

## Is composting a feasible disposal option for beach-stranded *Sargassum* in South Florida?

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Over the last decade there has been increased proliferation of *Sargassum* in the north Atlantic Ocean, with massive strandings occurring on near annual frequency in the Caribbean, western Africa, and United States since 2011. Such events have environmental, health, and economic impacts, because *Sargassum* is known to have a high capacity to absorb metals from the environment [1]. A common disposal method is mechanical collection of the stranded *Sargassum* and subsequent landfill disposal. Thus, leachates of degrading *Sargassum* can contribute to contamination in soils and groundwater near landfills. Compost can be a potential solution and can present a sustainable management method if concentrations of potentially toxic metals are below EPA guidelines. The objective of this project is to determine whether composting is a feasible management solution for *Sargassum* strandings. We assessed compositional characteristics of the compost [nutrient ratios (C:N, P), elemental concentrations, abundance of indicator bacteria] in both small-scale and large-scale settings. The first phase (small-scale) of study involved experiments using tumbler composters, which independently evaluated the impacts of washing the *Sargassum* prior to composting, as well as the impact of mixing with other vegetative wastes (grass, mulch, etc). The second phase (large-scale) involved two 4 yd<sup>3</sup> compost piles with different additives (a control pile and vegetative waste) in a municipal setting. In the first phase, the mixture of *Sargassum* and grass clippings produced compost with the best C:N ratios and lowest concentrations of toxic metals. Bacteria levels did exceed EPA regulatory limits in this treatment. Preliminary radish bioassay experiments also suggested best growth in the compost treatment mixed with grass clippings. Unwashed *Sargassum* produced compost with moderate C:N but the highest concentrations of toxic metals. Within the larger scale experiments conducted in the second phase, the *Sargassum* treatment produced the best C:N ratios and lowest bacteria levels compared to the *Sargassum* and vegetive waste treatment.

[1] Rodríguez-Martínez, R. E., et al., (2020). *PeerJ*, 8, e8667.