

Environment and organisms - Task #375

Assemble monthly mean MODIS LST values for the complete record (2000-2012) for Oregon

03/07/2012 08:35 AM - Adam Wilson

Status:	New	Start date:	03/07/2012
Priority:	Normal	Due date:	
Assignee:		% Done:	0%
Category:	Climate	Estimated time:	0.00 hour
Target version:			
Activity type:	Coding/analysis		
Description			
This is for use in the development of the climate-aided interpolations. Steps:			
<ol style="list-style-type: none">1. Download complete record for MODIS tile that includes Oregon2. Mask out clouds and other low quality values using the QC field3. Extract the day and night temperatures (to develop min and max temperatures)4. Calculate average, SD, and number of included values (so we know how many values were missing) for each pixel, for each month.			
Related issues:			
Related to Task #416: Scope out workflow for calculating monthly LST climatol...		In Progress	05/15/2012

History

#1 - 03/11/2012 11:52 AM - Benoit Parmentier

Started downloading and scripting for the average calculation. There are missing dates and I will be downloading additional images to extent the time series.

#2 - 04/24/2012 02:00 PM - Adam Wilson

I just noticed that the IRI data library [http://iridl.ideo.columbia.edu/SOURCES/USGS/LandDAAC/MODIS/1km/8day/version_005/] has the 1km 8-day MODIS LST for much (all?) of the world. That library is really useful because they will process data for you and deliver the product (such as long-term monthly means [http://iridl.ideo.columbia.edu/SOURCES/USGS/LandDAAC/MODIS/1km/8day/version_005/Terra/NSA/Day/LST/?help+filters]). The 8-day resolution would necessitate a shift in thinking about monthly means, but this would allow rapid processing for all the regions they have.

Even if this isn't useful, perhaps we should think about processing the 8-day LST products rather than daily... This would lead to smaller data requirements (1/8th)...

#3 - 05/01/2012 01:20 PM - Adam Wilson

The NASA Ames team is willing to generate the monthly LST climatologies, but we'll need to be specific about what we want. They suggested calculating these from the 8-day product [https://lpdaac.usgs.gov/products/modis_products_table/land_surface_temperature_emissivity/8_day_l3_global_1km/mod11a2] (rather than the 1-day values). Any objections to this?

I suggested that we should calculate:

1. Mean LST
2. SD of LST
3. number of observations incorporated into the mean
4. number of clear (not cloudy) days
5. number of clear (not cloudy) nights

We'll also need to tell them exactly how to handle the QA flags. Should we only keep "high quality" data? In some regions we may need to settle for lower quality data in order to have any. Should we get two means, one with only high quality and one with all available? We're only talking about monthly climatologies, so the data requirements are not nearly as high as for daily data.

#4 - 05/17/2012 03:44 PM - Jim Regetz

See task [#416](#) for progress on developing and evaluating a procedure for doing this ourselves.

But I will add a comment here about use of the 8-day product. Associated with work on the other task, I wrote up a script that faithfully reproduces a MODIS 11A2 (8-day) daytime LST grid by doing a simple arithmetic average over non-null values from the eight associated 11A1 (daily) grids. I confirmed this on several different tiles/dates. So it appears that the daily QC flags were ignored in the aggregation from 11A1 to 11A2.

I'd put forth the following two reasons for preferring daily inputs if feasible:

1. We can actually use QC info to filter values at the daily level
2. We can compute monthly mean over a calculated N (where N is up to 31) daily high-quality observations rather than ~4 8-day values that were each previously averaged over some unreported number of non-null daily observations.

Test comparison script committed here: [source:climate/extra/test-lst-8day-avg.py@01b3830e](https://source.climate/extra/test-lst-8day-avg.py@01b3830e)