

Background

The West Nile Virus causes flu-like symptoms in people. In some cases, it causes encephalitis, which may result in serious brain complications or may be fatal. Although the West Nile Virus affects animals, it is mainly a disease of birds. The Virus is transmitted to humans when a mosquito bites a bird that has the disease and later bites a person. Humans do not get the West Nile Virus from other humans or directly from animals.

Using maps from NOAA (National Oceanic and Atmospheric Administration) satellites, researchers can trace the weather and vegetation which affect mosquitoes that transmit the West Nile Virus to people. Since mosquitoes thrive in warm, moist surroundings, researchers look for patterns of weather conditions that may help predict where the Virus will spread and be most serious. Then, authorities can take disease-controlling precautions to help save lives.



Procedure

1. Use Figure A3.1, the map titled, “Average Temperature July, 2001”, to follow these instructions.
 - 1a. Using the data in Table A3.1, write the number of bird cases and the number of human cases for the year 2000. Use the form “Bird Number/Human Number” in the space on the figure for New York state. For example, New York would be 1263/14. If no number is listed then use a dash (-) instead of a blank. Circle the numbers.
 - 1b. Using the data in Table A3.2, write the number of bird cases and the number of human cases for the year 2001. Use the form “Bird Number/Human Number” in the space on the figure for Florida. For example, Florida would be “1066/12”. If no number is listed then use a dash (-) instead of a blank. Put a box around the numbers.





1c. Color the rectangles that denote temperature range on the map in Figure A3.1 according to the labels. Then, lightly color Figure 3.1 so that you can see the numbers you wrote. Notice that there are letters on the figure that correspond to a color to guide you. For example, areas marked with an “A” should be colored red on the temperature figure.

2. Repeat Steps 1a through 1c for the map titled, “Total Precipitation (Inches) July, 2001”, in Figure A3.2.



Data for Tables A3.1 and A3.2 come from the Center for Disease Control (CDC) in Atlanta, Georgia. These data are provisional and subject to revision or adjustment in the future. Some states reported to the CDC even if there were no cases; some states reported “No Data”; still other states did not report.



West Nile Virus - 2000		
State	Number of Bird Cases	Number of Human Cases
Connecticut	1118	1
Delaware	0	
Maryland	48	
Massachusetts	449	
New Hampshire	7	
New Jersey	1280	6
New York	1263	14
North Carolina	1	
Pennsylvania	36	
Rhode Island	81	
Vermont	1	
Virginia	7	
Washington, D.C.	5	
Total	4295	21

Table A3.1. Bird and Human West Nile Virus Cases by State - 2000

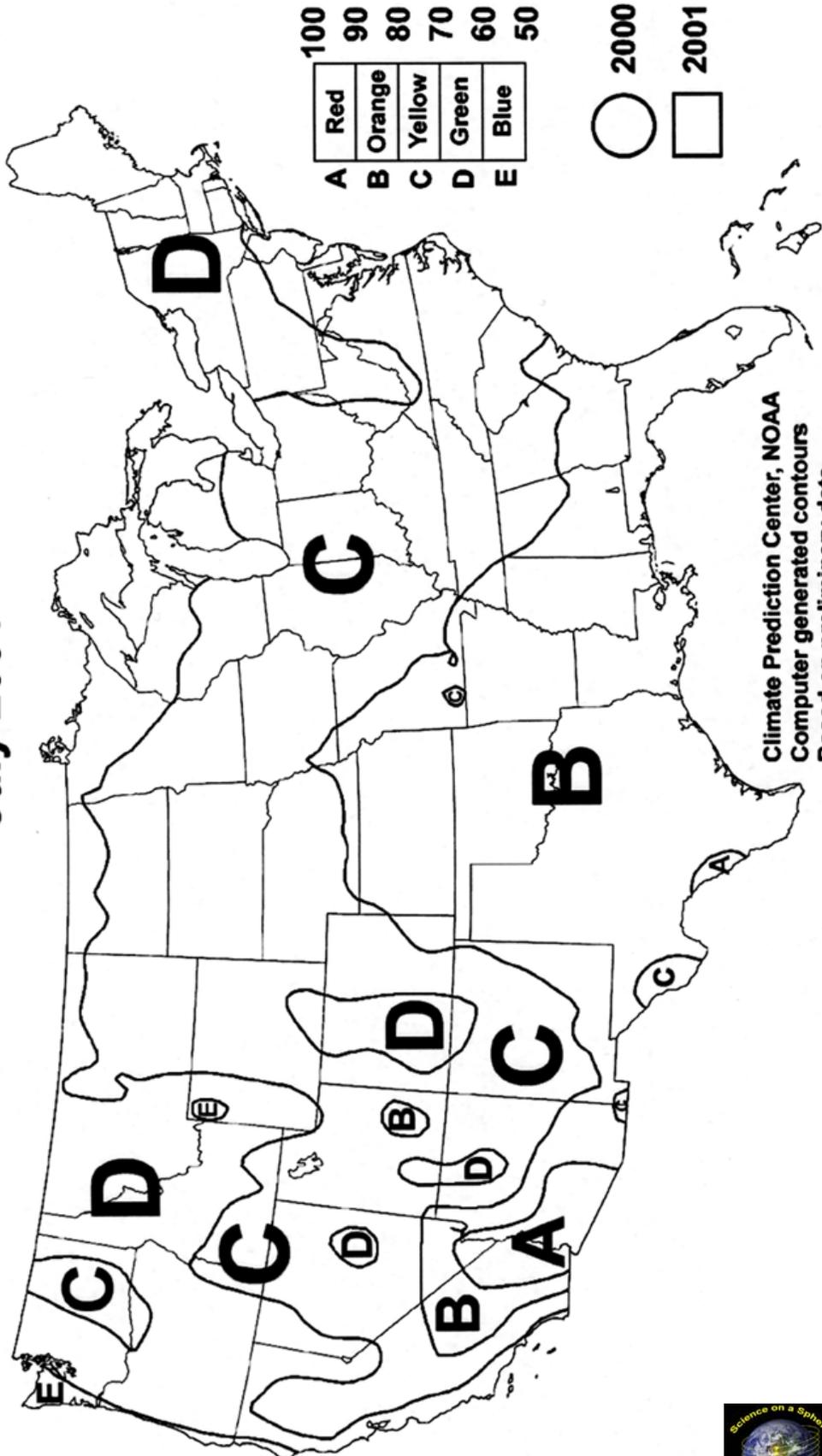
West Nile Virus - 2001		
State	Number of Bird Cases	Number of Human Cases
Alabama	59	2
Arizona	0	No Data
Arkansas	4	0
California	No Data	0
Connecticut	444	6
Delaware	34	0
Florida	1066	12
Georgia	326	5
Illinois	138	0
Indiana	47	No Data
Iowa	1	No Data
Kentucky	43	0
Louisiana	6	1
Maine	7	No Data
Maryland	454	6
Minnesota	0	0
Massachusetts	1238	3
Michigan	65	0
Mississippi	3	0
Missouri	7	No Data
Nebraska	0	0
New Hampshire	83	No Data
New Jersey	1069	12
New Mexico	0	0
New York	726	14
North Carolina	8	No Data
North Dakota	No Data	0
Ohio	286	No Data
Oklahoma	0	0
Pennsylvania	361	3
Rhode Island	245	0
South Carolina	0	0
Tennessee	46	No Data
Vermont	0	0
Virginia	215	0
Washington	0	0
Wisconsin	58	0
West Virginia	0	No Data
Washington, D.C.	359	No Data
Total	7398	64

Table A3.2. Bird and Human West Nile Virus Cases by State - 2001





Average Temperature (Degrees F) July 2001



Climate Prediction Center, NOAA
Computer generated contours
Based on preliminary data

Figure A3.1. Temperature and West Nile Virus





Total Precipitation (Inches) July 2001

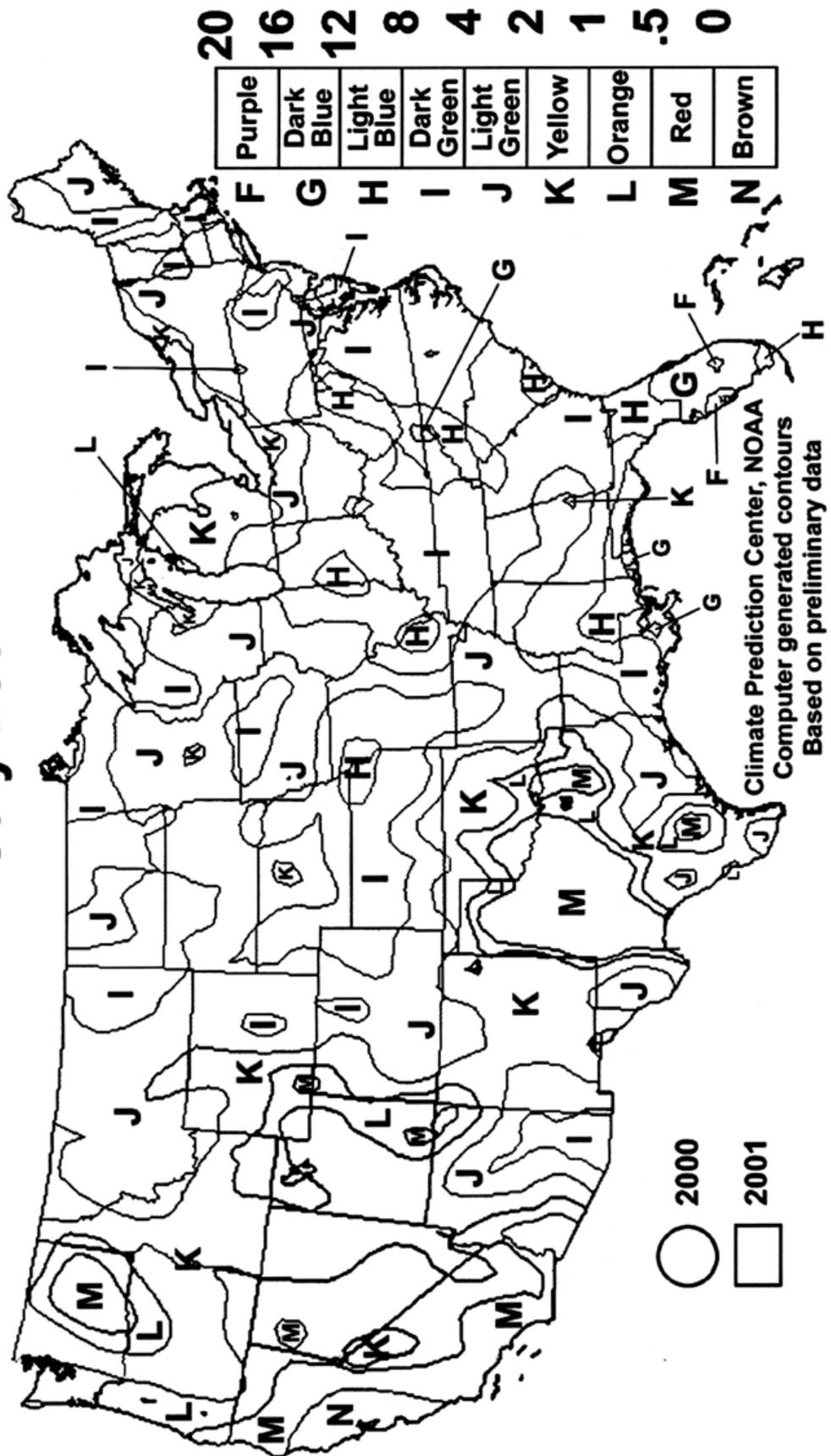
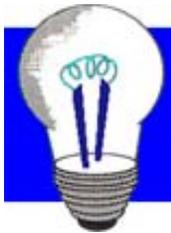


Figure A3.2. Precipitation and West Nile Virus



Questions

1. In what geographic part of the U.S. were most West Nile Virus bird infections found in 2000? Human infections?
2. How did the geographic location for the cases of West Nile Virus bird infections change between 2000 and 2001?
3. What is the temperature range for the geographic area where the most West Nile Virus bird infections were found?
4. What is the precipitation range for the geographic area where the most West Nile Virus bird infections were found?
5. Based on the maps that you completed using Figures A3.1 and A3.2, where do you think the West Nile Virus bird infections might appear next?
6. Based on the maps that you completed using Figures A3.1 and A3.2, what geographic location might have the most human cases of the West Nile Virus? What weather conditions exist in this area?
7. Why do you think that the West Nile Virus first appeared in New York?



Conclusion

Review the problem stated on the first page and write a detailed conclusion.





Answer Key

1. Northeast
2. Spread south along the Atlantic coast
3. 60 - 90 degrees Fahrenheit
4. 2 - 20 inches
5. Mid U.S.
6. Southern U.S. where the temperature and precipitation are high.
7. New York City is a major port. Birds, mosquitoes or other animals probably carried the virus from another country; the virus probably flourished and spread because of warm temperatures and high humidity.

