The need to dewater dredged sediments is a significant and urgent issue in the US and around the world. In the US alone, it is estimated that nearly 270 million cubic meters of sediments are dredged each year to preserve and protect water bodies. One of the most important steps following the removal of sediments from water bodies is dewatering. Recently, geotextile tubes are increasingly used for the dewatering of dredged sediments. Geotextile tubes are simple to transport and use, and are significantly more economical than confined disposal facilities and mechanical systems. Geotextile tubes have also been successfully used across a variety of industries. Cause for concern, however, is that the geotextile tube dewatering industry currently lacks uniformity amongst consultants, designers, manufacturers, and researchers in regards to establishing testing standards and assessing dewatering performance. While much ambiguity remains, the dewatering industry has apparently reached agreement on its use of polymer flocculants. Chemical conditioners are used extensively, if not exclusively, despite limited research in polymer-geotextile tube systems and their safety. New materials, such as natural fiber and composite geotextiles, and the potential for “green” polymers could significantly change the geotextile tube dewatering industry. Recent study undertaken at Syracuse University is directed toward an experimental investigation of the dewatering performance of typical dredged sediments and fly ash with polymeric and natural flocculants. The overall goal of this study is to provide a framework for evaluating the effectiveness of chemically conditioned sediment dewatering using geotextile tubes.