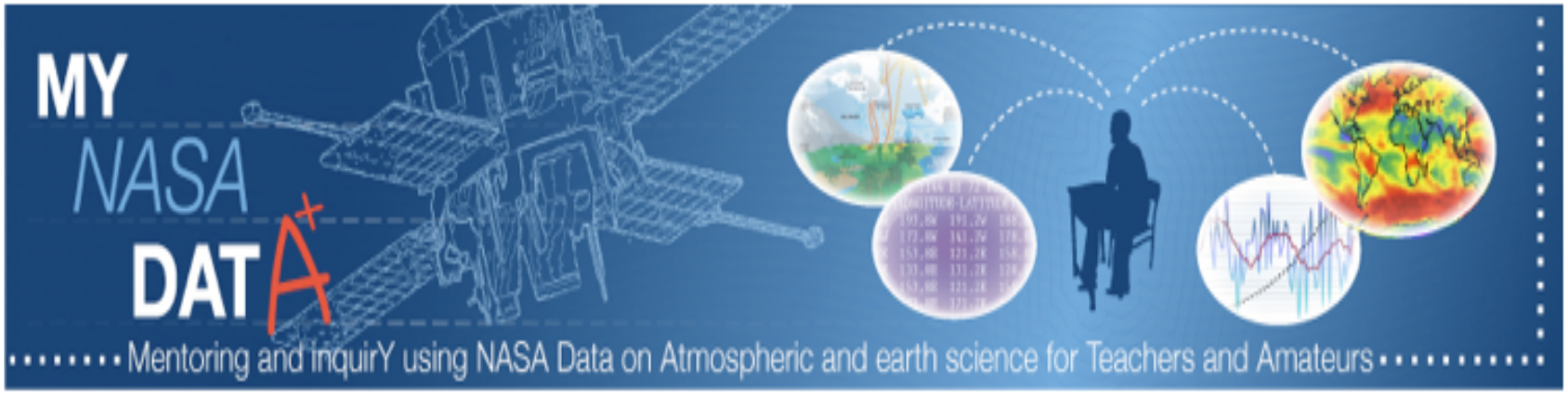
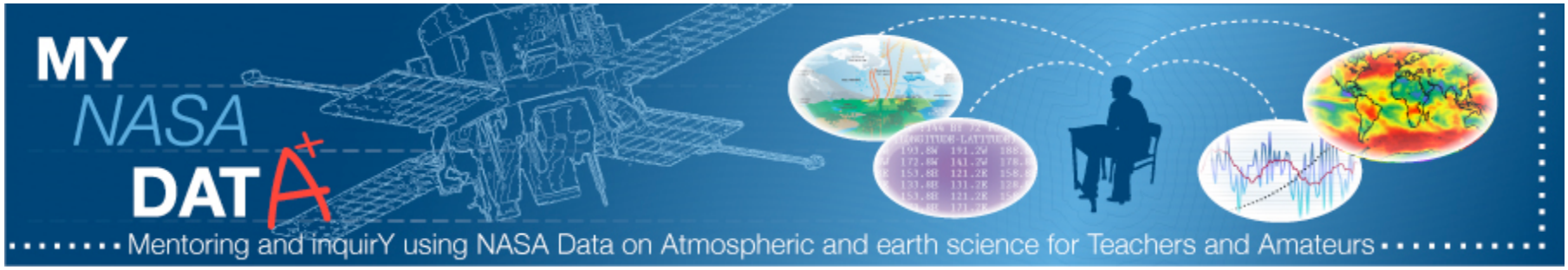
Welcome to …



Preston Lewis

What is MY NASA DATA?



- Involve students in real science.
- Enable K-12 teachers and students, as well as citizen scientists, to explore the large volumes of data that NASA collects about the Earth from space.
- *Students use scientific inquiry and math skills as they access and display microsets of the Earth System.*

http://mynasadata.larc.nasa.gov

MY NASA DATA

Mentoring and inquirY using NASA Data on Atmospheric and earth science for Teachers and Amateurs

What is MND

UNDER CONSTRUCTION
Visit the old site: MY NASA DATA - Old Site MY NASA DATA (MND) is a tool that allows anyone to make use of satellite data that was previously unavailable. Through the use of MND's Live Access Server (LAS) a multitude of charts, plots and graphs can be generated using a wide variety of constraints. This site provides a large number of lesson plans with a wide variety of topics, all with the students in mind. Not only can you use our lesson plans, you can use the LAS to improve the ones that you are currently implementing in your classroom.

MY NASA DATA

- Home
- Live Access Server
- Lesson Plans
- Data Sources

Popular Searches

Misson

Google™ Custom Search

- Photos
- Events
- Connect
- Apps

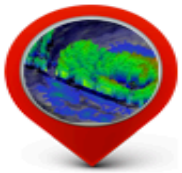
News from MY NASA DATA, the Science Directorate, and S'COOL

Earth Science Week 2012: Meet Dr. Dalia Kirschbaum

NASA Educators Online Network is offering Free Webinar Series throughout the Month of October (2012).

Elementary

Middle School


High School

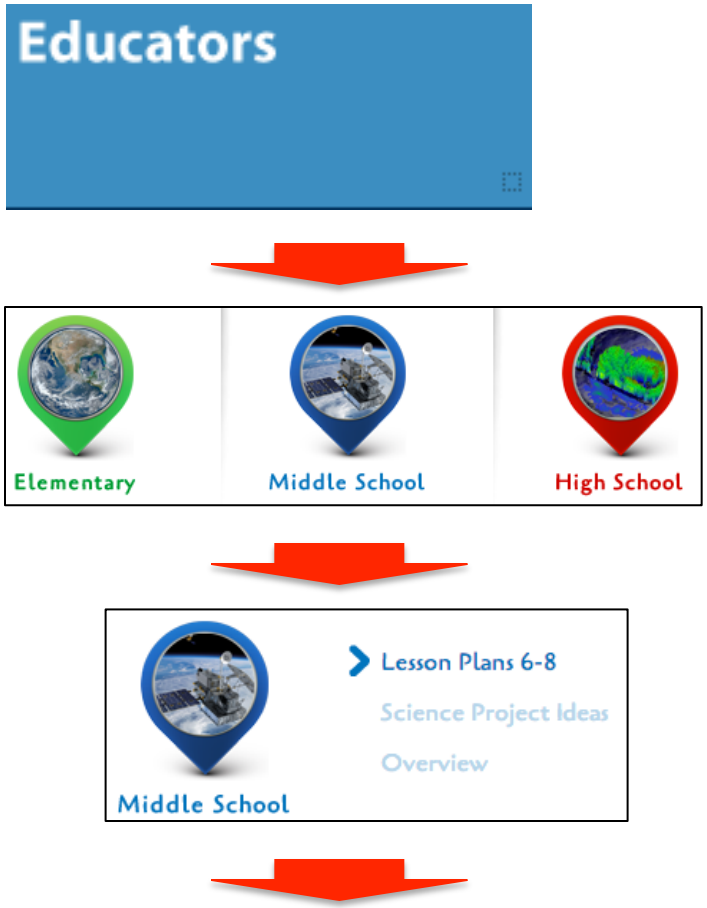
Educators

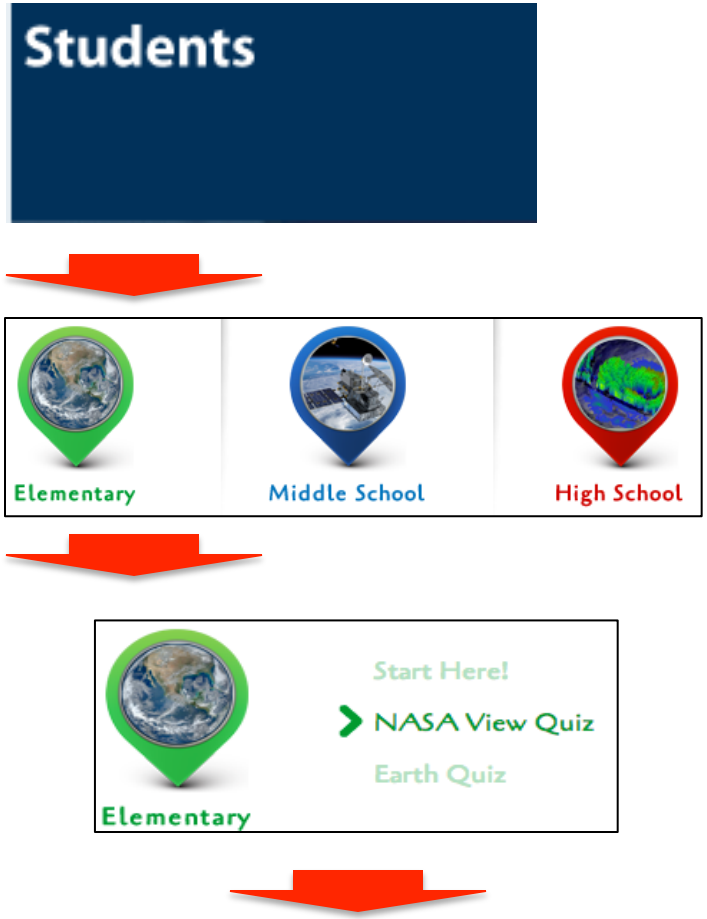
Teachers learning to use the sun photometer in Puerto Rico

MY NASA DATA is an online avenue whereby educators can bring NASA data into their classroom and provide students with real-world science experiences. One of the main goals of the MY NASA DATA project is to remove the barriers (such as file size, format, and complicated computer tools) that prevent the use of authentic NASA Earth Science data in the classroom. The principal activity of the project is to create "microsets" from large scientific data sets, and to wrap these with tools, lesson plans, and supporting documentation so that a teacher can use the information in the classroom. Microsets may be a single parameter for the whole globe, or a time series for a single location, and they may be static or made on the fly as students explore a topic. A few examples of possible parameters to investigate include the atmosphere, vegetation, aerosols, snow and ice cover, and the oceans.

In addition to the microsets, the MY NASA DATA website offers a growing collection of over 120 standard based lesson plans to help teachers get started with data exploration. Some of the lessons were developed by the MY NASA DATA team, while others have been contributed by educators who have used the MY NASA DATA website. All lessons identify relevant national or

New site Architecture: Linear Path to follow





Only contains teacher items:
- Standards
- Background information
- Tools
- Many Other teacher only items

Only contains Student items:
- Science Project ideas/starters
- Activities (Inquiry and PBL)
- Glossaries and Quizzes
- Geared towards the science student

MY NASA DATA Lesson Plans

The collection of MY NASA DATA lesson plans is intended to provide the educator with a variety of specific examples, incorporating a more "teacher-directed" strategy, of how authentic satellite data can be integrated into the curriculum.

The majority of MY NASA DATA lessons were developed by classroom teachers to use real NASA data in their curriculum. Other lessons were developed by the MY NASA DATA team as examples of lessons using microsets from the Data Access page.

Featured on the Science Project Ideas section of our website are examples of a more "student-directed" strategy, with an inquiry-based research approach for using authentic data.

If you are a visitor to the MY NASA DATA site, these illustrations of how other teachers have used authentic satellite data as a resource may serve as an inspiration. We invite you to use them as is or to create your own lesson from the rich data resource that the LAS provides. If you create your own lesson, please consider sharing it with other educators through this ever-growing list.

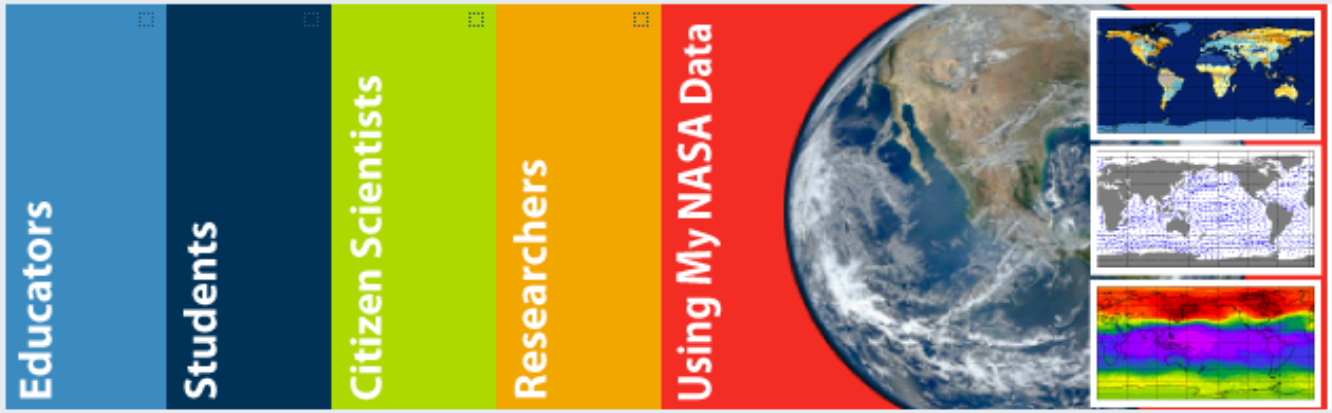
CLICK the buttons on the left of the page to see the various lessons that are available by grade level. Please note that some lessons can be adapted to a lower or higher grade-band.

- Search by Live Access Server Parameter
- Search by Environmental Science Topic
- Search by Data Category
- Search by Virginia SOL
- Search by National Science Education Standards

MY NASA DATA

- Home
- Live Access Server
- Lesson Plans
- Data Sources

Google™ Custom Search



Lesson Search by LAS Parameter

Please make a selection from the drop down menu below to access our lesson plans by the parameter names used in the Live Access Server (LAS). If you do not know which parameter you would like to use, you can browse the Live Access Server Sample Images to find a description of some of the parameters available in the LAS.

SELECT CATEGORY

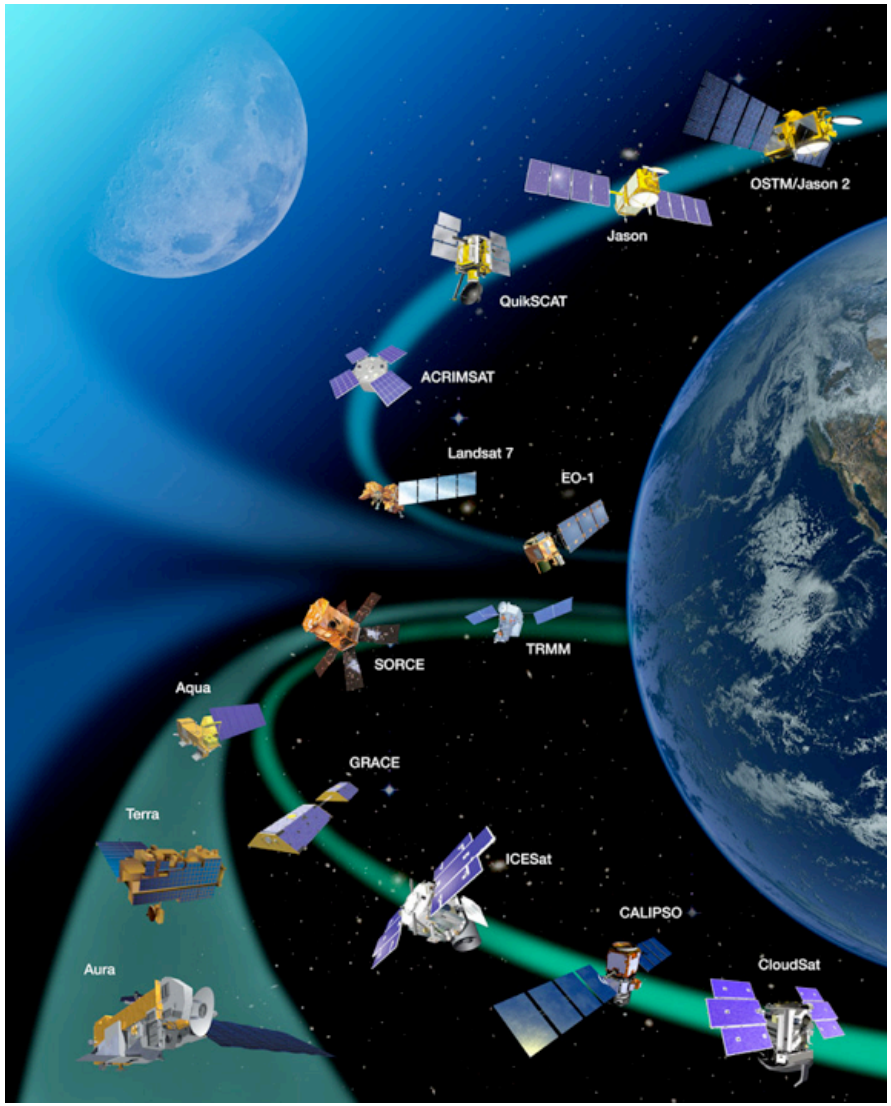
- ✓ Choose one
- Aerosols
- Air Quality
- Atmospheric Pressure
- Atmospheric Radiation
- Atmospheric Temperature
- Atmospheric Water Vapor
- Clouds
- Precipitation
- Biosphere
- Cryosphere
- Surface Conditions
- Surface Cover
- Surface Radiation
- Oceans

Look up parameters

Search for Lesson Plans

What types of data do we have?

- Atmosphere
- Biosphere
- Cryosphere
- Land Surfaces
- Oceans



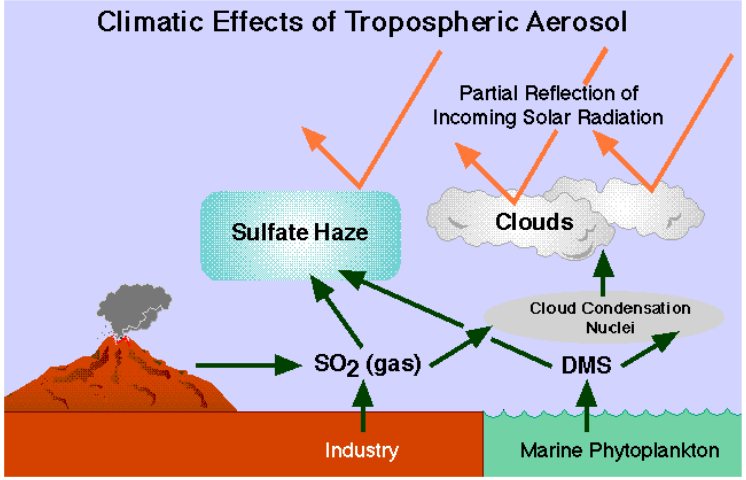
The satellites of NASA's Earth Observing System monitor daily events and long term changes. (NASA image by Jenny Mottar.)

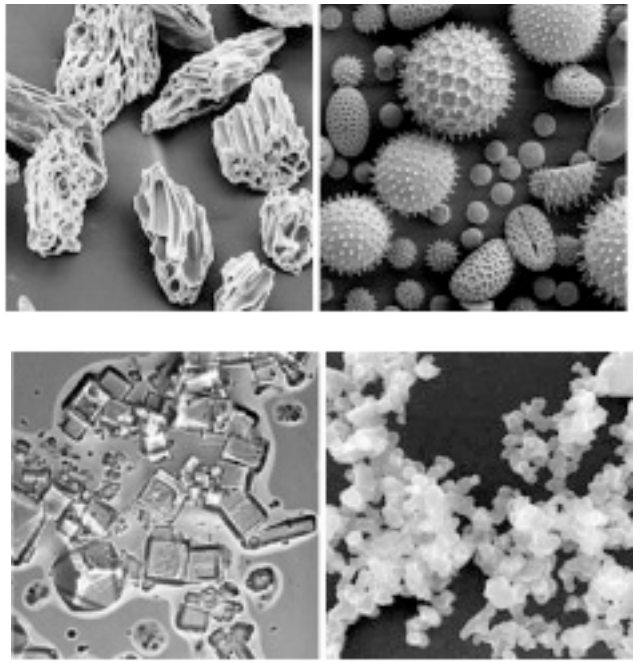
Plot examples that can be made using the Live Access Server

Preston Lewis, SSAI/NASA Langley Research Center

Lets look some examples of Aerosols in the atmosphere:

As featured in the A-Train Symposium





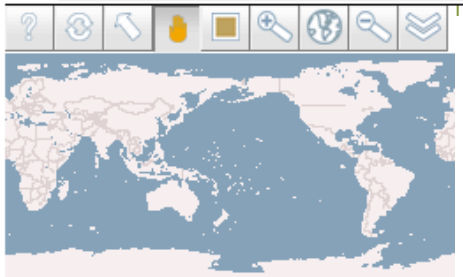
MY NASA DATA Home Intermediate LAS Basic LAS Climate Change LAS

MY NASA DATA Live Access Server

Choose dataset | Update Plot | Set plot options | Animate | Compare | Google Earth | Show Values | Export to Desktop Application | Save As ... | Link To ... | Print

Atmosphere / Precipitation

Monthly Precipitation (GPCP)



90 N

0 E | 0 E

90 S

MAPS

- Latitude-Longitude

HOVMOLLER PLOTS

- Longitude-Time
- Latitude-Time

LINE PLOTS

- Time Series
- Longitude
- Latitude

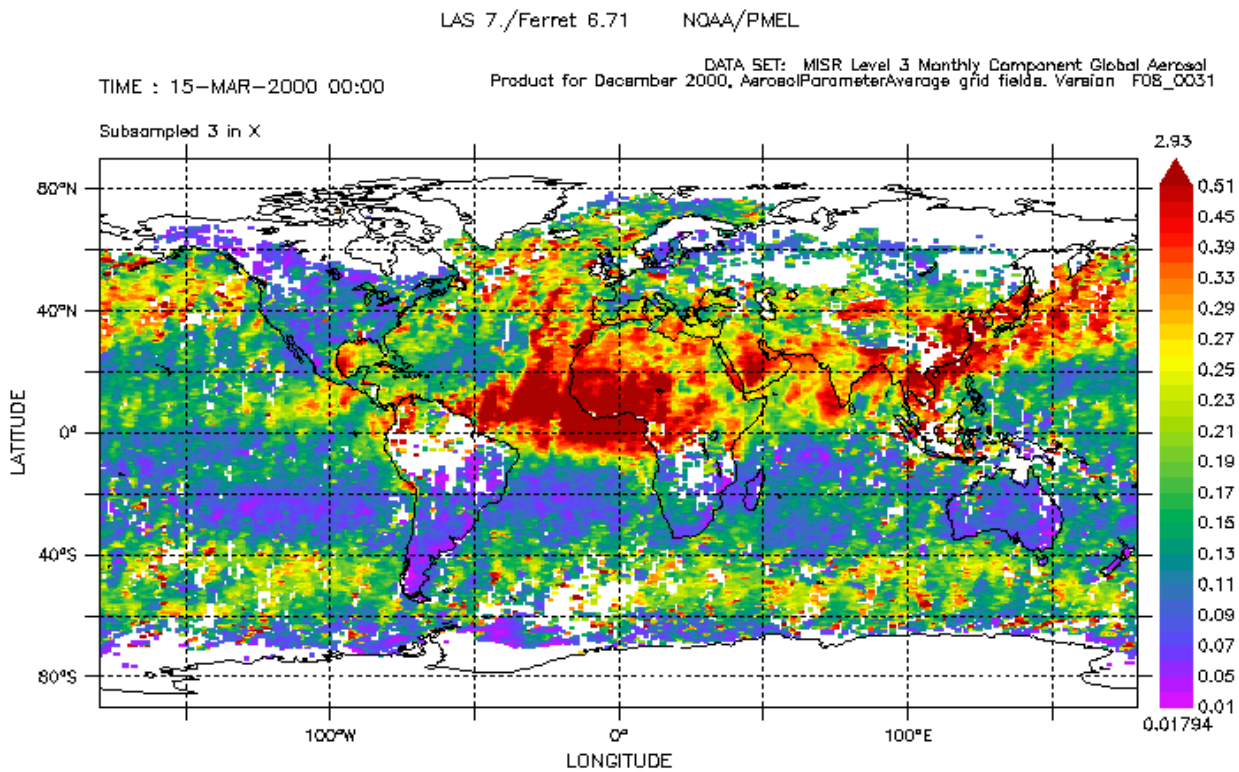
SCATTER PLOTS

- Property-Property

Date:

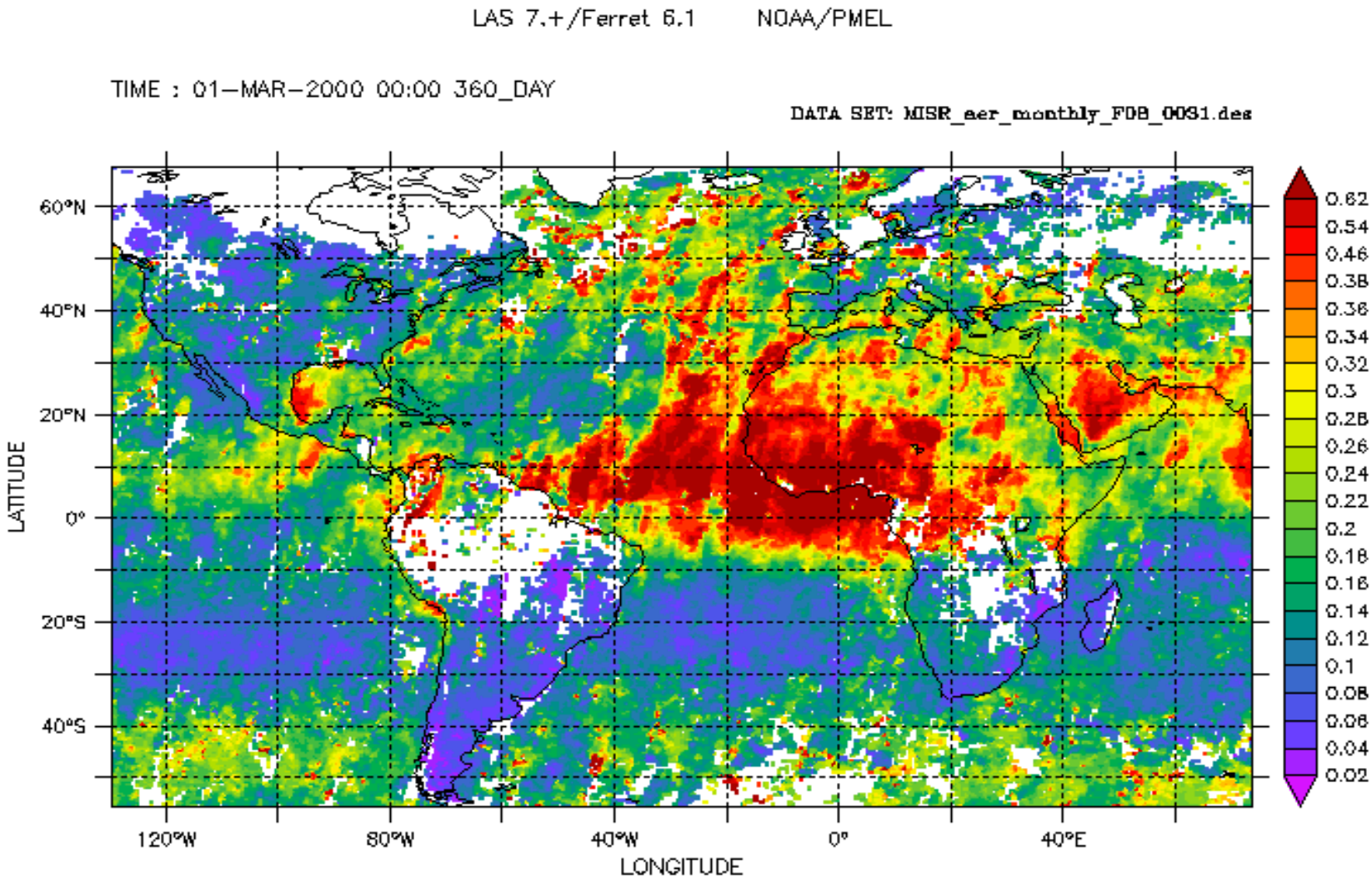
Feb | 1979

Apply analysis



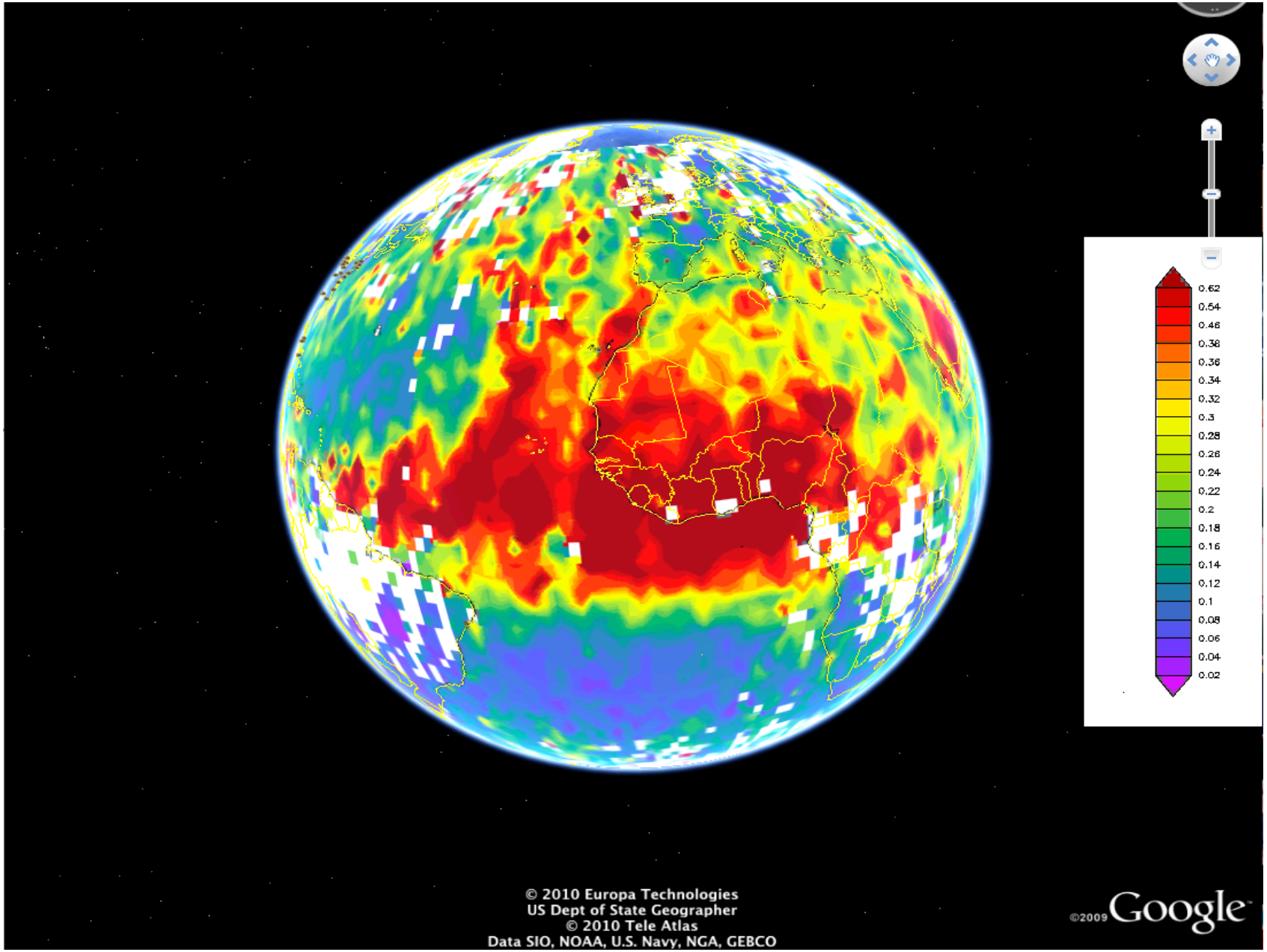
Monthly Aerosol Optical Depth (MISR) (dimensionless)

MND Data Access: Color plot



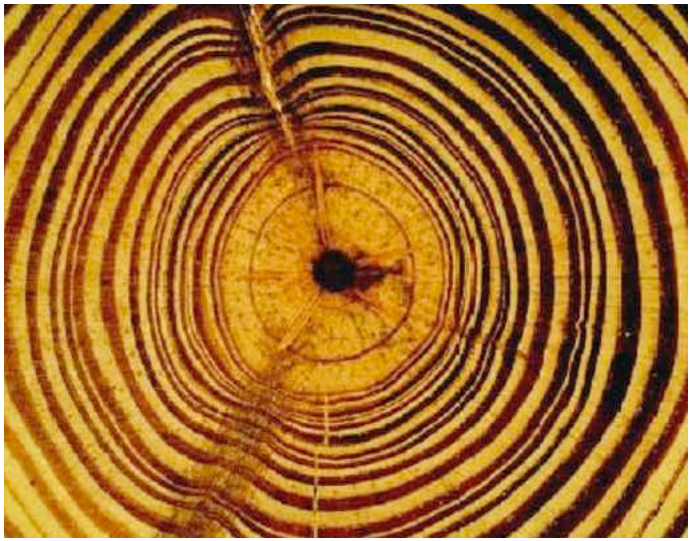
Monthly Aerosol Optical Depth (MISR) (dimensionless)

MND Data Access: Google Earth



Now lets look at Precipitation and its effects on tree rings:

"Analyzing Tree Rings to Determine Climate Change"



Tree Information

Virginia Pine:
Pinaceae Pinus virginiana

Location: Kenbridge VA
Longitude: 81.2 W
Latitude: 36.2N

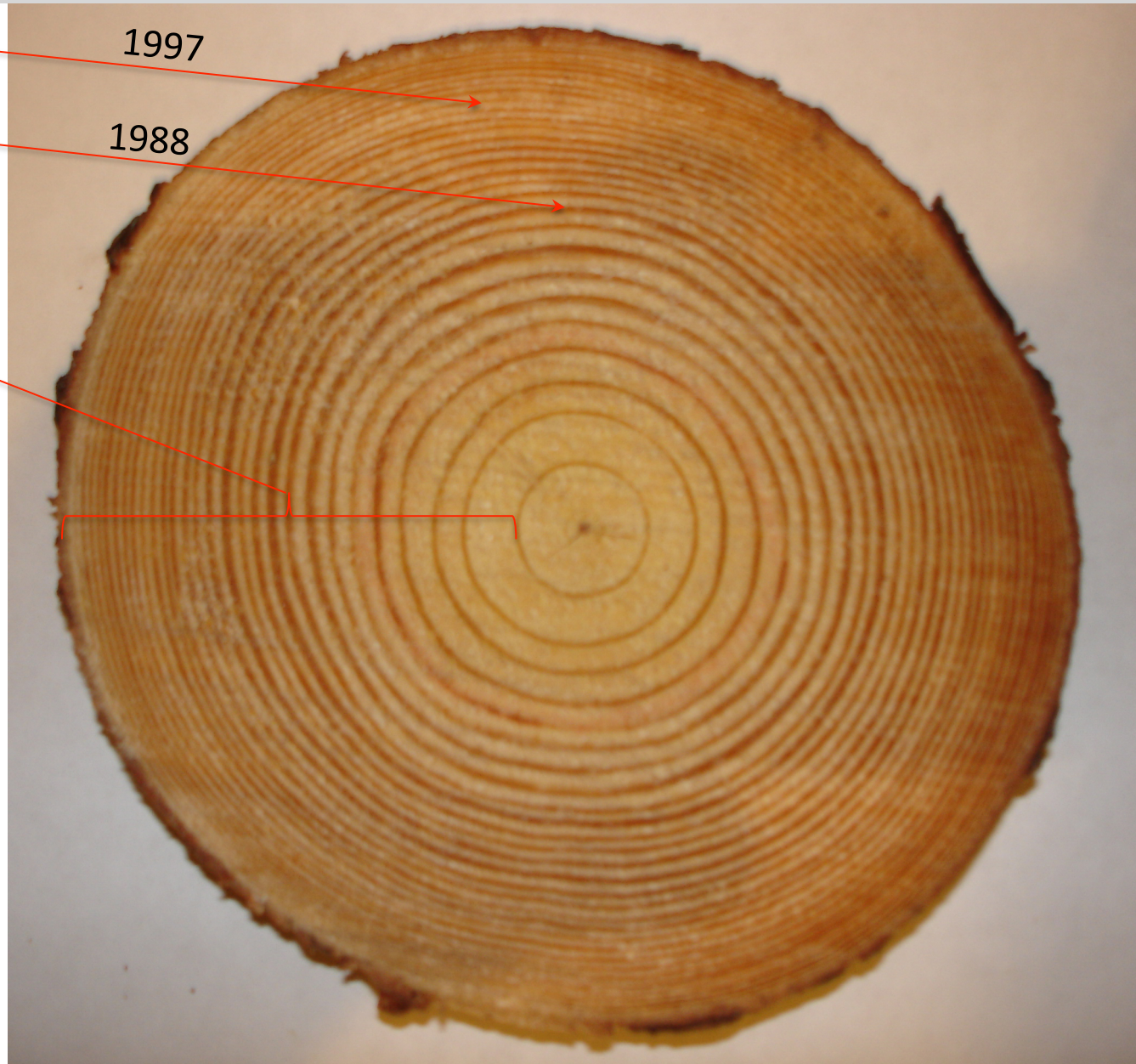
Cut Down: 2009
Age: 29 years

Items of Interest

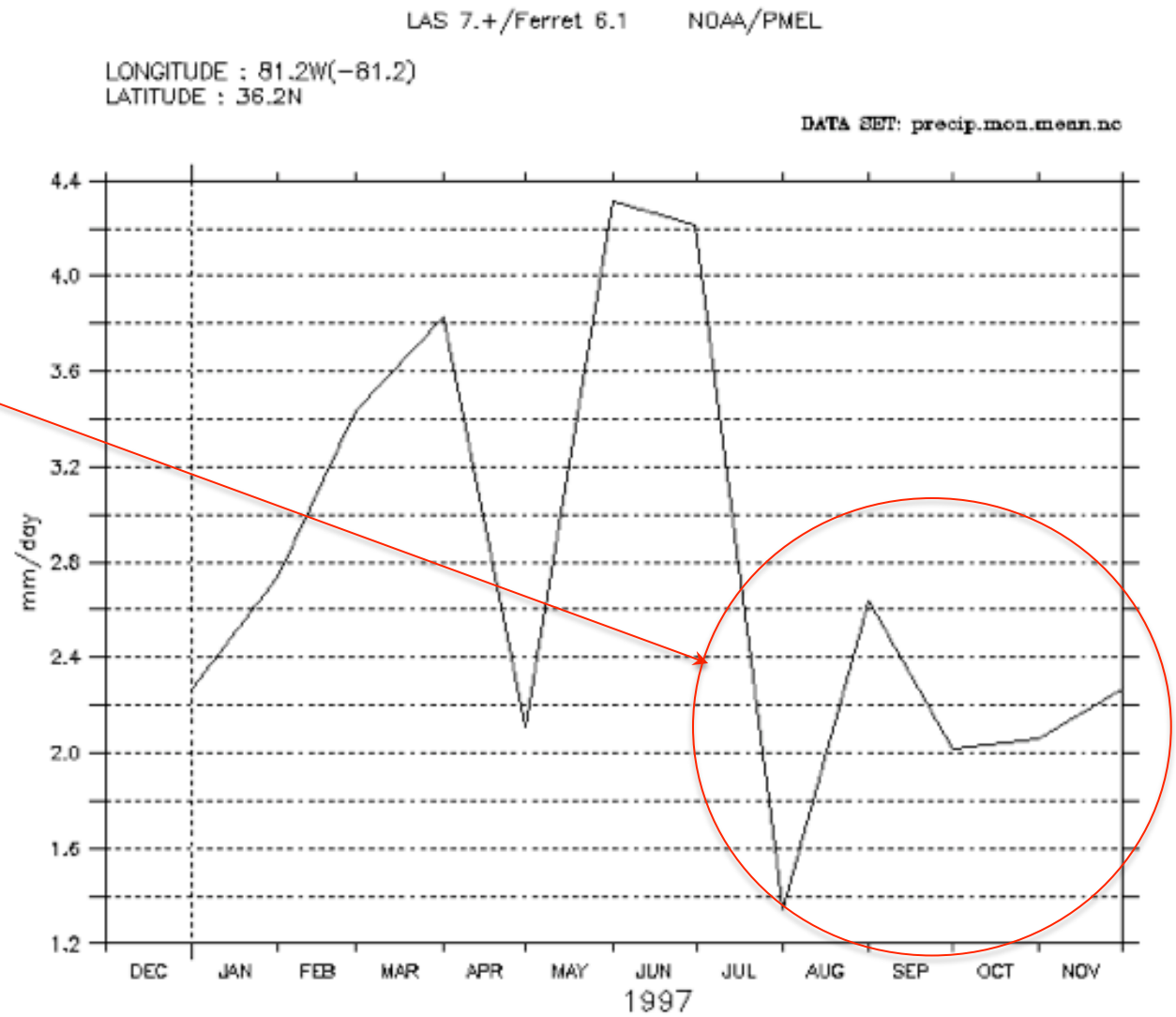
1. Very thin dark ring?

2. Rather thick dark ring?

3. Consistent decrease in ring thickness

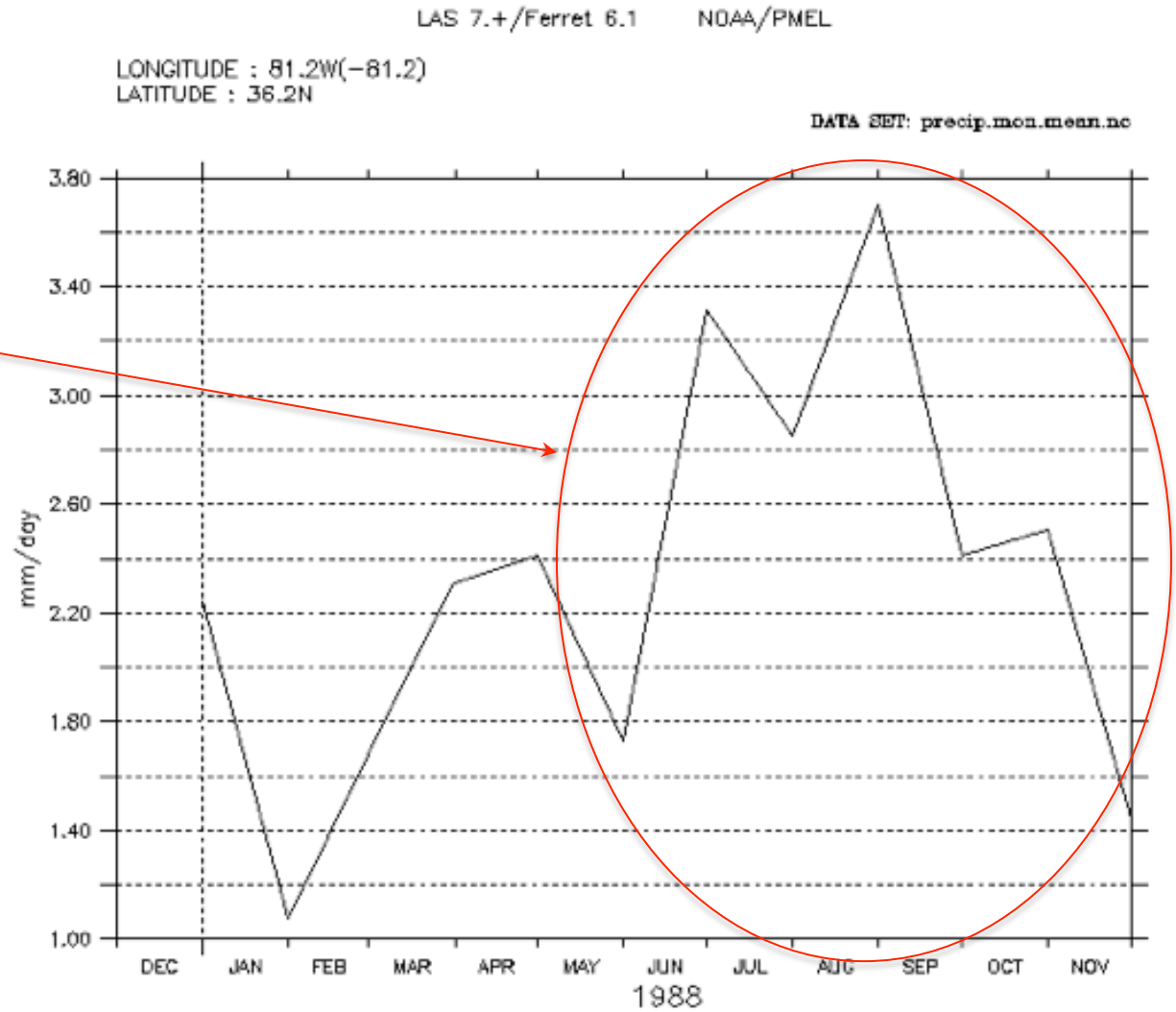


1. Very Thin Dark Ring?



-Lower amounts of rainfall in the summer cause the presence of a very thin summer growth ring.

2. Rather Thick Dark Ring?



-Increased rainfall during the summer months caused the dark growth ring to be larger than surrounding years.

3. Consistent Decrease in Ring Thickness

3. Consistent decrease in ring thickness

How can the Live Access Server be used to show long term trends?

Long Term Trends in the LAS

-In the LAS, a user option for output format is an ASCII text file.

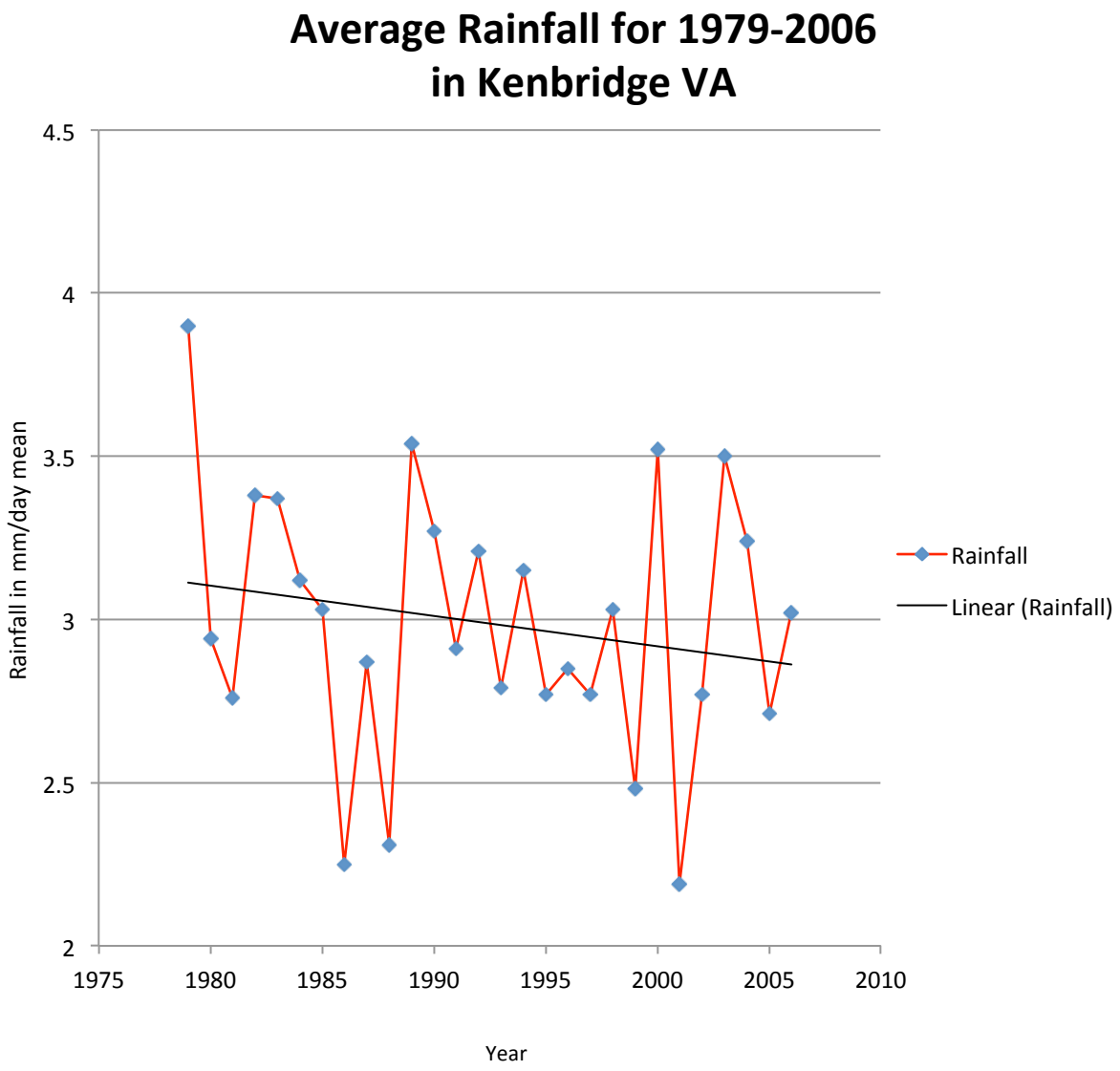
-This text file can be imported into Excel allowing the user to manipulate the data as needed.

```
VARIABLE : Average Monthly Rate of Precipitation (mm/day)
DATA SET : CPC Merged Analysis of Precipitation (includes NCEP Reanalysis)
FILENAME : precip.mon.mean.nc
FILEPATH : /usr/local/ferret-dataset/data/
BAD FLAG : -9.9692100E+36
SUBSET   : 337 points (TIME)
LONGITUDE: 81.2W(-81.2)
LATITUDE : 36.2N
```

01-JAN-1979	00	4.98	01-JAN-1981	00	0.63	01-JAN-1983	00	2.13
01-FEB-1979	00	4.44	01-FEB-1981	00	3.42	01-FEB-1983	00	3.76
01-MAR-1979	00	4.02	01-MAR-1981	00	2.43	01-MAR-1983	00	4.43
01-APR-1979	00	4.23	01-APR-1981	00	2.24	01-APR-1983	00	5.11
01-MAY-1979	00	3.68	01-MAY-1981	00	4.53	01-MAY-1983	00	3.64
01-JUN-1979	00	4.09	01-JUN-1981	00	3.22	01-JUN-1983	00	3.15
01-JUL-1979	00	4.35	01-JUL-1981	00	4.32	01-JUL-1983	00	1.69
01-AUG-1979	00	2.38	01-AUG-1981	00	1.81	01-AUG-1983	00	2.36
01-SEP-1979	00	6.79	01-SEP-1981	00	3.45	01-SEP-1983	00	1.89
01-OCT-1979	00	2.34	01-OCT-1981	00	2.68	01-OCT-1983	00	4.34
01-NOV-1979	00	4.36	01-NOV-1981	00	1.01	01-NOV-1983	00	3.21
01-DEC-1979	00	1.19	01-DEC-1981	00	3.4	01-DEC-1983	00	4.76
01-JAN-1980	00	3.46	01-JAN-1982	00	3.84	01-JAN-1984	00	2.03
01-FEB-1980	00	1.04	01-FEB-1982	00	5.2	01-FEB-1984	00	4.98
01-MAR-1980	00	5.52	01-MAR-1982	00	2.51	01-MAR-1984	00	3.58
01-APR-1980	00	4.2	01-APR-1982	00	2.86	01-APR-1984	00	3.66
01-MAY-1980	00	3.27	01-MAY-1982	00	3.55	01-MAY-1984	00	5.43
01-JUN-1980	00	2.48	01-JUN-1982	00	3.67	01-JUN-1984	00	2.86
01-JUL-1980	00	4.35	01-JUL-1982	00	4.35	01-JUL-1984	00	5.17
01-AUG-1980	00	2.61	01-AUG-1982	00	3.2	01-AUG-1984	00	3.03
01-SEP-1980	00	2.88	01-SEP-1982	00	2.24	01-SEP-1984	00	0.64
01-OCT-1980	00	2.38	01-OCT-1982	00	2.88	01-OCT-1984	00	1.95
01-NOV-1980	00	2.29	01-NOV-1982	00	3.43	01-NOV-1984	00	2.58
01-DEC-1980	00	0.8	01-DEC-1982	00	2.88	01-DEC-1984	00	1.57

3. Consistent Decrease in Ring Thickness

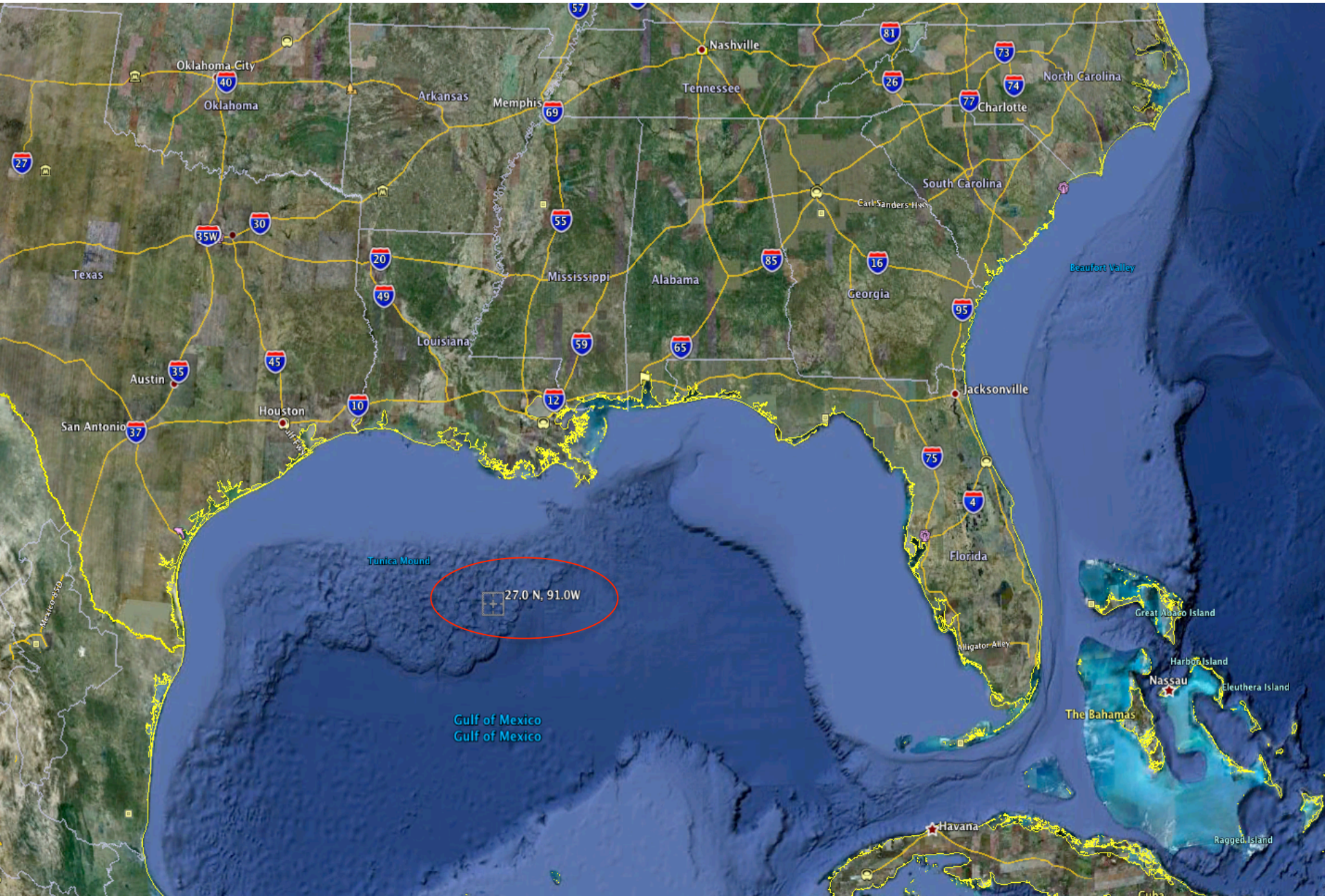
-Declining rainfall coupled with increase tree size accounts for the consistent decrease in ring thickness.



Hurricanes as Heat Engines

Using the LAS to better understand plots.

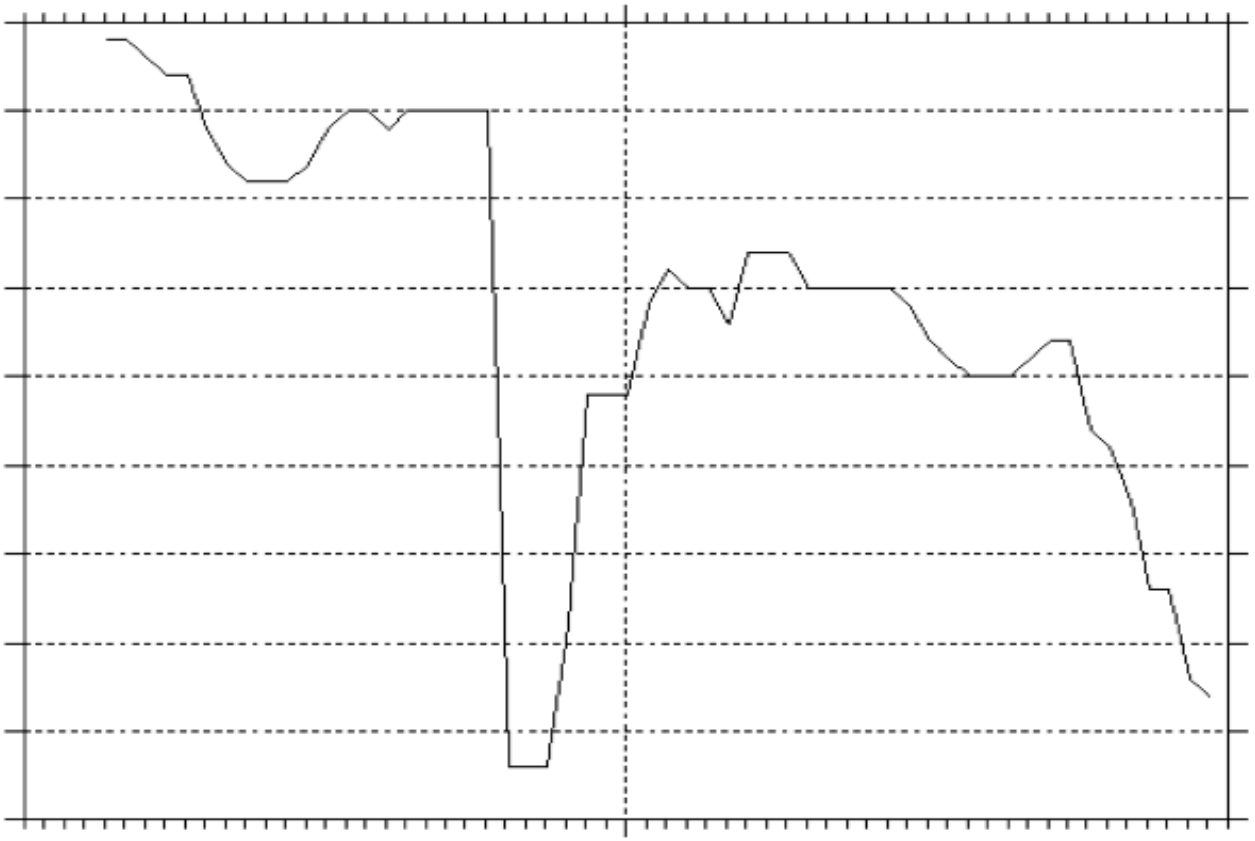
Lets look at a time series plot for a spot along Rita's path (Sept 1- Oct 30)

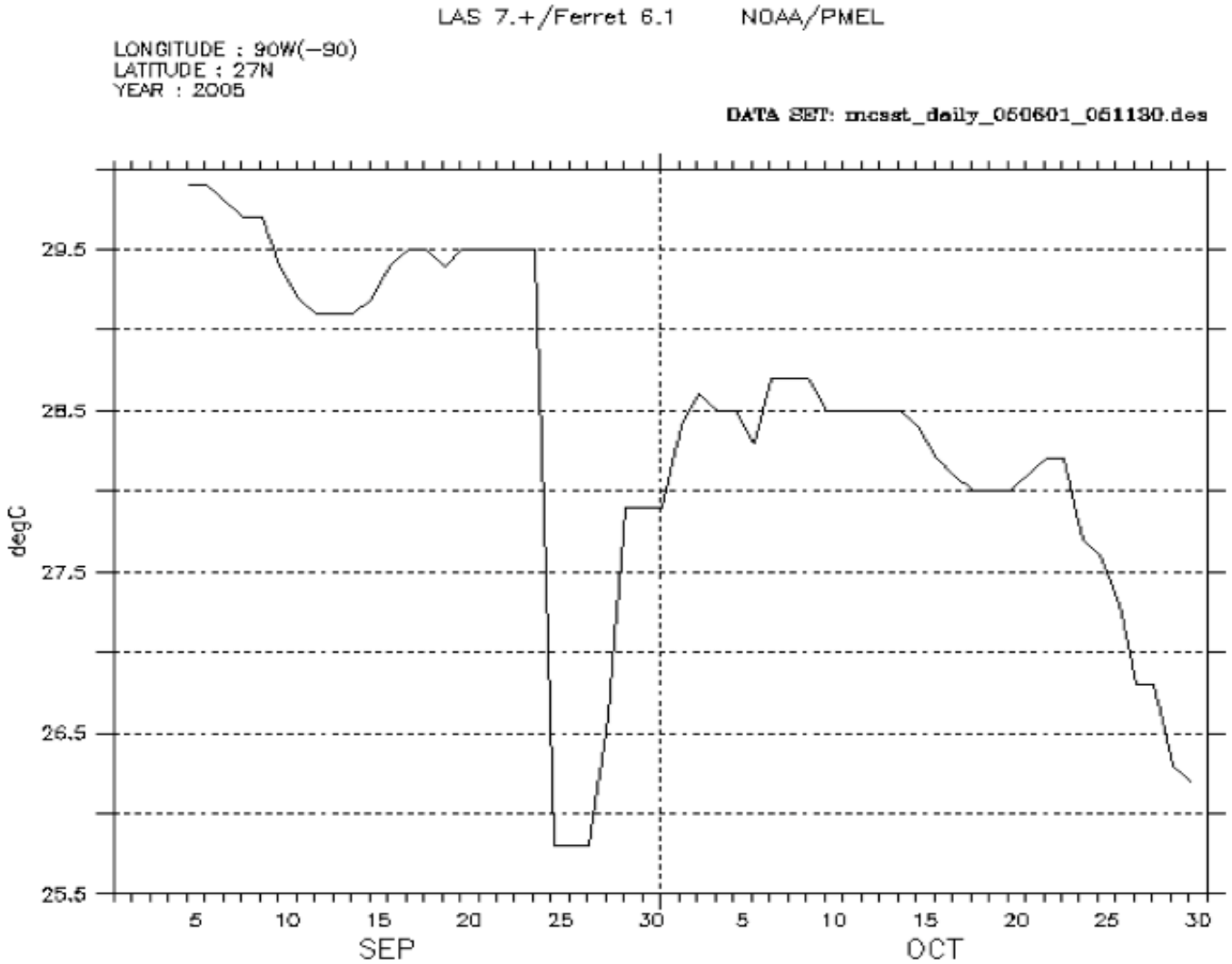


Factors that Influence Hurricane Formation

- Warm Sea Surface Temperature
- Rapid cooling of air as it rises
- Rotation in a low pressure system
- Available moisture

What Could this be a plot of?





Daily Sea Surface Temperature (MCSST) (degC)

Part II

Making a color plot of the region to see daily SST changes

What to look for after the plots are produced:

- Changing sea surface temperatures as shown in the color plots to follow

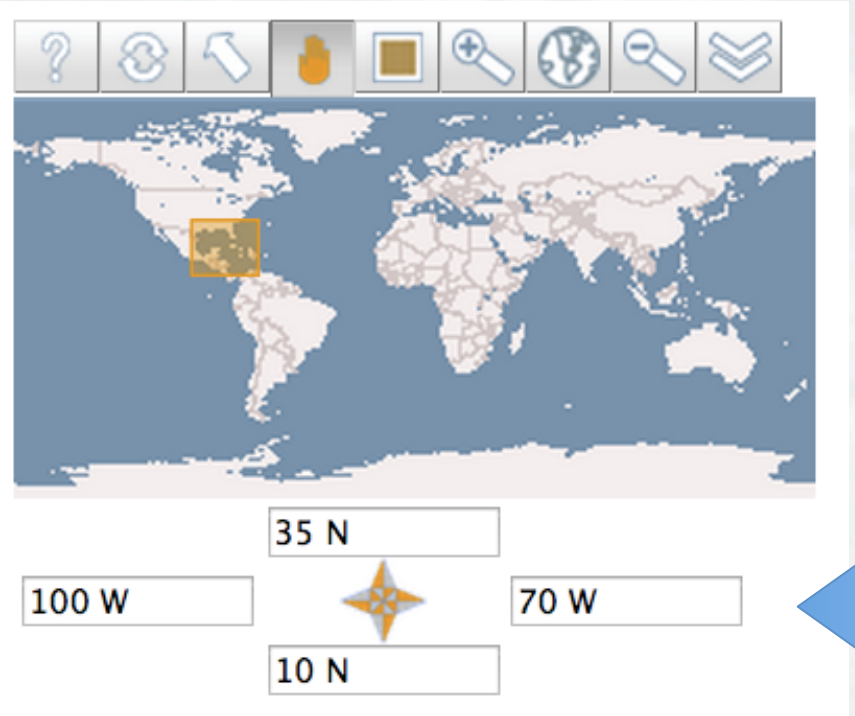
- Length of time it took for the water temperature to change (is there a delay or is there a sudden change in temp?)

The Details:

Data Set: **Daily Sea Surface Temperature (GHRSST)**

Day(s): ***September 20-27, 2005***

Location:

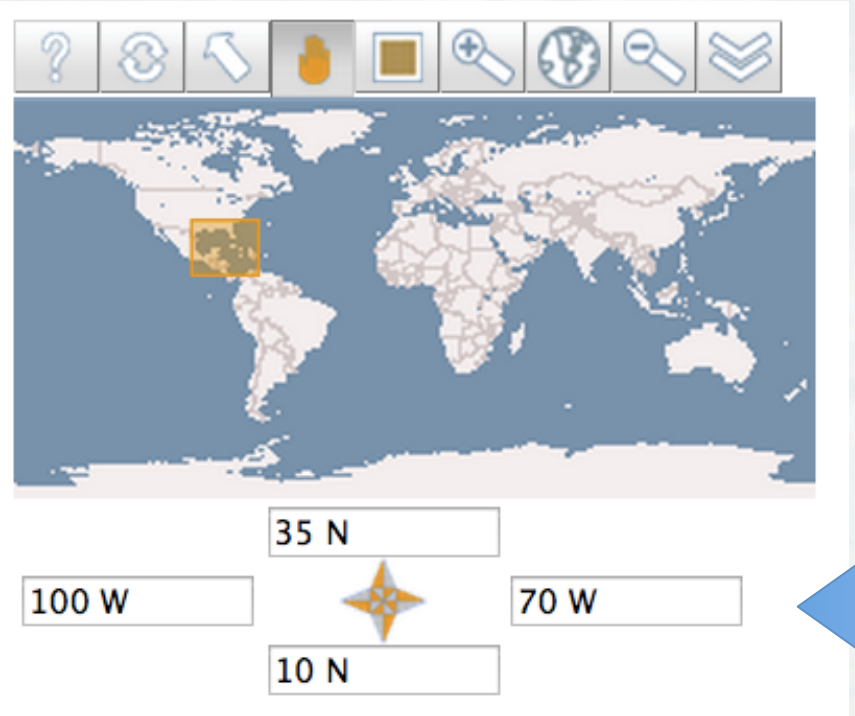


The Details:

Data Set: Daily Sea Surface Temperature (GHRSST)

Day(s): September 20-27, 2005

Location:



Who wants to volunteer to take a try on the LAS?

The Options:

Now that a basic color plot (lat lon color plot) has been produced you can also quickly produce the following from it:

- *Animation*
- *Google Earth Overlay*
- *Or easily switch to a line plot*