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| **Plants of the salt marshes**  The salt marsh environment is one of the harshest environments that a plant could live in. Most roots systems of plants that live in areas that lack salt in the soil have developed as to take advantage of the polar properties of water. "Because water molecules cohere to each other via chemical bonds, called hydrogen bonds, water molecules at the top of the plants are connected to water molecules in the soil much like the cars of a train. When water transpires (*a diffusion process*) from the leaves, other water molecules are brought closer to the root surface."(www.ussl). This mechanism helps plants to absorb water and carry it to the top of the plant. But how do plants control that the water flows into the plant rather than out of it? Plants have also evolved to take advantage of the osmotic properties of water. When a cell has the same amount of solutes inside of it, as outside of it the water will stay in place. This means that the water has come to equilibrium. However in a plant that does not live in salty areas the solute concentration is greater inside of the plant than outside of the plant. This works to the advantage of the plant because water will flow from where it is less concentrated to where it is more concentrated. Because the water is flowing into the plant the plant can carry it to it leaves.  In a plant that lives in salty soils or a halophyte, the concentration level of solutes is greater outside of the plant than in the plant (www.ussl). This would, in plants that are not adapted to live in salty environments, create a reverse flow of water. This reverse flow would cause the water in the plant to flow out of the plant to the more concentrated soil, dehydrating the plant. Salt marsh plants have developed to absorb the salt water and excrete the salt through special cells. By doing this they are creating fresh water, which they can utilize. (Conradson, 12)  Pickle-weed is by far the dominant plant of the salt marsh. It has evolved to withstand a salt concentration of 6-\_ %, while most other salt marsh plants can only withstand a salt concentration of 2%. "In salt-succulent halophytes like pickle-weed, energy requiring pumps within each cell move the salt into the vacuole where it is stored. When the vacuole cannot hold any more salt the cell breaks down and dies. Younger cells then take over the job of pumping and storing salt. This process results in what is called "salt-succulence", where the green photosynthetic tissue of the plant has many large cells holding massive amounts of salt in the interior vacuoles of the cells. If you could taste the glands, they would be very salty like pickles. That is how they got the name pickle-weed." (www.npsc.) Eventually the because the pickle-weed plant does not excrete salt, the salt will become so compacted in the stems of the plant, that that part of the plant will turn pinkish red and fall off. This is much like the process of those trees that leaves will turn color and fall off. (Conrason p12) Not all of the salt marsh plants are able to efficiently grow in soil with as high a percent of salt as the pickle-weed plant. Most are not able to survive in soils with a ratio much higher than 2% (www.npsc.) Because of this, the different plants of the salt marsh tend to group together in bands. The plants will only grow in the soils that they can tolerate.  Due to the harsh environment of the salt marsh and the high salinity levels there isn�t a variance in the salt marsh plant species. The most common salt marsh species are:  **Plant Scientific Name**  Alkali Heath *Frankenia grandifolia*  Wild mustard *Brassica spp.*  Sand dock *Rumex spp.*  Curly dock *Rumex crispus*  Beet or Swiss chard *Beta vulgaris*  Fat hen or salt brush *Atriplex patula*  Pickle-weed *Salicornia Virginica*  Marsh Dodder *Cuscuta salina*  Fennel or sweet anise *Foeniculum vulgare*  Jaumea *Jaumea carnosa*  Gum plant *Grindelia humilis*  Coyote Brush *Baccharis piluaris*  Brass Buttons *Cotula coronopifolia*  Star Thistle *Centurea solstitialis*  Cat tail *Typha latifolia*  Salt grass *Distichlis spicata*  Wild oats *Avena spp.*  Cord Grass *Spartina foliosa*  Sea Lettuce *Ulva spp.*  Chart from Exploring our Bay lands, p54  [<--- Back](http://docs.google.com/intorduction2.html) [Next --->](http://docs.google.com/introduction4.html)  [[Home](http://docs.google.com/home.html)][[Introduction](http://docs.google.com/introduction.html)][[Hypothesis](http://docs.google.com/hypothesis.html)][[Procedure](http://docs.google.com/Procedure.html)][[Data](http://docs.google.com/data.html)][[Conclusions](http://docs.google.com/conclusions.html)][[Bilio/Links](http://docs.google.com/biblio.html)]  [[2001 Projects](http://docs.google.com/index.html)][[2000 Projects](http://docs.google.com/AP2000/index.html)][[1999 Projects](http://docs.google.com/AP99/index.html)][[1998 Projects](http://docs.google.com/AP98/index.html)] |