

COSMOS Cluster 3

Summer 2013

Cruise Tracks

Instructor: Prof. Lynn Russell
Teaching Fellow: Megan Jones
Teaching assistants: Jacob Sanchez

Website: <http://marinetraffic.com/ais/>

Objectives:

As part of this demonstration, the student will be able:

1. to observe the number and types of ships off the coast of California
2. to view ship paths and think about how they contribute to ship tracks
3. to think about how ships affect climate

Activity:

1. Go to the website above and zoom in on California. You will see that if you zoom in close enough, you can see individual ships.
2. Look at the legend on the left. Observe the different ship types. Spend some time looking at each ship type.
3. Zoom in on an area close to the coast until the Google length scale shows “20 km”. Estimate the size of the region you have chosen.
____ km by ____ km = _____ km²

Count the total ships in the area:

What type of vessel do you see the most of?

How many are there?

4. Zoom back out. Where is the largest number of ships?

5. Compare the port of Oakland/San Francisco to the ports of Long Beach/Los Angeles. Does one port have more ships? Does one port have more of one type of ship?

6. Choose one cargo ship and write down the:

name:

flag:

size:

destination:

speed:

7. Click on multiple vessels and select “show vessel’s track”. Look at multiple vessel tracks. Make a comment about the paths of the Cargo Vessels and Tankers. Are they all moving along the same track? Do they stay close to the coast? Are their paths perfectly straight? Where are they going?

8. Using your knowledge of CCN, clouds, and pollution, what will you observe above these ships? Hint: ship tracks. What causes a ship track? Which ships do you think make the “best” ship tracks (biggest, brightest)?

9. There are new regulations that require ships to use “low-Sulfur” fuel when they are close to the coast. How do you think low-Sulfur fuel would affect ship tracks. Based on the vessel tracks you observed, do the ships spend a lot of time close to the coast with low-sulfur fuel?

10. Cargo ships have multiple influences on climate. They produce: carbon dioxide which acts to *warm* or *cool* the climate (choose one). At the same time, they produce particles that act as CCN and create ship tracks which act to *warm* or *cool* the climate (choose one).