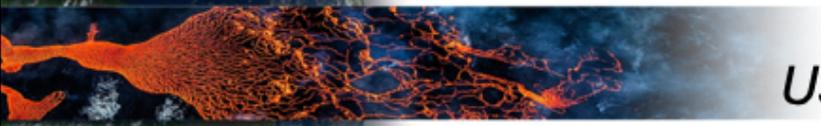


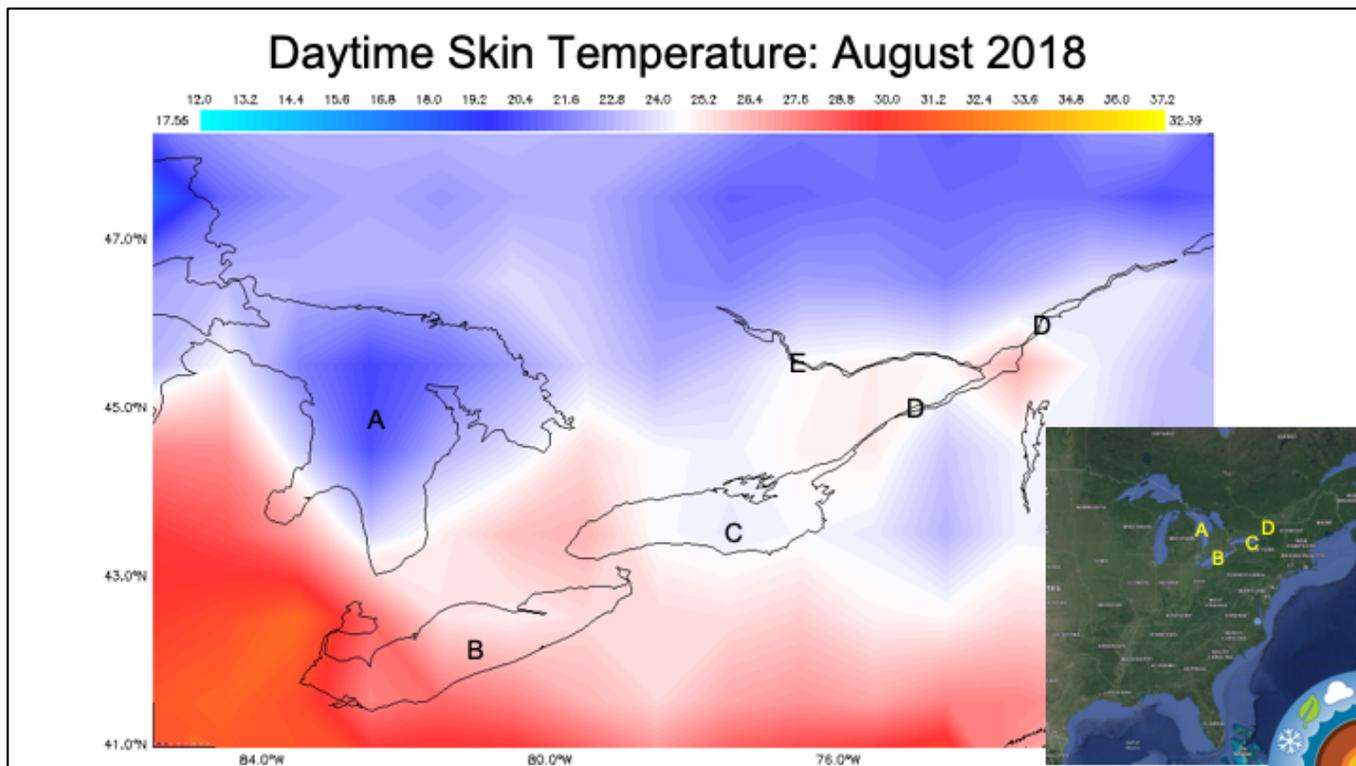
**“Scientifically-Interesting  
Stories with *My NASA Data*”**



*Using NASA Data To  
understand...*



**Urban Heat Island**



## Teacher Talking Points:

This mapped plot from the Earth System Data Explorer shows Daytime Surface Skin Temperature observed in August 2018. The quantity describes the surface skin temperature. This value describes the temperature of the land or ocean surface in the topmost layer (first few centimeters at the top of the surface). It is different than the surface air temperature, which is a measure of the temperature of the air closest to the surface.

## Focus Questions:

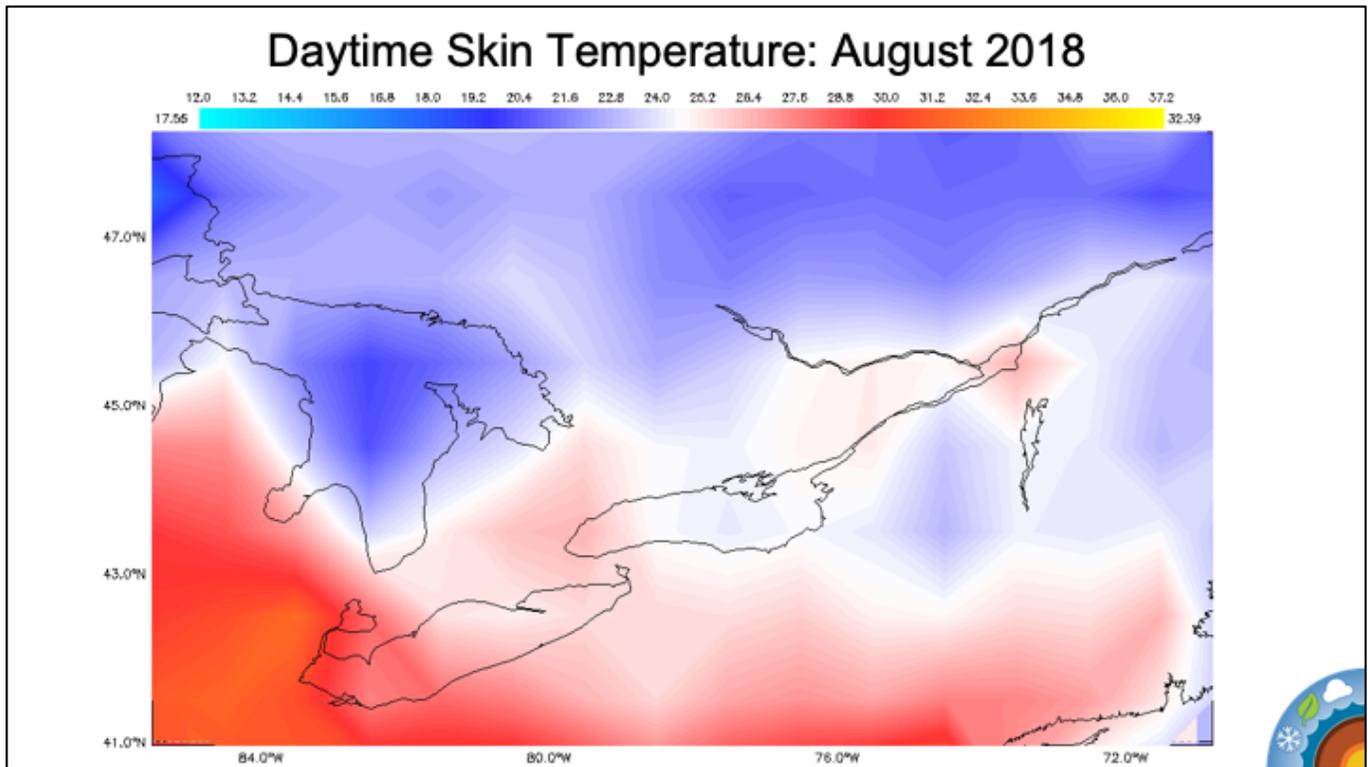
1. What water bodies are located in this image?

- a. *A - Lake Huron*
  - b. *B - Lake Erie*
  - c. *C - Lake Ontario*
  - d. *D - St. Lawrence River*
  - e. *E - Ottawa River*
1. What do the colors mean on the color bar?
    - a. *Reds indicate higher surface skin temperatures.*
    - b. *Blues indicate lower surface skin temperatures.*
  2. What would you predict to have a warmer daytime surface skin temperature in August, the land or water?

*Land. A land surface tends to warm up faster than a water surface when warmed by sunlight. It takes more energy to warm a land surface than a water surface.*
1. What color shows the most? What does it mean?
    - a. *The image seems to be divided equally among blues and reds; blues to the north and reds to the southwest. The surfaces in the southwestern part of the image are warmer; the surfaces in the northern part of the image are cooler.*
    - b. *There do appear to be some spots of warmer surface temperature that are located along the rivers.*

**Related Resources:** Consider using the My NASA Data Map Cube and Question Sheet with this map. See [link](#) for details.

**Image Credit:** Earth System Data Explorer (To visualize Daytime Surface (Skin) Temperature in the Earth System Data Explorer, visit this [link](#).)



## Teacher Talking Points:

Analyze the map image of Daytime Surface Skin Temperature in the Great Lakes region in August 2008.

## Focus Questions:

1. What questions can you ask about this image?

*Questions will vary.*

A. How does...?

B. I wonder if...

C. How is \_\_\_\_\_ the same as? Different than?

D. How many...? How long...? How often...?

1. What may cause the warmer patches of surface skin temperature along the Ottawa and St. Lawrence Rivers?

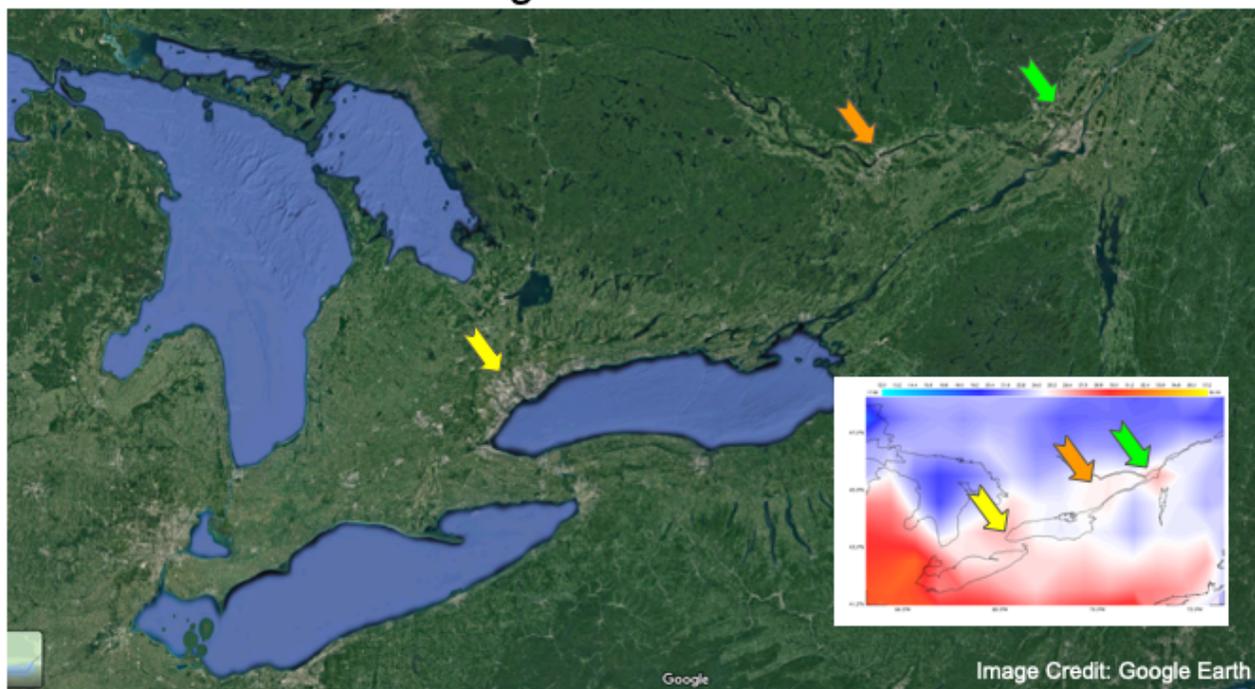
*An urban area is a city. A rural area is out in the country. The sun's heat and light reach the city and the country in the same way. The difference in temperature between urban and less-developed rural areas has to do with how well the surfaces in each environment absorb and hold heat. When you visit a big city, you won't see many plants. Instead, you'll see sidewalks, streets, parking lots and tall buildings. These structures are usually made up of materials such as cement, asphalt, brick, glass, steel and dark roofs. Materials such as asphalt, steel, and brick are often very dark colors—like black, brown and grey. A dark object absorbs all wavelengths of light energy and converts them into heat, so the object gets warm. In contrast, a white object reflects all wavelengths of light. The light is not converted into heat and the temperature of the white object does not increase noticeably. Thus, dark objects—such as building materials—absorb heat from the sun. In rural areas, the land is covered by plants and bare soil. These surfaces contain water. The energy from sunlight is used to evaporate the water in these*

*surfaces instead of raising the temperature of the surface.*

**Related Resources:** Consider using the My NASA Data Map Cube and Question Sheet with this map. See [link](#) for details. More information can be found [here](#).

**Image Credit:** Earth System Data Explorer (To visualize Daytime Surface (Skin) Temperature in the Earth System Data Explorer, visit this [link](#).)

## Satellite image of Southern Canada



### Teacher Talking Points:

Analyze the satellite image of the Great Lakes region.

#### Focus Questions:

1. What do you notice about the areas near the arrows? What does this indicate?  
*The surfaces are not green and vegetated like the surrounding land areas. They are a white/tan color. These are urban areas.*
1. How do these areas relate to the data in the surface temperature map?  
*These are areas that have warmer surface skin temperatures.*

2. Based on what you know about Urban Heat Island, what could these area do to help minimize surface temperatures?

*Answers may vary.*

- a. Plant more gardens, trees, and vegetation*
- b. Paint black asphalt streets, parking lots, and dark roofs with a more reflective coating*
- c. Use building materials that allow water to flow through*

1. What story do the data tell about the Earth System?

*Humans can impact the temperature of Earth's surface through changing land cover.*

**Image Credit:** Satellite image of southern Canada (Google Earth)