

Plant Adaptations



Emergent Wetland Plants Adaptations to Saturated Soils

Wetland plants often grow in dense, clay soils. These wet soils are devoid of oxygen. Roots require oxygen; however, wetland plants have evolved adaptations to enable gases to transfer from the air down to the roots. Some wetland plants have floating leaves and stems that rest on the water surface, but “emergent plants” grow straight up out of the water and can handle changing water depths. These plants must have sufficiently rigid stems to hold the flowers and fruits above the water for wind pollination and seed dispersal, while also having spongy channels for carrying oxygen to the roots. Plant populations expand by extending underground stems or by dispersing seeds to wetland edges where the correct balance of light, oxygen and water exists.

Emergent Plant Adaptations

Bulrush
Schoenoplectus californicus

Flowers

Flowers are held up high to keep them above water for wind pollination and seed dispersal.

Stems

Tall, fibrous stems hold plants erect through variable water levels.

Spongy, hollow stems transport gases such as oxygen and carbon dioxide to and from roots.

Roots

Underground stems, called **rhizomes**, store starchy energy which allows plants to spread vegetatively underwater.

Cattail
Typha latifolia

Prairie Bulrush
Bolboschoenus maritimus

Common Spikerush
Eleocharis macrostachya

Salt Marsh Plants Adaptations to Extreme Saline Conditions

When plants grow they take in water through their roots and lose water through leaf transpiration. In salt marshes, salts flow into plants during water uptake and become concentrated during transpiration and evaporation. High salt levels interfere with cell function. For this reason, these plants must reduce water loss to keep the salt diluted, so they often develop water conserving adaptations like those found in desert plants. These adaptations include succulent leaves and stems, waxy coatings, and small or vertically-held leaves which help reduce transpiration. Other adaptations allow plants to excrete salt.

Salt Grass
Distichlis spicata



Adaptation:
Excess salt is secreted out of the leaves through salt glands.

Pickleweed
Salicornia virginica



Adaptation:
Excludes salts from roots; retains water in succulent stems.

Spearscale
Atriplex triangularis



Adaptation:
Waxy, vertical leaves reduce water loss.

Alkali Heath
Frankenia salina



Adaptation:
Small, gray reflective leaves reduce loss of fresh water.

Salt Extrusion



Salt grass is able to actively move salts out of living cells.
(Note salt crystals above.)

Plant Community Mosaic

This cross-section illustrates how 1 to 2 foot differences in water depth can create very different environments to which just a few plants are adapted. These wetland plants have evolved novel ways to handle salts, flooding and drought.

