

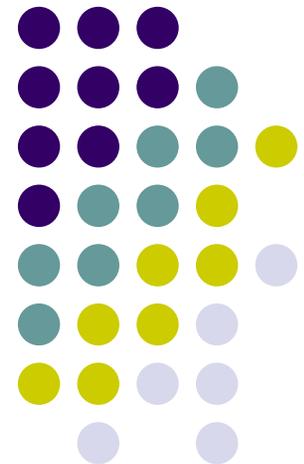
Regional Temperature and Sea Level Trends

Washington, DC Metropolitan Area

Metropolitan Washington Council of Governments

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August 22, 2007





Outline

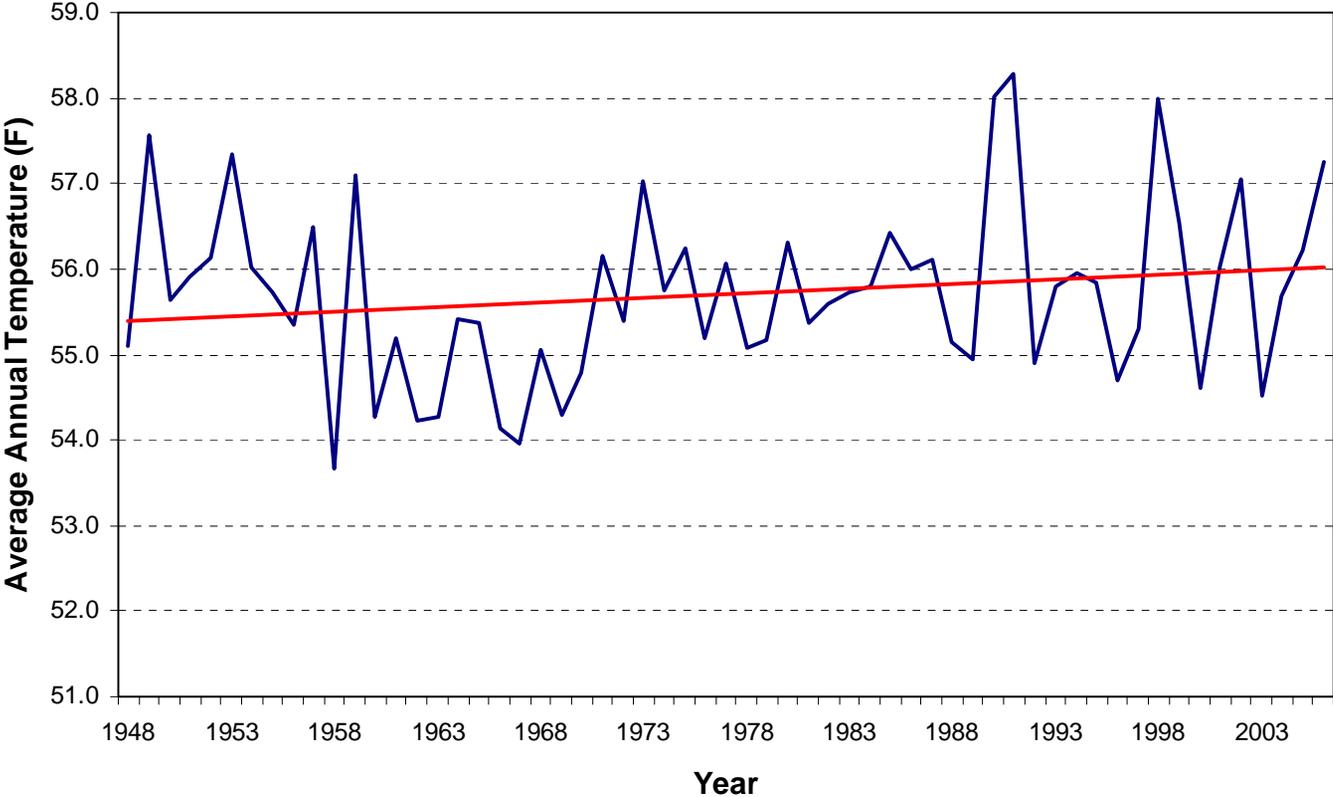
- Historical Temperature Trends of Washington, DC
- Global Carbon Dioxide Concentration Trends
- Relationship between GHG and Temperatures & Sea Level
- Impacts of Climate Change on Washington, DC
- Regional DC Temperature Projection to 2050
- Impact of GHG Emission Reductions

Regional Temperature Trends of DC Metropolitan Area



DC Regional Station-Averaged Temperature

Warming Trend of +0.11 °F per decade since 1948



Stations used in the regional average:

- National Arboretum
- Dalecarlia
- National Airport
- Dulles Airport
- Woodstock, MD
- Lincoln, VA
- Louisa, VA

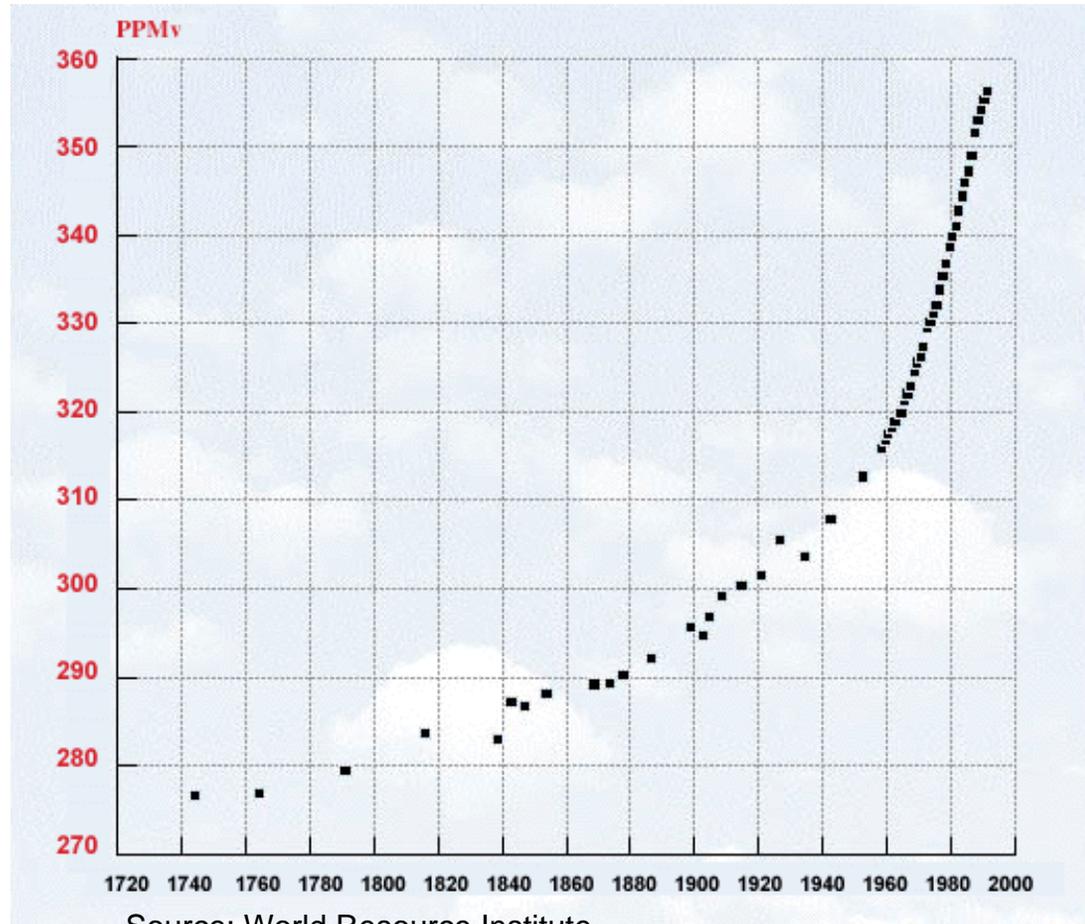
— DC Area Station Averaged Temperatures — Linear (DC Area Station Averaged Temperatures)

Carbon Dioxide Concentration Trends & Temperature-GHG Relationship



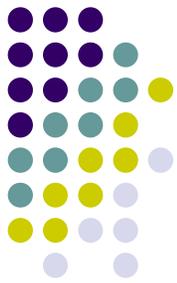
- 379 ppm CO₂ in 2005, up from 280 ppm in 1800
- Since 1970s, 1.7 ppm/yr added via emissions
- To raise the global temperature by 1.0°C, a 125 ppm increase in CO₂ is needed.

Global Atmospheric Carbon Dioxide Concentrations (PPMv)

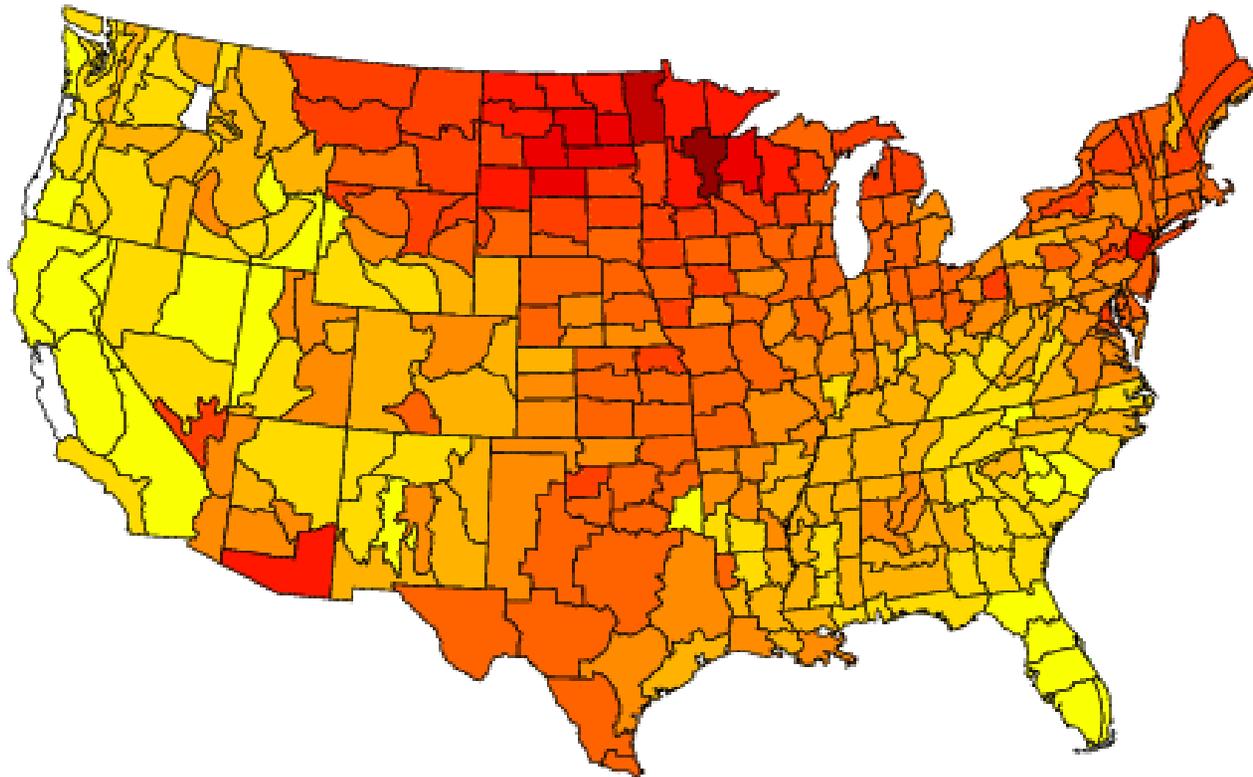


Source: World Resource Institute

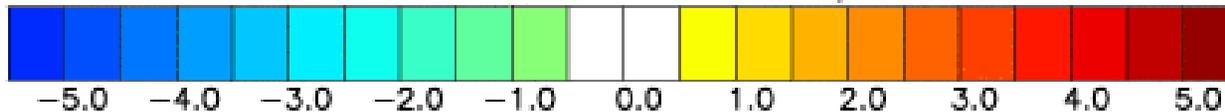
Temperatures in DC and the United States in 2006



Temperature Anomalies (F)
Jan to Dec 2006
Versus 1961–1990 Longterm Average



NOAA/ESRL PSD and CIRES-CDC



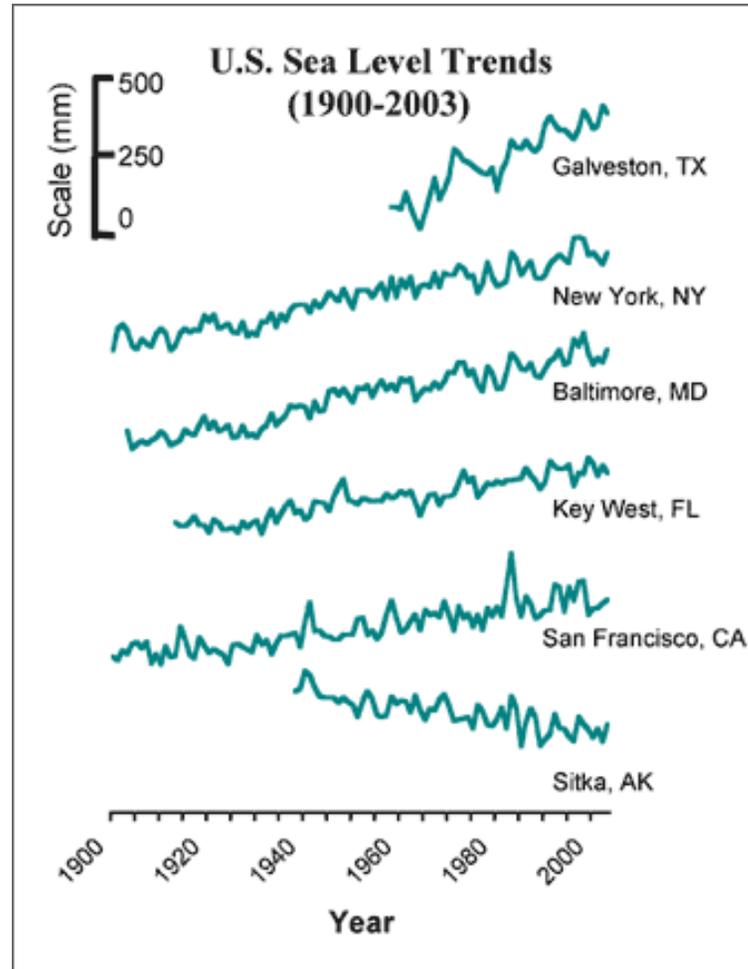
Source: NOAA Climate Diagnostics Center



Nationally: Five of the last 10 years has made the top ten warmest years in the U.S.

Year	National Average Daily Mean Temperature	Rank: Based on the Time Period Selected (1895-2006)
1998	55.01 deg F	1
2006	54.93 deg F	2
1934	54.91 deg F	3
1999	54.60 deg F	4 (tie)
1921	54.60 deg F	4 (tie)
1931	54.38 deg F	6
2001	54.33 deg F	7
2005	54.27 deg F	8 (tie)
1990	54.27 deg F	8 (tie)
1953	54.16 deg F	10

Sea Level Trends for DC & Baltimore



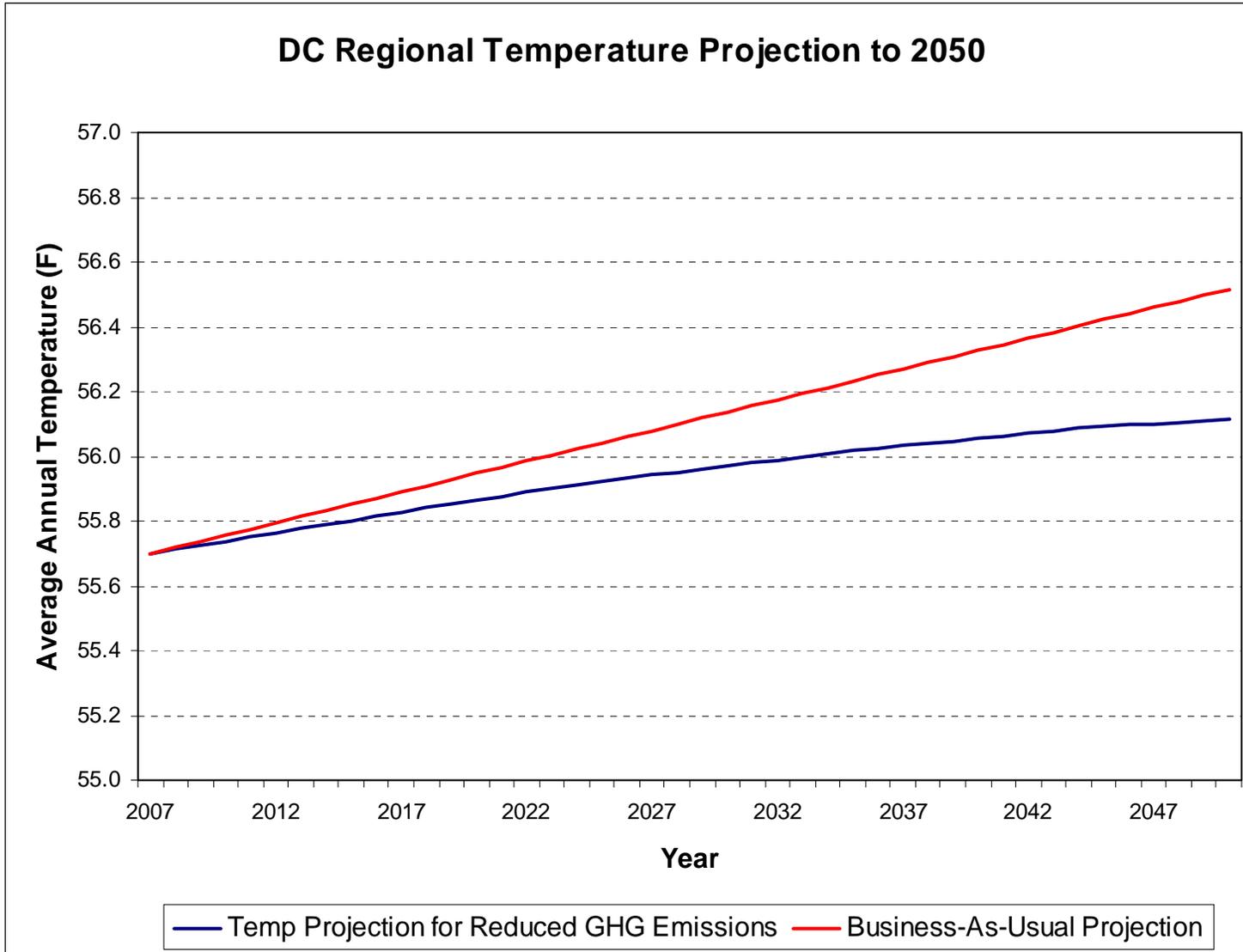
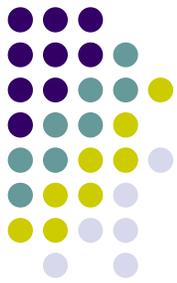
Source: EPA - Climate Change

Impacts of Climate Change



- Increased risk of drought, heat, flash floods, tidal/coastal flooding
- Rising sea levels
 - Low lands vulnerable to inundation
 - Saltwater contamination of fresh water used for drinking and irrigation
- Decrease in water quality in the Chesapeake Bay
 - Harmful algal blooms from increased runoff, harms fish and crab populations
 - Impact on water resources for DC & Baltimore
- Threats to public health
 - Heat-related illnesses and deaths
 - Insect-borne diseases
 - Air quality
- Agricultural production may potentially decline
 - Multi-billion dollar industry around DC & Baltimore
 - Sensitive to changes in temperature and precipitation patterns

Temperature Projection to 2050: Reduced Emissions vs. Business-as-Usual





Impact of GHG Emission Reductions

- Global effort needed to reduce CO2 emissions.
- If the 80% below 1990 levels by 2050 target is met, global temperatures would be flattened at levels far below the business-as-usual projections.
- The rise in regional average DC metro area temperature may be cut in half as a result.