The Novice Researcher

An ESC Story

Stu, The Novice Researcher

- A.B. in Earth Sciences from Dartmouth College
- Now a Master's student in Atmospheric and Oceanic Sciences at the University of Michigan

One day in September…

- Professor: “Find out why MODIS Aqua and Terra aerosols are anticorrelated over Tibet. I’m off on sabbatical.”
- Stu: “What? They are? Hey, wait, how do I reach you?”
- Exit Master’s thesis advisor, stage right.

Stu's Travels

- Googles "MODIS Terra Aqua AOD Tibet anticorrelation"
- Result comes back from within Earth Science Collaboratory.
- Click...

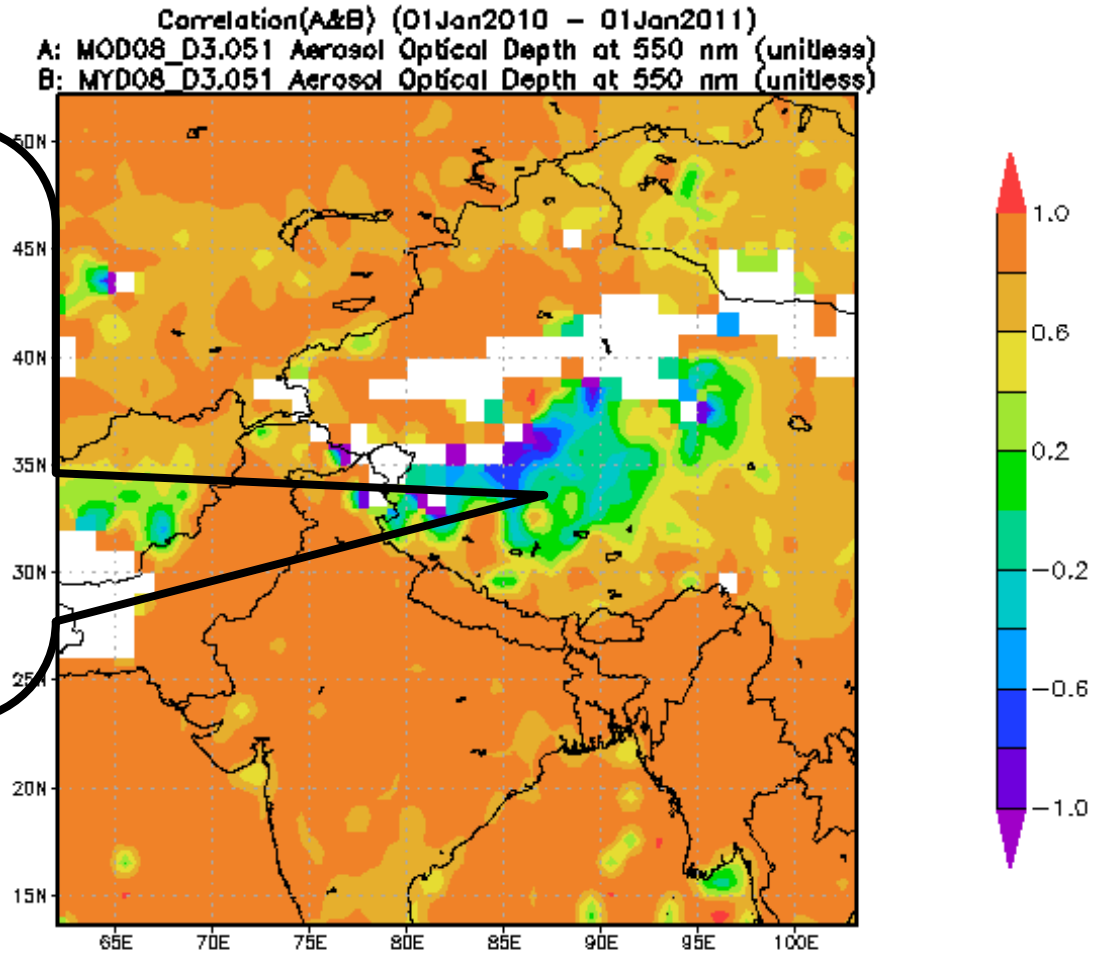
“Click”

“Odd, MODIS Aqua and Terra AOD are anticorrelated over Tibet for 2010” -- *jpearson39, 29 May 2012*

Read Journal Articles

Peruse Research Notebook

Rerun Analysis



Stu's On His Way

- Checks *jpearson39*'s research notebook for related results
- Repeats *jpearson39's* Correlation Map workflow with different years, filtering options, etc.
- Decides he really needs to look at the higher resolution Level 2 data, not Level 3. Uh-oh...

Level 2 data is hard...

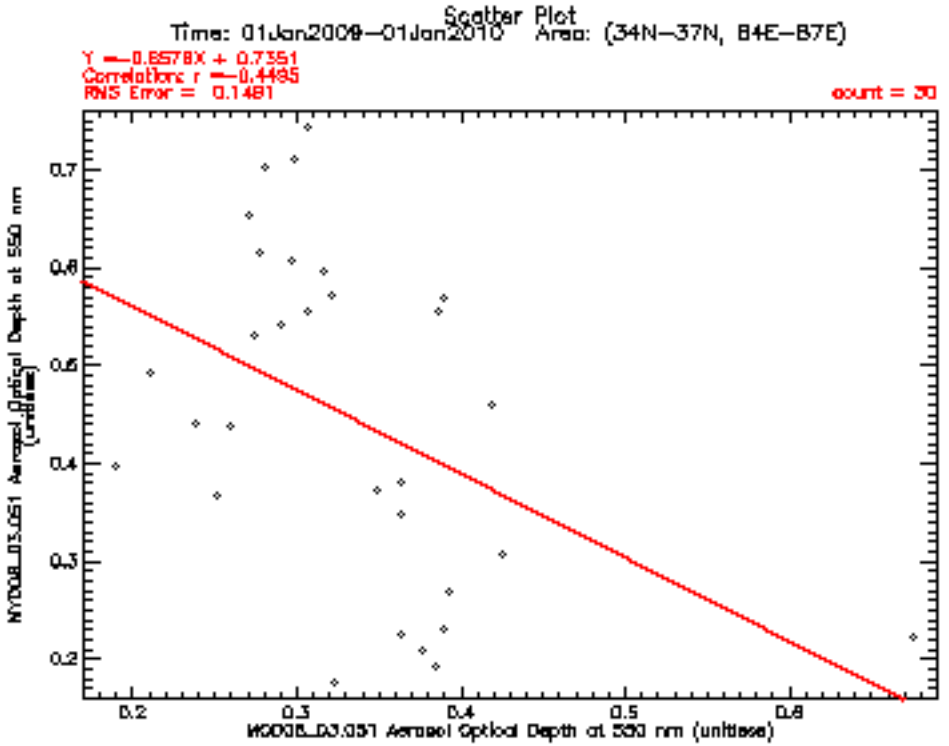
- Not gridded, hard to compare Aqua v. Terra...
- How to get started???
- Stu searches for articles about MODIS L2 aerosols, locates a prolific author on the topic, *cjones97*
  - Starting from the most relevant article, Stu looks at the Research Notebook, then drills down on a workflow to see how the data are handled
  - Whoa, looks like Level 2 data needs quality filtering(!), and bias correction(!!)
- Stu clones the workflow to get started, then modifies to meet his needs, etc.
- Now he still needs to match up Aqua and Terra...

Finding coincident L2 MODIS Aqua and Terra aerosols

- Matching up data from 2 satellites is *hard and tedious*
- Stu searches ESC library to find a coincidence tool to match Aqua and Terra aerosol values within given time and space tolerance
  - Output is HDF
- Finally, Stu finds a service to make an X-Y scatterplot
  - Input is netCDF
  - ESC locates an appropriate HDF->netCDF converter
  - Stu and ESC construct a workflow to matchup, filter, correct and plot MODIS Aqua and Terra aerosol values

Stu gets his first result!

- ESC's provenance shows it to trace back to *cjones97*'s workflow
- Stu also links back to *jpearson39*'s original results with L3 correlation maps (easy as it is still in his ESC history)



- Elapsed Time with ESC: < 2 days (much of it looking at prior results)
- Elapsed Time before ESC: > 30 days

A couple months later…

- Now Stu's results are the ones other people are looking at to get started, and his Level 2 comparison workflow (since refined) is a starting point for other researchers in the same field