

# The global abundance and size distribution of lakes, ponds, and impoundments

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ABSTRACT: One of the major impediments to the integration of lentic ecosystems into global environmental analyses has been fragmentary data on the extent and size distribution of lakes, ponds, and impoundments. We use new data sources, enhanced spatial resolution, and new analytical approaches to provide new estimates of the global abundance of surface-water bodies. A global model based on the Pareto distribution shows that the global extent of natural lakes is twice as large as previously known (304 million lakes; 4.2 million km² in area) and is dominated in area by millions of water bodies smaller than 1 km². Similar analyses of impoundments based on inventories of large, engineered dams show that impounded waters cover approximately 0.26 million km². However, construction of low-tech farm impoundments is estimated to be between 0.1% and 6% of farm area worldwide, dependent upon precipitation, and represents >77,000 km² globally, at present. Overall, about 4.6 million km² of the earth□s continental □□land□□ surface (>3%) is covered by water. These analyses underscore the importance of explicitly considering lakes, ponds, and impoundments, especially small ones, in global analyses of rates and processes.