

Coastal Studies Counter "Out Of Sight, Out Of Mind" Mentality: Migrating Mine Tailings Threaten Reef In Lake Superior

Due to high spatial resolution and excellent water penetration in marine and northern Laurentian Great Lakes waters, light detection and ranging (LiDAR), coupled with multispectral imaging (MSS), can resolve key coastal features and clarify environmental issues. Global mining continues to advocate discharge of tailings into coastal and river environments. Previous investigations described a metal-rich 'halo' around the Keweenaw Peninsula, Michigan, a consequence of historic copper mining. Grand (Big) Traverse Bay offers an excellent example of mine tailings that progressively spread from a legacy discharge site. Between 1901-1932, two stamp mills (Mohawk and Wolverine) released 22.7 million metric tonnes of tailings into a single pile off Gay. Subsequently waste rock has dispersed along the shoreline, impacting benthic invertebrate communities, encroaching upon critical fish breeding grounds, damming stream outlets, intercepting wetlands and contaminating recreational beaches. In the bay, Buffalo Reef is a productive spawning area for lake trout and whitefish critical for commercial and recreational fishing in Lake Superior. Stamp sand movement into Buffalo Reef compromises normal deposition and hatching of fish eggs by: 1) physically burying cobble and boulder fields, and 2) having toxic effects on food webs. Here we utilize multiple LiDAR/MSS over-flights, field sampling (ROV, Ponar), and hydrodynamic modeling, to quantify tailings spread and environmental consequences.