

Niche Shift and Potential Distribution of an Invasive Freshwater Diatom (*Didymosphenia geminata*) in Southern Chile

Sunil Kumar¹, Vivian Montecino², Ximena Molina^{2,4}, María L.C. Castillo^{2,3} and Ramiro O. Bustamante^{2,3}

¹Natural Resource Ecology Laboratory, Colorado State University

²Departamento de Ciencias Ecológicas, Facultad de Ciencias, Universidad de Chile, Chile

³Instituto de Ecología y Biodiversidad, Universidad de Chile, Chile

⁴POCH Ambiental S.A., Germany

Abstract. The freshwater diatom *Didymosphenia geminata* (Lyngbye) M. Schmidt is a single-celled alga primarily distributed in temperate regions of Northern Hemisphere. This diatom has emerged as a nuisance species in lakes, streams, and rivers around the world. It forms large thick mats on the bottom of the streams and rivers which negatively affect aquatic organisms. We used maximum entropy (MaxEnt) model to integrate field collected *D. geminata* occurrences with climate data layers, and predict potential distribution of *D. geminata* in southern Chile. We compared *D. geminata*'s climatic niche between Chile and the United States (U.S.). Our model predicted suitable habitat for *D. geminata* in southern Chile between 36° and 48° latitude. We found significant differences between U.S. and Chilean climatic niche of *D. geminata*. We identified areas where *D. geminata* can potentially colonize if no management actions are taken. Our results can be used for prioritizing future surveys in southern Chile for an early detection and management of *D. geminata*, and for the conservation of native flora and fauna in freshwater ecosystems in Chile.