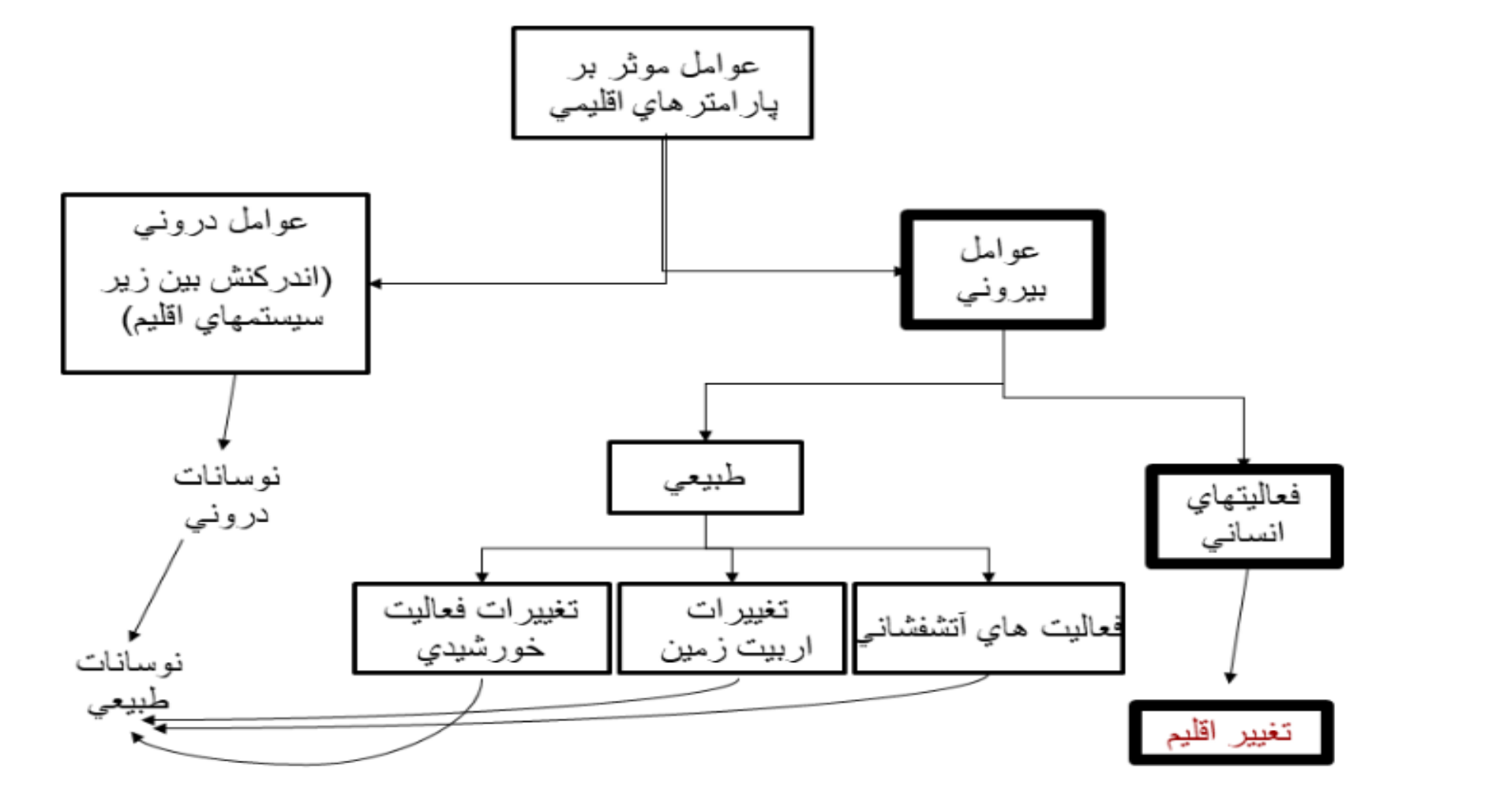
مفاهیم پدیده تغییر اقلیم

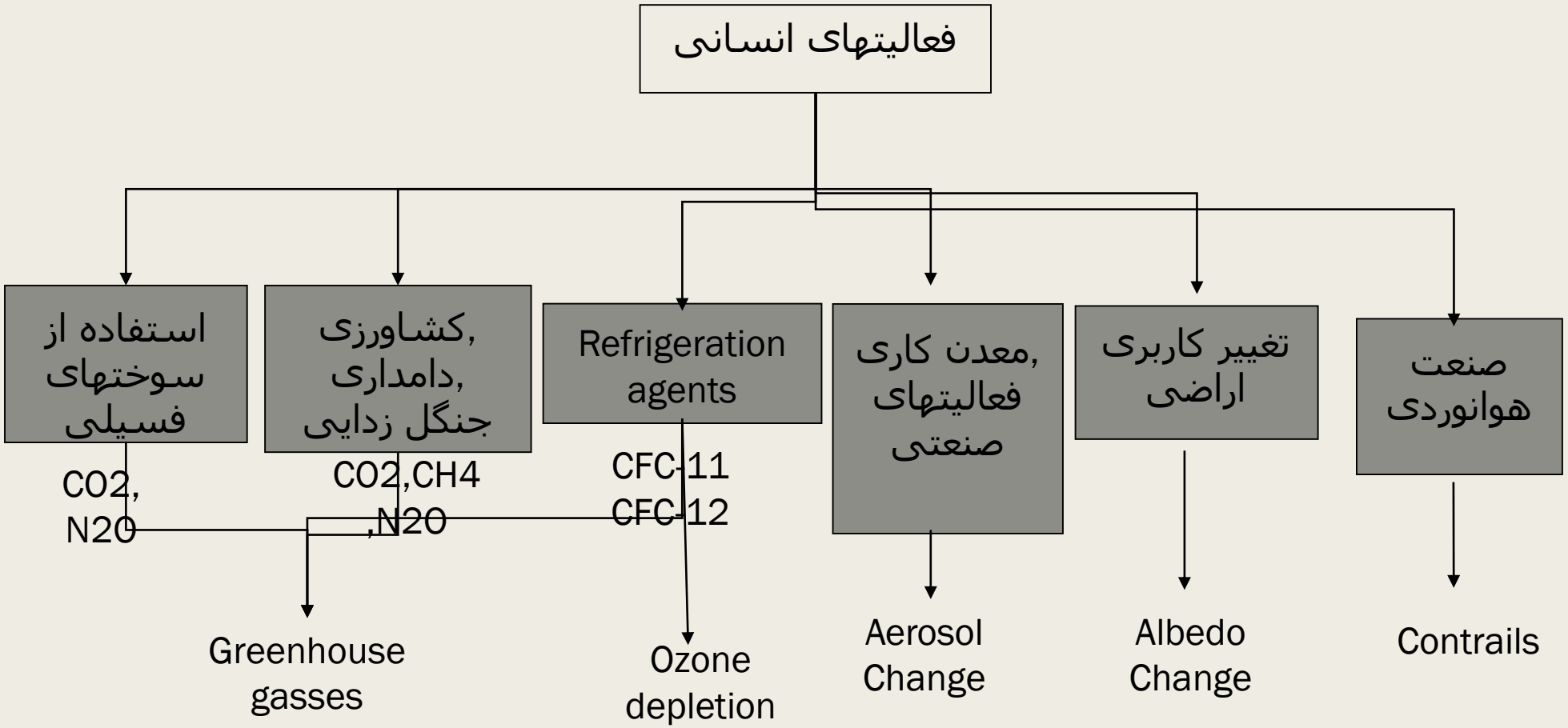
علیرضا مساح بوانی
هیات علمی دانشگاه تهران

چند سوال

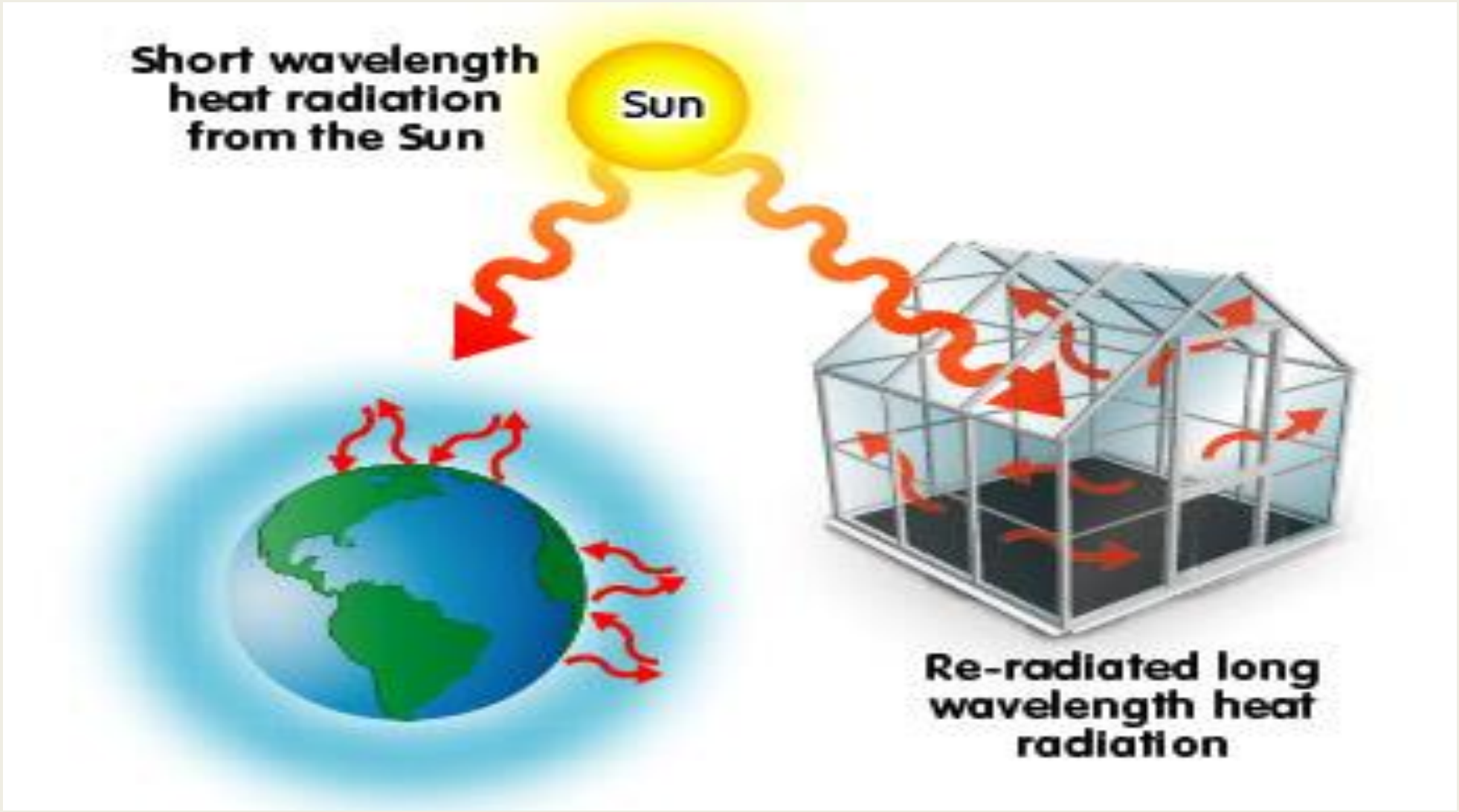
1. تغییر اقلیم چیست؟
2. آیا تغییر اقلیم در گذشته تاثیر گذار بوده است؟
3. اثرات تغییر اقلیم در آینده چه خواهد بود؟
4. باورهای غلط در زمینه تغییر اقلیم؟

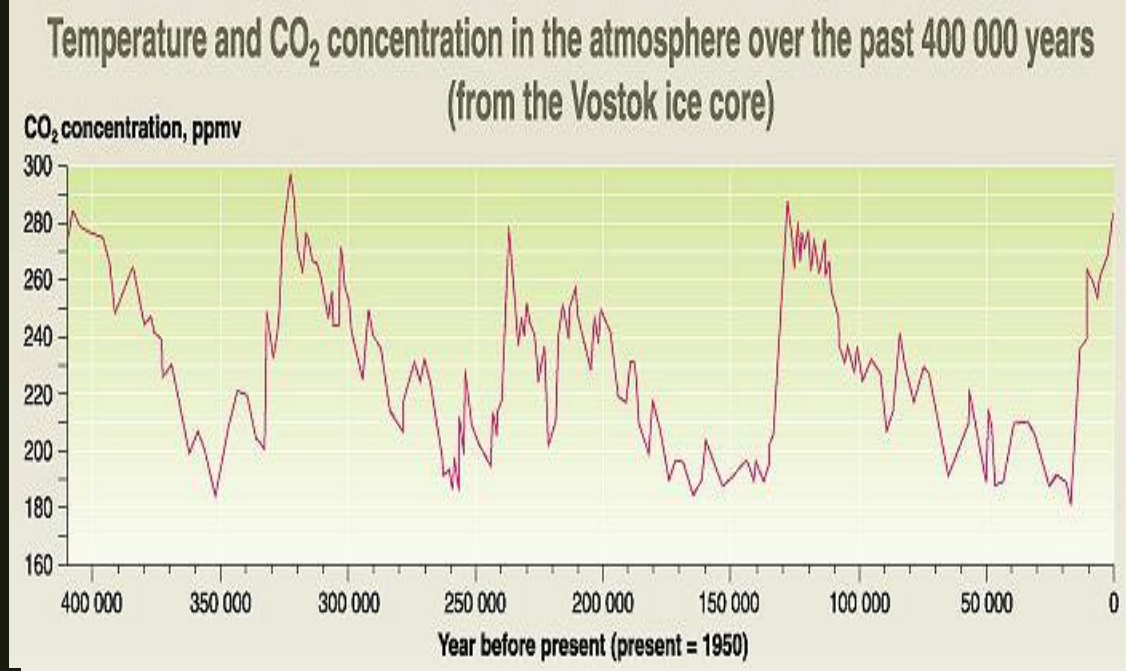
تغییر اقلیم چیست؟

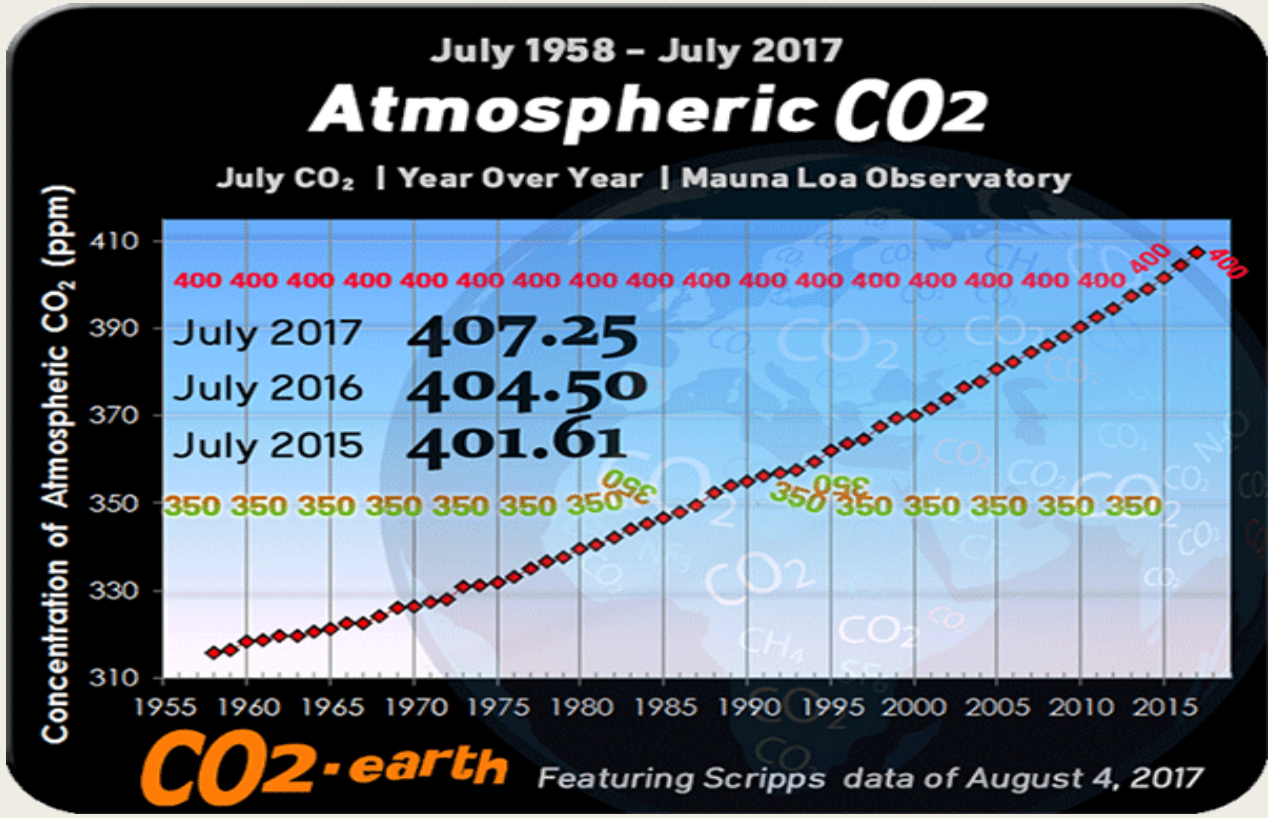



فعالیتهای انسانی
استفاده از سوختهای فسیلی
کشاورزی, دامداری, جنگل زدایی
Refrigeration agents
معدن کاری, فعالیتهای صنعتی
تغییر کاربری اراضی
صنعت هوانوردی
CO2, N20
CO2,CH4 ,N20
CFC-11 CFC-12
Greenhouse gasses
Ozone depletion
Aerosol Change
Albedo Change
Contrails

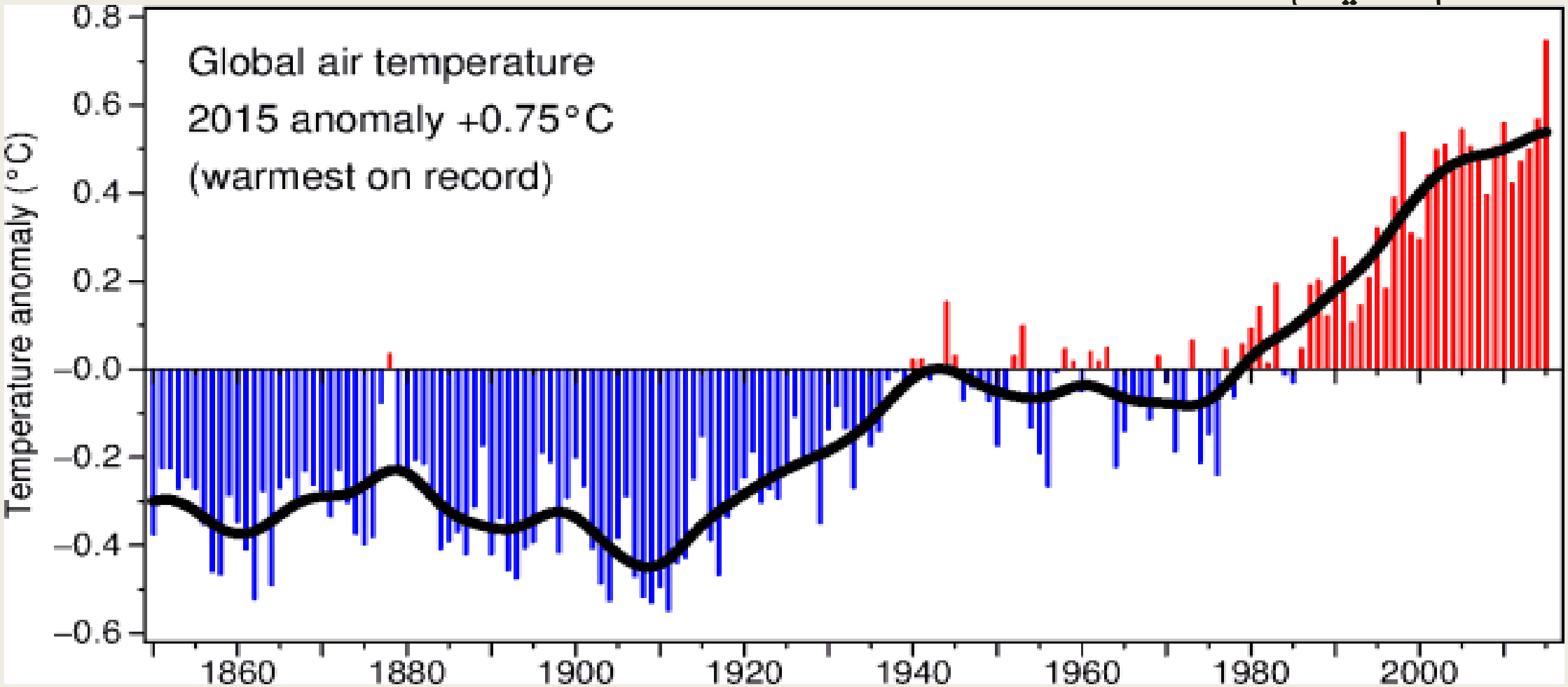
اثر گلخانه ای




Temperature and CO_2 concentration in the atmosphere over the past 400 000 years
(from the Vostok ice core)
CO_2 concentration, ppmv
300
280
260
240
220
200
180
160
400 000
350 000
300 000
250 000
200 000
150 000
100 000
50 000
0
Year before present (present = 1950)


July 1958 – July 2017
Atmospheric CO2
July CO_2 | Year Over Year | Mauna Loa Observatory
Concentration of Atmospheric CO_2 (ppm)
410
390
370
350
330
310
July 2017 407.25
July 2016 404.50
July 2015 401.61
1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015
CO2·earth
Featuring Scripps data of August 4, 2017

2- آیا تغییر اقلیم در گذشته در سطح کره زمین تاثیرگذار بوده است؟



2- آیا تغییر اقلیم در گذشته در سطح کره زمین تاثیرگذار بوده است؟

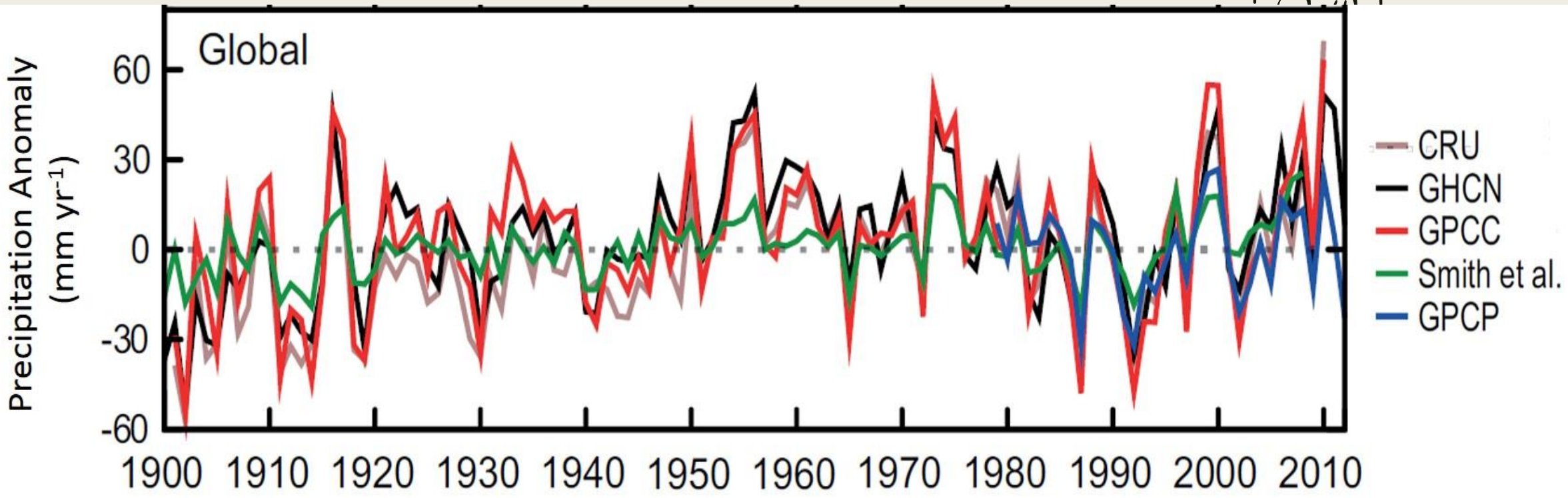
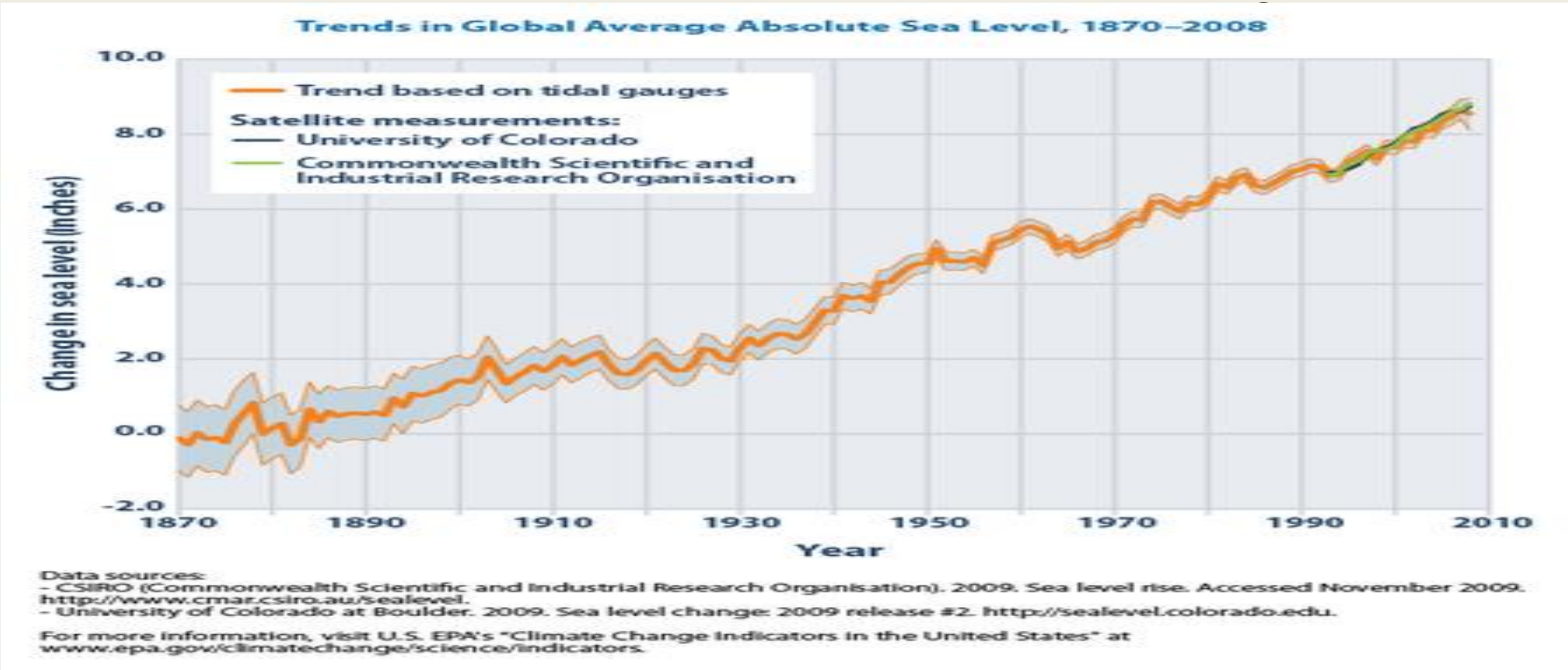
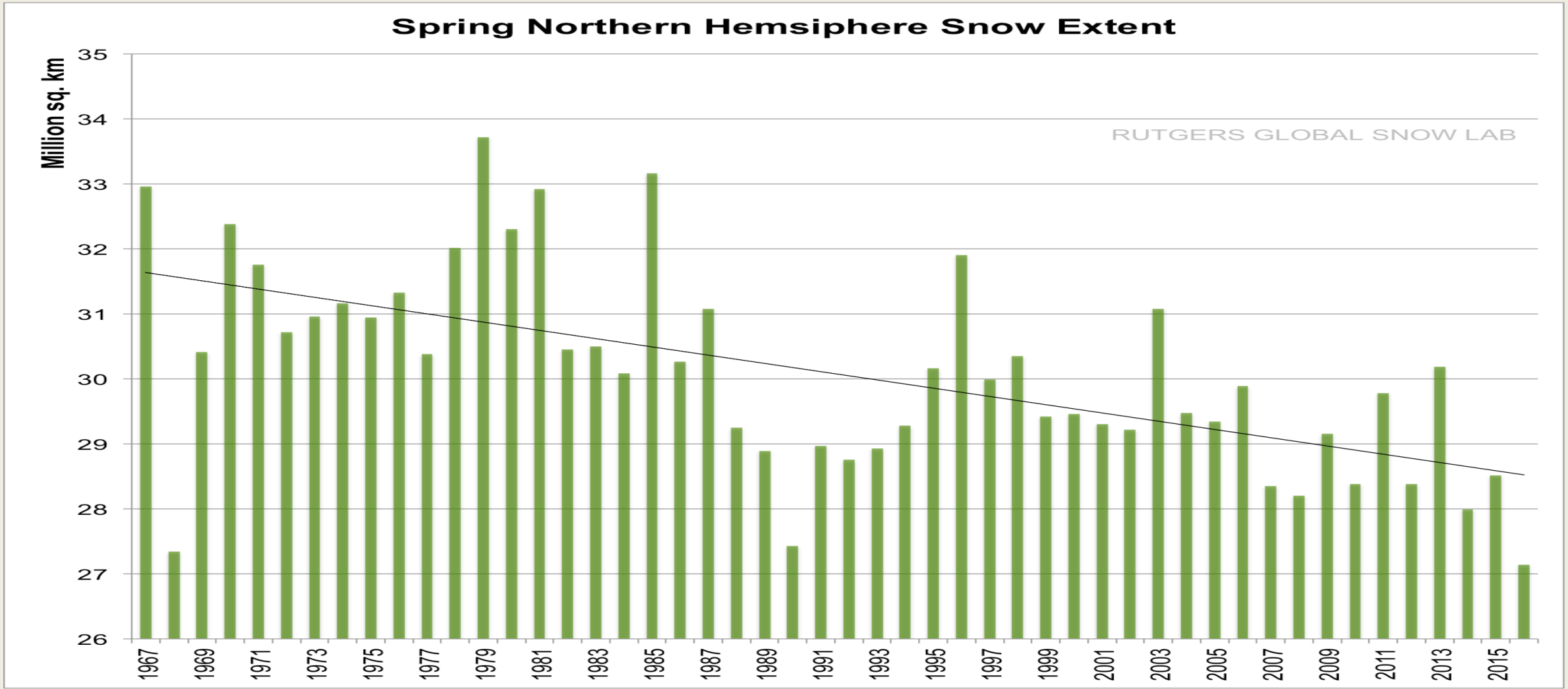


Figure 1: Change in average global precipitation over land (relative to 1981-2000) from five global data sets. Source: IPCC AR5 WGI, Chpt 2, Figure 2.28

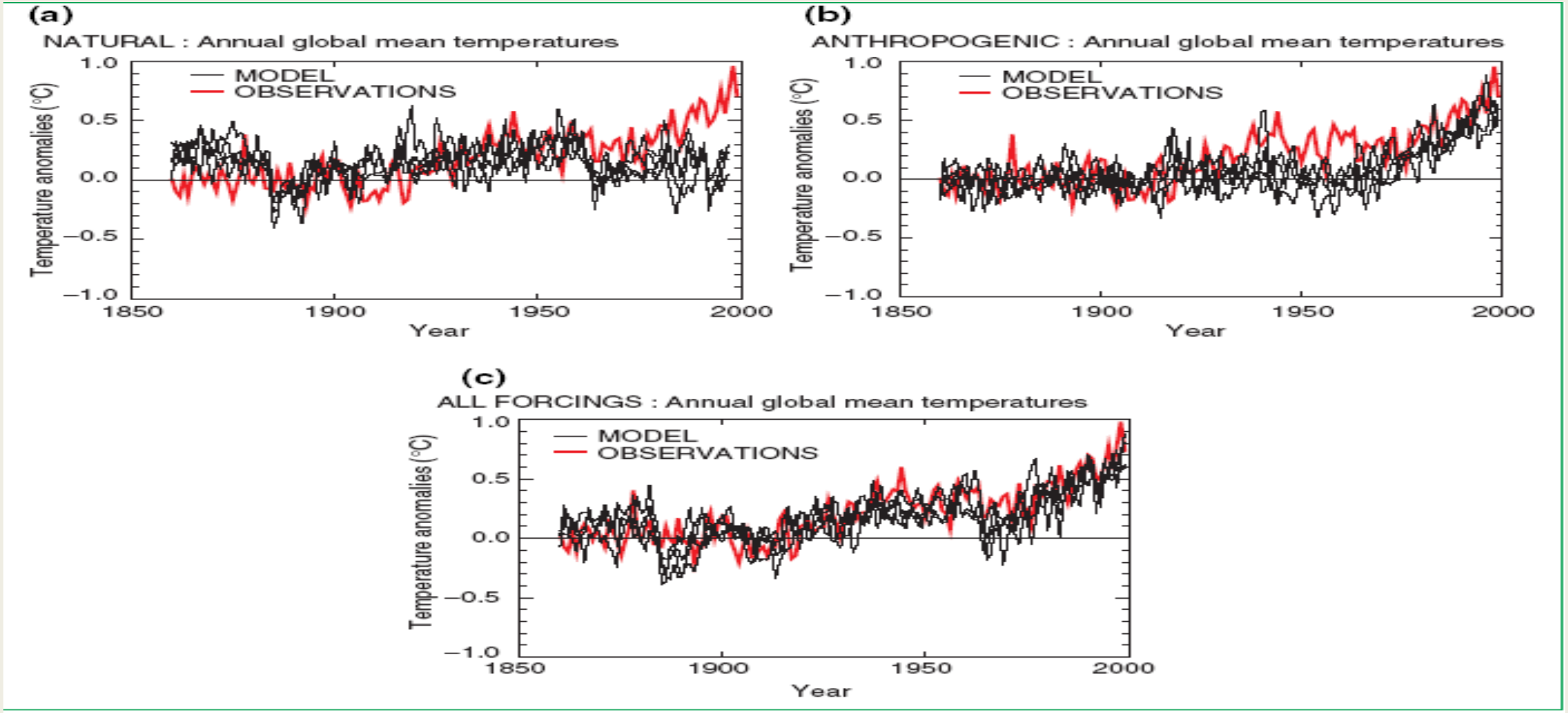
2- آیا تغییر اقلیم در گذشته در سطح کره زمین تاثیرگذار بوده



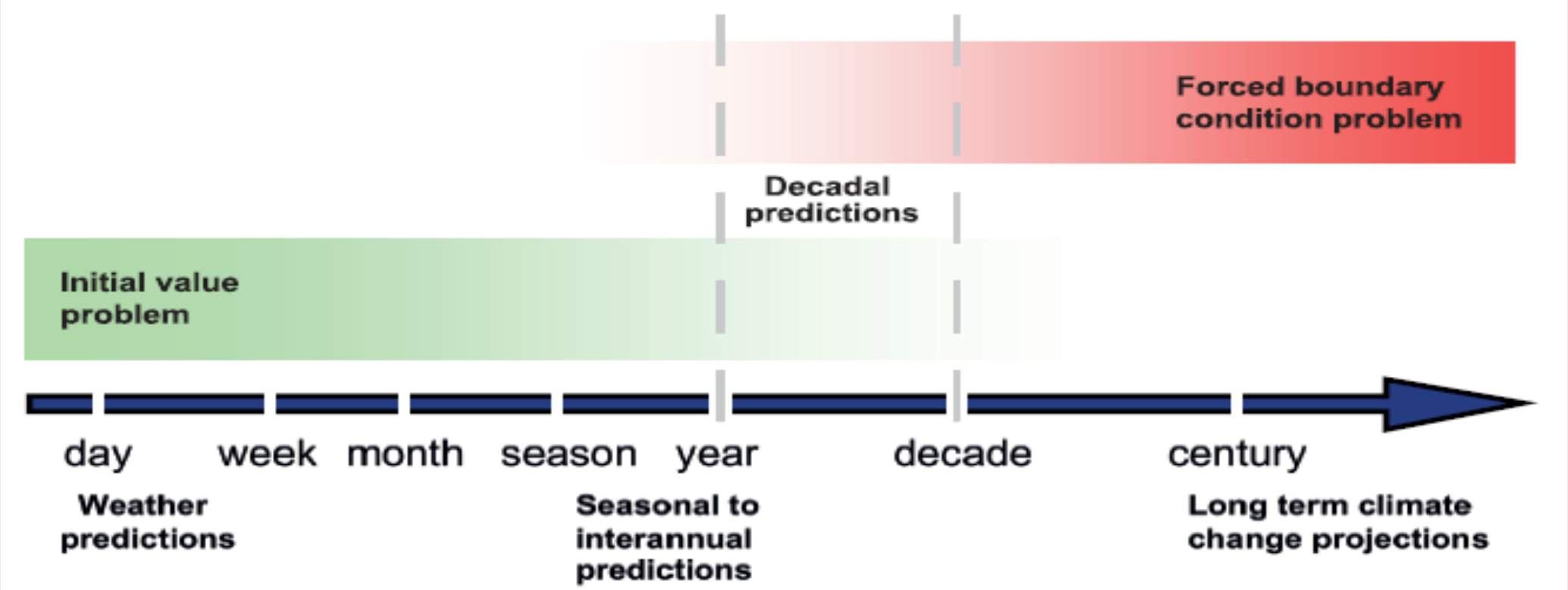
2- آیا تغییر اقلیم در گذشته در سطح کره زمین تاثیرگذار بوده است؟



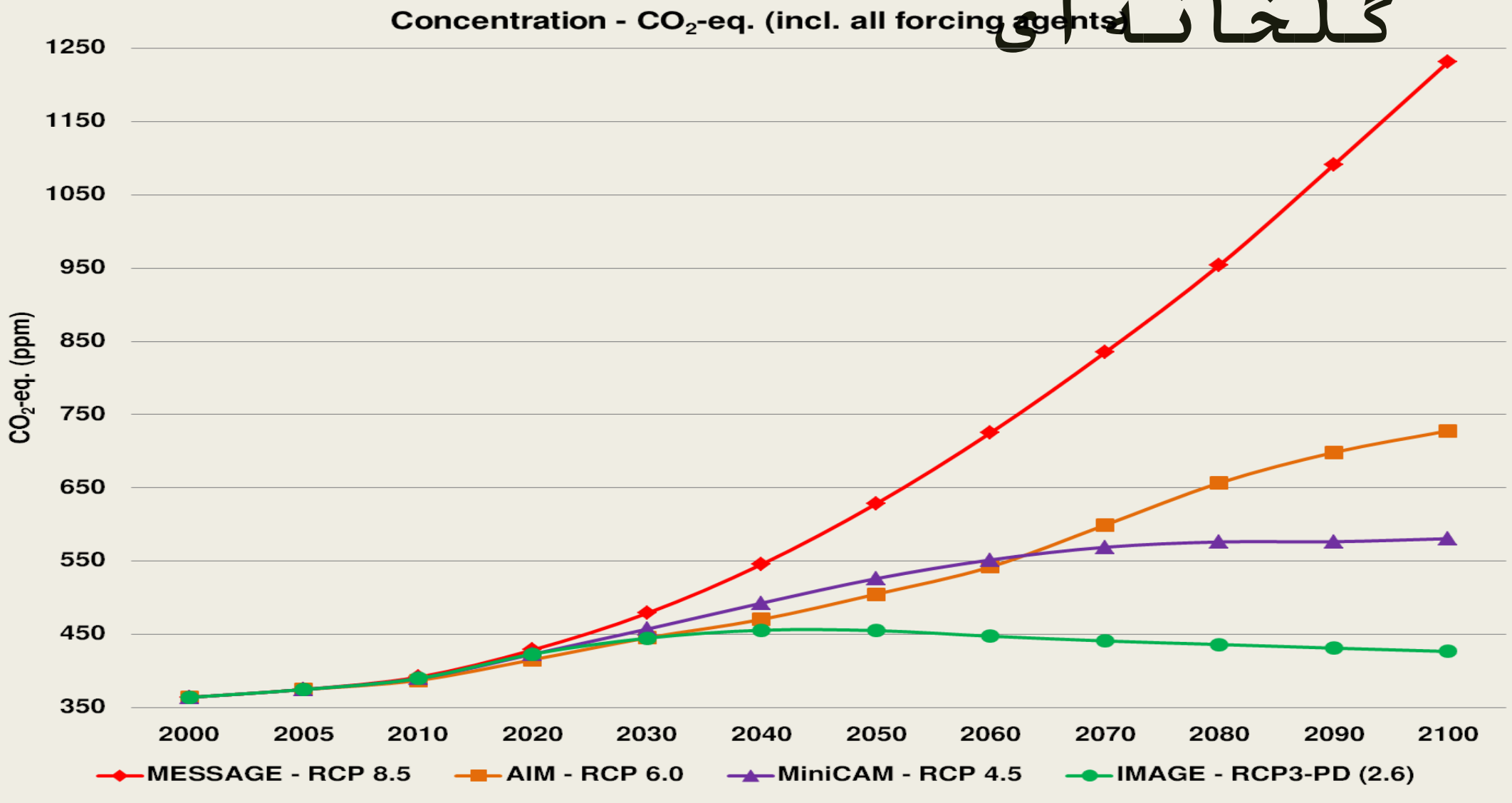
نقش تغییر اقلیم در تغییرات گذشته دمای کره زمین چه مقدار بوده است؟ (Global warming)

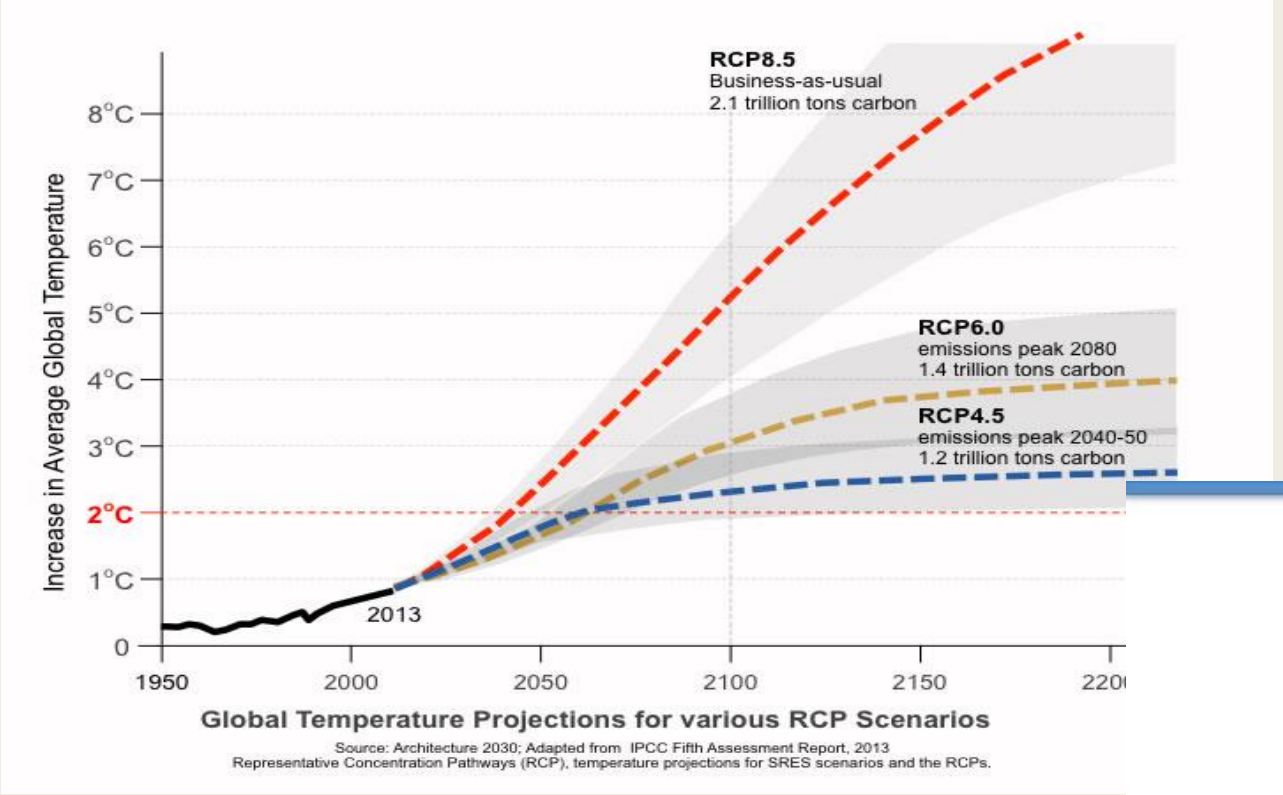


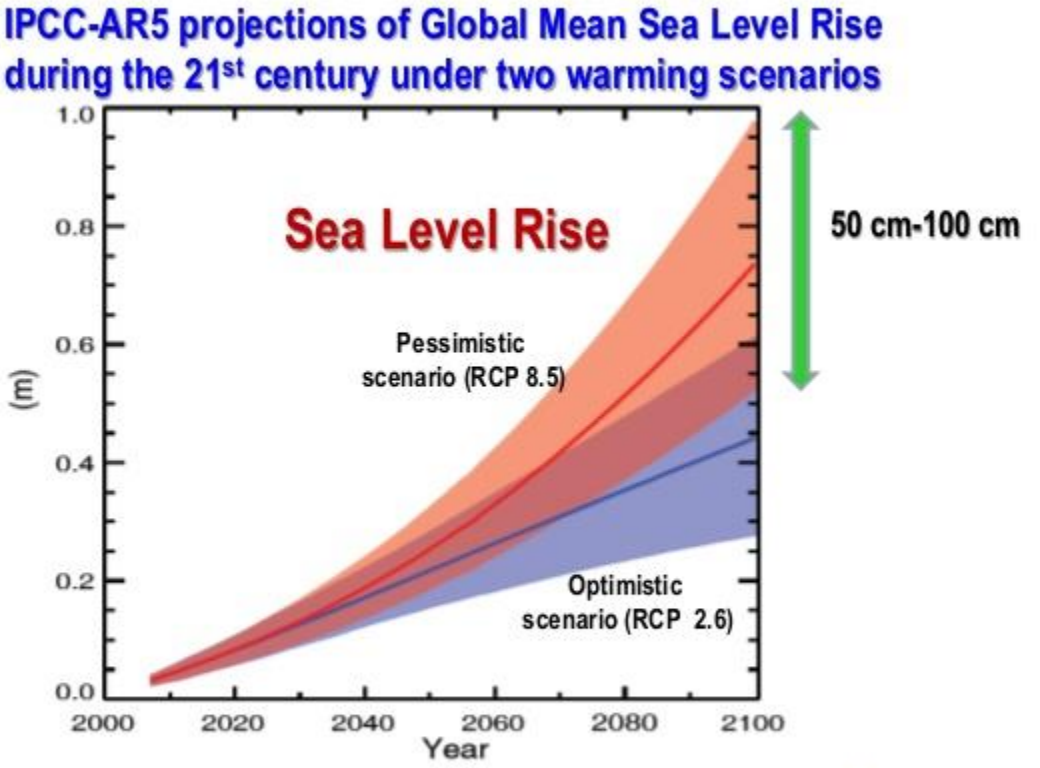
اثرات تغییر اقلیم در دوره های آتی

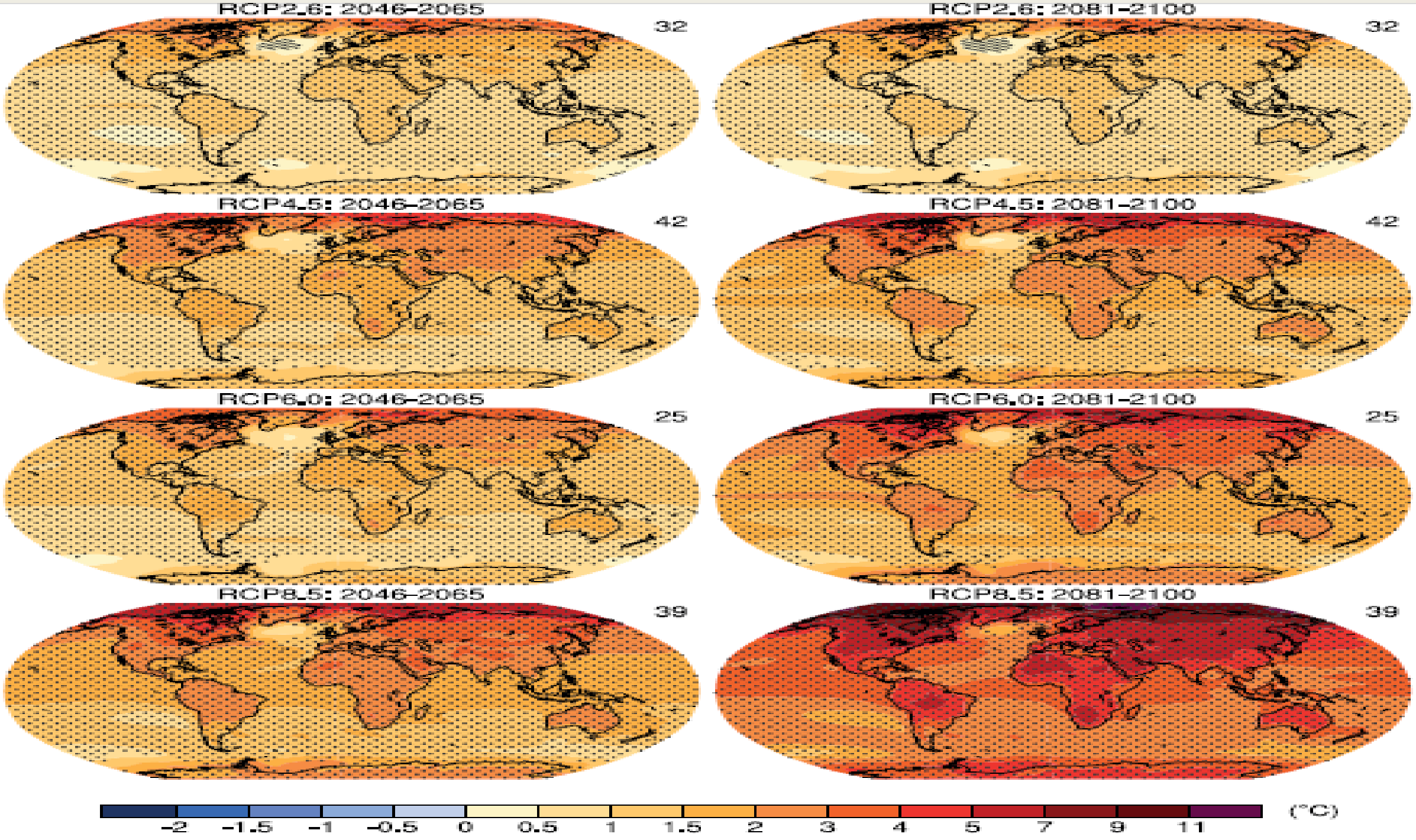


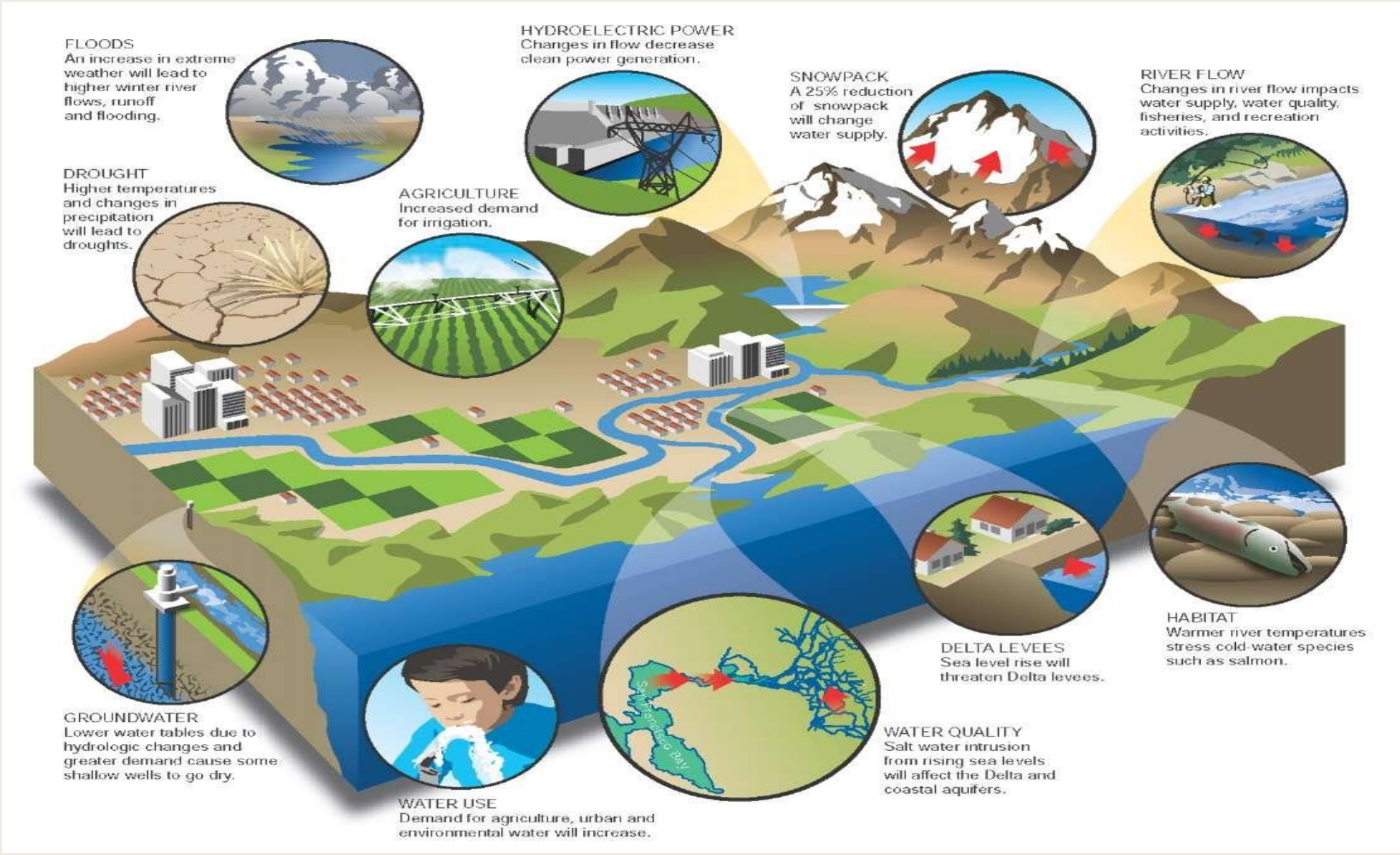
سناریوهای انتشار گازهای گلخانه‌ای




RCP8.5
Business-as-usual
2.1 trillion tons carbon
RCP6.0
emissions peak 2080
1.4 trillion tons carbon
RCP4.5
emissions peak 2040-50
1.2 trillion tons carbon
Increase in Average Global Temperature
8°C
7°C
6°C
5°C
4°C
3°C
2°C
1°C
0
2013
1950
2000
2050
2100
2150
Global Temperature Projections for various RCP Scenarios
Source: Architecture 2030; Adapted from IPCC Fifth Assessment Report, 2013
Representative Concentration Pathways (RCP), temperature projections for SRES scenarios and the RCPs.


IPCC-AR5 projections of Global Mean Sea Level Rise during the 21st century under two warming scenarios
Sea Level Rise
50 cm-100 cm
Pessimistic scenario (RCP 8.5)
Optimistic scenario (RCP 2.6)
(m)
1.0
0.8
0.6
0.4
0.2
0.0
2000
2020
2040
2060
2080
2100
Year
IPCC AR5 Working Group I
Climate Change 2013: The Physical Science Basis
ipcc
INTERGOVERNMENTAL PANEL ON climate change


RCP2.6: 2046–2065
32
RCP2.6: 2081–2100
32
RCP4.5: 2046–2065
42
RCP4.5: 2081–2100
42
RCP6.0: 2046–2065
25
RCP6.0: 2081–2100
25
RCP8.5: 2046–2065
39
RCP8.5: 2081–2100
39
−2 −1.5 −1 −0.5 0 0.5 1 1.5 2 3 4 5 7 9 11
(°C)


FLOODS
An increase in extreme weather will lead to higher winter river flows, runoff and flooding.
HYDROELECTRIC POWER
Changes in flow decrease clean power generation.
SNOWPACK
A 25% reduction of snowpack will change water supply.
RIVER FLOW
Changes in river flow impacts water supply, water quality, fisheries, and recreation activities.
DROUGHT
Higher temperatures and changes in precipitation will lead to droughts.
AGRICULTURE
Increased demand for irrigation.
HABITAT
Warmer river temperatures stress cold-water species such as salmon.
DELTA LEVEES
Sea level rise will threaten Delta levees.
GROUNDWATER
Lower water tables due to hydrologic changes and greater demand cause some shallow wells to go dry.
WATER QUALITY
Salt water intrusion from rising sea levels will affect the Delta and coastal aquifers.
WATER USE
Demand for agriculture, urban and environmental water will increase.

از توجه شما بسیار ممنون