INTRODUCTION: Extreme weather events, characterized by deviations from local meteorological patterns, can cause floods and increase precipitation variability, favoring the entry of contaminants into water bodies. In Rio Grande do Sul, an extreme event (26/04–4/07/2024) generated floods in several cities, directing water flow from the north to the Atlantic Ocean via Lagoa dos Patos, raising the level of the lagoon and estuarine zone, with possible transport of sediments and contaminants. This study evaluated the quality of surface water in the south of Lagoa dos Patos, with collections in June 2024, through toxicity tests and analysis of the MXR biomarker in microcrustaceans. **MATERIALS AND METHODS:** Between June 5 and 20, 2024, water samples were collected at five points south of Lagoa dos Patos, in Rio Grande. Toxicity was analyzed by acute assay with *Daphnia magna*, according to ABNT NBR 12713 (2022), based on mortality. To evaluate the MXR phenotype, the organisms were exposed to Rhodamine B, and the efflux of the dye, after washing and incubation in clean water, indicated the activity of the transport proteins. **RESULTS AND CONCLUSIONS:** Ecotoxicity assays did not indicate toxicity, however cellular defense activity, assessed by fluorescence, varied significantly between groups ($p < 0.001$). Animals exposed to point 1 showed greater efflux (513,552.8 ± 13,450.5 a.u.f.), followed by those exposed to point 2 (167,665.1 ± 432.7 a.u.a.f.), compared to the others ($p<0.001$, n= 5-8). Temporally, a reduction in efflux activity was observed throughout June, following the dissipation of the flood plume. Geographically, points 3, 4 and 5 showed significant differences in the collection on June 20, with emphasis on point 3 (presenting twice as many as the others), possibly more impacted due to being in an area with difficult drainage. Despite the absence of toxicity in tests with microcrustaceans, the biomarker indicated activation of cellular defenses, signaling changes in water quality associated with the 2024 climate event and reinforcing the importance of continuous environmental monitoring.