



The Influences of the Anthropogenic Agents in Increasing the Temperature for Various Emission Scenarios.

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Abstract:

Predicting future climate regionally and by space images and landscape studies indicate that the major influences is the increasing of carbon dioxide which attain to more than 350 ppm. The evidences accordingly refer to the increase in the earth temperature which attains to approximately 4 C° and 7.2 F° causes rapid inversion and changing the climate, so the surface air temperature is 22 C° in 1999 will be accordingly more than 26 C° in 2090.

Key words: Greenhouse gases , Global warming ,Climate change

تأثيرات العوامل البشرية في زيادة حرارة الارض من خلال سيناريوهات انبعاث مختلفة

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الخلاصة

ان التنبؤ بالتغيرات المناخية المستقبلية يعتمد على تقدير غاز ثاني اوكسيد الكاربون وزيادته بصورة كبيرة وهذا ما اوضحته دراسات الاستشعار عن بعد التي اشارة الى ريادة اكثر من 350 ج م م وهذا يزيد من درجة حرارة الارض حيث ان حرارة الجو في 1999 اذا كانت 22 درجة مئوية ستصبح عام 2090 26 درجة مئوية

Introduction:

Anthropogenic agents (human activity), are diagnosed since three decades and climatic zones shift overtime. In addition, topography changes, global temperatures change, and plate motions move landmasses to different latitudes, Montgomery (1). All these consequences will lead to change and deform the environment, which is already being noticeable on the whole atmosphere, precisely by adding so much undesirable materials to the nature causing wide and disastrous pollution either to water or air, and changing scarily the constant ratios of the Ecosystem and the wide influences which are directly affects the increasing of the ratios of greenhouse gases, which lead to form the known natural problem called the global warming(2). The case will be familiar and the studies should focused not only for the certain areas, but in this type of studies should have take in consideration so many parameters to avoid the bad consequences of the great influences of rising undesirable gases that ultimately causes wide destructions to the whole nature. The industrial countries are of certainly the main source of this type of disastrous pollution that extend the affection of the rising temperature to other urban, which is not so much deals with any type of industry.

The undertaken study is focused on one of the most important natural features called dust storms, that strikes so many countries from time to time, and its influences increased with the increasing of green house gases to include so many countries closer to deserts, to form one of the most threaten agents by extending the areas of deserts forming the most current and natural disastrous geographic features called Desertification.

The effects of climate –change _Induced drought

Virtually every aspect of the planet Earth, especially climate, has changed over the last four billion years. There is no reason to believe that these changes will cease, or more to the point, that we can stop such changes because they are now impacting our daily lives .From a geological point of view global climate change is inevitable, and we need to ask ourselves whether our efforts to curb such change is likely to have the desired mitigation effect? While the solution is complicated and certainly cannot be answered within such a research, but the goal is to help put global change with respect to various scenarios performed in one of the most developed laboratories .The Earth climate has changed considerably throughout geologic time and ironically ,we live at one of the few times when global climate is what geologists called "Icehouse condition" ,for most of Earth's history "hothouse or green house condition "prevailed, ice caps were absent ,and the average global temperature was considerably warmer than present. The consensus among scientists is the anthropogenic input of greenhouse gases to the atmosphere, particularly carbon dioxide (CO₂) have triggered a phase of global warming (3 ,4). The pace and intensity of future warming and the associated significant environmental changes are likely to be governed, in part, by anthropogenic green house gas inputs.

Global warming:

Defined as that some incoming sunlight is reflected by the Earth's atmosphere and surface but most is absorbed by *the surface, which is warmed. Infrared (IR) radiation* is then emitted from the surface. Some IR radiation escapes to space, but some is absorbed by the atmosphere's greenhouse gases (water vapor, carbon dioxide, and methane) and reradiated in all directions, some to space and some back toward the surface, where it further warms the surface and the lower atmosphere, forming recently common phenomenons in all over the world. The possibility that human actions are changing Earth's climate will be one of the most pressing concerns of the twenty first century (5), Figure-1. Climate greatly influences the distribution of life on Earth .Changes in temperature or moisture can alter populations, killing some organisms outright, stressing others, or causing migrations. Average global temperatures are increasing, with calculations projected from existing data predicting a rise in temperature of 2.5°F (1.4°C) by 2050. The primary cause of global warming is elevation in the concentration of CO₂ in the atmosphere .Carbon dioxide is a colorless, odorless gas present at a concentration of 370 parts per million. Although it is a minor atmospheric constituent, CO₂ has major effects on life by influencing temperature.

CO₂ that blankets Earth prevent radiation from exiting the atmosphere as quickly as it enters. CO₂ does not absorb short-wave solar radiation, including light waves. Thus, light reaches Earth's surface, where it is transduced to heat .The surface radiates long –wave heat radiation out ward, but CO₂ absorbs this radiation and reradiates some of it back toward Earth's surface, trapping heat there .This increase in surface temperature is called greenhouse effect, because CO₂ blocks heat escape much as do the glass panes of a greenhouse (E. Other gases that contribute to the greenhouse effect include methane, nitrous oxide, and CFCs .These gases trap heat much more efficiently than does CO₂, but because they are scarcer, they contribute only half as much to global warming. CO₂ level (2), and global average Temperature Figure -2. The presence of high ratios of greenhouse gases is already consider as Anthropogenic input model , associated with natural temperature sourced from volcanic activities and solar energy, inclined from natural temperature indicating the great influences of the increasing rate of temperature that exceeds warming and create wide spread climate changes Figure -3.

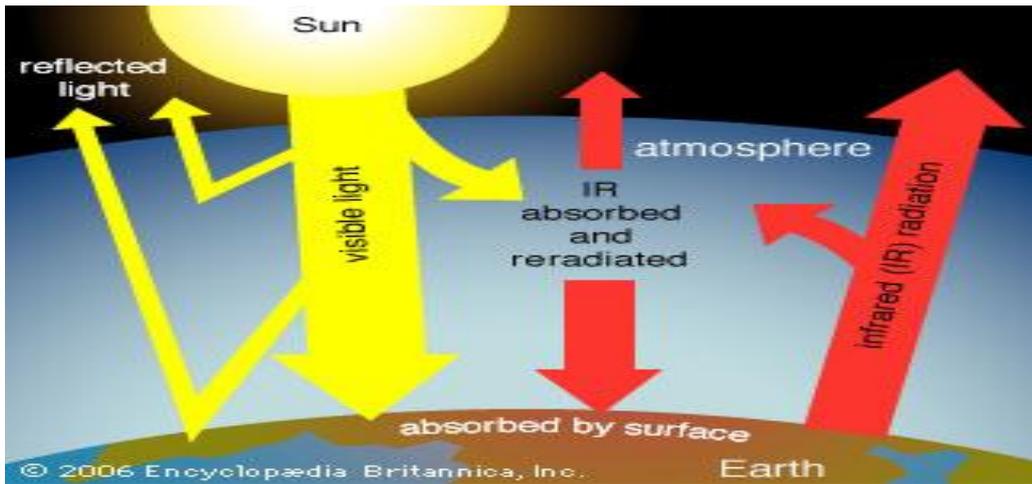


Figure 1- Illustration of the Global warming Encyclopædia Britannica ,Inc 2006.

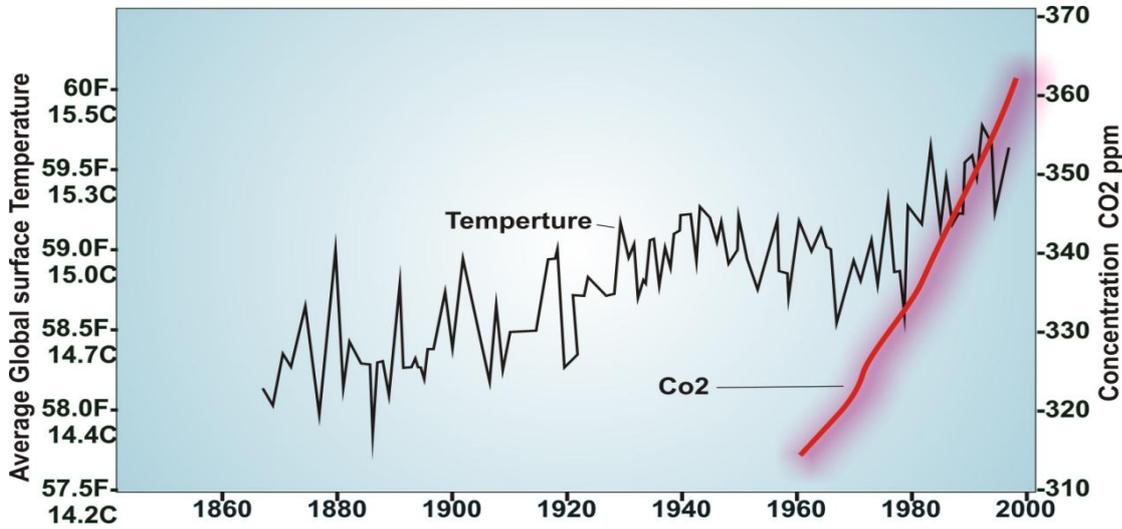


Figure 2 -The correlation of CO2 level and average temperature (Lewis etal, 2004)

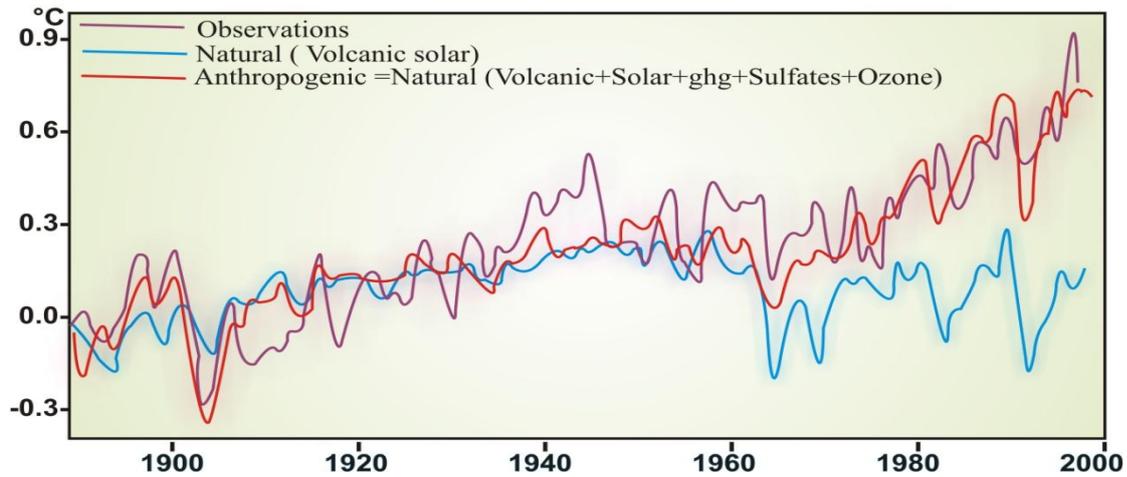


Figure 3 - The climate model output with the presences of global warming and beyond (IPCC)

Desertification:

The expansion of desert in to surrounding areas, it can be a natural process , a human –driven one ,or a combination of the two current desertification problems in Africa and Asia illustrate how short –sighted agricultural practices rob land of water. Although there are so many reasons for desertification in Africa, the problem is cattle grazing and in Asia it is growing cotton, so drought is not usual in this part of the world, and desertification is not limited. In many nations ,overgrazing ,improper irrigation ,unregulated vehicle activity ,and other human impacts are degrading arid lands .The extra ordinary warming due to green house still the main reason to climate change and thermal inversion by smog (smoke + fog) and acid rain ,also the surface temperature exceeds abnormally , all these agents and another pollutants contribute in expanding deserts. The deviation of moderate surface temperature of the Earth (land and ocean) along a century indicates actual rising approximately 1°C on the land and 0.5°C on the ocean refer clearly to a disastrous result in case the monitoring is absent. Figure -4.

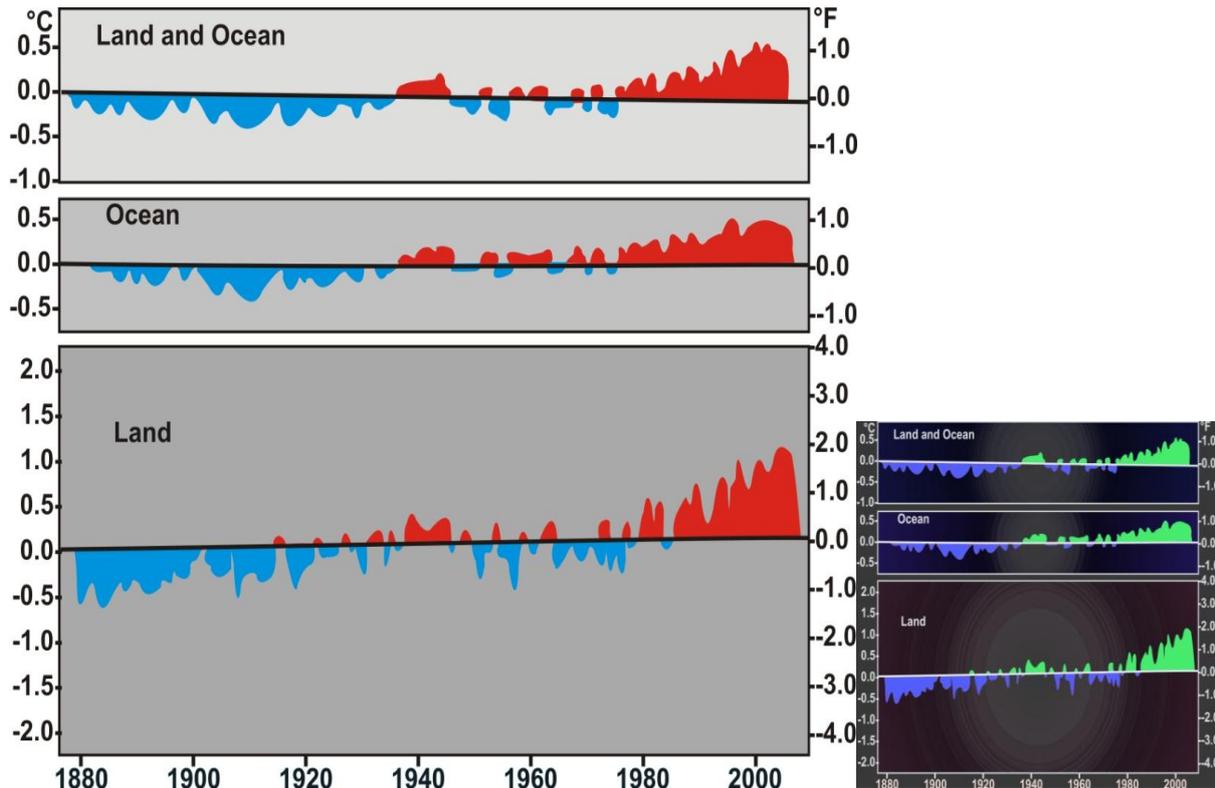


Figure 4-The deviation of moderate surface temperature (land and sea)

The influences of deserts on nearby regions

Even the most arid zones receive from 150 -200 mm (6-8in) of rainfall a year .In some parts there is no plant cover, elsewhere it is scattered .The process of erosion through natural causes is a serious problem and in dry regions such as deserts, the damaging consequences can be seen to striking effect . Erosion is particularly rife in the desert where there is nothing to combat the effects of considerable temperature variations. The erosive influence of wind actions, against which there is no obstacle, is very evident, and it is this that we shall discuss here. Wind erodes in two different ways: by abrasion, wearing away hard materials such as rock, and by deflation, the blowing away of loose material such as sand, which is itself a powerful abrasive agent. Winds sweep up the finer fragments of sand, the coarser grains remain where they are. The finer particles fall to the ground again in suitable places and are either added to dunes already there or form new ones in the course of time. This mechanism is still working and affecting wide regions surrounding deserts and the affections of the local winds is so much restricted comparing to the expansion of the winds that strikes the nearby countries due to the incremental variations of global warming, that lead to form dust storms(Fig-5), and will extends the area under the influence of desertification.

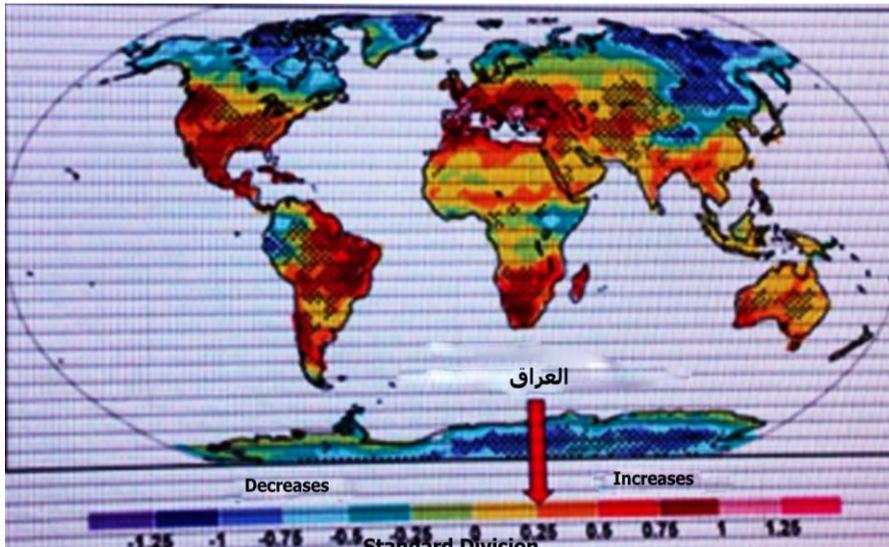


Figure 5-The standard deviation simulation for drought days for the coming 100 years.

Methodology:

Geologists have their view and ideas to estimate the changes in climate conditions with respect to wetlands, deserts and Antarctica studies and the tectonic frame, consequences of these various indicators lead to determine the hazardous future waiting the earth ,so stepping away from the geological evidences ,the international organization such as (IPCC, EPA) and so many global authorities monitoring the planet earth and set up various models depending on the measurements ,and hypothesis gained for the purpose of simulation . So the undertaken studies determine and reflect the anthropogenic input and declare the affection of increasing temperatures on climate changes. The application of the various emission scenarios (High, Medium and Low) clearly divert from the commitment of warming without CO₂, based on the 20th century standard emission Figure- 6.

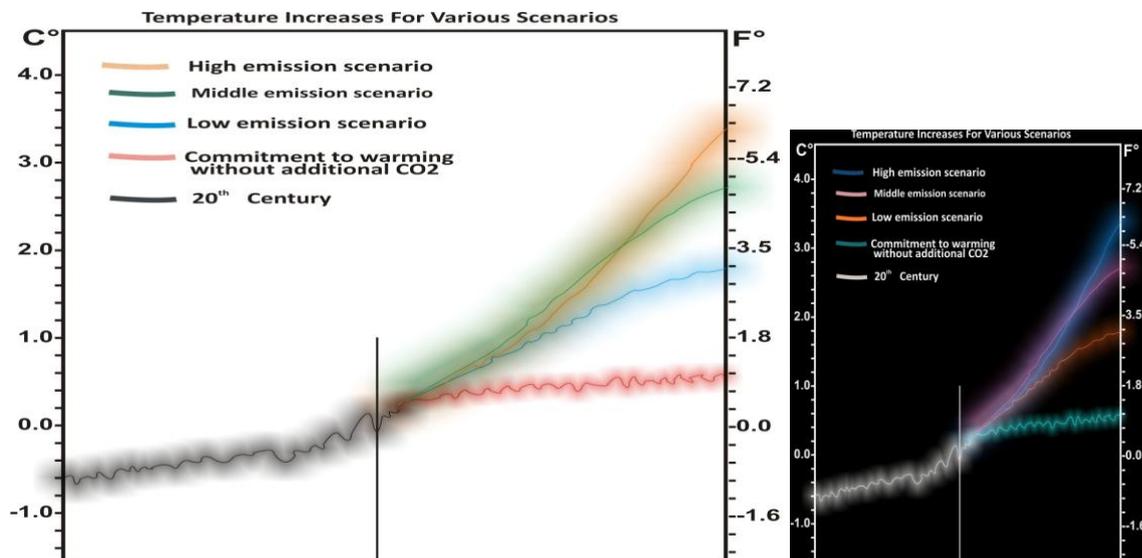


Figure 6 - Various Scenarios for Increasing Temperature

Predicting future climate

Everyone who has studied past climates agrees that climatic conditions have changed dramatically over time (Figure7).Some of those changes appear to been slow, incremental variations that have persisted for millions of years .Within the period for which more data are available, and especially the last few thousand years, significant global changes in temperature have taken place within decades Spencer (2003). The record of variation in global temperature for the past thousand years assembled by IPCC depicts a gradual drop in temperature averages until the last century when temperature

increased about 0.5 °C (0.9°F). The last century shows rises in temperature that are far above natural variability. The conclusion according to these effects of increased greenhouse gases and changes in land use, notably the conversion of forestland to cropland, evidences of desertification, cause these rises. The scenario behind doubling of the carbon dioxide content of the atmosphere suggest even higher temperatures in the range of 1°C to 4°C by the year 2100 (figure-8).

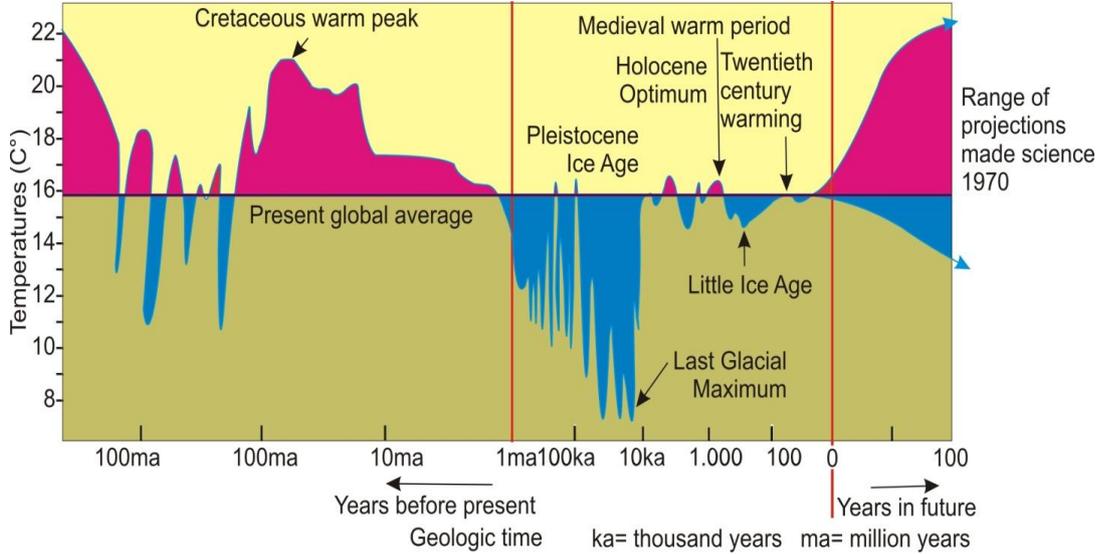


Figure 7-The Temperature record of the Earth over Geologic Time .Note the use of logarithmic scale and the prominent breaks that occur at the present and at one million years before the present.

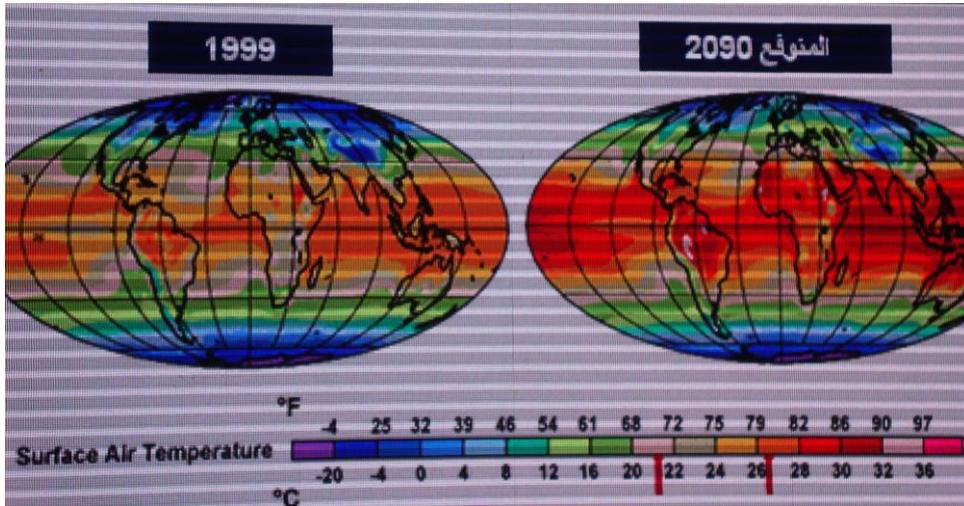


Figure 8-The estimated temperature degree of the surface air for the coming Century

Conclusions:

Studies are still in the early stages of deciphering the causes of climatic change with enough precision to make reliable long –term predictions ,but it seems clear that long term climate for the whole Earth depends on the amount of solar radiation reaching the surface of the Earth.

Risk assessment expressed by so many scenarios is indeed forming precautions and suggests that drastic change could occur in the future, alarming globally all authorities, peoples and coming generations are coming to face very bad consequences in front, unless consideration should be taken to protect the planet earth from major destructions ahead by sequestration of this gas from the industrial complexes this will lead to mitigation. Accordingly the heat of the sun which is not discussed here for it is a part of natural affection, otherwise the e global warming caused by incremental variations of carbon dioxide CO2 within the atmosphere.

From these data, it is clear that sharp climate changes are superimposed on the long –term trends related to solar insolation. For this reason, special attention to recent changes in the greenhouse –gas content of the atmosphere is warranted.

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