

ENSO US LANDFALL PROBABILITIES REVISITED

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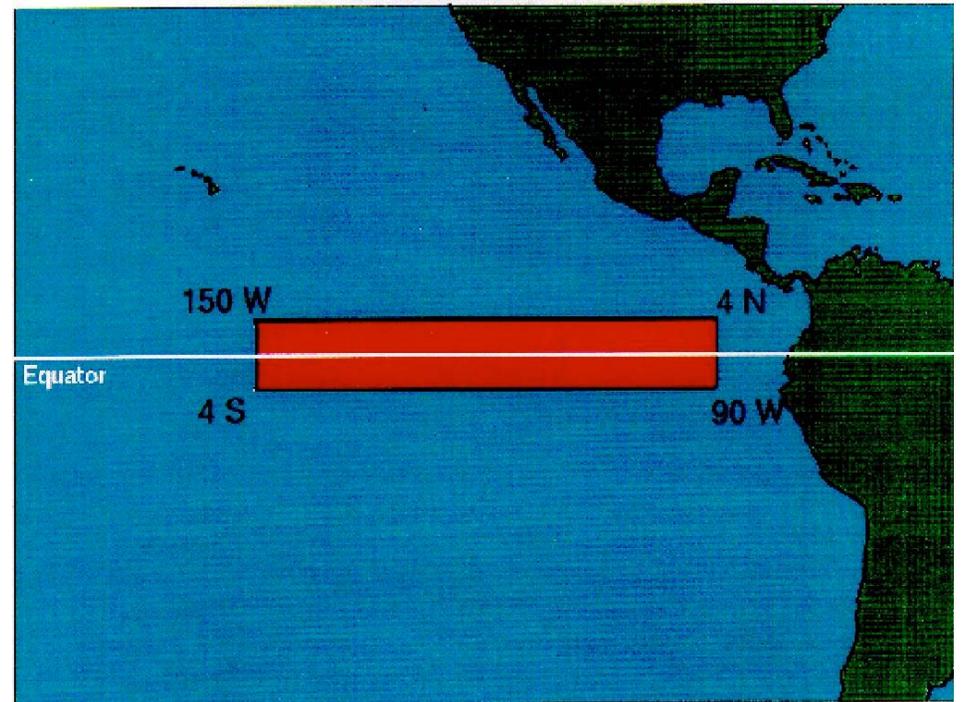
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IS EL NINO CHANGING?

Japan Meteorological Agency (JMA) ENSO Index

- SST Anomalies averaged over the red shaded portion of the equatorial Pacific Ocean
- Smoothed with a five-month running average to reduce noise



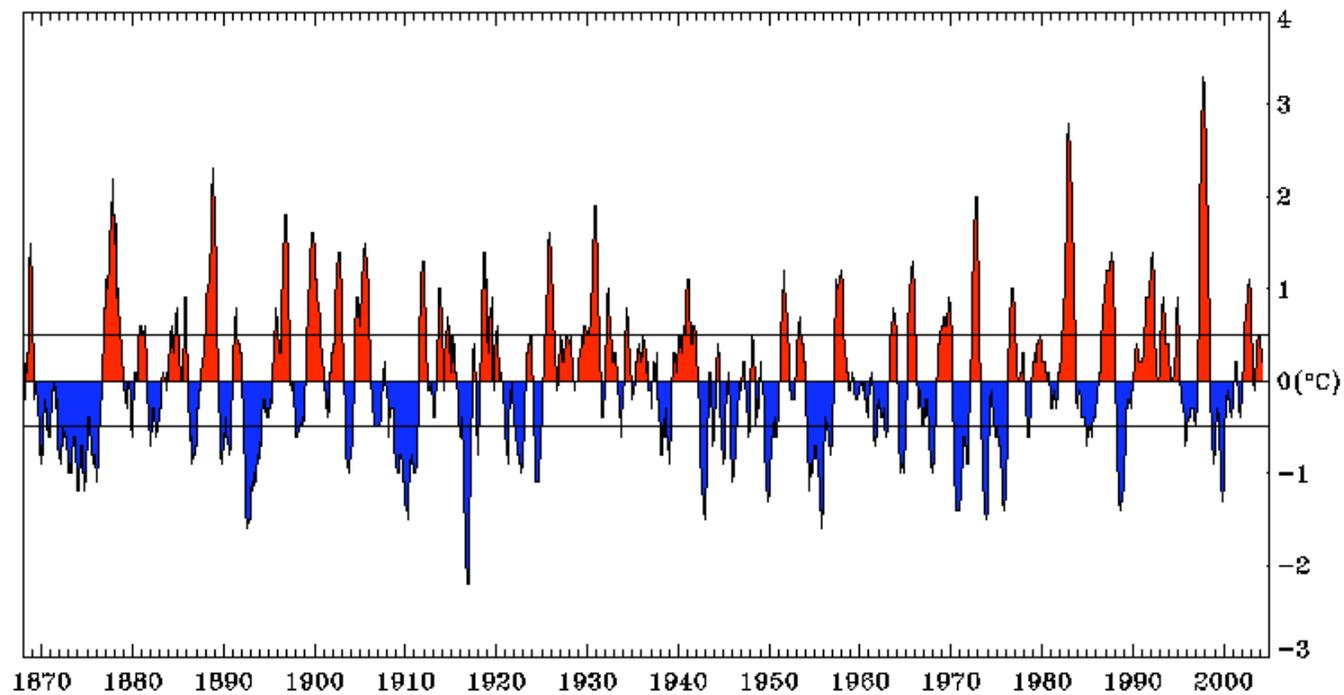
Changes in the ENSO Cycle



JMA Index

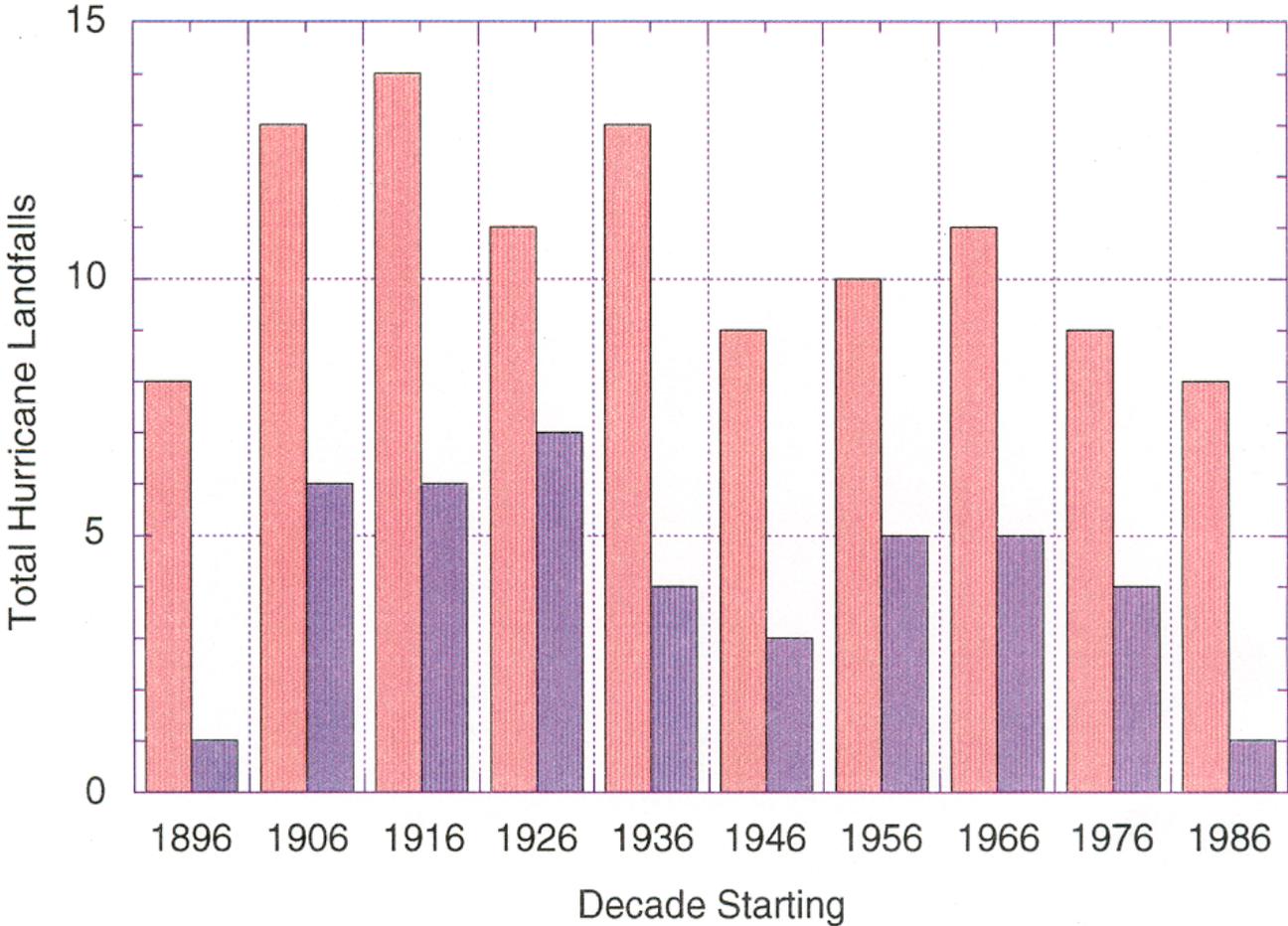


(Last Updated 08/13/04)



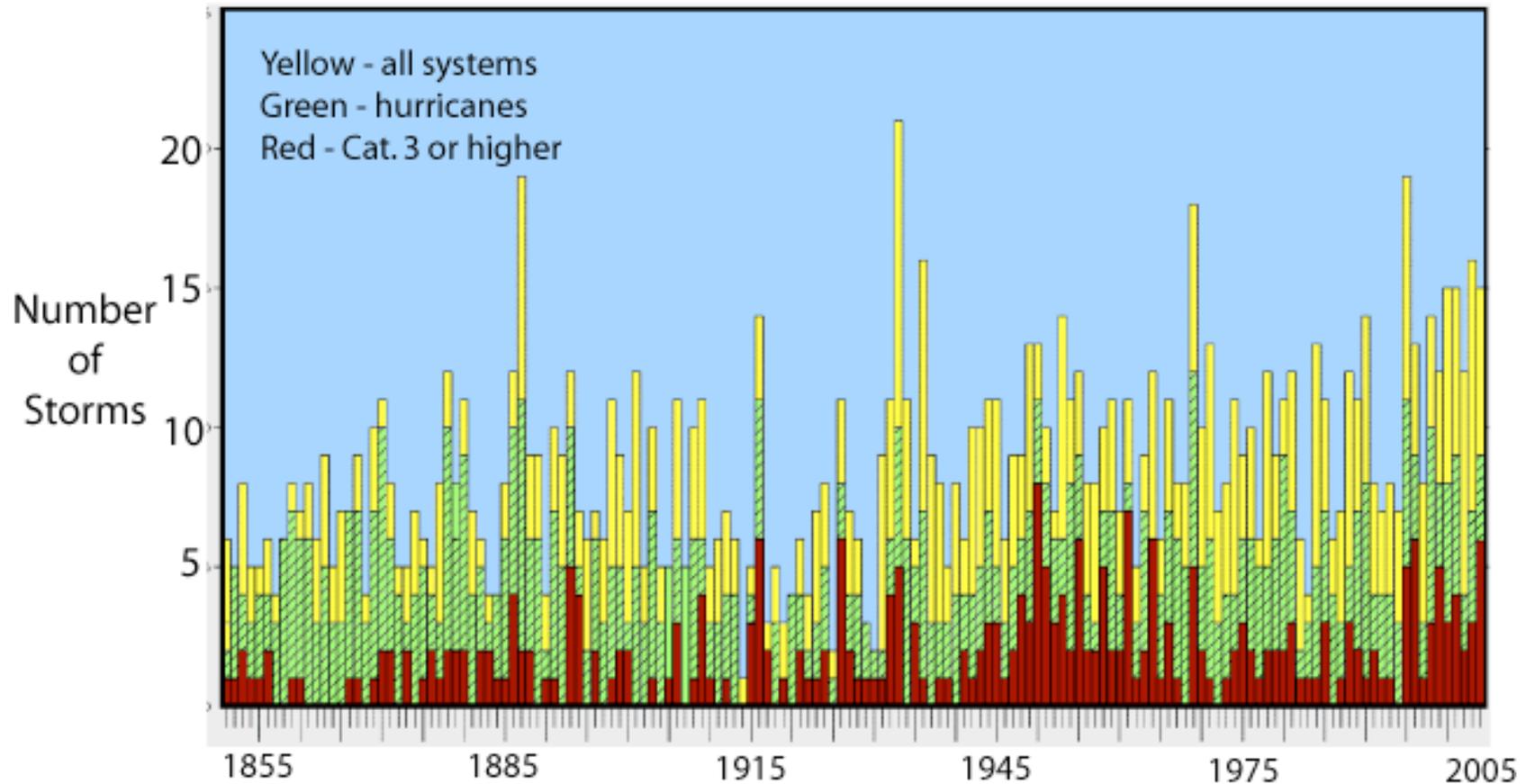


Gulf Landfalling Hurricanes By Decade

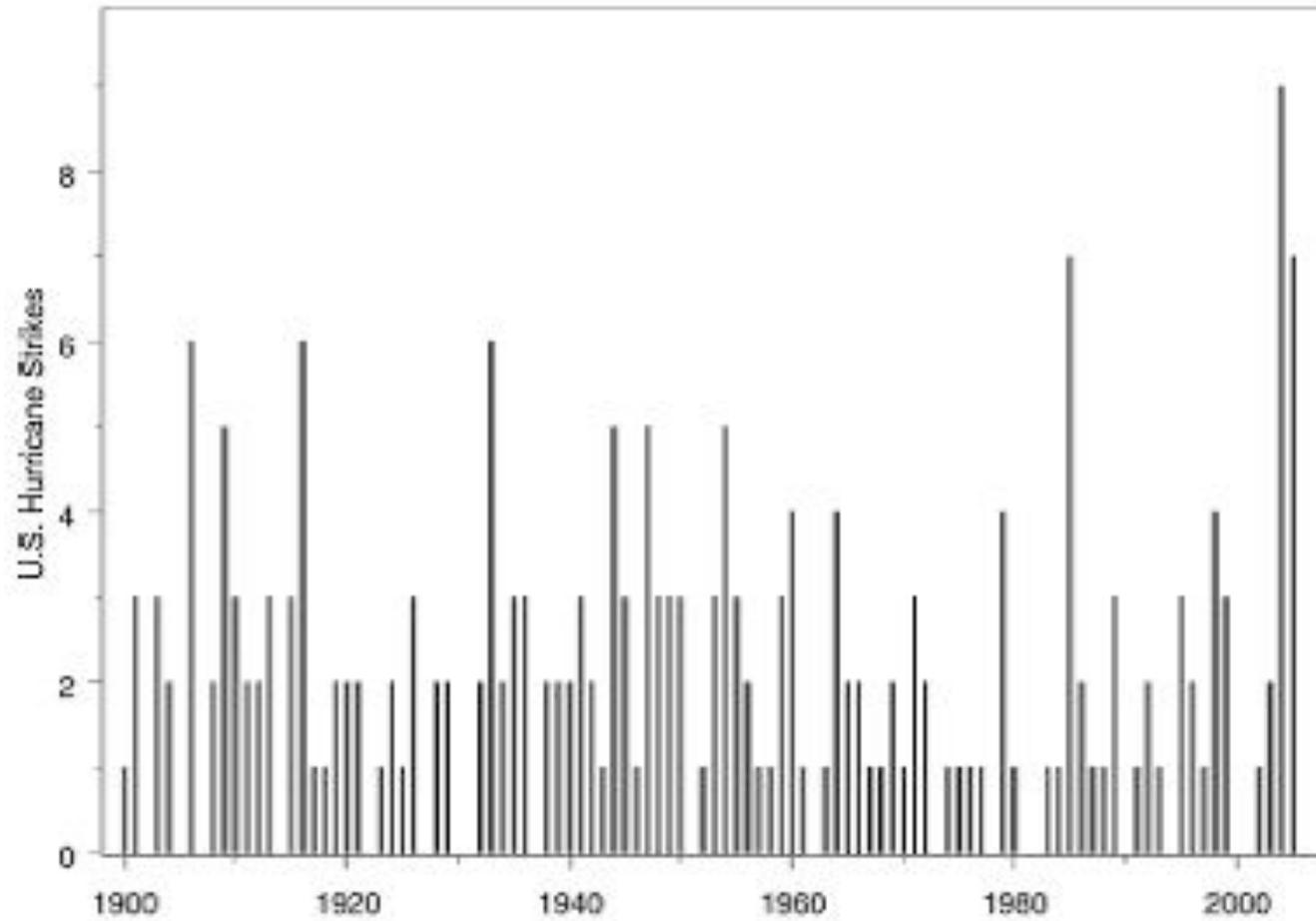


Atlantic Hurricanes

Historical Hurricane and Tropical Storm Counts for the Atlantic Basin



HURRICANE LANDFALLS



- “Over the long term the effects of changes in society dwarf the effects of any projected changes in tropical cyclones...”
- “...claims of linkages between global warming and hurricane impacts are premature...”
- - Pielke, et. al., 2005
- “Thus large, long-term ‘trends’ in tropical cyclone frequency are primarily manifestations of increased monitoring capabilities and likely not related to any real change in the climate in which they develop.”
- - Landsea, 2007

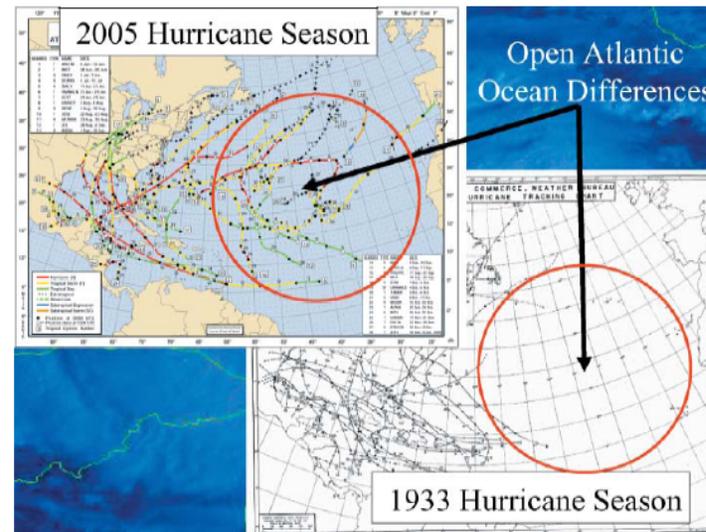
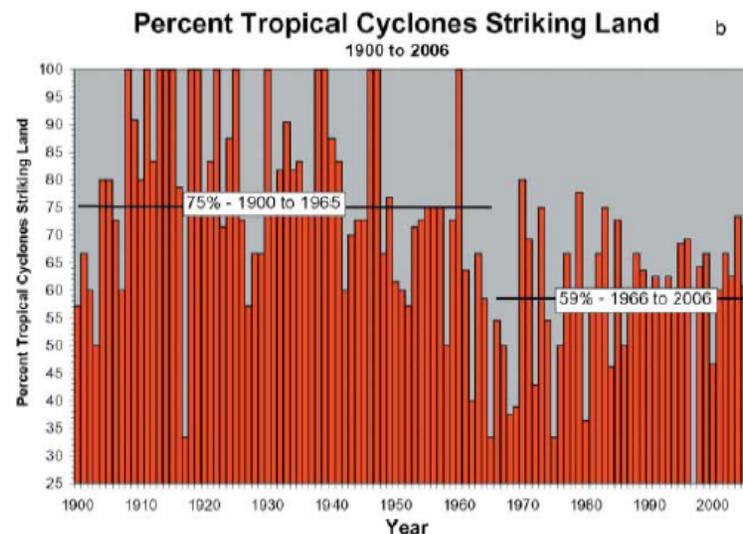
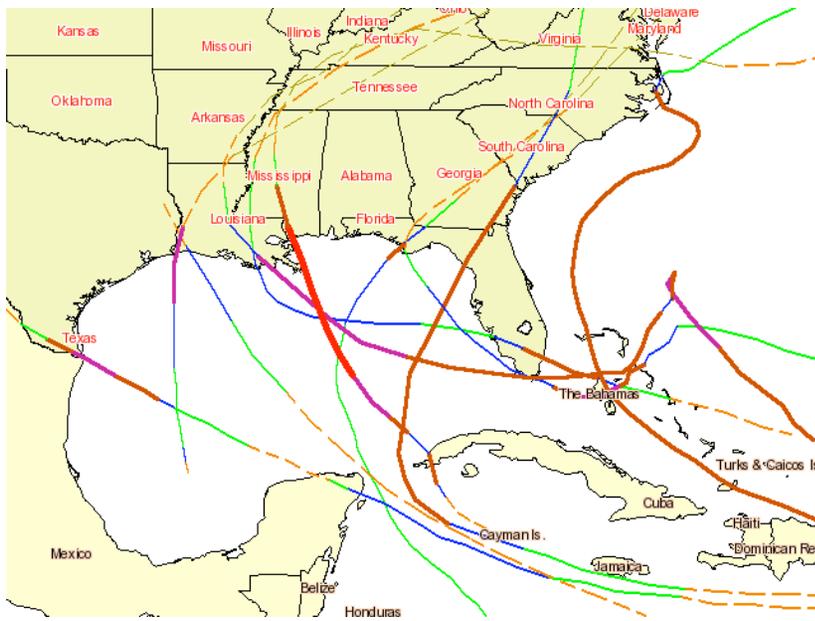


Fig. 1. Track maps of the Atlantic hurricane seasons of 2005 and 1933, the two busiest hurricane years on record for tropical cyclone frequency. The circles highlight large differences in activity that occurred over the open Atlantic Ocean.

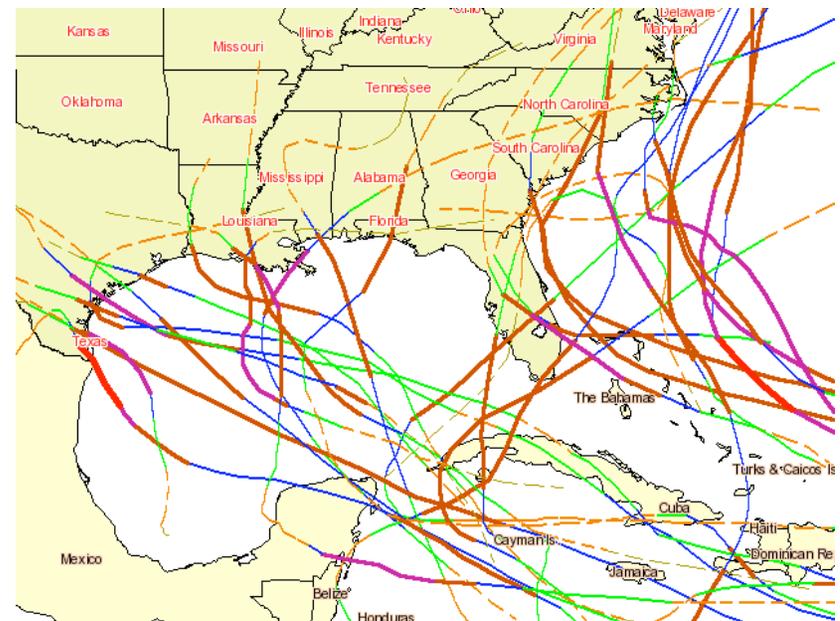


El Niño/La Niña and Major Hurricanes

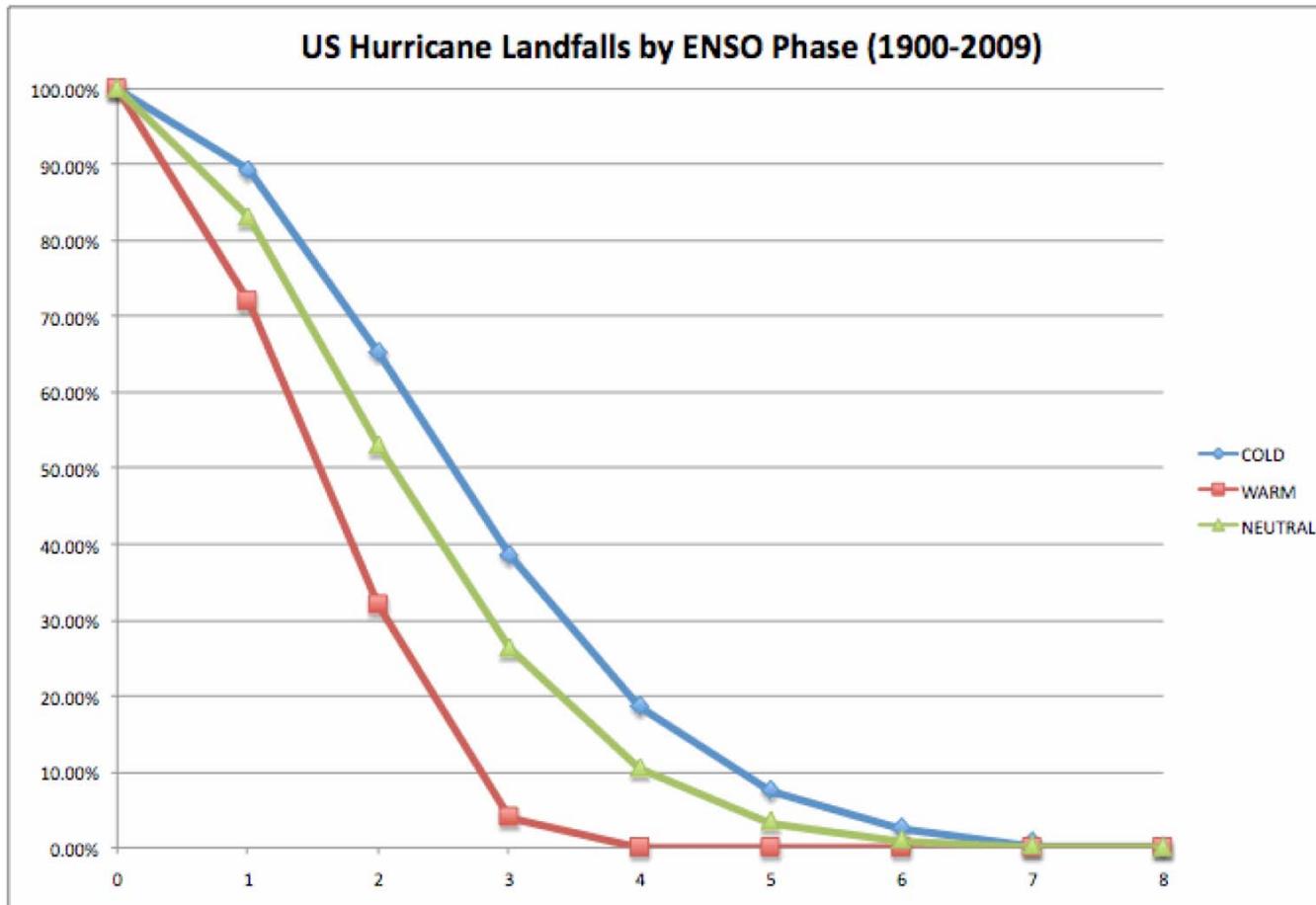
El Niño



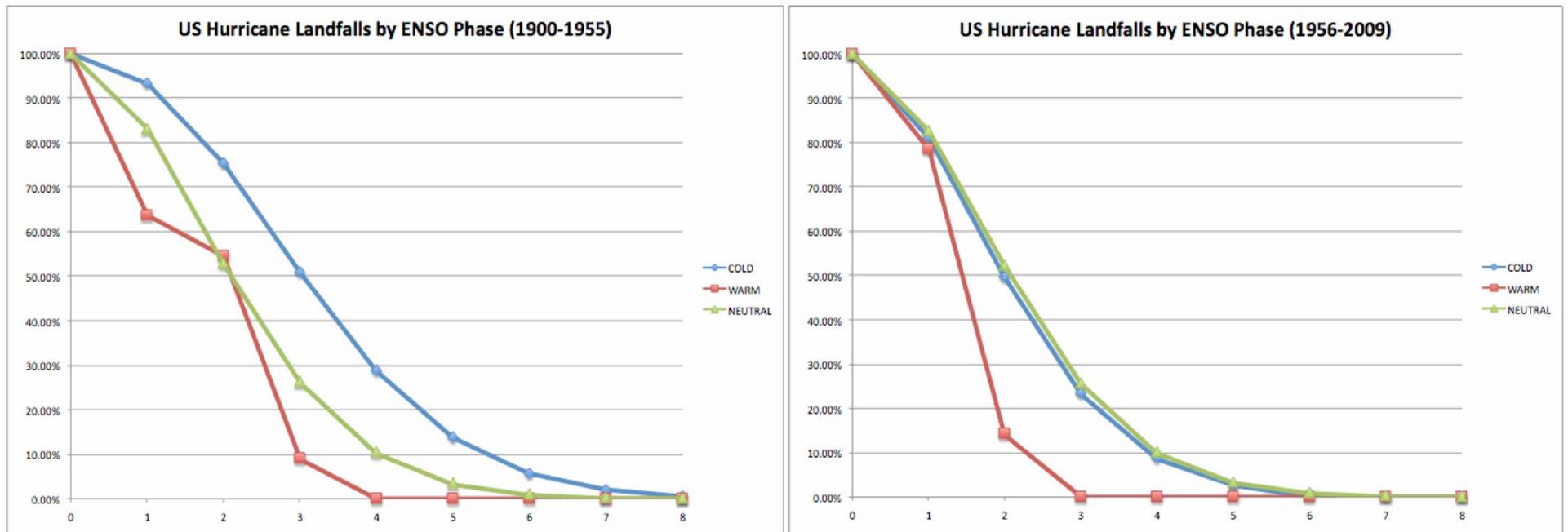
La Niña



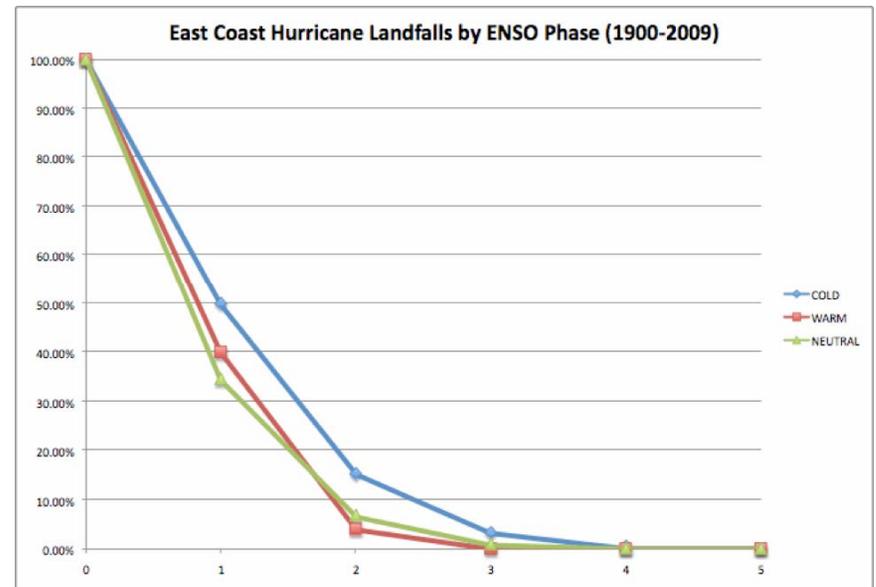
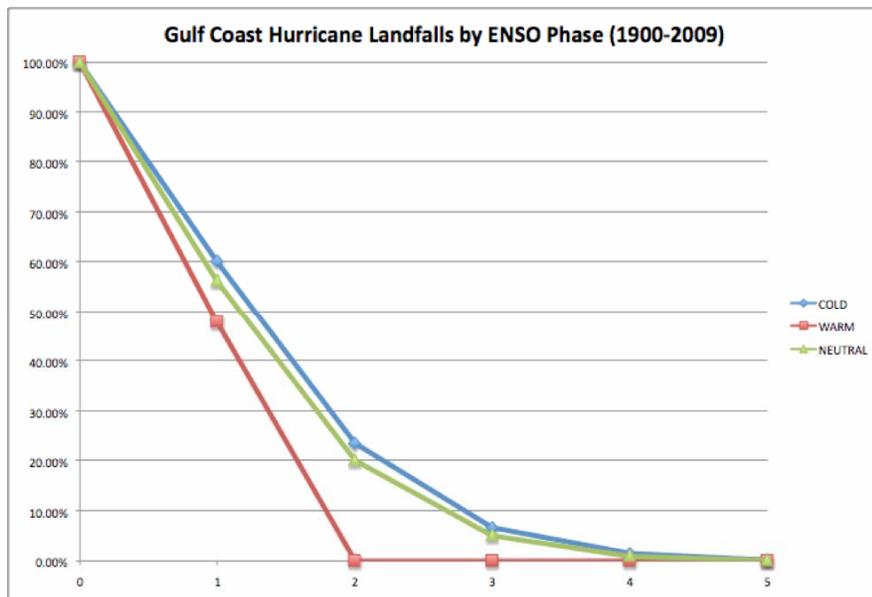
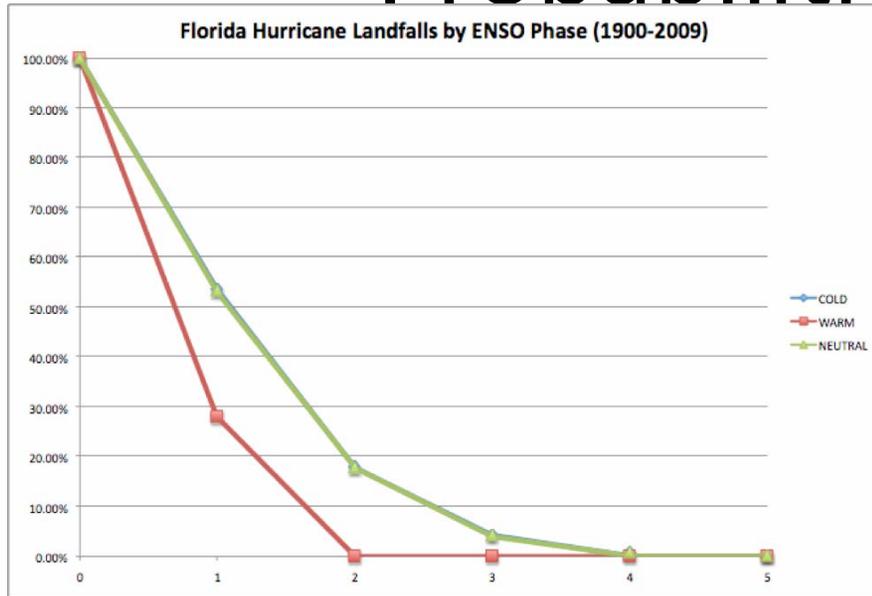
Hurricane Landfall Probabilities



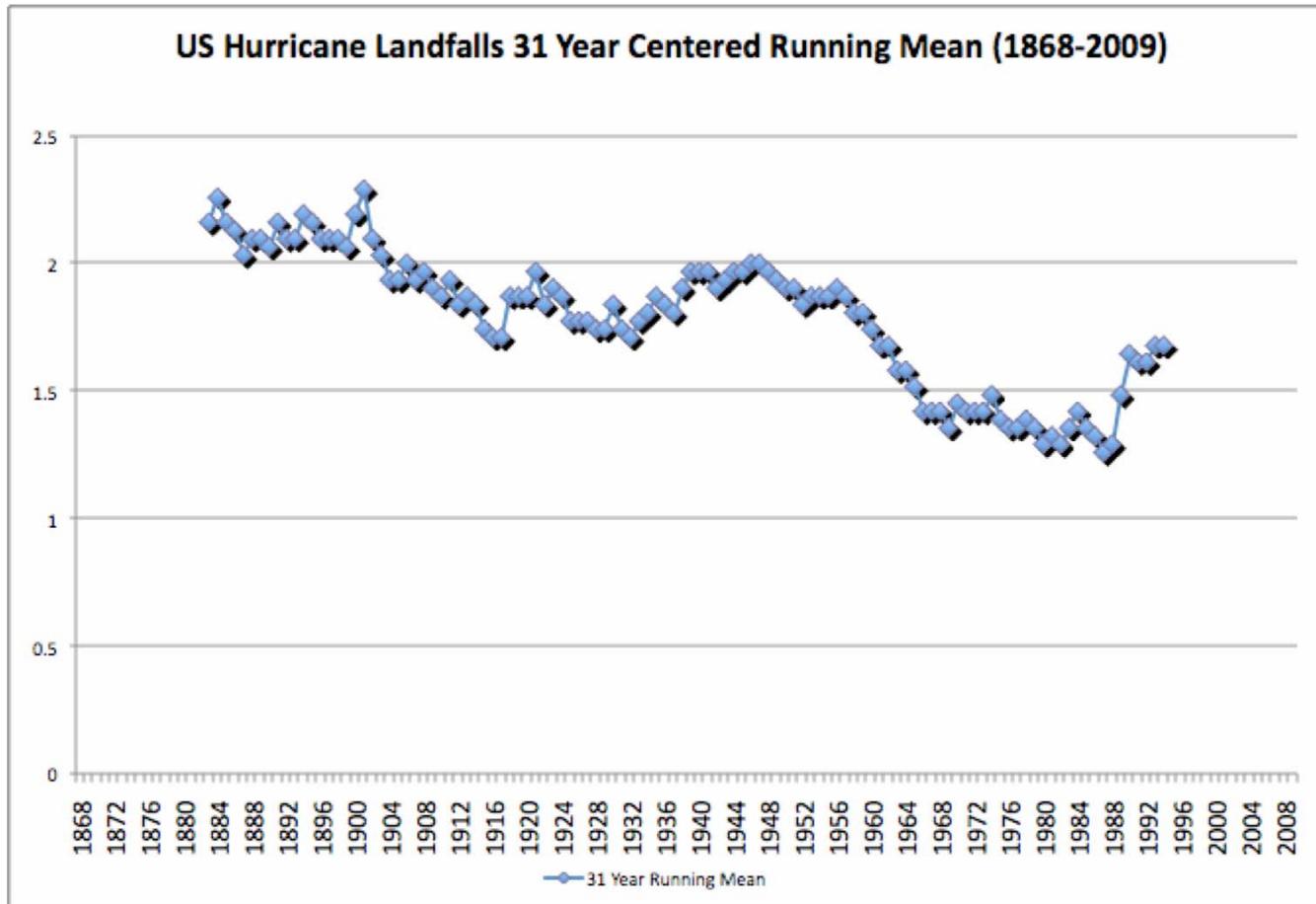
Changes in Probabilities this Century



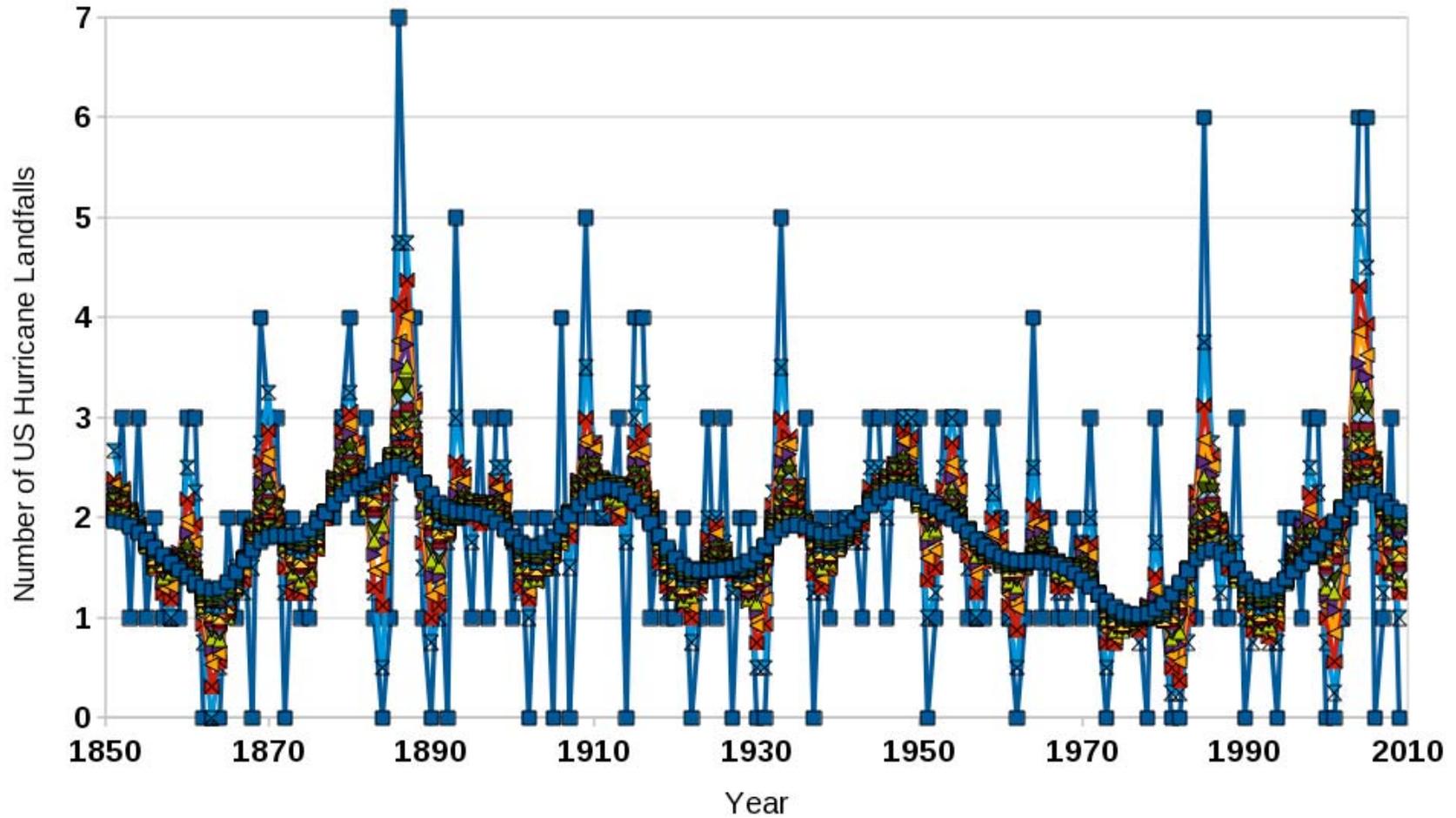
Probabilities by Region



Filtered Hurricane Landfalls Since 1867



US Hurricane Landfalls (1851-2009)



CONCLUSIONS

- A) ENSO PHASE PROBABILITIES ARE NOT CHANGING.
 - B) PROBABILITY OF 2 OR MORE EVENTS: WARM 30%, NEUTRAL 50%, COLD 70%
 - C) IN RECENT YEARS, LA NINA EQUALS NEUTRAL
 - D) EXTRA LA NINA EVENTS OCCUR NORTH OF FLORIDA
 - E) IN GULF OF MEXICO, NO LA NINA EXTRA STORMS
- F) There are quasi cycles in Atlantic hurricanes but no trend

THE END

QUESTIONS PLEASE