# ZINC IN AN OLIGOTROPHIC PATAGONIC LAKE: RESPONSE TO A NATURAL ENVIRONMENTAL DISASTER IN LOW TROPHIC LEVELS

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## Introduction

Zinc (Zn) is an essential element for life. Despite its importance, the trophodynamics in natural lake systems has been poorly studied, and is unknown in the Patagonian waterbodies. This element reaches the ecosystem from natural sources, such as volcanic eruptions, which are frequent in the study region, releasing Zn to the aquatic environment by ash leaching (Ruggieri et al., 2011). The Puyehue-Cordón Caulle volcanic complex erupted in 2011 affecting the Lake Nahuel Huapi area, especially the Rincón Branch, the nearest lake point to the volcano. This environment is characterized by a zooplanktonic community composed by copepods and cladocerans and their main predator, the forage small fish *Galaxias maculatus* (Milano et al, 2013; Arcagni et al, 2015).

The aim of this study was to analyze the changes in Zn concentrations ([Zn]) in *G. maculatus* and its prey associated with the impact of the volcanic event.

## Methods

Zooplankton > 200 µm were sampled from a boat by hauling the water column in two depths (90 to 45 m, and 45 m to the surface). *G. maculatus* adults were captured using baited traps and seine nets. [Zn] were determined by Instrumental Neutron Activation Analysis in lyophilized material (Ribeiro Guevara et al., 2005).

## Results

The zooplankton studied consists of adult cladocerans *Bosmina longirostris* (O. F. Müller, 1785), *Ceriodaphnia dubia* (Richard, 1894) and the copepod *Boeckella gracilipes*. In the samples collected immediately before the Puyehue-Cordón Caulle 2011 eruption, [Zn] ranged from 85 to 258 µg $g^{-1}$, whereas after the event (Winter 2011) [Zn] were maximum (29-805 µg $g^{-1}$), decreasing to 87-156 µg $g^{-1}$ in 2012 and 2014. *G. maculatus* [Zn] showed the same trend, increasing considerably after the eruption (285-593 µg $g^{-1}$) and returning to previous values one year later, (112-191 µg $g^{-1}$), a condition that remained after 2 years (116-198 µg $g^{-1}$).

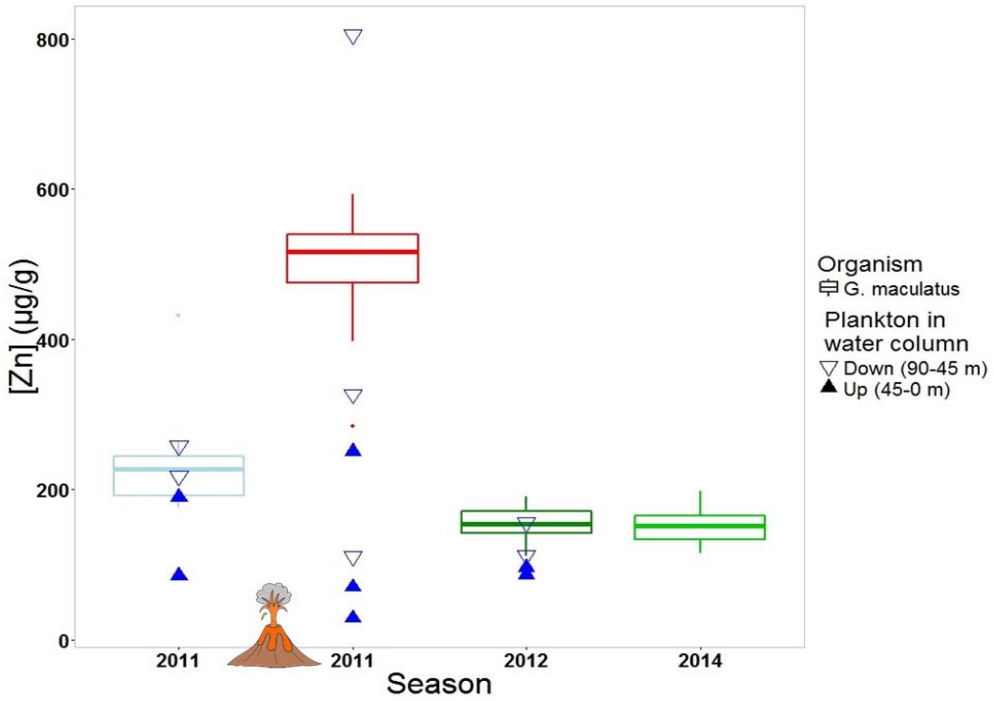


**Figure 1**. Seasonal variation of Zn concentrations (µg/g DW) in zooplankton above the thermocline (triangles up) and below the thermocline (triangles down), and small puyen (box plots), before and after the volcanic eruption.

## Conclusion

Higher Zn concentrations observed in both trophic levels after the volcanic event, may be related to a higher input of Zn from the volcanic ashes. However, a year later the system recovered showing similar [Zn] levels than those recorded before the eruption.

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