MY NASA DATA Lesson:

__See notes at the end of the lesson for data updates with the new Earth System Data Explorer__

1492: Using Data to Explain a Journey

Purpose:

To understand how Christopher Columbus made journeys across the Atlantic Ocean by examining wind patterns and data

Grade Level: 6 – 8

Estimated Time for Completing Activity:

50 minutes

Image courtesy Library of Congress

Prerequisite

- Overview of the Trade Winds

Tools

- Computer with Internet Access

Vocabulary:

- atmospheric pressure
- climatology
- Hadley Cell
- latitude
- longitude
- maps
- Trade Winds

Lesson Links:

- Trade Winds and the Hadley Cell

- [Overview of the 1492 Journey](#)

- [Voyage Route](#)
- [Live Access Server (Advanced Edition)](#)

Background:

FRIDAY, AUGUST 3...

Friday, August 3, 1492, at 8 o clock we started from the bar of Saltes: we went with a strong sea-breeze 60 miles, which are 15 leagues, toward the south, until sunset: afterwards to the south-west and to the south, quarter south-west, which was the way to the Canaries...

Back in the days of Christopher Columbus, voyages made across bodies of water were dependent upon winds and currents to drive the sailing ships. Thus good navigation routes were often determined by prevailing weather conditions such as the Trade Winds, and then discovered by explorers. In this lesson, you will explore the wind climatology for the Atlantic Ocean basin (as determined by satellite data from the past ten years), and then compare it to the route documented by Columbus in 1492.

Procedure:

1. Click on the Lesson Link for the Live Access Server.
2. If you are not automatically prompted with parameter choices click on 'Choose Data Set' in the upper left hand corner of the screen then, select Oceans, Monthly Wind Speed – Climatology 1995 to 2005 (NOAA NCDC).
3. Using the double downward arrow found above the navigation map to the left of the screen, choose 'North Atlantic' from the drop down menu
4. Change the Date to: August
5. Be sure to click the radio button next to 'Update Plot' to view your changes
6. Return to select other months of the journey to explore wind magnitudes.
7. Repeat these steps in LAS to explore two other parameters:

a. Oceans, Monthly Ocean Wind Speed Vectors (NOAA NOMADS) – vector plot showing wind direction
b. Atmosphere, Atmospheric Pressure, Monthly Surface Pressure (ISCCP) – color plot showing atmospheric pressure

Questions:

1. What correlation do you see between the wind climatology of the Atlantic Basin and the 1492 Columbus route?

2. Why did Columbus take one path west and a different path to return?

3. Why is there low wind speed in the central area of your plot?

4. What correlations do you think exist between the wind speed and atmospheric pressure?

Extensions:

1. Explore LAS data to compare global ocean winds to atmospheric pressure. What persistent patterns exist in other regions of the world?

2. Compare and contrast historic measurement and directional devices to current technologies. What tools and knowledge would Christopher Columbus have used to determine his direction, speed, and distance traveled?

Lesson plan contributed by Malinda Burk, Lincoln, Nebraska

Click here for Teachers Notes

View lesson without Standards

Data Notes from Dr. Brad (12/2018):
The wind climatology and atmospheric pressure data is no longer found on the Earth System Data Explorer. However, the wind pattern across the North Atlantic is consistent each year, so a plot of August wind vectors from any year can be used for this lesson (Atmosphere->All data->Wind Speed and Vectors->Vectors-> Monthly Near-Surface Wind Vectors). A plot of sea level pressure can be found at http://www.cpc.ncep.noaa.gov/products/precip/CWlink/climatology/Sea-Lvl-Pressure.shtml.