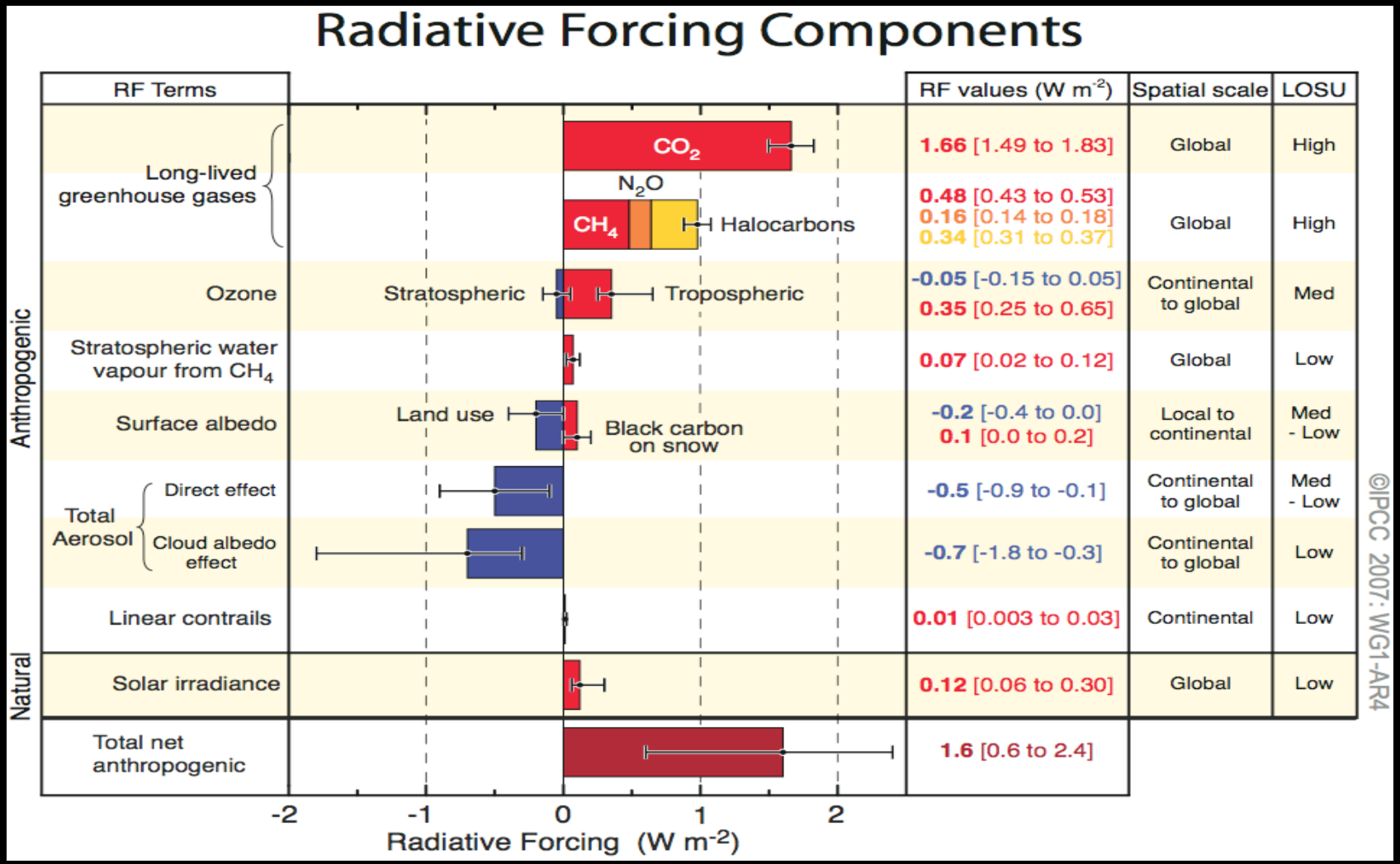
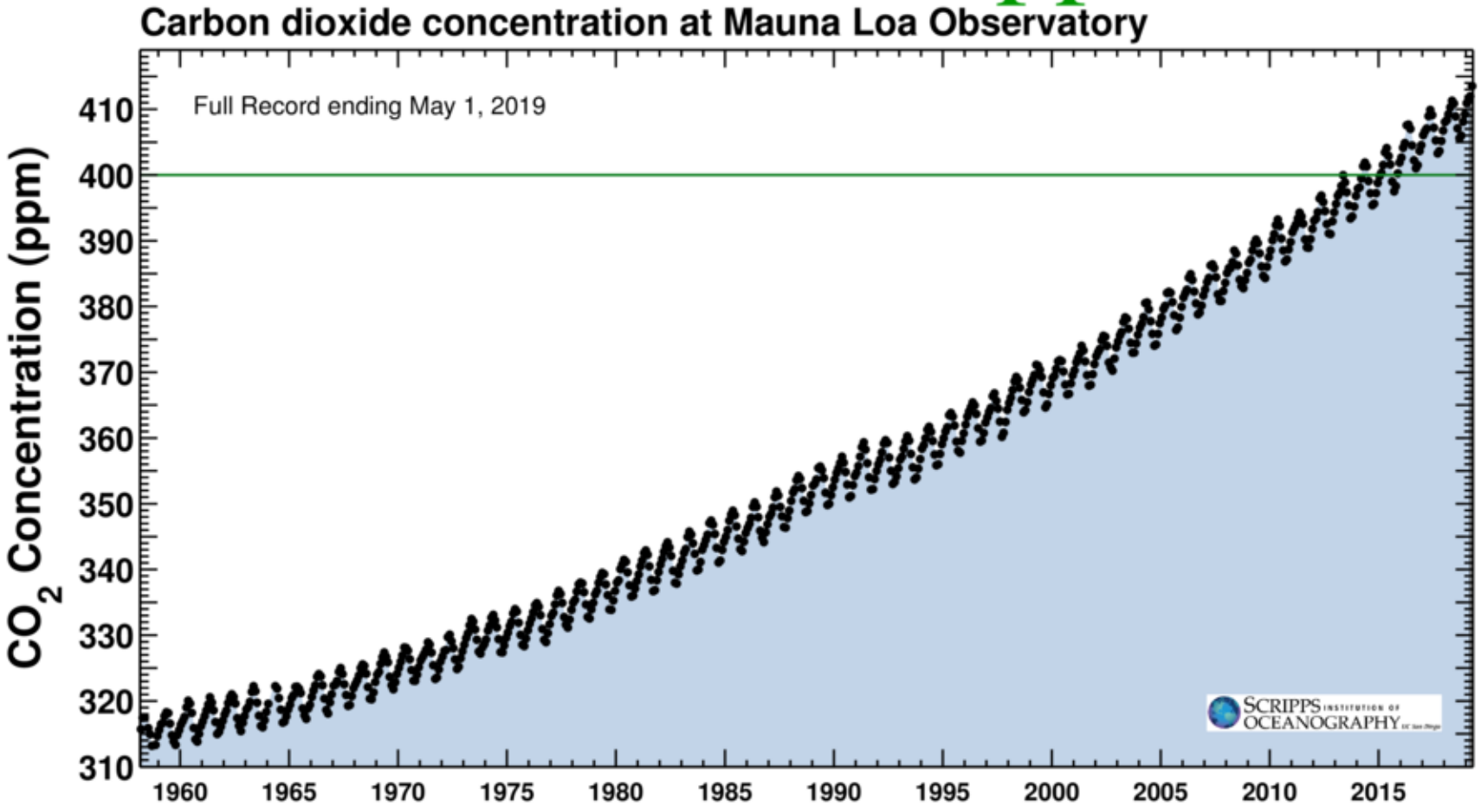
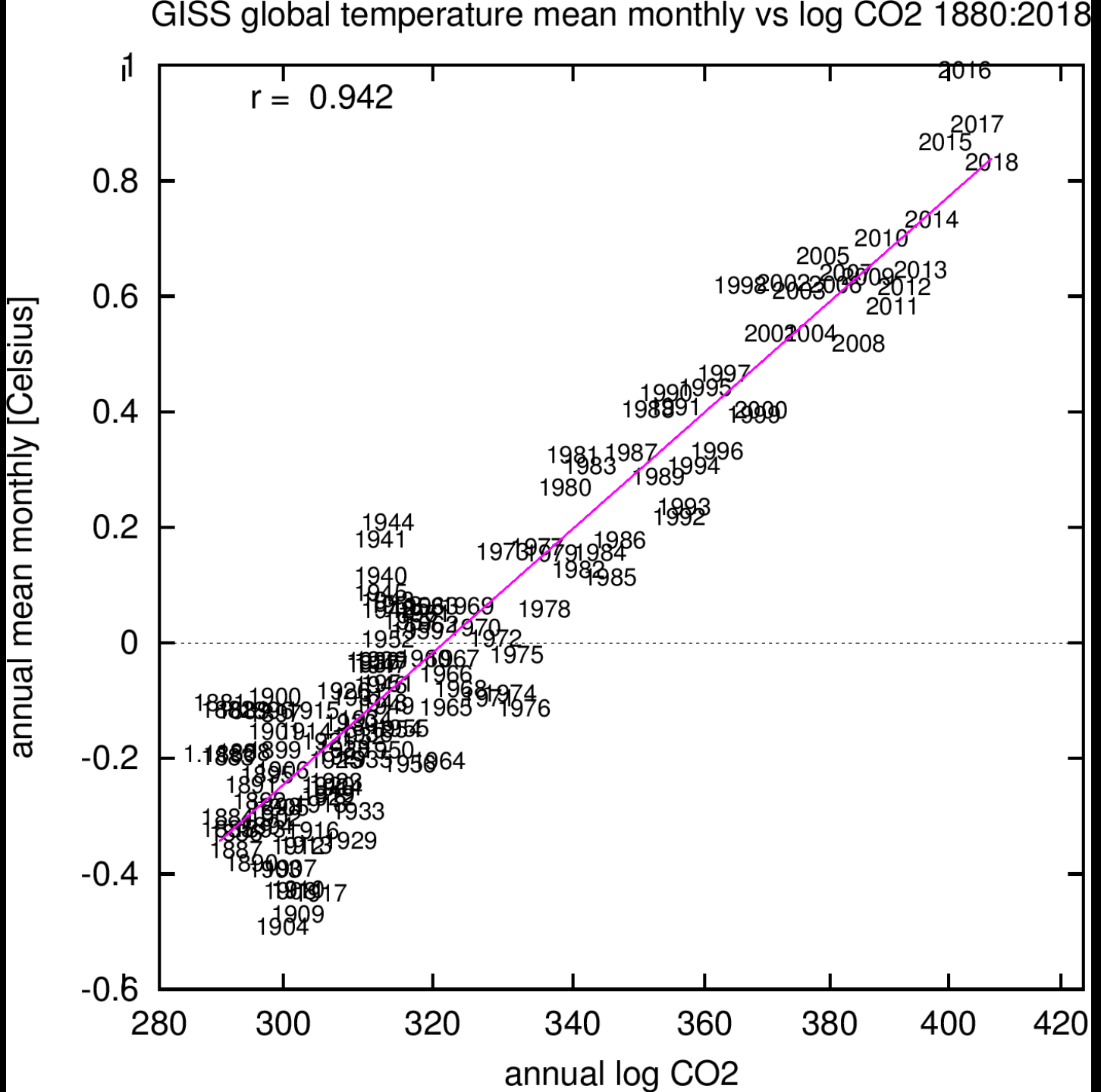
Radiative Forcing Components



Latest CO_2 reading
May 01, 2019

414.94 ppm




GISS global temperature mean monthly vs log CO2 1880:2018
r = 0.942
annual mean monthly [Celsius]
annual log CO2
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
280
300
320
340
360
380
400
420
2016
2017
2015
2018
2014
2010
2005
2013
2012
2011
2004
2008
1997
1995
1990
1991
2000
1999
1981
1987
1996
1983
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1989
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1992
1944
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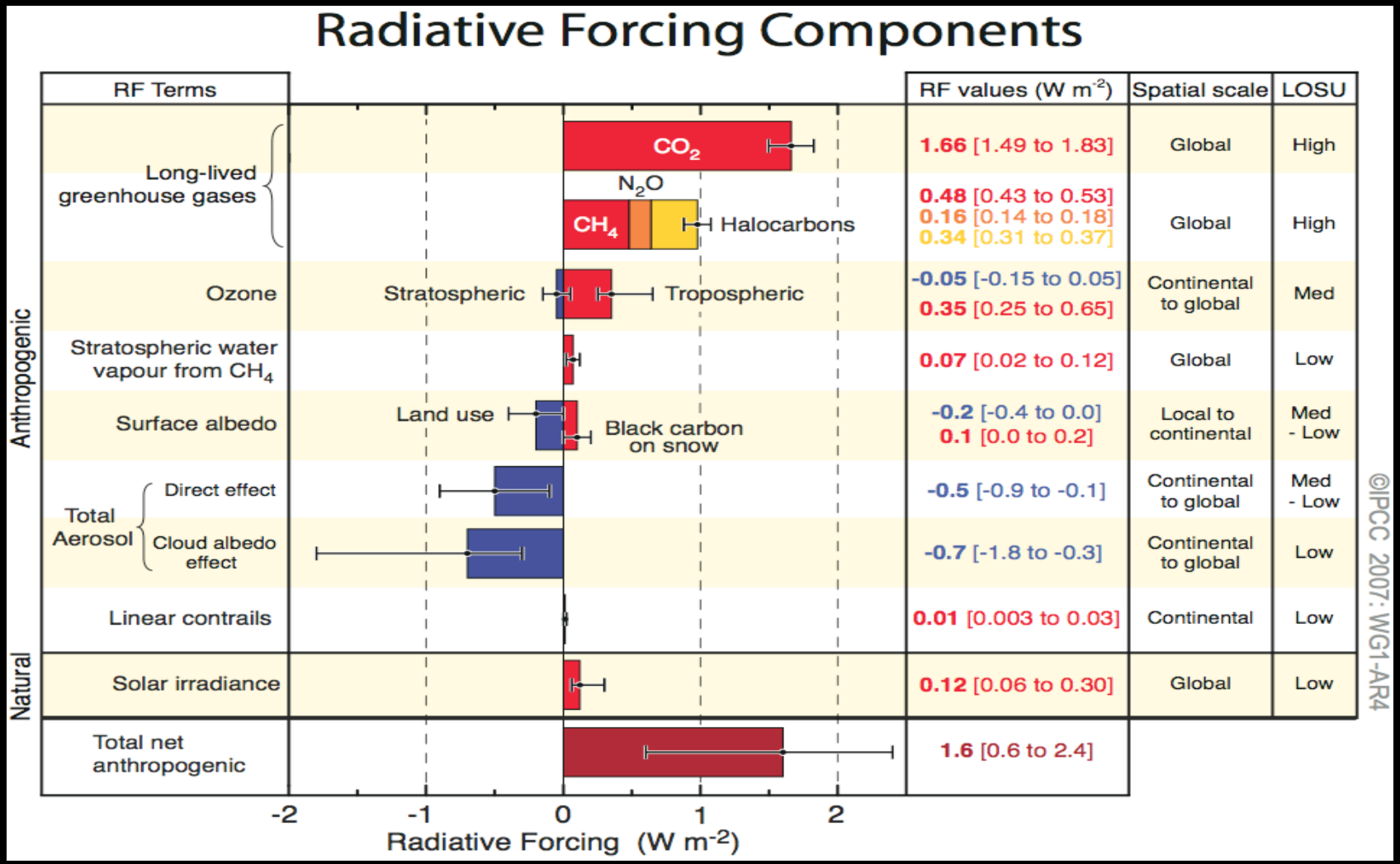
1976
1965
1964
1933
1929
1917
1909
1904

Radiative Forcing Components



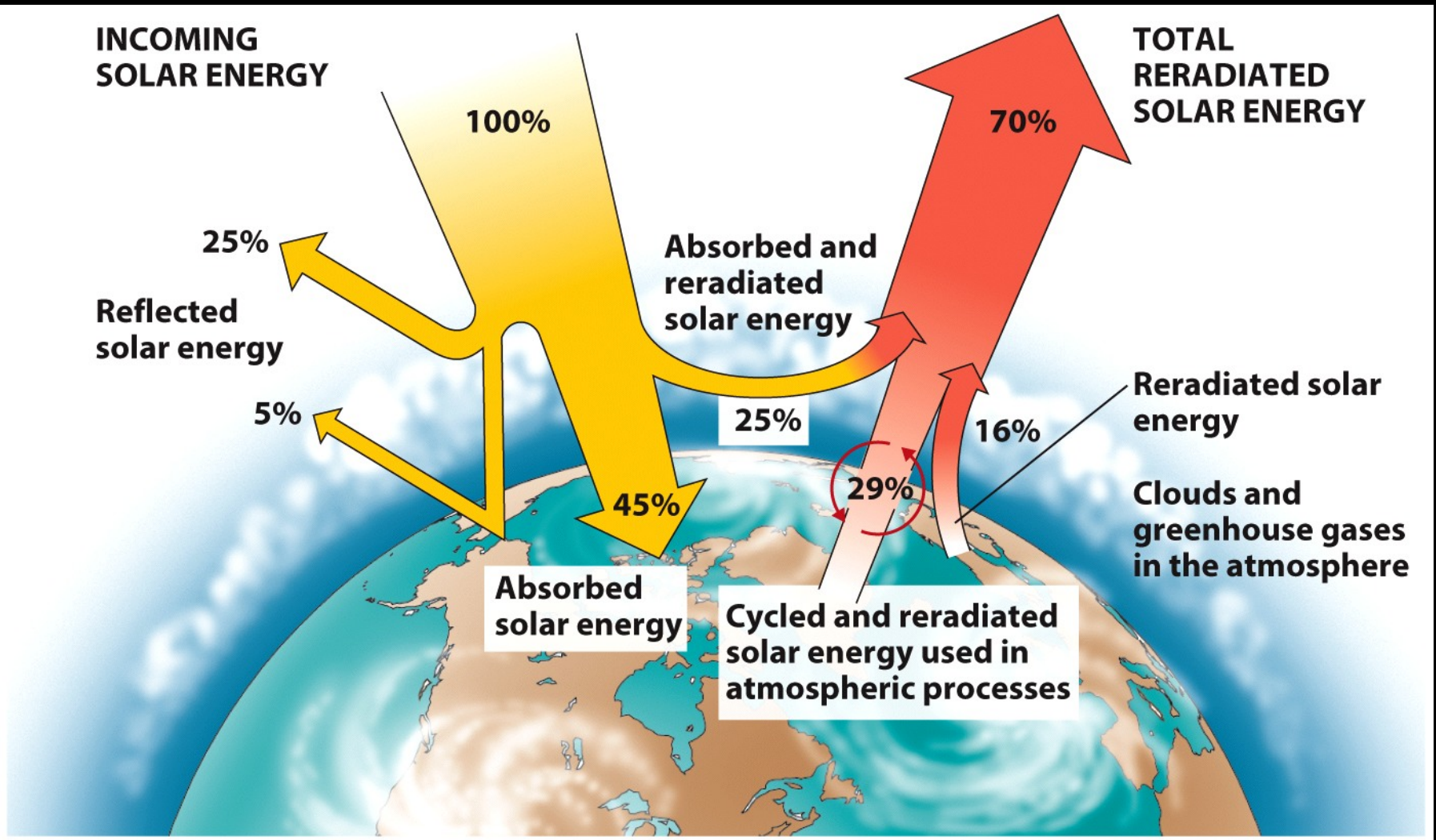


Figure 13-5
Environmental Geology, Second Edition

The Global Carbon Cycle

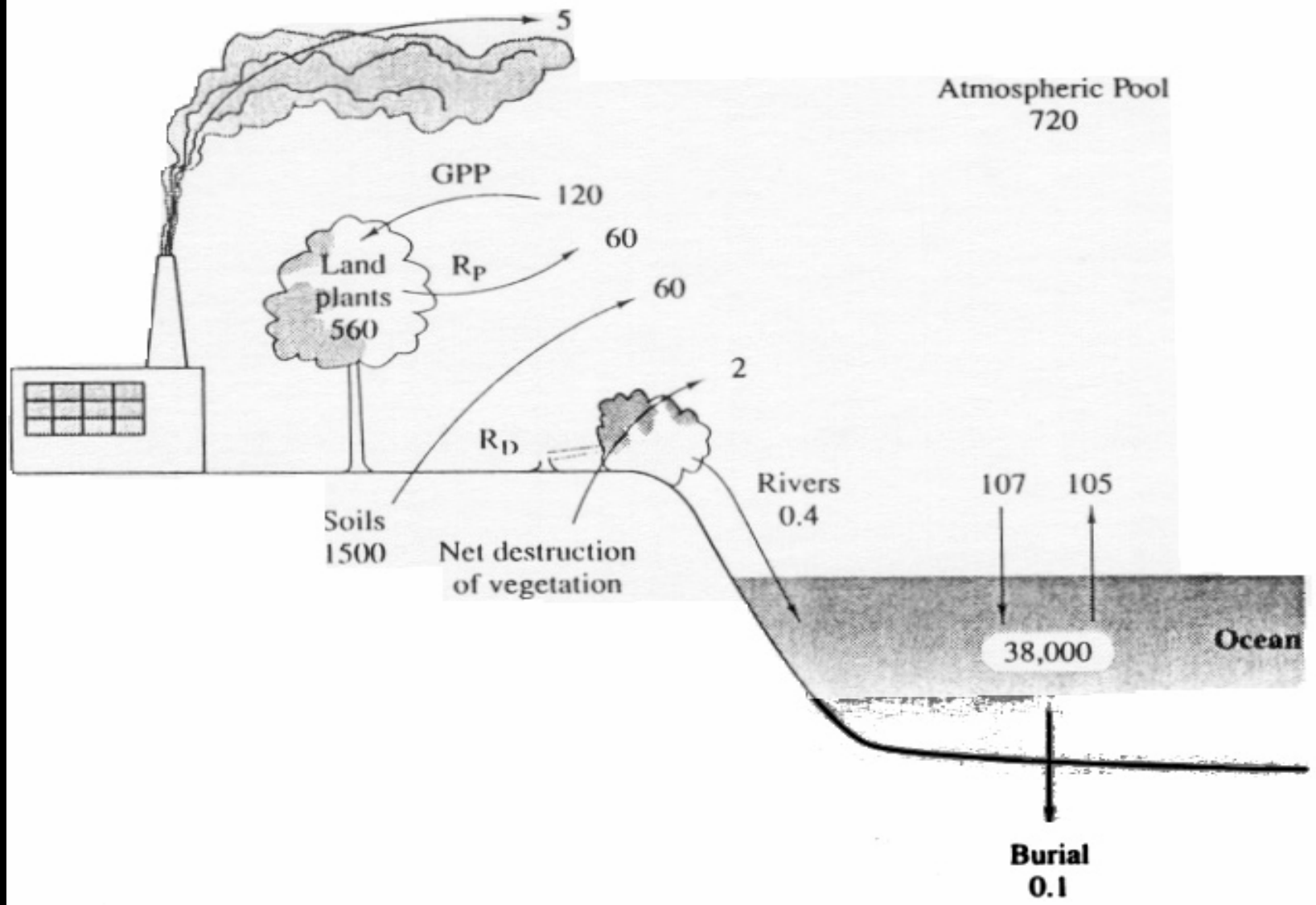
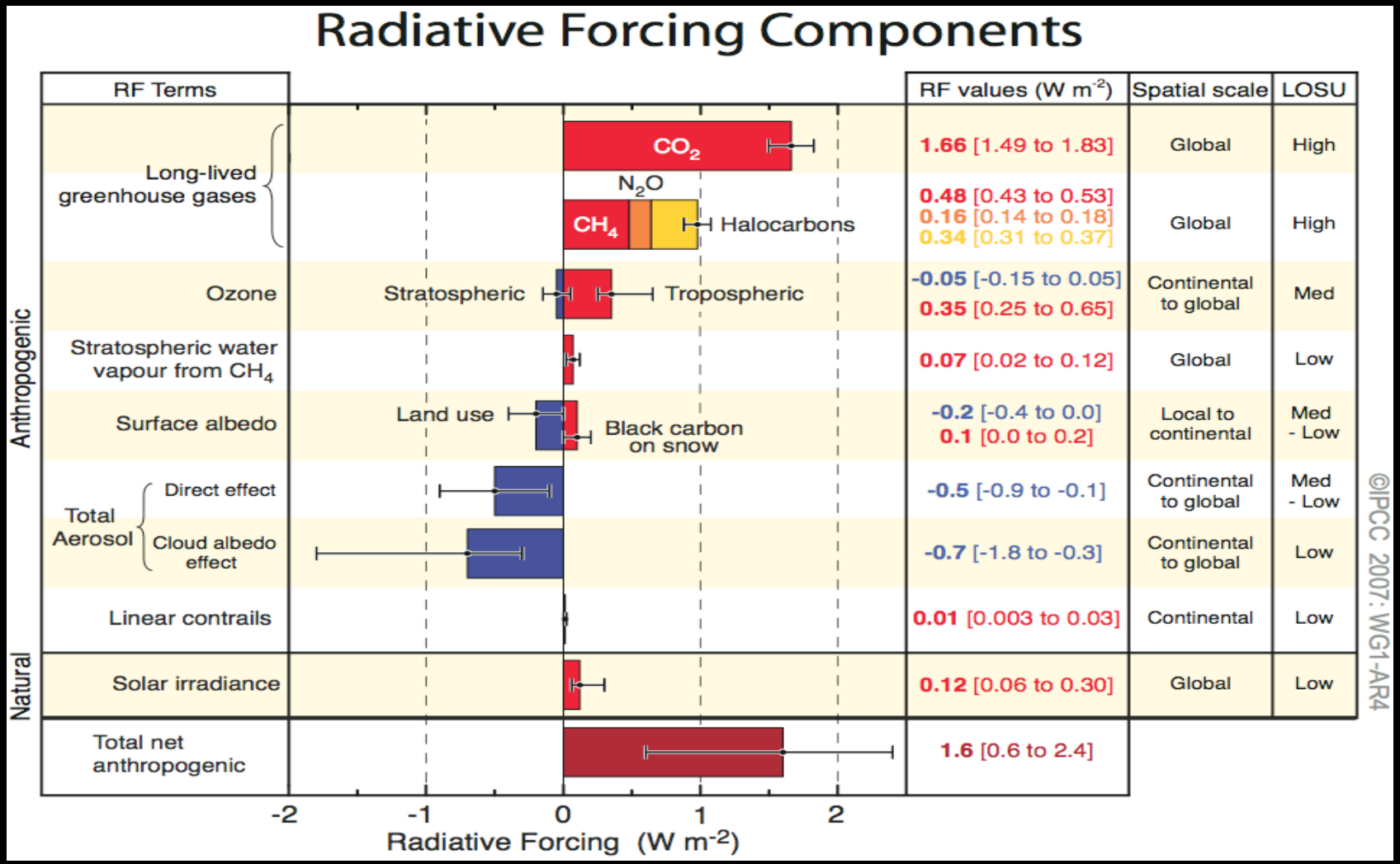
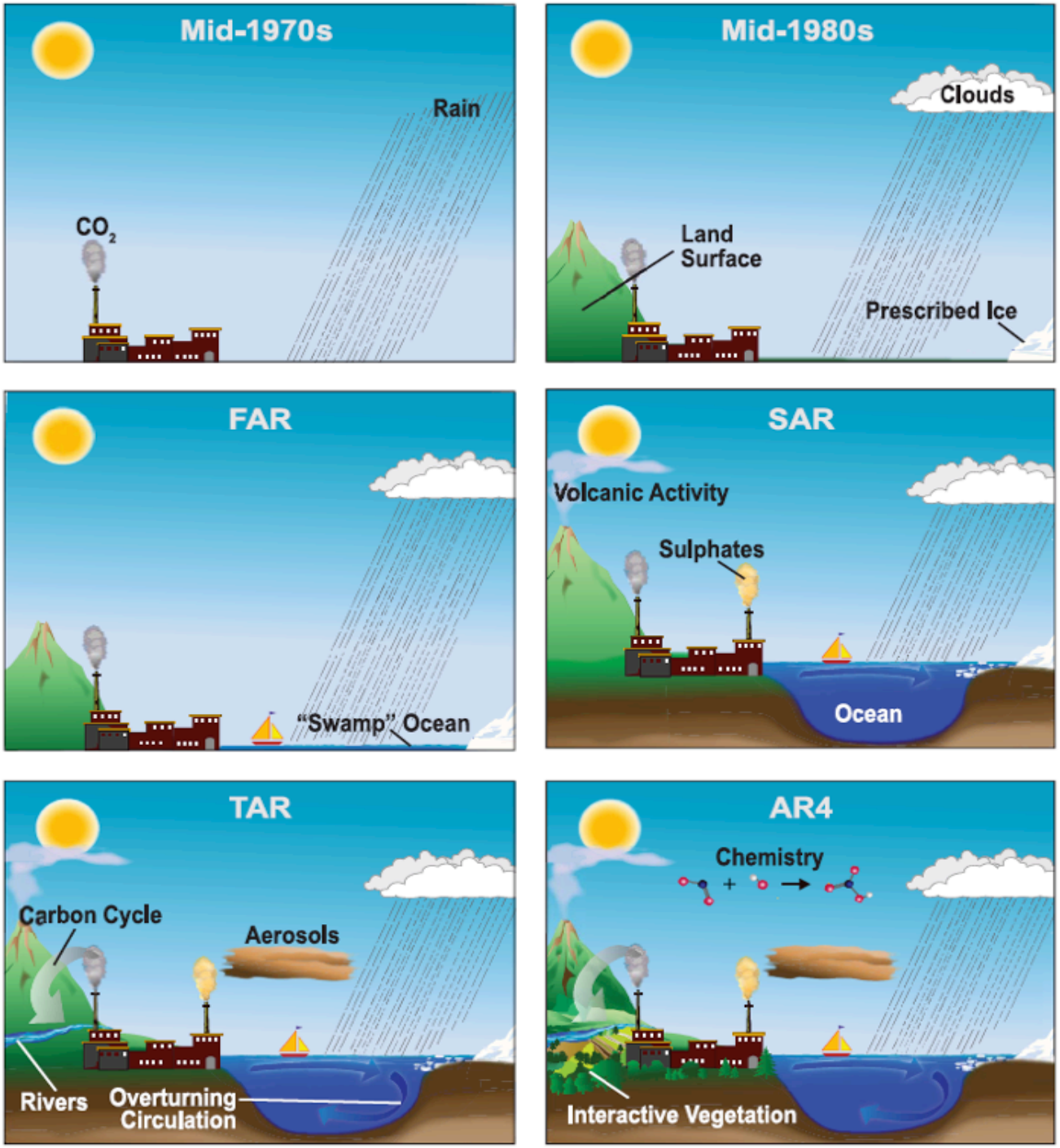
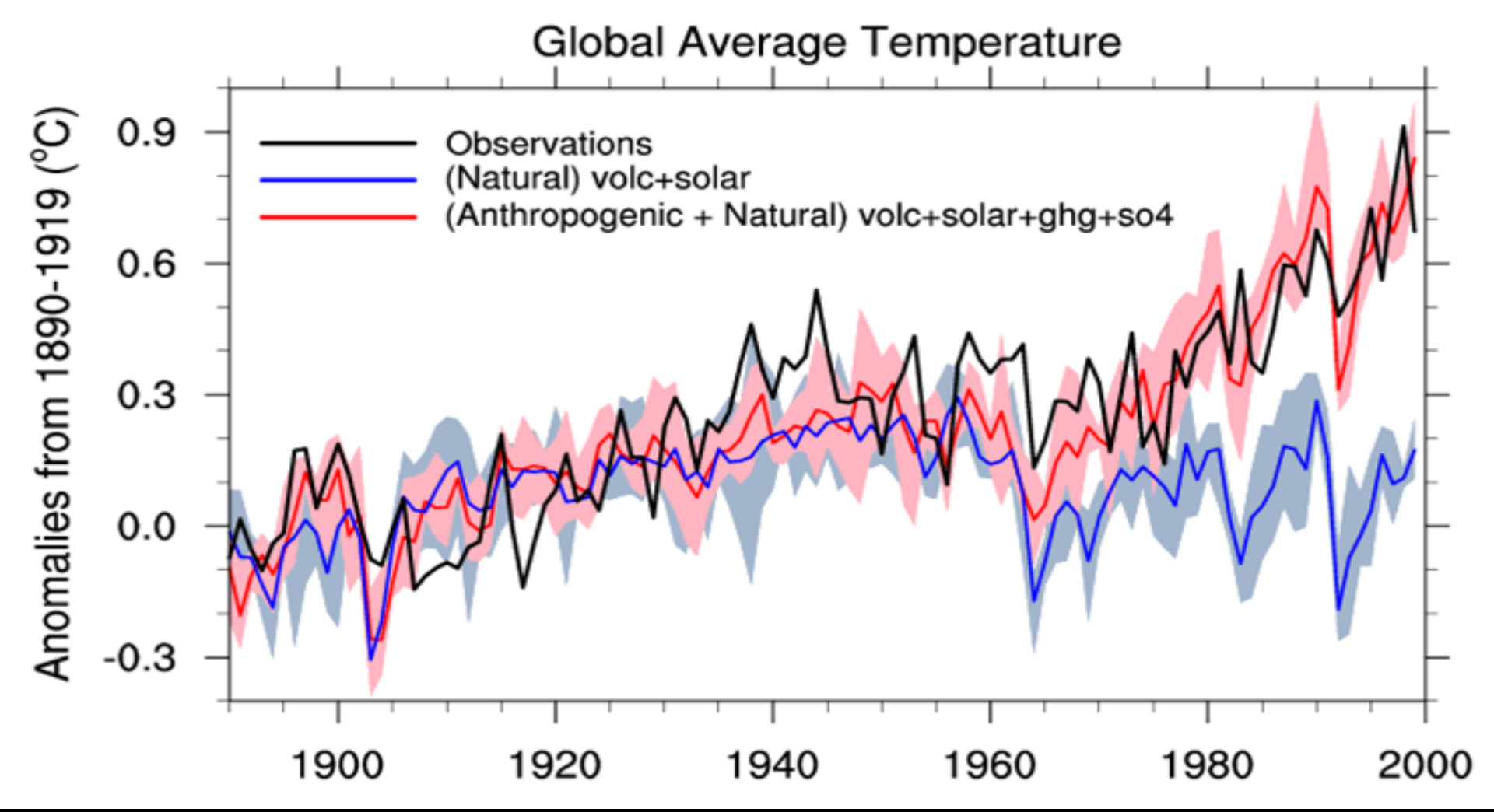


Figure 11.1 The present-day global carbon cycle. All pools are expressed in units of 10^{15} g C and all annual fluxes in units of 10^{15} g C/yr.

Radiative Forcing Components




Mid-1970s
Rain
CO_2
Mid-1980s
Clouds
Land Surface
Prescribed Ice
FAR
"Swamp" Ocean
SAR
Volcanic Activity
Sulphates
Ocean
TAR
Carbon Cycle
Aerosols
Rivers
Overturning Circulation
AR4
Chemistry
Interactive Vegetation

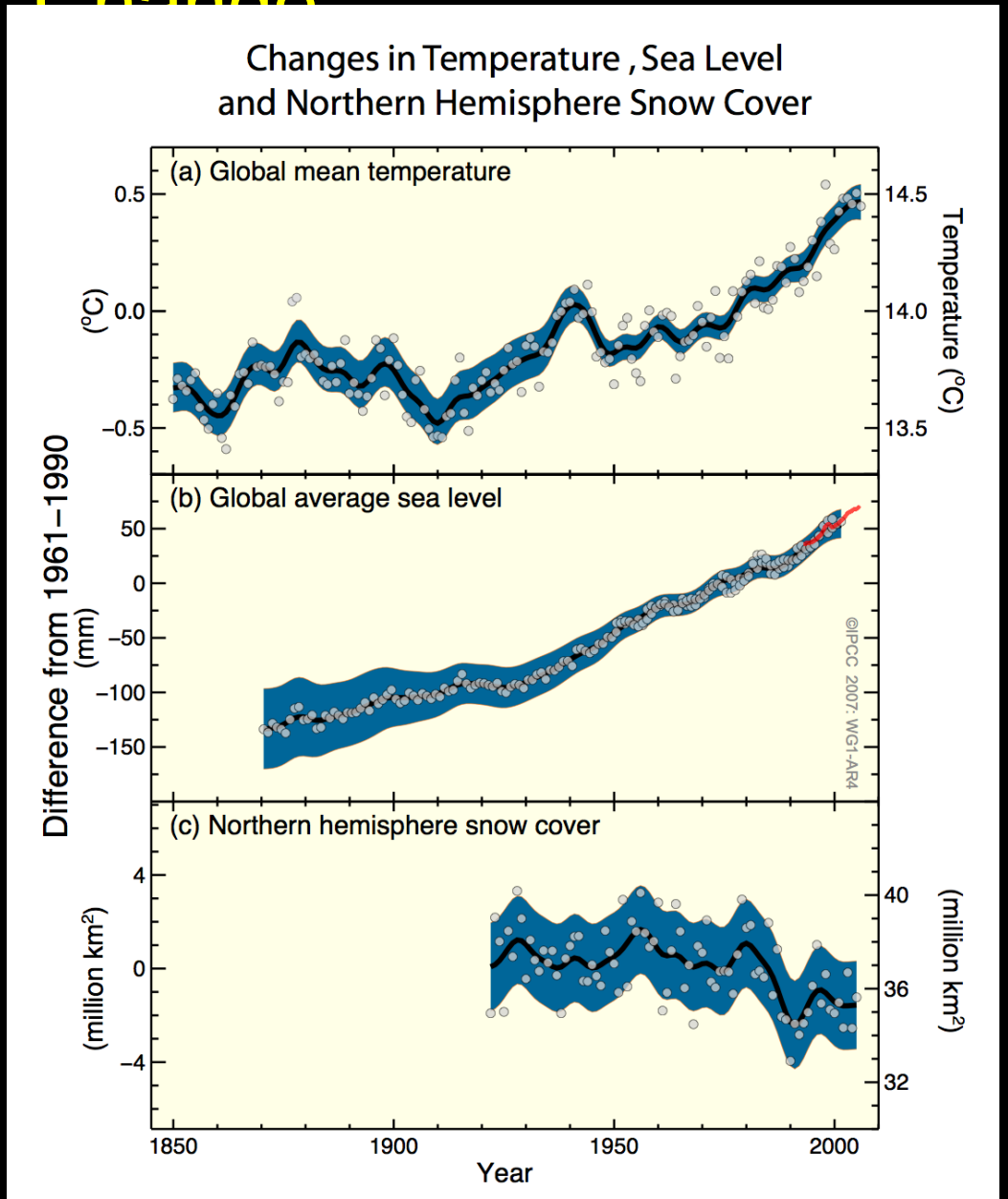

Global Average Temperature
Observations
(Natural) volc+solar
(Anthropogenic + Natural) volc+solar+ghg+so4
Anomalies from 1890-1919 (°C)
0.9
0.6
0.3
0.0
-0.3
1900
1920
1940
1960
1980
2000

Direct Observations of Recent Climate Change

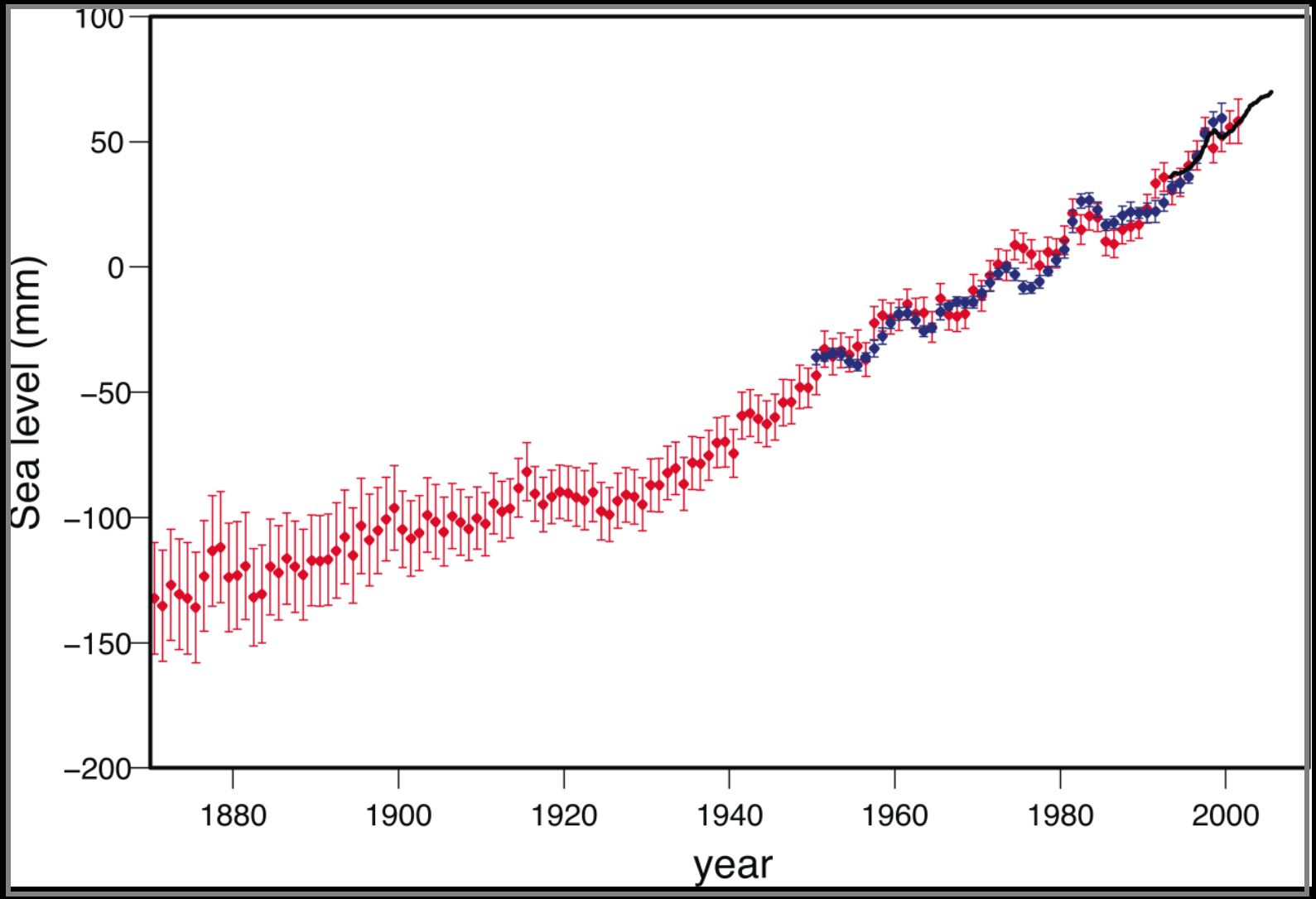
Gobal mean temperature

Global average sea level

Northern hemisphere Snow cover



20 cm rise
in 120 years



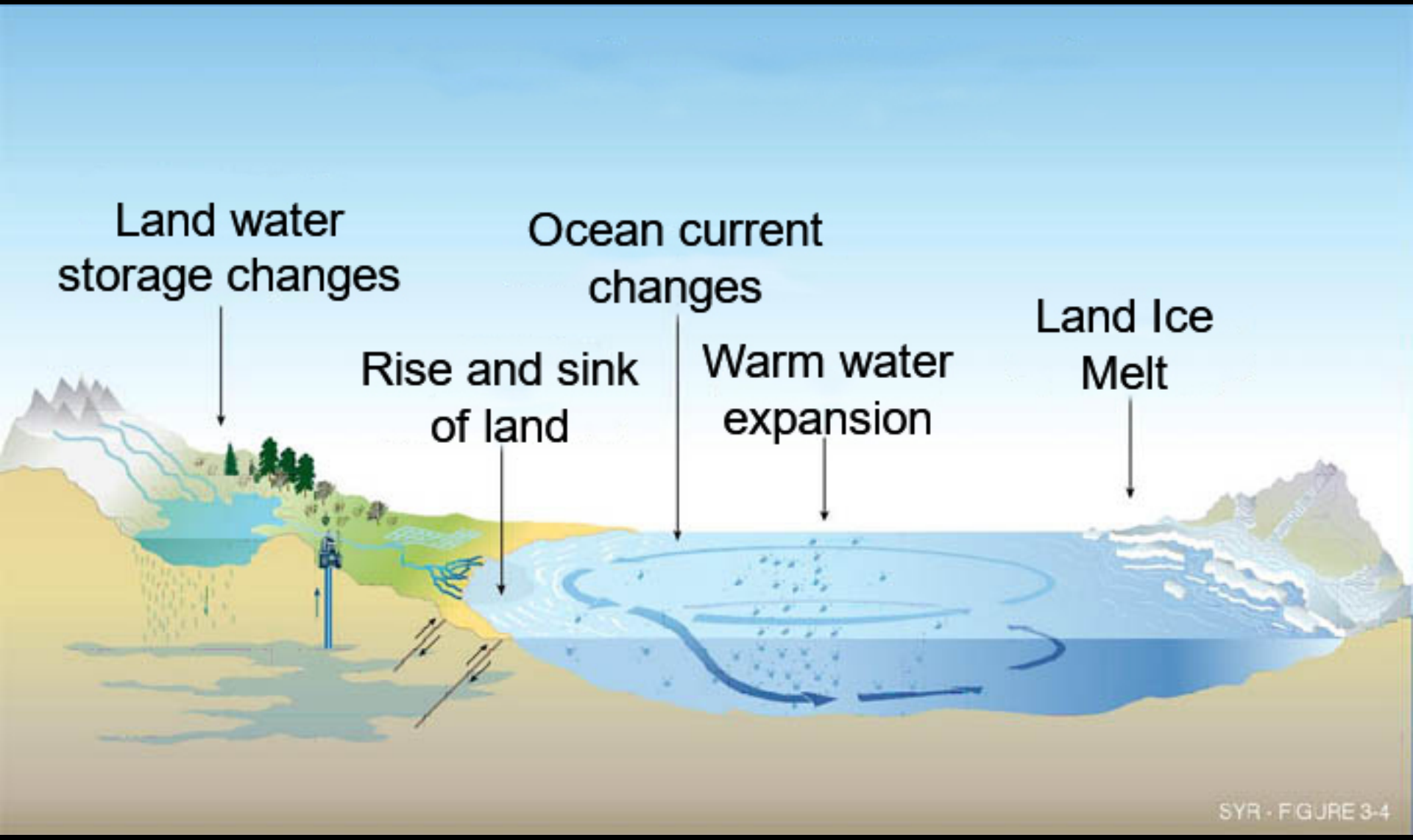
Contemporary Sea Level Rise

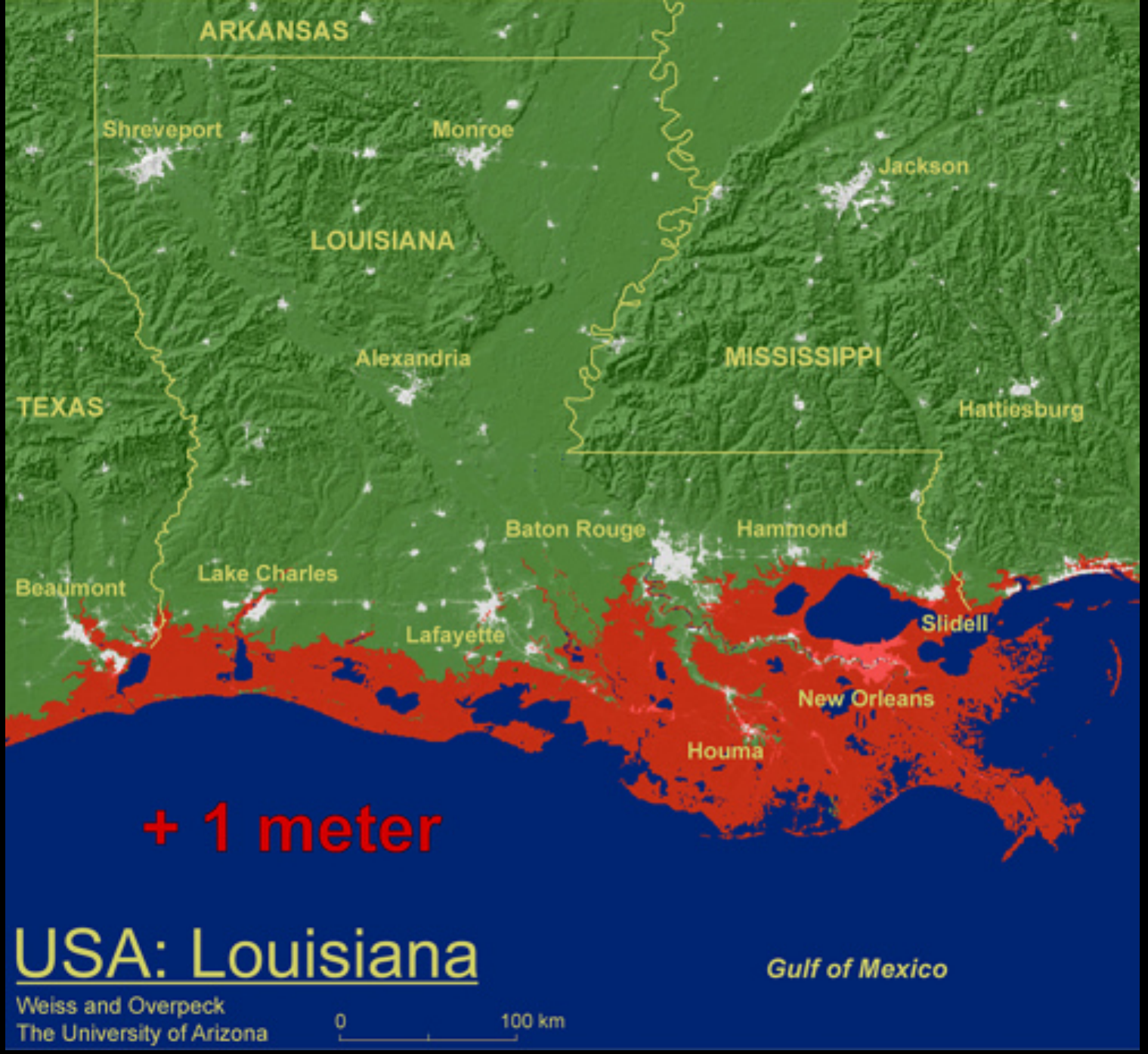
IPCC - AR4

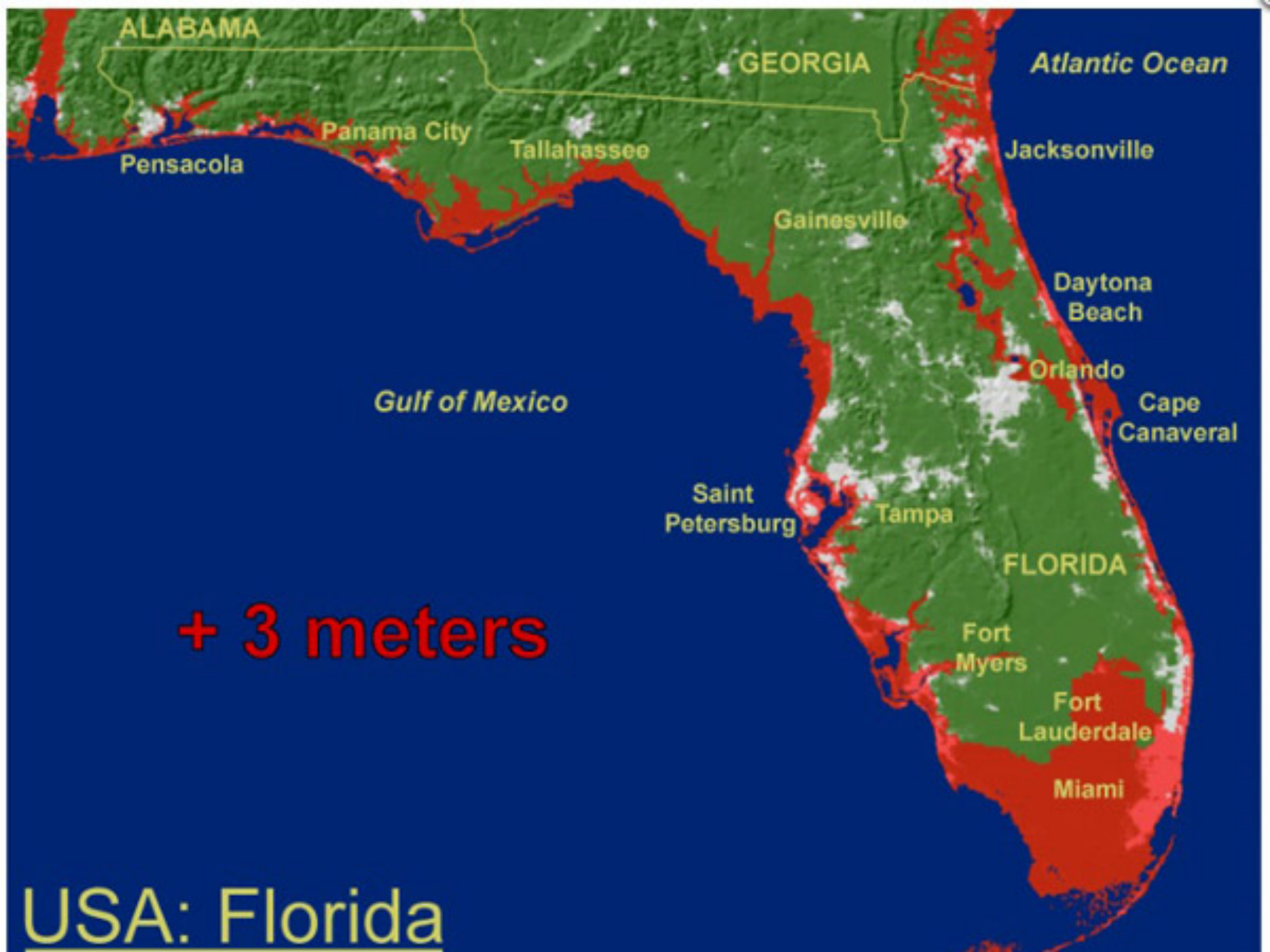
Table 13.1 | Global mean sea level budget (mm yr^{-1}) over different time intervals from observations and from model-based contributions. Uncertainties are 5 to 95%. The Atmosphere–Ocean General Circulation Model (AOGCM) historical integrations end in 2005; projections for RCP4.5 are used for 2006–2010. The modelled thermal expansion and glacier contributions are computed from the CMIP5 results, using the model of Marzeion et al. (2012a) for glaciers. The land water contribution is due to anthropogenic intervention only, not including climate-related fluctuations.

Source	1901–1990	1971–2010	1993–2010
Observed contributions to global mean sea level (GMSL) rise			
Thermal expansion	–	0.8 [0.5 to 1.1]	1.1 [0.8 to 1.4]
Glaciers except in Greenland and Antarctica[a]	0.54 [0.47 to 0.61]	0.62 [0.25 to 0.99]	0.76 [0.39 to 1.13]
Glaciers in Greenland[a]	0.15 [0.10 to 0.19]	0.06 [0.03 to 0.09]	0.10 [0.07 to 0.13][b]
Greenland ice sheet	–	–	0.33 [0.25 to 0.41]
Antarctic ice sheet	–	–	0.27 [0.16 to 0.38]
Land water storage	–0.11 [–0.16 to –0.06]	0.12 [0.03 to 0.22]	0.38 [0.26 to 0.49]
Total of contributions	–	–	**2.8 [2.3 to 3.4]**
Observed GMSL rise	**1.5 [1.3 to 1.7]**	**2.0 [1.7 to 2.3]**	**3.2 [2.8 to 3.6]**

What causes sea level to change?




ARKANSAS
Shreveport
Monroe
Jackson
LOUISIANA
Alexandria
MISSISSIPPI
TEXAS
Hattiesburg
Baton Rouge
Hammond
Lake Charles
Beaumont
Lafayette
Slidell
New Orleans
Houma
+ 1 meter
USA: Louisiana
Gulf of Mexico
Weiss and Overpeck
The University of Arizona
0
100 km


ALABAMA
GEORGIA
Atlantic Ocean
Panama City
Pensacola
Tallahassee
Jacksonville
Gainesville
Daytona Beach
Orlando
Gulf of Mexico
Cape Canaveral
Saint Petersburg
Tampa
FLORIDA
+ 3 meters
Fort Myers
Fort Lauderdale
Miami
USA: Florida

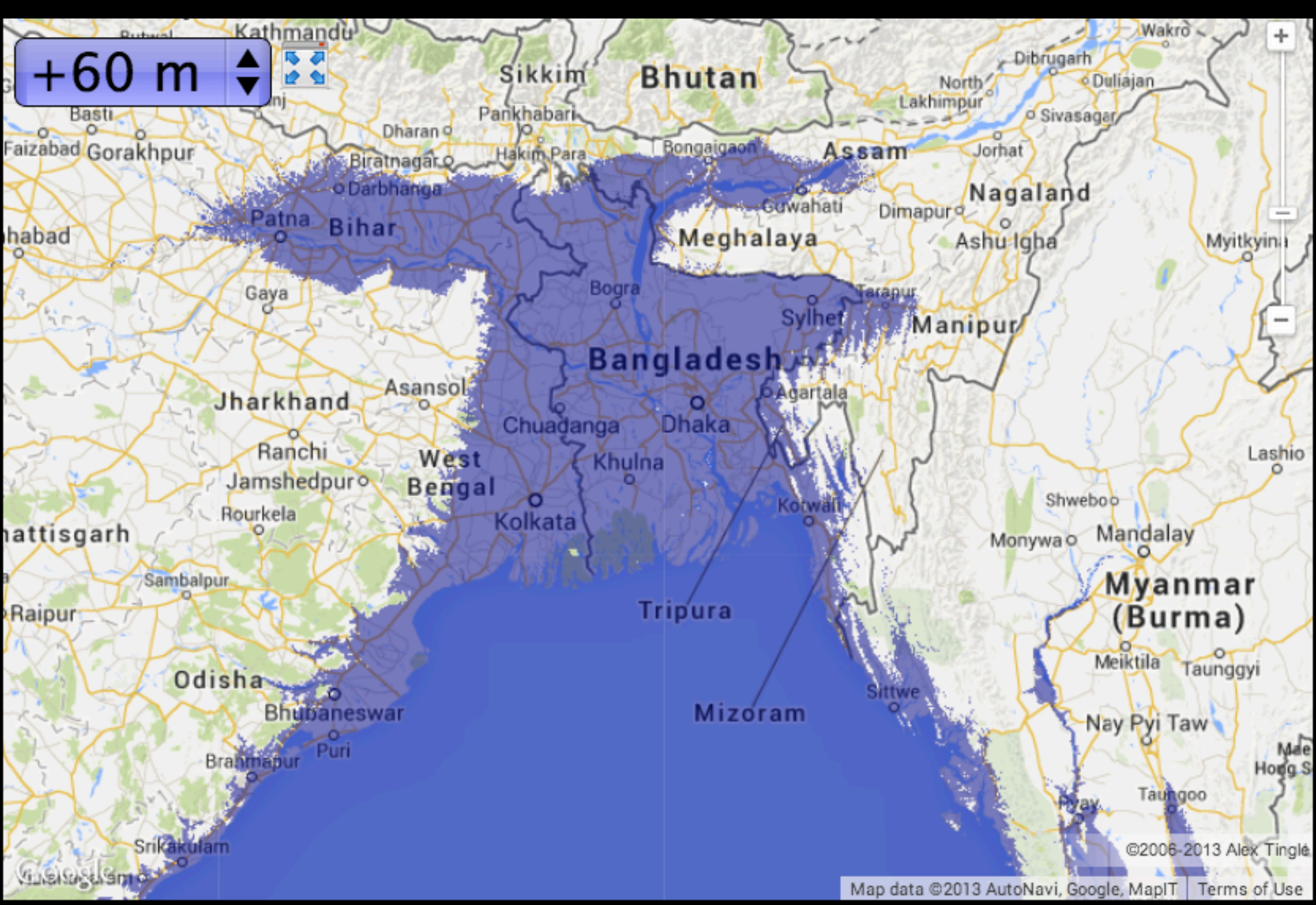

+60 m
Kathmandu
Sikkim
Bhutan
Wakro
Dibrugarh
Duliajan
North Lakhimpur
Sivasagar
Basti
Faizabad
Gorakhpur
Pankhabari
Dharan
Hakim Para
Bongaigaon
Assam
Jorhat
Biratnagar
Darbhanga
Guwahati
Nagaland
Dimapur
Ashu Igha
Patna
Bihar
Meghalaya
Myitkyina
Gaya
Bogra
Tarapur
Sylhet
Manipur
Bangladesh
Asansol
Agartala
Jharkhand
Chuadanga
Dhaka
Ranchi
West Bengal
Khulna
Lashio
Jamshedpur
Kolkata
Shwebo
Rourkela
Monywa
Mandalay
Sambalpur
Raipur
Tripura
Myanmar (Burma)
Meiktila
Taunggyi
Odisha
Sittwe
Bhubaneswar
Mizoram
Nay Pyi Taw
Puri
Brahmapur
Taungoo
Srikakulam
©2006-2013 Alex Tingle
Map data ©2013 AutoNavi, Google, MapIT
Terms of Use

Table 13.1 | Global mean sea level budget (mm yr^{-1}) over different time intervals from observations and from model-based contributions. Uncertainties are 5 to 95%. The Atmosphere–Ocean General Circulation Model (AOGCM) historical integrations end in 2005; projections for RCP4.5 are used for 2006–2010. The modelled thermal expansion and glacier contributions are computed from the CMIP5 results, using the model of Marzeion et al. (2012a) for glaciers. The land water contribution is due to anthropogenic intervention only, not including climate-related fluctuations.

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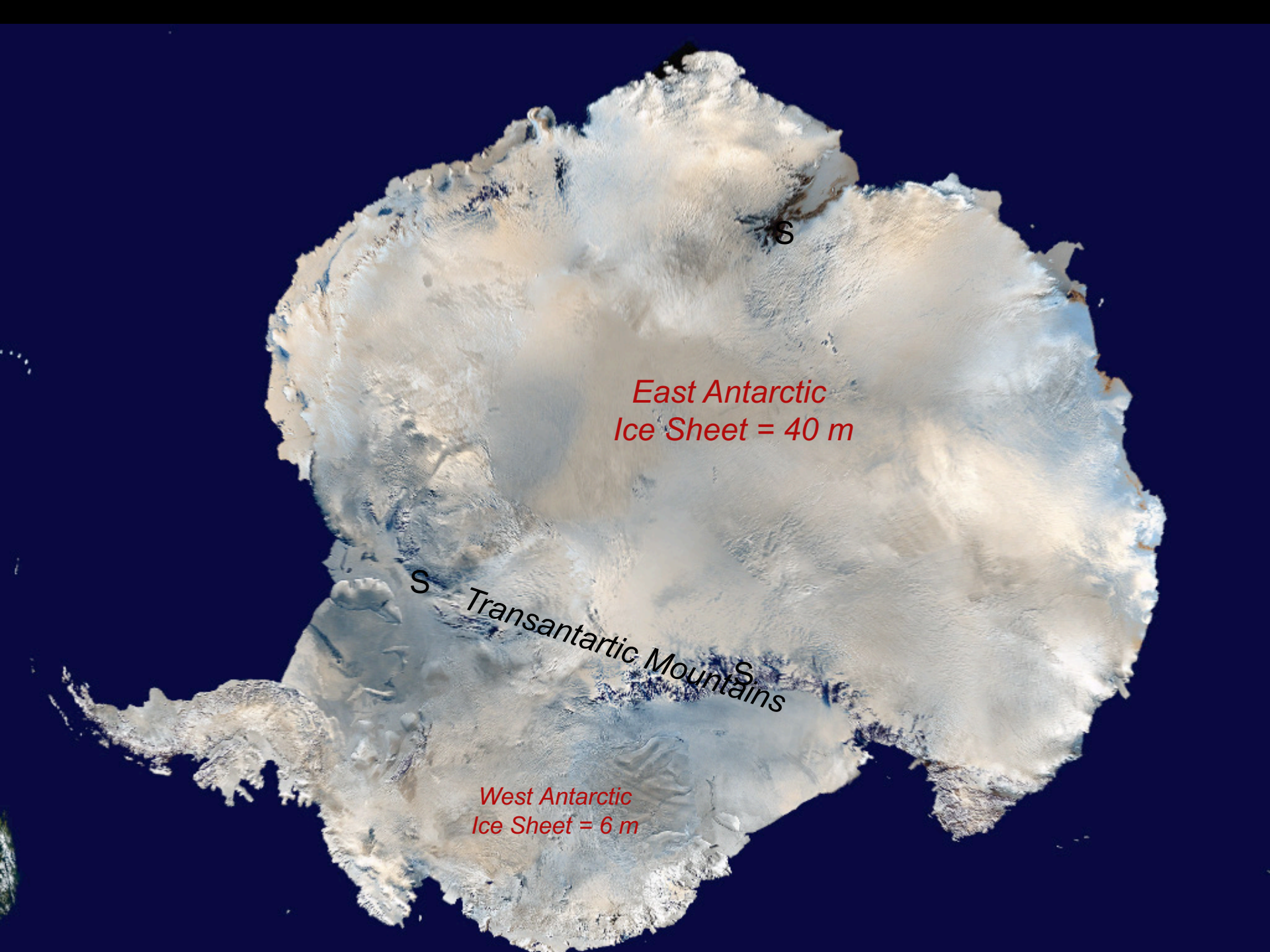
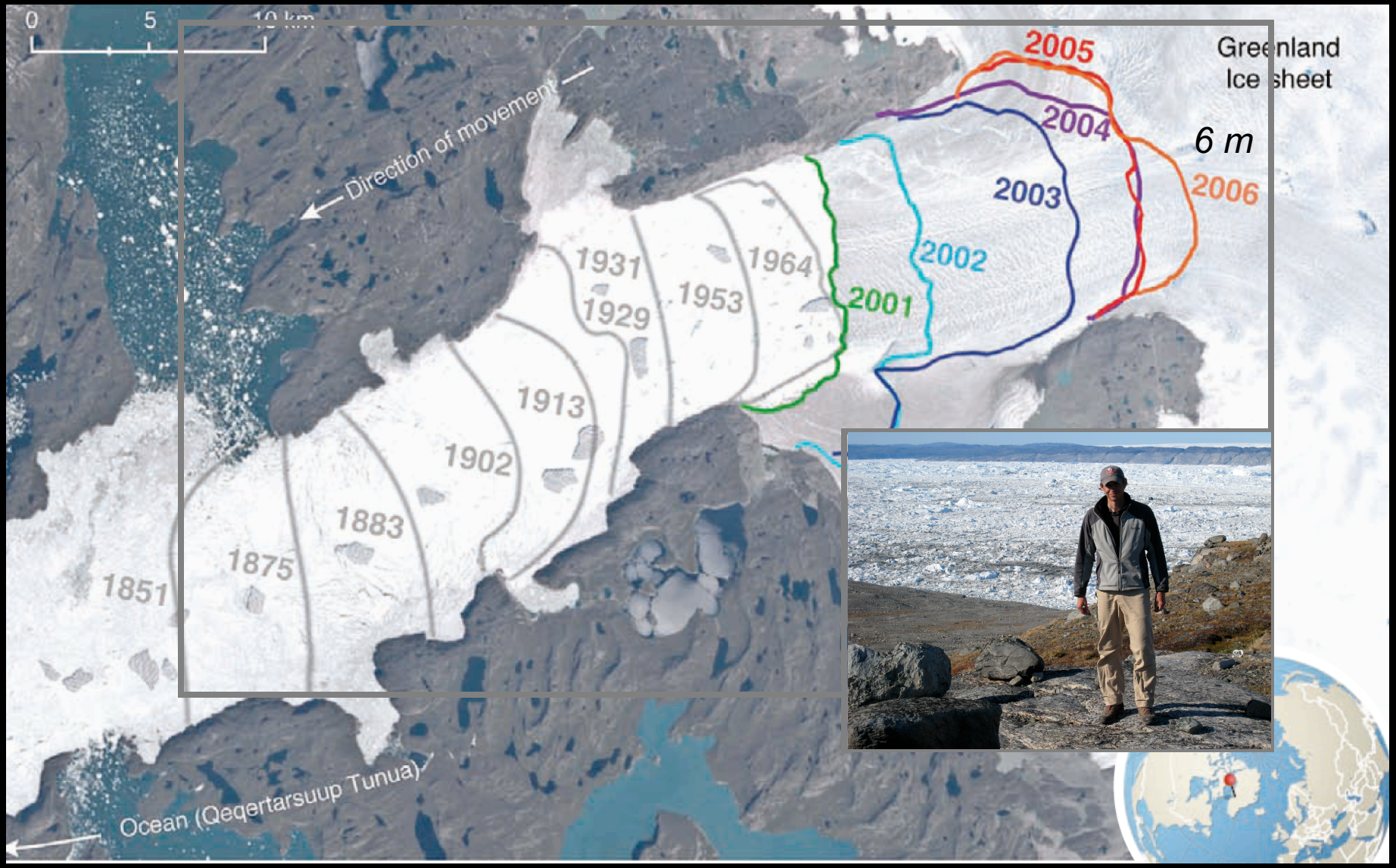
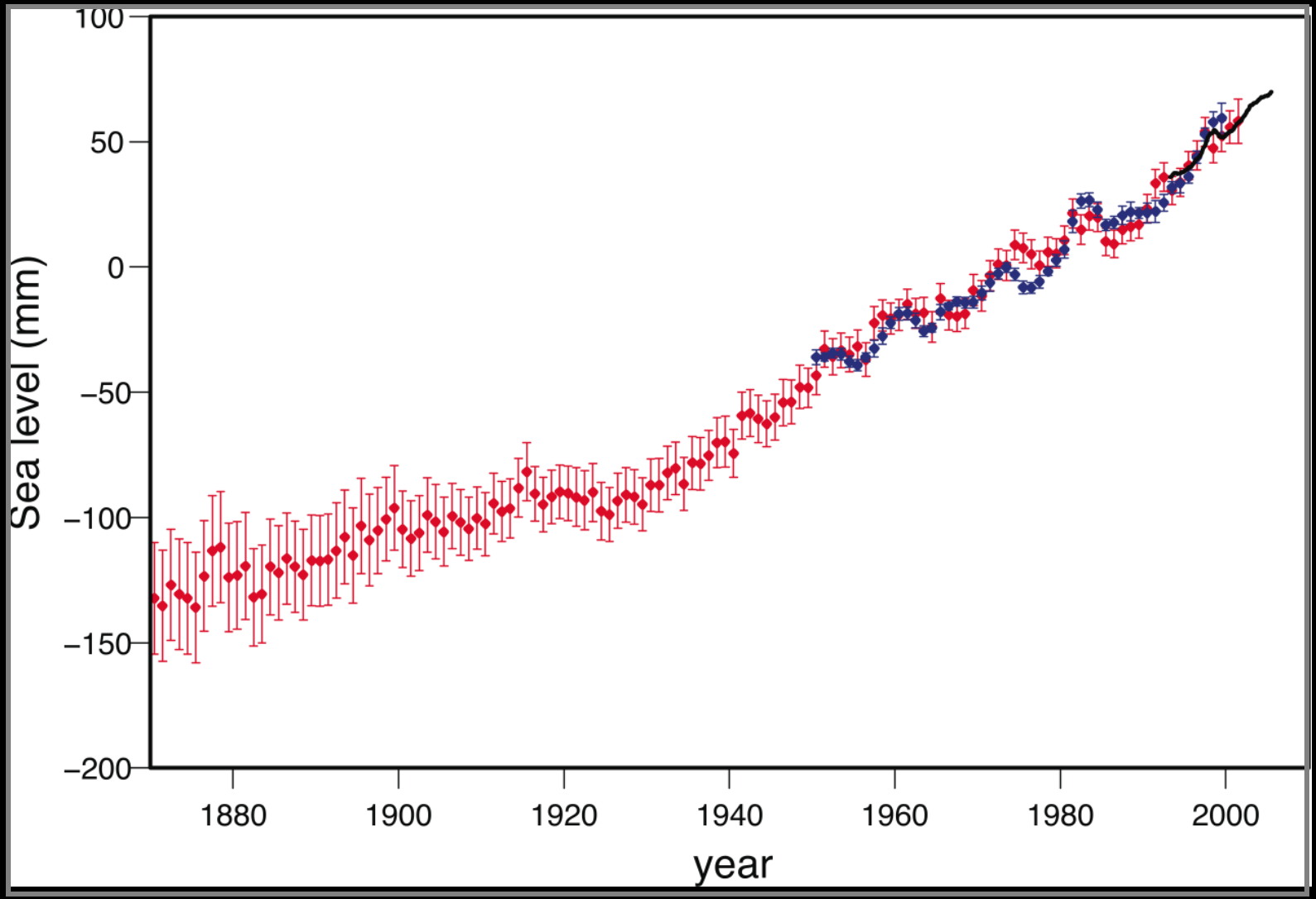
Glacier Bay
ca. 1750
Icy Strait
Gulf
of
Alaska


East Antarctic
Ice Sheet = 40 m
Transantartic Mountains
West Antarctic
Ice Sheet = 6 m

Jakobshavn Isbræ - western Greenland

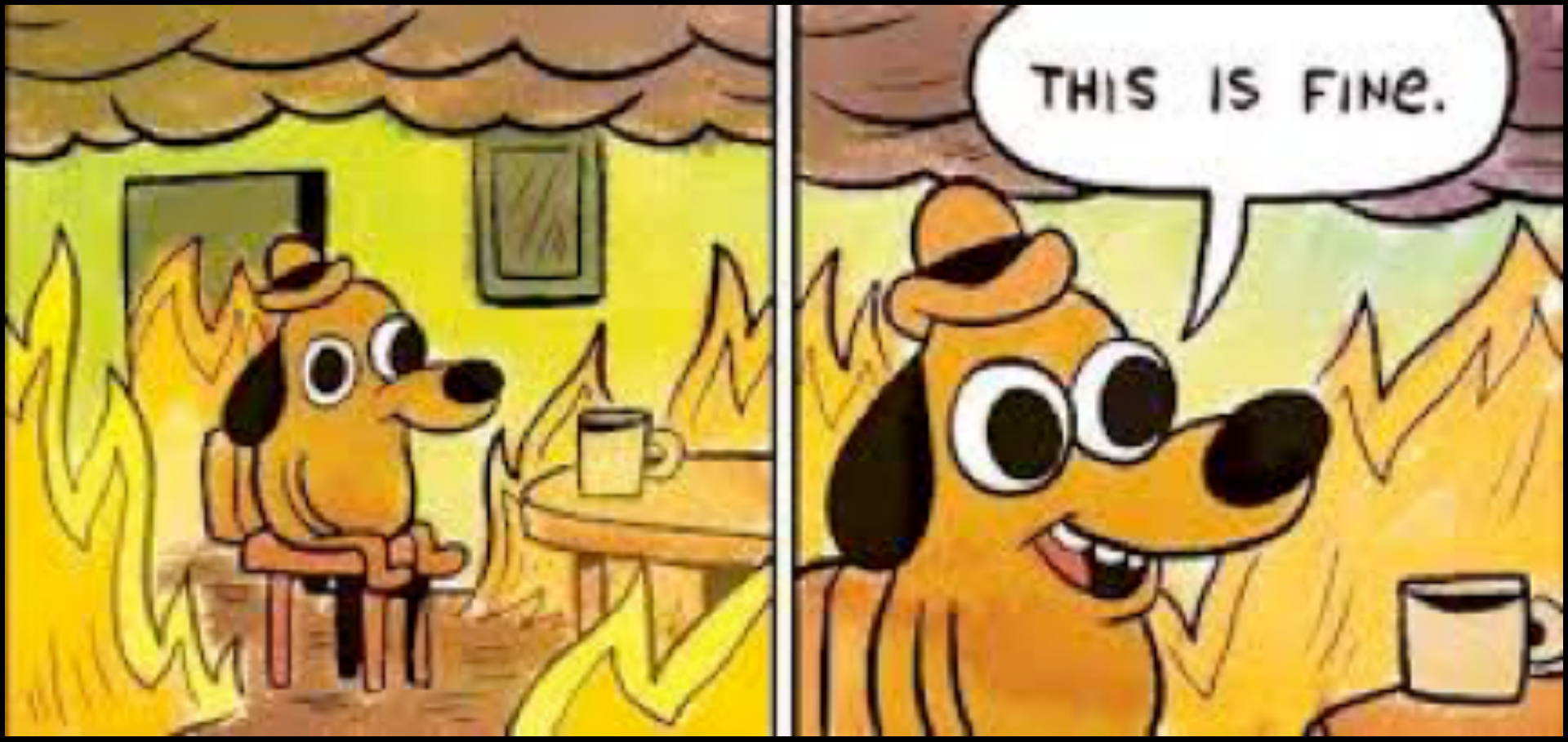


20 cm rise
in 120 years



Contemporary Sea Level Rise

IPCC - AR4


THIS IS FINE.