

**HUMAN INTERVENTION IN AN URBAN LAKE, ZEEKOEVLEI, SOUTH AFRICA**Supriyo DAS<sup>1\*</sup>, Joyanto ROUTH<sup>1</sup> and Alakendra N. ROYCHOUDHURY<sup>2</sup>*1. Department of Geology and Geochemistry, Stockholm University, Stockholm 10691, Sweden.**2. Department of Geological Sciences, University of Cape Town, Rondebosch 7700, South Africa.*

Zeekoevlei (vlei an Afrikaan word for a lake), the largest shallow freshwater lake in South Africa, has been heavily impacted by cultural activities, which resulted in hyper-eutrophic condition. In this study, we investigated the recent anthropogenic activities in lake sediments (0-10 cm) by using *n*-alkanes, pigments, elemental carbon and nitrogen ratio (C/N) total organic carbon (OC), stable carbon and nitrogen isotopes ( $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ ) and polyaromatic hydrocarbons (PAH) as markers. Rapid urbanization and heavily fertilized farming in the catchments in past decades result in elevated primary production in the lake. This is indicated by high TOC concentration (9-14%), typical  $\text{C}_{\text{organic}}/\text{N}_{\text{total}}$  ratio (11-13),  $\delta^{13}\text{C}_{\text{organic}}$  (-18 to -19‰),  $\beta\beta$ -carotene (3-5  $\mu\text{mol/gC}$ ) and high *n*-C<sub>17</sub> values (600-1500 ng/mg TOC) at these depths. Although, higher zeaxanthin values (3-5  $\mu\text{mol/gC}$ ) indicate elevated cyanobacterial population, excessive raw sewage input could mask the cyanobacterial signature of  $\delta^{15}\text{N}_{\text{organic}}$  values (~11‰) in these sediments. High anthracene to anthracene plus phenanthrene ratio (> 0.10) indicate combustion sources of hydrocarbon pollutants in lake sediments. Concentrations of individual PAH compounds are the lowest at surface (e.g., 7-1678 ng/mg TOC for anthracene). TOC and pigment concentrations also follow the upward decreasing trend. This probably indicates strict lake environmental management practice in recent years by the local authority.