Groundwater Modeling Techniques

Chapter 9

9.1 why developed

9.2 Type of models
- Porous Media Models
- Miscellaneous analog model
- Electrical analog model
- Digital Model

- Porous Media Models
- Sand Tank Models
  Eq. 10.1 , 10.5 , 10.8
- Will flow , seepage , artificial recharge , dispersion , seawater intrusion
- Transparent Models
    (demonstration and educational tool)

- Analog Models
- Viscous Fluid Models
    Eq. 10.11 , 10.12
- Membrane Models
- Moire Pattern Models
- Thermal Models
- Blotting Paper Models
- Electric Analog Models
- Conductive Liquid Models
- Conductive Solid Models
- Resistance – Capacitance Networks
- Resistance Network

-Digital Models

- FDM Fig 9.4.1

- FEM Fig 9.2.1

- Hybrid Computer Models

- Modeling for GW. Mgt.

9.3 Steps in the GW model development
    (Anderson and Woessner)
  1. Determine the purpose of the model
  2. Developa conceptual model
  3. Select the governing equations and computer code
  4. Model design
  5. Calibration
  6. Sensitivity analysis
  7. Verification
  8. Prediction
  9. Predictive sensitivity
  10.   Presentation of modeling design and results
  11.   Post audit analysis
  12.   Model redesign using insight from the post
     audit anlaysis

9.4 Simulation of two dimensional GW systems
     Governing equations
     Finite difference equations
     Solution
      Case study
9.5 Three dimensional GW flow model

9.6 Modflow 2000

9.7 Case study

9.8 Particle tracking (modpath)
9.9 example
9.10 Solute transport (MOC3D)
9.11 GW Modeling software support