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Comments: Global warming is dominated by considering the near-surface air temperature (Tsfc) as if it were a standard by which one might measure the climate impact of the extra warming due to increases in greenhouse gases. Fundamentally, the proper variable to measure is heat content, or the amount of heat energy (measured in joules) in the climate system, mainly in the oceans and atmosphere. Thus the basic measurement for detecting greenhouse warming is how many more joules of energy are accumulating in the climate system over that which would have occurred naturally. This is a truly "wicked" problem (see House Testimony, Dr. Judith Curry, 17 Nov 2010) because we do not know how much accumulation can occur naturally. Unfortunately, discussions about global warming focus on Tsfc even though it is affected by many more processes than the accumulation of heat in the climate system. Much has been documented on the problems, and is largely focused on changes in the local environment, i.e. buildings, asphalt, etc. This means that using Tsfc, as measured today, as a proxy for heat content (the real greenhouse variable) can lead to an overstatement of greenhouse warming if the two are assumed to be too closely related. In a complicated process, due to these local changes, there is greater mixing of the naturally warmer air above down to the shallow nighttime cool layer. This makes TMin warmer, giving the appearance of warmer nights over time. The subtle consequence of this warming is from a turbulent process which redistributes heat near the surface not to the accumulation of heat related to greenhouse warming of the deep atmosphere. The importance of this is that many of the positive feedbacks that amplify the CO2 effect in climate models depend on warming of the deep atmosphere not the shallow nighttime layer. During the day, the sun generally heats up the surface, and so air is mixed through a deep layer. Thus, the daily high temperature (TMax) is a better proxy of the heat content of the deep atmosphere since that air is being mixed more thoroughly down to where the thermometer station is. The relative lack of warming in TMax is an indication that the rate of warming due to the greenhouse effect is smaller than models project.The problem with the popular surface temperature datasets is they use the average of the daytime high and nighttime low as their measurement (i.e. (TMax+TMin)/2). But if TMin is not representative of the greenhouse effect, then the use of TMin with TMax will be a misleading indicator of the greenhouse effect. TMax should be viewed as a more reliable proxy for the heat content of the atmosphere and thus a better indicator of the enhanced greenhouse effect. This exposes a double problem with models. First of all, they overwarm their surface compared with the popular surface datasets (the non-circle symbols in Fig. 2.1). Secondly, the popular surface datasets are likely warming too much to begin with. This is why I include the global satellite datasets of temperature which are not affected by these surface problems and more directly represent the heat content of the atmosphere (see Christy et al. 2010, Klotzbach et al. 2010).Watts et al. demonstrate that when humans alter the immediate landscape around the thermometer stations, there is a clear warming signal due simply to those alterations, especially at night. An even more worrisome result is that the adjustment procedure for one of the popular surface temperature datasets actually increases the temperature of the rural (i.e. best) stations to match and even exceed the more urbanized (i.e. poor) stations. This is a case where it appears the adjustment process took the spurious warming of the poorer stations and spread it throughout the entire set of stations and even magnified it. This is ongoing research and bears watching as other factors as still under investigation, such as changes in the time-of-day readings were taken, but at this point it helps explain why the surface measurements appear to be warming more than the deep atmosphere (where the greenhouse effect should appear.)Activists claim that the 2011 drought in Texas was 20 times more likely due to extra greenhouse gases, but only based on statistics from a modeling exercise . As it turns out, the model overstated the warming rate of Texas, so that it's statistics wouldn't apply correctly to the real world. In fact, the authors of the original article actually made that point in their study saying the result gave very limited information regarding real world impacts, and that the amount of impact of greenhouse gases was unknown. This was (another) unfortunate episode in misrepresenting the science of climatology.