In space plasma, collisionless magnetic reconnection (CMR) is a basic process by which energy stored in magnetic fields is converted into kinetic and internal energy. At the earth’s magnetopause, CMR provides a way for the exchange of mass, momentum, and energy between the solar wind and the earth’s magnetosphere. At this boundary, CMR is typically observed by large scale effects such as high speed plasma jets and magnetic field reversals. These large scale effects are driven by the small scale effects of the electron diffusion region in the separator between the two different magnetized plasmas. Recently, a new set of observable diagnostics of the electron diffusion region have been introduced that are based on the theoretical conditions for magnetic field topology change and benchmarked in fully kinetic computer simulations. They are (1) non-perturbative expansion parameters of Guiding Center Theory, (2) electron pressure anisotropy, (3) electron pressure agyrotropy, and (4) electron thermal mach number. These diagnostics are unique to the electron diffusion region and provide a finer sieve for identifying CMR events. Results of these observables across candidate CMR events in the magnetopause will be presented.