Gravitational wave memory in an expanding universe ALEXANDER TOLISH, ROBERT WALD, The University of Chicago — We investigate the gravitational wave memory effect in an expanding FLRW spacetime. We find that if the gravitational field is decomposed into gauge-invariant scalar, vector, and tensor modes after the fashion of Bardeen, only the tensor mode gives rise to memory, and this memory can be calculated using the retarded Green’s function associated with the tensor wave equation. If locally similar radiation source events occur on flat and FLRW backgrounds, we find that the resulting memories will differ only by a redshift factor, and we explore whether or not this factor depends on the expansion history of the FLRW universe. We compare our results to related work by Bieri, Garfinkle, and Yau.