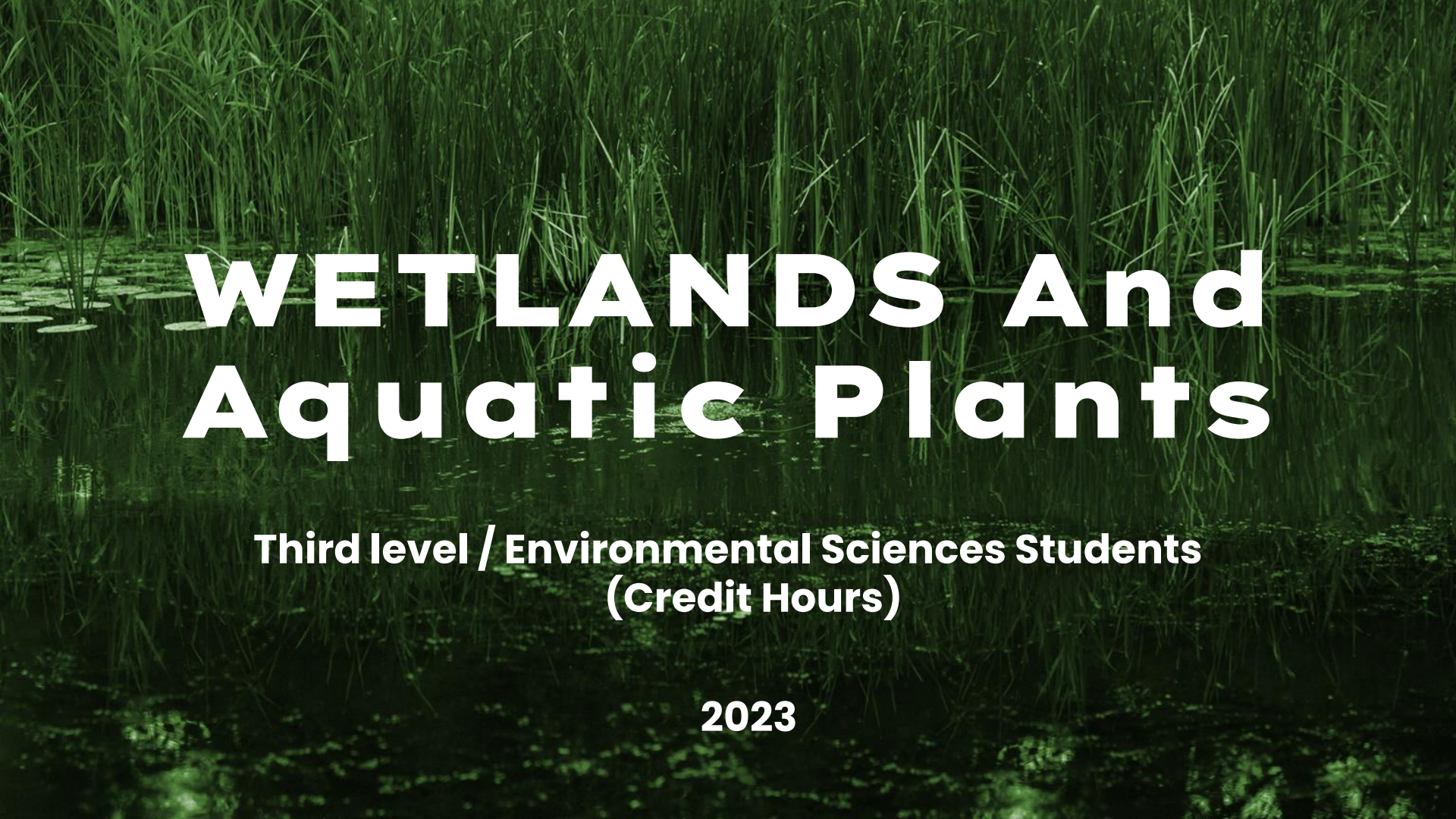

WETLANDS And Aquatic Plants

Third level / Environmental Sciences Students
(Credit Hours)

2023

Under supervision

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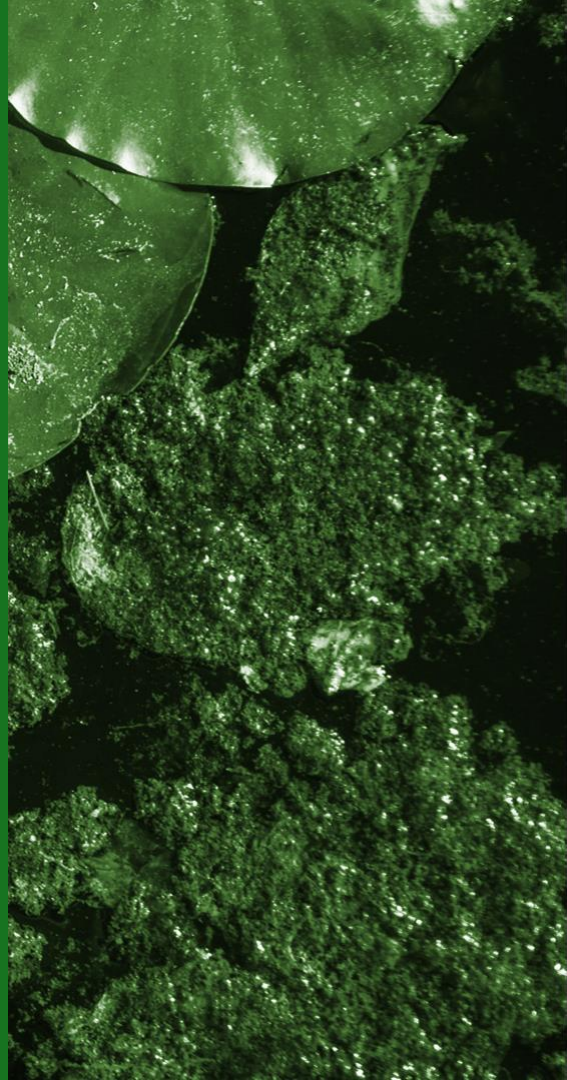


FEBRUARY 2

01 WETLANDS Definition

02 / 02 / 2022

Wetlands are areas of land covered or saturated with fresh, brackish or salt water that's generally still or slow moving. The water can also sit just below the surface.

areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season.

Water saturation (hydrology) largely determines how the soil develops and the types of plant and animal communities living in and on the soil.

Wetlands may support both aquatic and terrestrial species.

The prolonged presence of water creates conditions that favor the growth of specially adapted plants (hydrophytes) and promote the development of characteristic wetland (hydric) soils.

An area doesn’t need to be permanently wet to qualify as a wetland. The flooding or saturation can also happen cyclically or intermittently.

The area just needs to be wet for long enough for its plants and animals to be adapted to – or even dependent on – wet conditions for at least part of their life cycle.

Many wetlands can be dry for 10 years or longer before being flooded after heavy rain and then stay wet for several years. This allows wetland plants and animals to regenerate and reproduce.

Wetlands vary widely because of regional and local differences in soils, topography, climate, hydrology, water chemistry, vegetation and other factors, including human disturbance.

wetlands are found from the tundra to the tropics and on every continent except Antarctica.

Two general categories of wetlands are recognized:

***coastal or tidal wetlands**
***inland or non-tidal wetlands.**

Coastal/Tidal Wetlands

are found along coasts. They are closely linked to estuaries where sea water mixes with fresh water to form an environment of varying salinities.

The salt water and the fluctuating water levels (due to tidal action) combine to create a rather difficult environment for most plants. Consequently, many shallow coastal areas are unvegetated mud flats or sand flats. Some plants, however, have successfully adapted to this environment. Certain grasses and grasslike plants that adapt to the saline conditions form the tidal salt marshes that are found along the coasts. Mangrove swamps, with salt-loving shrubs or trees, are common in tropical climates. Some tidal freshwater wetlands form beyond the upper edges of tidal salt marshes where the influence of salt water ends.

Inland/Non-tidal Wetlands

are most common on floodplains along rivers and streams ,in isolated depressions surrounded by dry land (for example, playas, basins and "potholes"), along the margins of lakes and ponds, and in other low-lying areas where the groundwater intercepts the soil surface or where precipitation sufficiently saturates the soil (vernal pools and bogs). Inland wetlands include marshes and wet meadows dominated by herbaceous plants, swamps dominated by shrubs, and wooded swamps dominated by trees.

Many of these wetlands are seasonal (they are dry one or more seasons every year), and, particularly in the arid and semiarid West, may be wet only periodically. The quantity of water present and the timing of its presence in part determine the functions of a wetland and its role in the environment.

02
WETLANDS
Types

02 / 02 / 2022

Types of Wetlands

- Marshes
- Swamps
- Bogs
- Fens

Types of Wetlands

***Marshes**

- Non-Tidal Marshes
- Tidal Marshes

Marshes are defined as wetlands frequently or continually inundated with water, characterized by emergent soft-stemmed vegetation adapted to saturated soil conditions. There are many different kinds of marshes, ranging from the prairie potholes to the Everglades, coastal to inland, freshwater to saltwater. All types receive most of their water from surface water, and many marshes are also fed by groundwater. Nutrients are plentiful and the pH is usually neutral leading to an abundance of plant and animal life.

Types of Wetlands

Functions & Values of Marshes

Marshes recharge groundwater supplies and moderate streamflow by providing water to streams. This is an especially important function during periods of drought. The presence of marshes in a watershed helps to reduce damage caused by floods by slowing and storing flood water. As water moves slowly through a marsh, sediment and other pollutants settle to the substrate or floor of the marsh. Marsh vegetation and microorganisms also use excess nutrients for growth that can otherwise pollute surface water such as nitrogen and phosphorus from fertilizer.

Types of Wetlands

Non-Tidal Marshes

Non-tidal marshes are the most prevalent and widely distributed wetlands in North America. They are mostly freshwater marshes, although some are brackish or alkaline. They frequently occur along streams in poorly drained depressions and in the shallow water along the boundaries of lakes, ponds and rivers. Water levels in these wetlands generally vary from a few inches to two or three feet, and some marshes like prairie potholes, may periodically dry out completely.

Types of Wetlands

Non-Tidal Marshes

Highly organic, mineral rich soils of sand, silt, and clay underlie these wetlands, while lily pads, cattails, reeds and bulrushes provide excellent habitat for waterfowl and other small mammals, such as Red-winged Blackbirds, Great Blue Herons, otters and muskrats

Types of Wetlands

Non-Tidal Marshes

Due to their high levels of nutrients, freshwater marshes are one of the most productive ecosystems on earth. They can sustain a vast array of plant communities that in turn support a wide variety of wildlife within this vital wetland ecosystem. As a result, marshes sustain a diversity of life that is disproportionate with their size. In addition to their considerable habitat value, non-tidal marshes serve to mitigate flood damage and filter excess nutrients from surface runoff.

Types of Wetlands

Tidal Marshes

Tidal marshes can be found along protected coastlines in middle and high latitudes worldwide. Some are freshwater marshes, others are brackish (somewhat salty), and still others are saline (salty), but they are all influenced by the motion of ocean tides.

Tidal marshes are normally categorized into two distinct zones, the lower or intertidal marsh and the upper or high marsh.

Types of Wetlands

Tidal Marshes

In saline tidal marshes, the lower marsh is normally covered and exposed daily by the tide. It is predominantly covered by the tall form of Smooth Cordgrass (*Spartina alterniflora*). The saline marsh is covered by water only sporadically and is characterized by Short Smooth Cordgrass, Spike Grass and Saltmeadow

Types of Wetlands

Tidal Marshes

Tidal marshes serve many important functions. They buffer stormy seas, slow shoreline erosion and are able to absorb excess nutrients before they reach oceans and estuaries. Tidal marshes also provide vital food and habitat for clams, crabs and juvenile fish, as well as offering shelter and nesting sites for several species of migratory waterfowl.

Types of Wetlands

***Swamps**

- Forested Swamps
- Shrub Swamps

A swamp is any wetland dominated by woody plants. There are many different kinds of swamps, ranging from the forested Red Maple, swamps of the Northeast to the extensive bottomland hardwood forests found along the sluggish rivers of the Southeast. Swamps are characterized by saturated soils during the growing season and standing water during certain times of the year. The highly organic soils of swamps form a thick, black, nutrient-rich environment for the growth of water-tolerant trees

Types of Wetlands

Swamps may be divided into two major classes, depending on the type of vegetation present: shrub swamps and forested swamps.

Swamps serve vital roles in flood protection and nutrient removal. Floodplain forests are especially high in productivity and species diversity because of the rich deposits of alluvial soil from floods. Many upland creatures depend on the abundance of food found in the lowland swamps, and valuable timber can be sustainably harvested to provide building materials for people.

Types of Wetlands

***Bogs**

- Northern Bogs
- Pocosins

Bogs are one of the most distinctive kinds of wetlands. They are characterized by spongy peat deposits, acidic waters and a floor covered by a thick carpet of sphagnum moss. Bogs receive all or most of their water from precipitation rather than from runoff, groundwater or streams. As a result, bogs are low in the nutrients needed for plant growth, a condition that is enhanced by acid forming peat mosses.

Types of Wetlands

There are two primary ways that a bog can develop: bogs can form as sphagnum moss grows over a lake or pond and slowly fills it (terrestrialization), or bogs can form as sphagnum moss blankets dry land and prevents water from leaving the surface (paludification). Over time, many feet of acidic peat deposits build up in bogs of either origin. The unique and demanding physical and chemical characteristics of bogs result in the presence of plant and animal communities that demonstrate many special adaptations to low nutrient levels, waterlogged conditions, and acidic waters, such as carnivorous plants.

Types of Wetlands

Bogs serve an important ecological function in preventing downstream flooding by absorbing precipitation. Bogs support some of the most interesting plants in the United States (like the carnivorous Sundew) and provide habitat to animals threatened by human encroachment.

Types of Wetlands

*Fens

Fens, are peat-forming wetlands that receive nutrients from sources other than precipitation: usually from upslope sources through drainage from surrounding mineral soils and from groundwater movement. Fens differ from bogs because they are less acidic and have higher nutrient levels. Therefore, they are able to support a much more diverse plant and animal community.

Types of Wetlands

* **Fens**

These systems are often covered by grasses, sedges, rushes and wildflowers. Some fens are characterized by parallel ridges of vegetation separated by less productive hollows. The ridges of these patterned fens form perpendicular to the downslope direction of water movement. Over time, peat may build up and separate the fen from its groundwater supply. When this happens, the fen receives fewer nutrients and may become a bog.

03
WETLANDS
Functions and Values

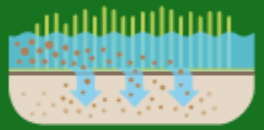
Functions and Benefits

MIGRATION
REST AREA

FUN

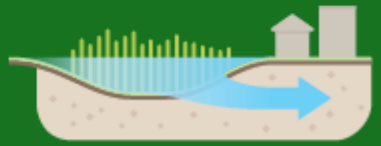
FLOOD & EROSION
CONTROL

HABITAT



CLEAN WATER

FOOD



WATER SUPPLY

7 BEST PRACTICES in wetland restoration

#GENERATIONRESTORATION #FORWETLANDS

World Wetlands Day
2 February 2023

smart
water magazine

1 Develop a **restoration** plan.

Restore multiple benefits. 2

Encourage **community participation.** 3

Address causes of **degradation.** 4

Restore native fauna and flora species. 5

Clean up the degraded area. 6

Organise access to the wetland site. 7

FREEPIK

7 benefits of restoring wetlands

A well restored wetland can provide many of the services performed by the original natural wetland. Here are seven ways restored wetlands can benefit us directly:

1. **Revive biodiversity**

   40% of the world's species live or breed in wetlands. Restoring wetlands powers the local food chain and attracts wildlife.

2. **Replenish and filter water supply**

   Wetlands naturally filter water, remove pollutants and boost the local water supply.

3. **Store carbon**

   Specific types of wetlands, especially peatlands, mangroves, intertidal marshes and seagrass beds are exceptionally efficient carbon sinks.

4. **Blunt the impact of floods and storms**

   Restored wetlands can act as sponges against excess rainfall and flooding, buffer coastal storm surges, and can shield communities in extreme weather.

5. **Improve livelihoods**

   Wetlands create livelihoods in fishing and aquaculture, and also provide goods like reeds and grasses. These opportunities often benefit indigenous populations.

6. **Boost eco-tourism**

   A restored wetland can be a sustainable magnet for visitors; a natural attraction that draws tourists along with opportunities to serve them.

7. **Enhance well-being**

   Revitalized wetlands provide a place to relax, experience nature – and enjoy sense of satisfaction at their resurgence.

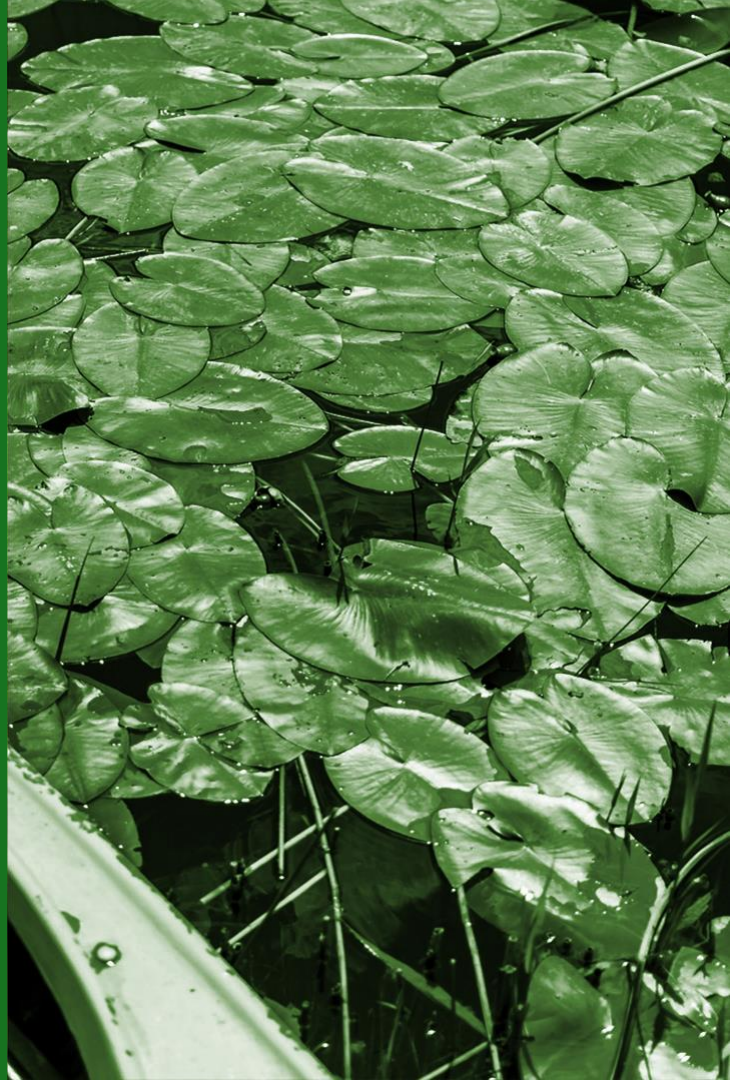
04
Aquatic Plants

Aquatic Plants

Aquatic plants are plants that have adapted to living in aquatic environments (saltwater or freshwater).

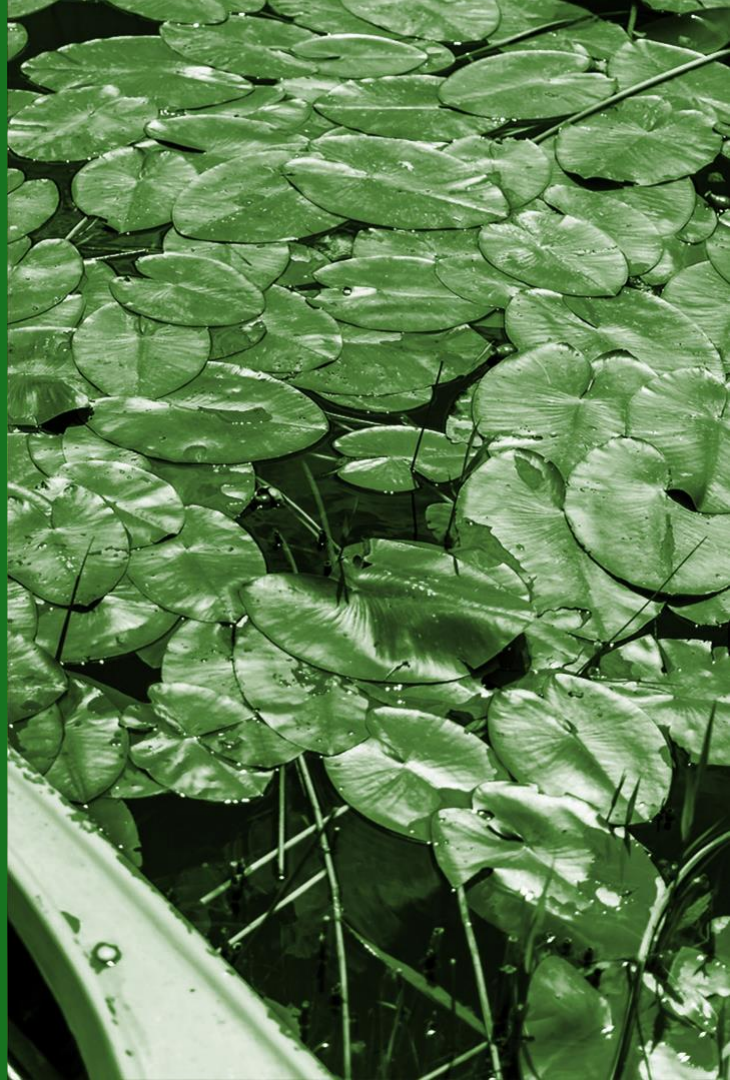
aquatic plants are any species that naturally prosper in a wet environment.

They are also referred to as hydrophytes or macrophytes to distinguish them from algae and other microphytes. A macrophyte is a plant that grows in or near water and is either emergent, submergent, or floating



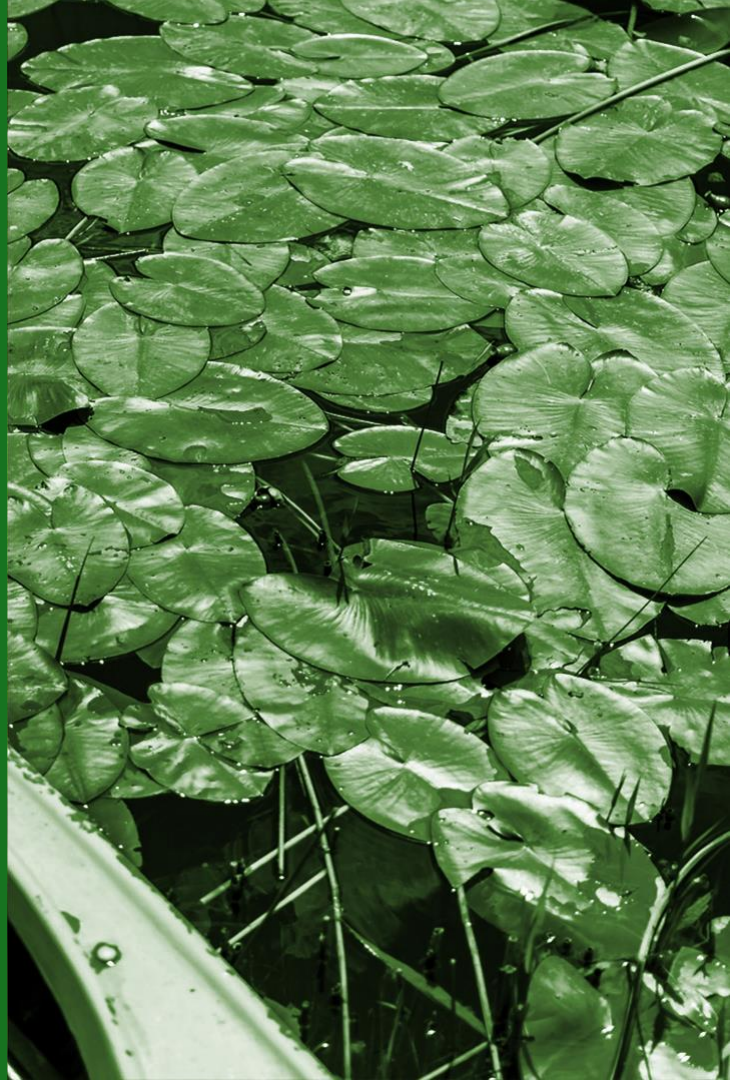
Aquatic Plants

- aquatic plants can utilize less of their resources for the purpose of support tissues as they are naturally able to stay afloat.
- water loss doesn't have to be a concern because these plants are constantly surrounded by it
- Submerged plants are usually without a cuticle layer in order to avoid excessive dryness.
- Submerged plants lack xylem since their leaves can do all of the work.



Aquatic Plants

- The leaves of submerged plants rarely have stomata.
- Immersed plants have leaves that stick out of the water with access to the air and sun, though their roots are always located at the bottom of a body of water.
- Free-floating plants have leaves that float on the surface of the water as opposed to sticking out of it.

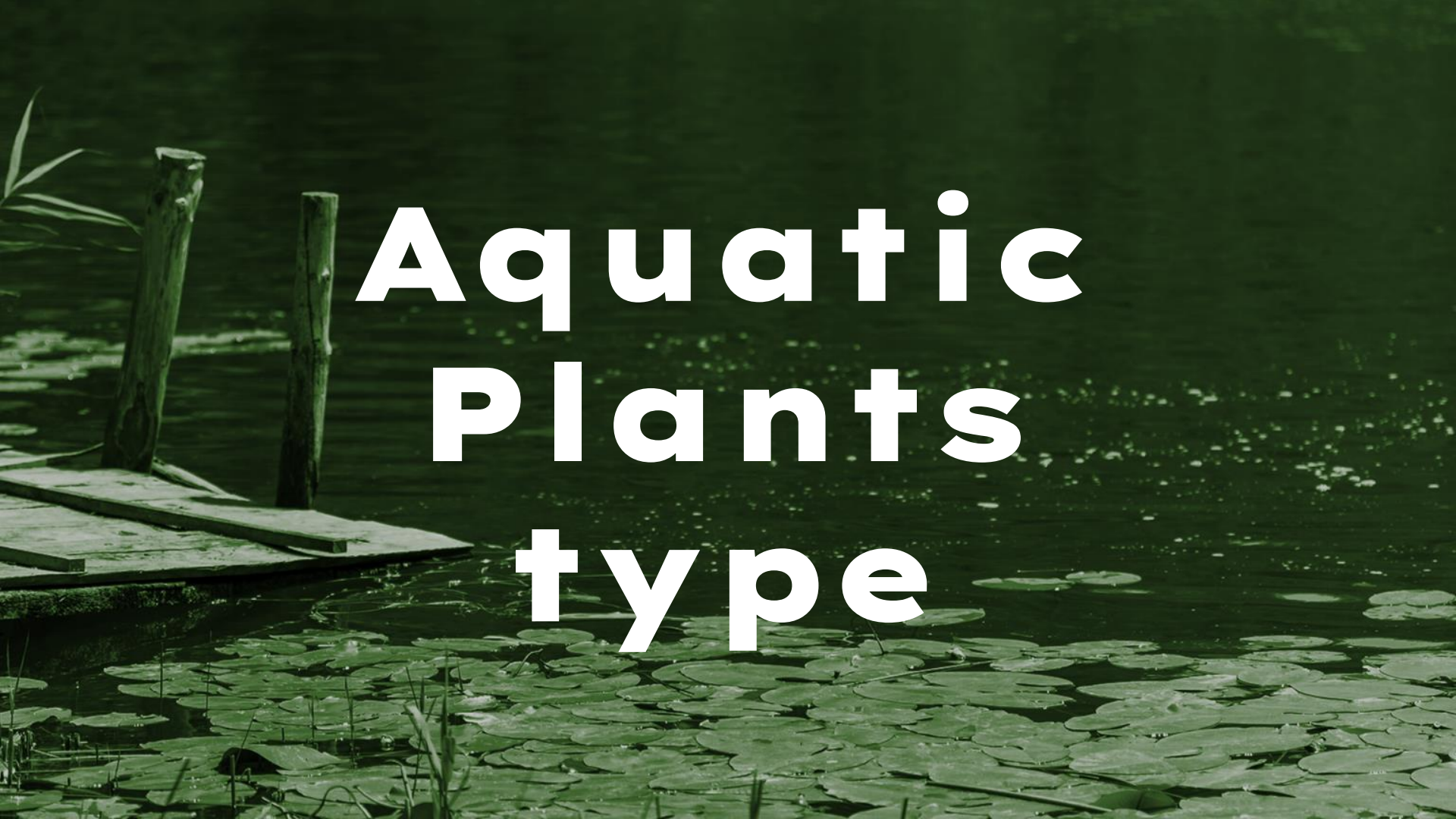


Benefits of aquatic plants

They are an extremely important part of aquatic environments as they can:

- Provide protection to fish
- Increase oxygen levels in water
- Filter water
- Prevent undesirable plants from growing
- Act as food

Additionally, in larger bodies of water specifically, they can also help our shores fight against aggressive currents and erosion.


Aquatic
Plants
type

* Floating-Leaved Plants

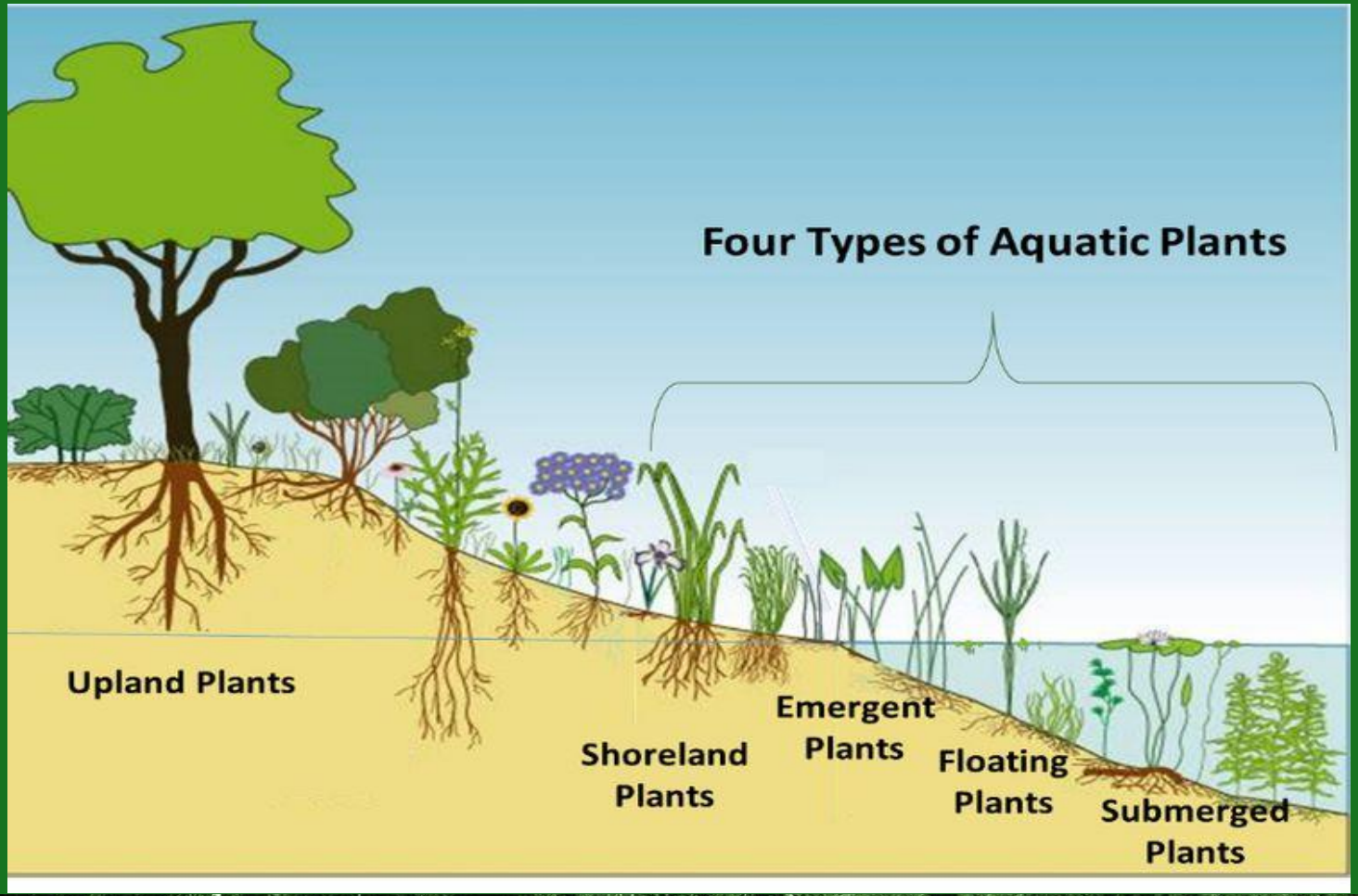
Floating plants are not attached to the water's bottom, but they have roots which absorb water. Floating plants can be found in fresh or salt water. The leaves of these plants are firm and remain flat in order to absorb more sunlight. Common examples of floating plants include various types of lilies (such as the water lily or banana lily) and the water hyacinth.

* Submerged Plants

Submerged or submersed plants are rooted to the water's floor and most of their vegetation is under water. The leaves of these plants are thin and narrow. Examples of submerged plants include hydrillas and bog moss.

* Emerged Plants

Emerged plants (also known as emersed) are rooted to the ground of the water but have most of their vegetation above water. These plants need constant exposure to sunlight. Examples of emerged plants include knotweed and redroot.


Four Types of Aquatic Plants
Upland Plants
Shoreland Plants
Emergent Plants
Floating Plants
Submerged Plants

WORLD WETLANDS DAY 2022

MON	TUE	WED	THU	FRI	SAT	SUN
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	1	2	3			

Thanks

2ND FEBRUARY