

Engineering: Building with Nature MOOC

Form and Functioning of Some Wetlands

by Prof. dr. Jill H. Slinger and Graciela del Carmen Nava Guerrero




The Convention on Wetlands of International Importance, known as the Ramsar Convention (www.ramsar.org), is an intergovernmental treaty that provides the framework for conservation and use of wetlands and their resources. These ecosystems are land areas saturated with water either permanently or seasonally and inhabited by aquatic plants.

In this document, you will study how the Ramsar Convention classifies and describes the Form and Functioning of some wetlands and other water-related ecosystems. Although more than 30 wetland types compose the complete RAMSAR classification system, we present you with a selection of those types as an introduction to the topic.





Please note that additional resources are available in the course. You can use them to learn about the remaining types, and you can consult different classifications.

Do not forget to share your questions or comments in the Discussion Forum.




Marine, Coastal Wetlands

Wetland Form	Wetland Functioning
<p>Permanent shallow marine waters</p> 	<ul style="list-style-type: none">• In most cases less than six metres deep at low tide• Typically close to estuaries.• Sea grass often covers these ecosystems.• Habitats and nursing sites for (keystone) species.• Highly biologically productive ecosystems.• Trapping of sediments and stabilization of shorelines.• Grass that is severed and carried by the water column forms drift beds, mats that float near the surface and provide food and shelter for young fishes and nutrients for invertebrates, shorebirds and other organisms.
<p>Sand, shingle or pebble shores</p>  	<ul style="list-style-type: none">• Includes sand bars, spits, sandy islets, dune systems and humid dune slacks.• Highly biologically productive ecosystems.• Habitats and nursing sites for (keystone) species.• Dunes occur in the inland of the intertidal zone, but commonly in conjunction with beaches and sandy shores.<ul style="list-style-type: none">○ Highly dynamic and mobile.○ Act as sediment reserves○ Stabilize coastlines and prevent erosion○ Provide areas for recreation○ Support high species diversity





Marine, Coastal Wetlands

Wetland Form	Wetland Functioning
<p>Estuarine waters</p> 	<ul style="list-style-type: none"> • Includes permanent water of estuaries and estuarine systems of deltas. • Variation of salinity within the brackish water, produced by the meeting of freshwater from the mainland and salt water from oceans. • Critical to marine systems. • Permanently or periodically open to the sea. • Filtering of water pollutants. • Habitats and nursing sites for (keystone) species. • Highly biologically productive ecosystems. • Transition zone between river and sea
<p>Intertidal mud, sand or salt flats</p> 	<ul style="list-style-type: none"> • Pivotal for ocean ecology. • Highly productive and diverse ecosystems. • Critical habitats for benthic organisms and (migrating) shorebirds.
<p>Intertidal marshes</p> 	<ul style="list-style-type: none"> • Includes salt marshes, raised salt marshes, tidal brackish and freshwater marshes. • Variation of salinity within the brackish water, produced by the meeting of freshwater from the mainland and salt water from oceans. • Critical to marine systems. • Permanently or periodically exposed to seawater. • Often extensions of bigger estuaries. • Exhibit strong zonation • Filtering of water pollutants. • Habitats and nursing sites for (keystone) species. • Highly biologically productive ecosystems.
<p>Intertidal forested wetlands</p> 	<ul style="list-style-type: none"> • Includes mangrove swamps. • Found in intertidal zones and estuarine margins in tropical and sub-tropical regions. • Adapted to brackish water. • Filtering of water pollutants. • Habitats and nursing sites for (keystone) species. • Highly biologically productive ecosystems. • Protect adjacent ecosystems against erosion.

Inland wetlands

Wetland Form	Wetland Functioning
<p data-bbox="204 286 544 342">Permanent rivers, streams or creeks</p> 	<ul data-bbox="592 286 1385 448" style="list-style-type: none">• Includes waterfalls.• Often connected to other surface water or groundwater.• Resting and breeding areas for migratory waterfowl, birds, and fish.• Saturated with water most of the time.
<p data-bbox="204 618 544 701">Seasonal, intermittent or irregular rivers, streams or creeks.</p> 	<ul data-bbox="592 618 1385 779" style="list-style-type: none">• Often connected to other surface water or groundwater.• Resting and breeding areas for migratory waterfowl, birds, and fish.• Saturated with water only during certain seasons.• Highly dependent on rainfall.
<p data-bbox="204 954 544 1014">Freshwater, tree dominated wetlands</p> 	<ul data-bbox="592 954 1385 1216" style="list-style-type: none">• Includes seasonally flooded forests.• Bind the soil of banks and protect them from erosion.• Trap sediments from floodwaters.• Habitats and nursing sites for (keystone) species.• Often connected to other surface water or groundwater.• Resting and breeding areas for migratory waterfowl, birds, and fish.• Rich in woody vegetation.

Human-made wetlands

Wetland Form	Wetland Functioning
<p>Aquaculture ponds</p> 	<ul style="list-style-type: none"> • Includes ponds for fish and shrimp production. • Provide resting and feeding areas for migratory waterfowl and birds. • May be nutrient-enriched. • Salinity and temperature values may fall outside of the ranges exhibited by naturally occurring wetlands.
<p>Ponds</p> 	<ul style="list-style-type: none"> • Includes farm ponds, stock ponds and small tanks. • Provide biotope for fish • Provide resting and feeding areas for migratory waterfowl and birds.
<p>Salt exploitation sites</p> 	<ul style="list-style-type: none"> • Includes saltpans and salines. • Salinity and temperature values may fall outside of the ranges exhibited by naturally occurring wetlands. • Provide niche habitats for salt-tolerant species; e.g. flamingos
<p>Water storage areas</p> 	<ul style="list-style-type: none"> • Includes reservoirs, barrages, dams and impoundments, generally over 8 hectares. • Provide habitat for fish. • Hypoxic or even anoxic sediments and water can occur at depth within a reservoir. • Temperatures in the water body can fall outside of the ranges exhibited by naturally occurring pools or lakes.