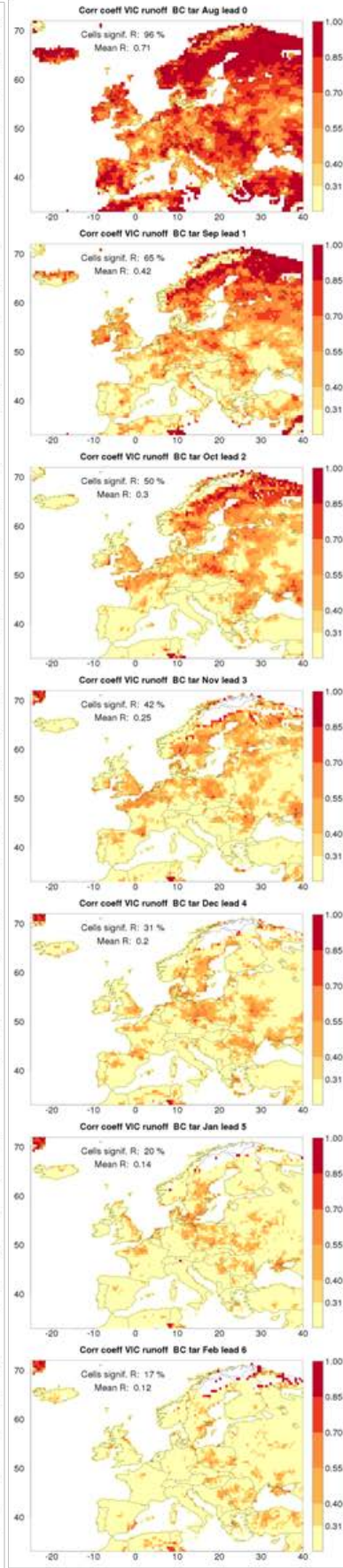
Initialisation October   **Initialisation November**   **Initialisation December**
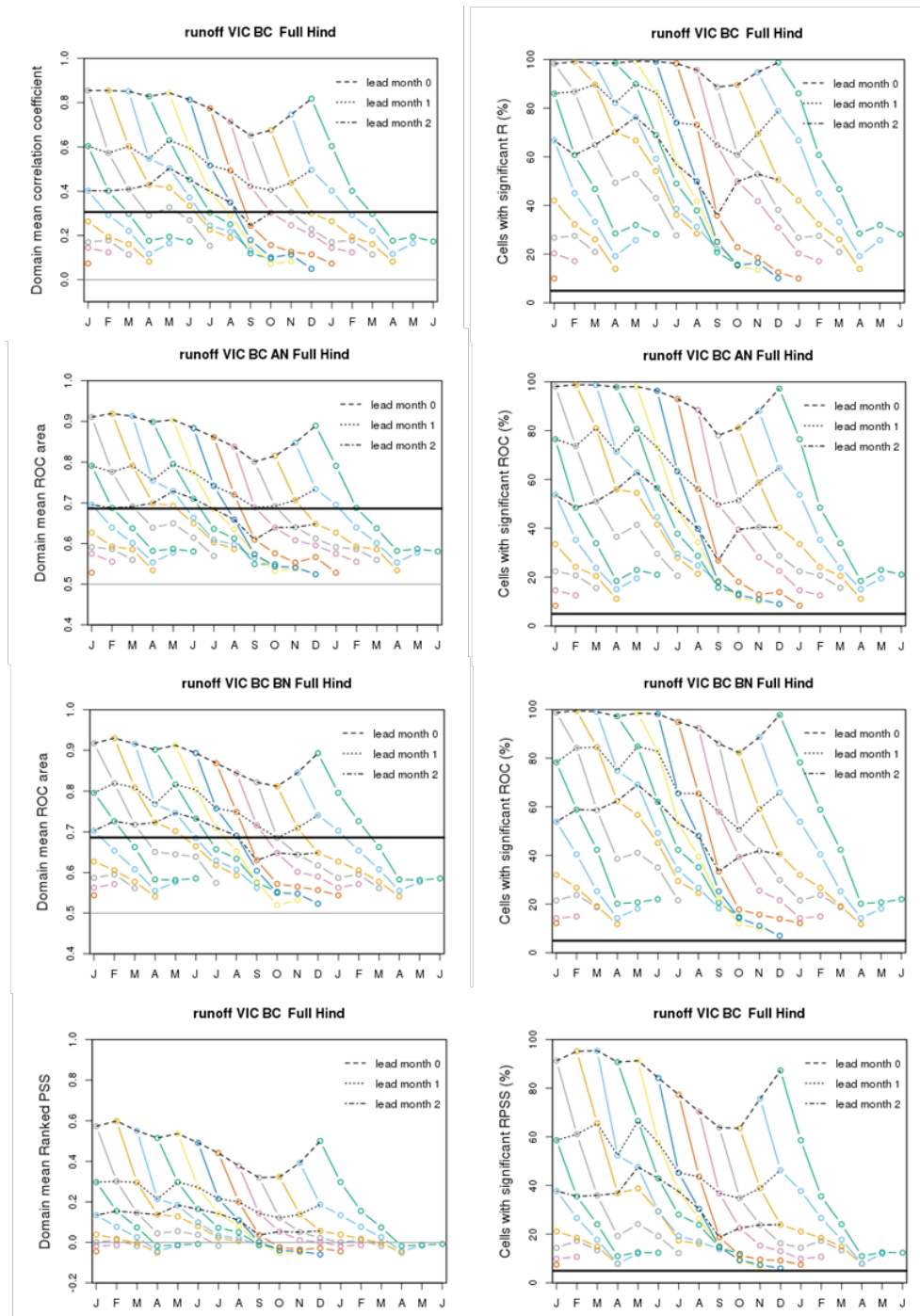
Figure S2: This figure supplements Fig. 4 (which itself is reproduced here at the top right). It shows four different metrics (from top to bottom: R, ROC area for AN and BN tercile, and RPSS) and two statistics of those metrics (domain mean value of the particular metric at left and percentage of cells with significant skill in that metric at right) as a function of initialisation month and lead time. The thick horizontal lines in the left-hand column give the threshold between significant and insignificant skill for *individual* cells (0.31 for R and 0.69 for ROC area). The thick horizontal lines in the right-hand column give the expected fraction of cells with significant skill, in the case that the hindcasts have no skill at all (5% for all metrics). More explanation is given in the caption of Fig. 4.
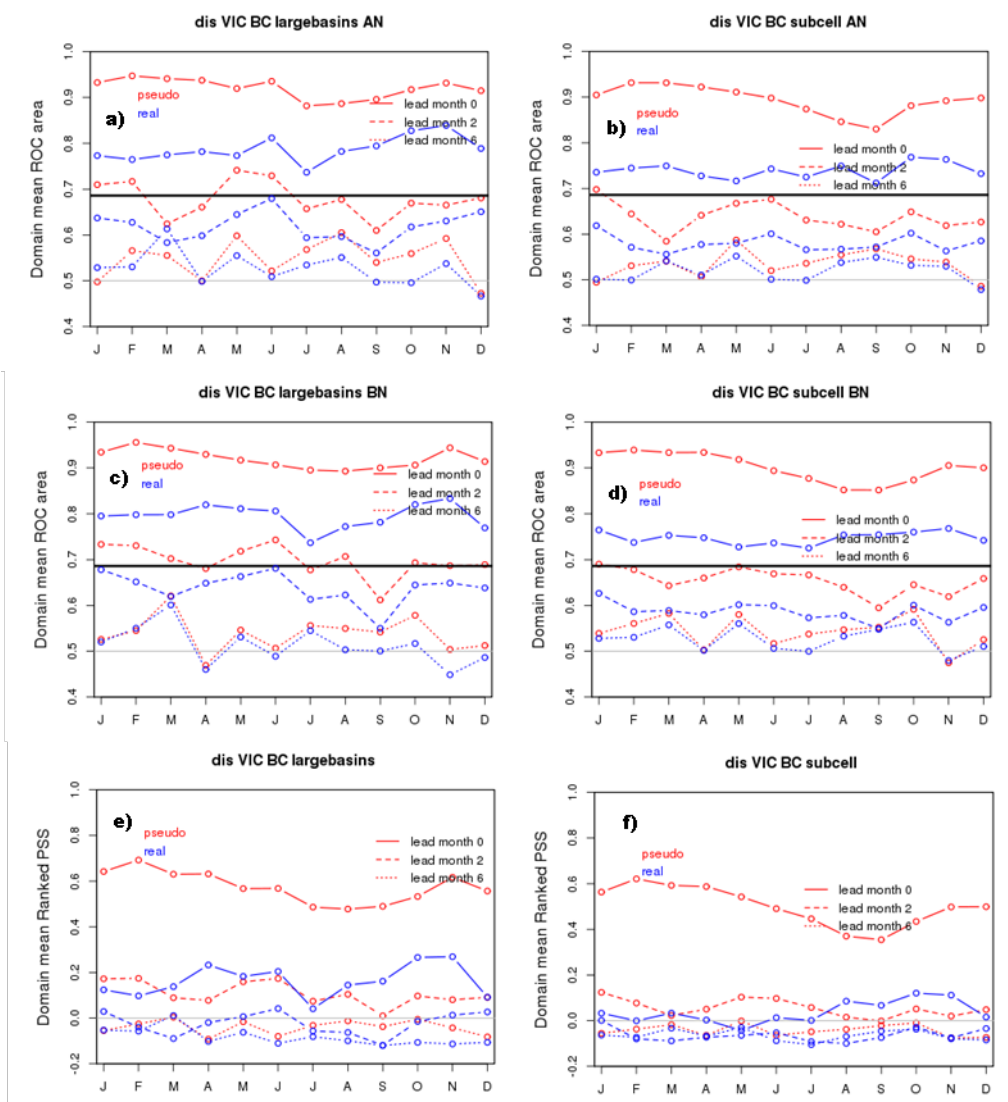
Figure S3: This figure supplements Fig. 7. It compares verification of discharge with pseudo-(red) and real (blue) observations, in terms of the annual cycle of different metrics for large basins (left-hand column) and small basins (right-hand column). The metrics are, from top to bottom, domain mean ROC area for the AN (a and b) and the BN tercile (c and d), domain-mean RPSS (e and f) and the percentage of cells with significant skill in terms of R (g and h), the ROC area for the AN (h and i) and the BN tercile (j and k), and the RPSS (m and n). All panels depict annual cycles for lead months 0, 2 and 6. The thick horizontal lines give the threshold between significant and insignificant skill for individual cells in (a, b, c and d) and the expected fraction of cells with significant skill, in the case that the hindcasts have no skill at all (g-n).
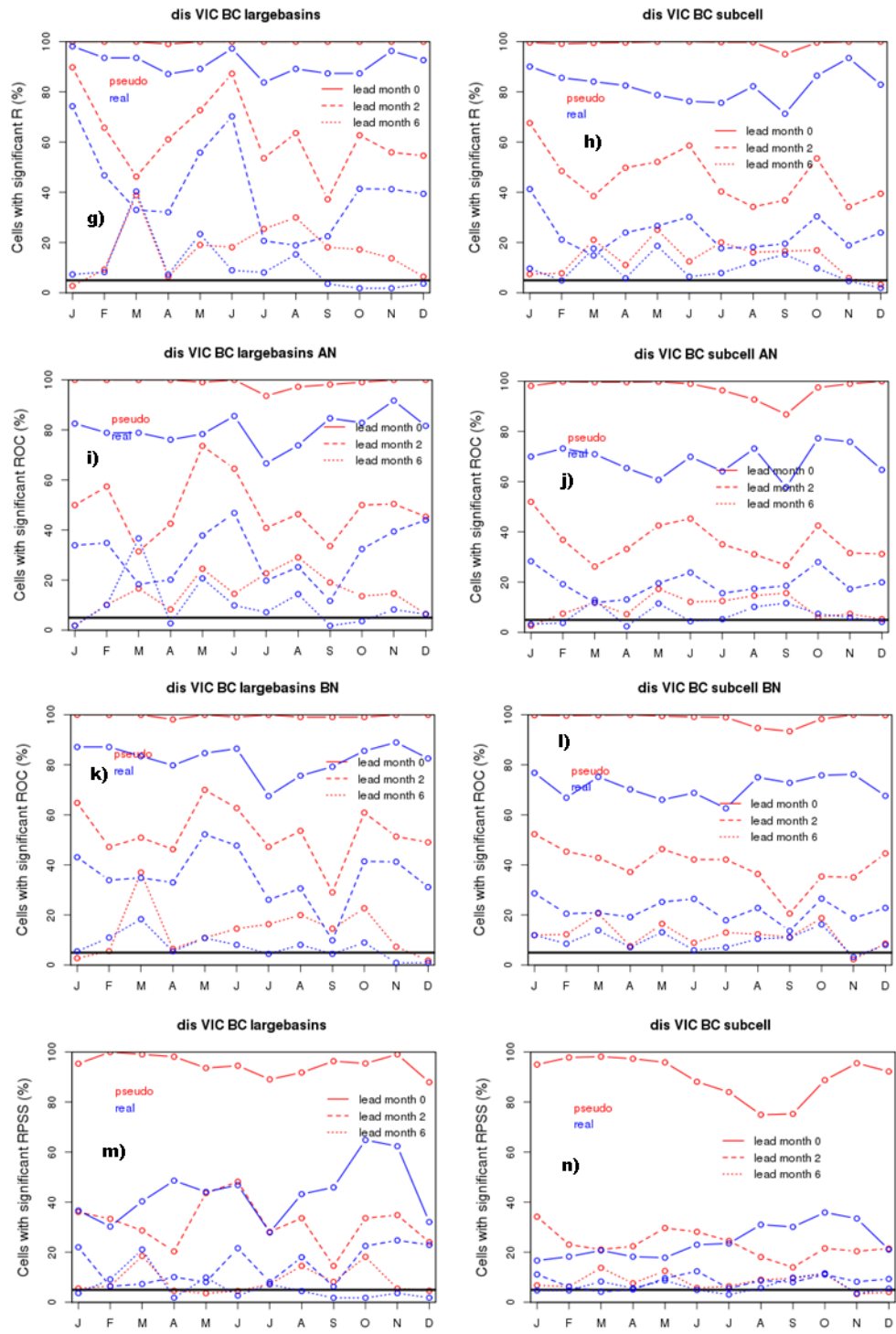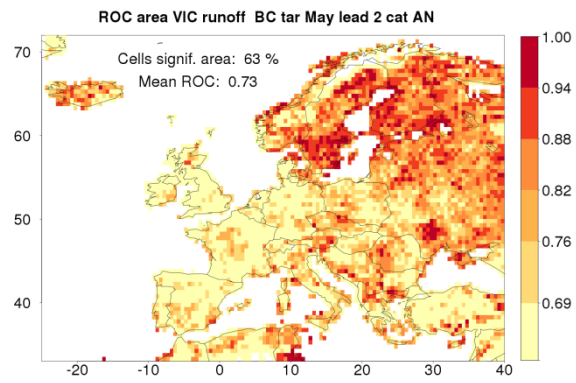
Figure S3 continued.

Figure S4: This figure supplements Fig. 8, mapping the ROC area for the AN tercile of the runoff hindcasts for target month May as lead month 2. More explanation is given in the caption of Fig. 1.