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Soren Galatius*, Department of Mathematics, Stanford University, Stanford, CA 94305, and
Oscar Randal-Williams. *Monoids of moduli spaces of manifolds*.

The homology of the moduli space of Riemann surfaces, in the limit where the genus tends to infinity, is determined by Madsen and Weiss' theorem. If we consider surfaces equipped with continuous maps to some background space B , the analogous question was solved by Cohen and Madsen, provided B is simply-connected. Our result shows that the condition of simple connectivity can be removed. We also give a new proof of Madsen-Weiss' theorem, the first proof that doesn't rely on Harer's homological stability. (Received April 12, 2010)