

Phase 1: Low-Fidelity POMDP

4D State: (L, σ, B, C)

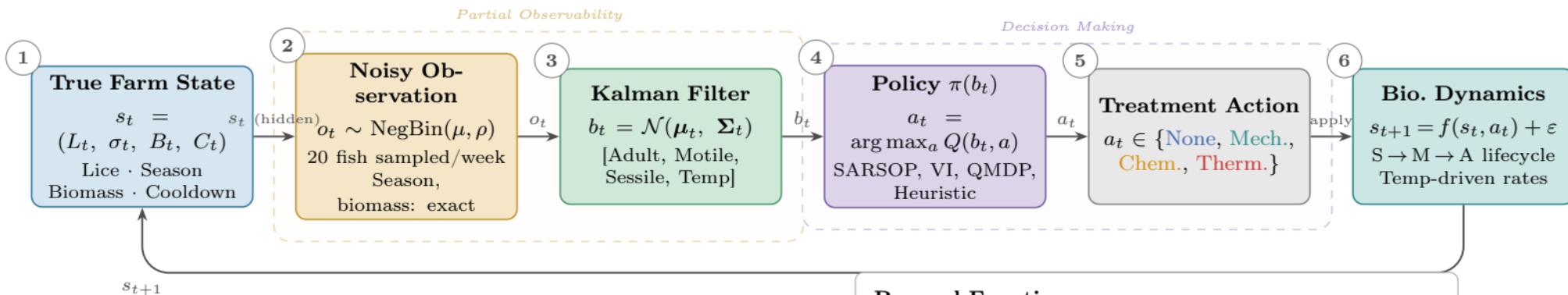
Solvers: SARSOP / VI / QMDP

Policy transfer

Phase 2: High-Fidelity Simulation

10D State: 3-stage lice dynamics

NegBin observation + Kalman filter



Treatment Actions

	None	Mech.	Chem.	Therm.
Cost (MNOK)	0	2.5	1.5	4.0
Efficacy (%)	0	75	60	88
Mortality (%)	0	0.6	0.4	0.8
Fish stress	0	0.35	0.30	0.40

Reward Function

$$R(s, a) = - \sum_i \lambda_i \cdot c_i(s, a)$$

λ_{trt} Treatment cost (direct MNOK)

λ_{reg} Regulatory penalty (threshold violation)

λ_{bio} Biomass loss (mortality + growth)

λ_{health} Fish welfare (treatment stress)

λ_{lice} Sea lice burden (chronic damage)