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Summer extreme events in Bahia Blanca, Argentina

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Climate change is intensifying and altering the frequency of extreme weather events globally. Argentina, in particular, has witnessed a surge in such events, especially during summer. Recent decades have seen devastating wildfires, prolonged droughts, intense heat waves, and severe weather phenomena, including bow echoes and tornadoes, across much of the country. This study focuses on identifying and characterizing severe summer events in Bahía Blanca in terms of meteorological conditions and their effects on the population to understand associated risks and inform future mitigation and adaptation strategies.

Three events stand out as particularly severe. First, on December 16, 2023, a bow echo event with winds exceeding 150 km/h and 60 mm of precipitation in just two hours. Second, between January 23 and February 1, 2024, the city experienced its longest recorded heat wave, with temperatures soaring above 40°C. Finally, on February 2, 2025, a rapidly developing convective storm produced devastating hail and winds over 110 km/h. These three events resulted in loss of life, critical infrastructure damage, vegetation loss, post-traumatic stress among residents, disruption of essential services for several weeks, and widespread property damage affecting nearly the entire city.

The occurrence of these three severe events within just two summers underscores the increasing frequency and intensity of such phenomena. This highlights the critical need for effective early warning systems and clear communication protocols to minimize risk. Furthermore, investing in resilient infrastructure is crucial for reducing short-term and long-term damage. Finally, developing a comprehensive climate change adaptation plan is essential for Bahía Blanca to address these escalating challenges effectively.