Gloria fault is one segment of the Eurasia-Nubia plate boundary. It is a large strike slip fault, located between 24ºW and 19ºW, with scarce seismic activity but which was the location of several large events during the XX Century, in particular the 25 November 1941 earthquake, a submarine strike-slip event of magnitude 8.3-8.4 and the 26 May 1975 with magnitude 7.9. Since the installation of the tide-gauge networks in several countries of the North East Atlantic area a significant amount of mareograms were obtained, concerning these events, in a number of coastal stations located along the European coasts. The most impacted areas were the west and northwest coast of Portugal where the sea overtopped some beaches, in November 1941, and the harbors of Azores, in 1975, where it was observed the fast withdraw of the sea followed by a strong influx over the highest water mark. We present here a systematic view of the tsunami potential of the Gloria Fault and its consequences for tsunami hazard assessment and recurrence along North East Atlantic coasts. Results of the tsunami hydrodynamic simulations are checked against observations and tide records and we discuss the corresponding implications in what concerns the design of the NEAMTWS decision matrix. This study is a contribution to projects: PTDC/MAR/113888/2009 PTDC/CTE-GIX/110205/2009 and TagusDelta: PTDC/MAR/113888/2009