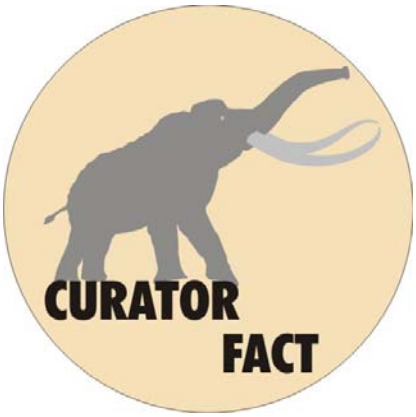

How to use this document:

The amount of information available on the impact of climate change is so vast that not everything could be included in the exhibition, and some of the information, while interesting and important, is more of a side story to what we explored. So, we have provided this supplemental handout that serves as both a **scavenger hunt** within the exhibition and a resource for additional information. Find the "Curator Fact" labels (like the one on the upper right hand corner of this page) and match the fact contained in this document with the section of the exhibition. To continue your experience at home, please visit our *Rising Tide* web page at:

http://www.state.nj.us/state/museum/rising-tide

This web page is full of fun games and interesting facts that provide a great way to keep learning at home or in the classroom – see how you can help to mitigate the impact of climate change!

FRIENDS of the New Jersey State Museum

NEW JERSEY STATE MUSEUM

PSEG

The Process Continues

1. We are presently living in an interglacial period, a slightly warmer period within the ice age that began approximately 42 million years ago. Humans have only been on Earth for approximately the last 200,000 years - that is only about 0.0048% of the time that the planet has been in the most recent ice-house conditions. That means that the entirety of the human lineage evolved during a period of relative cold, and we are adapted to live in relatively cold conditions and no humans have ever experienced the warm global average temperatures that are predicted to occur on Earth later this century.

2. The large mural of an active glacier is the Perito Moreño Glacier in southern Patagonia, Argentina. This image was chosen not just as a dramatic background but because it illustrates conditions that were common in northern New Jersey at the height of the Ice Age nearly 20,000 years ago. From this picture alone, it is difficult to grasp the true immensity of this enormous sheet of ice. For a better sense of scale, look at the image on the end of the wall facing the river - look closely - you can see tourists and a tour boat in various places in front of the glacier.

New Jersey's Ice Age Legacy

1. Jefferson's Ground Sloth – In the early 19th century, a great rivalry pitted scientists from the "Old World," mostly Europe, against those from the "New World," especially the United States. Old World scientists and socialites generally regarded many aspects of the American continent to be inferior to those of their own homelands. This attitude even extended to animals, both modern and extinct. When Thomas Jefferson described the claw of *Megalonyx jeffersoni*, he believed it to be the claw of an enormous lion and used this discovery to reject the elitist views of the Europeans.

2. In addition to being a renowned portrait painter, Charles Willson Peale was a "jack of all trades" – he was a Pennsylvania politician and served in the military during the Revolutionary War. As was often the case with educated men in the late 18th century, he was also interested in natural history. His museum in Philadelphia was the first natural history museum in the New World and was the forerunner to the Academy of Natural Sciences of Philadelphia, which still exists today. He is most famous, though, for painting the portraits of many early American dignitaries and heroes of the Revolutionary War. There are three of his paintings in this exhibit. Can you find them?

The Process Continues

1. Between 1989 and 2002, Red Knot populations declined by more than 66%, and scientists have predicted that the American subspecies could be extinct by 2010. The knots are considered an endangered species in New Jersey, but the federal government has so far refused to officially recognize this species as endangered. Governor Jon S. Corzine signed legislation that protected a vital food source for the Red Knots during their migration through New Jersey. The legislation ended New Jersey horseshoe crab harvesting in 2008, but harvesting continues in Delaware, Maryland, New York, and Virginia. No one can say for sure if these and other restrictions may save this amazing bird.

2. Snow geese are becoming so numerous in many areas that they are starting to become a nuisance, especially to farmers whose fields are damaged by large flocks of these birds. In order to try to control their populations, many states are loosening hunting laws – making it easier to harvest more of these birds during extended hunting seasons. Even New Jersey is getting into the act.

Greenhouse Gases

1. Greenhouse Gases:
   CH_4 – Methane
   CO_2 – Carbon dioxide
   C_6F_{14} – Perfluorohexane, or tetradecafluorohexane
   CCl_4 – Carbontetrachloride
   C_2F_6 – Hexafluoroethane
   C_4F_{10} – Perfluorobutane
   HFC – Haloalkanes
   O_3 – Ozone
   CO – Carbon monoxide
   SF_6 – Sulfur hexafluoride – the most potent greenhouse gas. It has a global warming potential 22,200 times that of CO_2.

2. The United States is home to less than 5% of the world's population, but we use more than 25% of the world's oil and coal, and almost 27% of the world's natural gas.

3. While the United States still uses the most amount of fossil fuels, it no longer produces the most greenhouse gases. In 2006, China surpassed the U.S. as the world's leading producer of greenhouse gases and the rapid industrialization of India is likely to push that country pass the U.S. in the near future. However, Americans still produce far more greenhouse gasses per capita (meaning per person) than any other country in the world.

Climate Change and New Jersey

1. As severe storms increase in intensity and become more commonplace in the near future, the economic impact of these storms will also increase exponentially. First, storms will cause flooding, which can destroy crops, wash away top soil, and destroy homes, businesses, and infrastructure. Stronger coastal storms will have higher storm surges, which will flood larger areas, increase the severity of coastal erosion, and destroy critical habitat for wildlife, including areas depended on by many of the fish and shell fish species caught by the state's fishermen.

2. There is an unseen phenomenon happening underground near shore areas; fresh groundwater flows slowly toward the sea. This holds back salty groundwater trying to push inland from the ocean. During droughts - or when people take too much fresh water out of the ground in these areas - there is not enough fresh water to hold back the salty water, so the salt water flows farther inland and contaminates the water supply. Many people that live near the shoreline are almost completely dependent on fresh groundwater for drinking and watering their crops.

3. Rising sea levels and increased storm intensity aren't the only causes for increased beach erosion. Warming ocean temperatures are creating changes in ocean circulation patterns. Some beaches grow larger because local circulation patterns naturally deposit sediment there. Similarly, some beaches naturally erode because currents carry sediment away. Ocean temperature changes are altering local sediment deposition patterns by changing circulation patterns. If ocean temperatures continue to increase a few more degrees, large-scale global ocean currents, like the Gulf Stream, could be severely altered or eliminated altogether.

What Can Be Done?

1. According to Energystar.gov, the ideal temperatures for your programmable thermostat are the following:

Setting	Time	Setpoint Temperature (Heat)	Setpoint Temperature (Cool)
Wake	6:00 a.m.	≤ 70° F	≥ 78° F
Day	8:00 a.m.	Setback at least 8° F	Setup at least 7° F
Evening	6:00 p.m.	≤ 70° F	≥ 78° F
Sleep	10:00 p.m.	Setback at least 8° F	Setup at least 4° F

Programming your thermostats according to this chart could save your family 15% on your electricity bills. For the average American home, that's $180 a year!