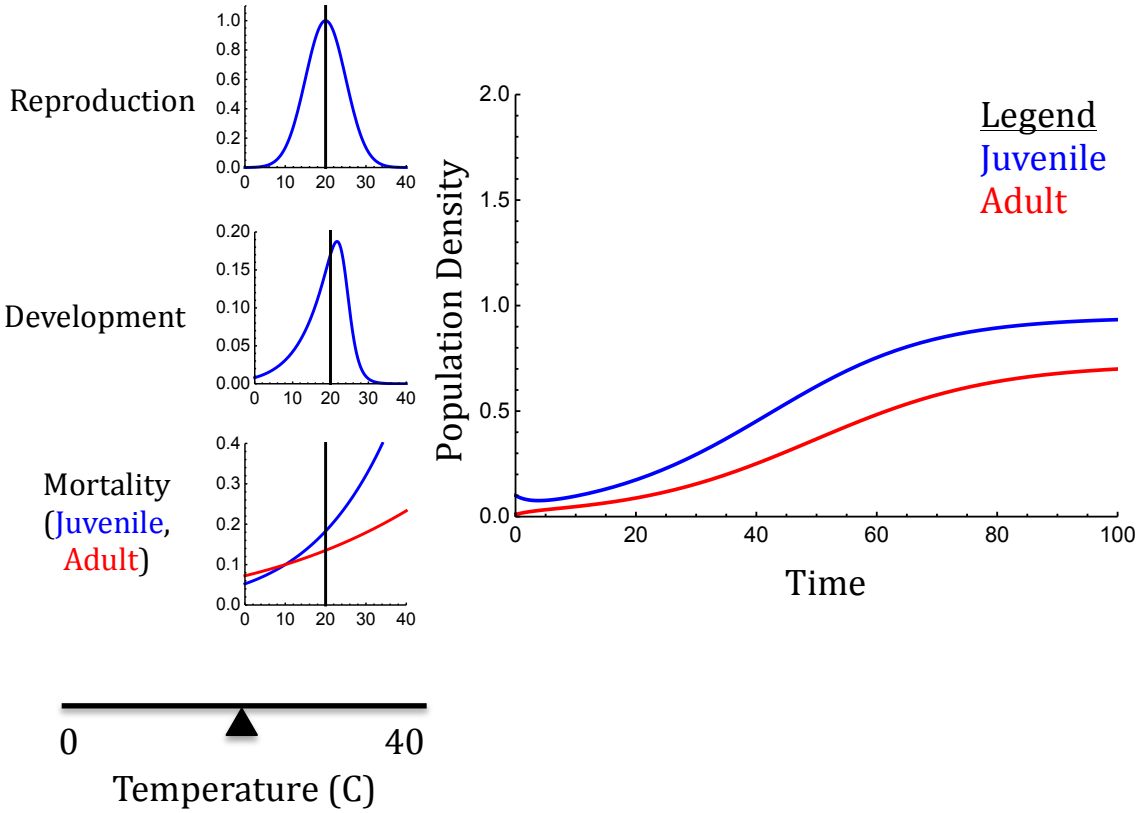

Model:

$$\frac{dJ}{dt} = r[T]Ae^{-A} - m[T]\,J - d_J[T]\,J$$
$$\frac{dA}{dt} = m[T]\,J - d_A[T]\,A$$

J and A are the densities of the juvenile and adult stages, respectively, and $r[T]$, $m[T]$, $d_J[T]$, and $d_A[T]$ are the temperature responses of reproduction, development, juvenile mortality, and adult mortality, respectively. The temperature-response functions are:

$$r[T] = r_{Topt}e^{-\frac{(T-T_{opt})^2}{2s^2}}$$
$$m[T] = m_R\frac{T}{T_R}\frac{e^{A_m\left(\frac{1}{T_R}-\frac{1}{T}\right)}}{1+e^{A_L\left(\frac{1}{T_L}-\frac{1}{T}\right)}+e^{A_H\left(\frac{1}{T_H}-\frac{1}{T}\right)}}$$
$$d_J[T] = d_{JR}e^{A_{dJ}\left(\frac{1}{T_R}-\frac{1}{T}\right)}$$
$$d_A[T] = d_{AR}e^{A_{dA}\left(\frac{1}{T_R}-\frac{1}{T}\right)}$$

Temperature response functions are plotted in the left panels and the population dynamics from the model are given in the right panel for the case of $T = 20$. Parameter values are given in the following table.

Parameter	Value
r_{Topt}	1
T_{opt}	293

s	5
m_R	0.1
T_R	283
A_m	15000
A_L	5000
A_H	70000
T_L	278
T_H	295
d_{JR}	0.1
A_{dJ}	5000
d_{AR}	0.1
A_{dA}	2500