The Effect of Runoff and Eutrophication on Mangroves

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Mangroves are increasingly facing threats from human activities. These coastline shrubs create ecosystems by oxygenating the water and collecting sediment, cleaning the water and creating a vital coastline barrier for storms. Mangroves have adapted to low nutrient bodies of water through careful mutualism with ammonium fixing bacteria. They have adapted to perform sclerophylly when nutrients are high, prioritizing growing their canopies. Due to runoff of nutrients from aquaculture, agriculture, and urban areas, increased levels of nutrients lead to underdeveloped roots which are weak to storms. High nutrient content in the water leads to massive growths of algae which block out sunlight and rapidly changing pH. The algae decomposes using up the water's dissolved oxygen and suffocating aquatic plants. Mangroves perform viviparous reproduction, where a fertilized egg grows off the mangrove, then floats to an ideal location. These allow us to test similar growing conditions of mangroves to see how they are affected by an abundance of nutrients. The results of the experiment showcased how run off waste products reduce the dissolved oxygen in water, leads to unsustained growth of canopies, and leads to roots not being prioritized.