

Process Model

$$\frac{dP}{dt} = rP(K - P)$$

$$\begin{bmatrix} N_1 \\ N_2 \\ \vdots \\ N_T \end{bmatrix} \sim \text{MVNormal}\left(\begin{bmatrix} 0 \\ 0 \\ \vdots \\ 0 \end{bmatrix}, \mathbf{K}\right)$$

$$k_{i,j} = \eta \exp(-\rho d_{i,j}^2)$$

Measurement Model

$$P_t^{obs} \sim \text{Normal}(\mu, \sigma_P)$$

$$N_t^{obs} \sim \text{Normal}(\nu, \sigma_N)$$

$$\mu = aP_t - (1 - a)N_t$$

$$\nu = bN_t - (1 - b)P_t$$

$$1 > a, b > 0.5$$