



PRESS RELEASE (2026/09/09)

Saline Lakes: Overlooked Ecosystems with Global Conservation Value

International study published in Nature Communications highlights the biodiversity and ecosystem services of saline lakes

Saline lakes account for nearly half of the global volume of lake water and are among the most environmentally sensitive aquatic ecosystems, yet their ecological and societal importance remains widely underestimated. A new international study, published in [Nature Communications](#), challenges this perception by assessing the conservation value and ecosystem services of 85 saline lakes distributed across the globe.

The study brings together 64 researchers from 20 countries and combines scientific expertise and regional knowledge to evaluate threatened species, ecosystem services, and the management challenges associated with saline lakes. The results show that these ecosystems support a much broader range of biodiversity and human benefits than is often recognized.

The global assessment was made possible through contributions from researchers with expertise in saline lakes from different regions of the world. [Associate Professor María Belén Alfonso](#), at Kyushu University's [Research Institute for Applied Mechanics \(RIAM\)](#), contributed information on saline lake ecosystems in Argentina, drawing on research conducted there earlier in her scientific career.

"Saline lakes are often treated as marginal environments, but the number of ecosystem services does not fall as salinity rises; the type of service changes instead. In dry regions there is no substitute for these lakes, and that is why management has to look at the whole catchment rather than the shoreline," explains Alfonso.

A hidden conservation value

The researchers identified 200 species listed as threatened or near threatened on the IUCN Red List that depend on the saline lakes included in the study. Birds accounted for 53% of these species, highlighting the importance of saline lakes as feeding, nesting, and stopover sites, particularly along migration routes in otherwise dry landscapes.

Saline lakes also differ markedly from one another. The number of species recorded continued to rise across the 85 lakes assessed, indicating that further saline lakes are likely to hold species not represented elsewhere in the dataset. The conservation value of saline lakes also extends beyond the species living directly in their waters. The study highlights the importance of ecosystem-level and genetic diversity, as well as a range of ecosystem services that are culturally and economically important.

Ecosystem services that are easy to overlook

The assessment quantified 11 categories of ecosystem services associated with saline lakes, including fisheries, salt extraction, recreation and tourism, water use, and other cultural and

economic benefits. The number of services provided per lake did not decline as salinity increased. Instead, their composition changed, with fisheries giving way to salt extraction and industrial water use in the most saline systems. The authors also emphasize a number of less visible functions that are difficult to quantify, including the regulation of microclimates in drylands, the prevention of saline dust storms, nutrient cycling, carbon sequestration, and the support of highly diverse microbial communities.

These less visible functions are particularly important because the loss or degradation of a saline lake can affect not only the organisms within the lake itself, but also surrounding ecosystems and human communities.

Why saline lakes need greater attention

Saline lakes are particularly sensitive to changes in their water balance. Because many are terminal water bodies, changes in water inflow, evaporation, climate, or water use within their catchments can produce amplified ecological effects. Their natural variability and the delayed responses of lake ecosystems also make conventional conservation approaches difficult to apply.

Based on the study and a series of international expert consultations, the authors propose five practical principles for improving the management and monitoring of saline lakes:

1. Manage the entire catchment, not just the lake. Because saline lakes depend on water entering from their entire basin, conservation cannot focus only on the shoreline. Water use upstream, including groundwater extraction, needs to be considered in management decisions.

2. Account for natural variability. Saline lakes can naturally fluctuate between very different states, including periods of very low water levels or even near-dry conditions. Management and assessment should therefore recognize this natural variability rather than relying on a single fixed reference state.

3. Establish long-term monitoring. Changes in saline lake ecosystems can occur with substantial delays following changes in their catchments. Long-term observations are therefore essential for distinguishing natural fluctuations from concerning trends and for detecting ecological change before irreversible impacts occur.

4. Involve stakeholders, especially across borders. Many saline lakes are influenced by activities throughout their catchments and, in some cases, span national boundaries. Effective management requires collaboration among governments, local communities, resource users, and other stakeholders, including the incorporation of local and Indigenous knowledge where relevant.

5. Apply adaptive management in the face of climate change. Because future climatic and hydrological conditions may differ substantially from the past, management needs to be flexible and capable of responding to changing lake conditions while maintaining key ecological functions and ecosystem services.

Together, these recommendations emphasize that protecting saline lakes requires a proactive, catchment-scale and long-term approach. The authors argue that saline lakes deserve greater recognition on national and international conservation agendas because their value extends beyond what can be readily measured within the water body itself and includes biodiversity,

ecosystem functions, cultural values, and benefits to surrounding communities.

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For more information about this research, see "The overlooked conservation values of saline lakes," Alfred Burian, Ramesh Wilson, Pavel Kratina, Örs Ábrám, Ekaterina Afonina, Javier Alcocer, María Belén Alfonso, ...Egor Zadereev et al., *Nature Communications*, <https://doi.org/10.1038/s41467-026-76684-0>

About Kyushu University

Founded in 1911, [Kyushu University](#) is one of Japan's leading research-oriented institutions of higher education, consistently ranking as one of the top ten Japanese universities in the Times Higher Education World University Rankings and the QS World Rankings. Located in Fukuoka, on the island of Kyushu—the most southwestern of Japan's four main islands—Kyushu U sits in a coastal metropolis frequently ranked among the world's most livable cities and historically known as Japan's gateway to Asia. Its multiple campuses are home to around 19,000 students and 8,000 faculty and staff. Through its [VISION 2030](#), Kyushu U will “drive social change with integrative knowledge.” By fusing the spectrum of knowledge, from the humanities and arts to engineering and medical sciences, Kyushu U will strengthen its research in the key areas of decarbonization, medicine and health, and environment and food, to tackle society's most pressing issues.



Fig 1. Flamingos at Laguna Epecuen, Argentina. A massive flock of southern flamingos (*Phoenicopeterus chilensis*) at Laguna Epecuén, Argentina—a key hypersaline habitat holding the second-largest colony of the species in South America. (Photo courtesy of the Municipality of Adolfo Alsina, Argentina)

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