Using CProb in R and Excel to conduct conditional probability analysis

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Goals of this Presentation

Goal 1: Introduce Conditional Probability

Goal 2: Introduce CProb as a tool for conducting conditional probability analysis

Goal 3: Install and Use CProb in Excel

Goal 4: Use CProb in R

What is Conditional Probability?

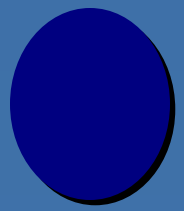
Conditional Probability is:

- Probability of one event occurring given another event has also occurred.

Environmental Context:

- Probability of an impaired environmental condition (i.e. response) given that another variable (i.e. stressor) is greater than, less than, or equal to a certain value

What is Conditional Probability?

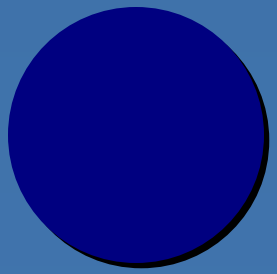


IBI = 5

TP = 0.02

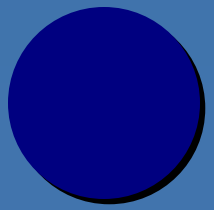
IBI = 3

TP = 0.04



IBI = 1

TP =0. 8



IBI = 1

TP = 1.5

IBI = 2

TP =0.04

Impairment = IBI < 3

Probability of Impairment = 3/5 = 0.6

Conditional Probability of Impairment

TP(X)	Impaired(Y)	Cond. Prob.
0.02	0	3/5 = 0.6
0.04	1	3/4 = 0.75
0.04	0	2/3 = 0.67
0.8	1	2/2 = 1
1.5	1	1/1 = 1

CProb 1.0

Why was CProb developed?

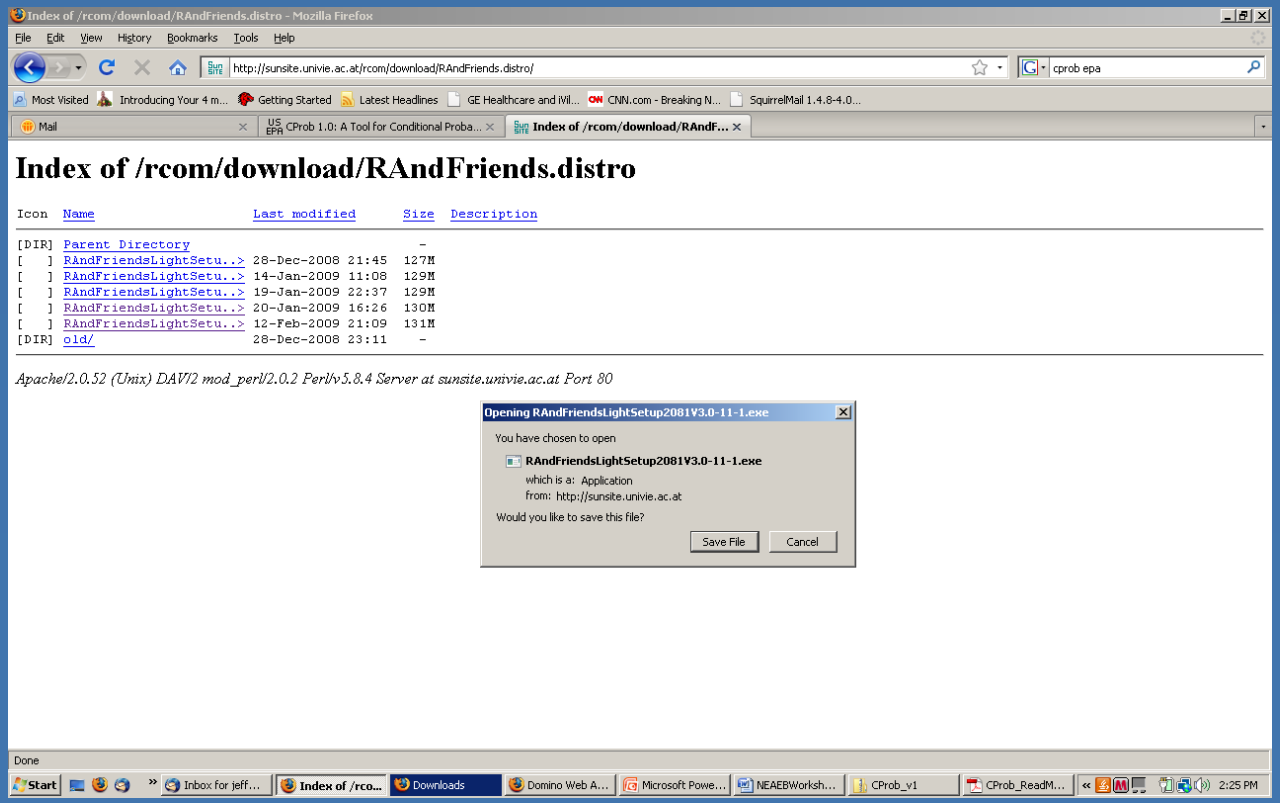
- Ease Calculations
- Make calculations reproducible with script
- Provide familiar user interface

What does it do?

- Conditional Probability
- Bootstraps Confidence Intervals
- Cumulative Distribution Functions
- Plots - Scatter Plots, CDFs, and Conditional Probability

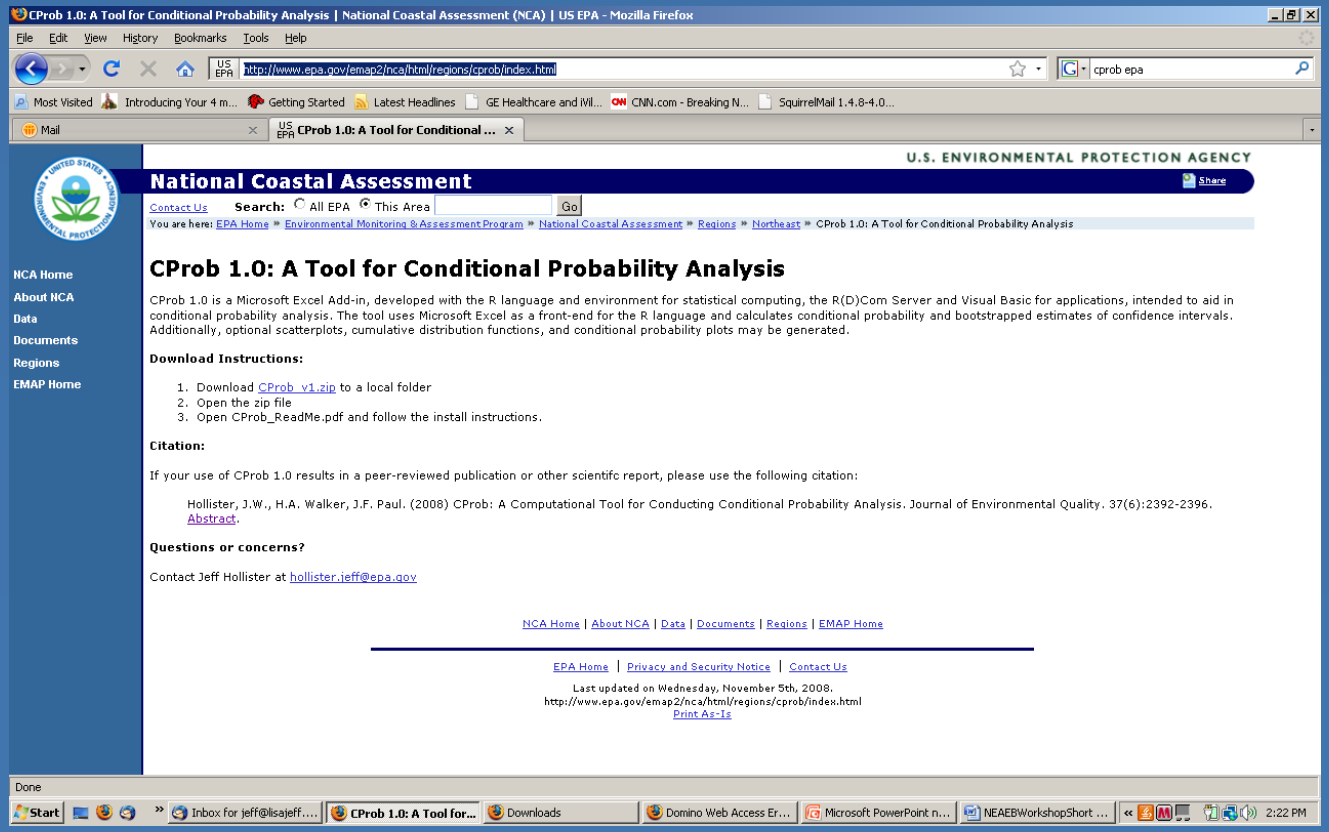
Using CProb 1.0 in Excel: Download

- Download R and R(D)Com Server:
  - Use most recent R and Friends: http://sunsite.univie.ac.at/rcom/download/RAndFriends.distro/



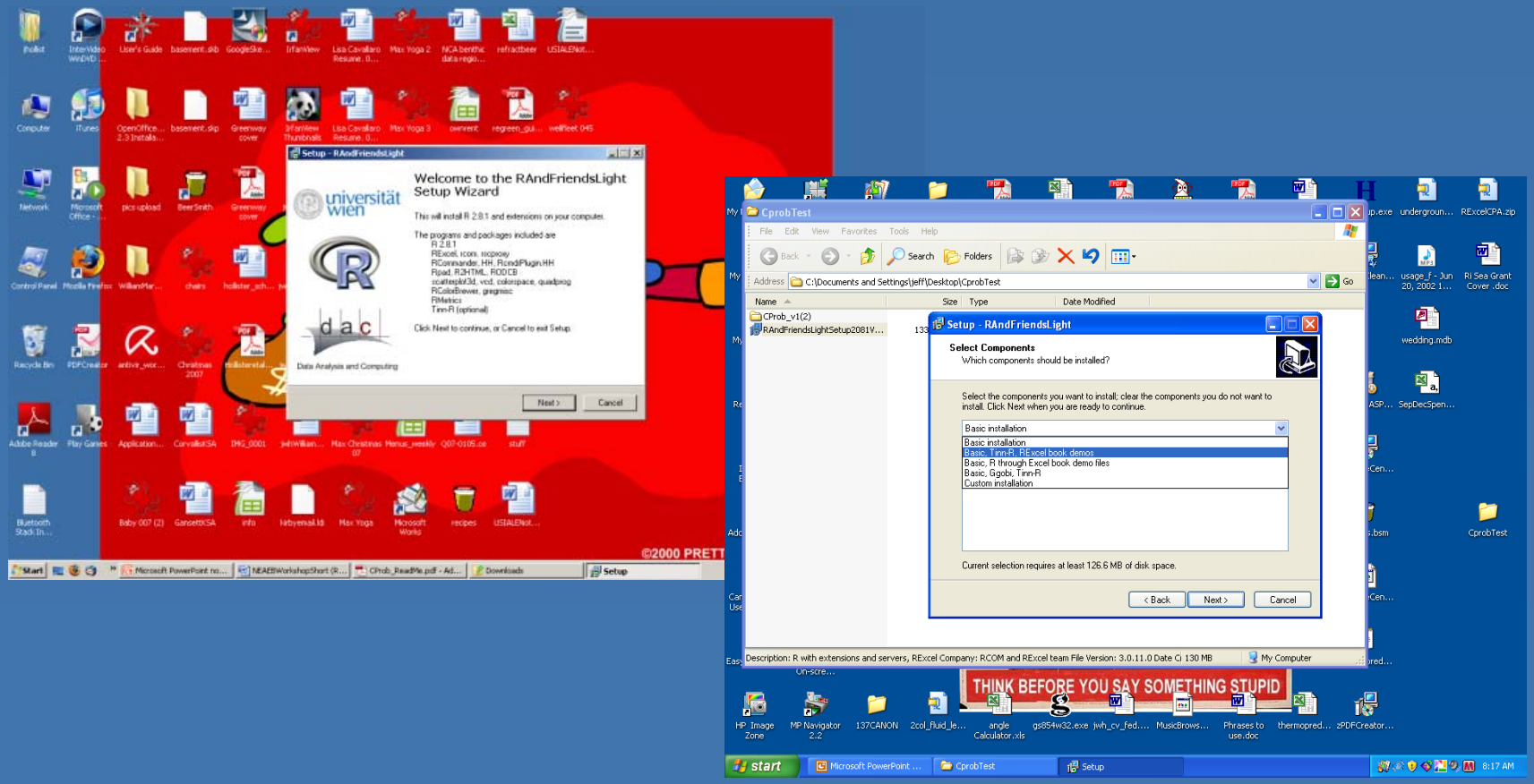
Using CProb 1.0 in Excel: Download

- Download CProb 1.0
  - http://www.epa.gov/emap2/nca/html/regions/cprob/index.html



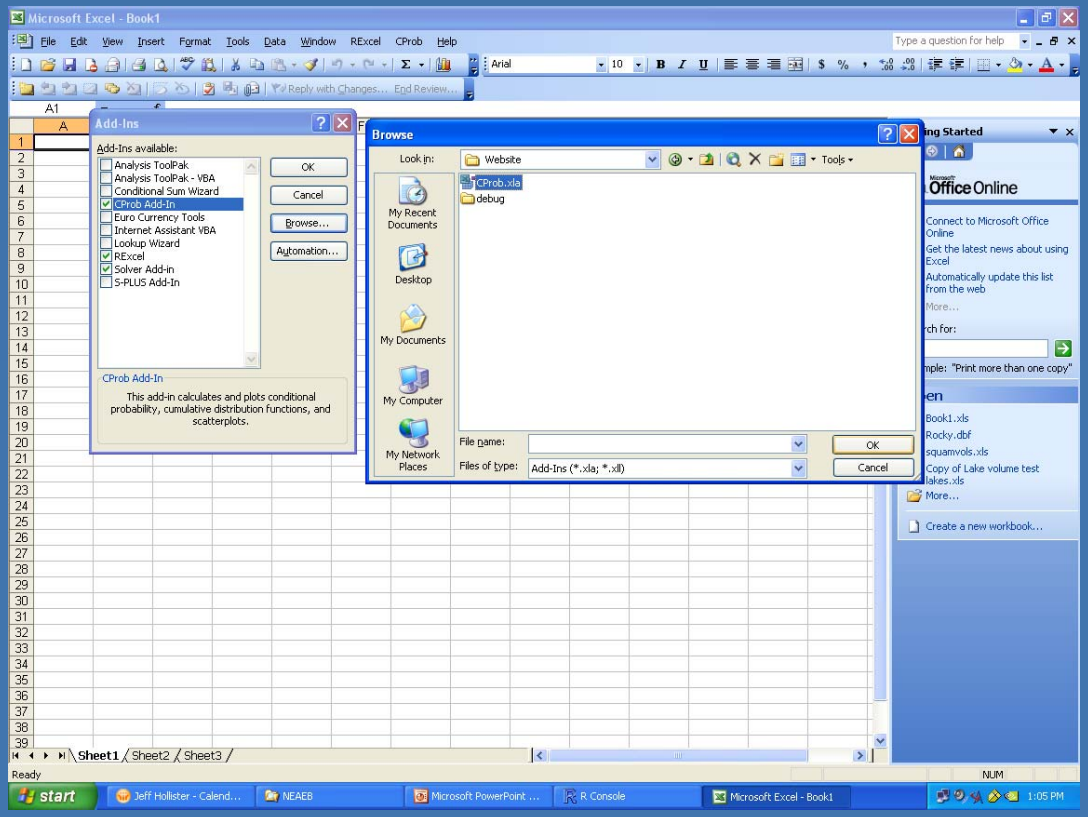
Using CProb 1.0 in Excel: Installation

Install R and Friends:

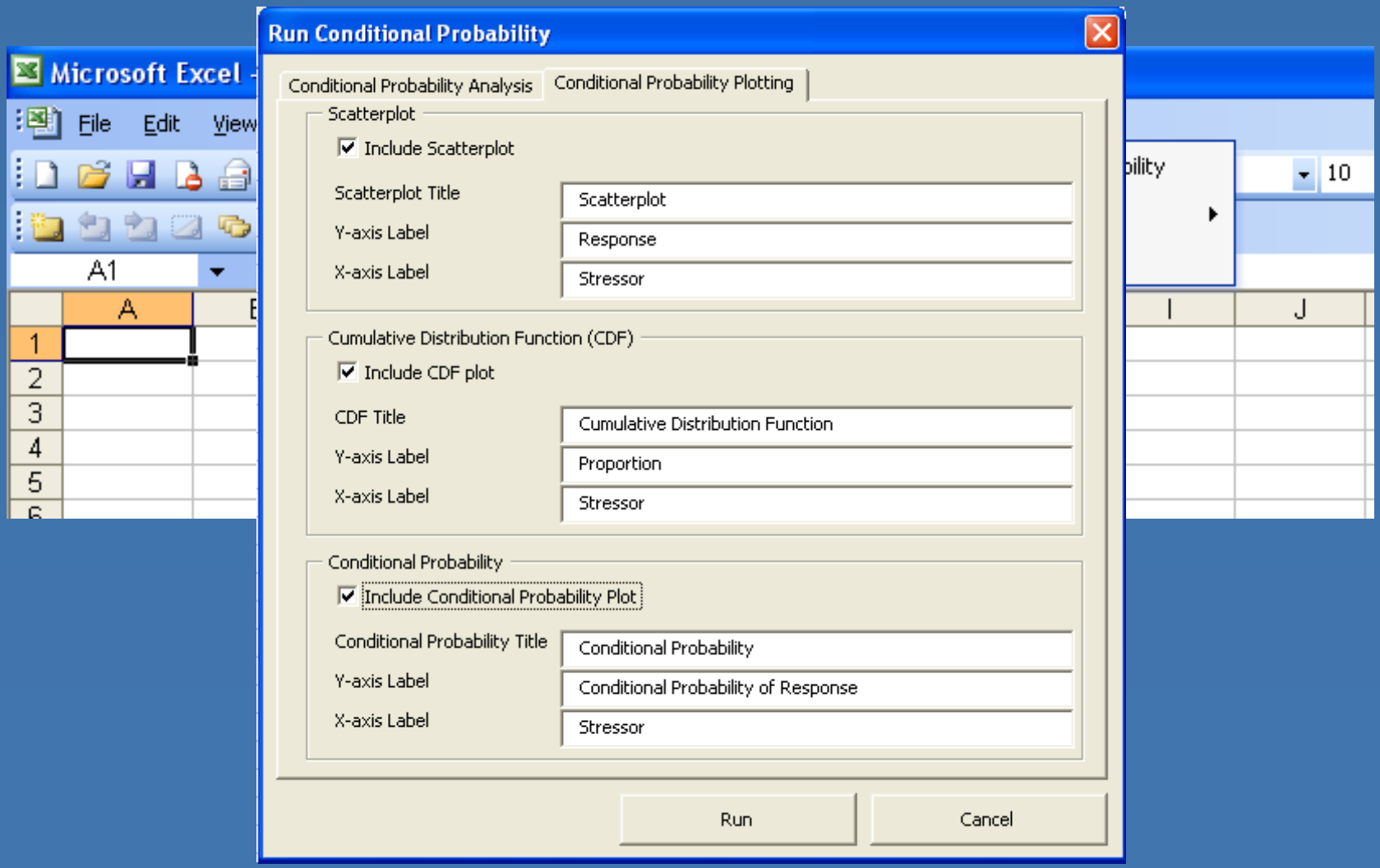


Using CProb 1.0 in Excel: Installation

Add CProb Add-in (Currently does NOT work with Office 2007):



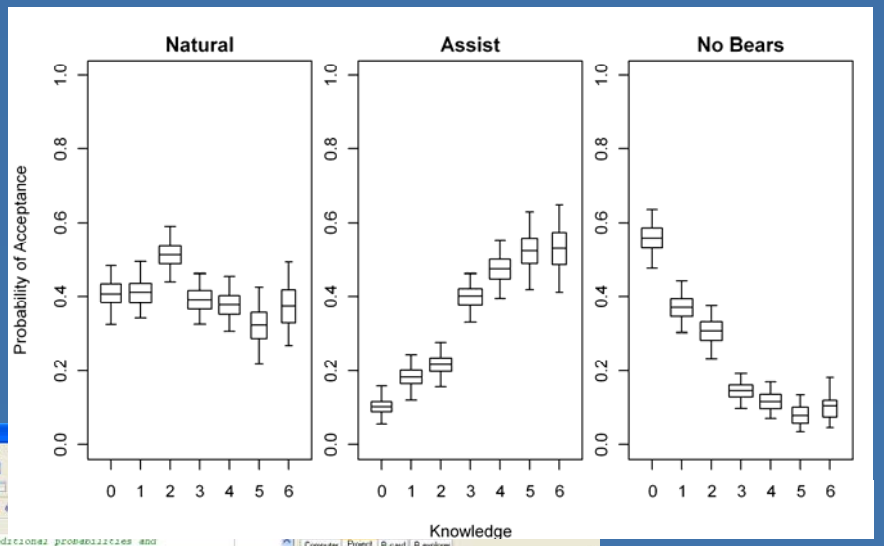
Using CProb 1.0 in Excel: User Interface

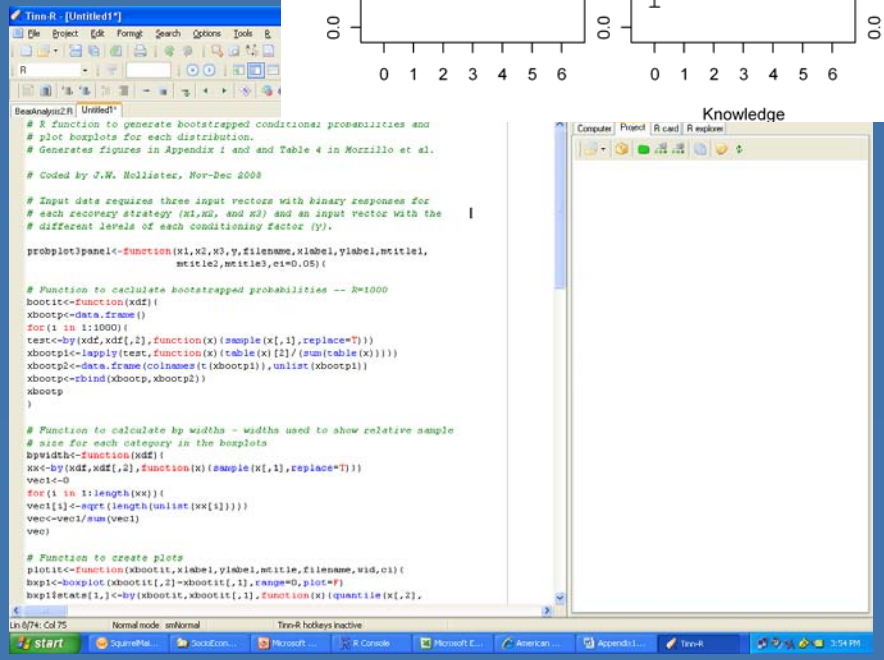


Using CProb 1.0 in Excel: EMAP Demo

Using CProb 1.0 in R: Why?

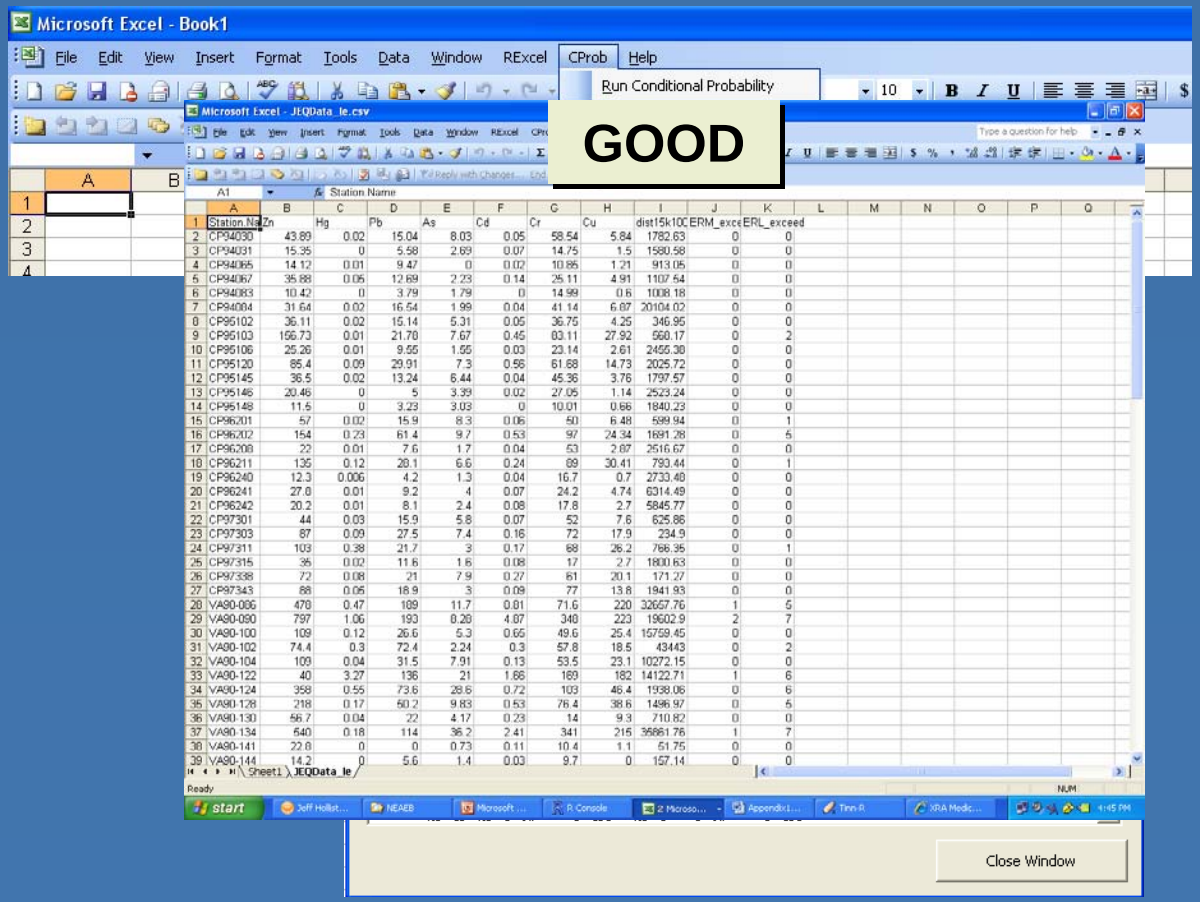
- Batch Processing
- Repeatability
- Access to R





Using CProb 1.0 in R: Script and Data

- **Script is accessible from Excel**
- **Read Script into R**
  - Two Ways
    - source("cprob.R")
    - Copy and Paste
- **Read Data into R**
  - K.I.S.S.



Using CProb 1.0 in R: National Lakes Assessment Demo (I Hope!!)