Electrical fields greatly increase saltmarsh growth and survival and speed restoration even in adverse conditions

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Intertidal saltmarshes are crucial fish and shellfish nurseries, and protect muddy and sandy shores from erosion, but are rapidly vanishing due to coastal development and pollution. Saltmarsh and oyster reef loss are major factors in coastal erosion. Saltmarsh grass, Spartina alterniflora, was grown next to an isolated polluted landfill site in Queens, New York City with and without electrical trickle charges from solar panels. Electrically stimulated Spartina grew 2.2 times taller, had more stems per clump, were darker green in color, and had 22.1 times higher survival over winter than control plants. Measurements with a pulse amplitude modulated fluorometer found higher photosynthetic rates and efficiency of photosystem II, and higher photosynthetic quantum yields in all Spartina electrical treatments. This was despite being grown lower in the intertidal than the lowest limit of nearby natural Spartina populations and in sediments near a Superfund site severely contaminated with hydrocarbons, PCBs, PAHs, and toxic trace metals. These results indicate that electrical stimulation can be used not only to greatly increase saltmarsh growth in restoration sites damaged by oil pollution, such as the Gulf of Mexico, but can also be used to increase Spartina growth and survival and to extend saltmarshes seaward of their normal limits and reduce coastal erosion. Large scale tests in saltmarsh damaged by oil spills should be conducted in Louisiana and in New York City.

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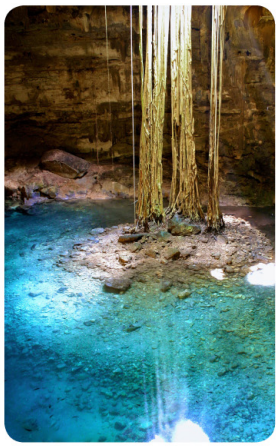


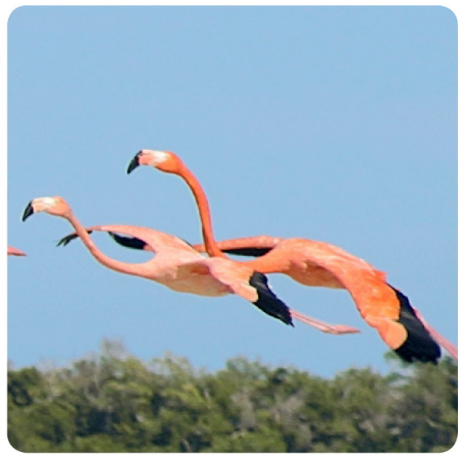

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