We will discuss a first-order Liouville theorem for random ensembles of uniformly parabolic systems under the qualitative assumptions of stationarity and ergodicity. In particular, the analysis will yield a quantitative homogenization estimate in terms of the sublinear growth of a canonical extended corrector. The sublinearity of the corrector provides the starting point for a Campanato iteration. We will use this iteration to establish, almost surely, an intrinsic large-scale $C^{1,\alpha}$-regularity estimate for caloric functions, from which the Liouville theorem follows. (Received February 17, 2018)