



## **A Darwinian mystery: fluctuations in runoff from the la Plata basin (Alexander von Humboldt Medal Lecture)**

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During the voyage of HMS Beagle, Charles Darwin sailed in a small boat along the River Paraná, a major tributary of the la Plata drainage system. He wrote about the occurrence of severe droughts (the latest of which had been termed the “gran seco”) alternating with periods of severe flooding. From reports received, he concluded that these events appeared to be cyclic with a period “of about fifteen years”. Because extended periods of low flow in Brazilian rivers are of immense economic importance, the presentation describes a search for the material which led Darwin to this conclusion. A prolonged period of low flow in another la Plata tributary - the River Paraguay - not unlike the “gran seco” reported by Darwin, has occurred more recently; if such low flows were to recur in the future, the consequences would be severe for a region where more than 70% of energy is supplied by hydropower. A priori considerations suggest the use of statistical long-memory models for predicting River Paraguay water-levels, and some preliminary results from their use are presented.