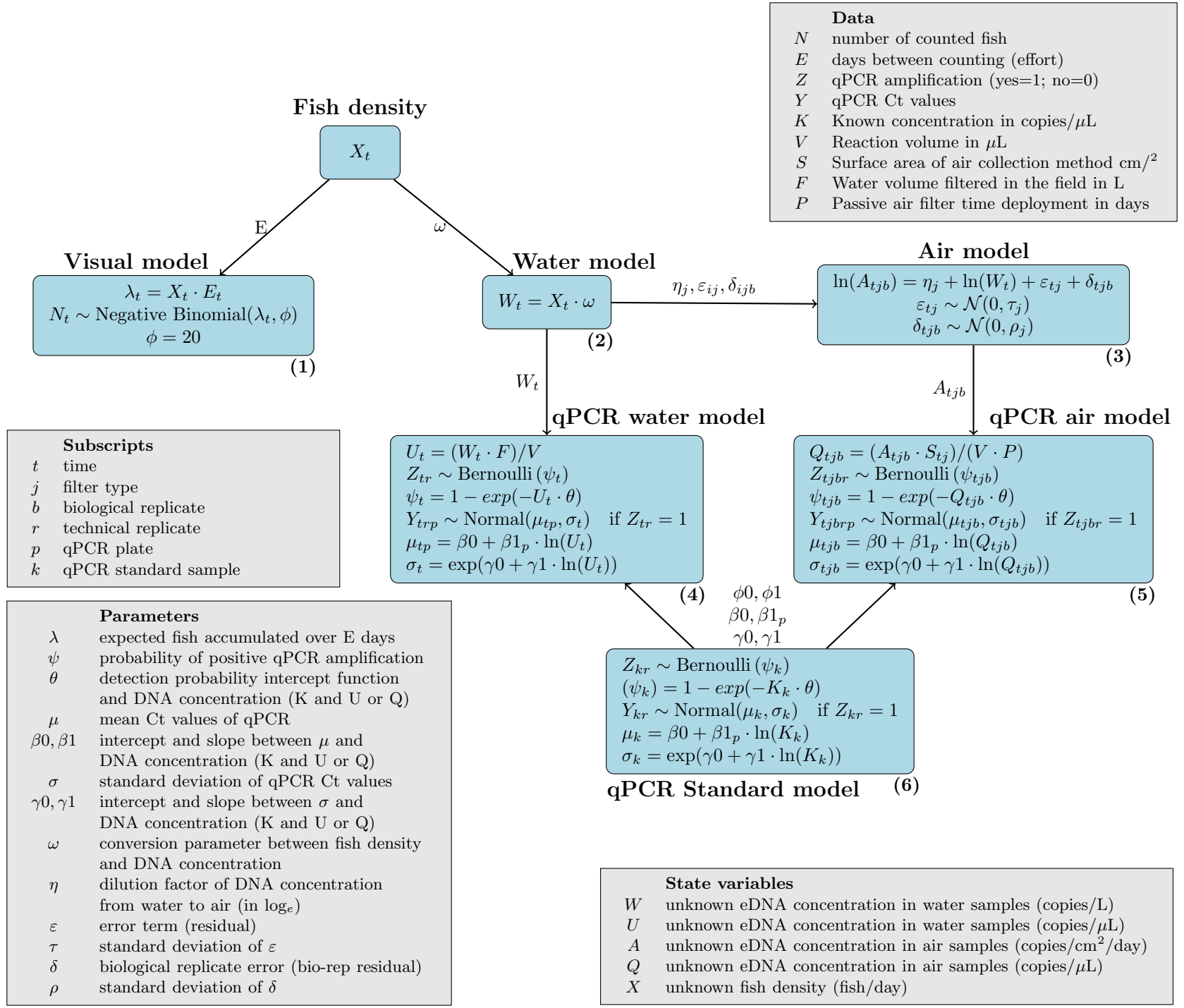

	Data
N	number of counted fish
E	days between counting (effort)
Z	qPCR amplification (yes=1; no=0)
Y	qPCR Ct values
K	Known concentration in copies/μL
V	Reaction volume in μL
S	Surface area of air collection method cm/^{2}
F	Water volume filtered in the field in L
P	Passive air filter time deployment in days

	Subscripts
t	time
j	filter type
b	biological replicate
r	technical replicate
p	qPCR plate
k	qPCR standard sample

	Parameters
λ	expected fish accumulated over E days
ψ	probability of positive qPCR amplification
θ	detection probability intercept function and DNA concentration (K and U or Q)
μ	mean Ct values of qPCR
$\beta 0, \beta 1$	intercept and slope between μ and DNA concentration (K and U or Q)
σ	standard deviation of qPCR Ct values
$\gamma 0, \gamma 1$	intercept and slope between σ and DNA concentration (K and U or Q)
ω	conversion parameter between fish density and DNA concentration
η	dilution factor of DNA concentration from water to air (in $\log_e$)
ε	error term (residual)
τ	standard deviation of ε
δ	biological replicate error (bio-rep residual)
ρ	standard deviation of δ

	State variables
W	unknown eDNA concentration in water samples (copies/L)
U	unknown eDNA concentration in water samples (copies/μL)
A	unknown eDNA concentration in air samples (copies/cm^2/day)
Q	unknown eDNA concentration in air samples (copies/μL)
X	unknown fish density (fish/day)