$$
\begin{aligned}
m_{sed1}\frac{dS_{sed1}}{dt} + m_{DOC1}\frac{dS_{DOC1}}{dt} + v_1\frac{dc_1}{dt} =& -Qc_1 - QC_{sed}S_{sed1} - QC_{DOC}S_{DOC1} - \omega(c_1 - c_2) \\
& - v_1\mu_{photo}c_1 - v_1\mu_{bio-a1}c_1 - v_1\mu_{hydr}c_1 - v_1\mu_{vol}c_1 \\
& - m_{sed}\mu_{bio-sed1}S_{sed1} - m_{DOC}\mu_{bio-DOC1}S_{DOC1} - Q_Lc_1 \\
m_{sed2}\frac{dS_{sed2}}{dt} + v_2\frac{dc_2}{dt} =& -v_2\mu_{bio-a2}C_2 - m_{sed}\mu_{bio-sed2}S_{sed2} + (\omega + Q_L)(c_1 + c_2)
\end{aligned}
$$