Hurricane! Answer key

Answers: **Part 1: Reading**

1. It was the 3rd largest flood on Wappinger Creek since 1928.
2. The size of a flood depends on the amount of rain, how much vegetation is in the area, and whether the ground is already saturated from previous rainfall.
3. Human factors that contribute to flooding include increasing impervious surfaces, reducing wetlands, and preventing water from moving naturally as it floods by building barriers.
4. Preventing future floods is possible by reducing the amount of development that takes place in flood-prone areas, increasing vegetation along stream banks, and allowing streams and rivers to move in a natural manner.

Answers: **Part 3: Questions**

1. Hurricane Floyd dropped 171.5 mm of rain on 9/16/1999, and the April 2007 storm dropped 76 mm on 4/15/07 and 56 mm on 4/16/07, for a combined total of 132 mm.
2. For Hurricane Floyd, peak flow occurred right after midnight on Sept. 17th, with the discharge at 320 cubic feet per second. It remained high for about one hour, beginning to recede around 1:30am.
3. For the April 2007 flood, peak flow occurred at 6:30am on April 16th, with the discharge rate at 1854 cubic feet per second. However, there was a second peak of 1789 cfs at 8:30 am that same morning.
4. Before the Hurricane Floyd flood event, the discharge rate varied between 4 and 11 cfs. Before the April 2007 flood, discharge rate varied between 57 and 147 cfs.
5. Although Hurricane Floyd dumped more rain on the region, there was significantly more stream flow during the April 2007 flood. Due to the time of year (April), the ground was already saturated with moisture and couldn't absorb any more rainfall. Consequently, the rain ran off into the streams and caused a larger flood event than the rainfall during Hurricane Floyd.
6. The curves differ in that the Hurricane Floyd stream returned to normal more slowly than the April 2007 stream. Since the land was able to retain more rainfall in September, the flooding in September was less severe, and it allowed the water to enter the stream channel in a slower, more controlled manner. The April 2007 flood occurred quickly, but it was also over very quickly.

Part 4: Historical Change

1. The peak flow was much higher in 1938 and 1955.
2. The flood in 1938 was a hurricane that occurred in September, killing more than 50 people in New York and causing billions of dollars in damage (in today's dollars). The 1955 flood was also a result of a hurricane, and caused a lot of damage around the Northeast.

Part 5: Future Change

1. The scientific name for a hurricane, regardless of its location, is *tropical cyclone.* In general, a cyclone is a large system of spinning air that rotates

around a point of low pressure. Only *tropical* cyclones, which have warm air at their center, become the powerful storms that are called hurricanes.

2. On average, there are between 16-25 hurricanes in the North Atlantic each year.
3. The number of hurricanes has been increasing. The evidence to support my answer comes from the NASA Earth Observatory website.
4. Based on the climate change report, there will be more intense storms in the future. This will cause damage to coastal areas, eroding beaches, damaging homes and communities, and potentially causing damage to fisheries. There will be less water available during the summer, and rain will fall in a more unpredictable pattern. Less snowfall means less runoff in the spring. More precipitation events will occur as rain instead of snow, which has consequences not just for hydrology but also for some plants, which rely on a blanket of snow as an insulator.
5. Free response answer.