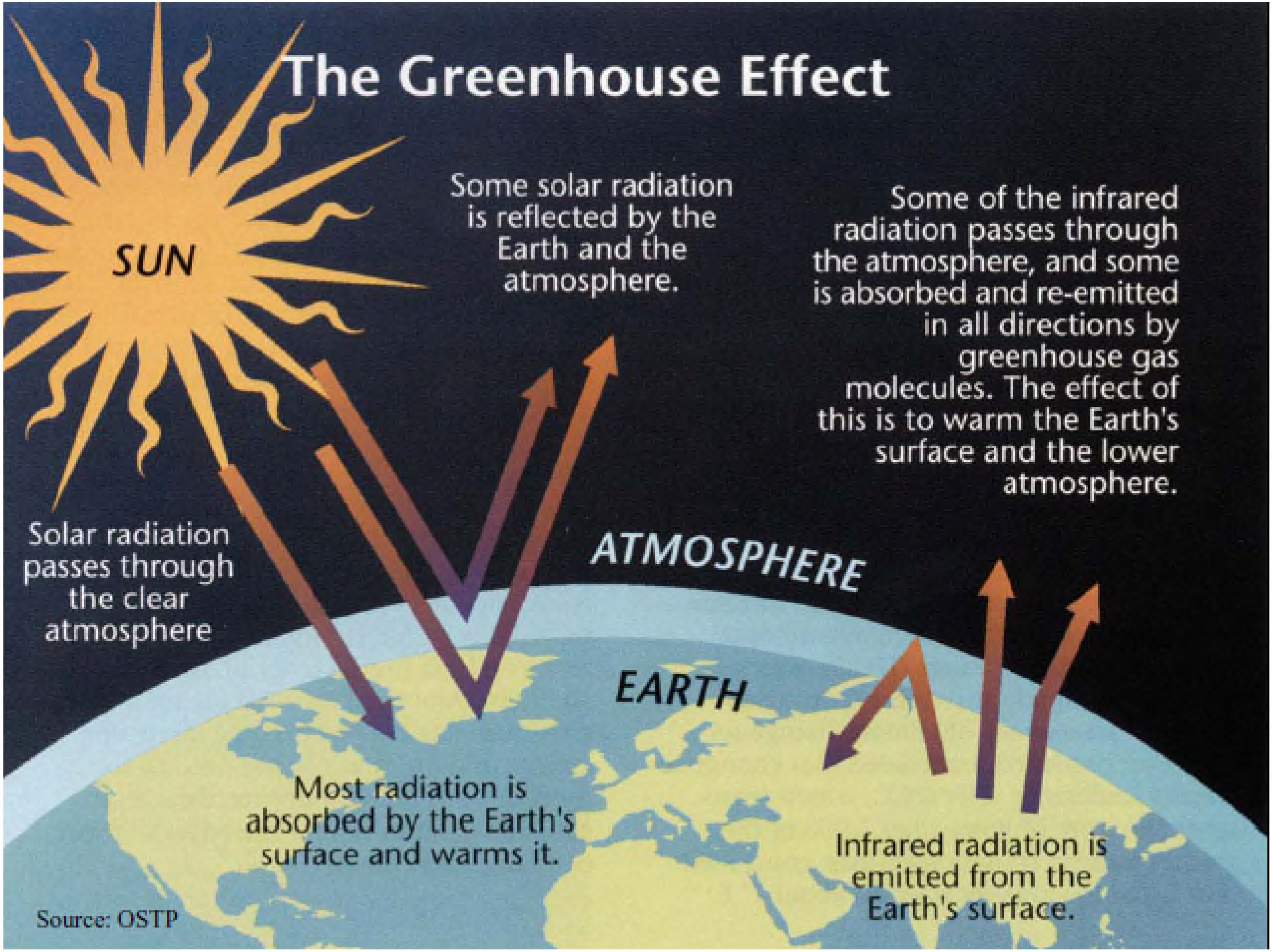
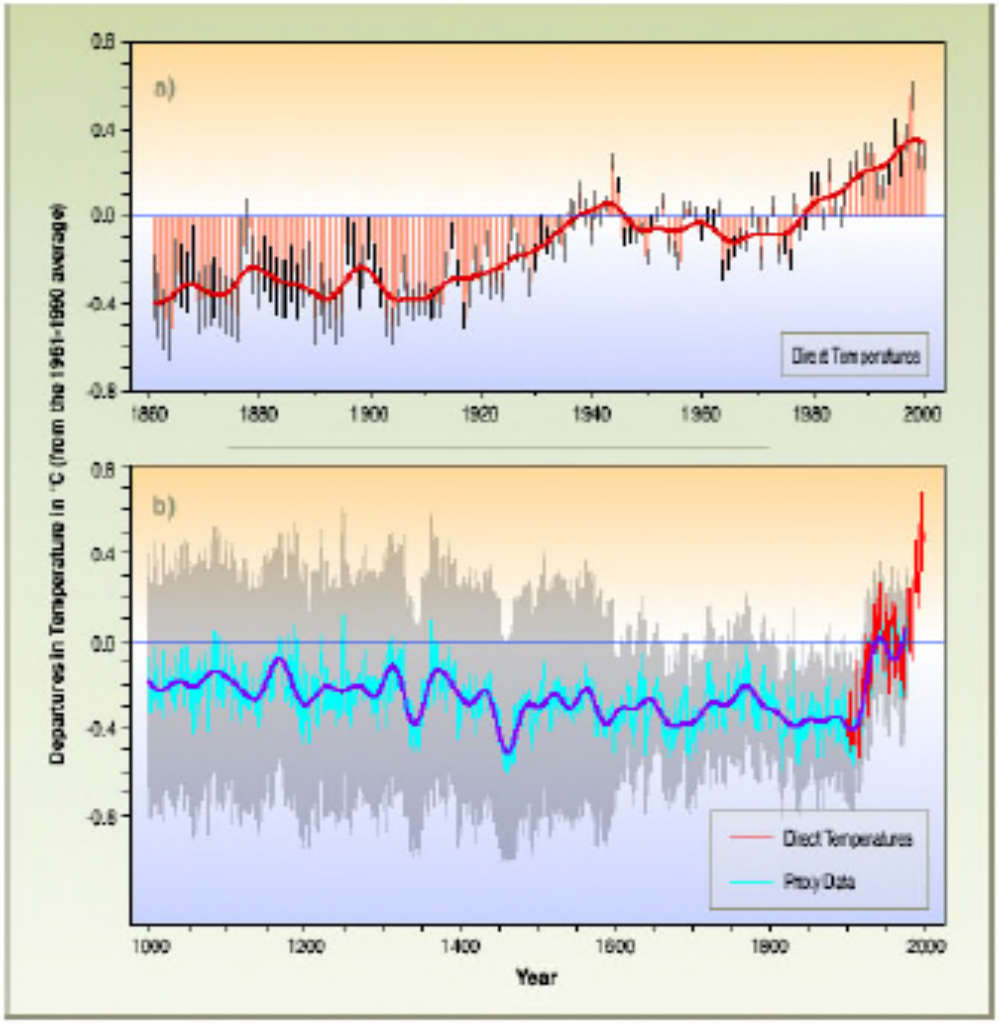
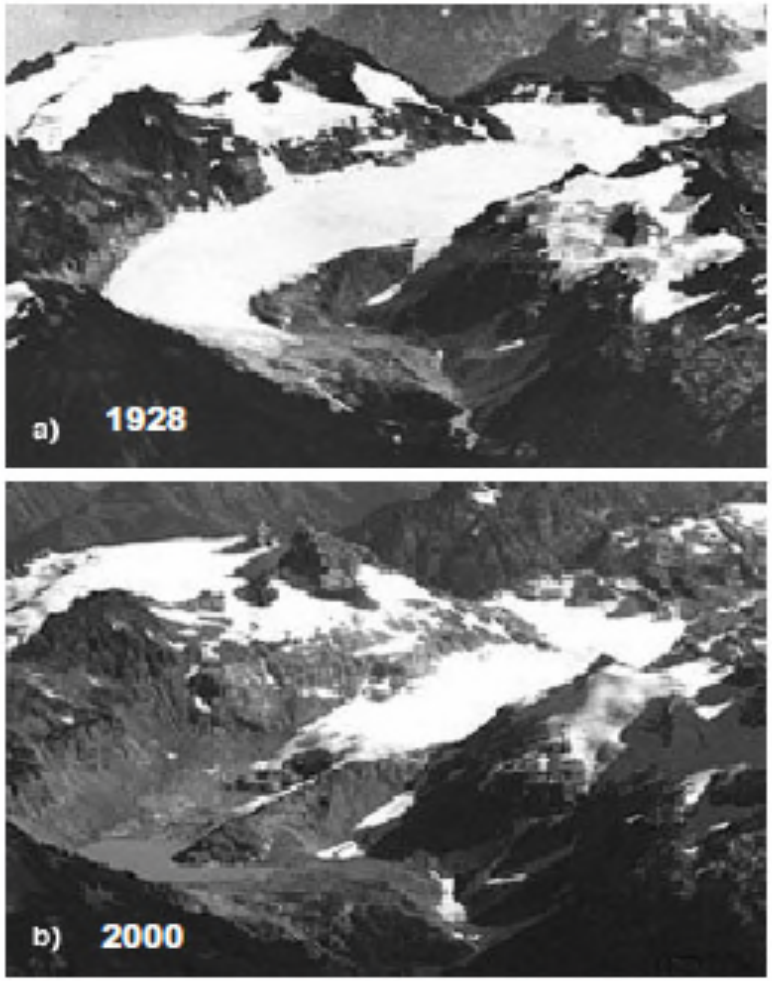

The Greenhouse Effect
SUN
Some solar radiation is reflected by the Earth and the atmosphere.
Some of the infrared radiation passes through the atmosphere, and some is absorbed and re-emitted in all directions by greenhouse gas molecules. The effect of this is to warm the Earth's surface and the lower atmosphere.
Solar radiation passes through the clear atmosphere
ATMOSPHERE
EARTH
Most radiation is absorbed by the Earth's surface and warms it.
Infrared radiation is emitted from the Earth's surface.
Source: OSTP

Strong Evidence for Global Warming

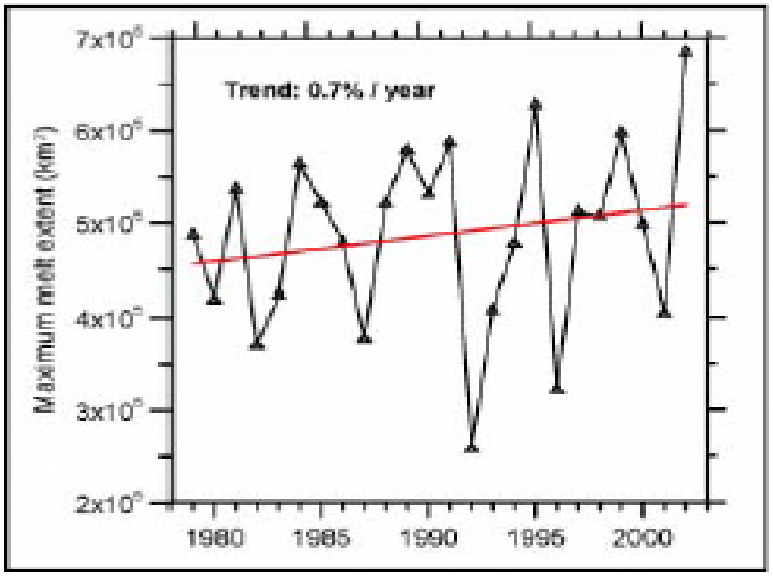


From US Climate Change Science Program

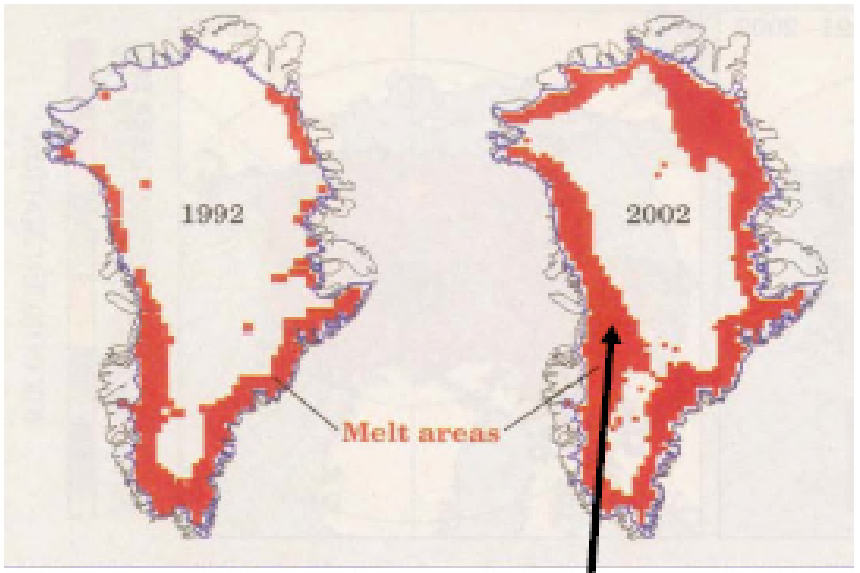


South Cascade Glacier, Washington

Increasing Melt Area on Greenland



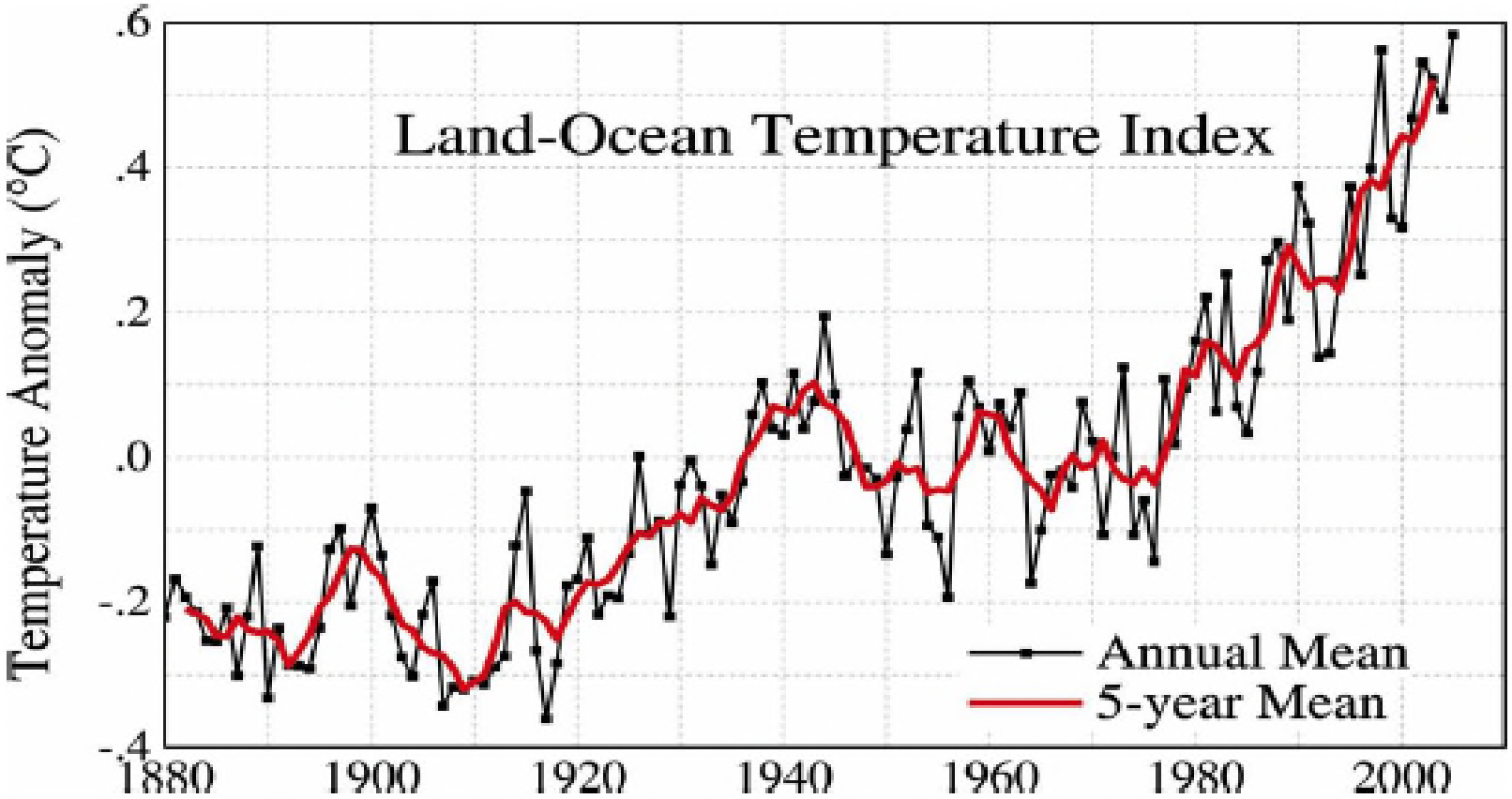
- 2002 all-time record melt area
- Melting up to elevation of 2000 m
- 16% increase from 1979 to 2002



70 meters thinning in 5 years

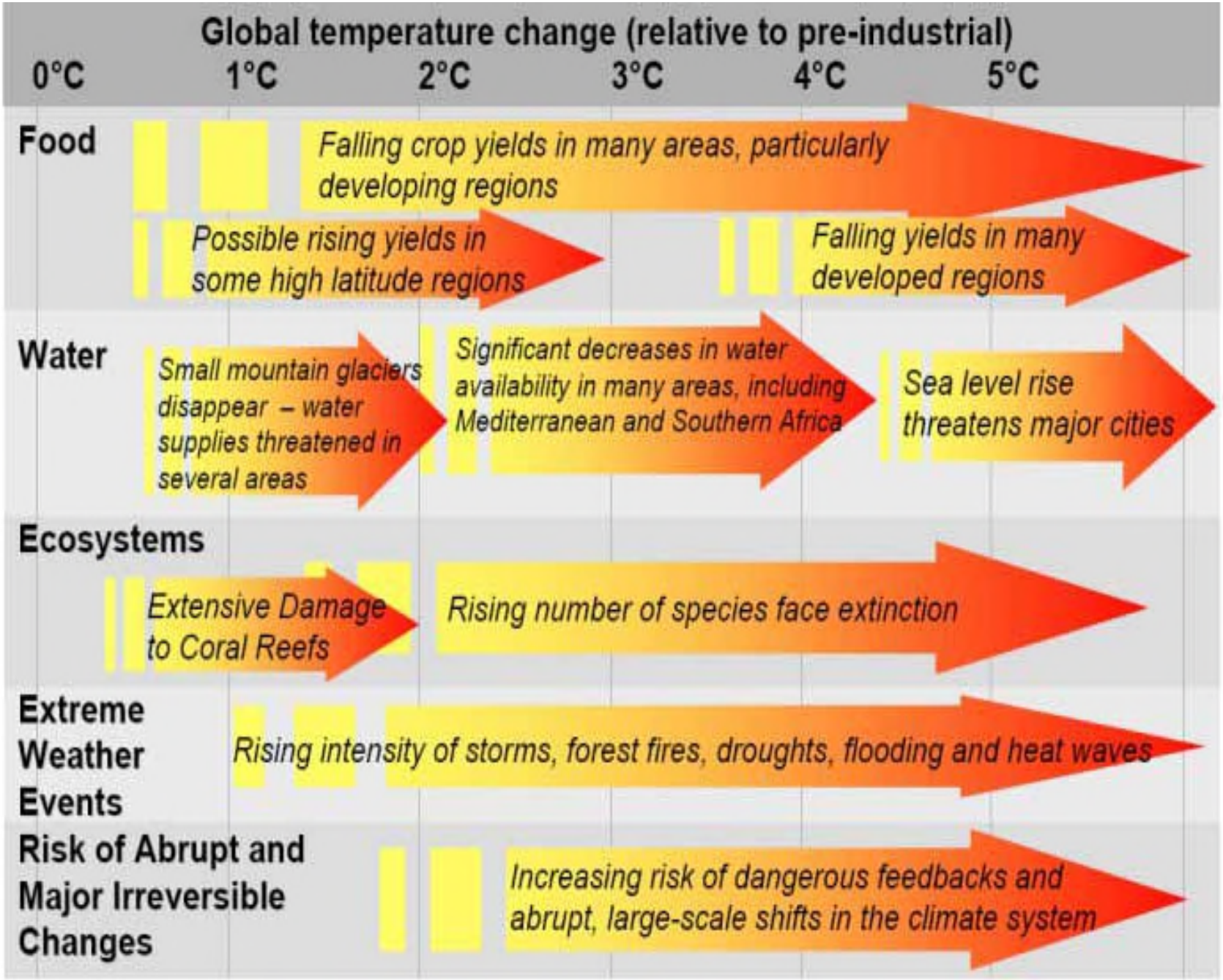
Satellite-era record melt of 2002 was exceeded in 2005.

Source: Waleed Abdalati, Goddard Space Flight Center

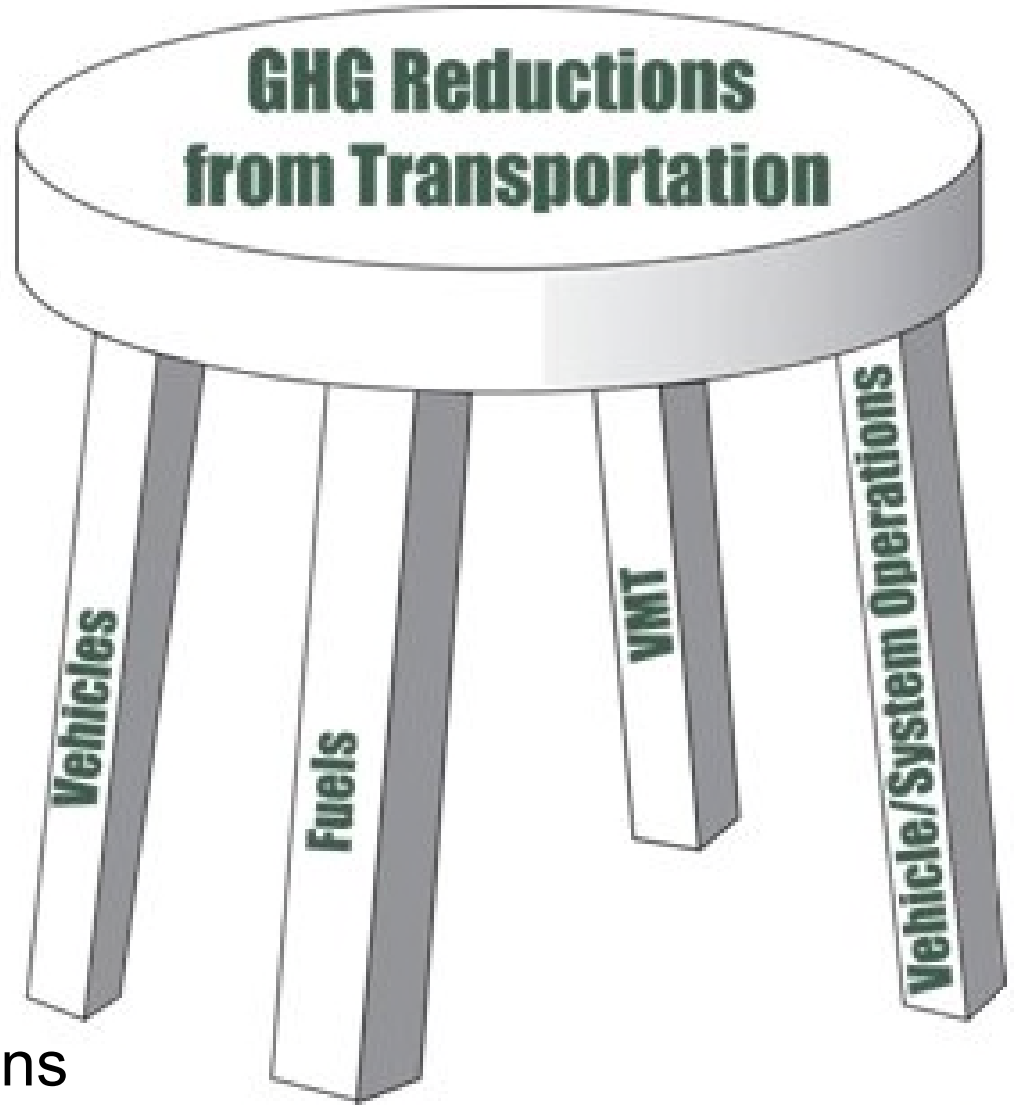


Global mean surface temperature change based on surface air measurements over land and SSTs over ocean. *Source:* Update of Hansen et al., *JGR*, 106, 23947, 2001; Reynolds and Smith, *J. Climate*, 7, 1994;Rayner et al., *JGR*, 108, 2003 (afterJames E.Hansen 2006).

Proj


Global temperature change (relative to pre-industrial)
0°C
1°C
2°C
3°C
4°C
5°C
Food
Falling crop yields in many areas, particularly developing regions
Possible rising yields in some high latitude regions
Falling yields in many developed regions
Water
Small mountain glaciers disappear – water supplies threatened in several areas
Significant decreases in water availability in many areas, including Mediterranean and Southern Africa
Sea level rise threatens major cities
Ecosystems
Extensive Damage to Coral Reefs
Rising number of species face extinction
Extreme Weather Events
Rising intensity of storms, forest fires, droughts, flooding and heat waves
Risk of Abrupt and Major Irreversible Changes
Increasing risk of dangerous feedbacks and abrupt, large-scale shifts in the climate system

Transportation GHG Reduction is a Four-legged Stool

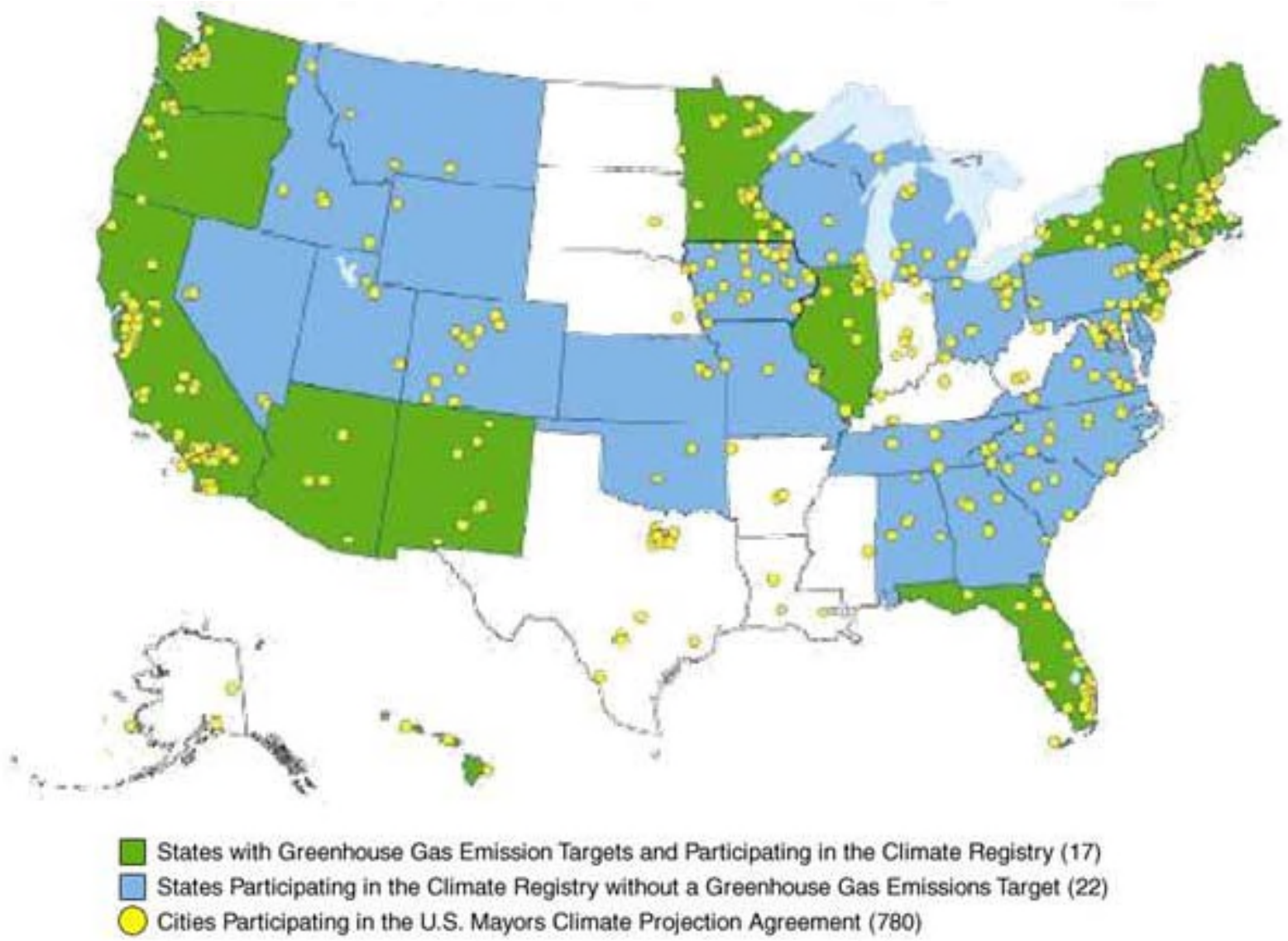


The 3-legged stool:
- Vehicles
- Fuels
- VMT

The 4th leg:
- Vehicle/System Operations

Many States Are Developing Aggressive Climate Action Plans

State and Local Participation in Selected Climate Change Initiatives



Lowering Greenhouse Gas Emissions

Effective public transportation systems can significantly reduce greenhouse gas emissions and air pollution, while at the same time reducing congestion.

Local governments can buy fuel efficient or alternative fuel vehicles for their fleets, including, buses, passenger vehicles, etc.

By creating pedestrian and biker friendly travel routes, cities and towns can often decrease the number of vehicles on the road, leading to less congestion, air pollution and greenhouse gas emissions.

A SAFETEA-LU reauthorization bill has not yet been introduced in the Senate and is currently being drafted by Environment and Public Works Committee staff.

Senate Commerce Committee Chairman John Rockefeller (D-W. Va.) and Surface Transportation Subcommittee Chairman Frank Lautenberg (D-N.J.) introduced "The Federal Surface Transportation Policy and Planning Act of 2009" legislation to establish a strategic, comprehensive national transportation policy.

The major goals of the bill are to:

- Reduce national per capita motor vehicle miles traveled on an annual basis;
- Reduce national motor vehicle-related fatalities by 50% by 2030;
- Reduce national surface transportation-generated carbon dioxide levels by 40% by 2030;
- Reduce national surface transportation delays per capita on an annual basis;
- Increase the percentage of system-critical surface transportation assets that are in a state of good repair by 20% by 2030;
- Increase the total usage of public transportation, intercity passenger rail services, and non-motorized transportation on an annual basis;
- Increase the proportion of national freight transportation provided by non-highway or multimodal services by 10% by 2020; and
- Reduce passenger and freight transportation delays and congestion at international points of entry on an annual basis.