Climate Variability versus Climate Change: How do you tell the difference?

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Precipitation time series from many regions are characterised by high year-to-year variability. That variability begs the question: is a given change in precipitation due to climate change or due to natural variability? In this talk we use the Murray-Darling Basin as a case study to examine approaches that can be used to distinguish climate change from climate variability. We show that the annual precipitation time series over the last 100 years is indistinguishable from a random time series. We combine that result with standard statistical techniques to examine how large a climate variation would have to be before it could be considered a climate change. We then relate those changes back to the hydrologic and socio-economic significance as opposed to the statistical significance.