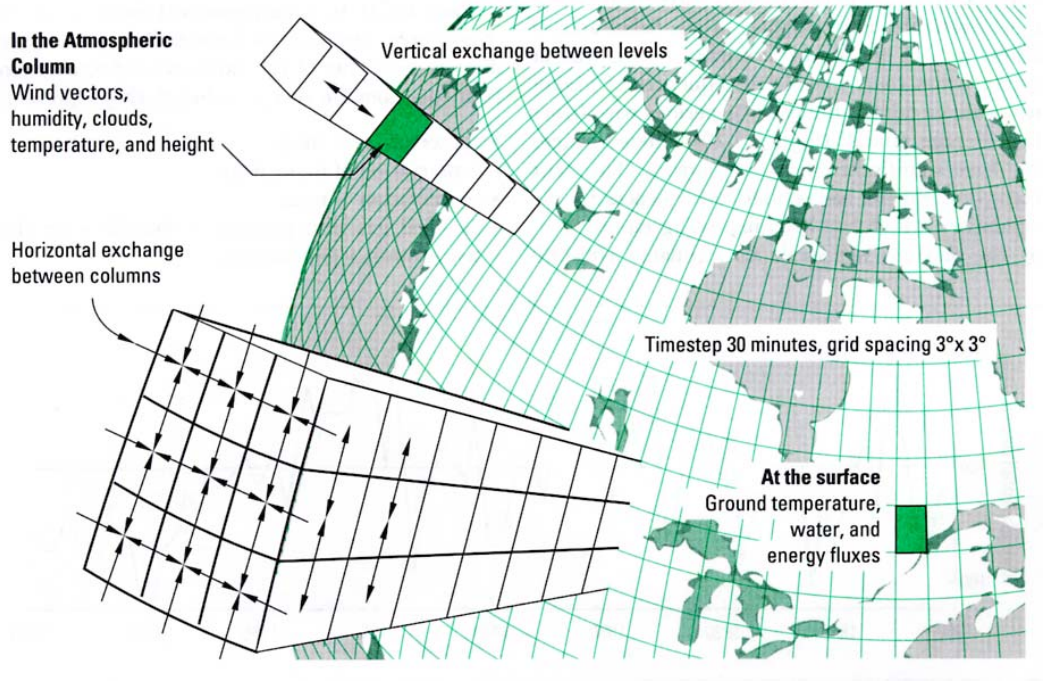
Severe Weather with Warming is Scientifically Incorrect

Many media stories usually based on reports from scientists claim storms and severe weather will increase and intensify with global warming. A recent example was a report of a NASA study that expanded the claim to include even smaller events such as thunderstorms.

http://www.usatoday.com/weather/climate/globalwarming/2007-08-31-severe-storms_N.htm

The scientists and the article acknowledge computer models of global climate are too coarse to simulate thunderstorms. They should also add they are too coarse to include relatively large weather systems. What does this mean? Computer models of global climate divide the world surface in to rectangles. These then become boxes of varying dimensions depending on how many layers you use for the atmosphere. This diagram illustrates the situation.

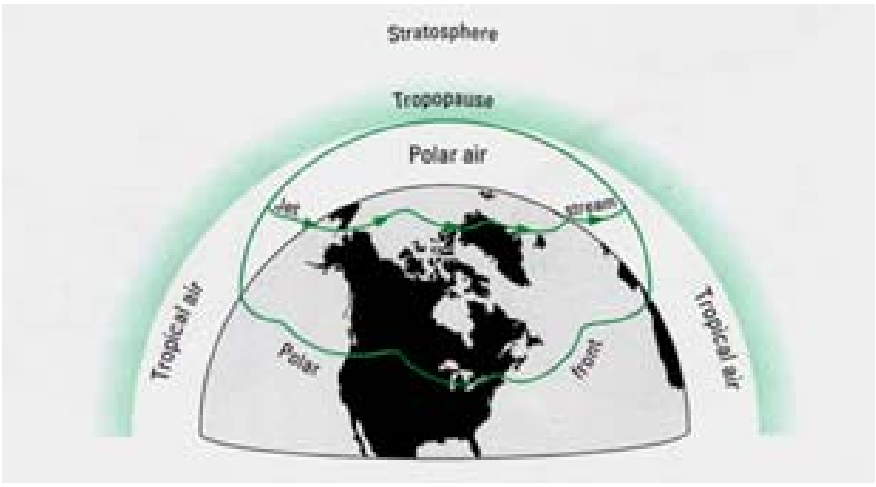


Source: Fundamentals of Physical Geography, Briggs, Smithson, Ball et al..

The size of the rectangles has decreased as computer capacity increased however the horizontal resolution varies from 250 to 600 km and the number of vertical divisions range from 10 to 20. Essex and McKitrick prosaically delineate the limitations in their book "Taken by Storm" as follows, "*At this moment, and at every moment, there are thousands of active thunderstorms in the hot, moist places of the planet. There are tens of millions of them in a year. It should be clear that this great and constant roar of atmospheric air conditioning is an important part of the global energy budget and should figure significantly into any model of the global climate. However, the mighty creature overhead, along with all of its cousins, is too small to show up in even the biggest and grandest global climate models. They are in the jargon of the field,* ***sub-grid scale*** *-computer reuse for "they fall between the cracks.""*

The NASA scientist also using a computer model, but presumably at a smaller scale, says his, *" computer model shows global warming will mean more strong updrafts, when the wind moves up and down instead of sideways."* The article then says, "*a unique combination of geography and weather patterns already makes the USA the world's hottest spot for tornadoes and severe storms in spring and winter. The large land mass that warms on hot days, the contours of the atmosphere's jet stream, the wind coming off the Rocky Mountains and more moist air coming up from the Gulf of Mexico all combine.*" These comments infer but fail to specify that it is the temperature contrast created by these juxtapositions that determine the frequency and intensity of the storms.

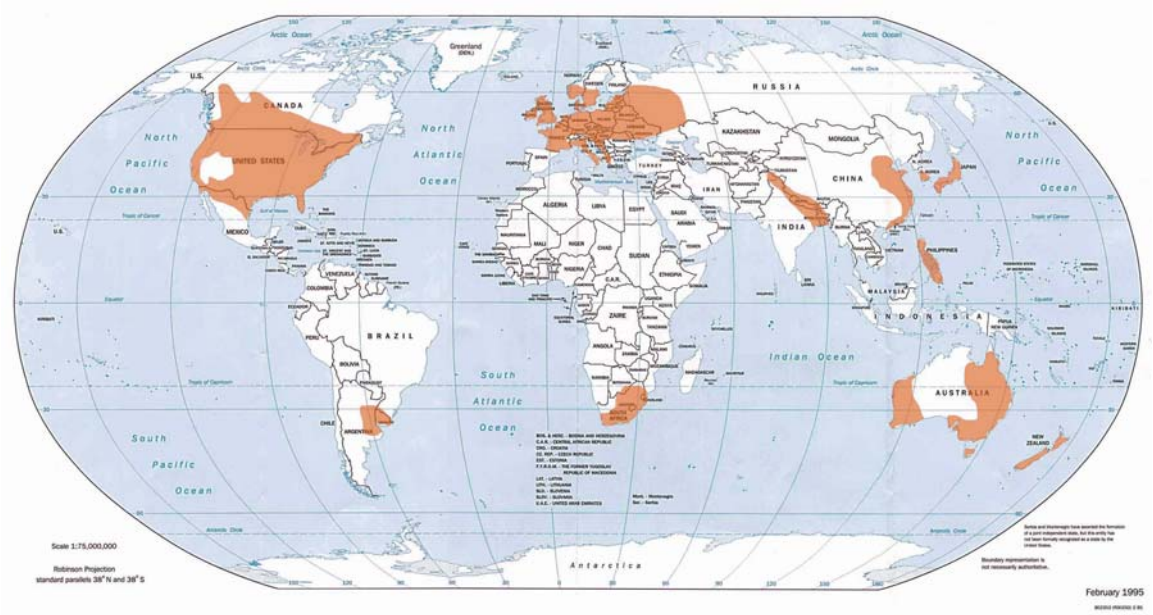
Here is a diagram that shows the basic division of the atmosphere between the cold polar air and the warm subtropical air. Almost all severe weather occurs in the middle latitudes between approximately 30° and 65° of latitude. Cyclonic storms, blizzards, severe thunderstorms and tornadoes are created where warm and cold air meet and that is most dramatic along what is generally known as the Polar Front.



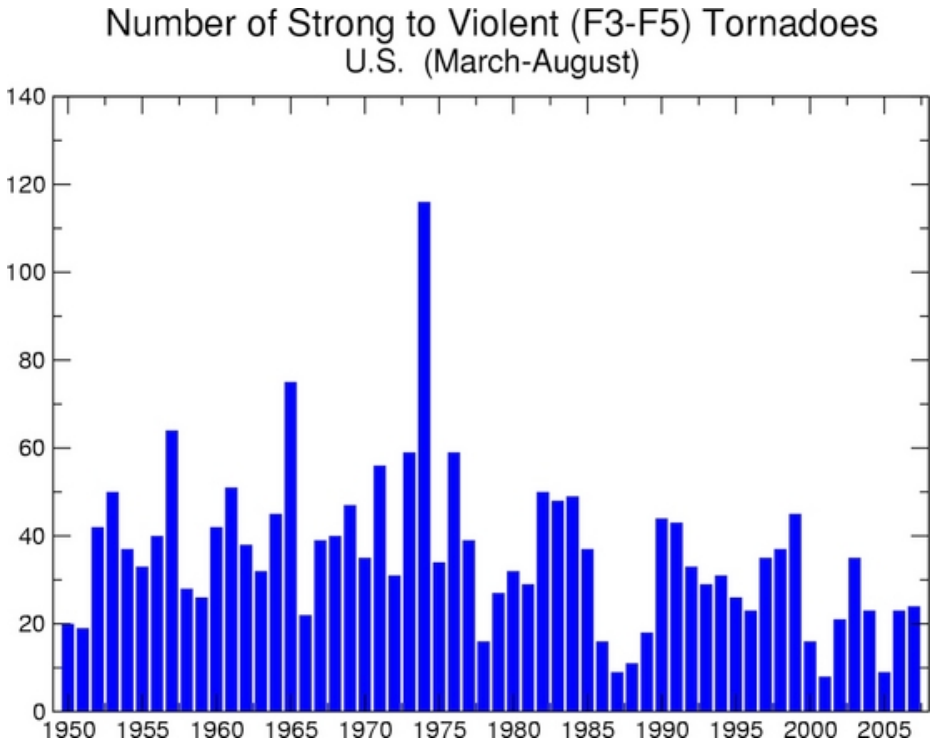
Source: Fundamentals of Physical Geography, Briggs, Smithson, Ball et al.
Temperature contrast across the Polar Front is the greatest in a short distance in each hemisphere. Temperature difference is directly related to pressure difference and the measure of the pressure difference between 35 and 55 degrees latitude is known as the zonal index. This pressure difference creates the strongest winds as illustrated by the location of the Jet Stream (more correctly called the Circumpolar Vortex) above the surface. It also means the formation of swirling low pressure systems or cyclones that in winter are blizzards. As the cold air advances it pushes up unstable bubbles of warm air to create heavy rain from large clouds. With enough force these can develop in to severe thunderstorms (cumulonimbus) and under certain conditions trigger tornadoes.

Why are the IPCC prediction and the media reports wrong? IPCC Reports claim increased CO2 levels will make the Polar air warm more than the Tropical air. If true, this will decrease the temperature contrast across the Front resulting in fewer storms and less severe weather. The exact opposite of what they claim. Current and historic records support this position.

This world map of tornado zones illustrates the point as they show the zones influenced by the Polar Front over the year and modified by land/sea and geographic factors. The contrast is greatest in the US and creates what is called Tornado Alley.



Source:
http://www.ncdc.noaa.gov/oa/climate/severeweather/tornadoes.html



http://www.ncdc.noaa.gov/oa/climate/severeweather/tornadoes.html

The graph from the National Oceanographic and Atmospheric Administration (NOAA) shows that severe tornadoes were higher in the period from 1950 to 1975 when global temperatures were going down. From 1980 to 2000 the world warmed and severe tornadoes declined. Since 2000 the world has cooled slightly and the pattern shows a slight increase in severe tornadoes.

Histories show storm frequencies and intensities increased with colder conditions. The massive storm, unequalled in the modern records that destroyed the Spanish Armada in 1588 is just one example. John Kington produced daily weather maps for a three-month period of 1588 including isobars based on ships records, and observations in Western Europe such as the journals kept by astronomer Tycho Brahe. A recent study commented on here adds further support:

http://wattsupwiththat.wordpress.com/2008/08/03/captains'-logs-yield-clues-to-past-climate-and-hurricanes/

Notice the prefacing comment by well-known meteorologist Anthony Watt's, "What I find most interesting is the 'Surge in the frequency' of storms in cold periods". He shouldn't be surprised but maybe this underscores the difference between meteorology the study of physics of the atmosphere and climate the study of changing weather patterns over time.

This very recent trend of an increase in severe weather is most likely to continue as the Earth cools. Proponents of human caused climate change will claim it proves them right. **They will continue their practice of claiming natural events as unnatural.** Uninformed and biased media will continue to amplify and disperse the false information. Unless people understand the basic science they will continue the fraud and thereby pressure politicians into inappropriate policies.

Dr. Tim Ball September 2008