



The role of the stratosphere in the European climate response to El Niño

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Observational evidence indicates a link between ENSO and climate over the North Atlantic-European area, with late winter cold northern European temperatures and a pattern resembling the negative phase of the North Atlantic Oscillation associated with many (but not all) El Niño events. Here we use an ensemble of experiments using an extended (60-level) version of the Hadley Centre model to demonstrate that the effect of El Niño is communicated via a teleconnection to the extratropics, an altered stationary eddy field in the extratropical troposphere, a subsequent response in the stratospheric circulation and a slow descent of signals back into the troposphere where they affect surface climate over Europe. Our analysis supports the growing evidence that the late winter European surface response to El Niño is via a stratospheric pathway and indicates a potential source of seasonal predictability for Europe.