**Getting from IBMs**

Suppose, in your IBM, demographic rate models are parameterized as function of three *continuous* covariates: temperature (T), rainfall (R), and population abundance (A).

For each covariate:

1. Get the observed minimum and maximum value, as well as the average value of the study period. Also get covariances, the value of R and A when temperature is minimum and maximum; the value of T and R when density is at its minimum and maximum; and so on
2. Run at least 100 simulations of the IBM, each for at least 100 years, and for each of the covariates using the following 4 “scenarios”: fix a given covariate (say, R) to (1) maximum or (2) minimum values, and (3) fixing the remaining covariates (say, T & A) to their average or (4) to their corresponding value when the focal covariate is at its maximum or minimum. Other parameters, such as initial structure of the input data can be fixed to their averages.
3. Calculate for each simulation and each scenario as:

That is, the average change in instantaneous population growth rates over the simulated years, discarding the initial 50 years as transient dynamics. Note, **if your IBM is on a sub-annual scale**, e.g., monthly, calculate the changes in abundance from one year to the next, using a month of your choice.

1. Plot to make sure these are reaching a stationary distribution.