DID THE SUN JUST EXPLODE?
(IT'S NIGHT, SO WE'RE NOT SURE.)

FREQUENTIST STATISTICIAN:

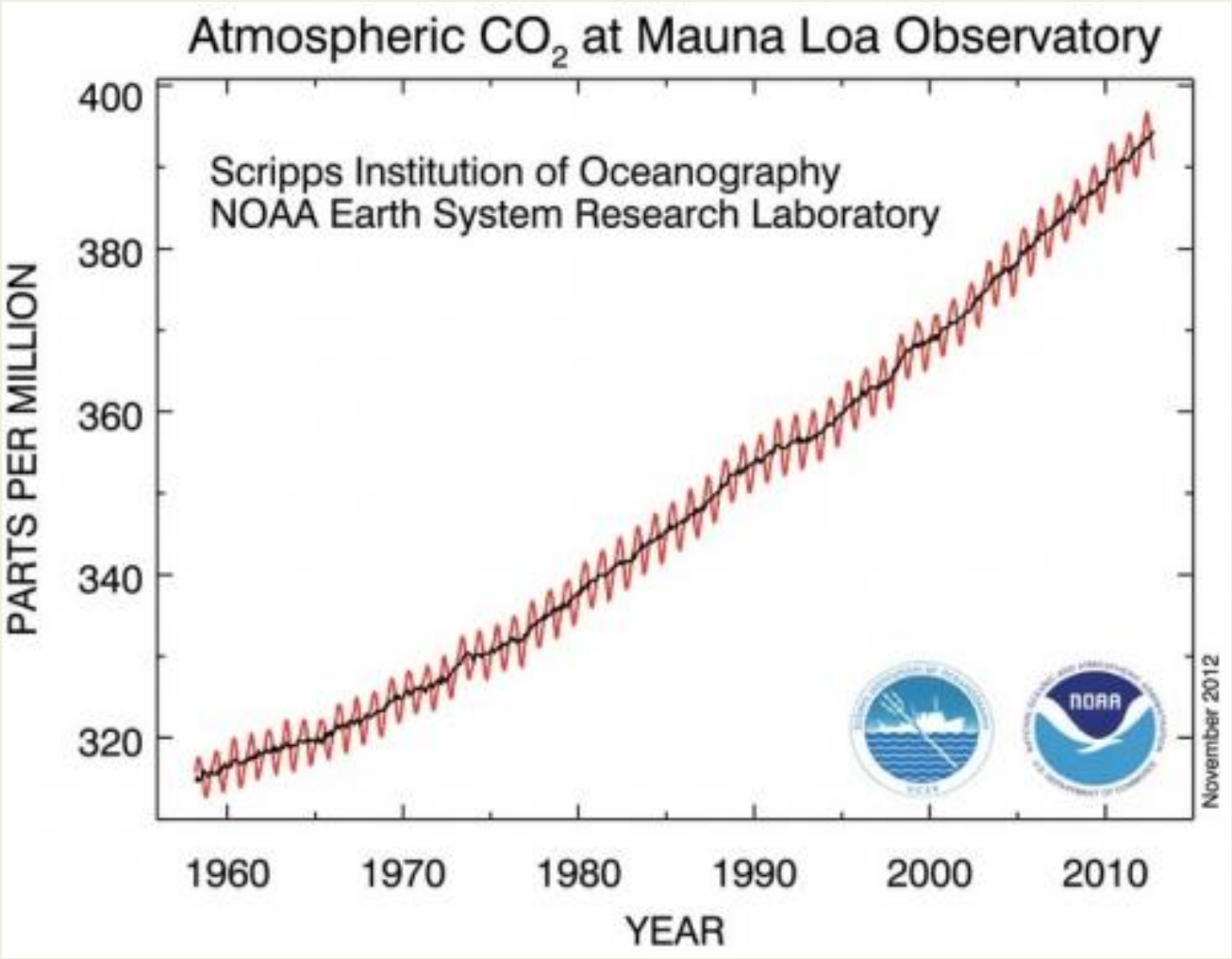
BAYESIAN STATISTICIAN:

Quantitative Thinking in the Life Sciences

Nov 28th – Simulating data and Colinearity

CO2 Hits New High; World Could Warm 7.2°F by 2060

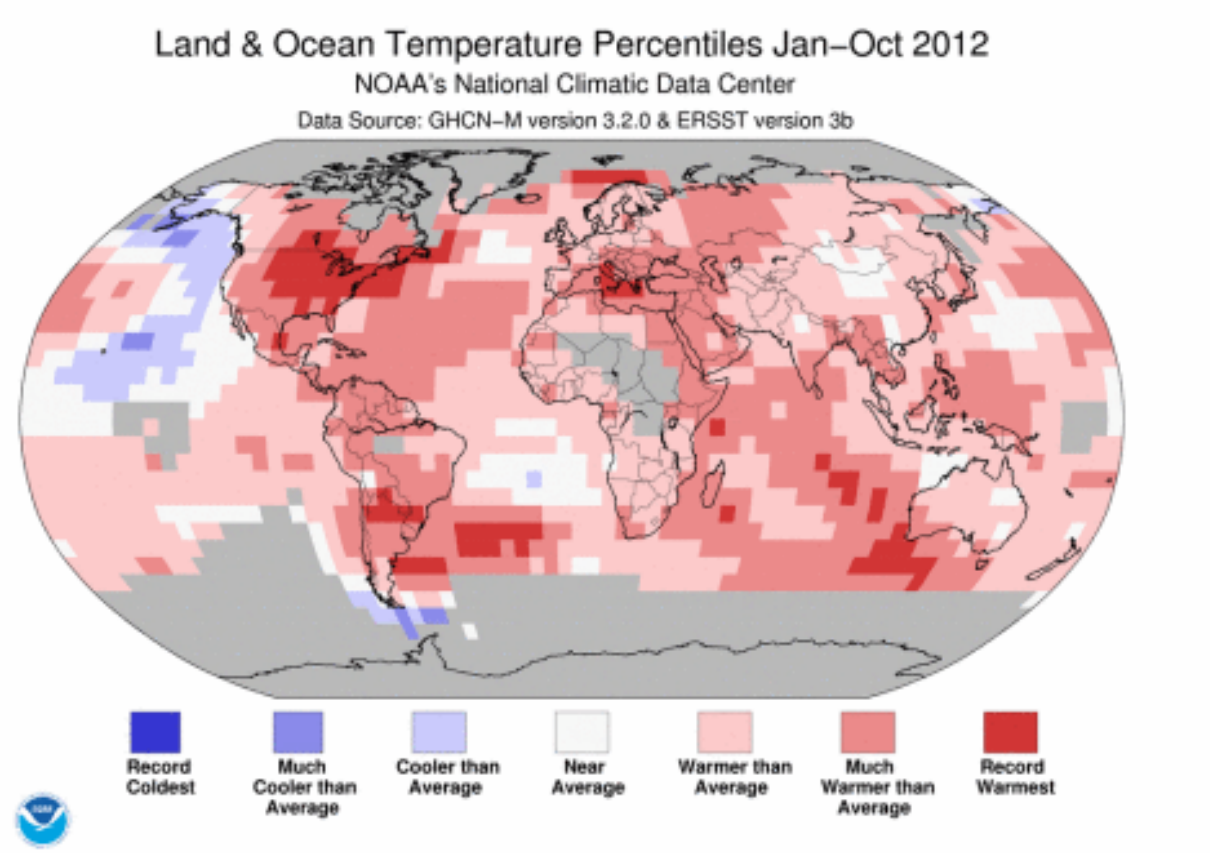
We are estimated to have observed a 1.8°F increase since 1900 (112 years)
Increase equates to an equivalent increase every 16 years



http://www.climatecentral.org/news/co2-hits-new-high-world-could-warm-7f-by-2060-15268

If you're 27 or younger, you've never experienced a colder-than-average month

By Philip Bump



If you were born in or after April 1985, if you are right now 27 years old or younger, you have never lived through a month that was colder than average.

http://grist.org/news/if-youre-27-or-younger-youve-never-experienced-a-colder-than-average-month/

Today

- Class project details – Lean on your classmates
- Distributions
- Colinearity
- Data simulation/test examples

Housekeeping

- Our Final is: MON 12/10/2012 07:30 - 10:15

- Class project due on our finals day
- All other (late) assignment due on Dec 5th
  - Dec 5th is the last day of class
  - (I need time to grade them!)
- Homework D is due today
  - R Code including matrix of simulated values and statistical test code
- This week's Plant and Soil Science Departmental talks 3 pm on Friday in 127 Jeffords
  - Dana Allen!

Class Project

Manuscript format! Polished for publication!

1. Introduction
2. Methods (how you will actually try to collect data & how you simulated you data)
3. Results
   - data simulation
   - test results
   - figures
4. Discussion and conclusions
5. References

Distributions: What if you have data?

- par(mfrow = c(1,2)) # graphical display with 1 row and 2 columns
- x= rbeta(n=10000,shape1= 2, shape2 = 4) # sampling from a Beta distrib
- hist(x) # what does that distribution look like?

- x = rbeta(n=50,shape1= 2, shape2 = 4)
- hist(x)
- # These are your sampled data. They look beta and you have reason to believe that they are beta but what are the distribution parameters?
- # New function! fitdistr
- require(MASS) # library that contains the fitdistr function
- fitdistr(x, “beta”, list(shape1=1,shape2=1))

Distributions

- require(MASS)
- http://127.0.0.1:15786/library/MASS/html/fitdistr.html
- fitdistr {MASS}
- "beta", "cauchy", "chi-squared", "exponential", "f", "gamma", "geometric", "log-normal", "lognormal", "logistic", "negative binomial", "normal", "Poisson", "t" and "weibull"

Chapter 7 in your book

- If you wanted to test to see if a distribution fits
  - Are my worms randomly occurring & independent?
- Chi-squared or G-test
- Chapter 7 in your book

Colinearity
Co-linearity

- Increase in flower size increases amount of pollen
- Increase in elevation, increase in number of days with snow cover
- decreased atmospheric pressure is significantly associated with good skiing

R Code Colinearity

Simulating your dependent (y) variable

How do you include the relationships/patterns in your simulation?

- Categorical style independent variables (e.g., Harvest type)
- Linear relationships (e.g., % inoculation or amount of pollen)
- Non-linear relationships (e.g., logistic, exponential decay)

R Code!