Body size is strongly related to physiology and ecology, and its evolution has been studied intensely for many animal groups. Crocodylomorphs occupy the intermediate–large range of body sizes among extant tetrapods, and have a rich and diverse fossil record, ranging in size from less than 30 centimetres to over 10 metres in length. To investigate crocodylomorph body size evolution, we used maximum-likelihood to fit macroevolutionary models to body length data within a phylogenetic context. We focused on non-uniform Ornstein-Uhlenbeck (OU) models ("SURFACE" model). Under an OU process, lineages are attracted towards an adaptive trait optimum (theta, θ) through time. SURFACE allows multiple adaptive regimes (i.e. shifts in trait optima). We also fitted other models, and conducted analyses using alternate body length proxies, tree topologies and time-calibration methods, to assess the influence of analytical choices on results. The SURFACE model fit best to our data, suggesting convergent evolution of body size among macroevolutionary adaptive zones. Although different trees identify regime shifts in phylogenetically distinct positions, we recognized some shared patterns. For instance, non-Mesoeucrocodilia crocodylomorphs maintained relatively small sizes (θ = 0.646 m), and experienced no or few shifts, thriving until the Late Cretaceous. During the Late Jurassic and Cretaceous, crocodylomorph body size disparity increased, with a high number of regime shifts, particularly within Notothosuchia and Thalattosuchia. Another important regime shift, towards larger body sizes (θ = 5.561 m), occurred in the lineage leading to extant crocodylians (Eusuchia), potentially related to an adaptive radiation of the group after the Cretaceous-Paleogene extinction.