Term: 2025-2026

Anabella Ferral has a PhD in Chemistry (Physical chemistry) and MSc. in Space Applications for Early Warning and Response to Emergencies from the National University of Córdoba (UNC) and the National Commission for Space Activities (CONAE), Argentina. She worked for the Secretary of Water Resources of Córdoba province in water resource monitoring and was the Head of the Master's Degree in Spatial Information Applications at the Gulich Institute from 2015 to 2020. Currently, she works at Gulich Institute as an Adjunct researcher of the National Council of Scientific and Technical Research of Argentina (CONICET) and as a Professor. Her research focuses on remote sensing of environmental quality indicators (water and snow) within the framework of the Sustainable Development Goals (SDGs), through the integration of information from Earth observations, numeric simulations, field campaigns, and laboratory measurements. Since September 2023, she has served as Associate Editor of the Geoscience and Remote Sensing Magazine published by IEEE-GRSS. She is an early career member of GEOAQUAWATCH.

Topic 1. Remote sensing tools to monitor inland water quality indicators within the framework of the 2030 Sustainable Development Goals

Topic 1 Abstract: Global change, understood as a response to the sum of anthropic and natural pressures on ecosystems, modifies the stationary balance of our planet, impacting the life on Earth.

Recently, the United Nations Statistical Commission proposed a series of quantitative indicators to measure the impact of public policies for each of the 17 Sustainable Development Goals (SDGs) to be achieved by 2030. In particular, SDG Goal 6 refers to the care of water resources and the provision of safe water and sanitation. Among the most relevant problems is the advanced eutrophication of water bodies. The excess of nutrients such as nitrogen and phosphorus that reach rivers, lakes, and oceans accelerate this process, which is manifested by the excessive proliferation of some microscopic algae and harmful cyanobacteria. Eutrophication in numerous water bodies worldwide has consistently led to significant fish mortality, as well as episodes of unpleasant odors and flavors in reservoirs designated for both, human consumption and recreational activities. Given this, citizens request urgent control, prevention, and mitigation measures from the municipal, provincial, and national authorities. Satellite information has been used for this purpose since 1972, based on biomass detection approaches leveraging chlorophyll concentration as an indicator. In the proposed talk, we present multidimensional remote sensing approaches to characterize eutrophication processes, in which spatial, temporal, and spectral resolutions of satellite data are analyzed. Results related to [Chlorophyll-a] models built by means of Landsat 8-OLI, Sentinel 2-MSI and TERRA-MODIS imagery to characterize pollution sources, the effect of mitigation measures, spatio-temporal trends as well as seasonal and interannual patterns are presented. The strength of absorbance, fluorescence, and reflectance spectral measurements of cyanobacteria cultures such as Microcysitis sp, Dolichospermum, and Pseudoanabaena are also presented. Finally, in the context of the new generation of hyperspectral satellites, PRISMA image analysis for a severe bloom event in the eutrophic reservoir is shown, where spectral similarity between laboratory, simulated, and satellite spectral signatures are calculated.

Topic 2. Integration of field and remote sensing data to monitor water and snow pollution in the frame of global change