## Conservation Biology BIOE 440/521 <br> HW 1 - Human Population Growth

1) Go to the population clock maintained by the US Census Bureau https://www.census.gov/popclock/

The screen shows US and World Population Clock, showing real-time estimates of numbers of humans (along with some other interesting information about population growth). Note both current estimates.

US: $\qquad$ World: $\qquad$

In 2012, the global human population was increasing by about $1.1 \%$ per year (see Figure 1.2 in CWP). Using that figure, and the population size you just recorded from the World Population Clock, calculate an estimate of world population size next year, and 50 years from now. Show your work and state the assumptions underlying your calculation (there is a range of reasonable assumptions you might make, just be clear about the assumptions you made..)
2) Using the links provided for $\mathbf{R}$ Exercise Two, download the output for 50year projections of the US population to the year 2060, from the US Census Bureau.

One file provides the data as an Excel spreadsheet that is easy to examine but has headings that extend over multiple columns, so it does not read into $R$ easily. Examine this file until you understand what each column shows, by comparing the numbers within a single row.

The other file has the same data, reformatted as a comma-delimited text file, so that it can be read easily into R. Right-click the link, save the file somewhere you can easily find it (e.g. on the desktop) and read it into R using the Import Dataset tab in the Environment window, or by the read.csv() [you will have to save it with the csv file extension to use this function] or read.table() functions.

These population projections use Leslie matrix projection methods that we will cover later in the class (the same methods are used to project population growth for humans and for other species). You don't have to examine this now, but the methods are given here. For now, use the data to plot and examine the following relationships, which will help you to answer the HW questions that follow.:

Population size vs. year; Population growth rate vs. year;
Total births vs year; Total births vs population size; Births per capita vs year
Total deaths vs year; Total deaths vs population size; Deaths per capita vs year

## Conservation Biology BIOE 440/521 <br> HW 1 - Human Population Growth

HW questions to turn in:

1. How is population growth expected to change over 50 years?
2. How are changes in births and deaths expected to affect these changes in population growth?
3. What is the intrinsic rate of increase predicted to be in 2025 , and in 2035 ?
4. (a) By what percentage are natural increase and the overall growth rate predicted to differ in 2025?
(b) By examining the data, what is the distinction between "natural increase" and the population growth rate?
