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Jurassic monster polar shift confirmed by sequential paleopoles from Adria, promontory of Africa

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Jurassic paleomagnetic data from North America have long been contentious, generating ambiguities in the shape of the global-composite apparent polar wander path (APWP). Here we show from a restudy of two subdivisions of the Late Jurassic Morrison Formation at the classic locality at Norwood on the Colorado Plateau that the derived paleopoles reflect variable overprinting probably in the Cretaceous and are of limited value for APW determination. We instead assembled an updated set of Jurassic paleopoles from parauthocthonous Adria, the African promontory, using primary paleomagnetic component directions derived from stratigraphically superposed intervals and corrected for diagnosed sedimentary inclination error. These paleopoles are found to be in superb agreement with independent igneous paleopoles from the literature across the so-called Jurassic monster polar shift, which in North American coordinates is a jump of $\sim$30° arc-distance from the 190–160 Ma stillstand pole at 79.5°N 104.8°E to a 148$\pm$7 Ma pole at 60.8°N 200.6°E defined by four Adria sedimentary paleopoles and the published Ithaca, Hinlopenstretet, and Swartsruggens-Bumbeni igneous paleopoles. The implied high rate of polar motion of $\sim$2.5°/Myr across the monster shift is compatible with maximum theoretical estimates for true polar wander (TPW). We include a critique of published Jurassic paleomagnetic data that have been variably used in reference APWPs but that as a result of their low quality muted the real magnitude of the Jurassic monster shift. Finally, we provide paleocontinental reconstructions to describe examples of the bold signature that the monster polar shift often left in the distribution of climate-sensitive sedimentary facies worldwide.