

## O39.5

### Seagrasses enhance their health under mild nutrient additions

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#### Abstract

Seagrasses are keystone species in estuarine and coastal systems. Therefore, the health of their stands has been considered and tried as one of the most important ecological indicators. However, their ecology has not been understood well enough for the development and application of robust indices providing clear perspectives over the studied cases. Most often, Principal Components Analysis has been applied to mono-specific, geographically narrowly-confined studies, yielding results that are unclear and/or cannot be extrapolated to other species or geographical locations. Stand above-ground biomass and shoot density have been consistently on the core of these indices, moved by the renowned Self-thinning law, in the past accolade the only rule in plant ecology worthy of the name 'law'. Yet, their modular construction gifted seagrass with an intricate biomass-density relation that became indecipherable until recently. In our recent works, we found that each of plants, algae and seagrass have their own Interspecific Boundary Line (IBL): an upper boundary to their biomass-density plot setting a maximum efficiency of space occupation for each of these taxa. We also observed that healthier stands placed closer to these IBL. This distance to the IBL was successfully tested as an ecological indicator, unveiling seagrass' responses to light, temperature, depth, season and nutrient concentrations. In our first tests, we applied this metric to two species in a few locations worldwide, having found that seagrasses occupied space more efficiently (i.e., stands were healthier) subject to intermediate nutrient concentrations. These occurred not in pristine conditions but rather in locations at intermediate distances from anthropogenic sources. We now extended our analysis to more species and a larger worldwide coverage. Our results show that seagrasses systematically optimize their health under mild anthropogenic nutrient additions. Hence, a good dispersion of nutrient loadings may be the key to optimize the co-existence of Man and seagrass.

#### Keywords

Seagrass, Biomass-density relation, ecological indicator, space occupation efficiency