This dataset was used in the analysis described in the manuscript by Khan, H., A. Laas, R. Marcé, B. Obrador. Major effects of alkalinity on the relationship between metabolism and dissolved inorganic carbon dynamics in lakes. In review: Ecosystems. This dataset was used to calculate short term changes of dissolved inorganic carbon (DIC) concentrations and its variability in Estonian lakes. DIC data were compared with measured dissolved oxygen (DO) data in lakes covering a range of different alkalinity levels. Our results suggest that a large part of the measured variability in DO and DIC reflects non-metabolic processes. In lakes of lower alkalinity, DIC dynamics appear to be mostly driven by aquatic metabolism, whereas in lakes of higher alkalinity calcite precipitation plays a major role on DIC dynamics and needs to be considered along with metabolism.