Coexistence of superfluid and Mott phases of strongly-interacting lattice bosons\footnote{NSF grant DMR-0605871} COURTNEY LANNERT, Wellesley College, ROMAN BARANKOV, SMITHA VISHVESHWARA, UIUC — Recent experiments on strongly-interacting bosons in optical lattices [1,2] have revealed the co-existence of spatially-separated Mott-insulating and number-fluctuating phases in the presence of an external trapping potential. Employing a simple theoretical model [3], we obtain an effective description of the superfluid state trapped between the Mott states. We calculate the collective excitation spectrum of such a superfluid and its critical temperature, and discuss the crossover between two- and three-dimensional behavior of its thermal properties as a function of the lattice parameters.