

Names: \_\_\_\_\_

## Climate Change and the Lake

Directions: Re-read the passage below and highlight any important information such as scientific data and results of climate change. Then, answer the questions on the back.

### A CHANGING CLIMATE

#### Climate change adds pressure to the Lake Champlain Basin's forested and aquatic habitats.

Climate change may be the greatest threat to the Lake Champlain Basin's forest health. Northern hardwood species such as maple, yellow birch, and American beech are threatened by warmer and drier growing seasons that can stunt growth and shift forest compositions toward warmer-climate species like oak and pine.

Human activities have aided the introduction of two invasive forest pests, the emerald ash borer and hemlock woolly adelgid. These species hitchhike in transported firewood and infested trees sold by nurseries. Ash and hemlock trees are important species in the Basin's natural landscape, and these pests can kill host trees quickly, increasing erosion from the steep slopes and riparian areas they occupy and reducing water quality. Forest managers are conducting routine monitoring and rapid-response containment of hemlock woolly adelgid infestations in the Lake George watershed, where hemlocks make up 80% of the watershed's forest. Vermont and New York agencies are developing forest management recommendations and enforcing

firewood movement regulations to slow its spread.

Increasing flooding events also spread invasive Japanese knotweed throughout riparian habitats. If left unmanaged, this plant will line rivers and streams for miles in thick, dense stands, outcompeting and replacing the native species that insects, fish, birds, and mammals rely on. The ground beneath these dense stands also rarely supports other vegetation, leaving the soil very susceptible to erosion.

#### The surface of the Lake freezes over less often than in the past, and the full impacts of climate change on habitats, fish, and wildlife are difficult to quantify.

The entire surface of Lake Champlain froze over nearly every year in the early 1900s. It now completely freezes much less frequently—currently once about every five years (Figure 20). Modeling suggests that by 2050, the Lake surface may complete freeze just once per decade.

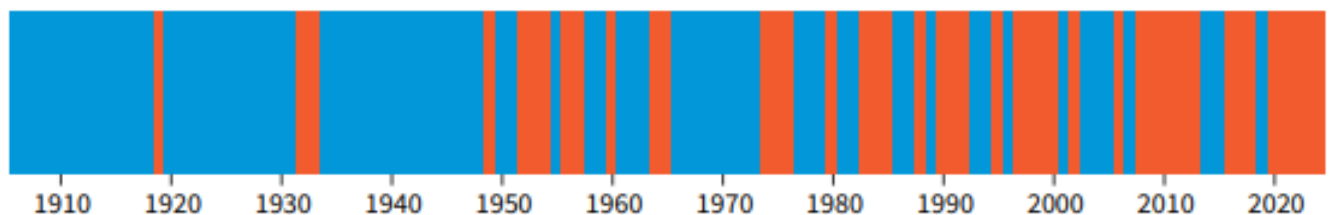
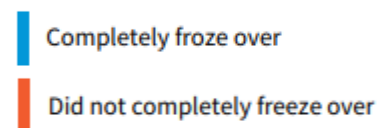
Scientists continue to track the impacts of climate change as the Lake Champlain Basin experiences more frequent and intense storms that increase erosion,

droughts in the summer that impact crops and increase the chance of wildfires, and milder winters that reduce ice cover. The warming climate impacts species diversity, habitat, and natural ecosystem function. Future winters may have shorter recreational seasons with limited ice fishing, and summers may be hotter with increased water quality impacts, thereby limiting recreational opportunities and other uses of the Lake.

Protecting and restoring forests,

floodplains, riparian habitat, and wetlands builds resilience back into watersheds. These natural features absorb floodwaters, store carbon, filter pollutants, support native species, and connect wildlife habitat, buffering communities from the pressures of a changing climate. Scientists at the University of Vermont have estimated that the Otter Creek floodplain near Middlebury saves the town as much as \$450,000 in flood damages each year.

Figure 20 | Surface freeze-over of Lake Champlain  
Winters when the surface of Lake Champlain:



1. List three ways that climate change is impacting Lake Champlain.

2. How often do scientists expect the lake to completely freeze over by 2050? What information in the reading and the graph make you agree or disagree with this conclusion?

3. Looking at this graph from the reading, what do you notice about the changes over time?

4. In what year did the trend of the lake freezing over less often begin? Explain your answer using evidence from the graph.

5. Study the graph below. How is the information it tells you different from and similar to the information in the graph at the top of the page? Write at least one way that it is different and one way that it is similar.

