



Message from the President Clark Boyd

In 2019, the Aquatic Ecosystem Restoration Foundation celebrates its 23rd year of being the focal point for aquatics, focusing on research, education, and outreach to state and local communities, as well as governmental agencies. One of our key activities is the continued support of the Aquatic's Best Management Practices handbook that is available online to everyone at <http://aquatics.org/bmp.html>. In April, the Board of Directors met in Atlanta for the first 2019 meeting for the group with incoming President Gerald Adrian presiding over the meeting. I want to thank outgoing President Dr. Tyler Koschnick for his leadership and work as AERF President the past 2 years. As incoming President, Gerald Adrian led the meeting and it was formally announced that he would be stepping aside as AERF President due to his retirement from UPL later in 2019. I want to thank both Tyler and Gerald for their leadership and vision while working in the aquatic arena for many years. My expectations were to work alongside Gerald for the next two years before assuming the leadership role as President of the AERF, but due to Gerald's well deserved retirement, I am now assuming the role of AERF President. I also want to thank Carlton Layne, our Executive Director, for his tireless effort to continue working as point person for the many projects that AERF is involved in and helping keep the AERF visible as a key resource for the aquatic market. I also want to thank Craig Jakubek with Syngenta for taking on the role of Vice President, and Richard Hinterman with Cygnet for continuing his role as Treasurer.

Earlier this year there were 5 listening meetings held in FL with the Florida Fish and Wildlife Conservation Commission (FWCC) concerning the management practices and use of herbicides. I attended the February 21 meeting held in Gainesville, FL and it was apparent that the public was very concerned about how the FWCC was managing the public's waterways. The emotions were high with many of the attendees, and the lack of science-based information was also evident. These emotions led to many compromises dealing with water quality, fish health and fish stocking levels, as well as overall safety of the environment. AERF had representation at 4 of the 5 listening sessions, and was an advocate for the management practices for controlling the noxious and invasive species that threaten the aquatic system in FL. Glyphosate and Diquat were two of the products that multiple attendees expressed concern over their use in FL, and their concern for potential harm to the environment. It is easy for a person to go online and search for information and find what you want to hear; and, with most of that information not science-based or peer reviewed, it becomes an emotional argument which is difficult to counter.

One of the key initiatives the AERF is looking to help lead is the issue with Harmful Algae Blooms (HAB). These pose a major concern to waters in the US, and particularly in FL. As an organization, AERF looks to help facilitate the research for the best control options as well working with both the Corp of Engineers and the communities on how to



Message from the Executive Director Carlton Layne

Please accept my apologies for the long interval between Newsletters. All the reasons for delaying the Newsletters which made so much sense at the time seem unacceptable in retrospect, so I won't even start making up stuff to justify our inaction. We'll make up for it by making this a really informative issue.

Glyphosate is an issue of concern around the world and AERF has received countless inquiries regarding its safety. We've dedicated a portion of our website to providing access to useful information relative to glyphosate. In this issue of the Newsletter we have included articles by Drs. Ferrell and Enloe from the Center for Aquatic and Invasive Species at the University of Florida and Bernalyn McGaughey with Compliance Services International (CSI). These folks know what they're talking about and I hope you will find their pieces helpful and informative.

The Environmental Protection Agency (EPA) has published its Glyphosate Proposed Interim Registration Review Decision and is soliciting comments. The public will should submit comments on EPA's proposed decision at www.regulations.gov in docket # EPA-HQ-OPP-2009-0361. AERF will be filing comments on the docket thanks to the assistance of Bernalyn and the folks at CSI. Comments must be filed by September 3, 2019.

Another major issue of concern is Harmful Algae Blooms (HABs). Dr. John Rodger's piece in this issue of the Newsletter is actually from his presidential address at APMS last year. His speech was so timely and spot on, that I have "borrowed" its theme time and time again, and that theme has been the driving force into AERF's current foray into HABs research. Over the past couple of years, we have all seen HABs expand geographically and in intensity. 2017 and 2018 were absolutely horrible years for HABs in the Lake Okeechobee system in Florida. AERF was presented an opportunity to test an operational hypothesis developed by Dr. Ciera Baird and her colleagues. She was formerly at Clemson University and is now employed at Aquatic Control. In short, a team of researchers which include Drs. Ciera Baird, Alyssa Calomeni, and Dail Laughinghouse, are collecting toxin-producing cyanobacteria from the field and conducting tests in the laboratory to determine effective products and rates to take to the field to actually manage the cyanobacteria. This experiment is about to begin so hopefully we'll have a lot to report in the next Newsletter and applicators will have a method to offer customers to replace doing nothing about HABs.

A couple of months ago the latest Waters of the United States (WOTUS) Rule was published in the *Federal Register*. The last day to file comments on the proposed rule to replace WOTUS is August 9th, 2019. Most comments have already been submitted but there is still time for those who haven't filed anything. After the comment period closes, the EPA will officially repeal the old WOTUS rule and then likely by the end of this year the final rule will be published. If you recall, the old rule prompted a lot of lawsuits from conservative groups and states. In all likelihood, the new final rule will start an avalanche of lawsuits from the other side of the political and environmental spectrum. Stay tuned.

The so-called "Pause" in Florida earlier this year halted all aquatic plant management operations in public waters until the Florida Fish and Wildlife Conservation Commission could conduct public meetings and hear the concerns of the people of Florida. AERF attended all but one meeting and spoke on behalf of the Florida aquatic plant management program. My biased view was there was a lot of bogus internet science presented, observations that conflict with existing data, and anecdotal observations unsubstantiated by any real science. The meetings confirmed my observation that "The loudest voice often has the weakest argument." Some questionable decisions have been made in an effort to appease the complainants. In my opinion, this approach is a fool's errand. AERF advocated

(Boyd continued)

best control these cyanobacteria. The AERF is working with Dr. H Dail Laughinghouse IV, Dr. Alyssa Calomeni and Ciera Baird, who are in the process of reviewing products and methods of control. As a society, we look forward to reviewing their findings and sharing the results with the aquatic market. AERF wants to thank those companies who help make this research possible with their support.

In 2019 we want to continue to focus on helping lead the charge with understanding the impact of HABs and Invasive and Noxious Weeds on our waterways, as well as the best way to manage these noxious and invasive plants and algae. AERF has the opportunity through our Technical Advisory Group to help expose the new regulators that are coming onboard with EPA to aquatic issues. The other key outreach is with our Educators; it is so important for individuals to get outside their comfort zone and understand the environment we all live in, and that the effect of doing nothing is a decision which may allow a small problem to grow into a large problem. I look forward to working with each member over the next few months in leading this organization and looking for new opportunities to highlight the benefit of what we do as an industry. The industry is changing; we have retirements of key individuals and these are being replaced by newer individuals who will look at an issue and ask why? AERF should be able to help provide answers to many of these questions through the BMP documentation of past practices while looking for new and better ways to improve our management of the harmful and invasive plants we will face in the future.

(Layne continued)

that FWCC should let the science speak for itself and management decisions should be based on sound science and not emotion. I'm sure this isn't over and there will be more to come. AERF will stay involved and provide whatever assistance we can. The Foundation's BMP was provided to all the Commissioners and FWCC staff for their information and use.

The week of July 8th, AERF sponsored an Aquatic Plant Management Tour in Southern Michigan and Northern Indiana. Attending were six representatives from the Office of Pesticides Programs in Washington, D.C., three representatives of the Health Canada *Pest Management Regulatory Agency (PMRA)* responsible for pesticide regulation in Canada, one representative of British Columbia, and one representative from the Invasive Species Centre in Ontario, Canada. Coordinated by Matt Johnson, President of Aquatic Control, and Joe Bondra, President of Cygnet Enterprises, the tour included presentations by both Michigan and Indiana regulators, field trips to lakes under active management strategies and those with no management at all, and an actual pesticide application conducted by Jim Donohoe, President of Aquatic Weed Control. An official report will be prepared, posted on the AERF website, and sent to you shortly wherein we will credit all who made the trip such a success.

AERF was also able to offer travel stipends to three EPA staff to attend the recent APMS meeting in San Diego.

None of these activities would have been possible without the generosity and support of the AERF donors. Thank you all. AERF is a 501(c)(3) nonprofit foundation and we have no other source of income but tax-deductible donations. If you are not currently a donor to AERF, please consider including us in your charitable contributions in the future. You too can be a part of an action-oriented organization working to advance the science of aquatic plant management and to promote regulatory decision-making based on sound science.

Is Glyphosate Still a Reasonable Option for Aquatic Weed Management?

Stephen Enloe and Jason Ferrell, UF Center for Aquatic and Invasive Plants

There is significant clamor these days about glyphosate and whether it can or should be used as a part of an integrated pest management program. The concerns over this molecule are many and focus on both the science of health risk and public perception. We seem to be standing at a point where a constant barrage of news from social media outlets have painted a very dark picture of the herbicide we have deemed safe for decades. Therefore, let's briefly consider where we are with the science and see if we can find a path forward.

The concerns with glyphosate started in 2015 when the International Agency for Research on Cancer (IARC) reclassified this molecule from "Possible Carcinogen" to "Probable Carcinogen". This change in classification sent shockwaves across the world since we have been told for decades that glyphosate was essentially benign to humans or the environment. This reclassification was a significant move and has since prompted many countries to re-review the data on glyphosate and determine if additional changes in categorization are required.

Subsequent independent re-reviews conducted by the US Environmental Protection Agency, the European Food safety Authority (EFSA), the European Chemicals Agency, Health Canada, France, Germany, Switzerland, New Zealand, Japan, Brazil, Australia, and South Korea have all come to conclusions that disagree with the IARC assessment. In short, none of these other agencies have concluded from the review of hundreds of studies that glyphosate poses a significant health risk. This begs the question, why does everyone seem to disagree with IARC?

This is a complicated and very technical question. If you are interested in a deep dive into this issue, we would highly recommend reading [Tarazona et al. 2017](#) for a full explanation of why the European Union disagrees with the IARC. However, here are some very important nuances of this reclassification. First, we need to set the conspiracy theories aside. The IARC did not make this decision because they are activists that want to penalize pesticides. The IARC is a group of very talented researchers with high ethical standards and a long track record of evaluating a very broad range of substances and activities that may cause cancer. The timing of their reassessment was legitimate and this does not seem to be a political move.

Second, according to Tarazona et al. (2017), the assessment of all the data show that the IARC and EFSA were actually in very close agreement on most points. However, they differed in their interpretation of specific data that could provide evidence of carcinogenicity in humans. In the end the IARC concluded it was enough to reclassify glyphosate while the EU concluded the data were too weak and inconsistent to warrant reclassification.

Third, what does "Probable Carcinogen" actually mean? It means that there is limited evidence that a substance or activity causes cancer in humans, but sufficient evidence in model species (mice and rats). If the IARC is correct (and it is still an "if") that glyphosate is a probable carcinogen, it moves it into the same classification that contains consumption of red meat, consumption of beverages heated to >65C, and workplace exposure to haircare products (here is the [full list](#)). It is important to recognize that the IARC did not move glyphosate to its category of known carcinogens. This fact has been completely ignored or missed by most media outlets. Known carcinogens like sunlight and tobacco are in a completely different classification than glyphosate and those stating that glyphosate is now a known carcinogen are doing so without scientific basis. The IARC is not saying that glyphosate causes cancer, but that it may be possible for glyphosate to cause cancer, just like consuming very hot beverages. But again, it is important to remember that just because IARC has made this designation doesn't make it so. Pesticide regulatory agencies around the world currently disagree with this assessment and the IARC continues to stand alone.

(Enloe and Ferrell continued)

Finally, the outcomes of the recent lawsuits filed against Monsanto on current public opinion cannot be overstated. In all three cases, juries have found in favor of the plaintiffs against the company. These jury outcomes would certainly seem to suggest glyphosate causes cancer. We cannot comment on what evidence for glyphosate causing cancer was presented or excluded from the trials. However, the jury decisions simply do not line up with the independent scientific assessments of every pesticide regulatory authority around the world that has re-reviewed glyphosate. This leaves us in a very difficult place where science and human psychology in the courtroom have moved in very different directions.

So where do we go from here? Should we abandon glyphosate as a useful tool in IPM programs? We would suggest that until additional and more convincing data are generated in rigorous studies and published, glyphosate is not likely carcinogenic and can be safely used in integrated pest management. However, we must remain willing to change this opinion if the data indicates otherwise. We would also suggest that we dedicate ourselves and our employees to education on this issue and strongly adhere to all glyphosate product label directions. Finally, committing ourselves to the dispassionate scientific evidence and being careful not to be swayed by emotion will also help us navigate this important topic.

Aquatic Plant Management Workshop August 13-15, 2019

<https://sites.google.com/ncsu.edu/aquaticplantmanagementworkshop/home>

The Aquatic Plant Management Group at North Carolina State University is excited to announce the second annual workshop on the management of aquatic plants. The two-day event will be held on August 13th and 14th at the WRC building located in Raleigh, NC.

A variety of related topics will be covered, including: Biology and Ecology of Aquatic Plants and Harmful Algal Blooms; Pesticide Labels and Compliance; Noxious Weed Regulations; Chemical, Mechanical, and Biological Control Techniques; Mosquito Biology and Control; and Field Demonstrations of: Seining and Electro-fishing, Aerial Drones, and Boat-based Drones. NC pesticide CECs: A: 7, D:7, I:0.5, N:7, X:7

In response to multiple requests, we have decided to include an additional half-day of advanced-topic training opportunities on August 15th. Topics to be included are Advanced Aquatic Herbicide Science; Advanced Survey Techniques and Data Processing; Advanced Reservoir and River Management; and Advanced Stormwater BMPs. NC pesticide CECs: A:2.5 D:2.5 N:2.5 X:2.5

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We have established a PayPal account for donations and annual sponsorship payments, for those who prefer to pay by credit card. Payments may be made through our website, or directly with Carlton, who has been equipped with a card reader.

APMS President's Address

John H. Rodgers, Jr.

APMS Buffalo, NY Annual Meeting 2018

I presented these remarks as the Presidential Address at the 58th Annual Meeting of the Aquatic Plant Management Society in Buffalo, New York. At the request of AERF, I have provided the text of that presentation.

Welcome to Buffalo, New York for the 58th Annual Meeting of the Aquatic Plant Management Society. My remarks today are organized in two parts: first, I will summarize activities and accomplishments of APMS this year, and then I will issue a call for action to APMS. I thank the Board of Directors of APMS for their service and dedication this year. The success of this Society is largely dependent on the service of the membership and I thank all of you who have sacrificed so APMS could move forward and especially so this meeting could occur.

Progress and Accomplishments

Importantly, APMS guides its actions by Strategic Planning. As an outcome of recent Strategic Planning, APMS has expanded its role to include management and study of algae:

Aquatic Plant Management Society, Inc.

An international organization of scientists, educators, students, commercial pesticide applicators, administrators, and concerned individuals interested in the management and study of aquatic plants and algae.

The APMS Vision and Mission Statements explicitly indicate that this scientific and professional society will actively engage in algae management guided by scientific research.

APMS Vision:

Be the leading international organization for scientific information on aquatic plant and algae management.

APMS Mission:

Provide a forum for the discovery and dissemination of scientific information that advances aquatic plant and algae management policy and practice.

The Core Values of APMS were presented in the Strategic Plan and emphasized the importance communication, science, students and diverse membership in the Society.

APMS Core Values

- *Provide platform for the exchange of science and technology*
- *Promote sustainable aquatic and riparian plant management through science*
- *Support and encourage sustained student involvement and education*
- *A membership representing the entire spectrum of aquatic plant management, including scientists, regulators, operators*

The accomplishments for the past year were important steps toward accomplishing the Society's Mission.

Accomplishments

- Research Methods Manual
- Graduate Student Research (Grant)
- Annual Meeting (Student Involvement)

Rodgers continued**Outreach**

- Bass Master's
- Plant Camps

A Call for Action

Harmful algal blooms (HABs) and outbreaks of noxious algae are becoming more frequent and intense. We are moving algae and invasive species around in our freshwater water resources at an unprecedented rate. Services provided by critical freshwater resources are often obviated by HABs leading to exposures posing risks for human health and harming freshwater aquatic resources. Water resource managers have been generally unprepared to deal with the algal biomass, production of taste-and-odor compounds and production of toxins. Initial reactions are usually to ignore the problems caused by harmful algal blooms and outbreaks of noxious algae and hope that the problems go away (How bad could this be?). Soon they discover that "hope" is not a management tactic and that "no decision is a decision". The next step (as the public becomes aware and alarmed) is for water resource managers to institute a monitoring program so the public can be informed about where the harmful algal blooms are and outbreaks of noxious algae occur. Consequently, beaches and drinking water sources can be posted and closed. Usually, dead fish and vertebrates (including endangered species) are collected and carried away to help to assuage public concerns. As the algae and problems grow, there is a limit to the number of freshwater resources that can be closed to the public and the services they provide can be cast aside. Affected and interested people scramble for a "Google" education on the subject (harmful algal blooms and outbreaks of noxious algae) and start to ask, and then demand, that something be done. The easy answer from unprepared water resource managers is "there is nothing we can do." And they are right (they do not know how to address the problem), but this does not mean there is nothing that can be done. If you have a plan, the plan can be implemented and results monitored so management can be improved (also called "adaptive management"). If you have a surface freshwater resource and you do not have a harmful algal bloom and noxious algae management plan, you need to get busy before the bloom arrives. The time to plan is before you are surrounded by harmful algal and outbreaks of noxious algae.

There are two fundamental approaches for intervention and management of HABs and noxious algae: 1) indirect, and 2) direct. Indirect approaches alter factors that can cause or promote algal growth, while direct approaches target specific problematic algae in the water resource or attempt to prevent the entry, spread or growth of noxious algae in uninfested water resources (e.g. *Nitellopsis*, *Caleurpa*) or transport from infested waters. Indirect approaches involve tactics such as nutrient control in the water resource and watershed or catchment as well as management of littoral zones during construction of impoundments such as stormwater ponds and reservoirs. Indirect approaches generally do not focus on a particular species of algae or HAB. Direct approaches target the specific problematic or recurring algal growth. None of the management options is a "silver bullet." Thus, water resource and HAB management is necessarily adaptive and ongoing, requiring consideration of and use of all options as appropriate.

It is commonly acknowledged that nutrient accumulation in lakes and reservoirs can be a cause of HABs. Therefore, a long-term solution may be to prevent or reduce nutrients like nitrogen and phosphorus from entering water resources. And while it is a noble effort to reduce nutrient run-off into water sources, there is not sufficient reliable evidence to suggest that reducing phosphorus or nitrogen run-off is an effective, timely management tactic. This is not intended to discourage attempts to decrease nutrient loading to water resources, but outcomes of expensive and protracted efforts and

(Rodgers continued)

associated expectations should be realistically considered. Unfortunately, nutrient loading does not have an equal and instantaneous action and reaction (analogous to Newton's Third Law). Stopping inputs of phosphorus to a water resource does not immediately reverse algal blooms because phosphorus is often stored in sediments as well as algae. At best, nutrient reduction in inflows may initially slow algae growth. Eutrophication emerges gradually over time, so reducing inputs of nutrients into a lake will likely not reduce algae growth to a point where the uses of a water resource are restored until decades or hundreds of years have passed.

In-lake approaches for nutrient management to control the frequency and intensity of algal growths also have proponents but lack operational evidence of reliable success. Proponents suggest that the algae can essentially be "starved" by managing essential nutrients such as phosphorus and nitrogen. While this appears to be a great idea on the surface, remember that an aquatic system or water resource needs algae as the base of the food chain. Likely, nutrient control would not be selective and the most competitive, opportunistic, or noxious algae would be the survivors or the last to go. Changing the trophic status or inducing an alternative "steady" state will be reflected throughout the aquatic system. This means less algae in general, less invertebrates and less fish. This is an ecosystem altering approach: starving the algae means less zooplankton and benthic invertebrates and less fish (i.e. a less productive aquatic ecosystem). In-lake approaches for nutrient management to control the frequency and intensity of algal growth assume that you can also control inputs of nutrients from the watershed or catchment as well as aeolian or air-borne inputs (from dust and forest fires, etc.) This is part of a "causes"- based approach aimed at controlling nutrients and thereby controlling algae. The approach suffers from a lack of success stories in the scientific literature at full scale. Nutrient and hydrologic budgets must be determined carefully and reasonable estimates of treatment success should be used to manage expectations. For example, one might expect greater success for this approach in aquatic systems that are not severely nutrient loaded and do not have high residual nutrient storage in sediments that are easily disturbed (by prevailing winds, episodic events – e.g. hurricanes; benthic fish).

To alleviate the adverse impacts of freshwater HABs on water resources and services such as drinking water in a timely manner, managers frequently turn to direct approaches involving chemical, physical, mechanical and biological tactics. There will be an ongoing opportunity for APMS to engage in providing assistance and solutions for people affected by these unrelenting problems. Management of our precious freshwater resources is never completed. As scientists and APMS members, we can participate in and advocate long-term, source-based solutions for HABs and offer research and approaches for short-term relief to provide the managers of critical freshwater resources some options. We can always argue about the source and cause of strep throat, but the next time sore throat is raging in your house, take the antibiotic and enjoy the relief. Then you can go on a quest for the cause.

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Precautionary Principle: We Must Ban Driving To Whole Foods

Alex Berezow

(reprinted with permission of [American Council on Science and Health](#))

"Better safe than sorry." That's a great lesson for a child when a parent explains why she should wear a helmet when riding her bicycle. But "better safe than sorry" makes for terrible public health policy.

Why? Because humans in general (and politicians in particular) are terrible at understanding risk. The reason is because to fully comprehend the concept of risk, a person must have a very good understanding of statistics and data analysis. The average person has neither.

What do you think is more dangerous, walking to the corner grocery store to eat GMOs every day or driving to the nearest Whole Foods to avoid GMOs? Most people would probably pick the former; in reality, the latter is, by far, more dangerous. Each year, about 40,000 Americans die in fatal car crashes, a substantial number of which happen close to home. Nobody has yet died from a GMO.

If we were to implement a "better safe than sorry" policy in this situation, the data make the decision obvious: People should be banned from driving to Whole Foods.

Of course, that "common sense" policy is pure gibberish. As a society, we have decided that the benefits of driving outweigh the associated risk. Yes, there is a very real chance that you will die on your next trip to Whole Foods, but the risk is quite small. Even though we don't consciously realize it, we tacitly acknowledge this risk-benefit ratio every time we climb into a vehicle.

NYT Editorial Endorses the Precautionary Principle

The "better safe than sorry" policy has an actual name: The precautionary principle. It has been enshrined into EU law, and many environmental and health activists believe something similar should be implemented in the United States. In a recent [editorial](#) titled "Why Does the U.S. Tolerate So Much Risk?", the New York Times echoed that sentiment.

The article begins reasonably enough. It questions the FAA's delayed decision to ground Boeing 737 Max 8 planes while many other countries were quicker to act. The editorial argues that Europe's precautionary mindset led them to make the right decision faster, while America's tolerance for risk delayed the right decision. Then, the editorial draws a parallel to bisphenol A (BPA), a chemical found in plastics, which it apparently believes should be banned on precautionary grounds due to its alleged "endocrine disrupting" ability.

But this is very faulty reasoning. Two crashed airplanes constitute substantial evidence of harm. There is no comparably damning evidence, however, for BPA. It's not even clear if endocrine disruption poses any health risk whatsoever to humans. A [review](#) published in Toxicology Letters in 2013 concluded:

"Overall, despite of [sic] 20 years of research a human health risk from exposure to low concentrations of exogenous chemical substances with weak hormone-like activities remains an **unproven and unlikely hypothesis**." [Emphasis added]

The reason BPA is used by manufacturers is because it is a useful plastic. It is even added as a liner to cans in order to prevent food from spoiling. It's perfectly legitimate to ask if the chemical is safe. But we should also be prepared to accept the answer (yes) after we investigate.

The NYT fails to grasp this. The editorial writer argues:

"The United States Food and Drug Administration insisted there was no evidence of danger. It did not remove the chemical from its list of approved substances in baby bottles until after manufacturers of baby bottles, concerned about a consumer backlash, stopped using BPA voluntarily."

(Berezow continued)

This is very poor reasoning. The job of the FDA is to objectively analyze data for evidence of safety or harm. It's job is to ignore the will of the mob, not succumb to it. Data, not political pressure, is what should drive the FDA's decisions.

The editorial also praises Europe for banning neonicotinoids, a useful pesticide that has been erroneously blamed for killing honey bees. In reality, [the honey bees are fine](#).

Ultimately, this is why the precautionary principle is bad policy. Far too often, the people responsible for implementing it -- politicians responding to noisy, uninformed voters -- make "common sense" policies that aren't rooted in scientific reality. That puts us on the road to banning people from driving to Whole Foods.

The original articles appears at <https://www.acsh.org/news/2019/03/18/precautionary-principle-we-must-ban-driving-whole-foods-13889>

The most effective way of protecting public health from harmful algal blooms is avoiding water containing cyanobacteria.

That's why EPA [developed the Cyanobacteria Assessment Network mobile app](#), an early warning indicator system for algal blooms in U.S. freshwater systems, which will allow local water quality managers to proactively plan for cyanobacteria harmful algal blooms in their communities.

NOAA, partners predict large summer harmful algal bloom for western Lake Erie

[Wet spring enhanced the flow of nutrients into lake, providing fuel for algal growth](#)

NOAA and its research partners are forecasting that western Lake Erie will experience a significant [harmful algal bloom](#) (HAB) this summer.

This year's bloom is expected to measure 7.5 on the severity index, but could range between 6 and 9. An index above 5 indicates blooms having greater impact. The severity index is based on bloom's biomass – the amount of algae – over a sustained period. The largest blooms occurred in 2011, with a severity index of 10, and 2015, at 10.5. [Last year's](#) bloom had a severity index of 3.6, while [2017's](#) was 8.0.

Lake Erie blooms consist of cyanobacteria, also called blue-green algae, that are capable of producing the liver toxin microcystin that poses a risk to human and wildlife [health](#). Such blooms may result in higher costs for cities and local governments that need to treat drinking water, prevent people from enjoying fishing, swimming, boating and visiting the shoreline, and harm the region's vital summer tourism economy. These effects will vary in location and severity due to winds that may concentrate or dissipate the bloom.

“Communities along Lake Erie rely upon clean, healthy water to support their community's well-being and economic livelihoods,” said Nicole LeBoeuf, acting director of NOAA's [National Ocean Service](#). “This forecast provides timely and trusted science-based information to water managers and public health officials so they can better anticipate blooms, mitigate impacts and reduce future outbreaks.”

It's Not About Glyphosate – Or Science

Bernalyn McGaughey

The herbicide glyphosate is one of the most important, and safest, weed control tools in existence. The US Environmental Protection Agency, the European Commission and other health and environmental agencies have declared it safe as used, and it's licensed in 130 countries. So far, only one institution – the quasi-governmental World Health Organization's (WHO) International Agency for Research on Cancer (IARC) – has declared glyphosate a hazard as a "Class 2a carcinogen" ("probably carcinogenic to humans"), right alongside other 2A listed products such as DDT, Diazinon, Dieldrin, lead compounds, Malathion and – malaria. The 5 insecticides listed here have all been banned, and UNICEF reports that malaria kills one child every 30 seconds, which is about 3000 children a day. IARC's labeling of glyphosate as a Class 2A carcinogen is extremely controversial, based on faulty application of data in the listing process, and out of line with every other global regulatory system's conclusion.

However, now that the label is out there, the battle is on for manipulating public opinion, and heck with the science or validity of any conclusion other than what can be emotionally persuaded. Christopher Bosso¹ notes that "federal regulation in almost any area of national life is today's governmental response to yesterday's conditions . . . This observation applies particularly to any area of great scientific or technological complexity." The general public, particularly those Twittering each other and getting their "science" from live feeds, has no clue as to which version of The Glyphosate Story is true. And to them, it doesn't really matter anyway. For example, Judge Chhabria, the California judge handling the first bellwether glyphosate class action suits, instructed the jurors that they "must not defer to regulatory agencies" and should instead reach their own judgement based on the evidence presented at trial. Consequently, the complex, lengthy and repeated process of government scientific review of glyphosate and the weight of evidence supporting their conclusions, has no relevance. However, the juror most typically has neither the scientific specialization nor the investment of time to "weigh" one piece of evidence against another.

Accusations on glyphosate's "hazard" are based largely on the misapplication of two groups of studies that can be found in published literature: those under conditions that are grossly out of line with how human exposure could actually occur, and those that are extrapolations from human population data (epidemiology studies). For example, studies that are conducted on unusual organisms – or through extreme exposure methods – or to tissues in vitro that are isolated from their normal metabolic processes – do not produce results in and of themselves that can be related to environmental levels of exposure. A valid scientific assessment that properly casts the weight-of-evidence of each study reviewed for the assessment in the analytical process would not find such information as damning or even relevant to a hazard conclusion in the absence of collaborating data generated through validated methods of testing.

For example, a Canadian scientist, Deborah Kurrasch, who's main research is on bisphenol A, admits that the experiments she has run are in their "early days for this field of research," which means that their repeatability and validity as a predictive tool for effects in humans or other non-target organisms is unproven. With regard to her findings of "hazard" related to glyphosate, one set of experiments involves soaking nematode worms, *C. elegans*, in Touchdown (a glyphosate formulation)—"in concentrations used by pesticide applicators—as a model to understand what effect the product could have on the nervous system of animals."ⁱⁱ Unless you fill your hot tub with field-application-strength glyphosate spray mixture (and put your head underwater) and soak for some portion of your day or

(McGaughey continued)

lifetime, your exposure to glyphosate levels in the environment are inconsequential when compared to a dose like that, setting aside other complicating factors like surface-active agents in the formulation and those hot tub chemicals that keep your water clear.

The second group of studies, those pooling large amounts of human population data and disease or death incidences, the same principle is true: without collaborating findings from studies using established methodologies and interpretation of those studies in a complex risk assessment process, there are many reasons why epidemiology studies cannot stand on their own to “predict” a hazard. A group of scientists working under a grant from NIEHS published one such “meta-analysis” on glyphosate.ⁱⁱⁱ Their conclusion was that their “meta-analysis” of human epidemiological studies suggests a compelling link between exposures to glyphosate-based herbicides and increased risk for non-Hodgkin’s Lymphoma (NHL). However, the underlying variabilities in data, assumptions on exposure, and even the initial hypothesis of such an analysis hugely complicate the actual power of the “meta-analysis” to reliably point to an “increased risk” for a single given endpoint such as NHL.

Add to the uncertainty of the methods the uncertainty of the disease itself that is at issue, non-Hodgkin’s Lymphoma. According to the Mayo Clinic, “Non-Hodgkin’s lymphoma is more common than the other general type of lymphoma — Hodgkin lymphoma. Many different subtypes of non-Hodgkin’s lymphoma exist. . . In most cases, doctors don’t know what causes non-Hodgkin’s lymphoma. . . In most cases, people diagnosed with non-Hodgkin’s lymphoma don’t have any obvious risk factors. And many people who have risk factors for the disease never develop it.”^{iv} There are six types of Hodgkin lymphoma, but to date at least 61 types of lymphomas have been described that have different characteristics from Hodgkin lymphoma. These were designated non-Hodgkin lymphomas and are divided further based on their development, spread and treatment options. Today, non-Hodgkin lymphoma represents the most common malignancy of the lymphatic system, and since the early 1970’s the incidence rates have nearly doubled.^v Since medicine does not know what causes this cancer, and it is actually a disease of many different forms, and since no one form of this disease is connected to any specific set of risk factors, blaming glyphosate for an “increased risk” of is simply not possible.

As Roger Peng reports in the Royal Statistical Society’s magazine *Significance*, we have “a growing problem in science today: collecting data is becoming too much fun for everyone. Developing instruments, devices, and machines for generating data is fascinating, particularly in areas where little or no data previously existed. Our phones, watches, and eyeglasses all collect data. Because collecting data has become so cheap and easy, almost anyone can do it. . . Data follow us everywhere and analyzing them has become essential for all kinds of decision-making. Yet, while our ability to generate data has grown dramatically, our ability to understand them has not developed at the same rate.”

The formula, then, is this: [A widely-used, largely innocuous-to-humans herbicide introduced in the 1970’s] + [A disease with no cause that has nearly doubled since 1970] x [(Social Media)x(Deluge of Data)] = Unprecedented Opportunity for Public Manipulation. In 1967, Frank Graham, writing for the National Audubon Society, noted “Conservationists have learned that it is not enough to complain to the world at large. Their most effective weapon against pollution is a well-substantiated case aimed at a specific target.”^{vi} At that time the target was DDT. At that time, the newly formed Environmental Defense Fund, which was leading the litigation against DDT, noted that if they were successful in the effort of banning DDT, then nothing would stop them from successfully felling their next target.^{vii}

(**McGaughey continued**)

Looking at a few clips of news items from the first 6 months of the year seems to demonstrate that The Glyphosate Story is no longer one of science:

Genetic Literacy Project: Science not Ideology

Examining the EU's contradictory treatment of glyphosate and copper sulfate pesticides

Andrew Porterfield | December 19, 2018

"The politics of the European Union have often left observers baffled. But the decisions—and lack thereof—over how to regulate two popular pesticides have culminated in a series of contortions as member countries, courts and the European Parliament try to combine a strict precautionary principle, support of organic agriculture, and science. The last category usually has received the shortest shrift. For both the herbicide glyphosate and the fungicide copper sulfate, the EU granted a five-year license. But there the similarity of how Europe handled them ends."

(https://geneticliteracyproject.org/2018/12/19/examining-the-eus-contradictory-treatment-of-glyphosate-and-copper-sulfate-pesticides/?mc_cid=63a55113fe&mc_eid=f44735d811)

Agrow Agribusiness Intelligence

US Judge agrees to limit evidence in glyphosate cancer trials

J. R. Pegg | January 7, 2019

The issues of Monsanto's alleged attempts to influence the EPA and other regulatory agencies and to manipulate public opinion are a "significant portion" of the plaintiffs' case, according to the judge.

"These issues are relevant to punitive damages and some liability questions," he explained. "But when it comes to whether glyphosate caused a plaintiff's NHL [Non-Hodgkin's Lymphoma], these issues are mostly a distraction, and a significant one at that. . . Judge Chhabria concluded that this "relatively minor concern" could be addressed by an instruction to the jurors that they "must not defer to regulatory agencies" and should instead reach their own judgement based on the evidence presented at trial."

(<https://agrow.agribusinessintelligence.informa.com/AG030678/US-judge-agrees-to-limit-evidence-in-glyphosate-cancer-trials>)

Agrow Daily News Alert

German BfR rejects report's plagiarism charge in glyphosate assessment

17 Jan 2019

The German federal institute for risk assessment, the BfR, has rejected accusations of deliberate deception while defending itself against a report claiming "plagiarism and super-ordinated copy and paste" in its assessment of the herbicide, glyphosate. Germany was the EU rapporteur member state for the renewal of glyphosate's approval and cleared the active ingredient in 2014 based on the recommendations of the BfR. The German draft re-assessment report (RAR) was forwarded to the European Food Safety Authority (EFSA), which concluded in 2015 that the ai was unlikely to be carcinogenic. In a new report, "experts" commissioned by the Greens/European Free Alliance parties discovered plagiarism "exclusively in the chapters dealing with the assessment of published studies on health risks related to glyphosate". In these chapters, about half (50.1%) of the content was identified by them as plagiarism.

(McGaughey continued)

Agrow Daily News Alert

EU court overturns EFSA refusal to release glyphosate data
08 Mar 2019

An EU court has annulled two decisions by the European Food Safety Authority (EFSA) to refuse access to certain toxicity and carcinogenicity studies on the herbicide, glyphosate. The issue centered on whether the requested information was related to emissions to the environment, because public interest overrides confidentiality considerations for such information. The EFSA argued that the information requested was not related to emissions, but the General Court of the European Court of Justice (ECJ) disagrees and says that public interest must prevail.

CropLife Magazine

The War on Glyphosate Spreads
April 3, 2019

Although glyphosate has been in use in crop fields since 1974, debate over the safety and continued use of the herbicide has never been more intense than now. And the scope of these attacks is spreading.

Although this finding [the IARC report] has been contradicted by research from other regulatory agencies around the world in the intervening years, many glyphosate opponents have consistently cited the IARC report as “proof” that the herbicide is dangerous to human health and should be banned.

Following months of indecisive votes among the 28 EU member states, an agreement to re-approve glyphosate use in the block for five years was reached in September 2017 as 18 countries voted in favor of it. Despite this, one of the countries that voted against continuing the use of glyphosate, France, vowed to “take all necessary measures to ban the product as soon as an alternative was made available.”

Agrow Daily News Alert

Bayer Releases all of its Glyphosate Safety Studies
09 April 2019

Bayer's Crop Science division has released all of the underlying safety study reports to the study summaries on the safety of legacy company Monsanto's herbicide, glyphosate. The company released 300 study summaries on the herbicide in December last year that had been submitted for the review that led to the EU renewal decision. The EU approved the herbicide for just five years after several member states rejected reapproval, coming into force December 2017.

Agrow Daily News Alert

France confirms phase out of glyphosate use by 2020 end - update
13 May 2019

France's Ministry of Agriculture has come up with an action plan to put an end to the main uses of the herbicide, glyphosate, “where alternatives exist”, by the end of 2020 and for all uses by 2022. The Ministry points out that farmers would not be left without solutions. the action plan also aims to reduce the use of agrochemicals by 25% by the end of 2020 and by 50% by 2025.

(McGaughey continued)

Agrow Daily News Alert

EU warns against MEPs' bid to influence the EFSA

Jackie Bird | 03 Jun 2019

A recent successful bid by the European Parliament to increase its representation on the management board of the European Food Safety Authority (EFSA) “should not be considered as a precedent”, warns the European Commission. The public access proposals arose out of the controversial five-year renewal of the EU approval of the herbicide, glyphosate. During the discussions on glyphosate and the public access proposals, many MEPs continued to question the independence of the EFSA despite repeated presentations by the agency at parliamentary hearings and its release of numerous documents related to the case.

Agrow Daily News Alert

Bayer appeals \$80 million award to US glyphosate cancer victim

06 Jun 2019

Bayer has appealed for legacy company Monsanto an \$80 million jury award to a man who claims exposure to the company's glyphosate-based herbicide caused his cancer. It argues that the decision runs counter to scientific evidence regarding the safety of the herbicide and conflicts with federal law.

Bayer says that either the verdict should be tossed out or that the company be granted a new trial. The company argues that US District Judge Vince Chhabria had failed to ensure a fair trial and allowed the jury to hear a “narrative ... that painted a misleading and prejudicial picture” of Monsanto's actions and the safety of glyphosate. "A number of procedural and evidentiary issues undermined the fairness and integrity of the trial," Bayer states.

Agrow Daily News Alert

Bayer seeks glyphosate alternatives and sustainability

17 Jun 2019

Bayer is setting targets on increasing sustainability of agriculture products, improved transparency and developing alternatives to glyphosate herbicide. . . Bayer says that glyphosate will play a continuing “important” role in its portfolio, while the company seeks alternative weed controls by investing some €5 billion (\$6 billion at the current rate) in research and development over the next decade. Bayer is facing various threats to its blockbuster herbicide. There are thousands of outstanding plaintiff cases claiming that glyphosate-based products resulted in third contracting cancer, and that legacy business Monsanto had failed to adequately warn users of the claimed risk. Early cases have resulted in large multimillion-dollar losses for the company. It has initiated appeals. Some countries are considering or, in some cases, promising bans on the herbicide.

* * * *

Science is losing. Agendas are winning. Banning DDT is one thing, but bringing down the world's most important herbicide with the world's best safety record? That is chilling. From its inception in 1992 at the United Nation's Earth Summit, 50,000 delegates, heads of state, diplomats and Non-governmental organizations (NGOs) hailed Agenda 21 as the “comprehensive blueprint for the reorganization of human society.” To introduce the plan, the Earth Summit Chairman, Maurice Strong boldly proclaimed,

(McGaughey continued)

“Current lifestyles and consumption patterns of the affluent middle class – involving meat intake, use of fossil fuels, appliances, air-conditioning, and suburban housing - are not sustainable.” In short, living the way we do is not sustainable. Raising crops conventionally and controlling pests that are disease vectors with insecticides is “not sustainable.” Sustainable farming practices, “limiting your footprint” and “going green” are buzzwords for curtailing your freedom to make choices about what you eat, where you go and how you get there.

ⁱ Christopher J. Bosso (1987). *Pesticides and Politics: The Life Cycle of a Public Issue*. University of Pittsburgh Press, Pittsburgh, PA.

ⁱⁱ Katarina Zimmer (2018). How Toxic is the World’s Most Popular Herbicide Roundup? *The Scientist Magazine*, February 7, 2018 as reported online (<https://www.the-scientist.com/news-opinion/how-toxic-is-the-worlds-most-popular-herbicide-roundup-30308>)

ⁱⁱⁱ Louping Zhang, L. Rana, R. M. Shaffer, et al (2019). Exposure to glyphosate-based herbicides and risk for non-Hodgkin lymphoma: A meta-analysis and supporting evidence. *Mutation Research/Reviews in Mutation Research* 178: 186-206 (February 2019) (<https://www.sciencedirect.com/science/article/pii/S1383574218300887#!>)

^{iv} Mayo Clinic (2019). Non-Hodgkin’s Lymphoma. Accessed on July 4, 2019 at <https://www.mayoclinic.org/diseases-conditions/non-hodgkins-lymphoma/symptoms-causes/syc-20375680>

^v News Medical (2019). Non-Hodgkin Lymphoma History. Accessed on July 4, 2019 at <https://www.news-medical.net/health/Non-Hodgkin-Lymphoma-History.aspx>

^{vi} Frank Graham (1967). *Audubon* 69(3): 30 (May 1967)

^{vii} Bosso Op. cit.

Let’s Talk About Glyphosate

Bayer Crop Science

Online and off, there is ongoing discussion about glyphosate, the active ingredient in most Roundup® brand herbicides and other weed-control products. It makes sense: around the globe, people are looking for information to answer questions and understand conversations around this widely-used herbicide.

We want to help you on your search for answers by sharing fact-based information, scientific findings from independent sources and institutions, and first-person accounts from those who rely on glyphosate.

Our hope is that by openly communicating about glyphosate – from why it was created to how it works, from its impacts on the environment and health to its role in modern agriculture – we can provide clarity on one of the most talked-about topics in farming.

So, what is the Bayer point of view? We are committed to helping farmers grow healthy crops for a growing world, while using natural resources efficiently, preserving the environment and protecting biodiversity.

[Click here to visit the Bayer information site.](#)

Your AERF Sponsorship is key to:

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Biology and Control of Aquatic Plants



A Best Management Practices Handbook: Third Edition

Lyn A. Gettys, William T. Haller and David G. Petty, editors

Sponsorship

The AERF respectfully requests that you consider sponsorship. AERF will continue to work on your behalf, and as a member, you will greatly benefit from our work on regulatory and research aspects of aquatic plant management. With changes in the regulatory environment now and in the future, it is essential to be involved and to support all the hard work of your AERF associates.

Please contact Carlton Layne for information on how you can best participate.

The AERF Mission

The Aquatic Ecosystem Restoration Foundation is committed to sustainable water resources through the science of aquatic ecosystem management in collaboration with industry, academia, government and other stakeholders.

Strategic Goals

- Provide the public information concerning the benefits and value of conserving aquatic ecosystems including the aquatic use of herbicides and algaecides in the aquatic environment.
- Provide information and resources to assist regulatory agencies and other entities making decisions that impact aquatic plant management.
- Fund research in applied aquatic plant management at major universities.

Upcoming Events

SCAPMS	Oct 2-4, S. Myrtle Beach, SC
FAPMS	Oct 14-17, St Petersburg, FL
MSAPMS	Nov 3-6, Baton Rouge, LA
TAPMS	Nov 26-27, Bryant, TX

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