Water Quality Modelling

Outcome of this Experiment

Understanding the mechanism of contaminant transport. Therefore we will simulate a water quality model with a tracer having triangular distribution.

Objectives

- Create a new project and draw a schematic of a river.
- Assign cross section and boundary condition data.
- Assign water quality data.
- Perform water quality analysis.
- View and present the results.

Data

- The channel is irregular and cross section data along with channel length data are given in the excel file.
- Manning's n can be taken as 0.025
- Discharge data, boundary condition, water quality data will be given in the class.
- Diffusion coefficient can be assumed as $0.1\ m^2/s$
- Tracer = (given value + last 2 digits of your roll)/1000

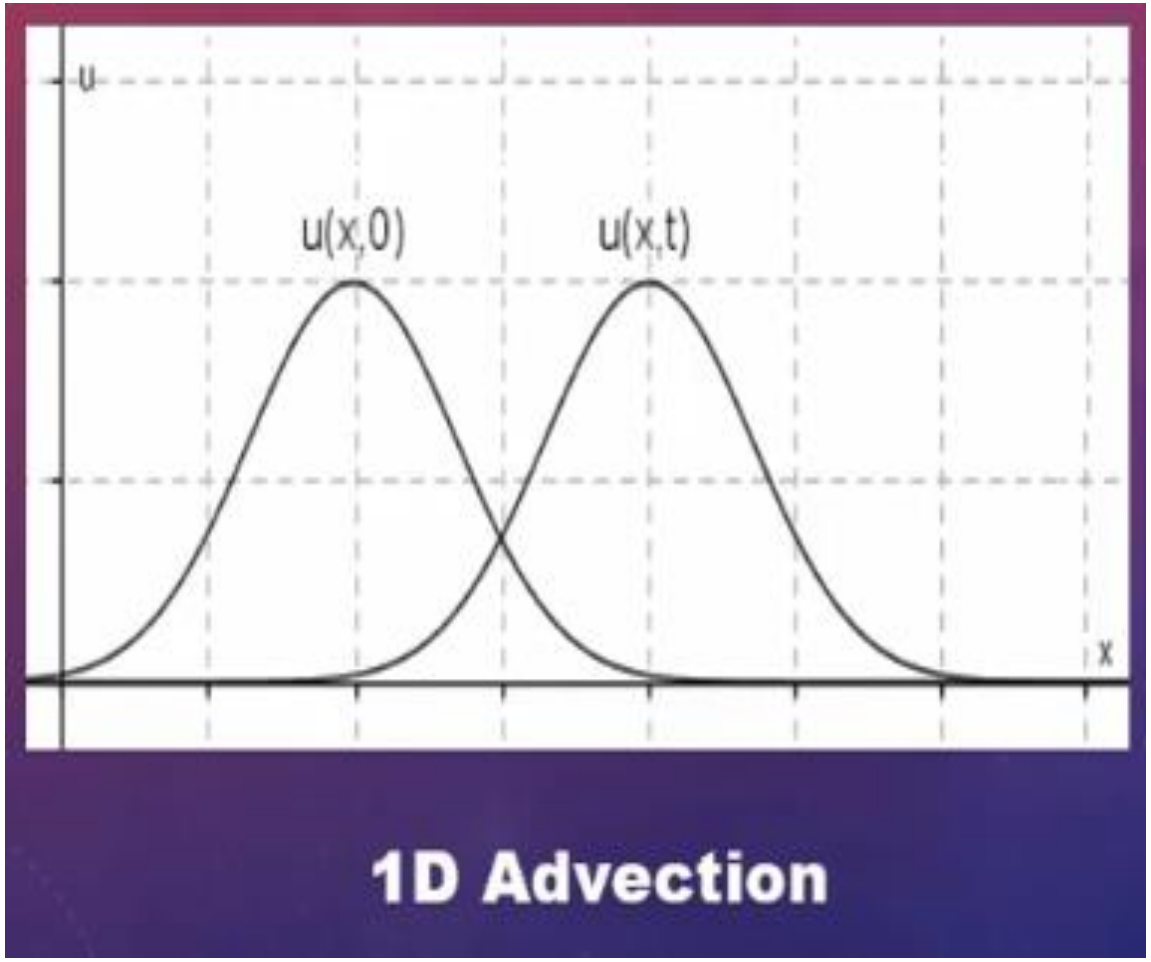
Advection and Diffusion

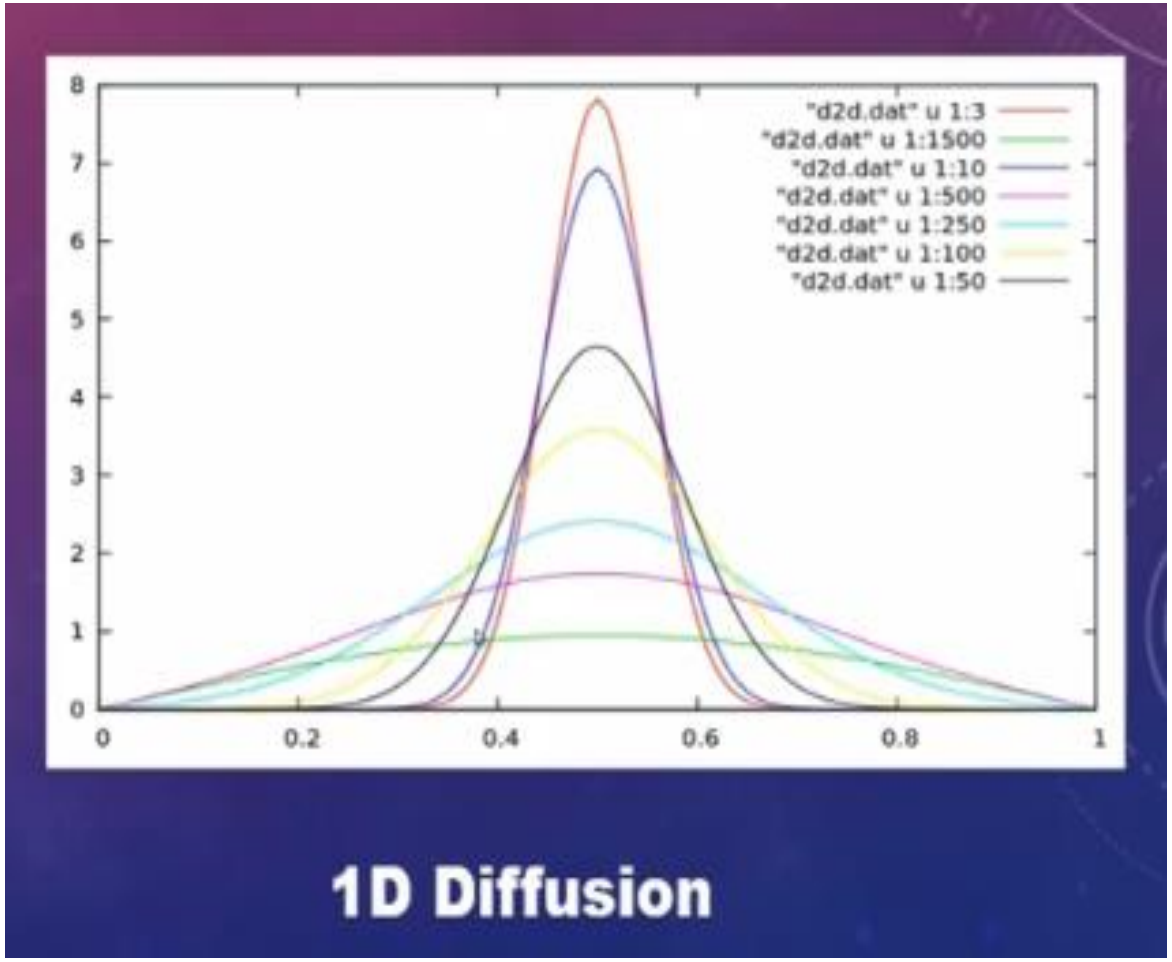
HEC RAS can solve 1D advection diffusion equation and simulate the transport of water temperature, nutrients and constituents.

Advection is defined as the transportation of any particle due to the velocity of water. By this process tracer will move from upstream to downstream without diminishing concentration.

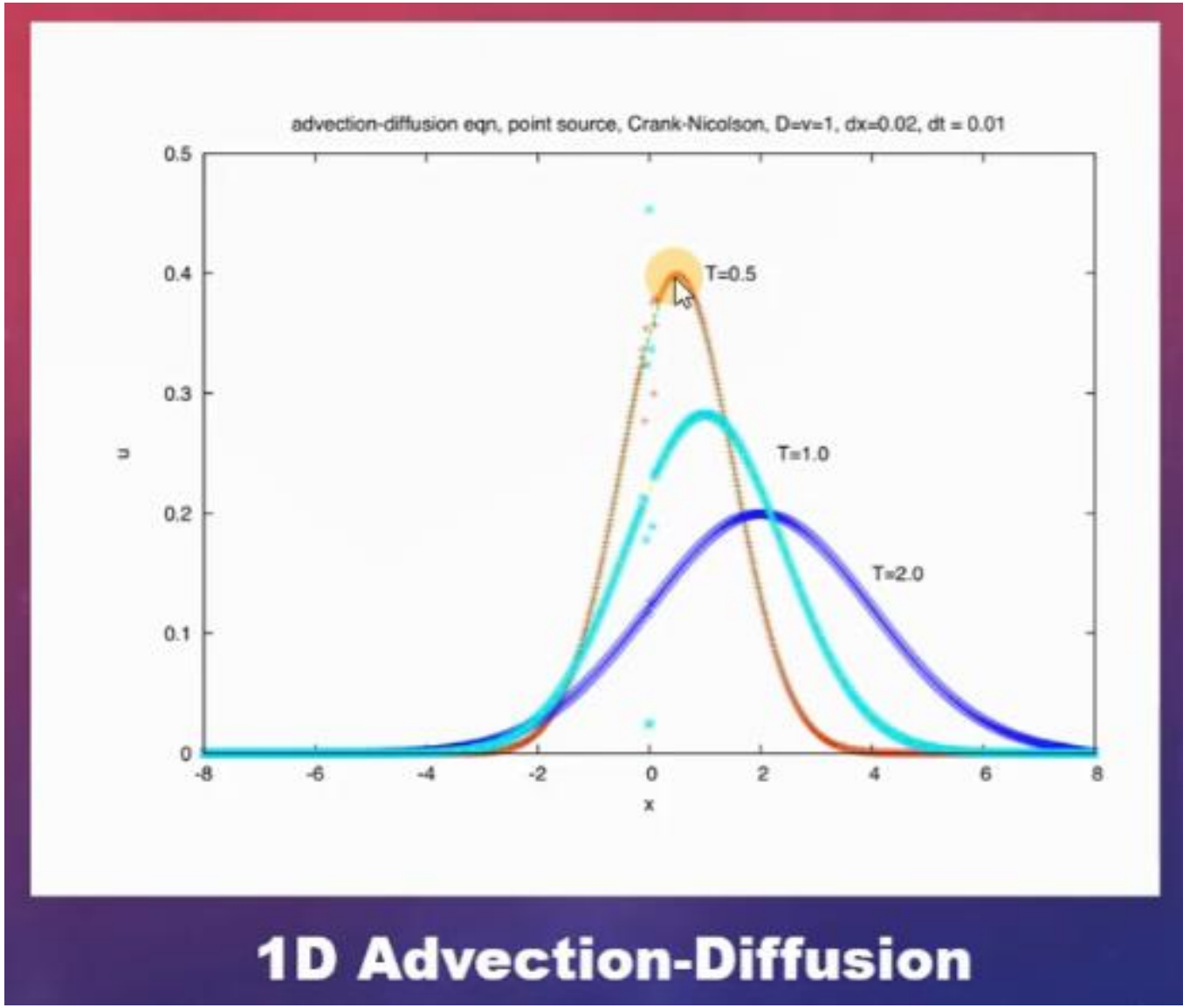
Diffusion is defined as the spreading of particles due to molecular or turbulent diffusion. By this process concentration of tracer will diminish over time.

Advection and Diffusion





Advection and Diffusion



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