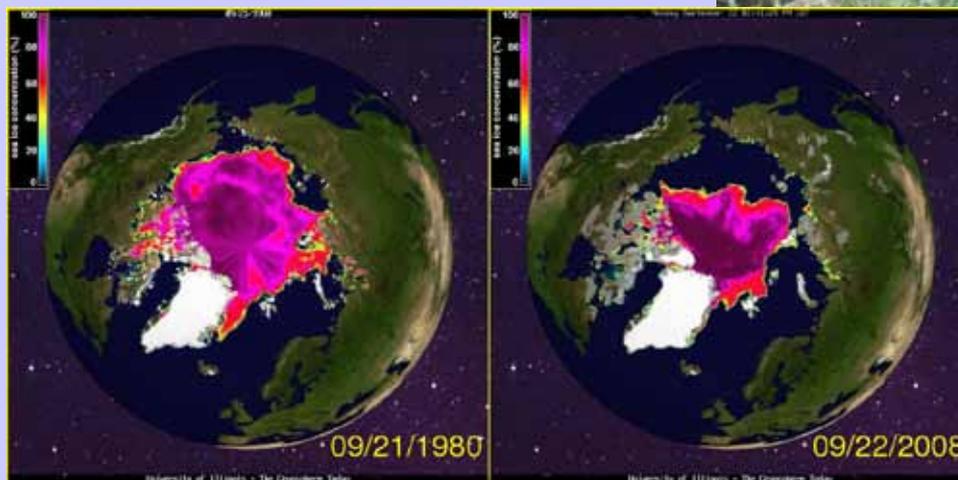


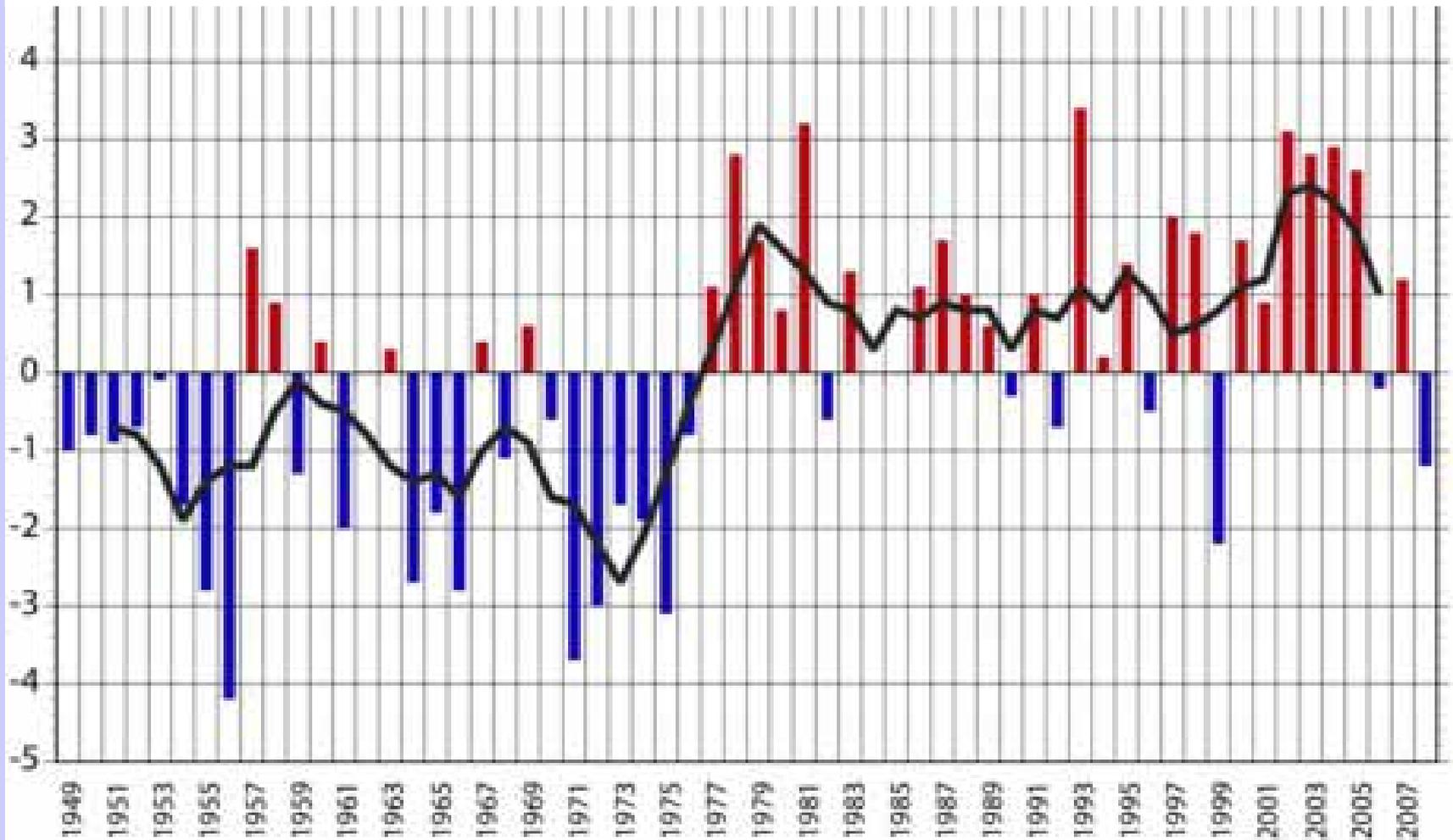
Alaska

Communities at Risk



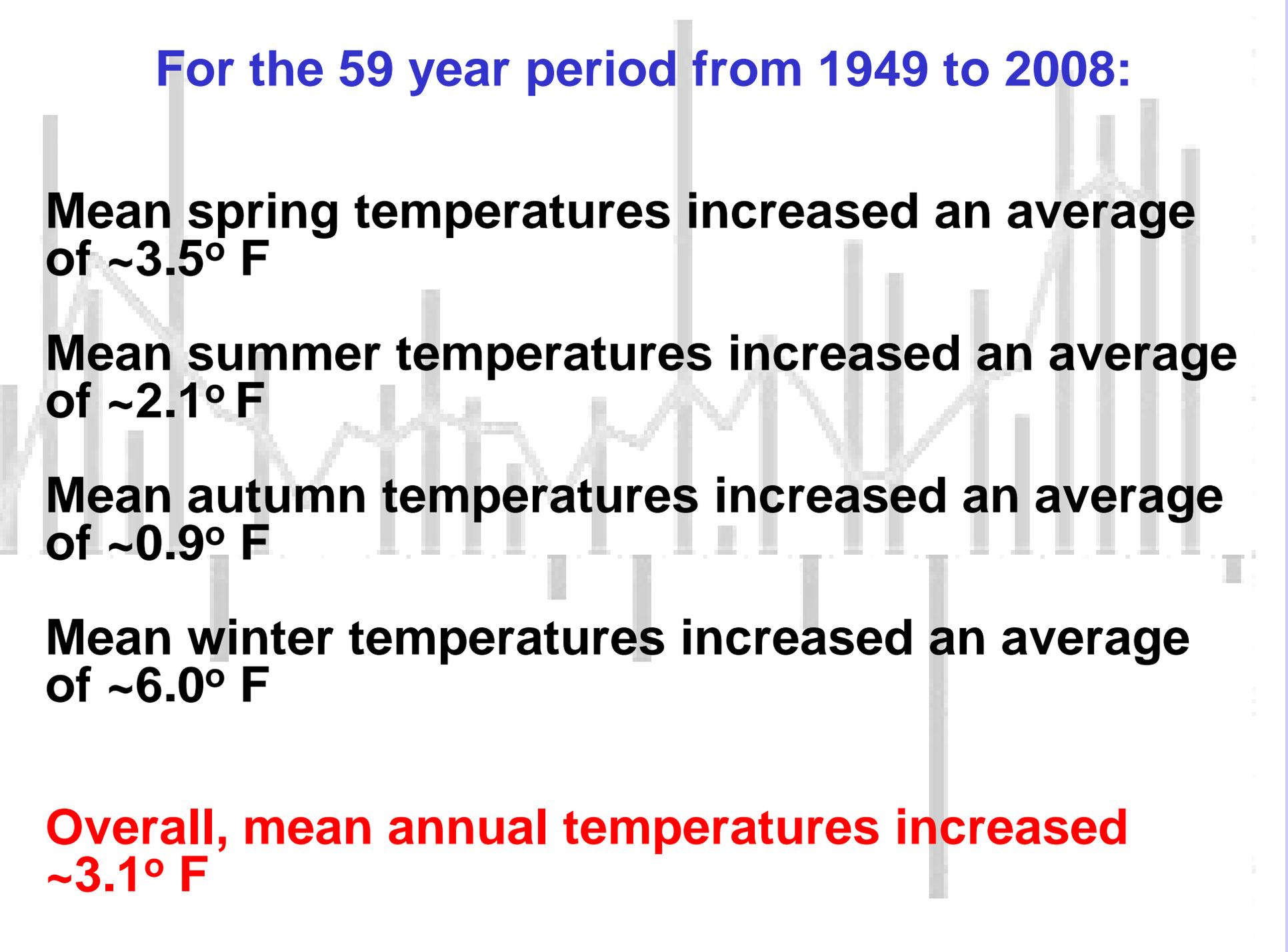
Bruce F. Molnia
U.S. Geological Survey
Reston, VA 20192

Temperature Changes in Alaska



Alaskan Mean Annual Temperature Departure 1949 - 2008

Source: Alaska Climate Research Center, Geophysical Institute, University of Alaska Fairbanks

A background chart with a light gray grid. The x-axis represents years from 1949 to 2008. The y-axis represents temperature in degrees Fahrenheit. The chart shows a clear upward trend in temperature over the period, with seasonal fluctuations. The overall increase is approximately 3.1 degrees Fahrenheit.

For the 59 year period from 1949 to 2008:

Mean spring temperatures increased an average of $\sim 3.5^{\circ}$ F

Mean summer temperatures increased an average of $\sim 2.1^{\circ}$ F

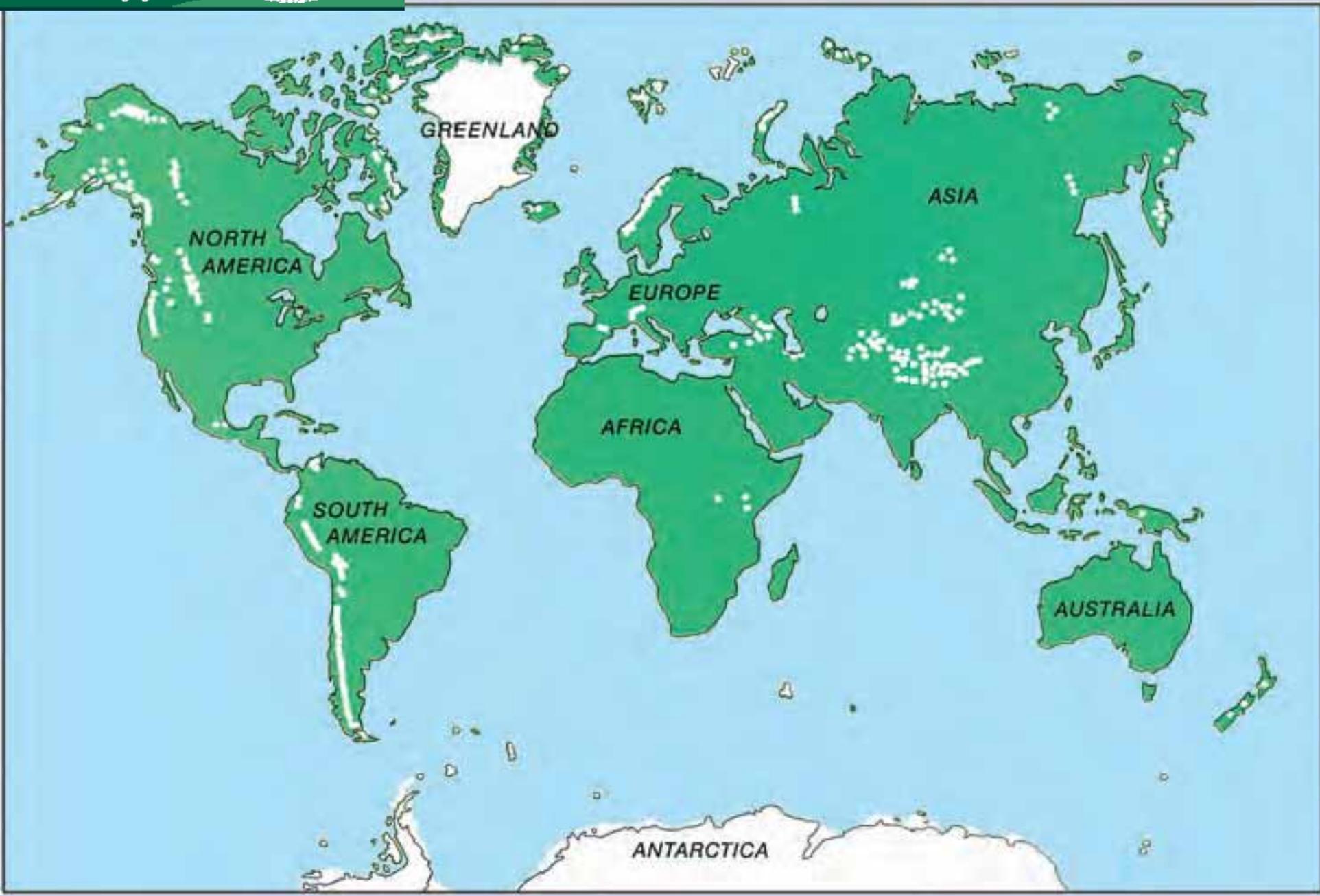
Mean autumn temperatures increased an average of $\sim 0.9^{\circ}$ F

Mean winter temperatures increased an average of $\sim 6.0^{\circ}$ F

Overall, mean annual temperatures increased $\sim 3.1^{\circ}$ F

An aerial photograph of a coastal city, likely San Francisco, showing the city's layout, the bay, and the surrounding hills. The text is overlaid in the center of the image.

**This is Resulting in
Sea Level Change &
Exposed Vulnerable
Unstable Coastlines**



Muir Glacier – 1899 – G.K. Gilbert







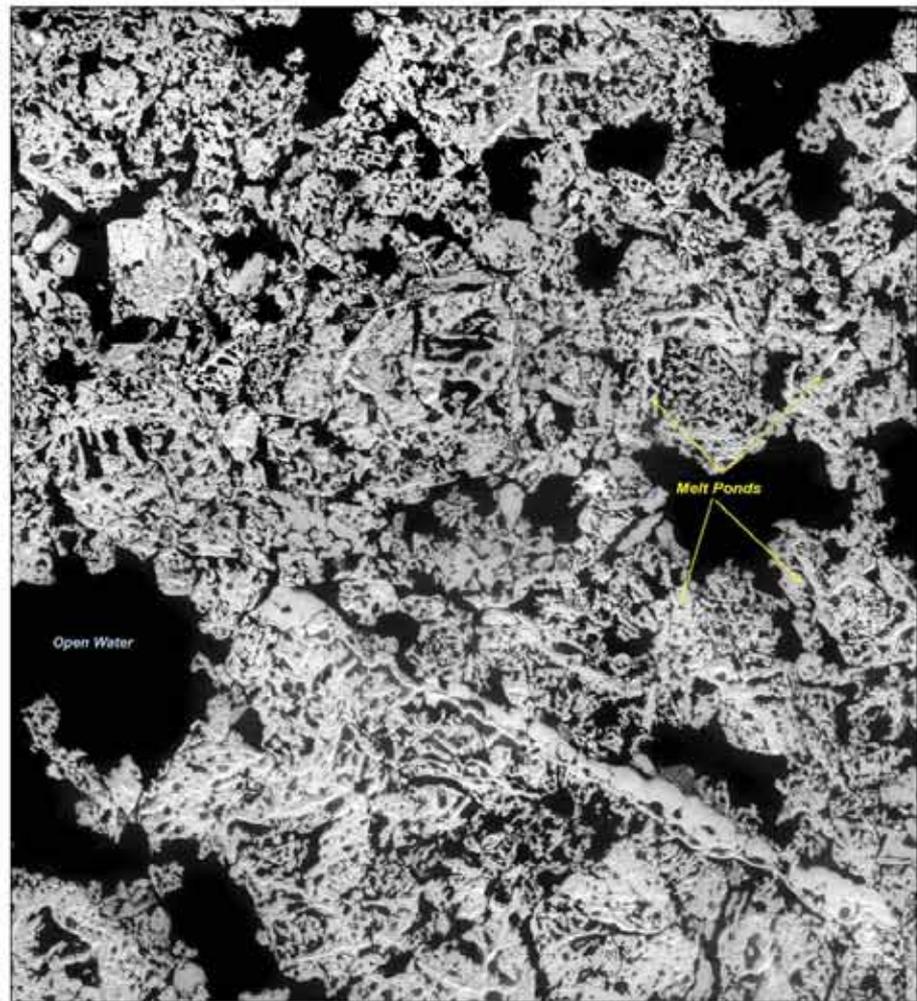
Muir Inlet - 2003



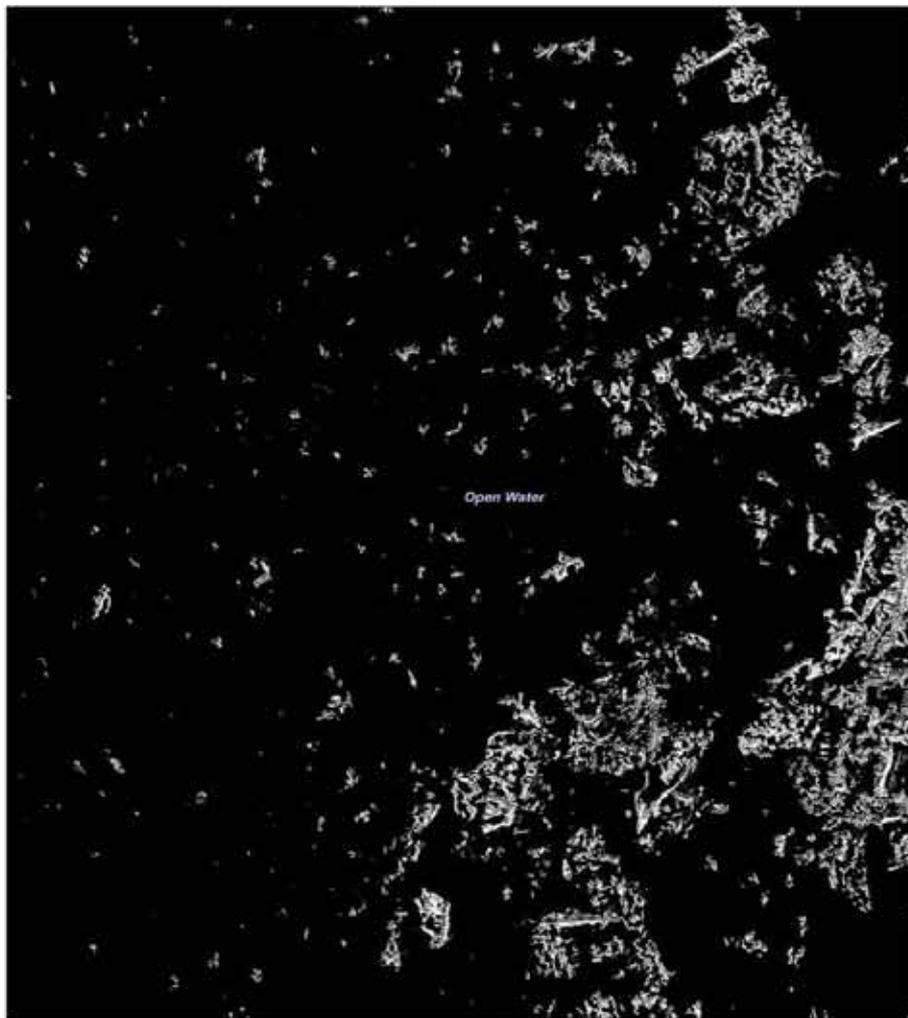
Sea Ice

Beaufort Sea

August 2001

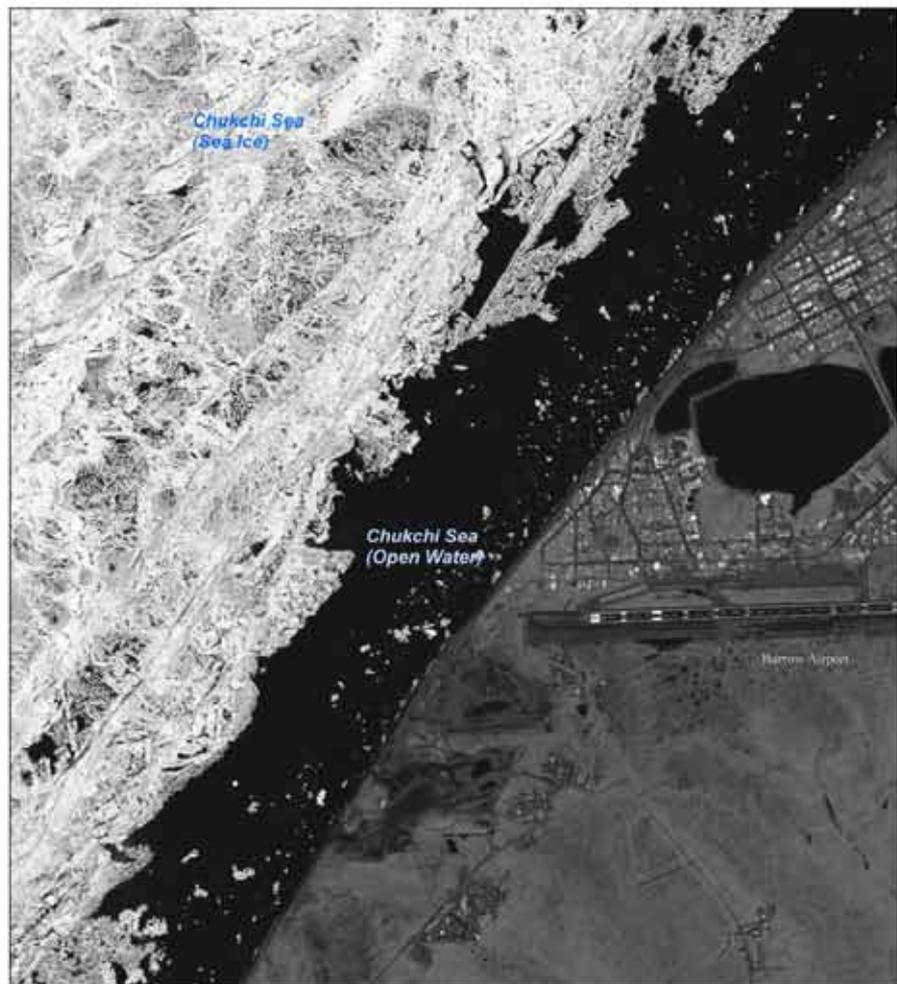


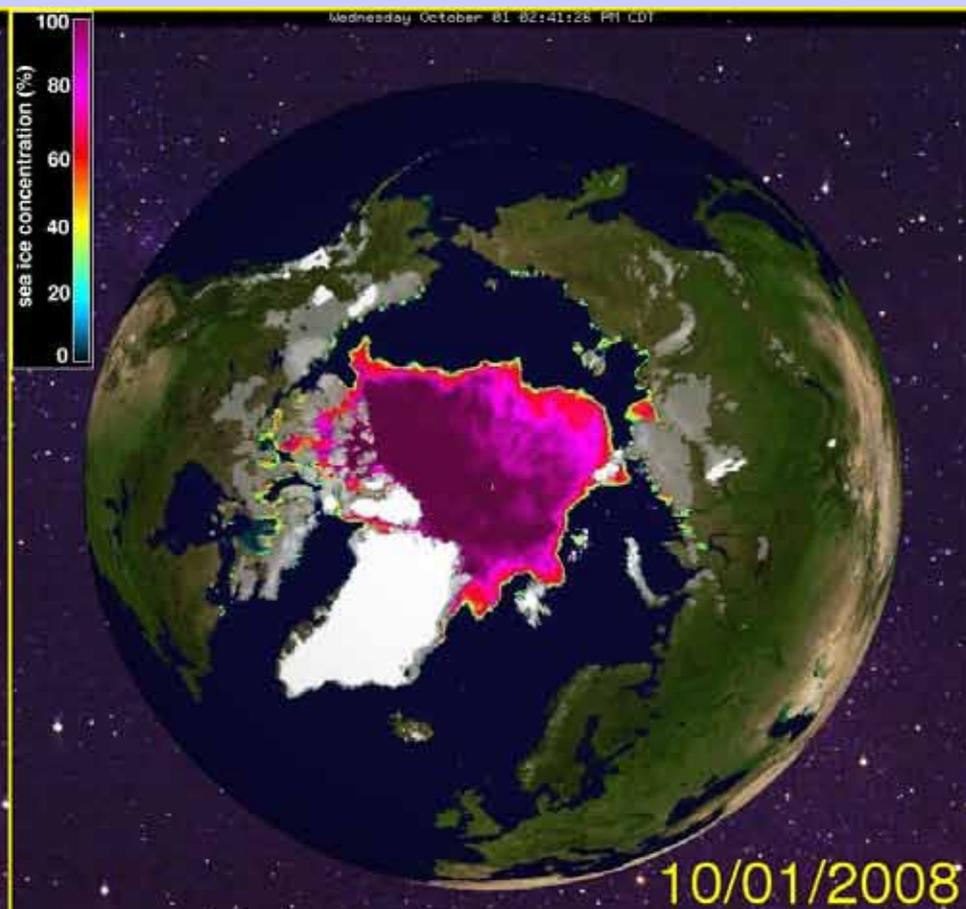
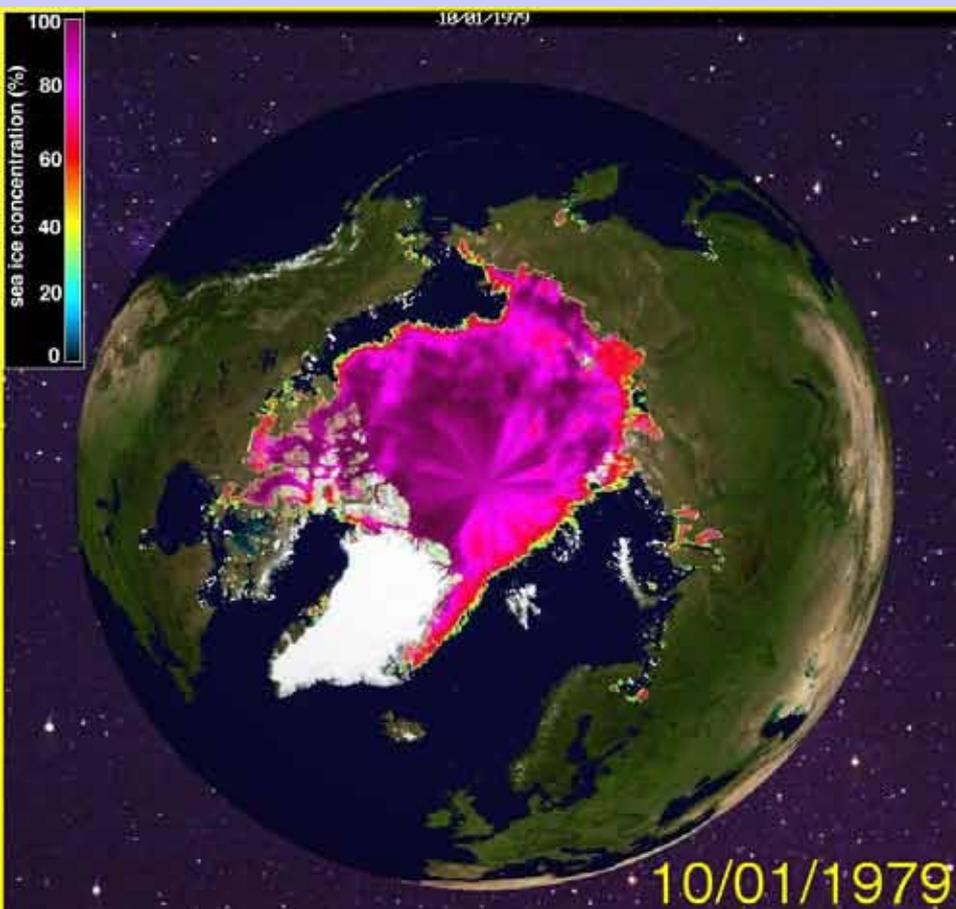
August 2007



Arctic sea ice cover has been declining for many years.

Barrow, Alaska





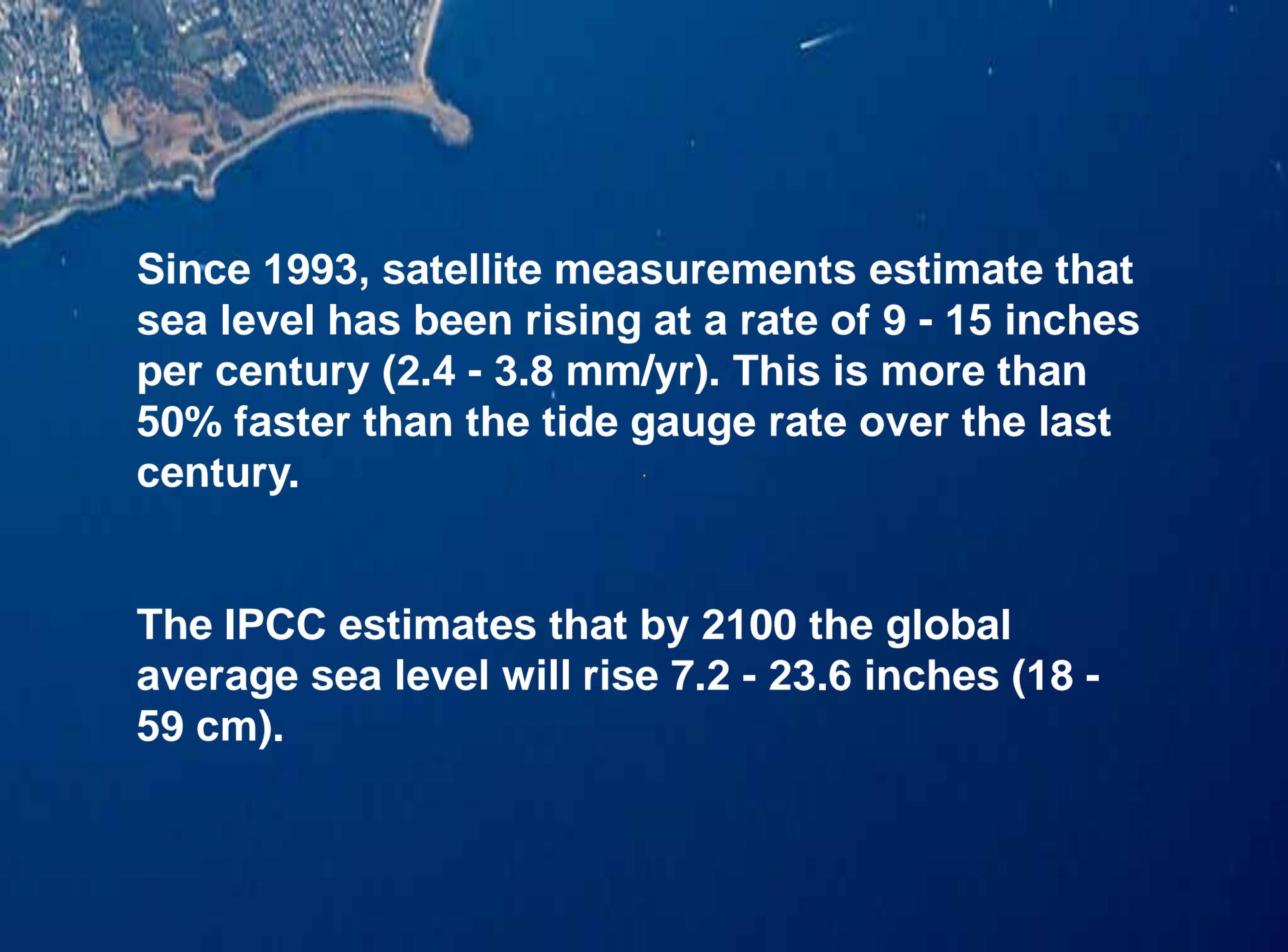




Recent, Current, and Future Sea Level Change

During the 20th century, sea level rose at an average rate of 4.8 – 8.8 inches (12 – 22 cm).

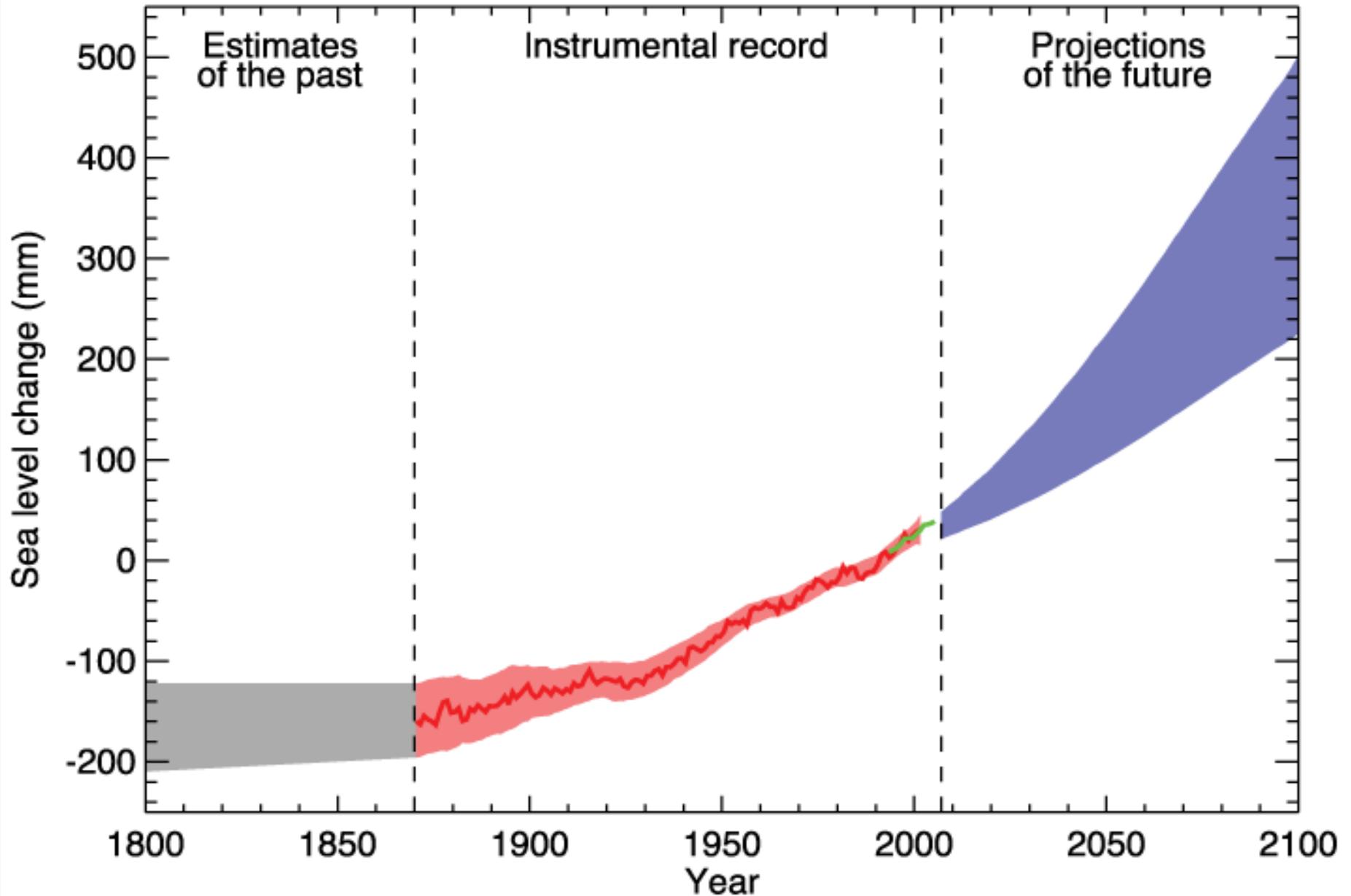
The IPCC expresses high confidence that the rate of observed sea level rise increased from the mid 19th to the mid 20th century.

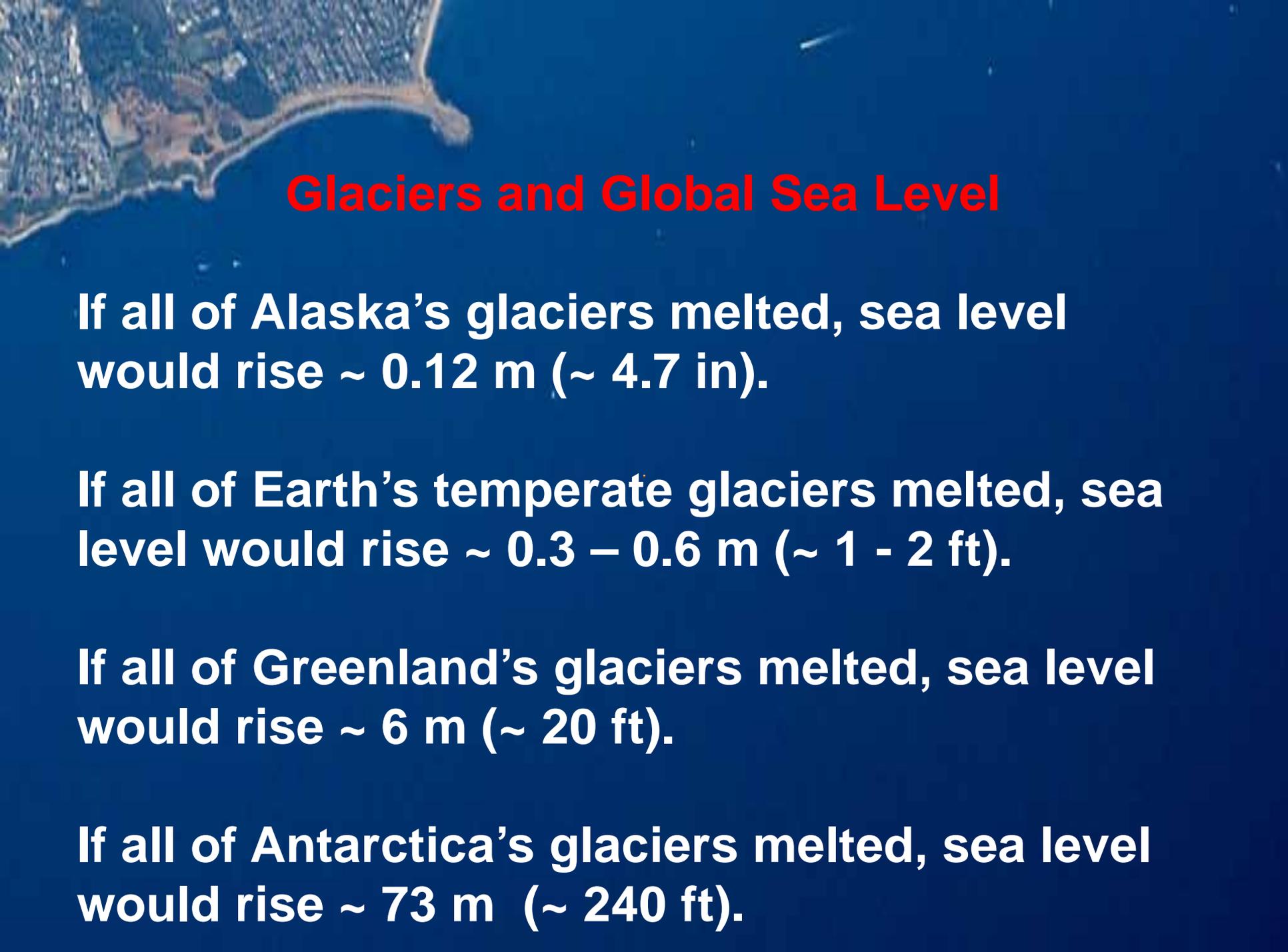
A satellite image showing a coastline. The land is a mix of brown and green, indicating a mix of land and vegetation. The ocean is a deep blue. The coastline is irregular, with several bays and peninsulas.

Since 1993, satellite measurements estimate that sea level has been rising at a rate of 9 - 15 inches per century (2.4 - 3.8 mm/yr). This is more than 50% faster than the tide gauge rate over the last century.

The IPCC estimates that by 2100 the global average sea level will rise 7.2 - 23.6 inches (18 - 59 cm).

Changing Sea Level – 1800 - 2100





Glaciers and Global Sea Level

If all of Alaska's glaciers melted, sea level would rise ~ 0.12 m (~ 4.7 in).

If all of Earth's temperate glaciers melted, sea level would rise ~ 0.3 – 0.6 m (~ 1 - 2 ft).

If all of Greenland's glaciers melted, sea level would rise ~ 6 m (~ 20 ft).

If all of Antarctica's glaciers melted, sea level would rise ~ 73 m (~ 240 ft).

