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TF1.3 Permanent Marshes

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Everlasting Swamp, Clarence River floodplain, Australia.
Source: John Spencer/OEH

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BIOME: TF1 PALUSTRINE WETLANDS
REALM: TRANSITIONAL FRESHWATER-TERRESTRIAL

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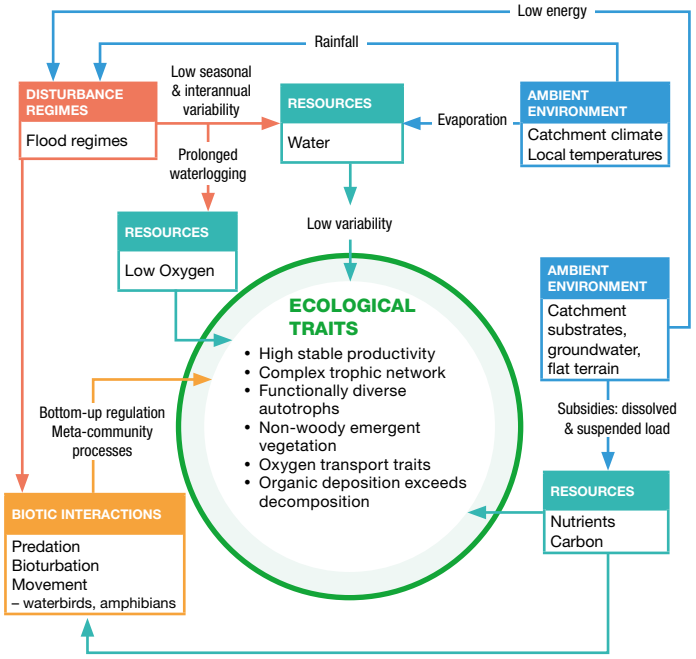

ECOLOGICAL TRAITS: These shallow, permanently inundated freshwater wetlands lack woody vegetation but are dominated instead by emergent macrophytes growing in extensive, often monospecific groves of rhizomatous grasses, sedges, rushes, or reeds in mosaics with patches of open water. These plants, together with phytoplankton, algal mats, epiphytes, floating, and amphibious herbs, sustain high primary productivity and strong bottom-up regulation. Although most of the energy comes from these functionally diverse autotrophs, inflow and seepage from catchments may contribute allochthonous energy and nutrients. Plant traits, including aerenchymatous stems and leaf tissues (i.e. with air spaces), enable oxygen transport to roots and rhizomes and into the substrate. Invertebrate and microbial detritivores and decomposers inhabit the water column and substrate. Air-breathing invertebrates are more common than gill-breathers, due to low dissolved oxygen. The activity of microbial decomposers is also limited by low oxygen levels and organic deposition continually exceeds decomposition. Their aquatic predators include invertebrates, turtles, snakes and sometimes small fish. The emergent vegetation supports a complex trophic web, including insects with winged adult phases, waterbirds, reptiles, and mammals, which feed in the vegetation and also use it for nesting (e.g. herons, muskrat, and alligators). Waterbirds include herbivores, detritivores, and predators. Many plants and animals disperse widely beyond the marsh through the air, water and zoochory (e.g. birds, mammals). Reproduction and recruitment coincide with resource availability and may be cued to floods. Most macrophytes spread vegetatively with long rhizomes but also produce an abundance of wind- and water-dispersed seeds.

KEY ECOLOGICAL DRIVERS: These systems occur in several geomorphic settings, including lake shores, groundwater seeps, river floodplains and deltas, always in low-energy depositional environments. Shallow but perennial inundation and low variability are maintained by frequent floods and lake waters, sometimes independently of local climate. This sustains high levels of water and nutrients, but also generates substrate anoxia. Substrates are typically organic. Their texture varies, but silt and clay substrates are associated with high levels of P and N. Salinity is low but may be transitional where wetlands connect with brackish lagoons (FM1.2, FM1.3). Surface fires may burn vegetation in some permanent marshes, but rarely burn the saturated substrate, and are less pervasive drivers of these ecosystems than seasonal floodplain marshes (TF1.4).

DISTRIBUTION: Scattered throughout the tropical and temperate regions worldwide.

Reference:
Grace, J.B., Wetzel, R.G. (1981). 'Habitat Partitioning and Competitive Displacement in Cattails (Typha): Experimental Field Studies'. *The American Naturalist* 118(4): 463–474.