How plate tectonics drive continental climate change in Australia

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Despite plate tectonics operating on a very different scale from climate, it is becoming increasingly clear that small and incremental tectonic change can have a major influence on climate.

Analysis of the IODP expedition 356 slope and shelf sediments indicates northwest Australia was humid in the early Pliocene (about5 million years ago). The progressive restriction of the Indonesian Throughflow greatly impacted Australian climate, depriving much of the continent of the abundant humidity available earlier. This shift to a climate similar to the modern time began about 3.5 million year ago. By about 2.4 million years ago, dust records indicate northwest Australia had an arid climate with strong seasonal rains. The restriction also influenced Indian Ocean circulation, with significant changes in the surface and deep waters. Regional changes in the northeast Indian Ocean are coincident with east African climatic shifts and so the restriction may, in turn, have influenced human evolution, as predicted by earlier modeling studies.