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Listen to the CFT Weyl anomaly with gravity

We propose a recipe - arguably the simplest - to compute the holographic type-B Weyl anomaly for general higher-derivative gravity in asymptotically AdS spacetimes. In 5 and 7 dimensions we identify a suitable basis of curvature invariants that allows to read off easily, without any further computation, the Weyl anomaly coefficients of the dual CFT. We provide few examples, where the anomaly coefficients have been obtained by other means, to illustrate the effectiveness of our prescription. We also examine the implications of these findings in the holographic description of 4D and 6D conformally invariant powers of the Laplacian (GJMS operators) and 4D conformal higher spins (CHS).