



A pilot program towards an Early Warning System for Harmful Algal Blooms in Bahía de La Paz, Gulf of California, Mexico

Oral

Modeling, Early Warning and Forecasting

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Since 2023 to date, a pilot program for an Early Warning System (EWS) for Harmful Algal Blooms initiated in Bahía de La Paz, Gulf of California with the main purpose to monitor harmful phytoplankton to reduce their impact in artisanal fishing, tourism, wildlife, and aquaculture. For this reason, by-weekly samplings have been conducted. Physicochemical parameters and paralytic toxins have been recorded; abundance of phytoplankton species has been determined by Utermöhl, and live cells have been collected with a 20 µm mesh phytoplankton net to isolate and cultivate phytoplankton species. Superficial temperature has ranged from 20°C from October 2023 to June

2024, to 30°C from July 2024 to October 2024; salinity oscillated from 35.4 in February 2023 to 37.9 in October 2024. In general, the phytoplankton community is dominated by diatoms, however, in the colder months of 2023 silicoflagellates dominated, and in the warmer months of 2023 and 2024 high abundances of cyanobacteria were found. In July 2024 an extensive bloom of the diatoms *Guinardia striata* and *Leptocylindrus danicus* was reported that lasted over a month, reaching maximum abundances of 144,500 and 3,625,000 cel L⁻¹, respectively, causing bad odor in local beaches. In April 2025 a bloom of *Chattonella* sp. was found reaching 541,600 cel L⁻¹. The highest abundances of *Gymnodinium catenatum* were recorded in May 2025 with 1,903 cel L⁻¹. Other harmful species reported have been: *Akashiwo sanguinea*, *Alexandrium* spp., *Dinophysis* spp., *Gambierdiscus* sp., *Gonyaulax polygramma*, *G. spinifera*, *Margalefidinium polykrikoides*, *Oscillatoria* sp., *Vulcanodinium rugosum* and *Pseudo-nitzschia* spp.

Palabras Clave

(1) Bahía de La Paz, (2) Mexico, (3) Phytoplankton.

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