Figure S1: Long-term frontal occurrence frequency from ESA SST (1982–2023) using the global front detection algorithm without random windows.
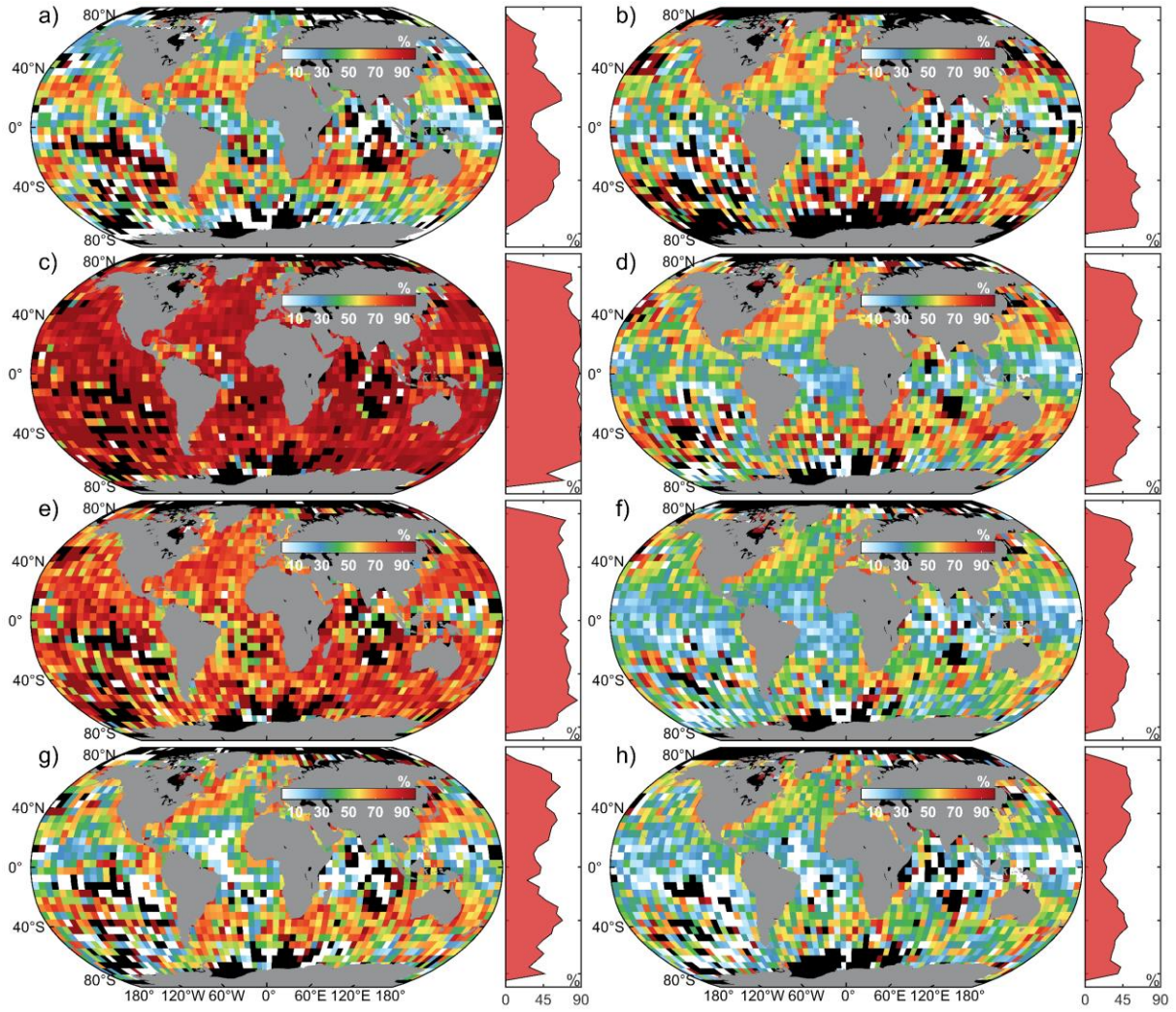
Figure S2: Statistical indicators of fronts derived from different datasets. a), c), e), and g) represent the hit rate for MODIS, REMSS, GLORYS, and HadGEM3-detected fronts, respectively, while (b), (d), (f), and (h) show their corresponding precision values.