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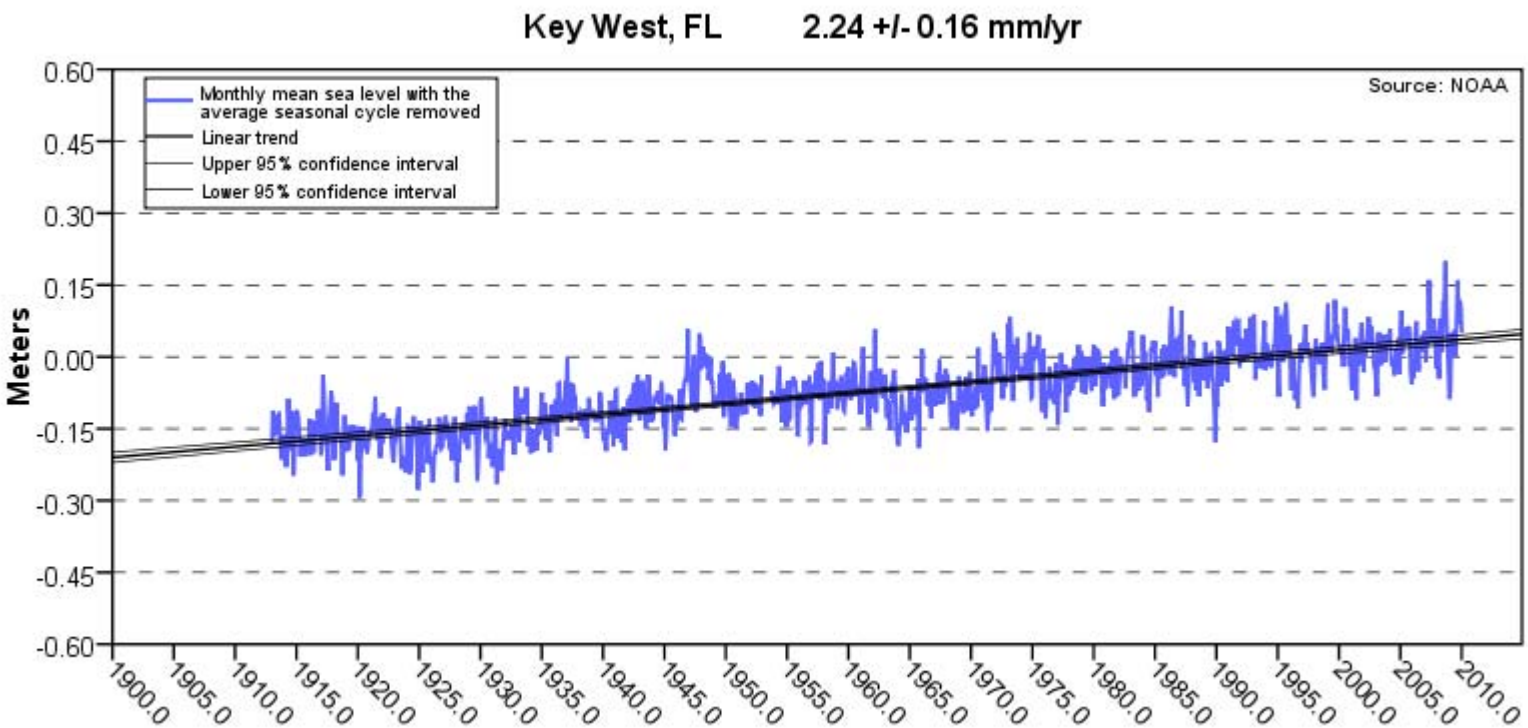
Mean Sea Level Trend
8724580 Key West, Florida
1903 - 2006



The mean sea level trend is 2.24 millimeters/year with a 95% confidence interval of +/- 0.16 mm/yr based on monthly mean sea level data from 1913 to 2006 which is equivalent to a change of 0.73 feet in 100 years.

Tidesandcurrents.noaa.gov

Sea Level Rise Contributing Factors

Table SPM.1. *Observed rate of sea level rise and estimated contributions from different sources. {5.5, Table 5.3}*

Source of sea level rise	Rate of sea level rise (mm per year) 1961–2003	1993–2003
Thermal expansion	0.42 ± 0.12	1.6 ± 0.5
Glaciers and ice caps	0.50 ± 0.18	0.77 ± 0.22
Greenland Ice Sheet	0.05 ± 0.12	0.21 ± 0.07
Antarctic Ice Sheet	0.14 ± 0.41	0.21 ± 0.35
Sum of individual climate contributions to sea level rise	1.1 ± 0.5	2.8 ± 0.7
Observed total sea level rise	1.8 ± 0.5[a]	3.1 ± 0.7[a]
Difference (Observed minus sum of estimated climate contributions)	0.7 ± 0.7	0.3 ± 1.0

From IPCC 4th AR

Sea Level Rise Projections for End of Century

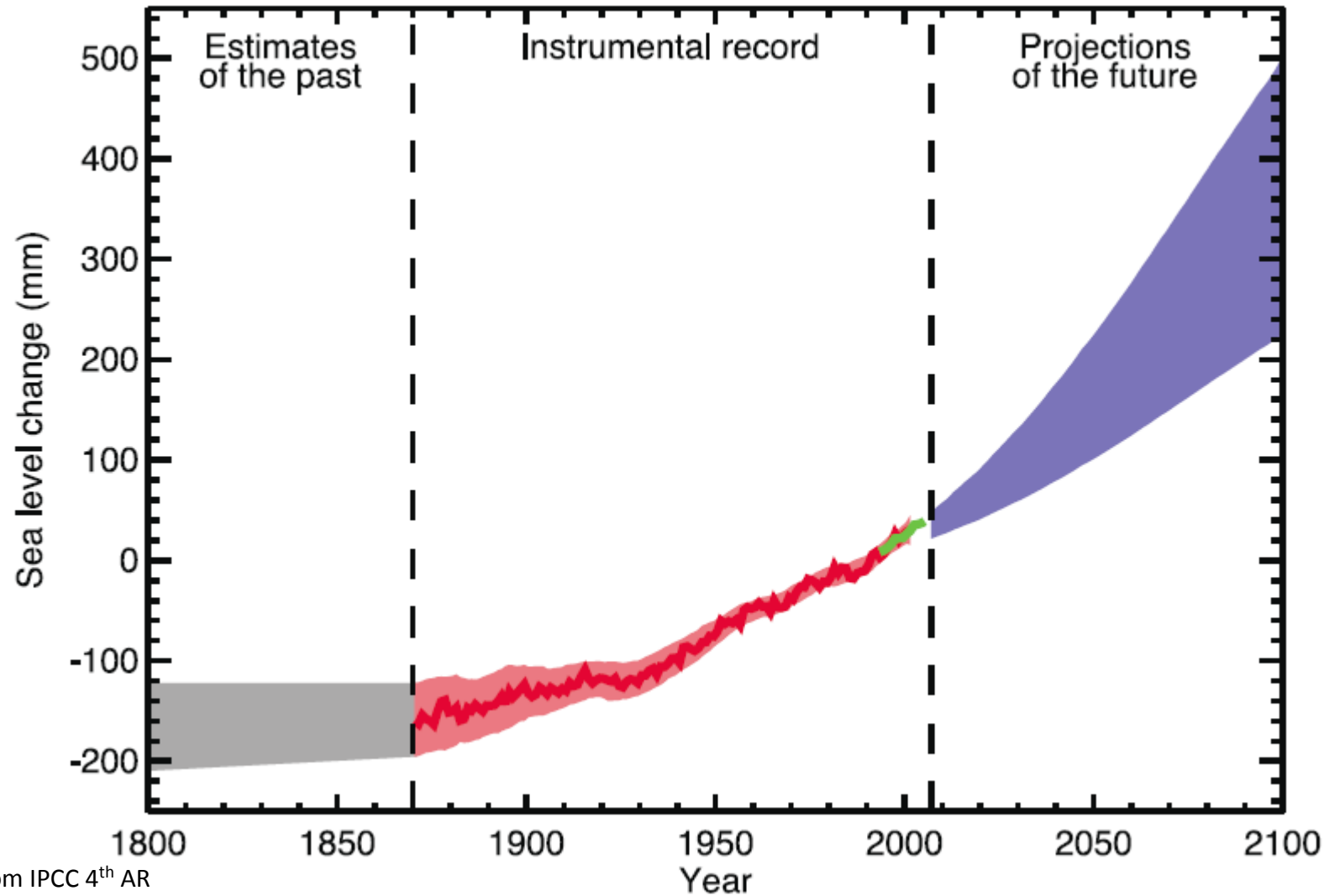
Table TS.6. *Projected global average surface warming and sea level rise at the end of the 21st century. {10.5, 10.6, Table 10.7}*

Case	Temperature Change (°C at 2090-2099 relative to 1980-1999) [a]		Sea Level Rise (m at 2090-2099 relative to 1980-1999)
	Best estimate	*Likely* range	Model-based range excluding future rapid dynamical changes in ice flow
Constant Year 2000 concentrations [b]	0.6	0.3 – 0.9	NA
B1 scenario	1.8	1.1 – 2.9	0.18 – 0.38
A1T scenario	2.4	1.4 – 3.8	0.20 – 0.45
B2 scenario	2.4	1.4 – 3.8	0.20 – 0.43
A1B scenario	2.8	1.7 – 4.4	0.21 – 0.48
A2 scenario	3.4	2.0 – 5.4	0.23 – 0.51
A1FI scenario	4.0	2.4 – 6.4	0.26 – 0.59

1 meter ~ 3.3 feet
0.3 meter ~ 1 foot

From IPCC 4th AR

Sea Level Rise Projections for End of Century



From IPCC 4th AR

HURRICANES…

No scientific consensus yet on change of hurricane frequency – either higher or lower.

However – all things being equal, an increase in SST in tropical North Atlantic translates to more intense hurricanes (not necessarily more).

BUT – all things may not be equal!!

Media Contact

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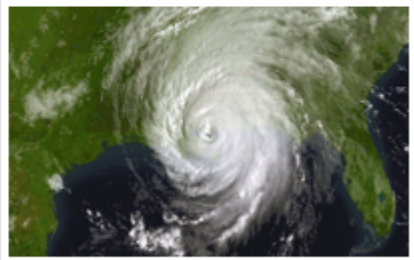
Warmer Ocean Could Reduce Number of Atlantic Hurricane Landfalls

January 22, 2008

A warming global ocean — influencing the winds that shear off the tops of developing storms — could mean fewer Atlantic hurricanes striking the United States according to new findings by NOAA climate scientists. Furthermore, the relative warming role of the Pacific, Indian and Atlantic oceans is important for determining Atlantic hurricane activity.

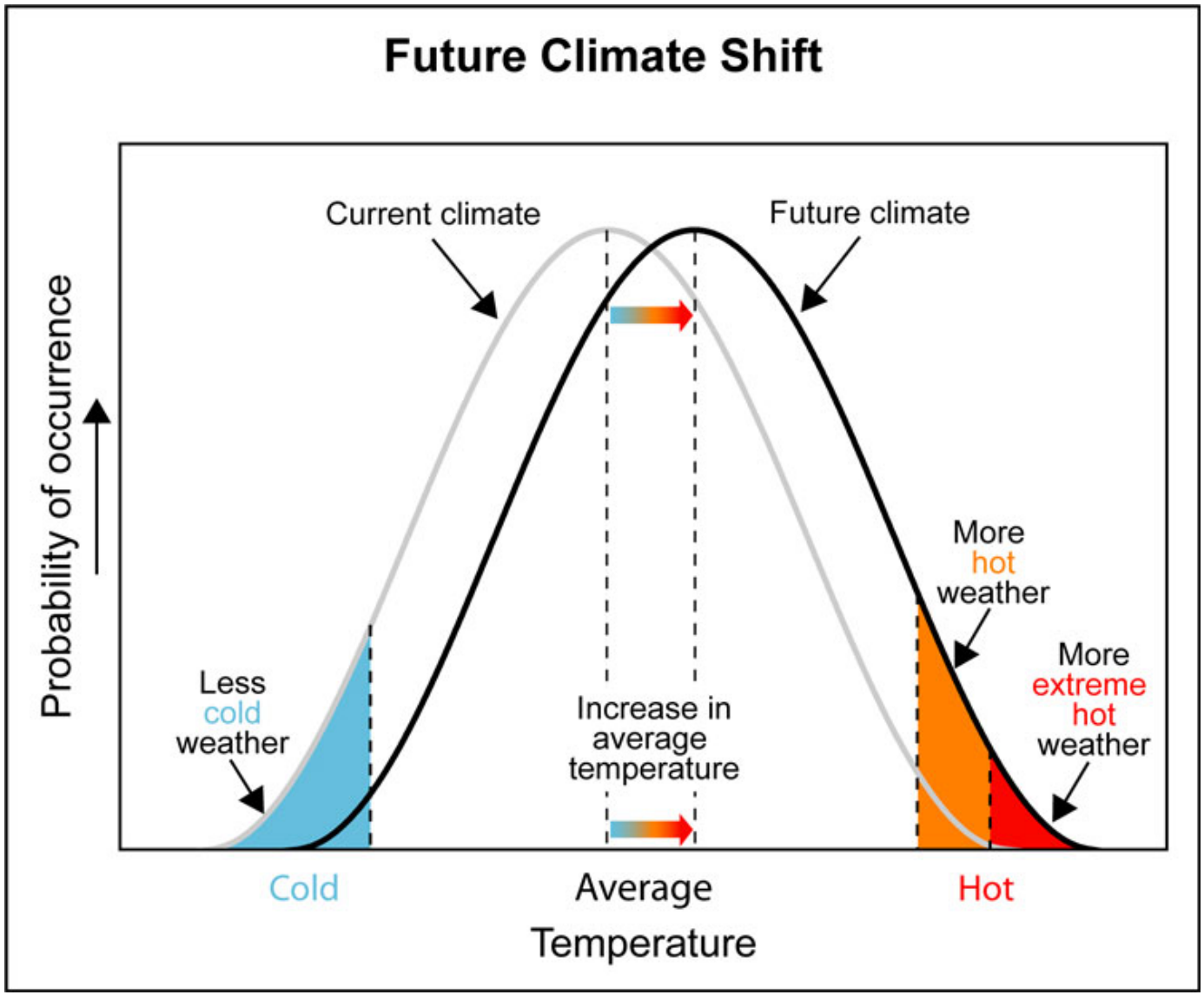


Hurricane Katrina on Aug. 28, 2005.

+ High Resolution (Credit: NOAA)

The article, to be published on January 23 in Geophysical Research Letters, uses observations to show that warming of global sea surface temperatures is associated with a secular, or sustained long-term increase, of vertical wind shear in the main development region for Atlantic hurricanes. The increased vertical wind shear coincides with a downward trend in U.S. landfalling hurricanes.

…summary…

- Sea Level Rise is already occurring and is a reality for the Florida Keys.
  - No noticeable acceleration of rate of increase in record as of yet.
  - At minimum (assuming current rate), sea level rise of around 9 inches expected by end of century.
- Stronger hurricanes are possible with increased SST
  - Storm surge related to hurricane strength
  - Storm surge exacerbated by sea level rise
- Temperature, non-tropical precipitation impacts uncertain in tropics and not as extreme as higher latitudes.
  - However, ancillary effects can be substantial.

A good way to conceptualize global warming…