

Layered in Time: Exploring the Impact of Nearly 8 Months of Stratification on Carbon Dynamics in a Mediterranean Reservoir

¹*Rodríguez-Gómez, S., ²Montes-Pérez, J.J., ¹Ruiz-Nieto, M., ¹Ledesma-Hernández, G., ¹Warren-Jiménez, P., ¹Conejo-Orosa, T., ³Reyes, I., ³Escot, C. & ¹Moreno-Ostos, E.

*lead presenter

¹ sofiarg@uma.es, University of Málaga, Department of Ecology and Geology, Spain

² University of Barcelona, Department of Evolutive Biology, Ecology and Environmental Sciences, Spain

³ Empresa Metropolitana de Abastecimiento de Aguas de Sevilla (EMASESA), Spain

Ecosystem metabolism determines its role as a CO₂ source or sink. In lakes and reservoirs, metabolism is conditioned by the phytoplankton community. This relationship was studied throughout a hydrological year in El Gergal, a Mediterranean mesotrophic and warm monomictic reservoir used for water supply to the city of Seville, Spain. Aerobic metabolic rates (respiration and primary production) were modeled using high-resolution data, including temperature, PAR, oxygen, salinity, and meteorological variables. The size structure of the phytoplankton community was examined using flow cytometry. Thermal stratification persisted for 7.7 months. During this period the aerobic ecosystem metabolism was autotrophic, with a net O₂ production of $0.06 \pm 0.03 \text{ mg l}^{-1} \text{ day}^{-1}$, and ultraphytoplankton (an intermediate size group between pico- and nanophytoplankton) dominated the community. Notably, the epilimnion was the only layer exhibiting net O₂ production, while the metalimnion remained almost neutral and the hypolimnion was heterotrophic. During the mixing period, El Gergal was heterotrophic (net O₂ consumption: $0.12 \pm 0.03 \text{ mg l}^{-1} \text{ day}^{-1}$) with picophytoplankton (the smallest size group) dominating the community. On an annual scale, El Gergal reservoir was slightly heterotrophic, raising concerns about its role as a CO₂ sink.

Preferred Session: OS2

Type of communication: Oral: **X**

If you are a student AIL member, would you like to be a candidate for any of the awards?

Best Oral Communication (Award) X

Best Poster Communication (Award)