# KELEA (Kinetic Energy Limiting Electrostatic Attraction) Assisted Restoration of Nature's Allostasis (KARNA) to Reduce Water Pollution with Secondary Benefits for Agriculture

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**Abstract**

Naturally occurring non-polluted water typically sustains a balanced coexistence of multiple life forms referred to as ecosystems. The types and relative abundance of the life forms comprising each ecosystem vary widely and are largely determined by environmental factors. Moreover, a well-functioning ecosystem contributes to the overall functionality of larger groupings of interactive ecosystems. Energy is needed to maintain the stability of each ecosystem. Potentially detrimental changes commonly occur within an ecosystem due to environmental changes, including the addition of certain foreign chemicals to the water. These changes will typically evoke a series of adaptations that collectively restore the water's sustainable and balanced life-supporting capacities. These adaptations are referred to as Nature's allostasis and require additional energy. There are limits, however, to the levels of disruptions, which can be reversed by Nature's allostasis. These limits are defined as tipping points beyond which the water is functionally impaired. Furthermore, the levels of impairments can progressively decline with the increasing unbalanced proliferation of certain life forms and the increasing accumulation of toxic chemicals. The thesis of this article is that the failures of Nature's allostasis can be attributed to insufficient energy. Conversely, Nature's allostasis can potentially be restored by the provision of additional energy. It is further postulated that Nature uses an environmental force termed KELEA, an acronym for Kinetic Energy Limiting Electrostatic Attraction, as its major source of allostasis-restoring energy. Methods are available to increase the KELEA levels of water. One such method involves the use of relatively few pellets comprising volcanic rock materials that are pulverized into fine particles and heated to partial melting temperatures, followed by slow cooling before pelleting. A commercial product is marketed as Kiko Technology. Kiko pellets are being used in conjunction with biochar and additional nutrients to improve the quality of the water in several US locations, including Spirit Lake, Iowa. The improvements have occurred in a stepwise manner, which is consistent with other means becoming progressively available within the improving ecosystems for attracting additional KELEA into the water. A series of experiments are outlined to further clarify the KELEA Assisted Restoration of Nature's Allostasis (KARNA). Improved quality of inland water will have secondary health, agricultural, and industrial benefits. Levels of chemical pollution of water should not be allowed to exceed those correctable by Nature's allostasis.



## Introduction

Chemical pollutants in water include manufactured industrial products, pharmaceuticals, petrochemicals, and agrochemicals [1]. The overall benefits to societies of polluting chemicals are generally considered greater than any environmental harm they may cause. Moreover, by not having to take financial responsibility for environmental damage, profits by manufacturers can be generated at lower direct costs to consumers. The situation is not unrestrained with certain environmental protections being established by Governmental authorities in developed countries, such as the EPA (Environmental Protection Authority) in the US.

Yet, fifty-one percent of the inland lakes and rivers in the United States are now too polluted to safely swim or fish [2]. Toxic chemicals are present throughout much of the remaining waterways. Huge levels of toxic chemicals occur especially in the vicinity of mining and fracking operations [3-4].

Pollution extends into the groundwater in land areas used to cultivate food and other crops and for the grazing of animals, including wildlife [5]. Foods can be additionally polluted with synthetic chemicals that are included during the cultivation of the crops or added during the processing of the foods [6].

Many chronic illnesses are attributed to the toxicity of chemical pollutants [7]. Particularly noteworthy are infectious diseases that may occur due to overall lowered immunity and the selective growth of pathogenic microorganisms in polluted water. Especially with gastrointestinal infections, pathogenic microbes can reenter the Nation's water as untreated sewage [8].

## Conventional Approaches to Improving the Quality of Water

As noted above, the chemical pollution of water is largely viewed as an inevitable consequence of human progress. Advances in biochemistry are helping to define specific details of the metabolic disruptions caused by both excessive quantities of natural chemicals and even relatively small amounts of synthetic chemicals. Moreover, increasing numbers of new chemicals are continually being manufactured to achieve industrial

goals. Microbes are also emerging that are capable of metabolically processing newly developed synthetic chemicals. Disrupted ecosystems may also support the excessive proliferation of certain life forms, referred to as invasive species, which would ordinarily have faced elimination within a functionally intact foreign ecosystem.

Combatting the extremes of chemical pollution has typically relied upon the physical removal of the contaminants or applying other chemicals to oppose the deleterious biochemical actions of the contaminants [9]. Chemicals are also commonly used in attempts to selectively kill pathogenic microbes and invasive animal species. Most of these efforts are expensive, directed at controlling individual contaminants, only marginally successful, and commonly lead to inadvertent secondary damage. Specific technologies are aggressively pursued upon the awarding of patents and/or when favorable political influence becomes available.

Many non-profit organizations also have the goal of reducing water pollution. Billions of dollars are raised annually through philanthropy and Governmental grants. At best, the efforts of these organizations are limited in scope and merely reduce the rate of further water pollution.

**KELEA Assisted Nature's Allostasis**

Recently conducted studies indicate that a far more effective approach to removing at least certain forms of pollution from water is to enhance Nature's allostasis capacity. This is achieved by increasing the water levels of the environmental force termed KELEA, an acronym for Kinetic Energy Limiting Electrostatic Attraction [10]. Volcanic rock materials that are pulverized and heated to their partial melting temperature before being cooled and pelleted comprise a simple, inexpensive means of adding KELEA to water. The pellets are marketed as Kiko Technologies (Figure 1). Relatively few Kiko pellets were used in conjunction with biochar to treat several heavily blue-green algae-contaminated tidal basins, referred to as sloughs, of Spirit Lake, Iowa. The first treated region was a small tributary connecting the Sandbar Slough to Spirit Lake. The toxic algae in the tributary disappeared within several days. Moreover, there was a noticeable progressive reduction in the levels of algae contamination throughout the entire slough. The treated site was revisited 6-weeks later. To the astonishment of the person visiting the treated site, a beaver had constructed a dam across the tributary [11]. The individual could not recall seeing any beaver activity adjacent to Spirit Lake over the previous five decades. Encouraged by this finding, several other toxic-algae-contaminated sloughs of Spirit Lake were treated. Based on prior experience, approximately 500 ml of a mineral and amino acid-rich solution were included with the pellets and biochar. The combination again led to the prompt reduction of the toxic algae both at and beyond the treated areas in the sloughs [12-14].

Without requiring further interventions, the treated sloughs have shown a remarkable progressing return of aquatic, land, and flying wildlife. Sightings have included muskrats, bullfrogs, crayfish, moose, mink, foxes, eagles, and swans. Fishermen are catching certain species of fish that were rarely being caught in prior years. These include yellow perch. The conclusion from fishermen, residents, members of the Spirit Lake Association, and others is that Spirit Lake and accompanying aquatic, land-based, and flying wildlife is of an especially high quality this year. Thus, quality improvements have seemingly extended into the entire Spirit Lake.

Along with regions of the Great Lakes, Spirit Lake has seen periodic massive increases in the number of zebra and quagga mussels. [15] These are considered invasive species that originally came from Ukraine and other parts of Europe, likely being carried in the ballast water of international shipping. They are detrimental to many other aquatic life forms due to nutrient depletion yet can also promote the growth of toxic cyanobacteria (blue-green algae).

Various means have been tried to eliminate zebra and quagga mussels from the many affected lakes, including the use of copper-containing compounds. These have not been particularly effective nor highly specific in the killing of the invasive mussels. Major efforts are also underway to reduce the transferring of mussels between lakes due to their attachments to the hulls of recreational boating.

A partial die-off of invasive mussels typically occurs in early summer and is generally attributed to a rising

water temperature [15]. Arguably, directly related to the apparent restoration of normal wildlife in Spirit Lake, the invasive mussels may be diminishing in numbers due to increases in natural predators, such as crayfish and yellow perch. Spirit Lake is experiencing an earlier die-off of the mussels beginning in mid-December of 2023. A notable feature in the die-off is the more rapid disintegration of the shells, such that they more rapidly convert to granular materials rather than remaining intact shells.

Similar improvements in water quality have occurred in other recently treated locations within the United States. These include a blue-green algae-contaminated lagoon and a similarly contaminated golf course waterhole in Alameda County, California [12].

These observations can be summarized as follows. Small numbers (˜10) of Kiko pellets administered in conjunction with approximately a pound of biochar (42-biochar), and 500 ml of a nutrient solution can trigger a progressive and seemingly stepwise, time-dependent process leading to the reduction in water pollution, restoration of normal wildlife, and die-off of invasive species. Once triggered, the continuing presence of the Kiko pellets and biochar is no longer necessary. Nor are the benefits restricted to the treated areas of water but extend into water contiguous with that of the treated areas. Major benefits have been seen at various locations in the US and elsewhere. This summation raises various questions that when answered should lead to further optimization of the anti-pollution measures.

**Questions Relating to KARNA (KELEA Assisted Restoration of Nature's Allostasis)**

1. What are the relative contributions, optimal amounts, and ideal proportionality of the three components currently being utilized? The relatively small amounts being used may have the intrinsic benefit of allowing the biological restoration process to proceed more sequentially. Restoration could begin with the selective growth of beneficial microbes that may outcompete pathogenic microbes. Next may be the flourishing of microinvertebrates, followed in turn by macroinvertebrates, and invertebrates. Such a progression would emulate evolution. Ways are available to quantify such sequential life-form changes in treated areas. Moreover, studies are likely to reveal previously unknown biological interactions and sensing mechanisms operating within complex ecosystems.
2. What is the mode of action of each effective component? Details are needed on the precise mechanisms of water activation using Kiko pellets, other dipolar materials, and fluctuating electrical charges. The proposed existence of KELEA as a discrete natural life force energy needs to be confirmed. The potential role of telluric currents in the activation of Kiko pellets is currently under investigation. So too is the possible relationship of electroculture and magnetoculture technologies to KELEA activation of water [16].
3. Can the effectiveness of the manufactured components be improved in economically beneficial ways, augmented, or replaced using other means of KELEA activation of water?
4. What is the timeline of the induced beneficial biological changes and what is the influence of specific forms of chemical and/or biological contamination on the emergence and temporary excesses of restorative biological agents? Precise laboratory monitoring of chemical and biological changes throughout the restoration process will yield useful information.
5. Can some of the observed biological changes be used to expedite remediation in other polluted waterways? Of particular interest will be characterizing microbes with specific catalytic abilities to degrade toxic synthetic chemicals.
6. Reminiscent of the Beauchamp/Pasteur debates [17], is the growth of invasive species due primarily to their presence or secondary to a disorder within the ecosystem due to other factors? If the latter, then intensive quarantine efforts may be unnecessary.
7. Can secondary benefits be shown, for example in farming and certain industrial processes, from the pollution reduction in water? Certainly, the benefits will extend to improved human and animal health. They will also increase outdoor enjoyment and shoreline property values.
8. What are the limits of Nature's allostasis even using maximal achievable KELEA levels?
9. Do the same Nature allostasis principles apply to reducing soil and air pollution and to improving human and animal health? Specific benefits of using Kiko pellets in large-scale rice and sugarcane

production have been described [18-19].

10. What are the implications of KELEA in other areas of basic science, including basic physics, chemistry, climate, and cosmology?

None of these questions need to be answered before the existing protocol can be employed in treating virtually all the world's polluted inland waterways. It is suggested that specific applications be compiled for public sharing. The concept of Nature's allostasis should be conveyed in educational programs, including those aimed at educating students. Regulations should be in place to limit pollution to within the augmented range of Nature's allostasis.

**Summary**

Widespread pollution of the world's waterways exists. Most prior efforts at pollution control have been directed at defining the biochemical and biological abnormalities caused by the pollutants and devising means to specifically reverse the adverse effects. Ecosystems are far more complicated than explainable by present-day science and interventions are typically only marginally effective and often have unanticipated adverse consequences. Nature can undergo self-corrective adjustments within its various ecosystems to maintain their intended functions. The term Nature's allostasis has been introduced to describe such adaptations. It is an energy and time-dependent process that may well parallel evolution in being initially regulated by microbial life forms and proceeding in a stepwise manner into beneficial and synergistic microinvertebrate, macroinvertebrate, and vertebrate life forms. The extent of disorder within an ecosystem, for example, due to excessive amounts of toxic chemicals or the over-proliferation of pathogenic microbes, may exceed Nature's capacity for allostasis. At these so-called tipping points, then can be further deterioration of the functionality of the ecosystem. It is proposed that Nature uses a natural force termed KELEA, an acronym for Kinetic Energy Limiting Electrostatic Attraction. Means are available to increase the KELEA levels of water. In doing so, it is possible to bring a disordered ecosystem back into the range of correctable allostasis. This has been shown in treated areas of Spirit Lake, Iowa, and other US locations using pellets obtained from volcanic rocks. The volcanic material is pulverized, heated to partial melting temperatures, and slowly cooled before pelleting. A commercial product is referred to as Kiko technology. Relatively few pellets are used in conjunction with biochar and nutrients to increase the KELEA levels in water. A series of questions are provided to advance the scientific understanding of KELEA and Nature's allostasis. Answering these questions should not await the use of Kiko and possibly related technologies to improve the world's waterways.

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**References**

1. Park SK, Tao Y, Meeker JD, Harlow SD, Mukherjee B (2014) Environmental risk score as a new tool to examine multi-pollutants in epidemiologic research: an example from the NHANES study using serum lipid levels.*PLoS One* 9(6):e98632.
2. Kelderman K, Phillips A, Pelton T, Schaeffer E, MacGillis-Falcon P, Bernhardt C (2022) *The Clean Water Act at 50: Promises Half-Kept at the Half Century Mark.* Environmental Integrity Project. https://environmentalintegrity.org/wp-content/uploads/2022/03/CWA-report-3.23.22-FINAL.pdf
3. Punia A, Singh SK (2021) Contamination of Water Resources in the Mining Region. In*Contamination of Water Health Risk Assessment and Treatment Strategies* . Eds.. Ahamad A, Siddiqui SI, Singh P. Elsevier, Amsterdam. 3-17.

4. Bonetti P. Leuz C, Michelon G. Large-sample evidence on the impact of unconventional oil and gas development on surface waters.*Science* 373(6557): 896-902.
5. Helmecke M, Fries E, Schulte C (2020) Regulating water reuse for agricultural irrigation: risks related to organic micro-contaminants. *Enviro. Sci Eur* 32:4
6. Food Additives, Contaminants, Carcinogens, and Mutagens (1983)*National Research Council (US) Committee on Diet, Nutrition, and Cancer. Directions for Research.* Washington (DC): National Academies Press (US). https://www.ncbi.nlm.nih.gov/books/NBK216714/
7. Sears ME, Genuis SJ (2012) Environmental determinants of chronic disease and medical approaches: recognition, avoidance, supportive therapy, and detoxification. *J Environ Public Health*2012:356798
8. Castro-Rosas J, Cerna-Cortés JF, Méndez-Reyes E, Lopez-Hernandez D, Gómez-Aldapa CA, Estrada-Garcia T (2012) Presence of faecal coliforms, Escherichia coli and diarrheagenic E. coli pathotypes in ready-to-eat salads, from an area where crops are irrigated with untreated sewage water. *Int J Food Microbiol.* 156(2): 176-180.
9. Safe Drinking Water Foundation (2017) Cleaning up after pollution. https://www.safewater.org/fact-sheets-1/2017/1/23/cleaning-up-after-pollution
10. Martin WJ (2014) *Stealth Adapted Viruses; Alternative Cellular Energy (ACE) & KELEA Activated Water.* Author House, Bloomington, IN. pp 321.
11. Martin WJ (2024) Reinvigorating polluted water ecosystems with KELEA (Kinetic Energy Limiting Electrostatic Attraction) in combination with biochar and water supplement. *Environ Anal Eco Stud* 11(5): 1353-1356.
12. Martin WJ (2024) KELEA (kinetic energy limiting electrostatic attraction) stimulated alternative cellular energy (ACE) pathway can restore allostasis in heavily polluted collections of water with secondary benefits to birds and land animals. *MOJ Eco Environ Sci* 9(1): 18-22.
13. Martin WJ (2024) KELEA assisted restoration of Nature's allostasis (KARNA) *Environ. Anal Eco Stud* 11(5): 1357-1361.
14. Martin WJ (2024) KELEA Restoring of Nature's allostasis as a low-cost alternative to using chemicals in agriculture. *Mod Tech Agri Horti Sci* 3(1): 1-5.
15. White JD (2014) Recent changes in invasive zebra mussel densities in Michigan inland lakes. Michigan Inland Lakes Convention, Michigan University. https://www.canr.msu.edu/michiganlakes/uploads/files/Convention_Presentations_Friday_May_-2/Jeffrey_White_Recent_Changes_in_Zebra_Mussel_Populations_in_Michigan_Inland_Lakes.pdf
16. Martin WJ 2024) KELEA (kinetic energy limiting electrostatic attraction) may explain electroculture and magnetoculture technologies in horticulture. *Horticult Int J* 8(1):8-10.
17. James DG (1982) The Hunterian oration on Louis Pasteur's final judgement. Host reaction, soil or terrain. *Trans Med Soc Lond* . 99-100: 131-47.
18. Martin WJ (2014) KELEA activated water leading to improved quantity & quality of agricultural crops. *Adv. Plants & Agriculture Res.*2(1):00033
19. Martin WJ (2024) A Low-Cost Practical Approach to Markedly Improving Rice Cultivation Using Kiko Volcanic Rock Derived Pellets to Enhance the Plants' Alternative Cellular Energy (ACE) Pathway via KELEA Activation of Groundwater. *Mod Concep Dev Agrono* 13(5): MCDA 000825.

**Figure 1** . Cylindrical shaped pellets obtained from the processing of volcanic rock material and marketed as Kiko Technology. The water-insoluble pellets weigh 0.8 gm and measure 8 x 8 mm with a 1 mm central hole.