

Ecology under lake ice

The majority of the world's lakes are located at latitudes where annual ice cover duration currently averages more than 150 days, yet only about 2% of freshwater research explicitly incorporates conditions under ice sampling. To address knowledge gaps about under ice ecology, we integrated winter limnology data from 42 research groups into a public data set involving more than 100 lakes across 140 degrees of latitude. Algae and their invertebrate grazers clearly persist under ice, albeit at lower biomass, and with substantial variation. Nutrients typically accumulate in the water column under ice, as predicted when primary producers are light limited, and patterns varied with size of the lakes. With global increases in water temperature and declines in ice cover, our capacity to predict lake responses will depend on continued progress in winter limnology and research that incorporates the full seasonal dynamics