Answer key: Hudson River Temperature

Part 1:

1. The air temperature has increased over the past 100 years.
2. The earth could be getting closer to the sun, the sun might be getting stronger, global warming could be occurring.
3. Heat waves will become more common, with more people dying of heat stress. Stressed plants may stop removing growing, and soil emissions of carbon dioxide will increase. Sea levels will increase between 5-6 meters, and glaciers will continue to melt at a faster rate.
4. We should be concerned because the sea level might rise, and weather may become more extreme.

Part 2:

1. The average river temperature has increased since 1946.
2. The highest temperatures have occurred in the last fifteen years. Based on these data, I would expect the temperature to continue to increase.
3. Any aquatic species that is sensitive to change would be affected by this change.
4. Based on this graph, I can conclude that the river is getting warmer.
5. This graph is similar to the air temperature graph, because as the air warms, so does the water. However, the air temperature is always lower than the water temperature. The water acts as sort of a buffer for the rapid changes in air temperature that happen naturally throughout a daily cycle.

Part 3:

1. Both the tomcod and smelt populations have declined.
2. Pollution, temperature, food sources, and predation (including fishing) could have caused these changes.
3. I would need to know whether other things have changed in the river, including the temperature changes.
4. I would say that the future of these two fish populations is not good, because very few of them survive.
5. The two fish species are very sensitive to changes in temperature. They are anadromous fish, spawning in the Hudson and moving out into the ocean later in life.
6. Based on the report, both the smelt and the tomcod are very sensitive to changes in temperature, and both are at the upper temperature tolerance in the Hudson. They have probably moved to areas further north where the water temperature is cooler.
7. I am convinced, but, I would like to know more about the fishing and pollution pressures placed on these fish species before making a definitive decision.

Part 4:

1. The main difference between the temperatures in 1900 and 1999 is that the temperature increased by an average of 4.1 degrees Fahrenheit. Differences in winter temperatures were much higher than that of summer temperatures.

2. Of the six anurans listed, five started calling earlier (bullfrog, gray treefrog, American toad, wood frog, and spring peeper). The gray treefrog started calling almost twenty days earlier.
3. Based on this information, amphibians are starting to mate earlier in the year. I think this is starting to happen because the winter temperatures aren't as cold anymore. I am confident in my statement, but I would like to know what other challenges the animals are facing in the region.
4. Other species that could be affected by climate change are birds that rely on insects for food. Insect populations could also be affected because they may start hatching earlier, or their populations may decline as predators arrive earlier in the year.
5. To combat the rising temperatures, we need to reduce the amount of carbon dioxide released into the atmosphere.