Due to a continuous release of synthetic chemicals since the onset of the industrial revolution, persistent organic pollutants (POPs) have slowly but surely infiltrated marine ecosystems to become an integral part of the global marine environment. The Arctic has become an important indicator region for assessing persistence and bioaccumulation properties of POPs since one of the criteria to qualify as a POP, according to the Stockholm Convention, is that the chemical shows evidence of long-range transport. In this doctoral thesis the occurrence of persistent halogenated POPs was studied in subArctic and Arctic marine mammals over a 25-year period. The emphasis was on studying temporal variations in concentration of three categories of POPs, which were represented by chlorinated, brominated, and fluorinated chemicals. Overall, pollutant concentrations showed signs of declining or levelling out, indicating a decrease in POP exposure in the studied areas in recent years. However, increasing levels of long-chain fluorinated compounds (PFCAs) present in most species was a finding of concern and implies that a continuous monitoring of these compounds is important.