

Geol 5828

Assignment 2a:

1. Describe  $Q$ ,  $q$ ,  $K$ ,  $T$ ,  $b$ , Darcy's law (in both the  $K$  and  $T$  forms), and mean pore water velocity. Include dimensions where appropriate using  $M$ ,  $L$ ,  $T$  for mass, length, and time respectively.
2. If the Biscayne Aquifer has a transmissivity of  $10^6$  gpd/ft (gallons per day per foot) and the seaward gradient is  $10^{-4}$ , what is the discharge to the sea (in gallons per day) over 20 miles of beach? Assume no pumping and no impact of salt water intrusion.
3. Beginning with the 1-D Laplace equation ( $\frac{\partial^2 h}{\partial x^2} = 0$ ), write a general expression for  $h(x)$ . Using the boundary conditions  $h(0) = 0$  m and  $h(100) = 1$  m, solve for the constants in your general expression (show all steps) and write the specific solution.