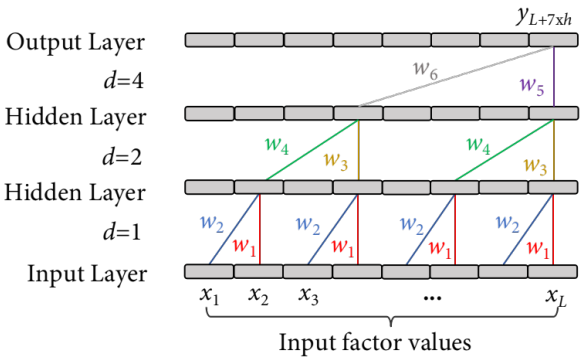
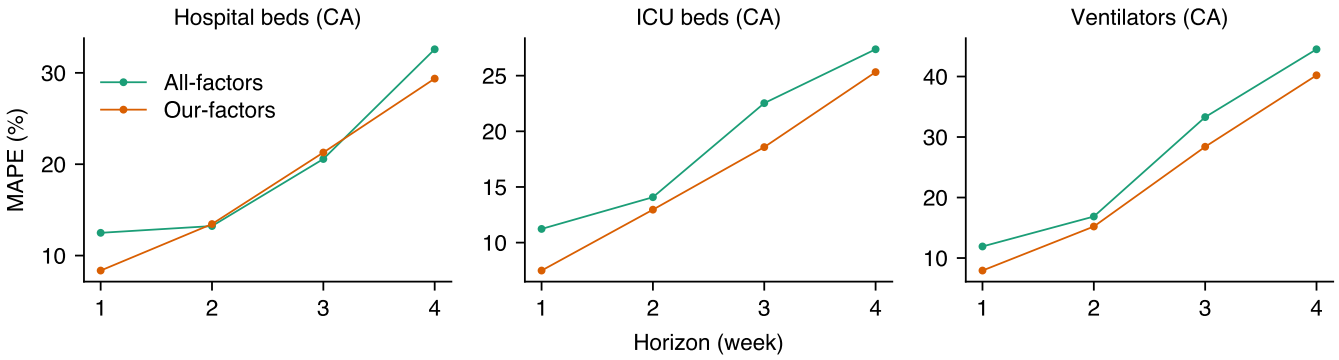
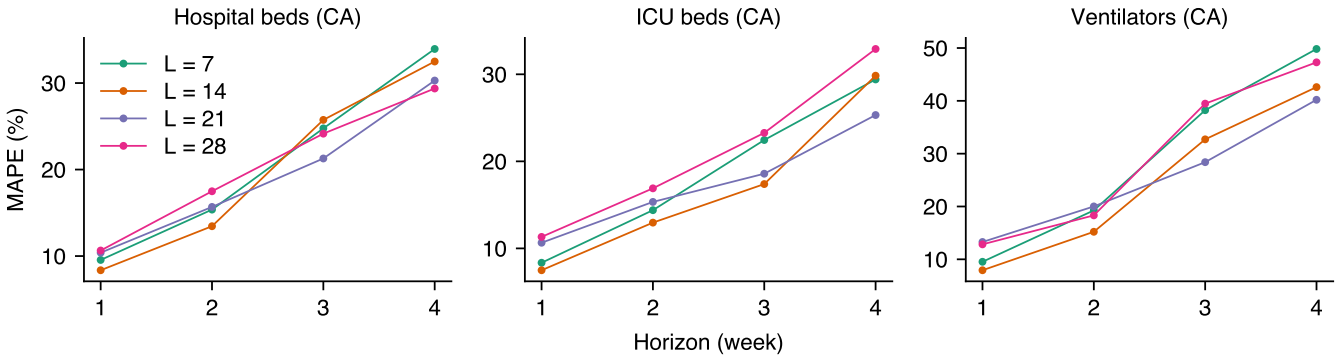
Supplemental Figures



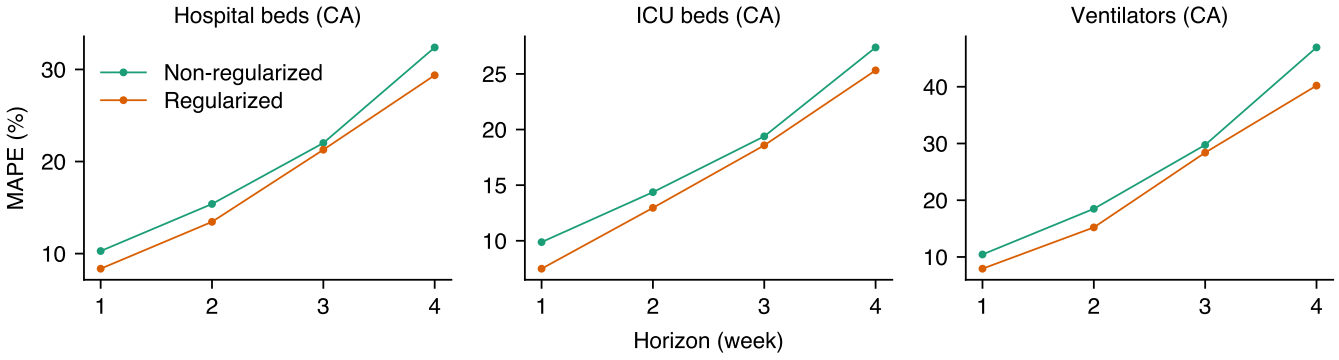
Supplemental Figure S1. An example of dilated convolutional network architecture with two hidden layers. To make an h-week forecast ($h \in \{1,2,3,4\}$), we use the values $[x_1,\ldots,x_L]$ in the last L days from t_1 to t_L (*e.g.*, the L = 21 days between 31 Oct and 20 Nov for the ICU-ON-4 forecast shown in Figure 1) to produce the forecast value $y_{L+7\times h}$ at time $t_{L+7\times h}$. For the first hidden layer, the convolution with dilation rate d = 1 (which means how many past values before current time t_L are used for convolution) maps the input to a higher dimension via two kernels (whose weights are w_1 and w_2); then, the next convolution with d = 2 maps the output of the first hidden layer via the other two kernels (with weights w_3 and w_4); eventually, the convolution with dilation rate d = 4 yields the output $y_{L+7\times h}$ ($h \in \{1,2,3,4\}$) at time $t_{L+7\times h}$ via the kernel weights w_5 and w_6. Here, the kernel weights (here, for d = 4, there are 6 parameters $\{w_1,\ldots,w_6\}$) are model parameters to learn and optimize in our training and validation processes.



(a) Using our task-specific factors (shown in Figure 3) in the past 7, 14, 21, 28 days yields lower (or equivalent) MAPEs for all forecasting tasks, compared to using all factors. (Note this corresponds to using 14×27 values for the 1-,2-week forecasts, and to using 21×27 values for 3-,4-week forecasts.)

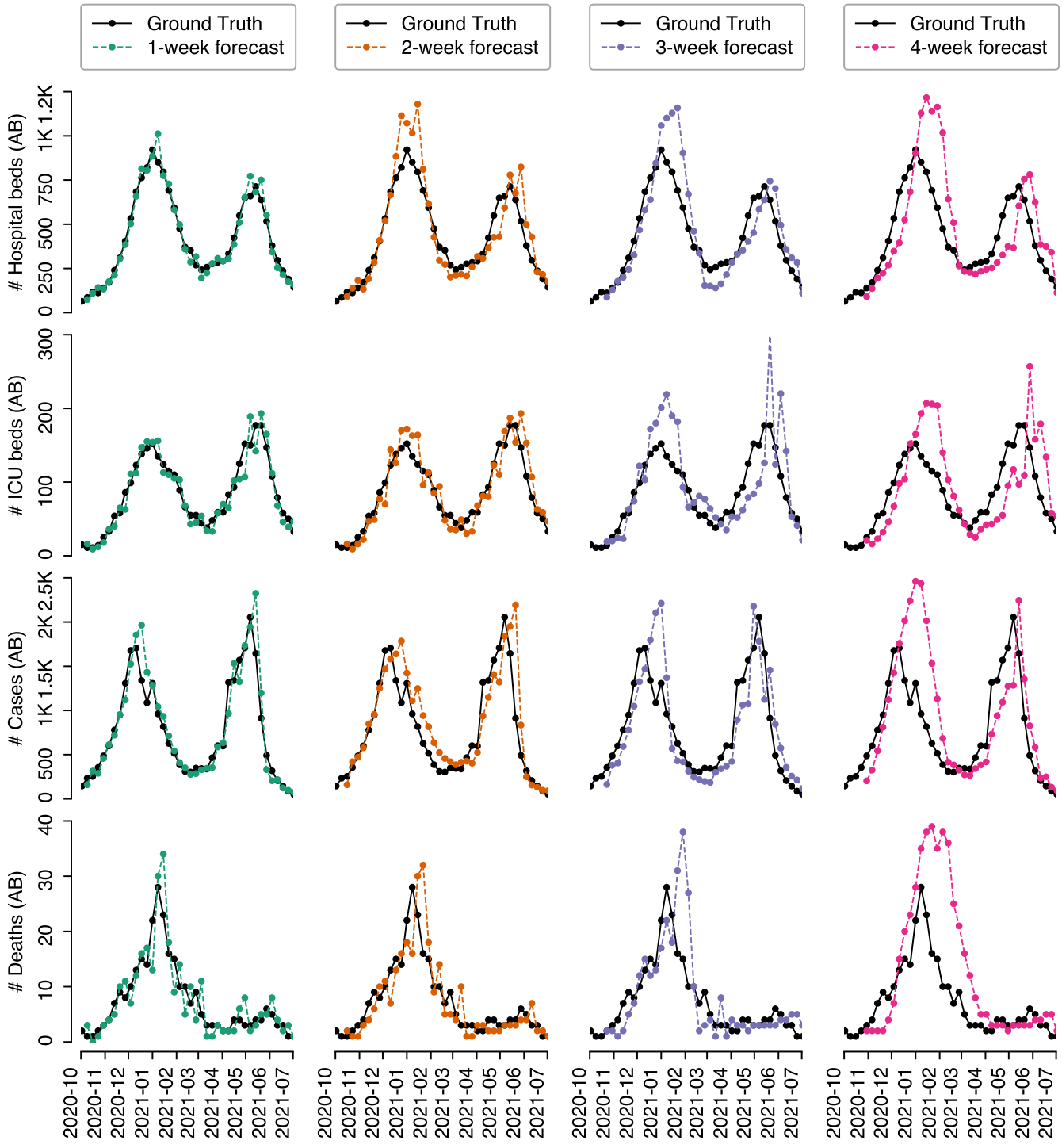


(b) Using the values of task-specific factors in the past $L = 14$ days produces more accurate 1-,2-week forecasts and using the values in the past $L = 21$ days produces more accurate 3-,4-week forecasts.

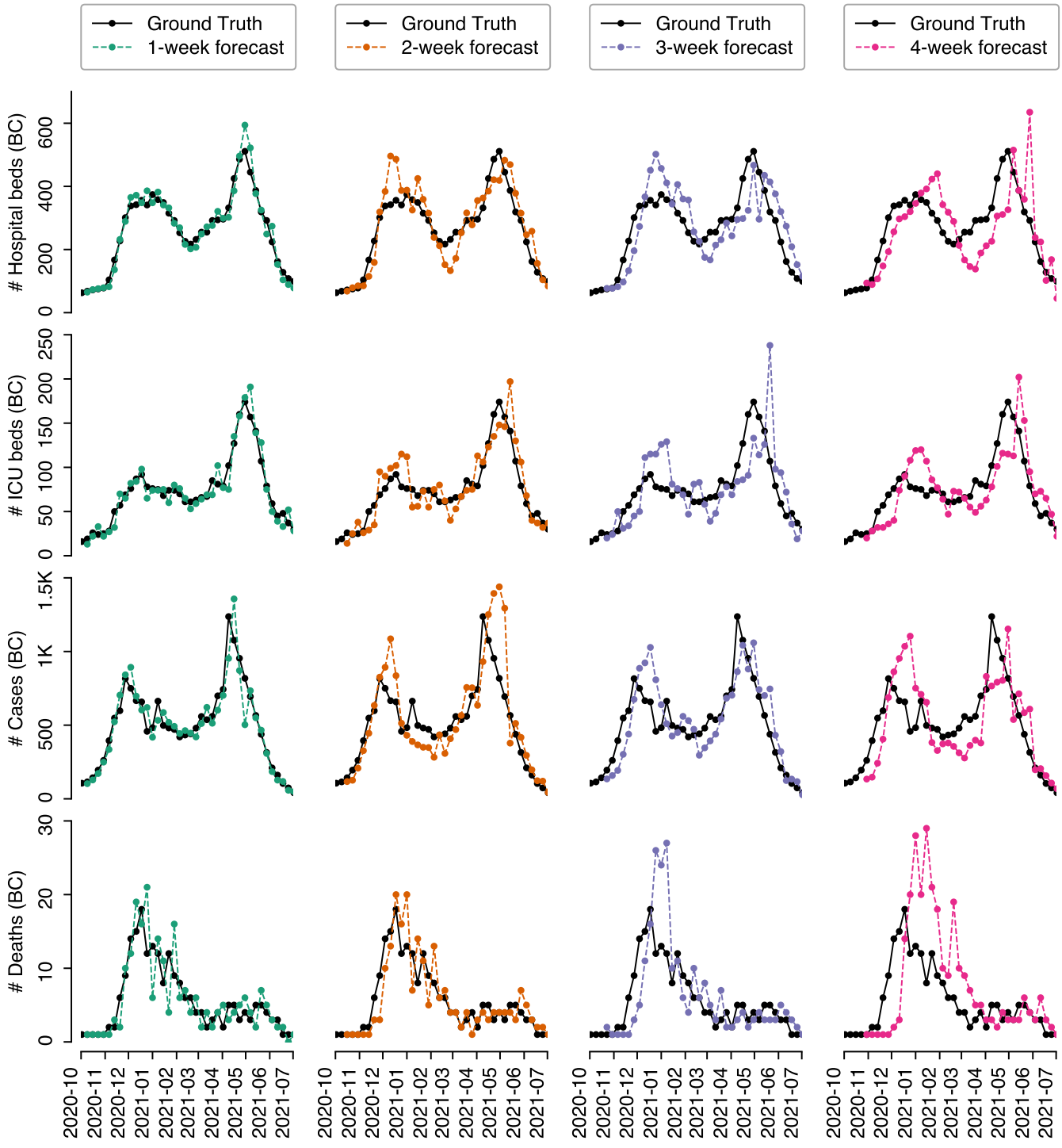


(c) TCN models with a non-zero dropout rate (*i.e.*, with regularized weights) can achieve lower MAPEs than with a zero dropout rate (*i.e.*, with non-regularized weights).

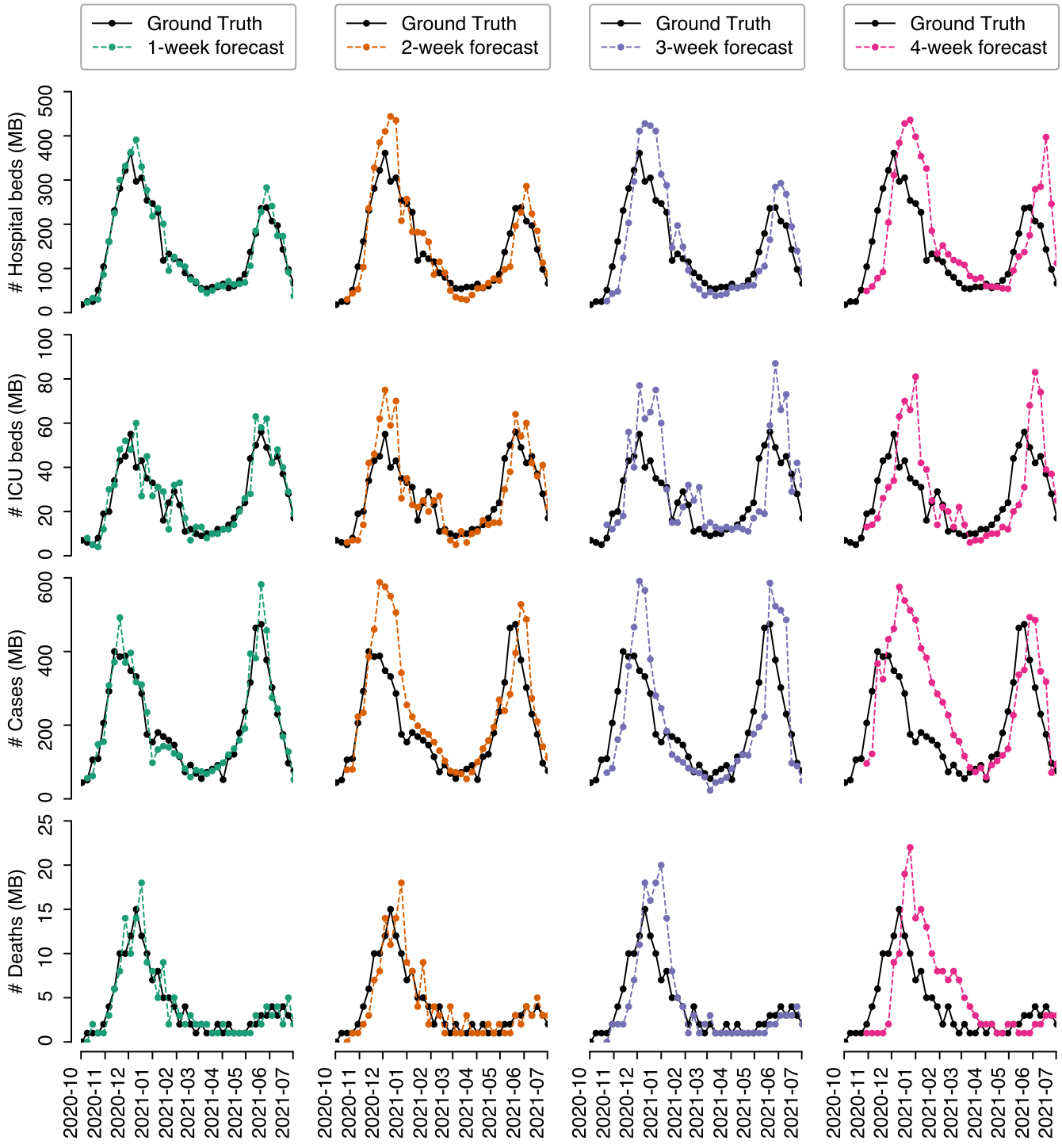
Supplemental Figure S2. MAPE of the Canada resource utilization forecasts yielded by TCN models with different settings.



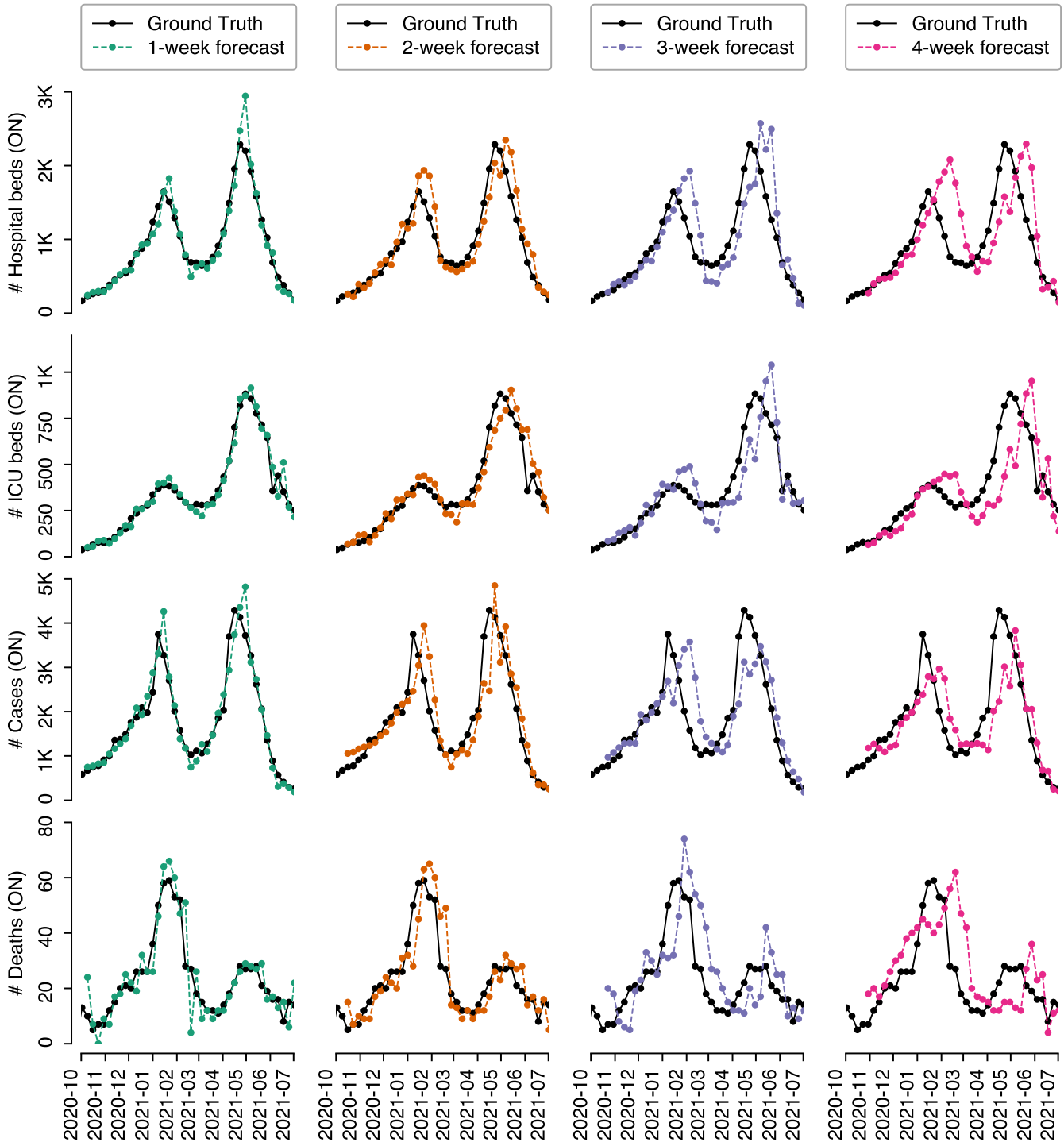
Supplemental Figure S3. 1-,2-,3-,4-week forecasts in **Alberta**.



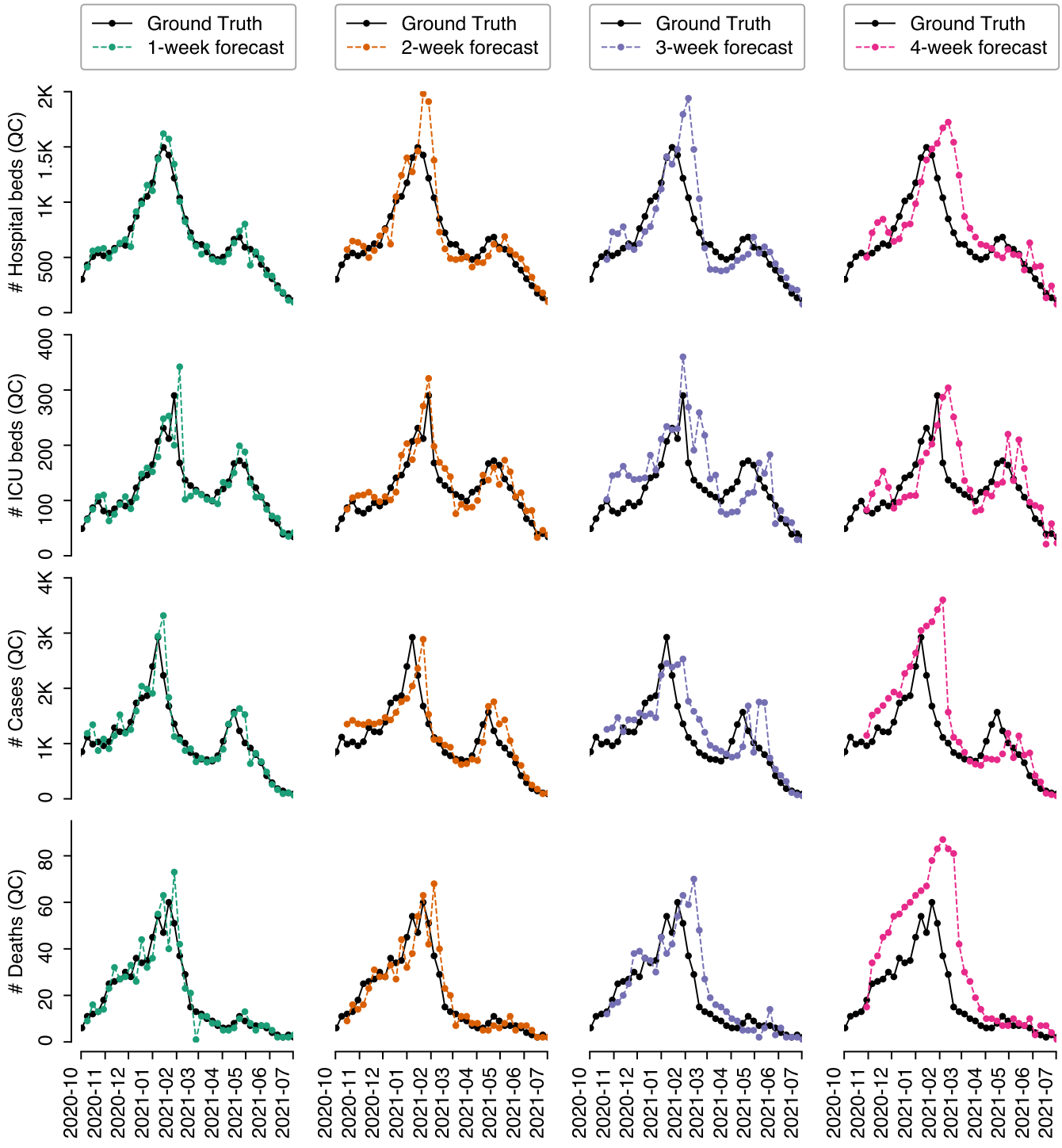
Supplemental Figure S4. 1-,2-,3-,4-week forecasts in **British Columbia**.



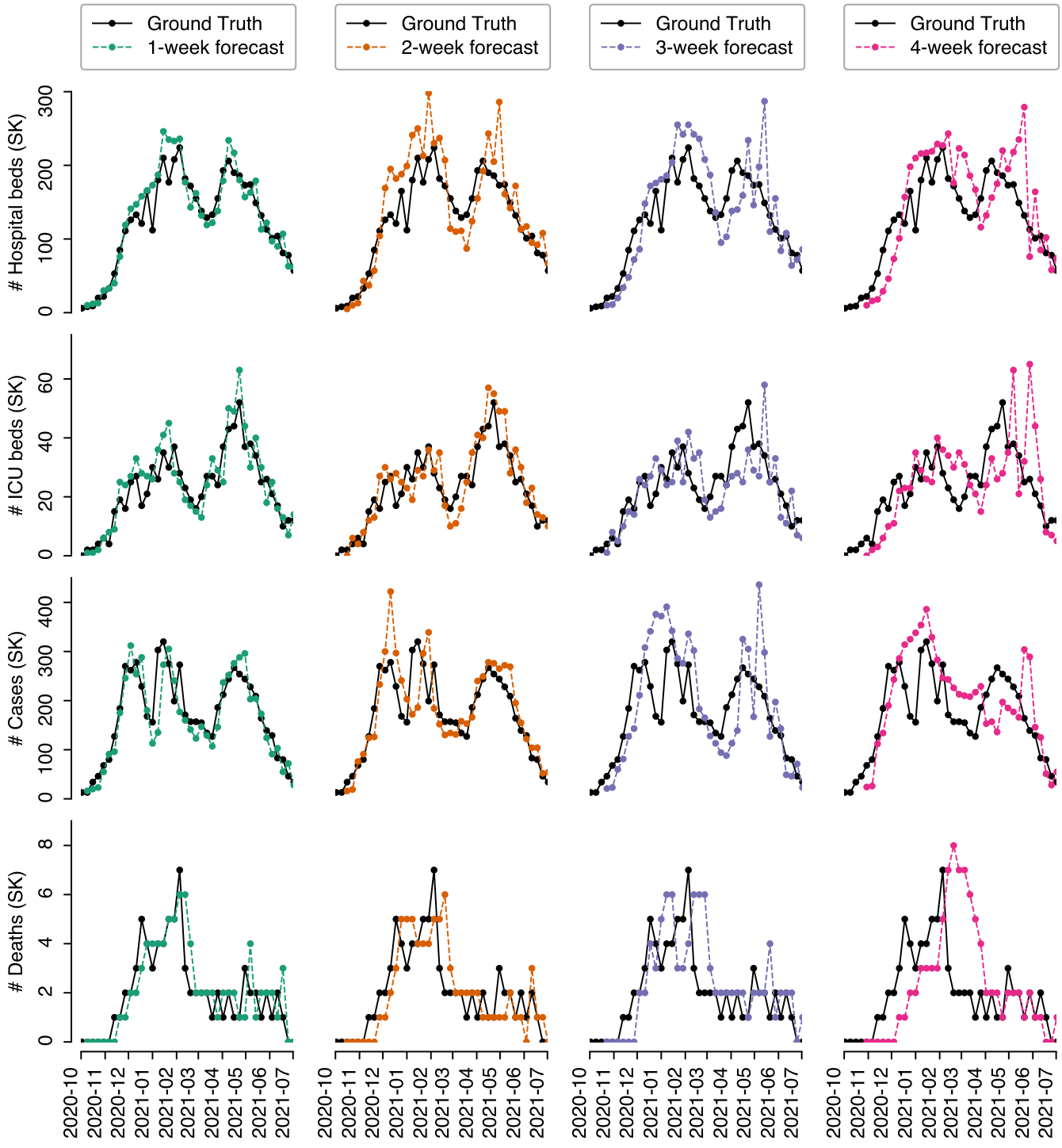
Supplemental Figure S5. 1-,2-,3-,4-week forecasts in **Manitoba**.



Supplemental Figure S6. 1-,2-,3-,4-week forecasts in **Ontario**.



Supplemental Figure S7. 1-,2-,3-,4-week forecasts in **Québec**.



Supplemental Figure S8. 1-,2-,3-,4-week forecasts in **Saskatchewan**.