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### IN-LAKE ALGAL BLOOM REMOVAL AND ECOLOGICAL RESTORATION USING MODIFIED LOCAL SOIL TECHNOLOGY

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**ABSTRACT** A “modified local soil induced ecological restoration” (MLS-IER) technology was developed for the restoration of degraded shallow lakes. This technology makes it possible to remove harmful algal blooms (HAB), to improve water quality, and to restore submerged macrophytes in shallow lakes simultaneously, safely, efficiently, and cost-effectively by using modified local soils, which can be carried out mechanically and automatically to very large areas. In 2006, MLS-IER was used in the whole bay (0.1 km<sup>2</sup>) in Taihu Lake (Wuxi, China, where a HAB caused disaster (the bay was fully covered by several centimeters’ HAB; fish and aquatic plants died; huge malodor) was successfully removed within one day using MLS-IER. Chlorophyll-a, total-P, and total-N within the bay were reduced by more than 86 % one day after the treatment and remained decreased over the following months. Algae toxins of microcystins RR and LR were reduced by more than 50% and 40% respectively compared to that outside the bay 4 months later. Macrophytes were successfully restored 4 months after the treatment, while the biomass of submerged macrophytes outside the bay was still nil during the same period. Four months after the treatment, the biodiversity index of zoobenthos and that of phytoplankton inside the bay became higher than that outside the Bay, while zooplankton diversity index remained relatively unchanged.

**Keywords:** Eutrophication, HAB mitigation, Alternative stable states transition, MLS-IER, Macrophytes restoration, Biodiversity improvement.