OPEN ACCESS Freely available online

ISSN: 2155-9546
Journal of Aquaculture Research & Development

Commentary

# Study of Surface Water Quality and Microsystems Limnology

**Helena Gabeira***

*Department of Limnology, Metropolitan University of Santos, Santos, Brazil*

## DESCRIPTION

Limnology is the study of drainage basins, water flow, and chemical changes that take place along the way. Landscape limnology, a relatively modern subfield of limnology, expressly looks at links between an aquatic environment and its drainage basin in order to study, manage, and attempt to maintain these ecosystems from a landscape viewpoint. The study of global inland waters as a component of the Earth System has recently given rise to the field of global limnology. This method takes into account inland water activities on a global level, such as the function of inland marine ecosystems in global biogeochemical. Water biology and hydrobiology, which investigate aquatic animals and their interaction with the biogenic environment, are closely related to limnology. Although limnology and disciplines with a focus on freshwater share many similarities, it also covers the study of upland salt lakes. Heat, currents, waves, and other periodic distributions of environmental variables all affect the physical features of aquatic habitats. The kind of feature and the structure of the soil around the body of water determine the morphometric of that body of water. Lake zones, for example, are determined by the depth of the water and are categorized according to the origin of the lake. The underlying geology of the region and the average water velocity both influence the morphometric of river and stream systems [1]. Along with precipitation patterns, topography, as well as other elements like vegetation and land development, has an impact on stream morphometric.

The terrain hydrology, lake surface size, and lake shape are all related to the connection between streams and lakes. Estuaries are another class of aquatic systems that fall under the study of limnology. Coastal areas are bodies of water that have seen river-ocean or sea contact. Although there are many different types of wetlands, the most common ones, marshes, bogs, and swamps, frequently alternate between having shallow waters and also being dry dependent on the season. The idea of "light zonation" describes how the quantity of sunshine that penetrates a water body affects its structure [2]. These zones outline different productivity levels in aquatic habitats like lakes. The photic or euphotic zone, for example, is the depth of a water column where sunlight may reach and where the majority of plant life can develop. The aphotic zone is the remainder of the water column, which is lower and doesn't receive enough sunshine to support plant growth. Similarly to light zones, thermal stratified or thermal zones are a method of classifying distinct lake levels according to temperature within an aquatic system. Heat is transferred lower in the water the less turbid it is, as more light can pass through it. In the water column, heating falls exponentially with depth, therefore the water will be warmest at the surface and get gradually colder as it descends [3]. Thermal stratification in a lake can be broken down into three primary categories. Since it is closest to the water's surface, the epilimnion absorbs both long- and short-wave radiation, warming the surface. Wind shear can help the ocean surface cool during the colder months. Within the water column, the thermocline is a region where water temperatures drop quickly. The hypolimnion, the lowest layer, typically has the coldest water since sunlight cannot penetrate it due to its depth. The thermocline is disturbed and the lake surface temperature becomes more uniform in temperate lakes as a result of the fall season cooling of the surface water. In winter, many lakes in colder climates may experience an inverse thermal boundary layer thickness when the water cools below 4°C. These lakes frequently have a short spring overturn and a lengthier fall overturn. The energy required to combine these strata of various temperatures is known as the relative thermal resistance. Aquatic ecosystems' water chemistry is impacted by a variety of natural factors, including as precipitation, the bedrock and soil beneath the drainage area, erosion, absorption, and sedimentation. Every body of water has a certain combination of organic and inorganic substances and elements [4].

The chemical characteristics of water are also impacted by biological processes. Human activities have a significant impact on the chemical makeup of waterways and their water quality in in addition to natural processes. Due to their complementary roles in respiration and photosynthesis, oxygen concentration and aqueous carbon dioxide are frequently discussed together. The concentrations of dissolved oxygen can change as a result of

**Correspondence to:** Helena Gabeira, Department of Limnology, Metropolitan University of Santos, Santos, Brazil, E-mail: gabeirahelena@gmail.com

**Received:** 27-Jan-2023, Manuscript No. JARD-23-19948; **Editor assigned:** 30-Jan-2023, Pre QC No. JARD-23-19948 (PQ); **Reviewed:** 17-Feb-2023, QC No JARD-23-19948; **Revised:** 24-Feb-2023, Manuscript No. JARD-23-19948 (R); **Published:** 02-Mar-2023, DOI:10.35248/2155-9546.23.14.729

**Citation:** Gabeira H(2023) Study of Surface Water Quality and Microsystems Limnology. J Aquac Res Dev.14:729.

physical, contaminant, and biological reactions. Concentrations of dissolved oxygen can be raised through physical processes like wind mixing, especially in the surface waters of aquatic habitats. Changes in water temperature have an impact on dissolved oxygen concentrations because oxygen in the water solubility is related to water temperatures and warmer water has a lesser ability to "hold" oxygen than colder water. Biologically, dissolved oxygen concentrations are influenced by both sunlight and aerobic respiration [5].

## REFERENCES

1. Bucchignani E, Zollo AL, Cattaneo L, Montesarchio M, Mercogliano P. Extreme weather events over China: assessment of COSMO-CLM simulations and future scenarios. Int J Climatol. 2017;37(3):1578-1594.
2. Hosseinzadehtalaei P, Ishadi NK, Tabari H, Willems P. Climate change impact assessment on pluvial flooding using a distribution-based bias correction of regional climate model simulations. J Hydrol. 2021;598:126239.
3. Lin Q, Wang Y, Glade T, Zhang J, Zhang Y. Assessing the spatiotemporal impact of climate change on event rainfall characteristics influencing landslide occurrences based on multiple GCM projections in China. Clim Change. 2020;162:761-779.
4. Chen J, Brissette FP, Chaumont D, Braun M. Performance and uncertainty evaluation of empirical downscaling methods in quantifying the climate change impacts on hydrology over two North American river basins. J Hydrol. 2013;479:200-214.
5. Teutschbein C, Seibert J. Bias correction of regional climate model simulations for hydrological climate-change impact studies: Review and evaluation of different methods. J Hydrol. 2012;456:12-29.