Good Seismology Programming Practices

- Use a Package Manager
  - homebrew
  - macports
  - apt
- Use a good editor
  - Atom
  - Sublime Text
  - BBEdit
  - vim
- Understand what you are programming.
- Outline
  - Create a task list
  - Create a flowchart
- Read code written by others
- When do they use functions?
- How do they structure their code?
- Comment your codes
  - Doxygen
  - ROBOdoc
- Write test codes as you develop
- Use Make or an IDE (Integrated Development Environment)
- Use git
- Know your compiler options
  - -g (debug)
  - -pg (profile)
  - -O (optimize)
- Use a debugger
  - gdb
  - idb
  - spyder (pydb)
- Profile your code
  - gprof
  - Instruments (OS X)
- Learn a scripting language
  - bash
  - PERL
  - Python
  - javascript
- Learn a compiled language
  - Matlab
  - Mathematica
  - Fortran
  - C
  - C++
- Learn object-oriented programming
- Learn a good graphics library
- Use a code snippet utility
- Keep a programming journal
- Use maintained numerical libraries
  - LAPack
  - FFTW
  - ODEPack
  - GNU
  - Optimization
  - Numerical Recipes

Remember, you are a geoscientist, not a programmer.

Define your goals
- Quick & Specific
- General & Reusable

Charles J. Ammon, Penn State, 2015