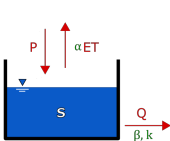


Synthetic truth

(a)

$$\alpha = 0.8 \quad \beta = 1.2 \quad k = 24.0$$



$$\frac{dS}{dt} = P - Q - \alpha ET$$

$$Q = \frac{S^\beta}{k}$$

Model 0: LSTM

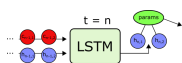
(c)



$$H(\text{istm}) = -24.54 \text{ nats}$$

Model 1: True model

(e)



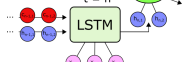
$$H(\text{istm}) = -43.93 \text{ nats}$$

$$\frac{dS}{dt} = P - Q - \alpha ET$$

$$Q = \frac{S^\beta}{k}$$

Model 2: Wrong process representation (correct architecture)

(h)



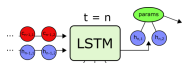
$$H(\text{istm}) = -21.09 \text{ nats}$$

$$\frac{dS}{dt} = P - Q - \alpha ET$$

$$Q = \frac{S}{k} \quad S \leq S_{\max}$$

Model 3: Wrong architecture and process representation

(k)



$$H(\text{istm}) = -16.09 \text{ nats}$$

$$\frac{dS_1}{dt} = P - Q_1 - \alpha ET$$

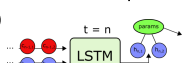
$$Q_1 = \frac{S_1}{k_1}$$

$$\frac{dS_2}{dt} = Q_1 - Q_2$$

$$Q_2 = \frac{S_2}{k_2}$$

Model 4: Overparametrized Model

(n)

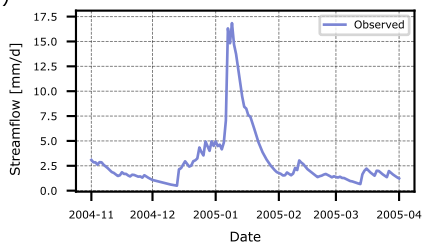


$$H(\text{istm}) = -43.01 \text{ nats}$$

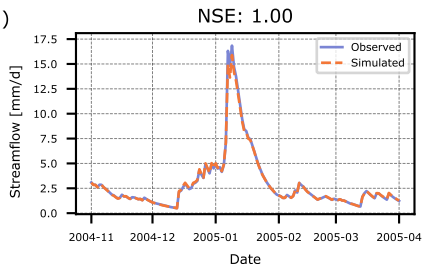
$$\frac{dS}{dt} = P - Q - \alpha ET$$

$$Q = \frac{(S - S_0)^\beta}{k}$$

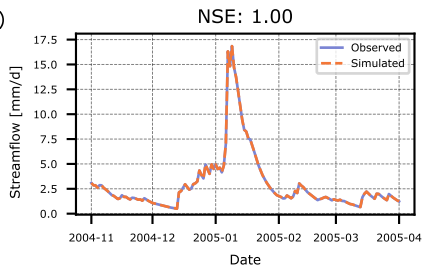
(b)



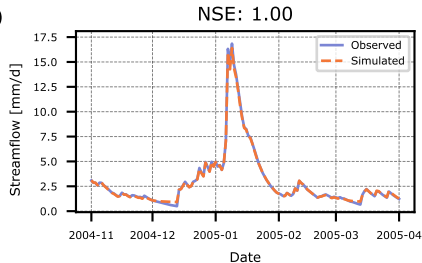
(d)



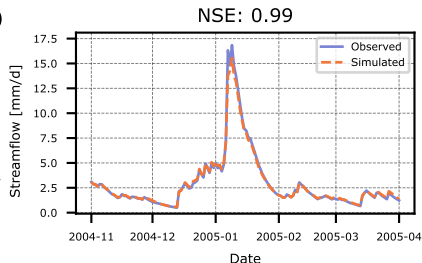
(f)



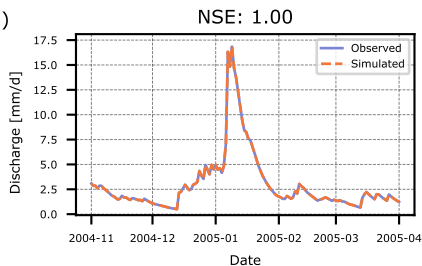
(i)



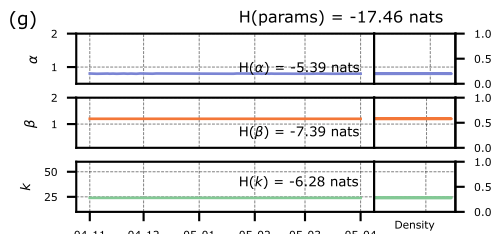
(l)



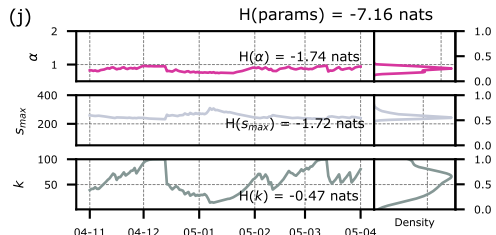
(o)



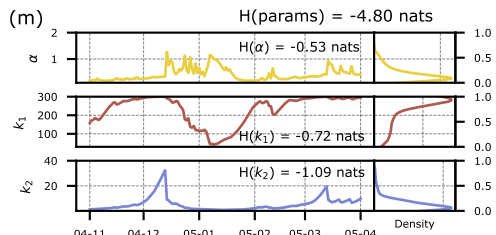
(g)



(j)



(m)



(p)

