In this paper, we address the problem of unsupervised change detection on two or more coregistered images of the same object or scene at several time instants. We propose a novel empirical-Bayesian approach that is based on a false discovery rate formulation for statistical inference on local patch-based samples. This alternative error metric allows to efficiently adjust the family-wise error rate in case of the considered large-scale testing problem. The designed change detector operates in an unsupervised manner under the assumption of the limited amount of changes in the analyzed imagery. The detection is based on the use of various statistical features, which enable the detector to address application-specific detection problems provided an appropriate ad hoc feature choice. In particular, we demonstrate the use of the rank-based statistics: Wilcoxon and Cramér–von Mises for image pairs, and multisample Levene statistic for short image sequences. The experiments with remotely sensed radar, dermatological, and still camera surveillance imagery demonstrate accurate performance and flexibility of the proposed method.