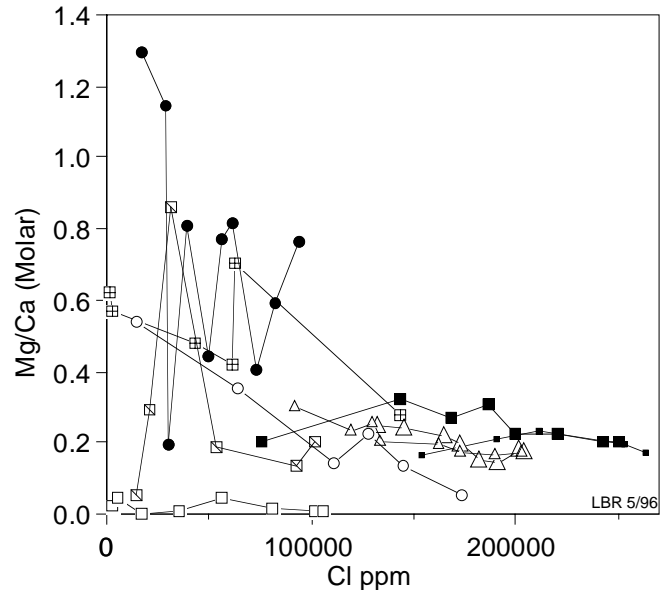
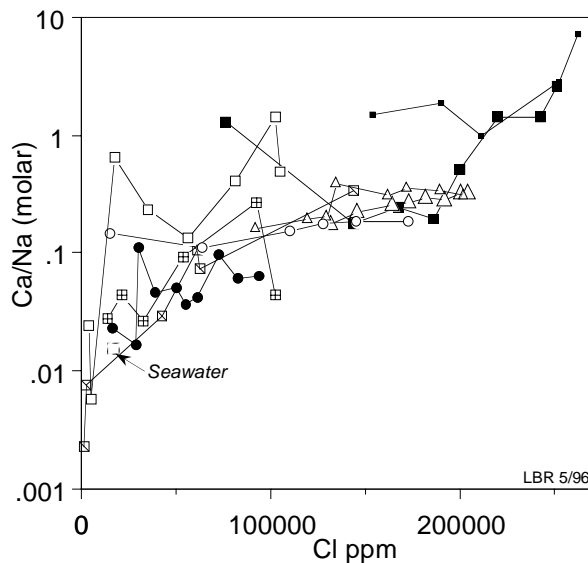


Deep-basin brines III: Dominance of Ca^{2+} among cations

As we observed in Part II of this series, the concentration of Ca^{2+} in deep-basin brines increases far beyond that of the other three major cations. That is true in both an absolute and relative sense. The plots below show that Ca^{2+} concentration increases relative to that of Na^+ (hence the increasing Ca/Na ratio show on the left plot) and relative to Mg^{2+} (hence the decreasing Mg/Ca ratio on the right plot).



Data are from sedimentary basins in the US., Canada, and the North Sea. The legend for the symbols is shown on "Deep-basin brines I: Density, TDS, and chloride".

The trend in Na^+ and Ca^{2+} may in part result from albitization of plagioclase feldspars, which consumes dissolved Na^+ and releases Ca^{2+} (Boles, J.R., 1982, Active albitization of plagioclase, Gulf Coast Tertiary: *American Journal of Science*, v. 282, p. 165-180). The trend in Mg^{2+} and Ca^{2+} may in part result from dolomitization of calcite, which consumes dissolved Mg^{2+} and releases Ca^{2+} .