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A Glossary of Commonly Used Acronyms and Definitions

ACEC	<i>Area of Critical Environmental Concern</i>			
Adjuvant	A substance added to a spray solution to assist in the performance of a product, such as an herbicide. The usual function is to help the chemical product stick to, wet, or penetrate the plant surface.			
Adsorbate	Any material absorbed onto the surface of another.			
Aeolian Soil	Soil transported from one point to another by the wind.			
Aerobic	Describes life, or processes which require the presence of molecular oxygen.			
Aestival	(lakes) Are permanent bodies of shallow water that freeze completely during winter periods.			
AFFF	<i>Aqueous Film Forming Foam</i>			
AG	<i>Attorney General</i>			
AGNPS	<i>Agricultural Non-Point Source Pollution Model</i>			
AGO	<i>Attorney General Opinion</i>			
AIS	<i>Aquatic Invasive Species</i> – An invasive species is not native and introduction causes, or is likely to cause economic, or environmental harm, or harm to human health.			
Algae	(pl. or Alga singular) Simple photosynthetic plants that occur as microscopic forms, suspended in water (phytoplankton), or as unicellular, or filamentous forms attached or rooted to bottom sediment, rocks or other substrates. Over 18,000 species of Algae have been classified, of over 80,000 known species. Some more common groups include:			
	Cyanobacteria	(Blue/Green)	Chlorophyta	(Green)
	Xanthophyceae	(Yellow/Green)	Chrysophyceae	(Golden Brown)
	Phaeophyta	(Brown & Red)	Cryptomonads	(Chrysophycean)
	Bacillariophyceae	(Diatoms)	Englenoids	(Green or Red)
	Dinoflagellates	(Red or Brown)		

Most of the nuisance, toxic or noxious conditions in fresh water are produced by three blue-green algae. These are often informally referred to as:

“Annie”	Anabaena floe-aquae
“Fannie”	Aphanizomenon flos-aquae
“Mike”	Microcystis aeruginosa

Algal Bloom A sudden growth in water, occurring in such numbers that the water becomes cloudy, or the algae becomes easily visible.

Algicide or Algaecide A chemical substance that kills algae.

Allochthonous Organic matter or sediment that enters a lake from outside, such as from the atmosphere or a drainage basin.

Alluvial Refers to material(s) or soils that have been deposited by running water such as in a riverbed, flood plain or delta.

Alum and Alum Treatment The process of adding Alum (liquid Aluminum Sulfate) $Al_2(SO_4)_3 \cdot 12H_2O$, into lake water to precipitate to a floc that settles through the water column removing fine particles to the sediment and building up a barrier to contain soluble Phosphorus to the lake sediments.

Amictic A lake that does not experience mixing or turnover on a seasonal basis.

Anaerobic Describes processes that occur in the absence of molecular oxygen.

Anoxia A condition of no oxygen in the water. (Also Anoxic)

Anthropogenic Involving the impact of humans on nature. Induced, caused or altered by the presence of humans, or by human activities, such as in water and air pollution.

AOC *Areas of Concern* – Federally designated places where numerous beneficial uses of areas (fishing, swimming, hunting, drinking water) have been impaired due to historical contamination. The original fourteen Michigan AOC’s include:

1. Clinton River
2. Deer Lake (delisted 2014)
3. Detroit River (Bi-National)
4. Kalamazoo River
5. Manistique River
6. Menominee River (Bi-State – Wisconsin)
7. Muskegon Lake
8. River Raisin
9. Rouge River
10. Saginaw River/Bay
11. St. Clair River (Bi-National)

- 12. St. Mary's River (Bi-National)
- 13. Torch Lake
- 14. White Lake (delisted 2014)

- Aphotic** Without light, a depth in a lake where photosynthesis is unable to occur.
- Aphytal** The plant-less zone of a lake bottom
- APWA** *American Public Works Association* Chicago 1894
- Aquifer** A zone of soil and/or rock containing enough water, that withdrawn, can support a well.
- Arhizous** Plants without roots
- Armoring** Normally refers to Rip Rap (large stones, boulders or randomly placed pre-cast blocks) located to prevent erosion and sedimentation into a body of water due wave action, water flow, and ice action. In Michigan, the term has also been applied to seawalls and bulkheads.
- ASCE** *American Society of Civil Engineers* New York 1852
- Avigational Trespass** Using a float plane to gain access to a private lake without permission.
- AWWA** *American Water Works Association* Denver 1881
- Bathymetric Map** A map showing bottom contours and depth of a body of water. It can be used to calculate a lake's volume.
- BCF** *Bioconcentration Factor*
- BCP** *Bioconcentration Potential*
- BUI** *Beneficial Use Impairment* – The IJC has identified fourteen (14), including:
1. Restrictions on Fish & Wildlife consumption
 2. Tainting of Fish & Wildlife Flavor (removed 2008)
 3. Degraded Fish & Wildlife Populations (not part of Saginaw River/Bay AOC)
 4. Fish Tumors or other Deformities
 5. Bird or Animal Deformities or Reproductive Problems
 6. Degradation of Benthos
 7. Restrictions on Dredging Activities
 8. Eutrophication or Undesirable Algae
 9. Restrictions on Drinking Water Consumption, or Taste or Odor Problems (removed 2008)
 10. Beach Closings
 11. Degradation of Aesthetics

- 12. Added Costs to Agriculture or Industry (not part of Saginaw River/Bay AOC)
- 13. Degradation of Phytoplankton and Zooplankton Populations
- 14. Loss of Fish and Wildlife Habitat (removed 2014)

Benthic Barrier A material usually consisting of rubber, plastic, silicone or combination of materials, designed to cover the littoral zone, or bottom land, in order to block sunlight from reaching photosynthetic macrophytes.

Benthos Organisms living in or on the bottom, or on macrophytes, in sediments, or other substrates of a lake or stream, that are macroscopic.

BMP *Best Management Practice(s)*

Biocoenosis A community of plant and animal life.

Biodegradation The decomposition or breakdown of a substance into its basic chemical components through the action of bacteria and/or other micro-organisms.

Biomass The weight of biological matter (fish, algae, plants, etc.) in a specified area.

Biomass of Macrophytes The weight of cleaned foliage, including runners, but not roots, dried in an oven at 105°C.

Biota All plants and animal species occurring in a specified area.

Biovolume of Algae The total volume of an alga, including all its cells, (if multicellular), and extra-cellular material.

BOD *Biochemical Oxygen Demand:* A measure of Water pollution, or, how fast microscopic organisms, as well as larger animals use oxygen in the water.

BTEX *benzene, toluene, ethylbenzene, and xylene*

CaCO₃ *Calcium Carbonate*

CAPA *Critical Aquifer Protection Area*

Carbamates A class of pesticides that attack the central nervous system of organisms.

CASN *Chemical Abstracts Service Number*

CAWS *Chicago Area Waterways System* – Formed in 1900, 87 miles of river

CDC **Centers for Disease Control and Prevention* – USDHHS, Atlanta, 1946

CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act</i> (Federal – Superfund) 1980, 42 U.S.C. § 9601 <i>et seq.</i>
Chelated	A specific type of compound in which a metal is bound or held by two or more chemical substances. The chelated metal will have unique properties unlike the metal in its uncombined form.
Chemocline	When a stratification occurs in a water column due to a steep salinity gradient.
Chlorophyll	One of three groups of pigments necessary to the photosynthetic process. (i.e. Chlorophylls, Carotenoids, and Biliproteins). Chlorophyll <i>a</i> is a primary photosynthetic pigment of all oxygen-evolving photosynthetic organisms. It is present in all known algae, photosynthetic organisms and photosynthetic bacteria. Chlorophyll <i>b</i> , although common in higher plants is found only in green algae and euglenophytes. It functions as a light-gathering pigment, in which light energy is transferred to Chlorophyll <i>a</i> . Chlorophyll <i>c</i> , consisting of two spectrally distinct components, most likely functions as an accessory pigment to photosystem II. Chlorophyll <i>d</i> , of no known function, is a minor pigment found only in certain red algae. Chlorophyll <i>e</i> , is a very rare type of chlorophyll found in some types of golden algae, and as its name suggests (bacterio-chlorophyll) it may be found in certain bacteria.
COD	<i>Chemical Oxygen Demand</i> is a nonbiological uptake of molecular oxygen by organic and inorganic compounds in water.
Copepodid	Is the free-swimming larval state of certain parasitic copepods.
Copepod	Is a crustacean appr. 1 mm to 2 mm in length, and tear drop shaped, with antenna, living in nearly all water habitats.
CP	<i>Cultural Practice(s)</i>
CPI	<i>Consumer Price Index</i>
CREP	<i>Conservation Resource Enhancement Program</i> – USDA In exchange for yearly rental payments, farmers agree to remove environmentally sensitive lands from production. 1985 -
CWA	<i>Clean Water Act [of the United States]</i> – Federal Law 33 USC § 1251, <i>et seq.</i> of 1972. This set of laws amends the basic structure for regulating the discharge of Pollutants to surface and ground waters of the U.S.

CMI	<i>Clean Michigan Initiative</i> – A voter approved ballot initiative which became P.A. 451 of 1994 (MCL 324.19606 <i>et seq.</i>), as amended to provide funding to implement physical improvement (i.e. cleanup, restoration, etc.) consistent with approved watershed management plans to restore impaired waters, and to protect high quality waters.
CSO	<i>Combined Sewer Overflow</i>
Cyanobacteria	A classification that includes most Blue-Green Algae.
CZMA	<i>Coastal Zone Management Act</i> U.S. E.P.A. – 1972, amended in 1983. 16 U.S.C. ch. 33 § 1451 <i>et seq.</i>
DOC	<i>Dissolved Organic Carbon</i>
DDT	<i>dichloro-diphenyl-trichloroethane</i> – A commonly used pesticide that was banned in 1972 that has contributed to fish consumption advisories in the Great Lakes ecosystem. It is believed to cause Liver damage and Liver Cancer, Nervous System Damage, Congenital Disabilities, and Reproductive Harm. It was first synthesized in 1874, but its use as a pesticide, particularly for insects was first recognized in 1939. It is persistent and bio-accumulative, with a half-life of at least 30 years.
Detritus	Non-living, dissolved and particulate organic material produced from the metabolic activities (and deaths) of terrestrial and aquatic organisms.
Dimictic	Describes the process in a typical temperate lake of moderate size, involving temperature destratification. Dimictic refers to two mixing periods, normally one in the spring and one in the fall.
Dioxin	A diverse range of chemical compounds known to be toxic and carcinogenic. A dioxin is a heterocyclic 6-membered ring where two carbon atoms have been replaced with oxygen atoms.
DO	<i>Dissolved Oxygen</i> refers to O ₂ molecules in the water column.
e-Coli	<i>Escherichia coli</i> (Fresh Water) A species of bacteria that is present in the digestive systems of all warm-blooded animals. While only moderately harmful to humans, on its own, it may be indicative of the presence of other harmful bacteria and pathogens.
Ecosystem	The complex set of relationships among living resources and their habitat.
EGLE	<i>Michigan Department of Environment, Great Lakes and Energy</i> (April, 2019)
EIA	<i>Environmental Impact Assessment</i>

- EIS** *Environmental Impact Statement*
- EMCOG** *East Michigan Council of Governments* A regional forum to discuss issues of mutual interest and concern, and to develop recommendations and plans to address those issues. All of this in hopes of leading to a common goal of improving quality of life for the residents of the east central region of Michigan. This area which encompasses the Saginaw River/Bay AOC and most of the Saginaw Bay Watershed includes the Counties (and appointed representatives of Arenac, Bay, Clare, Gladwin, Gratiot, Huron, Iosco, Isabella Midland, Ogemaw, Roscommon, Saginaw, Sanilac, Tuscola, and the Saginaw Chippewa Indian Tribe. Its offices are in Saginaw, Michigan. Formerly known as the East Central Michigan Regional Planning and Development Council.
- Epipellic Algae** Algae growing on sediment or objects on a lake or stream bottom.
- Epipleuston** Organisms living at the surface-tension-layer of water.
- ESA** *Endangered Species Act* 1973
- Euphotic Zone** Upper layers of a body of water that receive sufficient light for photosynthesis.
- Eutrophication** The process of physical, chemical, and biological changes associated with nutrient, organic matter, and silt enrichment or sedimentation of a lake, stream or reservoir. This causes a dense growth of plants and the degradation of fish and animal life due to a lack of oxygen. In the past, if the process was accelerated by man-made influences, it was often referred to as “cultural eutrophication”.
- Evapotranspiration** How water is transferred from land to the atmosphere by evaporation from the soil, and transpiration from plants.
- Exotic Species** A non-native species that is introduced into an area.
- Facultative Bacteria** Bacteria that live under Aerobic or Anaerobic Conditions.
- FCMP** *Fish Contaminant Monitoring Program*
- FCSV** *Fish Consumption Screening Values*
- Flashiness** The ability of a stream to quickly reach flood stage after a snowmelt or rainfall event.
- Fluor** A chemical solution used to measure the radioactivity of a sample.

Flushing Rate	The rate at which water enters and leaves a lake, relative to lake volume, usually expressed as the time needed to replace the lake's volume with inflowing water.
Flux	The rate at which a measurable amount of material flows past a designated point, in a given amount of time.
Food Web	The pattern of production and consumption of organic material in an ecosystem.
FOIA	<i>Freedom of Information Act</i> – Michigan Public Act 442 of 1976, as amended, MCL 15.231, <i>et seq.</i>
Food Web	The system of interlocking and interdependent food chains.
4-R Nutrient Stewardship Program	A program that provides a framework to achieve Cropping system goals, such as increased production, increase farmer profitability, enhanced environmental and improved sustainability. To achieve These goals, the 4-R concept incorporates the <u>Right</u> fertilizer source; at the <u>Right</u> rate; at the <u>Right</u> time; and in the <u>Right</u> place.
Foreshore	Generally, that part of the shore that lies between the high and low water marks.
Furan	Any heterocyclic organic compound consisting of a five-membered aromatic ring with four carbon atoms and one oxygen atom. Furans are colorless, flammable, volatile, toxic and carcinogenic.
GIS	<i>Geographic Information System</i>
GLC	<i>Great Lakes Commission</i> – A compact of the eight Great Lakes States and two Canadian Provinces, located in Ann Arbor, MI, whose goal is to promote comprehensive development, use and conservation of the Great Lakes Basin; to address areas of the Basin with special problems or concerns; to assist with maximum benefit from public works, to navigational aids; and to advise in securing and maintaining a proper balance among industrial, commercial, agricultural, water supply, residential, recreational and other legitimate uses of the water resources of the Basin. 1955
GLIS	<i>Great Lakes Inventory System</i>
GLITTH	<i>Great Lakes International Trade and Transport Hub</i> – This initiative is a joint effort between the U.S. and Canada to leverage the assets of a shared region and to capitalize on the connectivity between them. These assets include the Great Lakes, supply chain infrastructure, world class universities, land and agricultural resources, and industry strengths such as advanced manufacturing.

GLITTH shares information and connects resources to advance business investment, job creation, environmental sustainability, and economic vitality.

- GLLA** *Great Lakes Legacy Act* – GLLA is a Federal program adopted by the U.S. Congress in 2002, and funded in 2004, to cleanup areas of contaminated sediments at former industrial sites and brownfield sites in the U.S., as well as 30 AOC's. The GLLA was implemented as an amendment to the CWA, Section 118 (c).
- GLNPO** **Great Lakes National Program Office* – USEPA - Chicago
- GLRI** *Great Lakes Restoration Initiative* – GLRI is an amendment to the CWA, Section 118 (c) by the U.S. Congress in 2011 in response to a challenge from the eight Great Lakes States' Governors to speed up funding for projects to restore and maintain the Great Lakes in a manner consistent with, and in furtherance of the GLWQA. Currently sixteen Federal Agencies receive funding for this purpose. Agencies or Departments marked with an asterisk are the sixteen (16) Federal Units that receive GLRI funding.
- GLSLCI** *Great Lakes and St. Lawrence Cities Initiative* – Is located in Madison, WI, and has partners including: University of Wisconsin (U of W), Wisconsin Coastal Management Program (WCMP), U of W Sea Grant, U of W – Madison – Department of Civil and Environmental Engineering, and the Southeast Wisconsin Regional Planning Commission (SWRPC). The initiative is funded by NOAA. Their purpose is to identify, plan for and protect against coastal hazards, Such as erosion, storm events, fluctuating water levels, to enhance community resilience and strengthen coastal economies thru-out the Great Lakes Basin.
- GLWQA** *Great Lakes Water Quality Agreement* – Initiated in 1972, the United States, Canada, and the Tribal Nations created the GLWQA. It had major revisions in 1978, again in 1983, 1987, and 2012. However, the primary purpose(s) of the agreement is: “to restore and maintain the chemical, physical, and biological integrity of the Waters of the Great Lakes.”
- GLWRCA** *Great Lakes / St. Lawrence River - Water Resource Compact Agreement* - An agreement amongst the eight Great Lakes States, as well as Ontario and Quebec to protect against the wholesale diversion of water from the Great Lakes Basin.
- GPS** *Global Positioning System*
- Greenbelts** Strips of shrubs, trees, and other suitable vegetation, planted to catch sediments from flowing across the ground to a lake or stream.
- Grey Infrastructure** Impervious surfaces like roads, buildings, and parking lots which prevent rainfall from penetrating the soil.
- Grey Water** The somewhat relative clean wastewater from washing machines, sinks and bathtubs.

- HAB** *Harmful Algae Bloom(s)* – Algal Blooms that produce concentrations of harmful toxins such as blue-green algae or cyanobacteria.
- Hardness** A term generally used as an assessment of water quality. Water hardness is governed by the content of calcium and magnesium salts, typically combined with carbonate, bicarbonate, sulfates, chlorides, and other anions of mineral acids.
- Head** The difference in elevation between the intake and discharge points for a liquid.
- Heavy Metals** Several toxic materials that most often originate from activities or products that include mining, tailings, industry, agricultural run-off, paints, treated lumber, city sewer systems, etc. then settle on the bottoms of lakes and rivers. Fish and other organisms that feed at the bottom accumulate high levels of heavy metals which may include (but are not limited to): Aluminum, Arsenic, Bismuth, Cadmium, Cesium, Cobalt, Gold, Lead, Mercury, Platinum, Selenium, Silver, Tin, etc., as well as certain compounds containing Copper, Iron and Zinc. Generally, the term refers to elements with a specific gravity of 5.0 or greater.
- Herding Agent** A chemical applied to the surface of the water to contain the spread of a floating oil spill.
- Histosols** Organic Soils
- Holomictic** Refers to lake types where the water completely mixes at least once per year.
- HREA** *High Risk Erosion Area*
- Humic Substances** These form most of the organic matter of soils and waters. Humic substances are formed largely as a result of microbial activities on plant and animal material, and are relatively resistant to further microbial degradation. They tend to persist in aquatic systems, with long residence times.
- Hydraulic Residence Time** The length of time water remains in a lake before evaporating, flowing out a stream, or infiltrating the soil. This time can vary from several days to hundreds of years.
- Impaired Waters** Under Section 303(d) of the CWA, States, Territories and authorized Tribes are required to develop lists of impaired waters. These are waters that are too polluted or otherwise degraded to meet water quality standards set by States, Territories of authorized Tribes.
- Implementation Metric** A tactical metric to measure progress toward accomplishing the recommendation.
- Indigenous** Existing, growing, or produced naturally in a region.

- In Situ** In Place. As an In Situ environmental measurement taken in the field, without removal of a sample to the laboratory.
- Influent** A tributary system.
- Instar** A stage between molts of developing crustaceans and insects.
- ITRC** *Interstate Technology & Regulatory Council*
- Inverse Stratification** A winter phenomenon where warmer water lays on the bottom of a lake, while cooler water or ice is at the surface. The result is a minor density gradient.
- Isothermal** The same temperature throughout, or top-to-bottom.
- Keyholing (or Funneling)** Any number of dwelling units built away from a lake or stream (for instance, on a second-tier lot), but with access to the water through one waterfront lot. Often times, where a beach, club house, or docks are shared.
- Lacustrine** Pertaining to or produced by, or inhabiting a lake.
- Lake Classification, or Lake Trophic State** A system generally designed to label a lake or pond to indicate the amount of eutrophication that has occurred, or is occurring.

Oligotrophic Lakes are poorly supplied with plant nutrients and support little plant growth. As a result, biological productivity is generally low, the waters are clear, and the deepest layers are usually well supplied with oxygen throughout the year.

Mesotrophic Lakes are intermediate in characteristics between oligotrophic and eutrophic lakes. They are moderately supplied with plant nutrients and support moderate plant growth.

Eutrophic Lakes are richly supplied with plant nutrients and support heavy plant growth. As a result, biological productivity is generally high, the waters are turbid because of occasional dense growths of phytoplankton, or contain an abundance of rooted macrophytes. Deepest waters exhibit reduced concentrations of dissolved oxygen during periods of restricted circulation, and some fish species may be stressed during late summer.

Hyper-Eutrophic Lakes exhibit all the characteristics of the eutrophic classification, but at greater and much accelerated rate. Large algae blooms are common and usually water clarity is almost non-existent.

Dystrophic Lakes are often called “Brown-Water” lakes due to the staining caused by humic or organic matter supplied by allochthonous sources. These lakes are typically very low in productivity and consequently, are usually extremely low in dissolved oxygen.

Heterotrophic conditions usually refers to the type of algae, macrophytes, bacteria, or even chemical composition of the water in a lake this is deprived of light throughout the water column.

LARA *Michigan Department of Licensing and Regulatory Affairs. Secretary of State, Lansing, MI.*

Legal Lake Level When Riparian Property Owners, or local Municipal Government petition the Circuit Court (in Michigan) to establish a Legal Lake Level. An order is issued by the Circuit Court Judge to the County Board of Commissioners, who then typically delegate implementation and enforcement to the County Drain Commission or the County Road Commission.

Lentic / Lotic Refers to the physical action of water. Lentic relates to standing water. Lotic refers to moving water.

Limiting Factor A condition whose absence or excessive concentration is incompatible with the needs or tolerance of a species or population and which may have a negative influence on their ability to thrive and/or survive. A factor such as temperature, light water or a chemical that limits the existence, growth, abundance or distribution of an organism.

Limnetic Zone Is the open, well-lighted area of a body of standing water, but not part of the littoral zone. Rather it is surrounded by the littoral zone. The Limnetic Zone and Littoral Zone combine to form the Photic Zone.

Limnology The study of inland waters. It is often regarded as a division of ecology and environmental science. It covers the biological, chemical, physical, geological and other attributes of all inland water, both lentic and lotic, both fresh and saline, both natural and artificial. It includes the study of lakes, ponds, rivers, stream, wetlands, and in some instances the watersheds of these.

Littoral Zone The portion of a body of water that includes all rooted plants. Typically, this zone extends from the shoreline to the bottom of the "light column".

Littoral-Profundal Zone is a region where vascular plants give way to filamentous macroscopic algae, and is below the littoral zone.

LUST *Leaking Underground Storage Tank Part 213, PA 451 of 1994 as amended. MCL 321.21301 et seq.*

Macroinvertebrates Aquatic insects, worms, clams, snails and other animals visible without the aid of a microscope, which may be associated with, or live on substrates such as sediments and macrophytes. They supply a major portion of fish diets, and consume detritus and algae.

- Macrophytes** Macroscopic rooted and floating aquatic plants, commonly called [water] weeds. These plants may flower and/or bear seed.
- MAEP** *Michigan Agricultural Environmental Assessment Program* – An innovative, proactive and voluntary program that helps farms of all sizes and all commodities voluntary prevent or minimize agricultural pollution risks, administered by MDARD.
- MAEP** *Michigan Association of Environmental Professionals* -Founded in 1978 to promote the advancement of interdisciplinary environmental education, planning, assessment, review and management. Pickney, MI
- MCL** *Michigan Compiled Laws*
- MCLA** *Michigan Compiled Laws – Annotated*
- Meromixis** This occurs in lakes that do not undergo complete periodic circulation, and the primary water mass does not mix with the lower portion. Meromictic lakes usually divide into two water stratum, including the Monimolimnion, or deeper, perennially stagnant portion of a lake; and the Mixolimnion, or upper portion which periodically circulates.
- Meroplankton** Organisms that are planktonic for only a part of their life cycle, usually the larval stage. Some fish, and some dinoflagellates and diatoms are included.
- Measures of Success** A measure of the improvement in environment, social or economic conditions, over time, as a result of multiple actions.
- MCNALMS** *Michigan Chapter – North American Lake Management Society* -founded 1990.
- MDARD** *Michigan Department of Agriculture and Rural Development*
- MDEQ** *Michigan Department of Environmental Quality (decommissioned April, 2019)*
- MDHHS** *Michigan Department of Health and Human Services*
- MDNR** *Michigan Department of Natural Resources*
- MEC** *Michigan Environmental Council* A 501(c)(3) educational group comprised of apprx. 70 other environmental organization, and based in Lansing, MI. Founded in 1980.
- MEDC** *Michigan Economic Development Corporation* Based in Lansing, MI, the MEDC was created under the Michigan Urban Cooperation Act of 1967, using an interlocal agreement between the Michigan Strategic Fund and local agencies, statewide.
- mg/L** *Milligrams per liter*

- Michigan Sea Grant** A collaborative effort of Michigan State University and the University of Michigan, Michigan Sea Grant is part of the NOAA based Sea Grant Network of 33 university based programs, helping to foster economic growth, and protect Michigan's Great Lake resources, thru education, research and outreach.
- MLSA** *Michigan Lake Stewardship Association*, a 501(c)(3) educational organization, formerly Michigan Lake & Stream Association, was formed in 1961. Its purpose is to cleanup and protect the State's water resources, and to protect Riparian Rights / Riparian Doctrine. A statewide organization, which at its peak had appr. 150,000 members and member organizations (POA's). Its central office is in Stanton, MI
- Monomictic** Cold Monomictic lakes, usually at higher altitude or Arctic regions, rarely exceed 4^oC., and circulate only once annually, during the summer. Warm Monomictic lakes usually found in more temperate areas never drop below 4^oC., and circulate freely during the winter, but stratify during the summer. Both types may also be referred to as holomictic.
- Morphometry** Relating to a lake's physical structure, including depth, shoreline length, etc.
- MPART** Michigan PFA's Action Response Team (EGLE)
- MT** *Metric Tonnes*
- MTBE** *methyl-tertiary-butyl ether*
- MUCC** *Michigan United Conservation Clubs* A 501 (c)(3) educational and service organization comprised of appr. 70 clubs involved with hunting, fishing and trapping. Founded in 1937, it advocates for the rights of and offers educational outreach for Hunters, trappers and fishermen.
- MUSTR** *Michigan Underground Storage Tank – Rules* Part 211 of PA 451 of 1994, as amended, and the administrative or promulgated rules initiated from this Part.
- MWAI** *Michigan Waterfront Alliance, Inc.* A 501 (c)(4) educational and advocacy group founded in 1995 review and impact legislative initiatives, higher Court Cases, Promulgated or Administrative Rules of Government Agencies that impact Michigan Waters and their use.
- NALMS** *North American Lake Management Society* – founded 1989
- Nannoplankton** Plankton small enough to pass through a specific size net.
- NEPA** *National Environmental Policy Act* – of 1969 42 U.S.C.A. § 4331 *et seq.*
- Neuston** Minute or microscopic organisms that rest or swim on the surface of a still body of water.

NFIP	<i>National Flood Insurance Program</i> – Presidential Order 12127 – 1968, then amended and extended in 1973. Under control of FEMA.
ng/L	<i>Nanograms per liter</i>
Nekton	Fish, amphibians, and other animals, large enough that their mobility is not necessarily determined by water motion.
Nival	Of, related to, or growing, in or under the snow.
NOAA	* <i>National Oceanic and Atmospheric Administration</i> – USDC, officially from 1970, however its origins can be traced to 1807.
Non-ionic Surfactant	A soap-like additive used in spray solution to improve its sticking and wetting properties when applied to plant foliage. Non-ionic refers to solution without any electrical charge.
Non-Humic Substances	Several compounds including: amino acids, carbohydrates, fats, resins, peptides, pigments, proteins, waxes, and other organic compounds exhibiting low molecular weight. These substances are typically used, and “turned-over” rapidly within an ecosystem, therefore separate concentrations of non-humic material in the water is usually quite low.
Nonindigenous	Fish, wildlife or plants not native to a place.
Nonpoint Source Pollution	Pollution, that comes from snowmelt and/or storm events that flows over impervious surfaces, collecting pollutants, and eventually drains into a body of water. Its origin may be underground flow, septic system leakage, surface runoff, etc. as opposed to a specific pipe or culvert.
NPDES	<i>National Pollutant Discharge Elimination System</i> – Permit programs that control water pollution by regulating point sources that discharge into waters of the United States.
NPDWR	<i>National Primary Drinking Water Regulations</i> – EPA
NPL	<i>National Priorities List</i> – EPA
NREPA	<i>Natural Resources and Environmental Protection Act</i> . Michigan Public Act 451 of 1994, as amended. The unification of all previous laws intended to protect Michigan’s Environment.
NTU	<i>Nephelometric Turbidity Unit(s)</i>
Nutrient	An element or chemical essential to life. Nutrients normally include carbon, nitrogen, phosphorus, oxygen and others. In limnological studies, the term may also refer to a lack of – or – an excess of an element or chemical in relation to an imbalance or problem in the ecosystem.

Nutrient Budget A measurement or assessment of the nutrients entering, exiting, and remaining in an ecosystem. Since phosphorus is a major contributing factor in a lake's trophic state, most Nutrient Budgets are created to assess phosphorus during initial studies.

Nutrient Cycling The flow of nutrients from one component of an ecosystem to another, for example: when plants die and release nutrients that become available to algae.

Nutrient Loading A quantitative assessment of the nutrients (usually phosphorus or nitrogen) entering an ecosystem.

Obligate Hydrophytes Species that are only found in wetlands, such as cattails. As opposed to *Ubiquitous Hydrophyte* species that grow either in wetland, or on upland areas.

OMA *Open Meeting(s) Act* – Michigan Public Act 267 of 1976, as amended, MCL 15.261, *et seq.*

Ordinary High Water Mark The physical demarcation [line] between the land above the water, and the land below the water this is usually reached and maintained over a period of time. It may also be a mark set by court order, such as when an artificial lake is created by a dam.

Organic Matter Molecules and compounds manufactured by plants and animals. These substances contain carbon atoms linked with other elements such as hydrogen, nitrogen, oxygen, phosphorus, sulfur, etc.

PAC *Public Advisory Council* – Each AOC has a group or organization, sanctioned by EGLE to represent that AOC and maintain contact with State and Federal Agencies

PAH(s) *Polycyclic Aromatic Hydrocarbon(s)* are a class of chemicals that occur naturally in coal, crude oil and gasoline. They are also produced burning trash, tobacco, and wood. Some useful products that contain PAHs are asphalt, wood preservatives and creosote.

Palustrine Pertaining to marshes or wetlands, or their habitats.

PAM's *Polyacrylamides* Synthetic polymers with extensive water retention and water saving capabilities.

Pathogen A micro-organism capable of producing disease in humans, animals or fish.

PBB *Polybrominated Bi-Phenyl(s)* are polyhalogenated derivatives of a biphenyl core. Their use in electrical and electronic products is now restricted because they cause immune system disorders.

PBT *Persistent Bio-accumulative Toxin*. Sometimes referred to as “Forever Chemicals.”

PCB *Polychlorinated Bi-phenyl* are organic chlorine compounds once used as dielectric and cooling compounds in electrical components, carbonless copy paper and heat transfer fluids. Banned in the U.S. in 1978, they are endocrine system disrupters, toxic, carcinogenic and environmentally persistent.

PCE *Perchloroethylene* or Tetrachloroethylene or Perclene. A carcinogenic used in de-greasing and in dry cleaning.

Pelagic Zone The open area extending from the littoral zone to the center of a lake.

Periphyton An assemblage of microorganisms (plants and animals) firmly attached to and growing on solid surfaces such as the bottom of a stream, rocks, logs, pilings and other structures.

Permitted Use Does NOT mean “allowed use”. Rather, it means, that to participate in a given activity, you must apply for and receive a permit for that activity.

Persistence or Persistent The relative ability of a chemical to remain stable following its release into environment. Persistent chemicals resist biodegradation and thus are of greater concern in the treatment of water and wastes.

PFA(s) *Perfluoroalkyl* Substances (see PFO's)

PFO(s) *Polyfluoroalkyl* Substances PFA's and PFO's extremely persistent compounds used in Stain & Water Repellants, Non-stick products such as Teflon, Polishes, Waxes, Paints and Cleaning Supplies, Fire Fighting Foam, Chrome Plating processes, Electronics manufacturing, Oil Recovery, etc. They can negatively affect Birth Weights, Immune systems, Liver and Kidney functions. PFO's are also Carcinogenic, Thyroid disruptors, cause negative impacts on Reproduction, and cause Developmental problems. They have a tendency to stay in the water column, rather than settling out into soils, creating a problem with drinking water.

Michigan has adopted regulatory drinking water standards for PFA's & PFO's. The EPA had issued some advisories, but they are not currently promulgated rules, legally enforceable. Both sets of standards are subject to amendment as more information is gathered and analyzed. Current standards are:

Specific PFA/PFO	Chemical Formula	Name	Michigan Standard	EPA Advisory
PFNA	C ₉ HF ₁₇ O ₂	Perfluorononanoic acid	6 ng/L	0.2 µg/L
PFOA	C ₈ HF ₁₅ O ₂	Perfluorooctanoic acid	8 ng/L	0.07 µg/L
PFHxA	C ₆ HF ₁₁ O ₂	Perfluorohexanoic acid	400,000 ng/L	none
PFOS	C ₈ HF ₁₇ O ₃ S	Perfluorooctanesulfonic acid	16 ng/L	0.04 µg/L
PFHxS	C ₆ HF ₁₃ O ₃ S	Perfluorobexanesulfonic acid	51 ng/L	none
PFBS	C ₄ F ₉ O ₃ S	Perfluorobutanesulfonic acid	420 ng/L	none
GenX	C ₃ F ₆ O	Hexafluoropropylene oxide	370 ng/L	none

pH *pondus hydrogenii* (quantity of hydrogen) or *potentia hydrogenii* (capacity of hydrogen). pH volumes are a numeric scale used to specify the acidity or basicity (alkalinity) of an aqueous solution. It is roughly the negative of a logarithm to base 10 of concentration, measured in units of moles per liter, of hydrogen ions. Very Acidic – pH = 1; Very Basic – pH = 14; Neutral – pH = 7

Phagotroph An organism, of any size, that obtains nutrients thru the ingestion of solid organic matter.

Photic Zone The region of a lake or stream where photosynthesis takes place. It extends down to the depth where plant growth and respiration are balanced by the amount of sunlight available.

Photolysis The breakdown of a material due to exposure to sunlight.

Phreatic Of or relating to ground water.

Phytoplankton Microscopic plants that float freely in open water.

PID *Photoionization Detector*

Place Making Originating in the 1960's, it is a multi-faceted approach to planning, design and management of public spaces. It capitalizes on a community's assets, inspiration and potential, with the goal of creating public spaces that promote people's health, happiness and well-being. Place making is a process that makes use of urban design principles. It can either be official and government led, or community driven grass roots tactical urbanism, such as extending sidewalks with chalk, paint, planters or open street events. Good place making, makes use of underutilized space to enhance the urban experience at the pedestrian scale, and to build habitats of locals. The main idea is about catering to people, not just cars and shopping centers.

Plankton Microscopic plants and animals, in the water, that form the basis of the food chain for higher forms of life.

Point Source Pollution Pollution from Industrial Areas, or Sewage Treatment Plants that is directly deposited into the water.

- Pollution** Any alteration in the character or quality of the environment which renders it unfit or less suited for certain uses. With respect to water, the alteration of the physical, chemical or biological properties by the introduction of any substance that adversely affects any beneficial use. Under the Clean Water Act, for example, the term is defined as the man-made or man-induced alteration of the physical, biological chemical or radiological integrity of the water.
- Pollution Indicator Organism** A plant or animal species that is not normally present in an aquatic environment unless the body of water has been subjected to damage by pollution. For example, *Escherichia coli* is a bacterium that is not normally found in an aquatic system, unless the system has been contaminated by the addition of fecal material. The organism signals the presence of pollution.
- Polymictic** Lakes of moderate depth where water circulate (top-to-bottom) frequently or even continuously.
- Potamon Zone** Stream reach at lower elevations, characterized by reduced flow, higher temperature and reduced dissolved oxygen. (See also Rhithron Zone)
- Precipitate** To precipitate indicates a process where a substance in solution reacts with other substances resulting in an insoluble compound that falls out of solution. A precipitate is the insoluble compound.
- Primary Productivity** The rate at which plants fix or convert light, water, and CO₂ into sugar in plant cells. Commonly measured as milligrams of carbon, per square meter, per hour.
- Profundal Zone** The water and sediment mass that occurs on a lake bottom below the depth of light penetration.
- POA's** *Property Owners Association(s)*
- Protozoa** Small, one-celled animals including Amoebae, Ciliates, and Flagellates.
- Prosperity Regions** The Regional Prosperity Initiative divided Michigan into ten (10) identified regions to create collaborative structure among local entities and support grant initiatives to provide State services, as well as Federal funding.
- PRP** *Principally (or Potentially) Responsible Party*
- PSBW** *Partnership for the Saginaw Bay Watershed.* Based in Bay City, MI, the PSBW is a group comprised of local governments, citizens, other environmental groups, agri-business, industry, and commercial entities, and governmental agencies, that have a stake in the restoration, clean-up and management of the Saginaw River and Bay. The PSBW is also the official designate for the AOC program. Merged in 1995 into a 501 (c)(3), non-profit service and education organization, it was originally the Saginaw River / Bay Watershed Council and the Saginaw Basin Alliance, and includes all or part of 22 Counties, and the Saginaw Chippewa Indian Tribe.

P.U.D. *Planned Unit Development* is a non-conventional arrangement of housing, roads, sidewalks, landscaping, etc. consistent with surrounding natural conditions. PUD's are somewhat controversial around lakes or rivers as they may have the effect of increased surface usage and increased nutrient loading.

QA/QC *Quality Assurance / Quality Control*

qPCR *Quantitative Polymerase Chain Reaction* is a laboratory technique of molecular biology. It monitors the amplification of a targeted DNA molecule during the PCR, in real-time. Two common methods for the detection of PCR products in real-time PCR are: (1) non-specific fluorescent dyes that intercalate with any double-stranded DNA; and (2) Sequence-specific DNA probes consisting of oligonucleotides that are labeled with a fluorescent reporter which permits detection only after hybridization of the probe with its complementary sequence. For purposes of water quality studies, qPCR may be used to identify the gene expression of specific animals, fish, humans, and microorganisms / pathogens.

RCRA *Resource Conservation and Recovery Act* Legislation requiring hazardous wastes be tracked from "cradle" to "grave". An amendment to the Solid Waste Disposal Act of 1965. This was 42 U.S.C. 82 § 6901 et seq. of 1976

Recalcitrant Of a substance that is degraded at an extremely low rate, if at all, when released into the environment. Consequently, this type material tends to accumulate in water, soil and biota.

Redd A type of fish spawning area associated with flowing water and clean gravel. Fish that use this type spawning area include trout, salmon and some types of minnows.

Region 7b A consortium of six (6) Counties, all part of the Saginaw Bay Watershed, including: Arenac, Clare, Gladwin, Iosco, Ogemaw and Roscommon. This organization offers assistance with:

Business Services;

Michigan Works (Jobs);

WIOA – Workforce Innovation & Opportunity

PATH – Partnership, Accountability, Training & Hope;

FAE&T- Food Assistance, Education & Training

GED – General Education Diploma – Testing

TAA – Training Adjustment Assistance

OS – Offender Success

MRS – Michigan Rehab Services and Veterans Service Partner

Senior Meal Services

Respiration The process by which living organisms produce energy, typically with the intake of O₂, and the release of CO₂ from the oxidation of complex organic substances.

- Rhithron Zone** A stream reach at higher elevations characterized by rapid flow, high temperature and high dissolved oxygen levels.
- Rhizome** Sometimes spelled Rizome, it is a root-like, underground stem, able to produce plant shoots from its top, and roots from its bottom.
- Riparian** The land, or, the title holder of such land, along the shore of a body of surface water. Technically, those abutting lakes and ponds are called littorians, while those abutting rivers and streams are riparians, but the courts have come to use the term riparian for all.
- Riparian Rights** A doctrine based on case law (in Michigan) verifying the right of a riparian, to six (6) broad categories of rights: The right to Use the water; The right to Access the water; The right of Wharfage over the water; The right of Accretions and certain protections related to bottomlands; The right to Hunt and Fish on the water; The right to Harvest ice.
- Rootstock** A root containing buds, sometimes used synonymously with Rhizome.
- RRCP** *Redevelopment Ready Communities Program* – A Statewide certification program that helps communities adopt innovative redevelopment programs and become economically competitive.
- Runoff** Water that runs across the ground, directly into a body of water, without soaking into the ground. (such as from a lawn, street, parking lot, farm field or other impervious surface)
- Secchi Depth & Secchi Disc** A measure of transparency of water, obtained by lowering a Secchi Disc (for fresh water, a black & white disc, 20 cm in diameter) into the water until it is no longer visible. The measurement may be taken in either feet or meters. The Disc created in 1865 by Angelo Secchi, was all white, and was modified in 1899 by George C. Whipple, who divided it into quadrants, painted alternatively black and white, like the target of a level rod. The marine version of the Secchi Disc is 30 cm in diameter.
- Sediment** referring to Bottom Sediment, these are materials that have settled in the basin of a water body, including remains of plants and animals, particulates, and soil particles.
- Seepage Lakes** Lakes having either an inlet or outlet, but not both, generally obtaining their water from groundwater and precipitation.
- S/cm.** *Siemens/centimeter*, a unit of electrical conductivity equivalent to the reciprocal of micro ohms cm. Named for Ernst Werner Siemens.
- SAM** *Site Assessment Model*

Seiche An oscillation of the water's surface of a body of water due to atmospheric pressure, wind, minor earthquakes, etc. This oscillation may be 1 foot to several feet in amplitude and may last several hours.

SLU *Special Land Use*

SOC's *Synthetic Organic Chemicals* Containing Carbon, including pesticides, herbicides and PCB's.

Soil Retention Capacity The ability of a specific soil-type to retain or absorb a given substance, such as water, phosphorus, nitrogen, etc., thereby retarding the movement of that substance toward a body of water.

Solute Any material which is dissolved in another, such as salt dissolved in water.

SPAC *Statewide Public Advisory Council* – A council of one representative, and at least one alternate representative from each AOC's PAC to maintain contact with State and Federal Agencies

Stormwater Water from precipitation events that runs off impervious surfaces and collects pollutants.

Stratification A layering of water caused by differences in water density. This difference may be caused by a temperature gradient or a chemical gradient or a combination of both. The most common type of stratification (in inland lakes), summer stratification is characterized by an upper stratum of warm, circulating, turbulent water called the *Epilimnion*. The bottom layer of water or *Hypolimnion* is generally deep, cold, and undisturbed. Between these is the *Metolimnion*, usually markedly different in temperature and chemical structure than the other layers.

Summer Kill Fish deaths, in excess of any normal amount, due to a lack of Dissolved Oxygen in the upper strata of a lake or stream. This condition is usually caused by O₂ depletion due to decomposition of aquatic plants, sediments, or other organic materials in the water.

Surfactant An agent that is used to decrease the surface tension of the water, useful for removing or dispersing oils and oily residues. Most detergents are surfactants. The term is derived from Surface Active Agent.

Sustainable Able to be maintained indefinitely without significant depletion of resources.

SWAS *Surface Water Assessment Section* (EGLE)

Swimmer's Itch or *Cercarial Dermatitis* is an irritating temporary rash caused by skin penetration of a flatworm during the cercaria (immature) stage of life. This worm is present in the feces of Geese, Ducks, Gulls, Beavers, Muskrats, etc. and once

excreted, they live parasitically for a short time in certain snail species. Not easily controlled, due to this complex life cycle, the rash may last for 2 to 3 weeks. Alcohol rubdowns and frequent showers often help to minimize penetration.

- Systemic** Referring to a chemical, particularly a herbicide, that when absorbed by a plant, may affect or alter any number of the plant's processes, including growth, budding, flowering, rooting, etc.
- TDR** *Transfer of Development Rights*
- TDS** *Total Dissolved Solids* All solids that are dissolved in water. Often Mineral Salts. Used to evaluate Water Quality.
- Teratogenic** Causing birth defects.
- Thermocline** A horizontal plane across a lake, at the depth of the most rapid vertical change in temperature and density of water, in a stratified lake.
- TMDL** *Total Maximum Daily Load* Is a regulatory term in the U.S. Clean Water Act describing a value of the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards. Alternatively, a TMDL is an allocation of that water pollutant deemed acceptable to the subject receiving waters.
- TOC** *Total Organic Carbon*
- Topographic Map** A map showing the elevation of the landscape at contours of 2, 5, 10, or 20 feet. Commonly used to delineate the watershed, it may also show roads, streams, wetlands, etc.
- TSCA** *Toxic Substances Control Act* 15 USC ch. 53 subch. 1 §§ 2602-2629, October 11, 1976
- Tragedy of the Commons** The concept that no one takes responsibility for things that everybody owns.
- Transparency / Turbidity** A measure of the difficulty to see into the water due to organic and inorganic materials (algae, plankton, chemicals or compounds, humic material, pollutants, etc.) in suspension, in the water. Turbidity measurements may be used to provide a measure of TSS or Total Suspended Solids, which is a time-consuming and tedious parameter to measure. Nephelometric Turbidity Units are measured by an instrument called a Nephelometer or a Turbidimeter that shines light thru a water sample, in most stream & river studies. For inland lakes, a Secchi Disc is often used.
- TSI** *Trophic State Index* is a classification system (a number) assigned to show the amount of eutrophication (or biological productivity) sustained in a body of surface water. The TSI of a lake or stream may be rated from 0 to 100. Using this scale, waters may be classified as:

Oligotrophic, has a TSI of 0 - 40. This has the smallest amount of biological productivity, and generally good water quality;

Mesotrophic or sometimes *Mesoeutrophic*, has a TSI of 40 – 60. This indicates moderate biological productivity and fair water quality;

Eutrophic, has a TSI of 60 – 70, or in some circles 60 – 80. These waters have high biological productivity and poor water quality.

Hypereutrophic, has a TSI of 70 – 100 with extreme biological activity, severe algae blooms, and very poor water quality.

In 1977 **Dr. Robert Carlson** of Kent State University devised a TSI to compare the determinations of three indicator parameters. Those are Chlorophyll *a* (*Ca*), measured in µg/l; Total Phosphorus (TP), measured in µg/l; and Secchi Disk (SD) depth, measured in meters.

TSI	Ca	P	SD	Trophic Class
<30 - 40	0 - 2.6	0 - 12	>8 - 4	Oligotrophic
40 - 50	2.6 - 20	12 - 24	4 - 2	Mesotrophic
50 - 70	20 - 56	24 - 96	2 - 0.5	Eutrophic
70 - 100+	56 - 155+	96 - 384+	0.5 - <0.25	Hypereutrophic

Total Phosphorus is a requirement for plant growth and is the most important nutrient to control in order to limit over population(s) of plants and algae. It is the limiting nutrient. The formula for the Carlson TSI is:

$$TSI_{TP} = 14.42(\ln TP) + 4.15$$

Green plants and most algae contain Chlorophyll *a*. *Ca* can be used to estimate the biomass of plants & algae. The formula for the Carlson TSI is:

$$TSI_{Ca} = 9.8(\ln Ca) + 30.6$$

Transparency or clarity of water is measured with a Secchi Disk. The Carlson formula for TSI is:

$$TSI_{SD} = 60 - 14.4(\ln SD)$$

$$(\ln = \text{natural logarithm} = \log_{10} \times 2.30)$$

Using the above formulae, the relationships between Phosphorus, Chlorophyll *a*, and Clarity can be loosely predicted from the following TSI equations:

$$\ln Ca = 1.449 \ln TP - 2.442$$

$$\ln SD = 3.876 - 0.98 \ln TP$$

Turion A resistant, dormant bud on shoots of certain aquatic vascular plants.

Turnover a periodic circulation of waters of the various strata in a lake. Turnover tends to replenish dissolved oxygen in the water, especially at lower strata.

µg/L	<i>Micrograms per liter</i>
Umhos/cm	<i>Micromhos per Centimeter</i>
Upland	Land above the ordinary High Water mark (or in some cases, above the Legal Lake level).
URC	<i>University Research Corridor</i> – This is a research cooperative comprised of Michigan State University, Wayne State University and University of Michigan.
USACE	<i>*United States Army Corps of Engineers</i> – U.S. Department of Army
USBIA	<i>*United States Bureau of Indian Affairs</i> – U.S. Department of Interior
USBLM	<i>United States Bureau of Land Management</i> – U.S. Department of Interior
USCG	<i>*United States Coast Guard</i> – U.S. Homeland Security
USDA	<i>*United States Department of Agriculture</i> - (includes <i>*Animal and Plant Health Inspection Service</i>)
USDC	<i>United States Department of Commerce</i>
USDOT	<i>United States Department of Transportation</i>
USFDA	<i>United States Food & Drug Administration</i>
USEPA	<i>*United States Environmental Protection Agency</i>
USF&W	<i>*United States Department of Fish & Wildlife</i> – U.S. Department of Interior
USFS	<i>*United States Forestry Service</i> - USDA
USGS	<i>*United States Geological Survey</i> – U.S. Department of Interior
USDHHS	<i>*United States Department of Health and Human Services</i> – (includes the <i>*Agency for Toxic Substances and Disease Registry</i>)
USFEMA	<i>United States Federal Emergency Management Agency</i>
USFHA	<i>*United States Federal Highway Administration</i> – USDOT
USMA	<i>*United States Maritime Administration</i> – USDOT
USNPS	<i>*United States National Park Service</i> – U.S. Department of Interior
USNRCS	<i>*United States Natural Resources Conservation Service</i> – USDA

(* denotes Federal Agencies that receive a portion of GLRI Funding)

UV *Ultraviolet*

Vadose Of, relating to, or being water, that is located in the Zone of Aeration above the ground water level.

Vegetation Strips See Greenbelts (Also called Buffer Strips or Runoff Strips)

Vernal Lakes Shallow lowland lakes caused by spring runoff and precipitation, that dry up during the summer.

VOC's *Volatile Organic Chemicals*

Water Column Applies to all water between the top (where the surface meets air) and the bottom (where water meets sediments).

Water Quality Survey or Water Quality Study The gathering of, and interpretation of quantitative data to manage and/or maintain a lake, river and sometimes a watershed. Common information gathered in a study of this sort include:

Topographic Maps	Bathymetric Maps
Transparency / Turbidity	Temperature Gradients
DO	NO ₂ & NO ₃
P & PO ₄	Methane
Ammonia	Alkalinity
Chlorophyll <i>a</i>	Conductivity
Salinity	pH
DCO	Weed & Plant Mapping
Fishery Survey	Total Coliform
Fecal Coliform	Sediment Core Sampling
Flushing Time / Hydraulic Residence Time	

Watershed An area of land that drains all water to a lower collecting point or watershed basin, at a moderately consistent rate.

Water Literacy Principles The understanding of water's influence(s) on the individual, and the individual's influence(s) on water.

Watershed Management A process of managing the water and related resources within a watershed, based on a knowledge of water hydrology, including precipitation, runoff, infiltration, evaporation, transpiration, storage, and water quality parameters. Reasons for management may be instituted for reasons varying from maintaining high water quality to addressing resource problems.

Wetland An area that has water frequently enough to support plants and animals that grow well in wet conditions. Three popular methods to delineate a wetland

include: Types of Soils; Types of Vegetation; Hydrology (being the presence either full-time or seasonal of water). Terms sometimes commonly used interchangeably with Wetland, include: Fen, Bog, Swamp, Marsh, etc. Each has somewhat unique properties.

- WHO** *World Health Organization* Established April, 1948 in Geneva, Switzerland.
- WHPA** *Wellhead Protection Area* The surface and sub-surface area surrounding a well or well field of a public water supply system, through which contaminants are likely to travel thru and reach such water well or well field.
- Winter Kill** The excessive death of fish, normally attributed to the lack or serious deprivation of oxygen in the water, under an ice and snow cover.
- WLEB** *Western Lake Erie Basin*
- WQS** *Water Quality Standard*
- WRD** *Water Resources Division* Michigan EGLE
- Zooplankton** Microscopic animals that float freely in open water, consume detritus, bacteria, some algae, and may, in turn be consumed by fish.