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Size, scale and suspension feeding

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Few organisms are as directly dependent on fluid flow characteristics as suspension feeders: Body size for suspension feeders determines the flow regime around them, and considering the extent of growth in aquatic organisms, ontological shifts between regimes are common. Physical limits to growth and patterns of modularity are important in many groups with indeterminate growth, where size of feeding surfaces is traded against the risk of mechanical failure and tissue volume. Feeding itself is highly dependent on flow, and hence size of the food-collecting element. Body sizes of suspension feeders vary over five orders of magnitude; from protozoa to whales. This provides a dramatic range of conditions in which suspension feeders operate, and leads to a range different of adaptations to this feeding mode. Suspension feeding represents convergence in feeding structures and mode on a massive scale across almost all phyla, convergence that we are currently unable to explain because we lack knowledge of the basic physics involved in the feeding process