Ozone is measured at the surface of the planet because high concentrations contribute to adverse health outcomes and ecosystem damage. Many ozone measurements take place at sites over land. The Great Lakes pose as unique areas where ozone abundances are higher, yet where few regular measurements occur. We developed a measurement strategy over Lake Michigan on the Lake Express Ferry and compare those measurements with land-based measurements and models to evaluate the unique off-shore environment that promotes ozone production. Ozone measurements and failings of the model predictions are discussed.