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Mixing in the Gulf of California

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The Gulf of California is a semi-closed basin (1100x160 km) with irregular topography and coastline. The most relevant feature is that the general circulation pattern has been attributed to a net heat gain in the annual mean from the atmosphere into the gulf. The heat flux into the gulf requires intense mixing. Tides and wind forcing has been assumed the driving mechanisms for mixing. In this work we estimate quantitatively the mixing produced by tides and wind from a numerical model. The numerical model is the Princeton Ocean Model. The method to quantify mixing is based in the calculation of the Background Potential Energy (BPE) balance. The BPE balance is integrated in sections across the gulf and shows the regions where intense mixing takes place. Tidal mixing is most intense where the topography changes abruptly and separates the shallow north gulf from the rest of the gulf. There is no intense tidal mixing in the northern gulf. The magnitude of the energy used in mixing smaller but comparable to the energy lost by bottom dissipation. The wind driving mixing seems to be also important, but has a different spatial distribution, being more significant than tidal mixing in the south and north gulf.