



## **Eutrophication dynamics in lake Baikal from remote sensing data**

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Lake Baikal, one of the oldest lakes on earth, the deepest (1642 m), and the largest in volume (23,615 cubic km) of all of Earth's freshwater bodies, is located nearly in the very center of Asia, 456 m above sea level. Baikal stretches for 636 km from the southwest to the northeast between 51°28' and 55°47' N, and 103°43' and 109°58' E. The area of Baikal's watershed is over 550,000 square km. Baikal is also unique in that its waters are rich in oxygen all the way to the bottom of the lake. A large number of the species living in Lake Baikal are endemic. In 1996, Lake Baikal was named a UNESCO Heritage Site, with Russia pledging to protect it.

A number of recent studies have reported degradation of the benthic littoral zone such as proliferation of benthic algae, death of snails and endemic sponges, large coastal wash-ups of dead benthic algae and macrophytes, blooms of toxin-producing benthic cyanobacteria, and inputs of industrial contaminants. In the open, pelagic basins, changes in the eutrophication and water transparency have also been noticed. Such studies were based on in-situ collected data, at different spatial and temporal frequencies. Remote sensing (RS) offers a comprehensive monitoring of all littoral and open areas of the lake at a high and regular time frequency. The amount of ecological information retrieved by RS is much lower than that provided by in-situ data, but RS can determine the representativeness of the chosen in-situ stations and detect un-sampled zones that need monitoring. Additionally, RS provides a harmonized methodology in space and time, which is crucial if statistical information is going to be derived. On its turn, in-situ data is required as a ground truth to transform the RS signal into relevant ecological indicators. In this work, we provide the first results of a new international project aimed to re-analyze archived RS data to study ecological changes in Lake Baikal and incorporate near-real time RS data to monitoring programs.