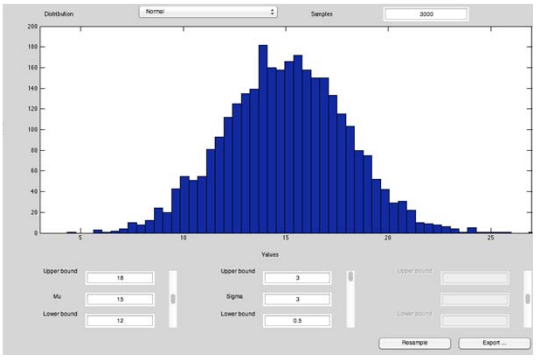
MATLAB: Streeter-Phelps model

- 1. Use Streeter-Phelps equation to plot DO sag curve downstream of a wastewater treatment plant discharge point

  Assume BOD at the discharge point, BOD_0, is 15 mg/L

- 2. More realistically, assume that BOD_0 has a normal distribution rather than a constant value: mean=15 mg/L, σ = 3 mg/L

  Find the probability distribution of DO concentration at the critical (lowest DO) point downstream
- In MATLAB, use the command "randtool" (random number generation tool)



You can select the distribution type, mean, σ, and sampling size in this window. Then export it and save it as a MATLAB variable.

- (a) What is t_{crit}?
- (b) Plot a histogram of DO_{crit} for the system with a normally distributed BOD_0.
- Use MATLAB statistics toolbox to find the mean, standard deviation, and 25%, 50% and 75% probability values of DO. (Recall that in the first MATLAB lecture, we used the command “dfittool” to plot a cumulative distribution curve.)