

Sargassum muticum, a brown macroalga non-native to the Salish Sea, has proliferated in urban marine ecosystems in the Pacific Northwest. Filling ecological niches left by declining kelp forests, it has the potential to disrupt ecosystem dynamics. Despite being generally regarded as an environmental concern, *S. muticum*'s increasing abundance may have potential utility as a sustainable building material. There is an interest in integrating more sustainable construction materials to mitigate environmental impact, reduce resource depletion, and enhance long-term resilience. Recognizing the demand for sustainable building materials and the abundance of non-native *S. muticum*, our study investigated the feasibility of incorporating *S. muticum* into construction by using it as an insulation material. Samples of *S. muticum* were collected from Alki Beach. Flammability characteristics were evaluated including the likelihood of ignition, smoldering duration subsequent to flame removal, and overall mass loss during combustion. Fiberglass, cellulose, and *S. muticum* were compared. Sargassum had a significantly lower probability of catching fire after 10 seconds of being exposed to open flame than cellulose or fiberglass (p -value < 0.0001). There was a significant difference in smoldering time between cellulose and sargassum samples (p -value < 0.0001). Sargassum had a longer smoldering time compared to cellulose, whereas fiberglass did not smolder at all. There was no significant difference in the total mass lost during burning across samples. While untreated *S. muticum* exhibited some unfavorable attributes as an insulation material that were unrelated to fire risk, further exploration is warranted, particularly focusing on chemical treatment methods to reduce smoldering behavior.