Geol 5828

Assignment 6:

1. Derive the 1-D CDE.

2. Derive an explicit finite difference expression for the 1-D CDE.

3. Solve the CDE subject to the following initial and boundary conditions:

    - $C(x,0) = 0$
    - $C(0,t) = 1$
    - $dC/dx|_{\infty,t} = 0$

    Use the following parameters corresponding to the glass bead column demonstration:

    - $D = 0.0045\ cm^2\ s^{-1}$
    - $v = 0.0072\ cm\ s^{-1}$

    Use all of the following methods to solve this problem:
    - Excel spreadsheet solution of explicit finite difference expression
    - Mathematica NDSolve numerical solution
    - Analytical solution

Compare the model results to the observations by plotting the model results (Concentration as a function of time) as a solid line over the observations plotted as open circles. I have placed the observed data on the web page.